3.4 AIR QUALITY

INTRODUCTION

This section describes the existing air quality in the SCAG region, identifies the potential impacts of the RTP on air quality, includes mitigation measures for the impacts, and evaluates the residual impacts.

ENVIRONMENTAL SETTING

The environmental setting addresses issues related to air pollutant emissions, including *criteria air pollutants* and *toxic air contaminants*. The term *criteria air pollutants* refers to those pollutants that are pervasive in urban environments and for which health-based state or national ambient air quality standards have been established. The term *toxic air contaminants* refers to those pollutants that occur at relatively low concentrations and are associated with carcinogenic and other adverse health effects, but for which no ambient air quality standards have been established. Criteria pollutants and toxic air contaminants are discussed in separate sections below.

Climate and Meteorology

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, air temperature gradients and local topography influence the movement and dispersal of pollutants.

The SCAG region incorporates four air basins and five air districts. The four air basins are the South Coast Air Basin (SCAB), the Mojave Desert Air Basin (MDAB), the Salton Sea Air Basin (SSAB), and the Ventura County portion of the South Central Coast Air Basin (SCCAB). The five air districts are the South Coast Air Quality Management District (SCAQMD), the Mojave Desert Air Quality Management District (MDAQMD), the Imperial County Air Pollution Control District (ICAPCD), the Antelope Valley Air Quality Management District (AVAQMD), and the Ventura County Air Pollution Control District (VCAPCD). The geographic boundaries of these air basins and air districts are shown in Figure 3.4-1 located at the end of this document.

South Coast Air Basin (SCAB)

The SCAB incorporates approximately 12,000 square miles, consisting of Orange County and the urbanized areas of San Bernardino, Riverside and Los Angeles counties. In May 1996, the boundaries of the SCAB were changed by the California Air Resources Board (ARB) to include the Beaumont-Banning area. The distinctive climate of the SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds.

The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds.[1]

The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High-pressure systems, such as the semi-permanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog. The basinwide occurrence of inversions at 3500 feet above sea level or less averages 191 days per year.[2]

The atmospheric pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 mph, smog potential is greatly reduced. [3]

Mojave Desert Air Basin (MDAB)

In total the MDAB encompasses approximately 21,480 square miles and includes the desert portions of San Bernardino County, Riverside, Palo Verde Valley, and Palmdale and Lancaster in the Antelope Valley. The MDAB is bordered by the SCAB and the Riverside County line to the south, Kern County line to the west, the Arizona and Nevada borders to the north and east, and the eastern portion of Riverside County to the southeast. The Kern County portion of MDAB is not in the SCAG Region. The climate is characteristic of a desert environment. The intervening mountain ranges block cool, moist coastal air and create hot, dry summers and cool winters. Meteorology is influenced by a moderately intense anti-cyclonic circulation, except during periods of frontal activity during the winter. On average, 20-30 frontal systems (i.e. storms) move into the MDAB each winter.[4]

The MDAB experiences high prevailing winds primarily from the south and west, which result in a visible "smog wall" being transported from SCAB through mountain passes. The exchange of lower and upper air tends to accelerate surface winds during the warm part of the day when convection is at a minimum. During the winter the rapid cooling of the surface layers at night retards this exchange of momentum, which often results in calm winds. [5]

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1 South Coast Air Quality Management District. April 1993. *CEQA air quality handbook*, p. A8-1.

2 *Ibid*, p. A8-2.

3 *Ibid.*

4 Mojave Desert Air Quality Management District. January 1996. *Triennial revision to the 1991 air quality attainment plan*.

5 *Ibid.*

The inversion conditions in the MDAB are much less favorable for the build-up 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. [6]

Salton Sea Air Basin (SSAB)

The SSAB includes all of Imperial County and the desert portion of Riverside County between the SCAB and the MDAB (known as the Coachella Valley area). Imperial County extends over 4,597 square miles, bordering on Mexico to the south, Riverside County to the north, San Diego County on the west, and the State of Arizona on the east. [7]

The southern portion of the SSAB is a part of the larger physiographic province of the Salton Trough. This province is a very flat basin surrounded by mountains: the Peninsular Ranges to the west, the Chocolate, Orocopia and Cargo Muchaco Mountains to the east. Most of the Trough is below sea level, and consists generally of desert, with agricultural land uses located at the north and south ends of the Salton Sea. [8]

Climatic conditions in the SSAB are governed by the large-scale sinking and warming of air in the semi-permanent subtropical high pressure center of the Pacific Ocean. The high-pressure ridge blocks most mid-latitude storms except in the winter when the high-pressure ridge is weakest and farthest south. Similarly, the coastal mountains prevent the intrusion of any cool, damp marine air found in California coastal environs. Because of the weakened storms and the mountainous barrier, the SSAB experiences clear skies, very low humidities, extremely hot summers, mild winters, and little rainfall. The flat terrain of the valley and the strong temperature differentials created by intense solar heating produce moderate winds and deep thermal convection. [9]

The combination of subsiding air, protective mountains, and distance from the ocean all combine to severely limit precipitation. Rainfall is highly variable with precipitation from a single heavy storm exceeding the entire annual total during a later drought condition. [10]

Humidities are low throughout the year, ranging from 28 percent in summer to 52 percent in winter. The large daily oscillation of temperature produces a corresponding large variation in the

6 *Ibid.*

7 Imperial County Air Pollution Control District. April 1992. *1991 air quality attainment plan*.

8 *Ibid.*

9 *Ibid.*

10 *Ibid.*

relative humidity. Nocturnal humidities rise to 50-60 percent, but drop to about 10 percent during the day. [11]

The SSAB occasionally experiences periods of high winds. Wind speeds exceeding 31 mph occur most frequently in April and May. On an annual basis, strong winds ($\geq$31 mph) are observed 0.6% of the time and speeds of less than 6.8 mph account for more than one-half of the observed winds. Wind statistics indicate prevailing winds are from the west-northwest through southwest; a secondary flow maximum from the southeast is also evident. [12]

Imperial County, in particular, experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken allowing pollutants to more easily disperse. Weak surface inversions are caused by cooling of air in contact with the cold surface of the earth at night. In valleys and low-lying areas, this condition is intensified by the addition of cold air flowing downslope from the hills and pooling on the valley floor. [13]

The presence of the Pacific high-pressure cell can cause the air mass aloft to sink. As the air descends, compressional heating warms it to a temperature higher than the air below. This highly stable atmospheric condition, termed a subsidence inversion can act as a nearly impenetrable lid to the vertical mixing of pollutants. The strength of these inversions makes them difficult to disrupt. Consequently, they can persist for one or more days, causing air stagnation and the buildup of pollutants. Highest or worst-case ozone levels are often associated with the presence of this type of inversion. Subsidence inversions are common from November through June, but appear to be relatively absent July through October. [14]

South Central Coast Air Basin (SCCAB)

The SCAG region includes the Ventura County portion of the SCCAB. Ventura County is comprised of coastal mountain ranges, the coastal shore, the coastal plain, and several inland valleys. The northern half of the County (Los Padres National Forest) is extremely mountainous with altitudes up to 8,800 feet. Consequently, the climate in the northern half of the County varies a great deal depending on elevation. Therefore, the climatological and meteorological description presented for Ventura County focuses on the southern half of the County where violations of federal and state ozone standards occur. [15]

In the winter, low-pressure systems originating in the northern Pacific Ocean bring clouds, rain, and wind into Ventura County. The average annual temperature in the coastal and inland valleys of the southern half of Ventura County ranges from the upper 50s at the coast (Point Mugu) to the mid-60s in Simi Valley. The difference between the maximum and minimum temperatures

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[11] *Ibid.*

[12] *Ibid.*

[13] *Ibid.*

[14] *Ibid.*

[15] Ventura County Air Pollution Control District. November 1996. *1994 air quality management plan*.

becomes greater as the distance increases from the coast. The average minimum and maximum temperatures at Point Mugu are 50°F and 60°F, respectively, while at the inland location of Simi Valley, the averages are 52°F and 77°F. The smaller range of temperatures at Point Mugu demonstrates the moderating influence of the ocean on air temperature. The ocean's ability to warm and cool the air while its temperature remains relatively unchanged produces the moderating effect. Inland area temperatures are more prone to rapid fluctuations. [16]

Almost all rainfall in Ventura County falls during the winter and early spring (November through April). Summer rainfall is normally restricted to scattered thundershowers in lower elevations, and somewhat heavier activity in the mountains. Humidity levels vary throughout the County. The range of humidity is primarily influenced by proximity to the ocean. Although the County's climate is semi-arid, average humidity levels are relatively high due to the marine influence. Coastal areas are more humid than inland areas during typical fair weather. The reverse is true during stormy periods. The lowest humidity levels are recorded during Santa Ana wind conditions. [17]

Ventura County winds are dominated by a daily land-sea breeze cycle. The land-sea breeze regime is broken only by occasional winter storms and infrequent strong northeasterly Santa Ana wind flows. Since the sea breeze is stronger than the land breeze, the net wind flow during the day is from west to east. Under light land-sea breeze regimes, recirculation of pollutants can occur as emissions move westward during morning hours, and eastward during the afternoon. This movement can cause a build-up of pollutants over several days. [18]

The vertical dispersion of air pollutants in Ventura County is limited by the presence of persistent temperature inversions. Approximately 60 percent of all inversions measured at Point Mugu are surface-based with most occurring during the morning hours. [19]

REGULATORY SETTING

Federal Regulatory Setting

Federal Clean Air Act (CAA)

The CAA was passed in 1963 by the U.S. Congress and has been amended several times. The 1970 Clean Air Act Amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including non-attainment requirements for areas not meeting national ambient air quality standards (NAAQS) and the Prevention of Significant Deterioration (PSD) program. The 1990

16 *Ibid.*

17 *Ibid.*

18 *Ibid.*

19 *Ibid.*

Amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the U.S.

U.S. Environmental Protection Agency (EPA)

The Federal CAA requires the EPA to establish national ambient air quality standards for air pollutants or air pollutant groups that pose a threat to human health or welfare. The primary responsibility for implementing and enforcing the provisions of the Clean Air Act rests within the individual states. This is accomplished through state implementation plans (SIPs), which must be submitted to the USEPA for review and approval. SIP submittal schedules vary by air basin, pollutant and the severity of air quality problems.

Federal Air Quality Standards

The CAA requires the EPA to list air pollutant compounds which may endanger public health or welfare; to publish air quality "criteria" describing the latest scientific knowledge on these compounds, their pollutant interactions, and control techniques; and to identify the NAAQS protective of public health and welfare. Currently, EPA has established national standards for ozone (O3), carbon monoxide (CO), sulfur dioxide (SO2), nitrogen dioxide (NO2), particulate matter (PM10 and PM2.5), and lead (Pb). The national air quality standards are presented in Table 3.4-1. For each compound, this table describes health issues related to exposure to each pollutant and identifies the major source(s) of these emissions.

National standards consist of two parts: an allowable concentration of a pollutant and an averaging time over which the concentration is to be measured. The allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (e.g., one-hour) or to a relatively lower average concentration over a longer period (e.g., 8 hours, 24 hours, or 1 month). For some pollutants, there is more than one air quality standard, reflecting both its short-term and long-term effects.

Federal Criteria Pollutants

Ozone (O3)

Ozone is a reactive pollutant, which is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NOX). ROG and NOX are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Short-term exposure to elevated concentrations of

Table 3.4-1: Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone (O3)	1 hour	0.09 ppm	0.12 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Motor vehicles.
	8 hours	---	0.08 ppm*		
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9 ppm	9.0 ppm		
Nitrogen Dioxide (NO2)	Annual Average	---	0.05 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.25 ppm	---		
Sulfur Dioxide (SO2)	Annual Average	---	0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	---		
	24 hours	0.04 ppm	0.14 ppm		
Suspended Particulate Matter (PM10, PM2.5)	Annual Geometric Mean	30 ug/m3 (PM10)	65 ug/m3 (PM2.5)*	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
	Annual Arithmetic Mean	---	50 ug/m3 (PM10)		
	24 hours	50 ug/m3 (PM10)	150 ug/m3 (PM10) 15 ug/m3 (PM2.5)*		
Lead	Monthly	1.5 ug/m3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction (in severe cases).	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 ug/m3		
Sulfates (SO4)	24 hours	25 ug/m3	---	Decrease in ventilatory functions; aggravation of asthmatic symptoms; aggravation of cardio-pulmonary disease; vegetation damage; degradation of visibility; property damage.	Industrial processes.

Source: California Air Resources Board, *Ambient Air Quality Standards*, January 25, 1999.
* pending court decision

ozone is linked to such health effects as eye irritation and breathing difficulties. Ozone may pose its worst health threat to those who already suffer from respiratory diseases. [20]

In 1979, EPA promulgated the current ozone standard, 0.12 parts per million (ppm), which is measured over a one hour period (i.e. the 1-hour standard). This standard addresses peak concentrations of ozone typically seen in urban areas.

