CHAPTER 3

EXISTING SETTING

Introduction
Air Quality
Energy
Hazards
Hydrology/Water Quality
Solid/Hazardous Waste Management

3.0 INTRODUCTION

CEQA Guidelines §15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives.

The following subchapters describe the existing environmental setting for those environmental areas identified in the Initial Study (see Appendix A) that could be adversely affected by the proposed project. These areas include the following: air quality; energy, hazards; hydrology/water quality; and solid/hazardous waste management.

SUBCHAPTER 3.1

AIR QUALITY

Criteria Air Pollutants
Current Air Quality
Non-Criteria Air Pollutants
Transport of Air Pollutants

3.1 AIR QUALITY

3.1.1 CRITERIA AIR POLLUTANTS

The purpose of the 2007 AQMP is designed to address the federal eight-hour ozone and PM2.5 air quality standards, to satisfy the planning requirements of the federal Clean Air Act, and to develop transportation emission budgets using the latest approved motor vehicle emissions model and planning assumptions. The U.S. EPA promulgated the eight-hour ozone standard in July 1997 and finalized Phase 1 of the ozone implementation rule in April 2004. This rule set forth the classification scheme for nonattainment areas and continued obligations with respect to the existing one-hour ozone requirements. As described by the Phase 1 rule, the Basin is classified as Severe 17 with an attainment date of June 2021, while the portion of the Salton Sea Air Basin (SSAB) under the SCAQMD's jurisdiction (Coachella Valley Planning Area) is classified as serious, with an attainment date of June 2013. On November 9, 2005, the U.S. EPA followed up its Phase 1 implementation rule with the Phase 2 rule. The Phase 2 rule outlines the emission controls and planning requirements air agencies must address in their implementation plans. The U.S. EPA also revoked the one-hour ozone standard, which had an attainment deadline of 2010. The SCAQMD, along with environmental groups, sued to challenge U.S. EPA's revocation. The eight-hour ozone attainment plan must be submitted to U.S. EPA by June 2007. On December 22, 2006, the federal Court of Appeals in Washington, D.C., ruled that the U.S. EPA did have the authority to revoke the one-hour ozone standard. Therefore, the 2007 AQMP does not need to demonstrate attainment of the one-hour standard. However, the court also ruled that EPA must require areas that had not yet attained the one-hour standard to continue to implement control requirements at least as stringent as those in effect under the one-hour standard. In particular, one-hour NSR and conformity provisions must continue to be implemented. In addition, if a serious or severe area fails to attain the one hour standard by the statutory date, the area must implement a measure requiring major stationary sources to either reduce their emissions to 80 percent of what they were in the attainment year, or pay an annual fee of $5,000 (adjusted for inflation) for each ton in excess of 80 percent.

Similar to the eight-hour ozone standard, the U.S. EPA promulgated the PM2.5 standards in July 1997. The U.S. EPA issued designations in December 2004, and they became effective on April 5, 2005. Under the 1990 CAA Amendments and U.S. EPA's "Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards," each state having a non-attainment area must submit to U.S. EPA an attainment demonstration three years after the designations became effective. The final date for submittal of PM2.5 attainment demonstrations is April 5, 2008. The SCAQMD has elected to submit the PM2.5 attainment demonstration concurrently with its eight-hour ozone attainment demonstration because many of the control strategies that reduce PM2.5 precursor emissions (e.g., NOx) are also needed to help attain the eight-hour ozone standard.

Unlike the eight-hour ozone standard, area designations for the PM2.5 standard did not have a classification system (e.g., serious, severe) and were designated as attainment, non-attainment, or unclassifiable. For the Basin and the portions of the Salton Sea Air Basin under the SCAQMD's jurisdiction, the regions were designated non-attainment and unclassifiable, respectively. The initial attainment date for areas such as the Basin is April 2010. Unclassifiable regions such as the Coachella Valley Planning Area do not require a planning demonstration for the federal standard and are not addressed in the 2007 AQMP. Projected air quality data for the SCAQMD shows that the region will not be able to meet the April 2010 deadline. Under Section 172 of the CAA, U.S. EPA may grant an area an extension of the initial attainment date for a period of one to five years. In the case of the Basin, the SCAQMD plans to request the full five year extension until April 2015. The following sections describe the existing air quality setting for criteria and noncriteria pollutants analyzed in the EIR.

3.1.1.1 Ambient Air Quality Standards and Health Effects

Health-based air quality standards have been established by California and the federal government for the following criteria pollutants: ozone, CO, NO_2, PM10, PM2.5, SO_2, and lead. The State has also set standards for sulfate and visibility. These standards were established to protect sensitive receptors from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO_2, far more stringent. The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3.1-1.

In 2005, the Basin exceeded the federal standards for ozone, PM10 or PM2.5 on a total of 89 days at one or more locations; this compares to 128 days in 2003 and 94 days in 2004 (based on the current eight-hour average federal standard for ozone). Despite the substantial improvement in air quality over the past few decades, some areas in the Basin still exceed the National Ambient Air Quality Standard (NAAQS) for ozone more frequently than any other area of the U.S. In 2005, the location in the nation most frequently exceeding the federal standard levels for ozone was within the Basin. Also, five of the ten locations in the nation that most frequently exceeded the eight-hour average federal ozone standard level were located in the Basin. The Basin has technically met the CO standards since 2003. Redesignation for attainment for the federal CO standard has been requested, but is still pending at this time. The air quality data collected from the SCAQMD monitoring network are presented in Table 3.1-2.

3.1.1.2 Current Emission Inventories

Emissions inventories developed for the 2007 AQMP use 2002 as the base year and projected emissions in the years 2014, 2020, and 2023. Additional emission inventories for other interim years (i.e., 2005, 2008, 2010, 2011, 2017, and 2030) are also developed. The inventory years are required to comply with federal and state Clean Air Act requirements. The 2002 base year emissions inventory reflects adopted rules and regulations with current compliance dates as of 2002; whereas, future baseline emissions inventories are based on project growth and adopted rules and regulations with both current and future compliance dates. Information necessary to produce an emission inventory for the Basin is obtained from the SCAQMD and other governmental agencies including: CARB, California Department of Transportation (CalTrans), and SCAG. The inventories only include anthropogenic emission sources (i.e., those associated with human activity).

Three inventories were prepared for the Final ~~Draft~~ 2007 AQMP for the purpose of regulatory and SIP performance tracking and transportation conformity: an annual average inventory, a summer planning inventory, and a winter planning inventory. Baseline emissions data presented in this subchapter are based on average annual day emissions (i.e., total annual emissions divided by 365 days) and seasonally adjusted planning inventory emissions. The Final ~~Draft~~ 2007 AQMP uses annual average day emissions to estimate the cost-effectiveness of control measures, to rank control measure implementation, and to perform PM2.5 modeling and analysis. The planning inventory emissions developed to capture the emission levels during a poor air quality season are used to report emission reduction progress as required by the federal and state Clean Air Acts.

TABLE 3.1-1

Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD Concentration/ Averaging Time	FEDERAL PRIMARY STANDARD Concentration/ Averaging Time (>)	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hour average > 0.07 ppm, 8-hr avg.>	0.08 ppm, 8-hour average	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage
Carbon Monoxide	9.0 ppm, 8-hour average> 20 ppm, 1-hour average>	9 ppm, 8-hour average 35 ppm, 1-hour average	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hour average>	0.053 ppm, annual average	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration

TABLE 3.1-1 (Concluded)

Ambient Air Quality Standards

AIR POLLUTANT	STATE STANDARD Concentration/ Averaging Time	FEDERAL PRIMARY STANDARD Concentration/ Averaging Time (>)	MOST RELEVANT EFFECTS
Sulfur Dioxide	0.04 ppm, 24-hour average> 0.25 ppm, 1-hour average>	0.03 ppm, annual average 0.14 ppm, 24-hour average	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in person with asthma
Suspended Particulate Matter (PM10)	30 µg/m^3, annual geometric mean > 50 µg/m^3, 24-hour average>	50 µg/m^3, annual arithmetic mean 150 µg/m^3, 24-hour average	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly
Suspended Particulate Matter (PM2.5)	12 µg/m3, ann. arithmetic mean >	15 µg/m^3, annual arithmetic mean 35 µg/m^3, 24-hour average(1)	
Sulfates	25 µg/m^3, 24-hour average>=	--(2)	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m^3, 30-day average>=	1.5 µg/m^3, calendar quarter	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 km^{-1} (visual range less than 10 miles), with relative humidity <70%, 8-hour average (10am – 6pm, PST)	--(2)	Visibility impairment on days when relative humidity is less than 70 percent

ppm = parts per million

(1) The U.S. EPA lowered the PM2.5 24-hour average standard from 65µg/m^3 to 35µg/m^3 in September 2006. The 65µg/m^3 standard will be in effect until 2010.

(2) No federal standard established.

TABLE 3.1-2

2005 Air Quality Data – South Coast Air Quality Management District

Carbon Monoxide							
Source/ Receptor Area No.	**Location of Air Monitoring Station**	**Station No.**	**No. Days of Data**	**Max. Conc. in ppm 1-hour**	**Max. Conc. in ppm 8-hour**	**No. Days Standard Exceeded[1]**	
						Federal	**State**
						≥ 9.5 ppm 8-hour	**> 9 ppm 8-hour**
LOS ANGELES COUNTY							
1	Central LA	087	365	4	3.1	0	0
2	Northwest Coastal LA County	091	365	3	2.1	0	0
3	Southwest Coastal LA County	094	365	3	2.1	0	0
4	South Coastal LA County 1	072	365	4	3.5	0	0
4	South Coastal LA County 2	077	--	--	--	--	--
6	West San Fernando Valley	074	350	5	3.5	0	0
7	East San Fernando Valley	069	363	4	3.4	0	0
8	West San Gabriel Valley	088	363	4	2.8	0	0
9	East San Gabriel Valley 1	060	365	3	1.7	0	0
9	East San Gabriel Valley 2	591	358	2	1.9	0	0
10	Pomona/Walnut Valley	075	365	4	2.5	0	0
11	South San Gabriel Valley	085	113*	3*	2.4*	0*	0*
12	South Central LA County	084	365	7	5.9	0	0
13	Santa Clarita Valley	090	365	2	1.3	0	0
ORANGE COUNTY							
16	North Orange County	3177	365	7	3.1	0	0
17	Central Orange County	3176	365	4	3.3	0	0
18	North Coastal Orange County	3195	364	5	3.2	0	0
19	Saddleback Valley	3812	365	2	1.6	0	0
RIVERSIDE COUNTY							
22	Norco/Corona	4155	--	--	--	--	--
23	Metropolitan Riverside County 1	4144	363	3	2.5	0	0
23	Metropolitan Riverside County 2	4146	365	4	2.4	0	0
23	Mira Loma	5212	362	3	2.1	0	0
24	Perris Valley	4149	--	--	--	--	--
25	Lake Elsinore	4158	365	2	1	0	0
29	Banning Airport	4164	--	--	--	--	--
30	Coachella Valley 1**	4137	364	2	0.8	0	0
30	Coachella Valley 2**	4157	--	--	--	--	--
SAN BERNARDINO COUNTY							
32	Northwest San Bernardino Valley	5175	364	3	1.8	0	0
33	Southwest San Bernardino Valley	5817	--	--	--	--	--
34	Central San Bernardino Valley 1	5197	365	3	2.1	0	0
34	Central San Bernardino Valley 2	5203	356	4	2.4	0	0
35	East San Bernardino Valley	5204	--	--	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--	--	--
38	East San Bernardino Mountains	5818	--	--	--	--	--
	DISTRICT MAXIMUM			7	5.9	0	0

ppm = parts per million of air by volume; -- = pollutant not monitored;
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin
(1) The federal and state one-hour standards (one-hour avg. CO > 35 ppm and > 20 ppm, respectively) were not exceeded.

TABLE 3.1-2 (Continued)

2005 Air Quality Data – South Coast Air Quality Management District

Ozone											
							No. Days Standard Exceeded				
							Health Advisory	Federal[2]		State[3]	
Source/ Recept or Area No.	Location of Air Monitoring Station	Station No.	No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm 8-hour	4th High Conc. ppm 8-hour	≥ 0.15 ppm 1-hour	> 0.12 ppm 1-hour	> 0.08 ppm 8-hour	> 0.09 ppm 1-hour	> 0.07 ppm 1-hour
LOS ANGELES COUNTY											
1	Central LA	087	365	0.121	0.098	0.072	0	0	1	2	2
8	Northwest Coastal LA County	091	361	0.114	0.09	0.077	0	0	1	7	5
3	Southwest Coastal LA County	094	365	0.086	0.076	0.068	0	0	0	0	1
4	South Coastal LA County 1	072	365	0.091	0.068	0.059	0	0	0	0	0
4	South Coastal LA County 2	077	--	--	--	--	--	--	--	--	--
6	West San Fernando Valley	074	365	0.138	0.113	0.098	0	2	12	30	29
7	East San Fernando Valley	069	365	0.142	0.108	0.081	0	2	2	13	12
8	West San Gabriel Valley	088	363	0.145	0.114	0.086	1	2	5	13	12
9	East San Gabriel Valley 1	060	365	0.145	0.122	0.087	1	4	6	20	14
9	East San Gabriel Valley 2	591	363	0.16	0.13	0.099	2	8	13	31	29
10	Pomona/Walnut Valley	075	361	0.14	0.112	0.096	0	4	11	26	18
11	South San Gabriel Valley	085	116*	0.077*	0.065*	0.051*	0*	0*	0*	0*	0*
12	South Central LA County	084	365	0.111	0.081	0.063	0	0	0	1	1
13	Santa Clarita Valley	090	364	0.173	0.141	0.118	5	11	47	65	69
ORANGE COUNTY											
16	North Orange County	3177	365	0.094	0.075	0.067	0	0	0	0	1
17	Central Orange County	3176	365	0.095	0.077	0.075	0	0	0	1	4
18	North Coastal Orange County	3195	338	0.085	0.073	0.068	0	0	0	0	0
19	Saddleback Valley	3812	365	0.125	0.085	0.078	0	1	1	3	6
RIVERSIDE COUNTY											
22	Norco/Corona	4155	--	--	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	4144	358	0.144	0.129	0.105	0	3	33	46	62
23	Metropolitan Riverside County 2	4146	--	--	--	--	--	--	--	--	--
23	Mira Loma	5212	358	0.135	0.116	0.105	0	3	25	34	51
24	Perris Valley	4149	365	0.126	0.103	0.082	0	1	3	11	18
25	Lake Elsinore	4158	365	0.149	0.119	0.097	1	4	15	37	46
29	Banning Airport	4164	359	0.144	0.132	0.119	0	10	39	47	66
30	Coachella Valley 1**	4137	363	0.139	0.116	0.108	0	4	35	41	63
30	Coachella Valley 2**	4157	365	0.114	0.095	0.092	0	0	18	18	36
SAN BERNARDINO COUNTY											
32	Northwest San Bernardino Valley	5175	365	0.149	0.121	0.101	1	8	15	34	34
33	Southwest San Bernardino Valley	5817	--	--	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	5197	355	0.15	0.128	0.113	2	9	23	49	47
34	Central San Bernardino Valley 2	5203	361	0.163	0.129	0.114	4	9	31	54	58
35	East San Bernardino Valley	5204	364	0.146	0.123	0.113	1	6	24	36	45
37	Central San Bernardino Mountains	5181	354	0.182	0.145	0.13	7	18	69	80	102
38	East San Bernardino Mountains	5818	--	--	--	--	--	--	--	--	--
	DISTRICT MAXIMUM			0.182	0.145	0.13	7	18	69	80	102