[20] South Coast Air Quality Management District. April 1993. *CEQA air quality handbook*.

In 1997, EPA revised the ozone standard setting it at 0.08 ppm averaged over an 8-hour time frame. However, a number of events delayed implementation of the new 8-hour standard. In May 2003, the EPA released its proposed rule to implement the 8-hour ozone NAAQS and plans to issue a final rule by the end of 2003. The proposed rule outlines steps that areas would be required to take to maintain or further clean their air and protect the public from ground-level ozone pollution.

In general, the 8-hour standard is more protective of public health and more stringent than the 1-hour standard because it addresses a broader period of time (i.e. a.m. and p.m. operation) and is more difficult to control. There are more areas that do not meet the 8-hour standard than there are areas that do not meet the 1-hour standard, including large areas of California. The South Coast Air Basin (SCAB) will be classified as a severe nonattainment area for the 8-hour standard. EPA will promulgate final attainment designations by April 15, 2004 (the 8-hour designations are consistent with the 1-hour designations for the SCAG Region). All areas not currently attaining the 1-hour standard, such as the SCAB, must submit an attainment demonstration plan within three years of designation (April 2007). The attainment dates vary by area and range between 2007 to 2021. The SCAB would have 17 years from that date of designation to demonstrate attainment (April 2021).

Carbon Monoxide (CO)

CO is a non-reactive pollutant that is a product of incomplete combustion. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic and are also influenced by meteorological factors such as wind speed and atmospheric mixing. Under inversion conditions, carbon monoxide concentrations may be distributed more uniformly over an area out to some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as for fetuses.

Sulfur Dioxide (SO2)

SO2 is formed through the oxidation of elemental sulfur; suspended sulfates are the product of further oxidation of SO2. The main sources of sulfur dioxide include fuel combustion, chemical plants, sulfur recovery plants and metal processing facilities. In some parts of the state, elevated levels can also be due to natural causes, such as wind-blown dust and sea salt spray. Suspended sulfates contribute to overall particulate concentrations in ambient air which, if high enough, are suspected to be a cause of premature death in individuals with pre-existing respiratory disease.

Nitrogen Dioxide (NO2)

NO2 and SO2 are two gaseous compounds within a larger group of compounds, NOX and sulfur oxides (SOX), respectively, which are products of the combustion of fuel. NOX and SOX emission sources can elevate local NO2 and SO2 concentrations, and both are regional precursor

compounds to particulate matter. As described above, NOX is also an ozone precursor compound and can affect regional visibility. (NO2 is the "whiskey brown" colored gas readily visible during periods of heavy air pollution.) Elevated concentrations of these compounds are associated with increased risk of acute and chronic respiratory disease.

Particulate Matter (PM10 and PM2.5)

PM10 consists of particulate matter that is 10 microns or less in diameter (a micron is one-millionth of a meter), and PM2.5 consists of particulate matter 2.5 microns or less in diameter. Both PM10 and PM2.5 represent fractions of particulate matter, which can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect.

National standards for particulate matter were first established in 1971. The original particulate matter standards were defined in terms of "total suspended particulate" (TSP), which includes particles that are 30 microns or smaller in diameter. In 1987, USEPA re-defined the standards in terms of PM10, instead of TSP, to focus on smaller-diameter particles, based on a comprehensive review of information on the health effects from inhaling particulate matter. Then, in December 1994, USEPA began another review process to determine if the PM10 standards set in 1987 provide a reasonable margin of safety, and if a new standard should be established for finer particles.

Based on numerous epidemiological studies and other health and engineering related information, USEPA established new standards for fine particulate matter (PM2.5) in 1997. Before establishing the new PM2.5 standards, discussions were conducted with the Clean Air Scientific Advisory Committee (CASAC). CASAC is a group of nationally recognized experts in the fields related to air pollution, environmental health, and engineering. CASAC reviewed and commented on the information generated by EPA regarding proposed particulate matter standards.

Subsequent to these discussions and reviews, EPA established PM2.5 concentration standards of 65 micrograms per cubic meter, 24-hour average, and 15 micrograms per cubic meter, annual average. EPA also re-affirmed the national PM10 standards of 150 micrograms per cubic meter, 24-hour average, and 50 micrograms per cubic meter, annual average, as providing an adequate margin of safety for exposure to particles with diameters of 10 microns or less. These recommendations were released in a staff report[21] that presents the conclusions of the Agency and of the review committee, CASAC. EPA is scheduled to release a PM2.5 implementation rule in late 2003 and finalize area designations in December 2004. The expected attainment dates are 2009-2014.

[21] United States Environmental Protection Agency. July 1996. *Review of the national ambient air quality standards for particulate matter, policy assessment of scientific and technical Information*, EPA-452/R-96-013.

Several studies that EPA relied on for their staff report have shown an association between exposure to particulate matter, both PM10 and PM2.5, and respiratory ailments or cardiovascular disease.[22,23,24] Other studies have related particulate matter to increases in asthma attacks.[25,26] In general, these studies have shown that short-term and long-term exposure to particulate matter can cause acute and chronic health effects. Fine particulate matter (PM2.5), which can penetrate deep into the lungs, causes more serious respiratory ailments.

Lead (Pb)

Gasoline-powered automobile engines used to be the major source of airborne lead in urban areas. Excessive exposure to lead concentrations can result in gastrointestinal disturbances, anemia, kidney disease, developmental disorders, and in severe cases, neuromuscular and neurologic dysfunction. The use of lead additives in motor vehicle fuel has been eliminated in California, and lead concentrations are thought to have declined substantially as a result.

Toxic Air Contaminants (TACs)

TACs also referred to as hazardous air pollutants (HAPs), are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. Toxic air contaminants are emitted by a variety of industrial processes such as petroleum refining, electric utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as particulate matter or as vapors (gases). Toxic air contaminants include metals, other particles, gases adsorbed onto particles, and certain vapors from fuels and other sources. An example of such a pollutant is the chemical benzene, which is in gasoline. Inhaling fumes that contain benzene could increase a person's cancer risk. Another example is particulate matter from diesel fuel exhaust.

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems. Pollutants deposited onto soil or into lakes and streams affect ecological systems and eventually human health through consumption of contaminated food.

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22 Pope, C.A., J. Schwartz, and M. Ransom. 1992. *Daily mortality and PM10 pollution in Utah Valley*, Arch. Environ. Health 42:211-217.

23 Thurston, G.D., K. Ito, P. Kinney and M. Lippman. 1992. *A multi-year study of air pollution and respiratory hospital admissions in three New York state metropolitan areas*, J. Expos. Analysis and Environ. Epidemiol. 2:429.

24 Burnett, R.T., R.E. Dales, D. Krewski. 1995. *Associations between ambient particulate sulfate and admissions to Ontario hospitals for cardiac and respiratory diseases*, Am. J. Epidemiolology 142:15-22.

25 Whittemore, A.S., and E.L. Korn. 1980. *Asthma and air pollution in the Los Angeles area*, A.J. Public Health 70:687.

26 Pope, C.A., D.W. Dockery, J.D. Spengler, and M.E. Razienne. 1991. *Respiratory health and PM10 pollution: A daily time series*, Am. Rev Respir. Dis. 144:688.

Toxic air contaminants are regulated under both state and federal laws. The 1970 Amendments to the Clean Air Act (first enacted by Congress in 1963) included a provision to address air toxics. Under Title III of the Clean Air Act, EPA establishes and enforces National Emissions Standards for Hazardous Air Pollutants (NESHAPs), which are nationally uniform standards oriented towards controlling particular hazardous air pollutants (HAPs). Title I, Section 112(c) of the CAA further directed EPA to develop a list of sources that emit any of 189 HAPs, and to develop regulations for these categories of sources. To date, EPA has listed 174 categories and developed a schedule for the establishment of emission standards.[27] Rather than promulgating NESHAPs for each pollutant, the CAA, as amended in 1990, directs EPA to set source category, technology based standards requiring companies to sharply reduce emissions of toxic air contaminants. These standards require industries to install Maximum Achievable Control Technology (MACT), which is defined as the control technology achieving the maximum degree of reduction in the emission of HAPs, taking into account cost and other factors. EPA is required to establish and phase in specific performance based standards for all of the industries that emit one or more of the pollutants in significant quantities.

State Regulatory Setting

California Environmental Quality Act (CEQA)

Projects that have the potential to emit air pollutants are generally required to undergo CEQA review to determine the potential for significant impacts from both the construction and operation phases of the project.[28]

California Clean Air Act

In 1988, the State Legislature passed the California Clean Air Act, which established California's air quality goals, planning mechanisms, regulatory strategies, and standards of progress. The California Clean Air Act provides the State with a comprehensive framework for air quality planning regulation.

The California Clean Air Act requires attainment of state ambient air quality standards by the earliest practicable date. Attainment plans are required for air districts in violation of the state ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide standards.

State Air Quality Standards

California has adopted more stringent standards than the federal government for most of the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted ambient air quality standards for some pollutants for which there are no corresponding national standards, as shown in Table 3.4-1.

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[27] United States Environmental Protection Agency, Office of Compliance, Office of Enforcement and Compliance Assurance. October 1998. *EPA office of compliance sector notebook project: Air transportation industry*.

[28] South Coast Air Quality Management District. April 1993. *CEQA air quality handbook*.

State Criteria Pollutants

The State criteria pollutants are the same as those identified under the federal criteria pollutants; refer to the description and discussion of the criteria pollutants above (ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, particulate matter, and lead).

Toxic Air Contaminant (TAC) Identification and Control Act

The California Air Resources Board's (ARB) statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983) established a process for identifying TACs and provided the authority for developing retrofit TAC control measures on a statewide basis. In 1992, the State legislature adopted Assembly Bill 2728 to provide a legal framework for the integration of the existing State air toxics programs, including those developed under AB 1807, with the new federal program discussed above. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly 1987) supplements the AB 1807 program, by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

California Air Resources Board (ARB)

The ARB is authorized to adopt standards, rules, and regulations to achieve the maximum degree of toxic air contaminant emission reduction possible from vehicular and other mobile sources. As part of this effort, the ARB adopted Phase 2 Reformulated Gasoline, a cleaner-burning gasoline, in spring of 1996. Phase II Reformulated Gasoline required the average benzene content to be reduced from 2.0 percent to 1.0 percent and the xylene content to be reduced from 11.0 percent to 2.4 percent.

The ARB and the Office of Environmental Health Hazard Assessment (OEHHA) have been evaluating diesel exhaust since 1989 under California's air toxics program, for potential identification as a toxic air contaminant. On August 27, 1998, the ARB formally approved a proposal to list particulate emissions from diesel-fired engines as a TAC. Emissions from diesel-fueled engines are mainly composed of particulate matter and gases, which contain potential cancer-causing substances such as arsenic, benzene, formaldehyde, nickel, and polycyclic aromatic hydrocarbons.

The ARB has already adopted many regulations that reduce particulate matter, nitrogen oxides (NOX), and sulfur oxides (SOX) emissions from diesel-fueled engines. These measures also reduce toxic air contaminants.

The existing control measures are as follows:

- A requirement for low sulfur/low aromatic diesel fuel that reduces particulate matter, NOX, and SOX, emissions (October 1993).

- Emission standards that restrict the amount of particulate matter emitted by new diesel cars, trucks, urban buses, and heavy-duty trucks (phased in from 1982 through 1996);

- Emission standards for NOX emissions from diesel cars, trucks, and urban buses (phased in from 1984 through 2004);

- The roadside testing of heavy-duty on-road vehicles for excessive particulate matter emissions (1991) and a requirement for fleet inspection and maintenance of heavy-duty vehicles (Summer 1998); and

- Emission standards that restrict the amount of particulate matter and NOX that can be emitted from many 1995 and newer diesel utility engines.

The planned control measures are as follows:

- Requirement to use low sulfur/low aromatic diesel fuel in locomotives.

- Reduction in the sulfur content in diesel fuel to no more than 15 parts per million (ppm) beginning in 2006.

- Reduction of particulate matter emissions by 2007 for heavy duty trucks by an additional 90 percent to emission levels no more than 0.01 grams per brake horsepower-hour through the use of catalytic filter traps.

- $25 million incentive program (the Moyer Program) to reduce TAC emissions from heavy-duty diesel-fueled engines by providing grants for the incremental cost of lower-emission engines.

Existing Air Quality within the SCAG Region

The CAA and California Clean Air Act classify air basins in terms of the severity of existing conditions and set deadlines for meeting ambient air quality standards depending on assigned classification. The CAA categories range from “marginal” to “extreme” and the California Clean Air Act categories are “moderate, serious, severe, and extreme.”

Existing air quality is monitored at over 50 monitoring stations throughout the SCAG region. The location of these stations is shown in Figure 3.4-1 located at the end of this document. Year 2000 through 2002 monitoring data is summarized in Table 3.4-2, which shows applicable standards, peak monitored concentrations, and the number of times standards were exceeded within each air basin.

Federal and State Attainment and Non-Attainment Areas within the SCAG Region

Under amendments to the CAA, EPA has classified air basins, or portions thereof, as either “attainment” or “non-attainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. In 1988, the State Legislature passed the California Clean Air Act, which is patterned after the CAA to the extent that areas are designated as “attainment” or “non-attainment,” but with respect to the state standards, rather than the national standards. Thus, areas in California have two sets of attainment/non-attainment designations: one set with respect to the national standards and one set with respect to the state standards.

Table 3.4-2: Air Quality Monitoring Data Summary

Pollutant	Averaging Time	Standard*	2000 Peak Conc.	2000 No. Days Exceed	2001 Peak Conc.	2001 No. Days Exceed	2002 Peak Conc.	2002 No. Days Exceed
Peak Concentrations and Exceedances: South Coast Air Basin								
O3	1-hour	0.09 ppm	0.18 ppm	17	0.19 ppm	26	0.17 ppm	32
	8-hour	0.08ppm	0.16 ppm	73	0.14 ppm	74	0.15 ppm	82
CO	1-hour	20.00 ppm	14.00ppm	0	12 ppm	0	16.00 ppm	-
	8-hour	9.00 ppm	10.00 ppm	2	7.71 ppm	0	10.1 ppm	1
NO2	1-hour	0.25 ppm	0.21 ppm	0	0.25 ppm	0	0.26 ppm	1
	AAM	0.05 ppm	0.04 ppm	-	0.04 ppm	-	0.04 ppm	-
SO2	1-hour	0.25 ppm	0.17 ppm	0	0.09 ppm	0	0.07 ppm	-
	24-hour	0.04 ppm	0.04 ppm	0	0.01 ppm	0	0.02 ppm	-
	AAM	0.03 ppm	0.00 ppm	-	0		-	-
PM10	24-hour	150 ug/m3	116.00 ug/m3	42	219 ug/m3	1	139 ug/m3	0
	AAM	50.00 ug/m3	60.1 ug/m3	-	63.1 ug/m3	-	58.5 ug/m3	-
	AGM	30.00 ug/m3	54.7 ug/m3	-	54.3 ug/m3	-	53.4 ug/m3	-
PM2.5	24-hour	65 ug/m3	119.6 ug/m3	-	98.0 ug/m3	-	82.5 ug/m3	8
	AAM	15 ug/m3	28.3 ug/m3	-	31.0 ug/m3	-	27.5 ug/m3	-
Lead	Monthly	1.50 ug/m3	0.09 ug/m3	0	0.23 ug/m3	0	0.06 ug/m3	-
	Quarterly	1.50 ug/m3	0.06 ug/m3	0	0.12 ug/m3	0	0.05 ug/m3	-
SO4	24-hour	25.00 ug/m3	26.7 ug/m3	1	20.6 ug/m3	0	17.8 ug/m3	-
Peak Concentrations and Exceedances: Mojave Desert Air Basin								
O3	1- hour	0.09 ppm	0.16 ppm	11	0.15 pmm	6	0.16 ppm	16
	8-hour	0.08 ppm	0.13 ppm	72	0.12 ppm	65	0.12 ppm	66
CO	1-hour	20.00 ppm	6.0 ppm	0	6.1 ppm	0	6.1 ppm	0
	8-hour	9.00 ppm	4.34 ppm	0	3.33 ppm	0	2.24 ppm	0
NO2	1-hour	0.25 ppm	0.10 ppm	-	0.1	-	MD: 0.085 ppm	0
							AV: 0.101 ppm	0
SO2	1-hour	0.25 ppm	0.025 ppm	0	0.012 ppm	0	0.012 ppm	0
	24-hour (AA?)	0.04 ppm	0.007 ppm	0	0.007 ppm	0	0.001 ppm	0
PM10	24-hour	50.00 ug/m3	90 ug/m3	-	115 ug/ m3	-	208 ug/m3	6
	AAM	50.00 ug/ m3	33.6 ug/m3	-	29.8 ug/ m3	-	34.3 ug/m3	-
	AAM	30.00 ug/ m3	19.3 ug/m3	-	26.6	-	30.8 ug/m3	-
PM2.5	24-hour	65 ug/ m3	38.6 ug/m3	-	35.0 ug/ m3	-	Lanc: 24.2 ug/m3	-
							Vict.: 37.6 ug/m3	-
	AAM	15ug/m3	11.9 ug/m3	-	11.5 ug/m3	-	Lanc.: 10.5 ug/m3	-
							Vict.: 13.7 ug/m3	-

Table 3.4-2: Air Quality Monitoring Data Summary (cont.)

Pollutant	Averaging Time	Standard*	2000 Peak Conc.	2000 No. Days Exceed	2001 Peak Conc.	2001 No. Days Exceed	2002 Peak Conc.	2002 No. Days Exceed
Peak Concentrations and Exceedances: South Central Coast Air Basin								
O_3	1-hour	0.09 ppm	0.128 ppm	2	0.129 ppm	2	0.132 ppm	1
CO	1-hour	20.00 ppm	6.2 ppm	0	8.3 ppm	0	6.2 ppm	0
	8-hour	9.00 ppm	4.29 ppm	0	3.08	0	El Rio: 1.2 ppm	0
							Simi: 2.3 ppm	0
NO2	1-hour	0.25 ppm	0.12 ppm	0	0.11 ppm	0	0.064 ppm	0
	AAM	0.05 ppm	0.02 ppm	-	0.19 ppm	-	0.017 ppm	0
SO2	1-hour	-	0.16 ppm	0	0.22 ppm	0	0.007 ppm	0
	3-hour	0.50 ppm					0.004 ppm	0
	24-hour	0.14 ppm	0.03 ppm	0	0.04	0	0.004 ppm	0
	AAM	0.03 ppm	0.004 ppm	-	0.005 ppm	-	0.001 ppm	0
PM10	24-hour	50.00 ug/m3	113 ug/m3	-	89 ug/m3	-	178 ug/m3	6
	AAM	50.00 ug/m3	33.8 ug/m3	-	31.5 ug/m3	-	43.2 ug/m3	-
PM2.5	24-hour	65 ug/m3	55.3 ug/m3	-	57.6 ug/m3	-	46.4 ug/m3	-
	AAM	15 ug/m3	10.3 ug/m3	-	14.9 ug/m3	-	14.6 ug/m3	-
Peak Concentrations and Exceedances: Salton Sea Air Basin								
O3	1-hour	0.09 ppm	0.17 ppm	5	0.17 ppm	15	0.16 ppm	5
	8-hour	0.08 ppm	0.11 ppm	33	0.11 ppm	54	0.12 ppm	55
CO	1-hour	20.00 ppm	19.9 ppm	0	16.0 ppm	0	19.2 ppm	0
	8-hour	9.00 ppm	15.47 ppm	6	12.33 ppm	6	11.56 ppm	3
NO2	1-hour	0.25 ppm	0.19 ppm	0	0.09 ppm	-	0.1 ppm	0
	AAM	0.05 ppm	0.016 ppm	-	0.017 ppm	-	0.017 ppm	-
PM10	24-hour	50.00 ug/m3	268 ug/m3	36	647 ug/m3	29	373 ug/m3	6
	AAM	50.00 ug/m3	95.2 ug/m3	-	86.2 ug/m3	-	34.3 ug/m3	-
	AGM	30.00 ug/m3	73.0 ug/m3	-	77.4 ug/m3	-	30.8 ug/m3	-
PM2.5	24-hour	65 ug/m3	84.2 ug/m3	-	60.2 ug/m3	-	46.5 ug/m3	-
	AAM	15 ug/m3	16.9 ug/m3	-	14.9 ug/m3	-	15.1 ug/m3	-

" – " means no data
ppm: parts per million
ug/m^3: micrograms per meter cubed
MD: Mojave Desert
AV: Antelope Valley
Lanc.: Lancaster
Vict.: Victorville

* Value is the most stringent of either the federal or state standard.

Source: SCAQMD's Annual Data Summary
VCAPCD's Annual Data Summary
MDAQMD's Annual Data Summary
ICAPCD's Annual Data Summary

Air Quality Plans and Programs

Under the CAA Amendments, areas designated as "non-attainment" are required to prepare regional air quality plans, which set forth a strategy for bringing an area into compliance with the

standards. Air quality plans developed to meet Federal requirements are included in an overall program referred to as the State Implementation Plan (SIP).

At the local level, the air quality management districts (AQMDs) and air pollution control districts (APCDs) are responsible for planning and implementation programs to attain Federal and State ambient air quality standards. As previously mentioned, there are currently four air basins and five air districts within the SCAG region, as described below.

- South Coast Air Basin (SCAB): covers the urbanized portions of the Los Angeles, Orange, Riverside, and San Bernardino counties and is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD).

- Ventura County portion of the South Central Coast Air Basin (SCCAB): covers the entire Ventura County and is within the jurisdiction of the Ventura County Air Pollution Control District (VCAPCD).

- Mojave Desert Air Basin (MDAB): covers the desert portions of the Los Angeles, Riverside, and San Bernardino counties. A small portion of this air basin is in Kern County and outside of the SCAG region. The SCAG portion of this air basin is under jurisdiction of three air districts:

    - Mojave Desert Air Quality Management District (MDAQMD) is the responsible agency for portions of the MDAB situated in San Bernardino County and the eastern part of Riverside County. The Riverside County portion is known as the Palo Verde Valley area.

    - SCAQMD is the responsible agency for a portion of the MDAB in Riverside County that is situated between the Salton Sea Air Basin (SSAB) and the Palo Verde Valley area.

    - Antelope Valley Air Quality Management District (AVAQMD) is the responsible agency for the Los Angeles County portion of the MDAB.

- Salton Sea Air Basin (SSAB): covers the entire County of Imperial and the eastern desert portion of Riverside County. The air basin is under the jurisdiction of two air districts:

    - Imperial County Air Pollution Control District (ICAPCD) is the responsible agency for the Imperial County portion of the SSAB.

    - SCAQMD is the responsible agency for the Riverside County portion of the SSAB situated between the SCAB and the MDAB (known as Coachella Valley).

South Coast Air Quality Management District (SCAQMD)

The regional agency responsible for developing air quality plans for the SCAB, and small portions of MDAB and SSAB, is the SCAQMD. SCAQMD is also the agency with permit authority over most types of stationary sources in the SCAB. SCAQMD exercises permit authority through its

Rules and Regulations, which has evolved to reflect state and federal requirements for "extreme" ozone nonattainment areas.

The SCAB is currently designated as a nonattainment area for state and national ambient air quality standards for ozone and respirable particulate matter (PM10).[29] The SCAB is still classified as a nonattainment area for the national CO standard and technically met the CO standards in 2002. The SCAQMD plans to request reclassification in the next few years. The SCAB is a "maintenance" area for the national NO2 standard, which denotes that it had once been a nonattainment area for that pollutant standard as well.

The CAA and the California Clean Air Act require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). Plans are also required under federal law for areas designated as "maintenance" for national standards. Such plans are to include strategies for attaining or maintaining the standards. For the SCAB, current federal and state air quality planning requirements have been consolidated into a single plan, the *2003 Air Quality Management Plan* (2003 AQMP)[30], the latest in a series of plans that have been developed over the years. The 2003 AQMP was adopted by the SCAQMD Governing Board on August 1, 2003. Subsequently, ARB adopted the South Coast SIP on October 23, 2003, and the USEPA has yet to approve the SIP.

With respect to the national ozone standard, the SCAB has been further classified pursuant to the CAA Amendments of 1990 as an "extreme" ozone nonattainment area. "Extreme" ozone nonattainment areas must demonstrate attainment within 20 years of enactment (i.e., by 2010). The 2003 AQMP does not include an attainment date for the more stringent state ozone standard.

The ozone strategy included in the 2003 AQMP builds upon a regulatory foundation established over the last several decades to improve air quality conditions in the SCAB. The 2003 AQMP carries forward a number of control measures identified in previous plans related to specific categories of stationary sources, on-road mobile sources, and off-road mobile sources. Development of the 2003 AQMP was a collaborative effort by SCAQMD, EPA, ARB and SCAG. Each agency is responsible for emission reductions from the various source categories.

Previous air quality plans underestimated the air emissions inventory and targets, and the magnitude of the required emission reductions reported in the 2003 AQMP is far greater than that reported in previous air quality plans. The changes in the emissions inventory and emission targets are mainly due to improvements in air quality modeling and to a better understanding of motor vehicle emissions. The emissions target, also known as the "carrying capacity," has tightened and the mobile source emissions inventory has increased, which equates to a need for greater emission reductions. However, it is important to note that the increase in required

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29 California Environmental Protection Agency, California Air Resources Board. August 1998. *Proposed amendments to the designation criteria and amendments to the area designations for state ambient air quality standards, and proposed maps of the area designations for the state and national ambient air quality standards*.