ppm = parts per million of air by volume; -- = pollutant not monitored;
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin
(2) The federal one-hour ozone standard was revoked and replaced by the eight-hour average ozone standard effective June 15, 2004.
(3) Air Resources Board has established a new eight-hour average California ozone standard of 0.07 ppm effective May 17, 2005.

TABLE 3.1-2 (Continued)

2005 Air Quality Data – South Coast Air Quality Management District

Nitrogen Dioxide					
Source/ Receptor Area No.	**Location of Air Monitoring Station**	**Station No.**	**No. Days of Data**	**Max. Conc. in ppm 1-hour(4)**	**Annual Average(4) AAM Conc. ppm**
LOS ANGELES COUNTY					
1	Central LA	087	364	0.13	0.0278
2	Northwest Coastal LA County	091	365	0.08	0.0178
3	Southwest Coastal LA County	094	365	0.09	0.0134
4	South Coastal LA County 1	072	365	0.14	0.0241
4	South Coastal LA County 2	077	--	--	--
6	West San Fernando Valley	074	365	0.09	0.0202
7	East San Fernando Valley	069	365	0.09	0.0294
8	West San Gabriel Valley	088	363	0.1	0.0241
9	East San Gabriel Valley 1	060	365	0.09	0.0251
9	East San Gabriel Valley 2	591	360	0.09	0.0224
10	Pomona/Walnut Valley	075	365	0.08	0.0312
11	South San Gabriel Valley	085	116*	0.09*	0.0308*
12	South Central LA County	084	360	0.11	0.0312
13	Santa Clarita Valley	090	347	0.087	0.0190
ORANGE COUNTY					
16	North Orange County	3177	361	0.09	0.0249
17	Central Orange County	3176	365	0.09	0.0211
18	North Coastal Orange County	3195	355	0.09	0.0131
19	Saddleback Valley	3812	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	4155	--	--	--
23	Metropolitan Riverside County 1	4144	365	0.08	0.0222
23	Metropolitan Riverside County 2	4146	--	--	--
23	Mira Loma	5212	346	0.08	0.016
24	Perris Valley	4149	--	--	--
25	Lake Elsinore	4158	365	0.07	0.0142
29	Banning Airport	4164	329	0.07	0.0148
30	Coachella Valley 1**	4137	352	0.1	0.012
30	Coachella Valley 2**	4157	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	5175	364	0.1	0.0313
33	Southwest San Bernardino Valley	5817	--	--	--
34	Central San Bernardino Valley 1	5197	361	0.1	0.031
34	Central San Bernardino Valley 2	5203	361	0.08	0.0259
35	East San Bernardino Valley	5204	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--
38	East San Bernardino Mountains	5818	--	--	--
	DISTRICT MAXIMUM			0.14	0.0313

ppm = parts per million of air by volume; -- = pollutant not monitored; AAM = annual arithmetic mean
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin
(4) The state standard is one-hour avg. > 0.25 ppm and the federal standard is annual arithmetic mean > 0.0534 ppm.

TABLE 3.1-2 (Continued)

2005 Air Quality Data – South Coast Air Quality Management District

Sulfur Dioxide					
Source/ Receptor Area No.	**Location of Air Monitoring Station**	**Station No.**	**No. Days of Data**	**Max. Conc. in ppm 1-hour(5)**	**Max. Conc. in ppm 24-hour(5)**
LOS ANGELES COUNTY					
1	Central LA	087	357	0.07	0.01
2	Northwest Coastal LA County	091	--	--	--
3	Southwest Coastal LA County	094	365	0.04	0.012
4	South Coastal LA County1	072	365	0.04	0.01
4	South Coastal LA County 2	077	--	--	--
6	West San Fernando Valley	074	--	--	--
7	East San Fernando Valley	069	361	0.01	0.006
8	West San Gabriel Valley	088	--	--	--
9	East San Gabriel Valley 1	060	--	--	--
9	East San Gabriel Valley 2	591	--	--	--
10	Pomona/Walnut Valley	075	--	--	--
11	South San Gabriel Valley	085	--	--	--
12	South Central LA County	084	--	--	--
13	Santa Clarita Valley	090	--	--	--
ORANGE COUNTY					
16	North Orange County	3177	--	--	--
17	Central Orange County	3176	--	--	--
18	North Coastal Orange County	3195	359	0.01	0.008
19	Saddleback Valley	3812	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	4155	--	--	--
23	Metropolitan Riverside County 1	4144	365	0.02	0.011
23	Metropolitan Riverside County 2	4146	--	--	--
23	Mira Loma	5212			
24	Perris Valley	4149	--	--	--
25	Lake Elsinore	4158	--	--	--
29	Banning Airport	4164	--	--	--
30	Coachella Valley 1**	4137	--	--	--
30	Coachella Valley 2**	4157	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	5175	--	--	--
33	Southwest San Bernardino Valley	5817	--	--	--
34	Central San Bernardino Valley 1	5197	365	0.01*=	0.004
34	Central San Bernardino Valley 2	5203	--	--	--
35	East San Bernardino Valley	5204	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--
38	East San Bernardino Mountains	5818	--	--	--
	DISTRICT MAXIMUM			0.07	0.012

ppm = parts per million of air by volume; -- = pollutant not monitored;
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin

(5) The state standards are one-hour avg. > 0.25 ppm and 24-hour avg. > 0.045 ppm. The federal standards are annual arithmetic mean SO2) > 0.03 ppm, three-hourr avg. > 0.50 ppm, 24-hour avg. > 0.14 ppm.