30 South Coast Air Quality Management District. August 2003. *2003 air quality management plan*.

emission reductions does not mean an increase in measured air pollution in the region. At this time, the responsible agencies have not been able to identify the needed emission reductions to meet attainment of the federal standards. This emission reduction shortfall presents quite a challenge to the region, as most of the substantial and feasible emission reductions have already been implemented.

Under Section 182(e)(5) of the CAA, extreme ozone areas are allowed to allocate emission reductions to long-term, unidentified measures such as anticipated future technologies, commonly referred to as "black box" measures. However, reliance on the "black box" measures will cease in the near future, as measures need to be identified by 2007 and emissions reductions achieved by 2010.

Pursuant to the CAA Amendments of 1990, the SCAB has been designated as a "serious" PM10 nonattainment area for the national PM10 standard. The 2003 AQMP serves as the PM10 attainment demonstration plan. This PM10 plan relies upon control of area sources, known as "fugitive" dust sources, such as construction sites, heavily traveled publicly maintained unpaved roads, and agricultural activities. To regulate such sources in the SCAB, the regional air district has adopted Rule 403 (Fugitive Dust). The purpose of Rule 403 is to implement the fugitive dust control measures in the applicable federal PM10 Plan. The 2003 AQMP predicts that the national PM10 standard will be attained by 2006.

The SCAB is designated as a "serious" nonattainment area for the national CO standard. The 2003 AQMP replaces the 1997 attainment demonstration that lapsed at the end of 2002 and also serves as the basis for CO attainment demonstration plan. The CO attainment strategy depends upon stationary-source requirements, increasingly stringent mobile-source tailpipe emissions standards, and oxygenated gasoline fuel specifications. CO emissions have been substantially reduced over the past decade and that trend is expected to continue. However, the 2003 AQMP does not include a request for EPA to consider re-designation of the CO classification.

In July 1998, the SCAB was redesignated by EPA from "nonattainment" to "unclassified / attainment" for the national nitrogen dioxide standard. As such, the SCAB became a "maintenance" area for that standard, and the 2003 AQMP serves as the Nitrogen Dioxide Maintenance Plan. Maintenance of the nitrogen dioxide standard will depend upon continued implementation of stationary source regulations, reductions in mobile-source emissions, as well as new control measures that are included as part of the ozone attainment strategy.

Ventura County Air Pollution Control District (VCAPCD)

The regional agency responsible for developing air quality plans for the Ventura County portion of the SCCAB is the VCAPCD. Ventura County is located within the SCCAB, which also includes Santa Barbara and San Luis Obispo Counties. The SCCAB has been designated as a nonattainment area for the state ambient air quality standards for ozone and respirable particulate

matter (PM10).[31] Ventura County is also located within a subregion within the SCCAB that is designated as a nonattainment area for the national one-hour-average ozone standard. With respect to this national ozone standard, Ventura County has been further classified as a "severe-15" nonattainment area, which means that the area is allowed 15 years from enactment of the CAA Amendments of 1990 to reach attainment.

The CAA and the California Clean Air Act require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). Such plans are to include strategies for attaining the standards. The applicable ozone air quality plan is the proposed *Air Quality Management Plan - Limited SIP Update* (proposed adoption in 2004).[32] This ozone plan is an update of prior state and federal ozone plans. It addresses both state and federal air quality planning requirements in a single document. This plan predicts attainment of the national ozone standard in Ventura County by 2005.

Mojave Desert Air Quality Management District (MDAQMD)

The MDAQMD is the agency responsible for developing the air quality plans in the San Bernardino County portion of the Mojave Desert Air Basin and Palo Verde Valley portion of Riverside County. MDAQMD is also the agency with permit authority over most types of stationary sources within its jurisdiction. MDAQMD exercises permit authority through its *Rules and Regulations*. The entire Mojave Desert Air Basin has been designated as a nonattainment area for the more stringent state ozone and PM10 standards. With respect to the national ozone standard, the Air Basin has been classified pursuant to the CAA Amendments of 1990 as "severe-17," which refers to "severe" ozone nonattainment areas that must demonstrate attainment within 17 years of enactment (i.e., by 2007).

The CAA and the California Clean Air Act require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). Such plans are to include strategies for attaining the standards. There are three applicable air quality plans: two related to ozone and one related to the national PM10 standard. The applicable ozone air quality plans include the Federal Ozone Attainment Demonstration Plan[33] and the State Ozone Air Quality Attainment Plan.[34] These two ozone plans recognize the overwhelming influence of pollution transport from the South Coast Air Basin on ozone concentrations in the Mojave Desert Air Basin. These plans, however, also recognize that

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31 California Environmental Protection Agency, California Air Resources Board. August 1998. *Proposed amendments to the designation criteria and amendments to the area designations for state ambient air quality standards, and proposed maps of the area designations for the state and national ambient air quality standards*.

32 Ventura County Air Pollution Control District. Proposed Adoption March 2004. *2003 air quality management plan revision – Limited SIP update*.

33 Mojave Desert Air Quality Management District. December 1994. *Post 1996 attainment demonstration and reasonable further progress plan*.

34 Mojave Desert Air Quality Management District. January 1996. *Triennial revision to the 1991 air quality attainment plan*.

emissions from within the Air Basin also contribute incrementally to the ozone problem, and include a strategy for regulating local emissions sources. These ozone plans rely heavily on the reduction of ozone and ozone precursor emissions within the South Coast Air Basin in predicting attainment of both the national and state ozone standards by 2007.

The applicable PM10 air quality plan is the Federal PM10 Attainment Plan.[35] This federal PM10 plan proposes a reduction in the geographic extent of the federal PM10 nonattainment area and refers to this smaller area as the Mojave Desert Planning Area. The federal PM10 plan recognizes that the PM10 problem in the Mojave Desert Planning Area is caused by both fugitive dust sources operating within the area as well as region-wide wind-blown dust during moderate to high wind episodes. The federal PM10 plan predicts attainment of the national PM10 standard in the Mojave Desert Planning Area by the end of 2000.

Antelope Valley Air Quality Management District (AVAQMD)

Historically, Antelope Valley has been under the jurisdiction of the SCAQMD. In 1996, however, a state law established a local air quality management district; jurisdiction within Antelope Valley was transferred to in mid-1997. AVAQMD has permit authority over most types of stationary sources in Antelope Valley and exercises permit authority through its *Rules and Regulations*. AVAQMD adopted the SCAQMD's *Rules and Regulations*, i.e., with SCAQMD revisions through June 1997, as its interim *Rules and Regulations*, until it can develop and adopt its own rulebook. The AVAQMD is responsible for the Los Angeles County portion of the MDAB.

Several subregions within the Mojave Desert Air Basin, including Antelope Valley, have been designated as nonattainment areas for the national one-hour-average ozone standard, and the entire Mojave Desert Air Basin has been designated as a nonattainment area for the more stringent state ozone standard and for the state respirable particulate matter (PM10) standard.[36] With respect to the national ozone standard, Antelope Valley has been further classified pursuant to the CAA Amendments of 1990 as "severe-17," which refers to "severe" ozone nonattainment areas that must demonstrate attainment within 17 years of enactment (i.e., by 2007).

The Federal Clean Air Act and the California Clean Air Act require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). Such plans are to include strategies for attaining the standards. For Antelope Valley, federal and state ozone planning requirements have been consolidated into a single plan, the AQMP for Antelope Valley.[37] The 1994 AQMP recognizes that transport of ozone and ozone precursors from the SCAB is the primary cause of ozone nonattainment status in

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[35] Mojave Desert Air Quality Management District. July 1995. *Final mojave desert planning area, federal particulate matter (PM10) attainment plan*.

[36] California Environmental Protection Agency, California Air Resources Board. August 1998. *Proposed amendments to the designation criteria and amendments to the area designations for state ambient air quality standards, and proposed maps of the area designations for the state and national ambient air quality standards*.

[37] South Coast Air Quality Management District. September 1994. *1994 air quality management plan, appendix I-A, air quality management plan for Antelope Valley*.

Antelope Valley. Pollutants originating in the SCAB are transported along a route northward through Newhall Pass into Antelope Valley.

Given the importance of pollutant transport to the ozone problem in Antelope Valley, the 1994 AQMP relies heavily on ozone precursor emissions reduction measures in the SCAB to demonstrate attainment by 2007. However, the 1994 AQMP recognizes that local sources also contribute to the problem and seeks to reduce locally generated emissions through state and federal controls as well as implementation of a permit program for local stationary sources. Since Antelope Valley cannot meet the reasonable further progress requirements set forth under the CAA Amendments of 1990, this permit program must be equivalent to that required for the next higher classification of ozone nonattainment (i.e., for "extreme" nonattainment areas). The 1994 AQMP predicts that the control strategy will attain the national ozone standard by 2007 but does not include an attainment date for the more stringent state ozone standard. An update of the AQMP carries forward the 1994 AQMP control approach for Antelope Valley.[38]

Imperial County Air Pollution Control District (ICAPCD)

The ICAPCD is the local agency responsible for developing air quality plans. ICAPCD is also the agency with permit authority over most types of stationary sources in Imperial County. ICAPCD exercises permit authority through its *Rules and Regulations*. Imperial County is located within the Salton Sea Air Basin (SSAB), which also includes Coachella Valley in Riverside County. SSAB is currently designated as a nonattainment area for state ambient air quality standards for ozone and respirable particulate matter (PM10).[39]

The CAA and the California Clean Air Act require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM10 standard). Such plans are to include strategies for attaining the standards. Three air quality plans apply to Imperial County, two related to ozone and one related to the national PM10 standard.

In 1979, Imperial County was designated as a nonattainment area due to periodic violations of the national oxidant standard (which has been replaced by the current ozone standard). In response to that designation, Imperial County prepared a "nonattainment plan" in 1979 as required by federal law. The 1979 nonattainment plan became the federal ozone plan for Imperial County. It proposed the adoption and implementation of a set of stationary source control measures designed to attain the national ozone standard by the end of 1987. Under the CAA of 1990, Imperial County's designation of nonattainment for the national ozone standard was confirmed under provisions of the Act that also recognize the possibility that international border areas may face special problems in attaining the standard.

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38 South Coast Air Quality Management District. November 1996. *1997 air quality management plan*.

39 California Environmental Protection Agency, California Air Resources Board. August 1998. *Proposed amendments to the designation criteria and amendments to the area designations for state ambient air quality standards, and proposed maps of the area designations for the state and national ambient air quality standards*.

The state ozone plan, the *1991 Air Quality Attainment Plan*, was prepared in compliance with the California Clean Air Act.[40] The *1991 Air Quality Attainment Plan* recognizes the substantial influence of pollutant transport from Mexico and the SCAB on the ozone problem in Imperial County but also includes a stationary source control measure program to reduce emissions generated within the County. The state ozone plan normally is updated on a triennial basis, but since the SSAB (which includes Imperial County) has a unique air quality problem in that an overwhelming significant portion of its air pollution is from upwind sources, an update to the *1991 Air Quality Attainment Plan* will not be required until the significance of these upwind sources has been quantified.[41]

The applicable PM10 air quality plan is the federal *State Implementation Plan for PM10 in the Imperial Valley*.[42] The PM10 plan includes a range of measures intended to achieve attainment of the national PM10 standards in the Imperial Valley Planning Area, which covers the western three-quarters of the county.

An update to the PM10 SIP was delayed due to a lawsuit between the EPA and Earth Justice on behalf of the Sierra Club concerning international trans-border emissions. In October 2001, EPA granted Imperial County a waiver from more stringent air quality regulations and concluded that the County would have met the PM10 standards "but for" emissions emanating from Mexico (Section 179(b) of the CAA). This provision allows agencies to demonstrate, through complex modeling, that attainment would be achieved, absent emissions from Mexico. In October 2003 the US Court of Appeals for the Ninth Circuit ruled in favor of the plaintiff and ordered EPA to reclassify the Imperial Valley as "serious" for PM10. This ruling will require the agency to enact more stringent pollution control requirements for industry, agriculture and other pollution sources.

State Implementation Plans/Transportation Conformity Analysis

To comply with the CAA in achieving the NAAQS, the ARB develops the State Implementation Plans (SIPs) for federally designated non-attainment areas. In California, SIP development has been a joint effort of the local air agencies and the ARB, working with many other federal, state, and local agencies. Most of the local air agencies' Air Quality Management Plans (AQMPs) are prepared in response to the federal and state requirements. Typically, these plans, which regulate both stationary and mobile sources of air pollution, include proposed rules and transportation control measures (TCMs) designed to achieve emission reductions to achieve standards. AQMPs/SIPs also include emission budgets that serve as emission limits for projects included in SCAG's RTP.

The Intermodal Surface Transportation Efficiency Act (ISTEA) and the EPA's Transportation Conformity Rule require that SCAG's regional transportation plans, programs and projects conform to the applicable SIPs/AQMPs in federally designated non-attainment areas. The applicable SIPs/AQMPs are those approved by EPA. The first complete Transportation

[40] Imperial County Air Pollution Control District. April 1992. *1991 air quality attainment plan*.

[41] Romero, Ray, Imperial County Air Pollution Control District, Personal Conversation, April 27, 1999.

[42] Imperial County Air Pollution Control District. June 1993. *State implementation plan for PM10 in the Imperial Valley*.

Conformity Rule was published in November 1993, and has been amended a number of times. The latest Transportation Conformity Rule is found at 40 CFR parts 51 and 93, published on August 15, 1997. Proposed amendments to the rule are pending and are expected to be final in early 2004.

The Transportation Conformity Rule is a set of criteria and procedures for determining conformity to the SIPs for the transportation plans, programs, and projects funded or approved under Title 23 U.S.C., or the Federal Transit Act. It is also required under Section 176(c) of the 1990 CAA Amendments.

The Transportation Conformity Rule is only applicable to investments in projects for on-road mobile sources and the associated emissions caused by related transportation activities. Emissions generated by on-road mobile sources include various pollutants of which four pollutants are significantly caused by the on-road mobile source activities. These are: carbon monoxide (CO), ozone (O3), nitrogen dioxide (NO2), and particulate matter less than ten microns in size (PM10). These four pollutants are subject to the federal requirements for transportation conformity analysis.

Sensitive Receptors

Certain population groups are especially sensitive to air pollution and should be given special consideration when evaluating air quality impacts from projects. These population groups include children, the elderly, persons with pre-existing respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. As defined in the SCAQMD *CEQA Air Quality Handbook* (1993), a sensitive receptor to air quality is defined as any of the following land use categories: (1) long-term health care facilities; (2) rehabilitation centers; (3) convalescent centers; (4) retirement homes; (5) residences; (6) schools; (7) parks and playgrounds; (8) child care centers; and (9) athletic fields. As indicated in Figure 3.4-2 (located at the end of this document) the sensitive receptors within a quarter mile buffer of proposed plan projects include schools, nursing homes, and hospitals.

METHODOLOGY

This section summarizes the methodology used to evaluate the expected impacts of implementation of the proposed Plan on air quality.

Regional mobile source emissions are based on an analytical process, which involves a computer-simulated forecast of emissions from the 2004 RTP out to year 2030. Federal conformity regulations require emissions to be based on the Latest Planning Assumptions, which include the latest vehicle data (fleet, age, activity) and latest socio-economic data. SCAG is required to use updated emission budgets for all relevant criteria pollutants for each Federal nonattainment area.

Mobile source emissions are a product of mobile source emission factors and vehicle activity data. The mobile source emission factors are based on the latest version of the ARB mobile source emissions inventory model, EMFAC2002 (version 2.2, April 23, 2003). The emission

factors accommodate certain performance assumptions including projected fuel efficiency in 2030, future emissions control technologies, and mobility assumptions (e.g., vehicle speed and idling). Vehicle miles traveled (VMT) are predicted by the California Department of Transportation (Caltrans) Direct Travel Impact Model 4 (DTIM4.02) traffic model. Appendix 7.3 contains the summary tables of criteria pollutants emissions by county and air basin for the SCAG region.

Projected vehicle emissions expected from the southern California transportation network in 2030 under the Plan were compared with those estimated for current conditions. Cumulative impacts were assessed by comparing projected vehicle emissions in 2030 to the emission budgets established in the local air quality management plans. Future 2030 craft emissions emissions were also compared with the emissions from current conditions. Airport emissions were derived using the Federal Aviation Administration (FAA) Emission and Dispersion Model (EDMS) version 4.11.

Short-term impacts were evaluated. These impacts result from construction activities which include construction equipment emissions, dust from grading and earthmoving operations, and emissions from workers' vehicles traveling to and from construction sites.

The quantification of increased cancer risk resulting from construction and operation of a sample of projects in the 2004 RTP was performed using an EPA-approved pollutant dispersion model in conformance with SCAQMD diesel exhaust risk assessment procedures.[43] Guidance published by the California Office of Environmental Health Hazard Assessment (OEHHA) was used in the design of the scope of analysis.[44]

Based on the OEHHA guidance, the analyses of health impacts were limited to evaluations of increased cancer risks from the inhalation pathway. The OEHHA procedures state that "the potential cancer risk from inhalation exposure to diesel PM will outweigh the potential noncancer health impacts" and that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multipathway cancer risk from the speciated compounds. On the basis of these statements, the assessments of risks associated with Diesel exhaust emissions from construction and operation of freeway segments conducted here were limited to the cancer impacts from the inhalation route only.

Comparison with the No Project

The analysis of air quality includes a comparison between the expected future conditions with the Plan and the expected future conditions if no Plan were adopted. This evaluation is not included

43 South Coast Air Quality Management District. December 2002. *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions*, http:/www/aqmd.gov/handbook/hra_guide.doc.

44 California Office of Environmental Health Hazard Assessment. October 2003. Appendix D: Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines, *Air Toxic Hot Spots Program Risk Assessment Guidelines*; *http://www.oehha.ca.gov/air/hot_spots/pdf/HRAfinalapps.pdf.*

in the determination of the significance of impacts; however, it provides a meaningful perspective on the expected effects and benefits of the 2004 RTP.

Determination of Significance

The methodology for determining the significance of the impacts on air quality compares the expected future Plan conditions to the current conditions, as required in CEQA Guidelines Section 15126.2(a).

SIGNIFICANCE CRITERIA

For purposes of this regional analysis, the following criteria for determining significance have been applied:

- Projected long-term emissions of criteria pollutants are considered significant if they are greater than the current emission levels.
- Projected long-term emissions of toxic air contaminants are considered significant if they are equal to or greater than current emission levels.
- Projected short-term regional emissions (construction) are considered to be significant if they exceed the thresholds established by the local air districts.
- Localized impacts on sensitive receptors (short-term and long-term) were compared to the significance threshold values presented in the SCAQMD *CEQA Air Quality Handbook*, Chapter 10, Air Toxics. The SCAQMD guidelines for operation permit processing considers the following types of projects significant:
    - Any project involving the emission or threatened emission of a carcinogenic or toxic air contaminant identified in District Rule 1401 that exceeds the maximum individual cancer risk of one in one million, or 10 in one million if the project is constructed with the best available control technology for toxics (T-BACT) using the procedures in SCAQMD Rule 1401.
- Projected long-term emissions are considered to be cumulatively significant if they are not consistent with the local air quality management plans and state implementation plans. The local air quality management plans demonstrate attainment with the NAAQS and consider emissions from all sources (stationary, mobile and area sources) in their attainment demonstrations. A project that has not been accommodated in the mobile source emissions budget will have a significant cumulative impact unless emissions are offset.

PROJECT IMPACTS AND MITIGATION MEASURES

Analysis of the potential air quality impacts of the 2004 RTP was conducted for both the construction and post-construction (operation) phases of the Plan. For each of these phases, an analysis was performed for regional emissions. The analysis for both operations and construction

impacts also addresses local area concentrations of TACs. A screening level Health Risk Assessment was conducted for project operation and construction phases of the Plan in accordance with SCAQMD, ARB and USEPA guidelines. Cumulative impacts were also assessed.

All mitigation measures shall be included in project-level analysis as appropriate. The lead agency for each individual project in the Plan shall be responsible for ensuring adherence to the mitigation measures prior to construction. SCAG shall be provided with documentation of compliance with mitigation measures through SCAG's monitoring efforts, including SCAG's Intergovernmental Review Process.

Impact 3.4-1: Long-term (Operational) Regional Impacts

- **Impact 3.4-1a: Under the Plan, PM10 emissions from on-road mobile sources would increase when compared to current conditions.**

- **Impact 3.4-1b: Under the Plan, emissions of ROG, NOX, CO, SOX and TACs would decrease when compared to current conditions.**

Direct, long-term impacts were assessed and are described in detail below. Projected long-term emissions of criteria pollutants are considered significant if they are greater than the current emission levels (2000 base year). Year 2000 represents current conditions, as it is the best practical, available and most accurate portrayal of current conditions.

Criteria Pollutant Emissions Analysis

To assess the effectiveness of the improvements proposed in the 2004 RTP, estimated air emissions for the year 2030 with the 2004 RTP were compared with the current conditions. The calculated emissions were compiled for each non-attainment area and SCAB County (SCAB portion only).

2004 RTP compared to current conditions

Table 3.4-3 summarizes emissions by nonattainment areas in the region. Under the Plan, emissions of ROG, NOX, CO and SOX for all nonattainment areas would decrease, when compared to current conditions. This would be considered a **beneficial** impact. Under the 2004 RTP, all nonattainment areas would experience elevated emissions of PM10. Antelope Valley would experience the greatest increase (75%) in PM10 emissions under the Plan. The SCAB would experience the smallest increase (4%) in PM10 emissions under the Plan. Emissions of PM10 for all nonattainment areas combined would increase 8% under the Plan, when compared to current conditions. The increase in emissions of PM10 would be a **significant** impact.

Table 3.4-4 summarizes the current and projected criteria pollutant emissions estimated for the 2004 RTP as compared to the current conditions by SCAB county. As shown in Table 3.4-4, under the Plan emissions of ROG, NOX, CO and SOX for all counties would decrease when

Table 3.4-3: Criteria Pollutant Emissions By Nonattainment Area
Plan Emissions in 2030 Compared to Current Conditions (Emissions in 2000)
(in Tons per Day)

		SCAB	Ventura	Antelope Valley	Victor Valley	Coachella Valley	Imperial	Sum
ROG	Current Conditions	412.61	21.28	8.07	14.37	7.54	10.47	474.34
	Plan	73.07	4.22	1.65	3.15	1.79	5.69	89.57
	Difference	-339.54	-17.06	-6.42	-11.22	-5.75	-4.78	-384.77
	% Difference	-82%	-80%	-80%	-78%	-76%	-46%	-81%
NOX	Current Conditions	737.4	30.64	12.84	31.17	15.72	13.65	841.42
	Plan	120.33	4.38	2.27	7.05	3.39	7.79	145.21
	Difference	-617.07	-26.26	-10.57	-24.12	-12.33	-5.86	-696.21
	% Difference	-84%	-86%	-82%	-77%	-78%	-43%	-83%
CO	Current Conditions	4222.49	194.27	86.74	169.97	88.96	105.86	4868.29
	Plan	538.1	25.14	14.4	26.89	16.02	41.91	662.46
	Difference	-3684.39	-169.13	-72.34	-143.08	-72.94	-63.95	-4205.83
	% Difference	-87%	-87%	-83%	-84%	-82%	-60%	-86%
PM10	Current Conditions	19.08	0.76	0.32	0.69	0.39	0.41	21.65
	Plan	19.8	0.86	0.56	1.01	0.64	0.59	23.46
	Difference	0.72	0.1	0.24	0.32	0.25	0.18	1.81
	% Difference	**4%**	**13%**	**75%**	**46%**	**64%**	**44%**	**8%**
SOX	Current Conditions	4.91	0.18	0.08	0.19	0.11	0.11	5.58
	Plan	2.44	0.11	0.06	0.12	0.08	0.08	2.89
	Difference	-2.47	-0.07	-0.02	-0.07	-0.03	-0.03	-2.69
	% Difference	-50%	-39%	-25%	-37%	-27%	-27%	-48%

Source: Southern California Association of Governments; EMFAC2002, DTIM 4.02

compared to the current condition emissions. PM10 emissions would decrease by 4% in Los Angeles County under the Plan. All other SCAB counties would experience an increase in PM10 emissions. Overall, emissions of PM10 for all SCAB counties combined would increase approximately 4% under the Plan. The increase in regional emissions of PM10 would be considered a **significant** impact.

2004 RTP compared to No Project

For illustrative purposes, Table 3.4-5 summarizes the differences between No Project and projected criteria pollutant emissions estimated for the 2004 RTP by nonattainment area. When compared to the No Project emissions, the 2004 RTP would result in fewer emissions of ROG, PM10, CO and SOX for all nonattainment areas. Emissions of NOX would increase 1% for all nonattainment areas combined, with the greatest increases experienced in Victor Valley and Coachella Valley.