TABLE 3.1-2 (Continued)

2005 Air Quality Data – South Coast Air Quality Management District

Suspended Particulates PM10[(6)]							
Source/ Receptor Area No.	Location of Air Monitoring Station	Station No.	No. Days of Data	Max. Conc. in μg/m³ 24-hour	No. (%) Samples Exceeding Standard: Federal > 150 μg/m³ 24-hour	No. (%) Samples Exceeding Standard: State > 50 μg/m³ 24-hour	Annual Averages[(7)] AAM Conc. μg/m³
LOS ANGELES COUNTY							
1	Central LA	087	61	70	0	4(6.6)	29.6
8	Northwest Coastal LA County	091	--	--	--	--	--
3	Southwest Coastal LA County	094	54	44	0	0	22.9
4	South Coastal LA County 1	072	59	66	0	5(8.5)	29.6
4	South Coastal LA County 2	077	59	131	0	18(30.5)	43.4
6	West San Fernando Valley	074	--	--	--	--	--
7	East San Fernando Valley	069	61	92	0	5(8.2)	34.3
8	West San Gabriel Valley	088	--	--	--	--	--
9	East San Gabriel Valley 1	060	55	76	0	12(21.8)	35.1
9	East San Gabriel Valley 2	591	--	--	--	--	--
10	Pomona/Walnut Valley	075	--	--	--	--	--
11	South San Gabriel Valley	085	--	--	--	--	--
12	South Central LA County	084	--	--	--	--	--
13	Santa Clarita Valley	090	60	55	0	1(1.7)	25.8
ORANGE COUNTY							
16	North Orange County	3177	--	--	--	--	--
17	Central Orange County	3176	61	65	0	3(4.9)	28.2
18	North Coastal Orange County	3195	--	--	--	--	--
19	Saddleback Valley	3812	55	41	0	0	19
RIVERSIDE COUNTY							
22	Norco/Corona	4155	58	79	0	5(8.61	31.6
23	Metropolitan Riverside County 1	4144	123	123	0	69(56.1)	52
23	Metropolitan Riverside County 2	4146	--	--	--	--	--
23	Mira Loma	5212	--	--	--	--	--
24	Perris Valley	4149	60	80	0	19(31.7)	39.2
25	Lake Elsinore	4158	--	--	--	--	--
29	Banning Airport	4164	58	76	0	2(3.4)	26.6
30	Coachella Valley 1**	4137	59	66	0	2(3.4)	25.9
30	Coachella Valley 2**	4157	115	106	0	39(34.2)	45.7
SAN BERNARDINO COUNTY							
32	NW San Bernardino Valley	5175	--	--	--	--	--
33	SW San Bernardino Valley	5817	60	74	0	19(31.7)	40.8
34	Central San Bernardino Valley 1	5197	60	108	0	29(48.3)	50
34	Central San Bernardino Valley 2	5203	60	72	0	23(38.3)	42.3
35	East San Bernardino Valley	5204	58	61	0	12(20.7)	33.2
37	Central San Bernardino Mtns.	5181	56	49	0	0	25.8
38	East San Bernardino Mountains	5818	--	--	--	--	--
	DISTRICT MAXIMUM			131	0	89	52.0

ppm = parts per million of air by volume; -- = pollutant not monitored; AAM = Annual arithmetic mean; AGM = Annual geometric mean
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin
(6) PM10 samples were collected every sic days (every three days at Stn. Nos. 4144 & 4157).
(7) Federal and state PM10 standards are AAM >50 μg/m³ and AAM > 20 μg/m³, respectively.

TABLE 3.1-2 (Continued)

2005 Air Quality Data – South Coast Air Quality Management District

Suspended Particulates PM2.5[(8)]							
Source/ Receptor Area No.	**Location of Air Monitoring Station**	**Station No.**	**No. Days of Data**	**Max. Conc. in µg/m³ 24-hour**	**98th Percentile Conc. in µg/m³ 24-hour**	**No. (%) Samples Exceeding Standard Federal > 65 µg/m³ 24-hour**	**Annual Average[(9)] AAM Conc. µg/m³**
LOS ANGELES COUNTY							
1	Central LA	087	334	73.7	53.2	2(0.6)	18.1
2	Northwest Coastal LA County	091	--	--	--	--	--
3	Southwest Coastal LA County	094	--	--	--	--	--
4	South Coastal LA County 1	072	324	53.9	41.4	0	16
4	South Coastal LA County 2	077	344	50.8	37.8	0	14.7
6	West San Fernando Valley	074	104	39.6	35.8	0	13.9
7	East San Fernando Valley	069	106	63.2	50.6	0	17.9
8	West San Gabriel Valley	088	113	62.9	43.1	0	15.1
9	East San Gabriel Valley 1	060	292*	132.7*	53.2*	1(0.3)*	17.0*
9	East San Gabriel Valley 2	591	--	--	--	--	--
10	Pomona/Walnut Valley	075	--	--	--	--	--
11	South San Gabriel Valley	085	76*	58.2*	54.0*	0*	17.0*
12	South Central LA County	084	114	54.6	48.5	0	17.5
13	Santa Clarita Valley	090	--	--	--	--	--
ORANGE COUNTY							
16	North Orange County	3177	--	--	--	--	--
17	Central Orange County	3176	333	54.7	41.9	0	14.7
18	North Coastal Orange County	3195	-	-	-	-	-
19	Saddleback Valley	3812	113	35.4	31.4	0	10.7
RIVERSIDE COUNTY							
22	Norco/Corona	4155	--	--	--	--	--
23	Metropolitan Riverside County 1	4144	334	98.7	58.4	4(1.2)	21
23	Metropolitan Riverside County 2	4146	110	95	41	1(0.9)	18
23	Mira Loma	5212	--	--	--	--	--
24	Perris Valley	4149	--	--	--	--	--
25	Lake Elsinore	4158	--	--	--	--	--
29	Banning Airport	4164	--	--	--	--	--
30	Coachella Valley 1**	4137	83*	26.2*	25.0*	0*	8.4*
30	Coachella Valley 2**	4157	104	44.4	25	0	10.5
SAN BERNARDINO COUNTY							
32	Northwest San Bernardino Valley	5175	--	--	--	--	--
33	Southwest San Bernardino Valley	5817	110	87.8	49.6	1(0.9)	18.8
34	Central San Bernardino Valley 1	5197	109	96.8	48.2	1(0.9)	18.9
34	Central San Bernardino Valley 2	5203	109	106.3	43.4	1(0.9)	17.4
35	East San Bernardino Valley	5204	--	--	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--	--	--
38	East San Bernardino Mountains	5818	51	38.8	38.8	0	12.1
	DISTRICT MAXIMUM			132.7	58.4	4	21.0

ppm = parts per million of air by volume; -- = pollutant not monitored; AAM = Annual arithmetic mean
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin

(8) PM2.5 samples were collected every three days at all sites except for Station. Nos. 060, 072, 077, 087, 3176, and 4144, where samples were taken every day, and Station. No. 5818, where samples were collected every six days.

(9) Federal PM2.5 standard is AAM > 15 µg/m³. State standard is AAM > 12 µg/m³ (state standard was established on July 5, 2003.

TABLE 3.1-2 (Continued)

2005 Air Quality Data – South Coast Air Quality Management District

Particulates TSP(10)					
Source/ Receptor Area No.	**Location of Air Monitoring Station**	**Station No.**	**No. Days of Data**	**Max. Conc. in µg/m³ 24-hour**	**Annual Average AAM Conc. µg/m³**
LOS ANGELES COUNTY					
1	Central LA	087	66	141	66.7
2	Northwest Coastal LA County	091	59	89	41.6
3	Southwest Coastal LA County	094	--	--	--
4	South Coastal LA County 1	072	61	112	55.5
4	South Coastal LA County 2	077	--	--	--
6	West San Fernando Valley	074	--	--	--
7	East San Fernando Valley	069	--	--	--
8	West San Gabriel Valley	088	58	89	44.6
9	East San Gabriel Valley 1	060	58	142	70.9
9	East San Gabriel Valley 2	591	--	--	--
10	Pomona/Walnut Valley	075	--	--	--
11	South San Gabriel Valley	085	39*	104*	66.4*
12	South Central LA County	084	57	118	67.4
13	Santa Clarita Valley	090	--	--	--
ORANGE COUNTY					
16	North Orange County	3177	--	--	--
17	Central Orange County	3176	--	--	--
18	North Coastal Orange County	3195	--	--	--
19	Saddleback Valley	3812	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	4155	--	--	--
23	Metropolitan Riverside County 1	4144	59	173	96.7
23	Metropolitan Riverside County 2	4146	60	125	75.8
23	Mira Loma	5212			
24	Perris Valley	4149	--	--	--
25	Lake Elsinore	4158	--	--	--
29	Banning Airport	4164	--	--	--
30	Coachella Valley 1**	4137	--	--	--
30	Coachella Valley 2**	4157	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	5175	57	94	53.4
33	Southwest San Bernardino Valley	5817	--	--	--
34	Central San Bernardino Valley 1	5197	61	295	100.2
34	Central San Bernardino Valley 2	5203	60	175	87.1
35	East San Bernardino Valley	5204	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--
38	East San Bernardino Mountains	5818			
	DISTRICT MAXIMUM			295	100.2