Table 3.4-4: SCAB Criteria Pollutant Emissions By County (SCAB portion only) Plan Emissions in 2030 Compared to Current Conditions (Emissions in 2000) (in Tons per Day)

		LA	SB	Orange	Riverside	Sum
ROG	Current Conditions	257.99	37.94	76.18	40.51	412.62
	Plan	40.37	8.09	14.45	10.16	73.07
	Difference	-217.62	-29.85	-61.73	-30.35	-339.55
	% Difference	-84%	-79%	-81%	-75%	-82%
NOX	Current Conditions	453.29	78.25	112.28	93.58	737.4
	Plan	68.92	14.95	17.43	19.02	120.32
	Difference	-384.37	-63.3	-94.85	-74.56	-617.08
	% Difference	-85%	-81%	-84%	-80%	-84%
CO	Current Conditions	2651.92	378.73	751.59	440.25	4222.49
	Plan	311.5	53.34	97.77	75.49	538.1
	Difference	-2340.42	-325.39	-653.82	-364.76	-3684.39
	% Difference	-88%	-86%	-87%	-83%	-87%
PM10	Current Conditions	11.79	1.83	3.23	2.23	19.08
	Plan	11.29	2.09	3.48	2.94	19.8
	Difference	-0.5	0.26	0.25	0.71	0.72
	% Difference	-4%	**14%**	**8%**	**32%**	**4%**
SOX	Current Conditions	2.95	0.53	0.8	0.64	4.92
	Plan	1.35	0.28	0.43	0.38	2.44
	Difference	-1.6	-0.25	-0.37	-0.26	-2.48
	% Difference	-54%	-47%	-46%	-41%	-50%

Source: Southern California Association of Governments; EMFAC2002, DTIM 4.02

Table 3.4-6 summarizes the differences between No Project and projected criteria pollutant emissions estimated for the 2004 RTP by SCAB county. When compared to the No Project emissions, the 2004 RTP would result in fewer emissions of ROG, PM10, CO and SOX for all SCAB counties. Emissions of NOX would increase 1% for all counties combined, with the greatest increases experienced in San Bernardino and Riverside Counties (SCAB portions only).

Toxic Air Contaminant (TAC) Emissions

Toxic air contaminants (TACs) include airborne substances other than the criteria pollutants that are known to cause cancer or otherwise harm human health. TAC emissions are also regulated by the local air quality management districts. Much of the effort toward controlling TACs has concentrated on point source emissions from businesses handling hazardous materials. However, mobile sources are responsible for approximately half of the total lifetime cancer risk attributed to air toxics.[45]

45 United States Environmental Protection Agency. Control of emissions of Hazardous Air Pollutants from Mobile Sources. *Federal Register*, 66:17234-17237, March 29, 2001.

Table 3.4-5: Criteria Pollutant Emissions By Nonattainment Area
Plan Emissions in 2030 Compared to No Project Emissions in 2030
(in Tons per Day)

		SCAB	Ventura	Antelope Valley	Victor Valley	Coachella Valley	Imperial	Sum
ROG	No Project	75.92	4.36	1.83	3.15	1.83	5.72	92.81
	Plan	73.07	4.22	1.65	3.15	1.79	5.69	89.57
	Difference	-2.85	-0.14	-0.18	0	-0.04	-0.03	-3.24
	% Difference	-4%	-3%	-10%	0%	-2%	-1%	-3%
NOX	No Project	118.99	4.44	2.35	6.88	3.33	7.81	143.8
	Plan	120.33	4.38	2.27	7.05	3.39	7.79	145.21
	Difference	1.34	-0.06	-0.08	0.17	0.06	-0.02	1.41
	% Difference	1%	-1%	-3%	**2%**	**2%**	0%	**1%**
CO	No Project	571.32	26.18	16.36	27.33	16.52	42.31	700.02
	Plan	538.1	25.14	14.4	26.89	16.02	41.91	662.46
	Difference	-33.22	-1.04	-1.96	-0.44	-0.5	-0.4	-37.56
	% Difference	-6%	-4%	-12%	-2%	-3%	-1%	-5%
PM10	No Project	21.11	0.89	0.64	1.04	0.65	0.59	24.92
	Plan	19.8	0.86	0.56	1.01	0.64	0.59	23.46
	Difference	-1.31	-0.03	-0.08	-0.03	-0.01	0	-1.46
	% Difference	-6%	-3%	-13%	-3%	-2%	0%	-6%
SOX	No Project	2.56	0.11	0.07	0.12	0.08	0.08	3.02
	Plan	2.44	0.11	0.06	0.12	0.08	0.08	2.89
	Difference	-0.12	0	-0.01	0	0	0	-0.13
	% Difference	-5%	0%	-14%	0%	0%	0%	-4%

Source: Southern California Association of Governments; EMFAC2002, DTIM 4.02

The EPA has designated the following 21 chemicals as mobile-source air toxics emitted by motor vehicles, locomotives, aircraft, ships and various types of nonroad equipment: 1,3-butadiene, acetaldehyde, acrolein, arsenic compounds, benzene, chromium compounds, diesel particulate matter (DPM) plus diesel exhaust organic gases, dioxin/furans, ethylbenzene, formaldehyde, lead compounds, manganese compounds, mercury compounds, MTBE (methyl tertiary butyl ether), naphthalene, n-hexane, nickel compounds, POM (polycyclic organic matter), styrene, toluene and xylene.

Since ROG emissions from mobile sources generally capture the majority of the volatile organic TAC contribution from the transportation network, ROG emissions are a good indicator of the volatile organic portion of mobile source TACs. As shown in Tables 3.4-3 and 3.4-4 and discussed previously, ROG emissions are expected to decrease under the Plan and therefore, the impact of the Plan on the volatile organic portion of TACs would be considered **beneficial**.

In 1998, the particulate portion of diesel exhaust was identified as a TAC by the California EPA. Recent studies conducted by the SCAQMD have attributed 70 percent of the potential health

**Table 3.4-6: SCAB Criteria Pollutant Emissions By County (SCAB portion only)
Plan Emissions in 2030 Compared to No Project Emissions in 2030
(in Tons per Day)**

		LA	SB	Orange	Riverside	Sum
ROG	No Project	42.52	8.10	14.79	10.51	75.92
	Plan	40.37	8.09	14.45	10.16	73.07
	Difference	-2.15	-0.01	-0.34	-0.35	-2.85
	% Difference	-5%	0%	-2%	-3%	-4%
NOX	No Project	69.14	14.13	17.17	18.54	118.98
	Plan	68.92	14.95	17.43	19.02	120.32
	Difference	-0.22	0.82	0.26	0.48	1.34
	% Difference	0%	**6%**	**2%**	**3%**	**1%**
CO	No Project	334.16	54.70	101.75	80.72	571.33
	Plan	311.50	53.34	97.77	75.49	538.1
	Difference	-22.66	-1.36	-3.98	-5.23	-33.23
	% Difference	-7%	-2%	-4%	-6%	-6%
PM10	No Project	12.21	2.12	3.61	3.17	21.11
	Plan	11.29	2.09	3.48	2.94	19.8
	Difference	-0.92	-0.03	-0.13	-0.23	-1.31
	% Difference	-8%	-1%	-4%	-7%	-6%
SOX	No Project	1.44	0.28	0.44	0.4	2.56
	Plan	1.35	0.28	0.43	0.38	2.44
	Difference	-0.09	0	-0.01	-0.02	-0.12
	% Difference	-6%	0%	-2%	-5%	-5%

Source: Southern California Association of Governments; EMFAC2002, DTIM 4.02

risks from TACs in the SCAB to the particulate portion of diesel emissions,[46] also referred to as diesel particulate matter (DPM). Since PM10 emissions from heavy-duty vehicles (diesel-fueled) generally capture the DPM contribution from the transportation network, these PM10 emissions are a reasonable indicator of the DPM portion of the mobile source TACs.

Table 3.4-7 summarizes PM10 emissions from heavy trucks. Heavy-duty truck PM10 exhaust emissions include most of the diesel-related TAC emissions. As shown in the table, PM10 emissions from heavy-duty trucks would be expected to decrease from 2000 levels for each nonattainment area. Table 3.4-7 also shows the PM10 emissions exclusively from heavy-duty vehicle exhaust. The emissions projections do not include newly proposed measures which would be expected to further reduce diesel particulate emissions. This comparison gives a good indication of trends in TAC emissions from the transportation network. As a result of the anticipated decline in TAC emissions, the 2004 RTP would potentially have a **beneficial** impact with respect to regional TAC emissions.

46 SCAQMD, *Multiple Air Toxics Exposure Study in the South Coast Air Basin*, MATES-II, March 2000.

Table 3.4-7: PM10 Emissions for Heavy-Duty Trucks per County (Tons per Day)						
	SCAB	**Ventura County**	**Antelope Valley**	**Victor Valley**	**Coachella Valley**	**Imperial County**
2000 Base Year	6.70	0.20	0.08	0.27	0.13	0.22
2030 No Project	3.58	0.10	0.05	0.21	0.10	0.21
2030 Plan	3.57	0.10	0.05	0.22	0.10	0.21
PM Exhaust only						
2000 Base Year	5.88	0.16	0.06	0.23	0.11	0.21
2030 No Project	2.16	0.05	0.03	0.12	0.06	0.15
2030 Plan	2.12	0.05	0.03	0.12	0.06	0.21
Source: Southern California Association of Governments; DTIM 4.02, EMFAC2002						

Vehicle Miles Traveled

The 2004 RTP highway and arterial projects would increase the capacity of the existing transportation network. The majority of improvements would be categorized under the TCM Categories of the 2003 SCAQMP to meet target emissions reductions. Most of the highway capacity improvements include widening existing highways to provide more lanes, reducing delays and congestion. Only a few new highway links are proposed in the plan. Much of the public transit improvements would include improved bus rapid transit and improved commuter rail services. However, single-passenger highway travel will continue to provide the backbone of the transportation network in the future, despite the increase in projected transit ridership. Projected VMT is expected to increase on highways and arterials throughout the SCAG region, corresponding with population growth. See Table 3.3-11 for projections of regional VMT.

Mitigation Measures

Emissions of particulate matter are directly related to growth and VMT. Regardless of how clean a vehicle operates, the vast majority of PM10 emissions from on-road sources is generated from re-entrained dust on paved roads and is a function of the vehicle miles traveled. Mitigation measures that reduce VMT are proposed. Additional measures to control fugitive dust and transportation-related PM10 are outlined in the 2003 SCAQMP and include control methods such as watering, chemical stabilization, paving, revegetation, track-out control, construction project signage, sweeping and motor vehicle controls.

MM 3.4-1a: Additional mitigation measures are hereby incorporated by reference from the following air quality management plans:

- 2003 South Coast State Implementation Plan (SIP)

- Ventura County Air Quality Management Plan (2004 AQMP – Limited SIP Update, Scheduled for adoption in March 2004)
- Mojave Desert Air Quality Management Plan (1996)
- Antelope Valley Air Quality Management Plan (1994/97)
- Imperial County Air Quality Management Plan (1991 and 1993)

MM 3.4-1b: The 2003 SCAQMP control measures consist of 1) SCAQMD's Stationary and Mobile Source Control Measures; 2) State and Federal Source Control Measures proposed by CARB; and 3) Transportation Strategy and Control measures provided by SCAG. These control measures are based on the implementation of short-term, defined measures as well as long-term measures which will rely on new technologies to further reduce emissions. The SCAQMP includes estimated emissions reductions based on these short-term and long-term programs. The transportation improvements proposed for the short-term emissions reductions are grouped in the SCAQMP under Transportation Control Measure (TCM) project categories and include the following measures:

- High Occupancy Vehicle (HOV) Measures: New HOV lanes, HOV bypasses and connectors, interchanges, High Occupancy Toll (HOT) Lanes;
- Transit and System Management Measures: Transit, Intermodal Transfer Facilities, Non-motorized Transportation Mode Facilities; and
- Information-based Transportation Strategies: Marketing for Rideshare and other services, Intelligent Transportation Systems, Telecommuting Programs and Real-time rail, transit or freeway information systems.

The 2004 RTP has been prepared to facilitate implementation of the transportation control measures outlined in the 2003 SCAQMP. The 2004 RTP incorporates both the capital and non-capital improvements recommended by the SCAQMP.

ARB's strategy, outlined in the South Coast SIP, includes the following elements:

- Set technology forcing new engine standards;
- Reduce emissions from the in-use fleet;
- Require clean fuels, and reduce petroleum dependency;
- Work with USEPA to reduce emissions from federal and state sources; and
- Pursue long-term advanced technology measures.

Significance After Mitigation

After implementation of all feasible mitigation measures and incorporation of measures as described above, the project would most likely have a **significant** and unavoidable impact on regional air quality.

Impact 3.4-2: Long-term (Operational) Localized Impacts

Freeway operations under the Plan would be likely to exceed the locally acceptable cancer risk of 1 in one million.

Localized impacts are addressed for the operational phase of the 2004 RTP. Mobile sources are sources of carcinogenic pollutants and are responsible for diesel exhaust. Areas near roadways typically register elevated concentrations of air toxics, and these areas are known as "hot spots." Exposure to such "hot spots" may lead to adverse health effects. The proximity to roadways is an important factor in assessing exposure. Typically, concentrations drop off dramatically (around 90 percent) after the first quarter mile from the roadway.