ppm = parts per million of air by volume; -- = pollutant not monitored; AAM = Annual arithmetic mean
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin
(10) Total suspended particulates (TSP) were determined from samples collected every six days by high volume sampler method, on glass fiber filter media.

TABLE 3.1-2 (Continued)

2005 Air Quality Data – South Coast Air Quality Management District

Lead(11)				
Source/ Receptor Area No.	**Location of Air Monitoring Station**	**Station No.**	**Max. Monthly Average Conc.(12) µg/m³**	**Max. Quarterly Average Conc.(12) µg/m³**
LOS ANGELES COUNTY				
1	Central LA	087	0.02	0.02
2	Northwest Coastal LA County	091	--	--
3	Southwest Coastal LA County	094	--	--
4	South Coastal LA County 1	072	0.01	0.01
4	South Coastal LA County 2	077	--	--
6	West San Fernando Valley	074	--	--
7	East San Fernando Valley	069	--	--
8	West San Gabriel Valley	088	--	--
9	East San Gabriel Valley 1	060	--	--
9	East San Gabriel Valley 2	591	--	--
10	Pomona/Walnut Valley	075	--	--
11	South San Gabriel Valley	085	0.03	0.03
12	South Central LA County	084	0.03	0.02
13	Santa Clarita Valley	090	--	--
ORANGE COUNTY				
16	North Orange County	3177	--	--
17	Central Orange County	3176	--	--
18	North Coastal Orange County	3195	--	--
19	Saddleback Valley	3812	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	4155	--	--
23	Metropolitan Riverside County 1	4144	0.02	0.02
23	Metropolitan Riverside County 2	4146	0.01	0.01
23	Mira Loma	5212	--	--
24	Perris Valley	4149	--	--
25	Lake Elsinore	4158	--	--
29	Banning Airport	4164	--	--
30	Coachella Valley 1**	4137	--	--
30	Coachella Valley 2**	4157	--	--
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	5175	0.02	0.02
33	Southwest San Bernardino Valley	5817	--	--
34	Central San Bernardino Valley 1	5197	--	--
34	Central San Bernardino Valley 2	5203	0.02	0.01
35	East San Bernardino Valley	5204	--	--
37	Central San Bernardino Mountains	5181	--	--
38	East San Bernardino Mountains	5818		
	DISTRICT MAXIMUM		0.03	0.03

ppm = parts per million of air by volume; -- = pollutant not monitored;
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin
(11) Lead was determined from samples collected every six days by high volume sampler method, on glass fiber filter media.
(12) Federal and state standards (qtrly. avg. > 1.5 µg/m³ and monthly avg. > 1.5 µg/m³, respectively) were not exceeded.

TABLE 3.1-2 (Concluded)

2005 Air Quality Data – South Coast Air Quality Management District

Sulfates(13)				
				No. (%) Samples Exceeding Standard
				State
Source/ Receptor Area No.	**Location of Air Monitoring Station**	**Station No.**	**Max. Conc. in $\mu g/m^3$ 24-hour**	**$\geq$ 25 $\mu g/m^3$ 24-hour**
LOS ANGELES COUNTY				
1	Central LA	087	14.2	0
2	Northwest Coastal LA County	091	11.7	0
3	Southwest Coastal LA County	094	--	0
4	South Coastal LA County 1	072	16.8	0
4	South Coastal LA County 2	077	--	--
6	West San Fernando Valley	074	--	--
7	East San Fernando Valley	069	--	--
8	West San Gabriel Valley	088	11.2	0
9	East San Gabriel Valley 1	060	10.2	0
9	East San Gabriel Valley 2	591	--	--
10	Pomona/Walnut Valley	075	--	--
11	South San Gabriel Valley	085	9.9	0
12	South Central LA County	084	17.3	0
13	Santa Clarita Valley	090	--	--
ORANGE COUNTY				
16	North Orange County	3177	--	--
17	Central Orange County	3176	--	--
18	North Coastal Orange County	3195	--	--
19	Saddleback Valley	3812	--	--
RIVERSIDE COUNTY				
22	Norco/Corona	4155	--	--
23	Metropolitan Riverside County 1	4144	10.3	0
23	Metropolitan Riverside County 2	4146	10.3	0
23	Mira Loma	5212	--	--
24	Perris Valley	4149	--	--
25	Lake Elsinore	4158	--	--
29	Banning Airport	4164	--	--
30	Coachella Valley 1**	4137	--	--
30	Coachella Valley 2**	4157	--	--
SAN BERNARDINO COUNTY				
32	NW San Bernardino Valley	5175	8.4	0
33	SW San Bernardino Valley	5817	--	--
34	Central San Bernardino Valley 1	5197	10.4	0
34	Central San Bernardino Valley 2	5203	10.9	0
35	East San Bernardino Valley	5204	--	--
37	Central San Bernardino Mtns.	5181	--	--
38	East San Bernardino Mountains	5818		--
	DISTRICT MAXIMUM		17.3	0

ppm = parts per million of air by volume; -- = pollutant not monitored;
* = less than 12 full months of data and may not be representative; ** = Salton Sea Air Basin
(13) Sulfate was determined from samples collected every six days by high volume sampler method, on glass fiber filter media.

Stationary Sources

Stationary sources can be divided into two major subcategories: point and area sources. Point sources are generally large emitters with one or more emission sources at a permitted facility with an identified location (e.g., power plants, refineries). Area sources generally consist of many small emission sources (e.g., residential water heaters, architectural coatings) which are distributed across the region. For 2002, reported data are used for point sources emitting more than four tons per year of the following criteria air contaminants: VOC, NOx, SOx, and PM2.5. For CO, facilities the emission reporting threshold is 100 tons per year. If either of these thresholds are triggered, all pollutants are reported by the facility.

Area source emissions were jointly developed by CARB and the SCAQMD for approximately 350 categories. Several special studies were conducted to improve the area source inventory. Specific source categories such as gasoline dispensing, consumer products, architectural coatings, fugitive dust, and ammonia sources were updated (see Appendix III of the Draft 2007 AQMP for further details). For consumer products and architectural coatings, revised and updated survey data were used. For fugitive dust, the PM10 to PM2.5 ratio was changed based on a study by the Western Regional Air Partnership (WRAP)(WRAP, 2005).

Mobile Sources

Mobile sources consist of two subcategories: on-road and off-road sources. On-road vehicle emissions are calculated using socioeconomic data and transportation models provided by SCAG, spatial distribution data from Caltrans' Direct Travel Impact Model (DTIM4), and EMFAC2007 Working Draft inventories obtained from CARB. The EMFAC2007 Working Draft reflects SCAG's revised baseline activity data from the modified 2004 RTP. The 2000 Census data, combined with SCAG's 2001 origin and destination survey data, are used in SCAG's modified 2004 RTP and in the Final ~~Draft~~ 2007 AQMP. Major improvements made to the EMFAC2007 Working Draft include:

1. Heavy heavy-duty diesel vehicles population redistribution;
2. Vehicle miles traveled updates;
3. Heavy heavy-duty diesel factors updates;
4. Pending vehicles updates;
5. Fuel correcting factors updates;
6. Ethanol permeation effects;
7. New population data; and,
8. New temperature and relative humidity profiles corresponding to the federal eight-hour ozone standard.

Figure 3.1-1 compares the on-road baseline emissions between EMFAC2002 and the EMFAC2007 Working Draft used in the 2003 AQMP and Final ~~Draft~~ 2007 AQMP, respectively. It should be noted that the comparison reflects changes in methodology, adopted rules, and updated growth projections since the release of EMFAC2002. The comparison is done using the same years as presented in the 2003 AQMP (i.e., 2002 and 2020).

Emissions from off-road vehicle categories (e.g., trains, ships, construction equipment, ports and rail cargo handling equipment) were developed primarily based on estimated activity levels and emission factors. The major changes made to the off-road model include:

1. Off-road equipment population, activity, and emission factor updates;
2. Locomotive inventory reflecting the 1998 South Coast Locomotive Memorandum of Understanding (MOU) and the 2005 CARB/Railroad MOU;
3. Cargo handling equipment updates;
4. Portable fuel containers updates;
5. Marine vessel updates; and,
6. Commercial harbor craft updates.

The inventory for trains was revised from the 2003 AQMP to reflect projected emission reductions based on the 1998 South Coast MOU and the 2005 CARB/Railroad MOU. Significant improvements have been made to the marine vessel category, which includes ocean-going vessels, commercial harbor craft, and other ships. For both the Port of Los Angeles and Port of Long Beach, more recent and comprehensive emission inventories and projections have been included in the Final ~~Draft~~ 2007 AQMP. New surveys and data sources for marine vessels have been used, as described in Appendix III of the Draft 2007 AQMP.

Figure 3.1-2 shows a comparison of the off-road baseline emissions based on the OFFROAD model revisions used for the 2003 AQMP and Final ~~Draft~~ 2007 AQMP. As the inventory methodology has improved, more emissions have been quantified, resulting in equal or higher emissions than previously anticipated in spite of more rules being adopted. This creates a greater challenge for attainment

Uncertainty in the Inventory

Over the years, significant improvements have been made to quantify emission sources upon which control measures are developed. Increased use of continuous monitoring and source tests has contributed to the improvement in point source inventories. Technical assistance to facilities and auditing of reported emissions by the SCAQMD also have improved the accuracy of the emissions inventory. Area source inventories that rely on average emission factors and regional activities have inherent uncertainty. Industry-specific surveys or source-specific studies during rule development have provided much-needed refinement to the emissions estimates.

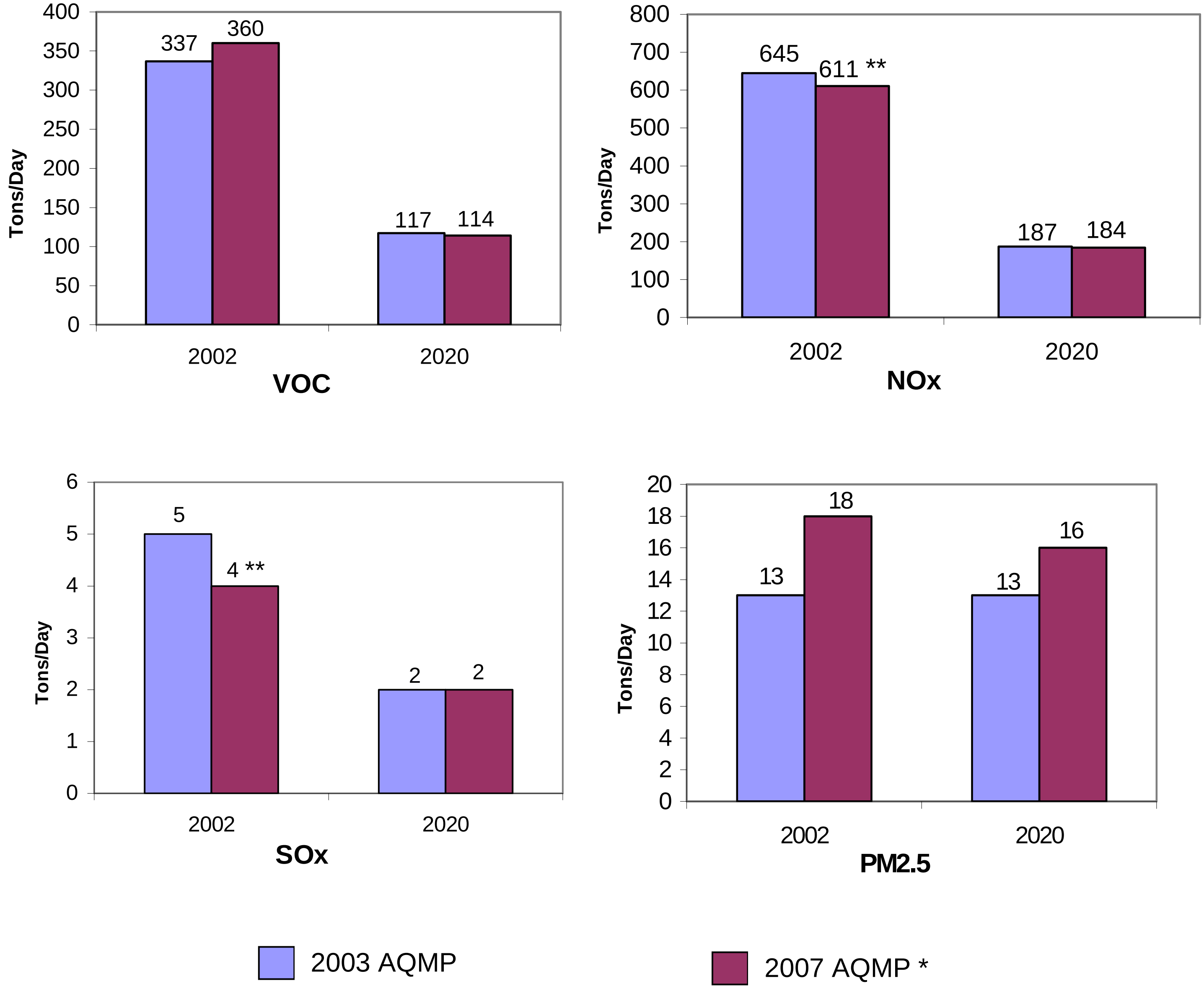


FIGURE 3.1-1

Comparison of On-Road Emissions Between EMFAC2002 (2003 AQMP) and EMFAC2007 V2.3(Proposed Modifications to Fianl ~~Draft~~ 2007 AQMP) (VOC & NOx – Summer Planning; SOx & PM2.5 – Annual Average Inventory)

* Year 2020 inventories incorporate rules adopted since the release of EMFAC2002.
** Redistribution of the heavy-duty truck VMT in the EMFAC2007 V2.3 causes heavy duty truck VMT reduction in the district. As a result, NOx and SOx emissions are relatively lower in the Proposed Modification to Final ~~Draft~~ 2007 AQMP than in the 2003 AQMP.
Note: External adjustments to the EMFAC2007 V2.3 are included.