Currently, there is a wide range of variability of concentrations throughout the SCAG region. The highest pollutant concentrations are found at the Ports, LAX, and along major corridors. The cancer risk in many of these areas is greater than the local air districts' acceptable risk of 1 in a million.

To determine the health impacts to the general public living near sections of freeway that would be affected under the 2004 RTP, a screening risk assessment was conducted to estimate increased cancer risks in areas near a sample of projects. The results indicate that cancer risk resulting from operation of freeway sections would be likely to exceed the acceptable threshold of one in a million at locations close to freeways. This impact would be considered significant.

However, the analysis also indicates that cancer risk levels in 2030 with implementation of the 2004 RTP would be substantially lower than cancer risk in 2000, primarily as a result of improvements in motor vehicle exhaust controls. The analysis also indicate that risk levels in 2030 without the 2004 RTP (the No Project) would be slightly higher than with the 2004 RTP.

Mitigation Measures

Same mitigation measures as Impact 3.4-1.

Significance After Mitigation

After implementation of all feasible mitigation measures the project would most likely have a **significant** and unavoidable impact.

Impact 3.4-3: Short-term (Construction) Regional Impacts

Under the Plan, construction activities would increase short-term air emissions.

The 2004 RTP would involve substantial construction to implement the proposed projects. The construction activities would create short-term temporary air emissions from the following activities: (1) demolition; (2) site preparation operations (grading/excavation); (3) fuel combustion from the operation of construction equipment; (3) delivery and hauling of construction materials and supplies to and from the site; (4) the use of asphalt or other oil based substances during the final construction phases; and (5) travel by construction workers to and from the site. Construction emissions are based on the type and magnitude of development that would be accommodated under the project, the timeline for construction, the mix of construction equipment required to build the project, and emission factors from the SCAQMD *CEQA Air Quality Handbook* and USEPA's AP-42. Emissions of NOX, VOC, and PM10 generated would be based on the number and type of operating vehicles and the number of hours of operation. Fugitive emissions would be based on the amount of soil disturbed, type of soil, duration, type of activity (grading, excavation, etc.), haul trips and other factors.

Most improvements in transit and system management (signal synchronization, striping, etc.) do not involve construction and are not expected to generate short-term impacts. However, a large number of the projects in the 2004 RTP would involve construction activities (new goods movement capacity enhancements, arterials, rail systems). It is very likely that some of these projects would be under concurrent construction throughout the region. Short-term impacts generated from the implementation of the 2004 RTP are expected to be significant.

The SCAQMD has developed thresholds of significance for individual construction projects within their jurisdiction as follows:

- Carbon Monoxide.....24.75 tons per quarter
- Reactive Organic Compounds .....2.5 tons per quarter
- Nitrogen Oxides.....2.5 tons per quarter
- Sulfur Oxides.....6.75 tons per quarter
- Particulates (10 microns) .....6.75 tons per quarter

These thresholds are established in the *CEQA Air Quality Handbook* prepared by the SCAQMD in 1993. Other air management districts within the SCAG region have adopted similar thresholds for individual construction projects for criteria pollutants. Project-level analysis conducted for CEQA purposes would estimate construction emissions for each project based on project specifics. Mitigation measures to reduce air quality impacts would be established in project-specific environmental documents. The construction of highways or arterials would be expected to generate a significant amount of construction activity and therefore exceed the significance thresholds established in the CEQA Handbook. This would create a significant short-term impact. These impacts would occur in localized areas depending on the construction site locations.

Individual projects would be required to implement mitigation measures to reduce construction emissions.

Other construction impacts include potential construction-related traffic impacts due to congestion from lane closures. These impacts should be addressed at the project level analysis.

Mitigation Measures

Compliance with SCAQMD Rule 403 (Fugitive Dust) will reduce emissions of fugitive dust from construction activities. The following additional air quality mitigation measures set forth a program of air pollution control strategies designed to reduce the project's air quality impacts from construction activities.

Land Clearing/Earth-Moving:

MM 3.4-3a: Apply water or dust suppressants to exposed earth surfaces to control emissions.

MM 3.4-3b: All excavating and grading activities shall cease during second stage smog alerts and periods of high winds.

MM 3.4-3c: All trucks hauling dirt, sand, soil, or other loose materials off-site shall be covered or wetted or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer).

Paved Surfaces:

MM 3.4-3d: All construction roads that have high traffic volumes, shall be surfaced with base material or decomposed granite, or shall be paved or otherwise be stabilized.

MM 3.4-3e: Public streets shall be cleaned, swept or scraped at frequent intervals or at least three times a week if visible soil material has been carried onto adjacent public roads.

MM 3.4-3f: Construction equipment shall be visually inspected prior to leaving the site and loose dirt shall be washed off with wheel washers as necessary.

Unpaved Surfaces:

MM 3.4-3g: Water or non-toxic soil stabilizers shall be applied as needed to reduce off-site transport of fugitive dust from all unpaved staging areas and other unpaved surfaces.

MM 3.4-3h: Traffic speeds on all unpaved surfaces shall not exceed 25 mph.

Other Construction Mitigation Measures

MM 3.4-3i: Low sulfur or other alternative fuels shall be used in construction equipment where feasible.

MM 3.4-3j: Deliveries related to construction activities that affect traffic flow shall be scheduled during off-peak hours (e.g. 10:00 A.M. and 3:00 P.M.) and coordinated to achieve consolidated

truck trips. When the movement of construction materials and/or equipment impacts traffic flow, temporary traffic control shall be provided to improve traffic flow (e.g., flag person).

MM 3.4-3k: To the extent possible, construction activity shall utilize electricity from power poles rather than temporary diesel power generators and/or gasoline power generators.

MM 3.4-3l: Revegetate exposed earth surfaces following construction.

Significance After Mitigation

After implementation of all feasible mitigation measures and incorporation of project features as described above, activities related to construction of the project would most likely exceed emission thresholds for regional NOX, CO, PM10, SO2, and ROG. Therefore, construction of the 2004 RTP would have a **significant** and unavoidable impact on regional air quality.

Impact 3.4-4: Short-term Localized Impacts

The cancer risk associated with construction projects under the Plan would likely exceed the locally acceptable cancer risk of 1 in one million.

Localized impacts were evaluated for the construction phase of the 2004 RTP. Construction vehicles are sources of carcinogenic pollutants and are also responsible for diesel exhaust.

To determine the health impacts to the general public living near sections of freeway that would be affected by the 2004 RTP, a screening risk assessment was conducted to estimate increased cancer risks in areas near a sample of projects. The results indicate that cancer risk resulting from construction activities would be likely to exceed the acceptable threshold of one in a million at locations close to freeways. This is the case for the maximum one-year cancer risk, which reflects the temporary nature of construction. When this same risk is spread over a 70-year lifetime (in accordance with health risk assessment procedures), risk levels are much lower, approaching the threshold of one in a million. Overall, this impact would be considered **significant**.

Mitigation Measures

MM 3.4-4: Construction equipment shall be equipped with diesel particulate traps. Low sulfur or other alternative fuels shall be used in construction equipment where feasible.

Significance After Mitigation

After implementation of all feasible mitigation measures and incorporation of measures as described above, the project would most likely have a **significant** and unavoidable impact on regional air quality.

Impact 3.4-5: Cumulative air quality impacts

Under the Plan criteria pollutant emissions would be less than the applicable emission budgets.

The analysis of regional cumulative impacts assessed the impacts of the 2004 RTP, including consideration of potential indirect effects in conjunction with other plans, programs, projects and policies that affect ambient air quality. Projected long-term emissions are considered to be cumulatively significant if they are not consistent with the local air quality management plans and state implementation plans. Consistency is demonstrated through the conformity analysis.

Regional emissions conformity is achieved if the projected emission inventories are within the budget emissions for each air basin for each milestone year. In addition to the regional emissions conformity, the RTP must show: 1) that the implementation of the Transportation Control Measures (TCM) contained in the SIPs is on schedule; 2) that the Financial Constraint Determination has been adequately prepared; and 3) that the required Interagency Consultation and Public Involvement has been adequately implemented.

The emissions budgets reflected in the AQMPs/SIPs function as the applicable emission budgets for the ozone conformity analysis for all non-attainment areas in the SCAG region. The conformity determinations based on the emission budgets for each air basin in the SCAG region, and conducted as part of the 2004 RTP development process, provide reasonable analysis of cumulative air quality impacts of the Plan. The regional transportation plan should conform to the emissions budgets established in each applicable SIP/AQMP. Federal Conformity regulations require emissions to be based on the Latest Planning Assumptions which include the latest vehicle data (fleet, age, activity) and latest socio-economic data. A conformity determination must be made for each nonattainment area in the Region.

A regional analysis estimates the emissions from the implementation of the 2004 RTP and compares them to the emission budgets identified in the AQMPs/SIPs. If the estimated emissions from the 2004 RTP are greater than the emissions budget then the plan would not conform. In the absence of an emission budget, an emission reduction test, such as the build/no build test is applied. In order to pass the build/no-build test, it must be demonstrated that emissions in the build scenario are less than the no-build scenario. Table 3.4-8 outlines the emission budgets required for each air basin and pollutant, the regional emissions analysis technique and the applicable SIPs.

The applicable emissions budgets in the SCAG region are established by air basin, by air district, by pollutant and by years of analysis (milestone, attainment, and planning horizon years) and are presented in Tables 3.4-9 through 3.4-18. The 2004 RTP conformity analysis has been prepared separate from this Program EIR and can be found in Appendices of the 2004 RTP. The analysis concludes that the plan conforms to federal and state requirements for meeting attainment goals throughout the SCAG region. Therefore, cumulative regional air quality impacts are considered to be **less than significant**. Following is a summary of the findings.

Table 3.4-8: 2003 SIPs (Emissions Budgets) and Regional Emission Analysis

Air Basin/Non-attainment Area	Pollutant	Regional Emission Analysis	SIP/AQMP Status (Emissions Budgets)
SCAB	Ozone, CO, NO2, PM10	Budget tests	2003 SCAQMP adoption 8/01/03 2003 South Coast SIP adoption 10/23/03
Ventura County (**SCCAB**)	Ozone	Budget tests	VCAQMP adoption scheduled for 2004
Southeast Desert Modified Antelope Valley (MDAB) San Bernardino Co. (MDAB) Coachella Valley (SSAB)	Ozone	Budget tests	Coachella portion of budget adopted by SCAQMD 11/6/03. Full budget adoption by MDAQMD Board scheduled for 2004
San Bernardino Co. (**MDAB**)	PM10	Build/no-build tests	No SIP scheduled for this area
Searles Valley (**MDAB**)	PM10	Build/no-build tests	No SIP scheduled for this area
Coachella Valley (**SSAB**)	PM10	Budget tests	2003 SCAQMP adopted 8/01/03 ARB approved in October 2003
Imperial Co. (**SSAB**)	PM10	Build/no-build tests	A SIP will be developed in future in compliance with recent court ruling
Imperial Co. (**SSAB**)	Ozone	Build/no-build tests	No SIP required for this area

SCAB: South Coast Air Basin, **SCCAB**: South Central Coast Air Basin, **MDAB**: Mojave Desert Air Basin, **SSAB**: Salton Sea Air Basin – **SCAQMD**: South Coast Air Quality Management District, **VCAPCD**: Ventura County Air Pollution Control District

Table 3.4-9: South Coast Air Basin (SCAB)
Ozone Emissions Analysis (tons/day)
Summer Temperatures - SCAB

Ozone Precursor		2005	2008	2010	2020	2030
ROG (VOC)	Budget	263	216	155	155	155
	Draft 2004 RTP	261.512	213.344	150.557	107.458	72.581
NOX	Budget	546	464	352	352	352
	Draft 2004 RTP	545.306	460.718	348.913	185.009	119.941

Regional emissions budget generated using EMFAC 2002. RTP emissions must be equal or less than budget (2010 – attainment year) – Emissions budgets based on the SCAQMD approved 2003 AQMP/SIP (8/01/03)

Table 3.4-10: South Coast Air Basin (SCAB)
Nitrogen Dioxide (NO_2) Emissions Analysis (tons/day)
Winter Temperatures – SCAB

NO2 Precursor		2003	2005	2010	2020	2030
NOX	Budget	686	686	686	686	686
	Draft 2004 RTP	684.635	617.202	448.327	206.409	132.162

Regional emissions generated using EMFAC 2002. RTP emissions must be equal or less than budget. (1994 - attainment year) - Emissions budgets based on the SCAQMD approved 2003 AQMP/SIP (8/01/03)

Table 3.4-11: South Coast Air Basin (SCAB)
Carbon Monoxide (CO) Emissions Analysis (tons/day)
Winter Temperatures – SCAB