Mobile source inventories remain the greatest challenge due to the high number and types of equipment and engines involved, in-use performance variables, and complex emission characteristics. As described earlier, many improvements were made to the EMFAC2007 Working Draft and such work is still ongoing. However, it should be acknowledged that there are still areas that may not have been adequately addressed. For example, ethanol permeation was not accounted for in the stationary source inventory for gasoline-powered equipment or gas stations, how best to reflect heavy heavy-duty truck in-use emissions with limited test data, and appropriate spatial and temporal distribution of recreational boats need to be examined further.

Relative to future growth, there are many challenges with making accurate projections. For example, where vehicle trips will occur, the distribution between various modes of transportation (such as trucks and trains), as well as estimates for population growth and changes to the number and type of jobs – although they are forecast with the best information available; nevertheless, they contribute to the overall uncertainty in emission projections.

Gridded Emissions

For air quality modeling purposes, the region is composed of the South Coast Air Basin, Coachella Valley, Antelope Valley, Ventura County (upwind area), and Mojave Desert. The modeling area is divided into a grid system composed of 5.0 km by 5.0 km grid cells defined by Universal Transverse Mercator (UTM) coordinates. Both stationary and mobile source emissions are allocated to individual grid cells within this system. In general, the modeling emission data features episodic-day emissions. Seasonal variations in activity levels are taken into account in developing gridded stationary point and area source emissions. Variations in temperature, hours of operation, speed of motor vehicles, or other factors are considered in developing gridded motor vehicle emissions. Hence, "gridded" emissions data used for ozone modeling applications differ from the average annual day or planning inventory emission data in two respects: 1) the modeling region covers larger geographic areas than the Basin; and 2) emissions represent day-specific instead of average or seasonal conditions. In the Final ~~Draft~~ 2007 AQMP, gridded inventories associated with selected ozone episodes have been prepared for air quality modeling analyses. In addition, gridded emissions for 2005 and 2014 were developed to calculate annual average PM2.5 concentrations.

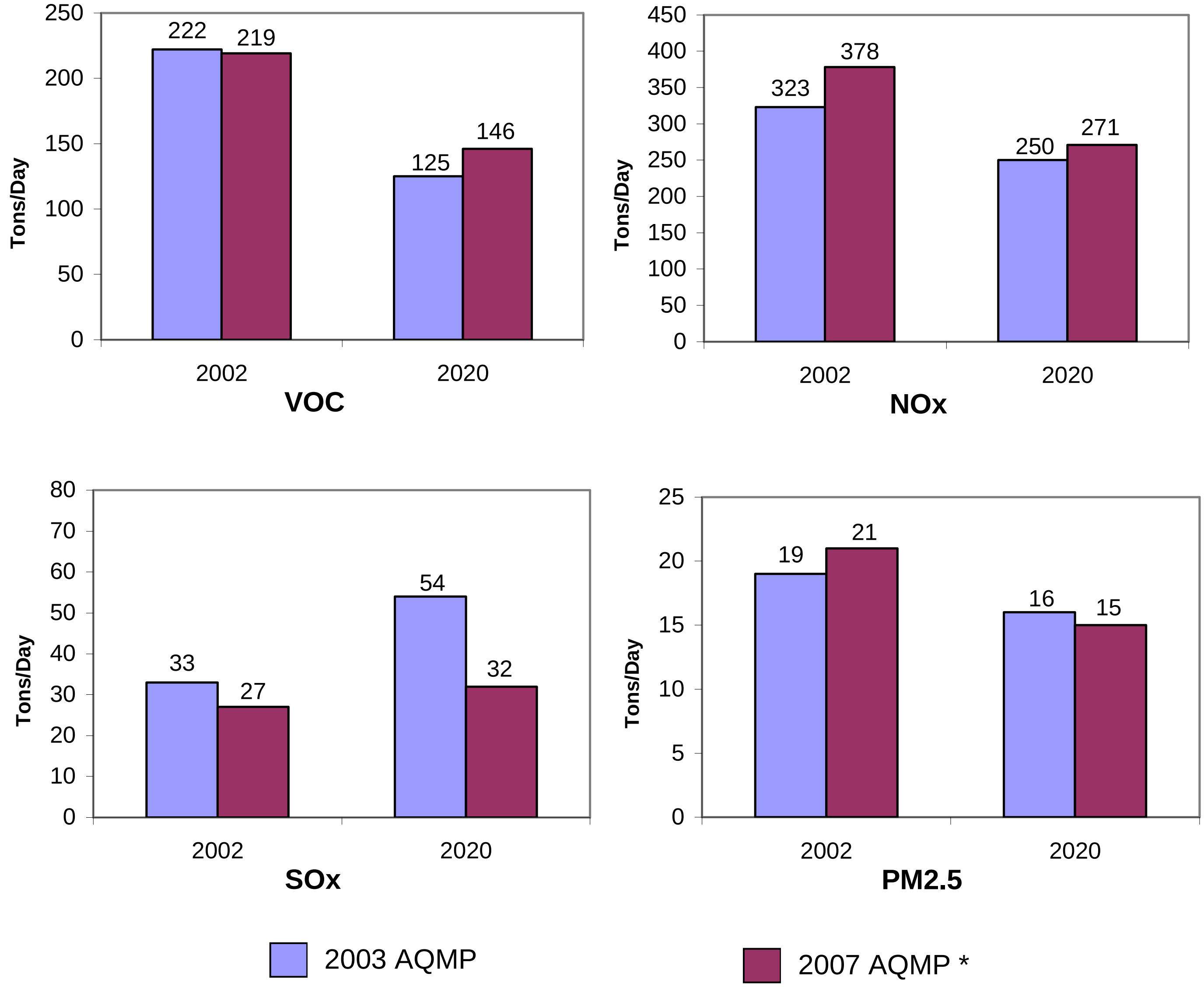


FIGURE 3.1-2

Comparison of Off-Road Emissions Between 2003 AQMP and Proposed Modifications to the Final ~~Draft~~ 2007 AQMP
(VOC & NOx – Summer Planning; SOx & PM2.5 – Annual Average Inventory)

* Year 2020 inventories incorporate rules adopted since the release of EMFAC2002

3.1.1.3 Base Year Emissions

The average annual daily amounts of VOC, NOx, CO, SOx, and PM2.5 emitted into the atmosphere of the Basin in 2002 are shown in Figure 3.1-3. In 2002, approximately 5390 tons per day of CO; 1104 tons per day of NOx; 975 tons per day of VOC; 54 tons per day of SOx; and 101 tons per day of PM2.5, were emitted into the Basin's atmosphere each day. Emissions vary relatively little by season, but there are large seasonal differences in the atmospheric concentrations of pollutants due to seasonal variations in the weather. The planning inventories for VOC and NOx Summer and Winter emissions in the atmosphere are shown in Figure 3.1-4. In 2002, approximately 897 tons per day of VOC and 1,078 tons per day of NOx were emitted into the summer atmosphere in the Basin and 1,152 tons per day of NOx and 5,181 tons per day of CO were emitted into the winter atmosphere in the Basin. Planning inventories are not used for PM2.5 analysis.