CO	2002	2005	2010	2020	2030
Budget	3,361	3,361	3,361	3,361	3,361
Draft 2004 RTP	3,350.68	2,629.29	1,801.62	861.81	526.86

Regional emissions generated using EMFAC 2002. RTP emissions must be equal or less than budget. (2000 – attainment year) - Emissions budgets based on the SCAQMD approved 2003 AQMP (8/01/03)

Table 3.4-12: South Coast Air Basin (SCAB)
Particulate Matter (PM10) Emissions Analysis (tons/day)
Annual Average Temperatures – SCAB

PM10 Precursor		2003	2006	2010	2020	2030
ROG (VOC)	Budget	311	251	251	251	251
	Draft 2004 RTP	309.454	247.378	188.417	160.718	72.971
NOX	Budget	635	549	549	549	549
	Draft 2004 RTP	634.328	546.787	368.383	193.549	124.831
Primary (PM)	Budget	168	166	166	166	166
	Draft 2004 RTP	164.579	165.958	161.926	159.253	158.174

Regional emissions generated using EMFAC 2002. To pass, RTP emissions must be equal or less than budget. (2006 – attainment year) - Emissions budgets based on the SCAQMD approved 2003 AQMP (8/01/03)
Note: For primary PM10 precursor, the 2003 PM10 AQMP allows use of the Backstop Measure (TCB-01) for additional regional emission reductions beyond the attainment year - not exceeding 9 tons/day and 16 t/d in the years 2020 and 2030 respectively

Table 3.4-13: Ventura County - South Central Coast Air Basin (VC/SCCAB)
Ozone (tons/day)
Summer Temperatures - SCCAB-Ventura County

Ozone Precursors		2005	2010	2020	2030
ROG (VOC)	Budget	14.30	14.30	14.30	14.30
	Draft 2004 RTP	14.24	10.76	6.32	4.22
NOX	Budget	21.40	21.40	21.40	21.40
	Draft 2004 RTP	21.36	15.18	6.85	4.38

Regional emissions generated using EMFAC 2002. To pass, RTP emissions must be equal or less than budget. (2005 – attainment year)

Table 3.4-14: Southeast Desert Modified Area
Ozone (tons/day)
Summer Temperatures – Antelope Valley, San Bernardino in MDAB and Coachella Valley in SSAB

Ozone Precursors		2005	2007	2010	2020	2030
ROG (VOC)	Budget	26.5	23.20	23.20	23.20	23.20
	Draft 2004 RTP	23.5	20.65	16.78	9.95	8.13
NOX	Budget	68.3	63.2	63.2	63.2	63.2
	Draft 2004 RTP	64.9	59.6	51.1	24.2	17.7

Regional emissions generated using EMFAC 2002. To pass, RTP emissions must be equal or less than budget. (2005 – attainment year)

Table 3.4-15: Mojave Desert Air Basin (MDAB)
Particulate Matter (PM10) Emissions Analysis (tons/day)
Annual Average Temperatures
MDAB San Bernardino County (excluding Searles Valley)

Particulate Matter (PM10)	2005	2010	2020	2030
No Project	7.887	9.074	11.027	13.217
Draft 2004 RTP	7.858	8.76	10.994	13.181

Regional emissions generated using EMFAC 2002. To pass, build emission must be less than no-build. (2000 – attainment year)

Mojave Desert Air Basin (MDAB) – Searles Valley: The Searles Valley planning area is designated as the PM10 federal non-attainment area. There are no proposed projects or programs in the 2004 RTP. There is no difference between the 2004 RTP and No Project scenarios.

Table 3.4-16: Salton Sea Air Basin (SSAB) – Coachella Valley PM10 (tons/day) Summer Temperatures – Antelope Valley, San Bernardino in MDAB and Coachella Valley in SSAB						
Ozone Precursors		**2003**	**2006**	**2010**	**2020**	**2030**
PM10	Budget	12.3	10.90	10.90	10.90	10.90
	Draft 2004 RTP	9.433	9.096	9.238	9.524	9.795
Regional emissions generated using EMFAC 2002. To pass, RTP emissions must be equal or less than budget. (2005 – attainment year)						

Table 3.4-17: Salton Sea Air Basin – Imperial County Ozone (tons/day) Summer Temperatures - SCCAB-Ventura County					
Ozone Precursors		**2005**	**2010**	**2020**	**2030**
ROG (VOC)	No Project	8.850	7.23	5.63	5.72
	Draft 2004 RTP	8.845	7.22	5.61	5.69
NOX	No Project	12.725	11.80	8.881	7.810
	Draft 2004 RTP	12.720	11.79	8.880	7.790
Regional emissions generated using EMFAC 2002. To pass, RTP emissions must be equal or less than budget. (2005 – attainment year)					

Table 3.4-18: Salton Sea Air Basin – Imperial County Particulate Matter (PM10) Emissions Analysis (tons/day) Annual Average Temperatures				
Particulate Matter (PM10)	**2005**	**2010**	**2020**	**2030**
No Project	5.731	6.571	8.800	11.289
Draft 2004 RTP	5.728	6.566	8.292	10.647
Regional emissions generated using EMFAC 2002. To pass, build emission must be less than no-build. (2000 – attainment year)				

Regional Emissions Test

- The 2004 RTP regional emissions for all applicable criteria pollutants are consistent with their respective emissions budgets for all milestone, attainment, and planning horizon years for all nonattainment areas in the SCAG region.

- The 2004 RTP regional emissions are less than the No Project emissions for the all areas which require the build/no-build test.

Timely Implementation of TCM Test

The TCM project categories listed in the 2003 South Coast SIP/AQMP are given funding priority and are on schedule for implementation. The TCM strategies listed in the 2003 ozone SIP/AQMP (limited SIP Update) for the Ventura County portion of the SCCAB are given funding priority and are on schedule for implementation.

Financial Constraint Test

The projects and programs listed in the 2004 RTP are financially constrained in conformance with federal requirements. The 2004 RTP Appendices contains detailed information on the financial analysis conducted for the conformity analysis.

Interagency Consultation and Public Involvement

This Draft Program EIR and associated outreach efforts conducted for the 2004 RTP satisfy the interagency consultation and public involvement requirements of the conformity analysis.

Mitigation Measures

The impact is **less than significant** and therefore mitigation measures are not required.

Significance After Mitigation

Not applicable.

Airport Air Emissions

Impact 3.4-6: Increased air traffic would increase emissions from aircraft and ground support equipment (GSE).

Criteria Emissions

Under the Preferred Aviation Plan in the 2004 RTP the future demand for air travel will be largely served by using available capacity at air fields located in the Inland Empire and north Los Angeles County. A decentralized system relieves pressure on constrained, urbanized airports and on the region's surface transportation infrastructure.

The primary pollutants emitted by jet aircraft engines are ROG, NOX, CO, PM10 and SO2. The amount of these pollutants emitted from an aircraft depends on the engine type and the aircraft operational mode. Operational modes consist of the following aircraft activities: approach, taxi-in, taxi-out, takeoff, and climbout.

Emissions from aircraft vary during each of the operational modes because engine performance is only optimal at a cruise power setting. For example, when aircraft are idling or taxiing, emissions of CO and VOC are highest. During takeoff and climbout, emissions of these substances decrease and NOX emissions predominate. Total aircraft-related emissions are also a function of an airport's airfield layout and the capacity of the airport to handle a given volume of aircraft in any given time period.

To evaluate the effects of both the Preferred and Constrained Aviation Plans on air quality, emission inventories of VOC, NOX, CO, SOX, and PM were prepared using the EPA approved Emission and Dispersion Modeling System (EDMS) Version 4.11. The EDMS is a computer model specifically developed by the FAA to assess aircraft activity at airports. Unlike the EMFAC emissions factors, EDMS emissions factors do not decrease in future years, since aircraft fuel emissions, operations, and engine technologies are expected to remain relatively constant. The EDMS database contains aircraft-specific data of operating times for the approach, takeoff, and climbout aircraft modes. For the aircraft modes of taxi-in/taxi-out and delay, data is developed on

an airport-specific basis. Climbout emissions are included in the model up to an elevation of 3,000 feet.

For the aviation air quality analysis, estimates of taxi-in/taxi-out times were derived from airport layout plans (ALPs) for the following facilities:

- Los Angeles International Airport
- Ontario International Airport
- John Wayne Airport
- Bob Hope Airport
- Long Beach Airport
- Palm Springs International Airport
- Palmdale Regional Airport
- San Bernardino International Airport
- Southern California Logistics Airport
- March Air Reserve Base

Taxi times were based on estimates of average daily runway use for the aircraft categories of air carrier, commuter, general aviation, and military and distances from each runway to a central ramp area. The model inputs include numbers of air passengers and projected flight schedules. The Preferred and Constrained Aviation Plans under the 2004 RTP were modeled with EDMS.

Estimates of aircraft delay were derived using the FAA's Advisory Circular (AC) 150-5060-5 (Airport Capacity and Delay) methodology. The delay methodology of the AC uses theoretical airfield capacities based on an airport's runway configuration and aircraft fleet mix to identify an annual service volume (capacity). As an example, for air carrier airports, the AC identifies that an average delay of 3.5 minutes per landing-takeoff (LTO) cycle occurs if the annual aircraft demand equals the airport's theoretical annual service volume. If the annual demand at the airport is less than the service volume, the average delay is less, if the demand is more, the delay is more.

The equipment used to service aircraft are collectively referred to as ground support equipment (GSE) and include the following:

- Aircraft Tugs - tow aircraft into and out of the terminal gate area. This equipment is also used to tow aircraft to and from hangers for maintenance. Generally, there are two types of tugs--those used for narrow body aircraft (i.e., B727, B737) and those used for wide body aircraft (i.e., B747, B767).

- Belt Loaders - mobile conveyor belts used to move baggage to and from an aircraft baggage compartment.
- Service Vehicles - designed specifically to service aircraft between flights and include cabin service, food, fuel, and lavatory trucks.
- Baggage Tugs - move baggage to and from the terminal area to the aircraft.
- Airstart Units - provide volumes of air to an aircraft's main engines for starting.

Small aircraft (such as air taxi aircraft) do not typically require the use of most service equipment. For other types of aircraft, FAA's EDMS assigns "default" aircraft ground service equipment and default "times-in-mode" for each piece of equipment for each aircraft in the fleet mix.

The analysis of existing conditions was based on actual 1999 operations and aircraft fleet mix for each of the airport facilities under evaluation. The analysis of future (2030) conditions was based on the projected number of operations and the forecast aircraft fleet mix developed in support of the aircraft noise analysis.

Emission inventories of VOC, NOX, CO, SOX and PM10 for each of the airports and for each of the scenarios under consideration are included in the Aviation Appendix. Table 3.4-19 summarizes the results of the model. The emissions listed would occur almost entirely within the South Coast Air Basin.

Table 3.4-19: Emission Inventory – Aircraft/Ground Support Equipment In tons per year (tpy)

Pollutant	1999 Base Year	2030 Constrained Plan	2030 Preferred Plan
ROG	1,942	2,883	2,691
NOX	8,195	14,305	15,695
CO	27,042	40,223	45,519
SOX	534	958	1,065
PM10	53	121	140

Source: Southern California Association of Governments; FAA Emission and Dispersion Model (EDMS) Version 4.11

By the year 2030 under the 2004 RTP, Preferred Aviation Plan, emissions of VOC, NOX, CO, SOX, and PM10 from aircraft and GSE are expected to increase in response to additional aircraft operations when compared to both existing (1999) levels and 2030 Constrained.

Toxic Air Contaminants

Since ROG emissions from mobile sources generally capture the majority of the volatile organic TAC contribution from aircraft and GSE, ROG emissions are a good indicator of the volatile organic portion of TACs from aviation sources. As shown in Table 3.4-19 and discussed previously, ROG emissions are expected to increase as result of the Preferred Plan and therefore, the impact of volatile organic toxics is considered to be significant.

Mitigation Measures

Management of operations at the regional airports is not within the scope of SCAG's authority. No mitigation measures proposed by SCAG would effectively minimize aircraft emissions. Nonetheless, SCAG shall support efforts to minimize emissions at airports. ARB has proposed concepts that the federal government should consider to achieve emission reductions such as more stringent engine standards, retrofit controls, cleaner fuel and applying standards to non-tactical military aircraft.

Additional environmental evaluation under CEQA will be required for airport expansion projects as well as long-range airport planning efforts at the local level. These evaluations will identify mitigation measures to reduce impacts of airport emissions on local air quality.

Significance After Mitigation

After implementation of all feasible mitigation measures as described above, activities related to aviation sources in the 2004 RTP (Preferred Aviation Plan) would most likely exceed current conditions for regional ROG, NOX, CO, SOX and PM10. Therefore aviation related emissions from the 2004 RTP would have a **significant** and unavoidable impact on regional air quality.

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