Figure 3.1-5 characterizes relative contributions by stationary and mobile source categories. Stationary sources are subdivided into point (e.g., chemical manufacturing, petroleum production, and electric utilities) and area sources (e.g., architectural coatings, residential water heaters, and consumer products). Mobile sources consist of on-road (e.g., light-duty passenger cars) and off-road sources (e.g., trains and ships). Entrained road dust is also included in the PM2.5 pie chart in Figure 3.1-5.

On- and off-road sources continue to be the major contributors for each of the five pollutants, as shown in Figure 3.1-5. For example, mobile sources represent 64 percent of VOC emissions, 91 percent of NOx emissions, and 98 percent of CO emissions. For directly emitted PM2.5, mobile sources represent 39 percent of the emissions with another 20 percent due to vehicle-related entrained road dust.

Within the category of stationary sources, point sources contribute more SOx emissions than area sources. Area sources play a major role in VOC emissions, emitting about five times more than point sources. Area sources are the predominant source (32 percent) of directly emitted PM2.5 emissions, including sources such as cooking.

In the mobile source category, emissions from on-road vehicles are much higher than those from off-road sources for all criteria pollutants except SOx and PM2.5. This can be explained by the fact that the sulfur content in fuels used for off-road vehicles is relatively higher than those for on-road vehicles, and commercial/industrial off-road equipment generates high levels of PM2.5.

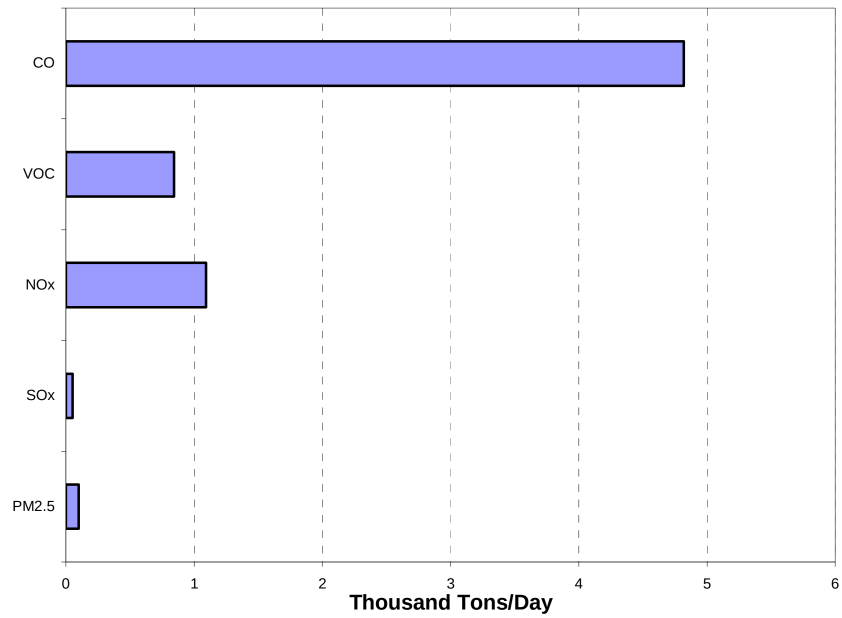


FIGURE 3.1-3

2002 Annual Average Daily Emissions in the Basin

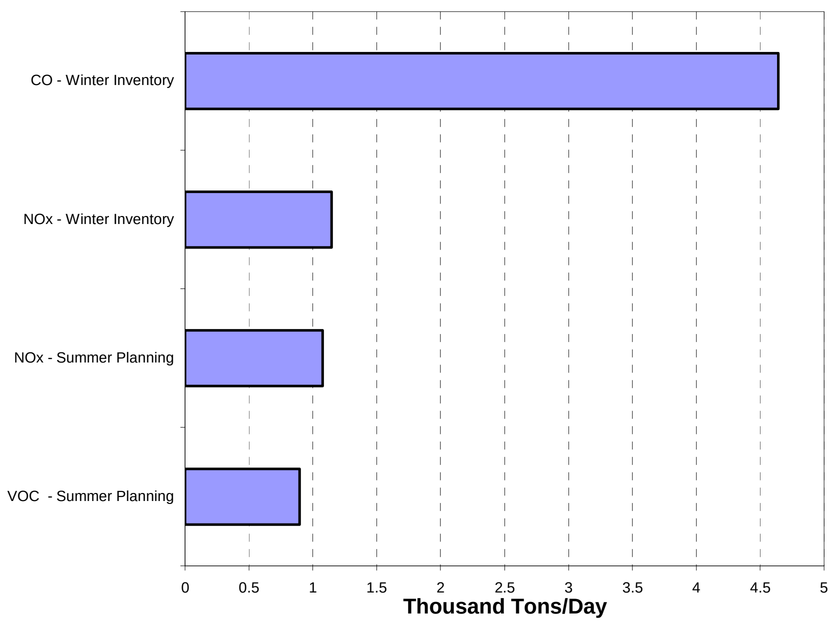
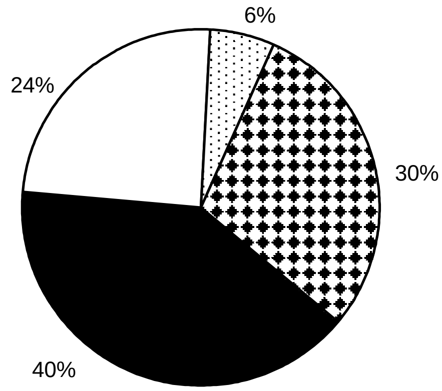
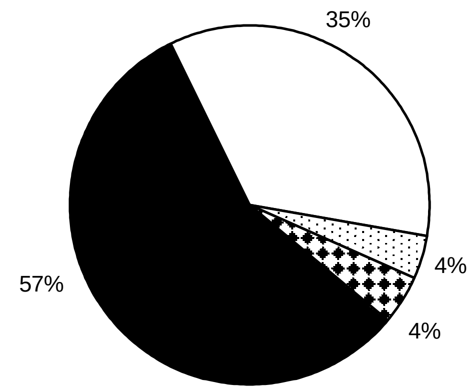


FIGURE 3.1-4

2002 Planning Inventory Emissions in the Basin

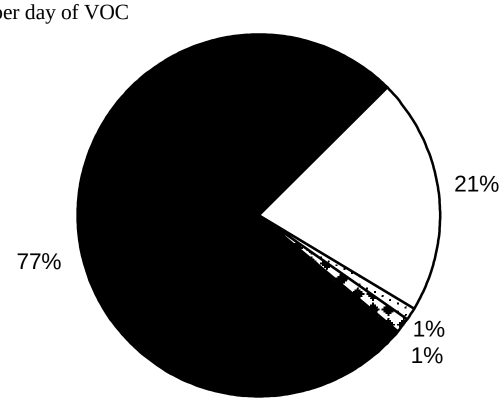


VOC Emissions: 897 Tons/Day

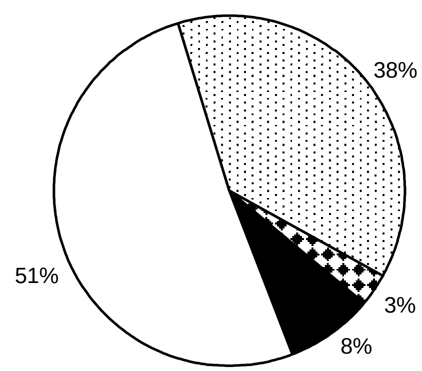


NOx Emissions: 1,079 Tons/Day

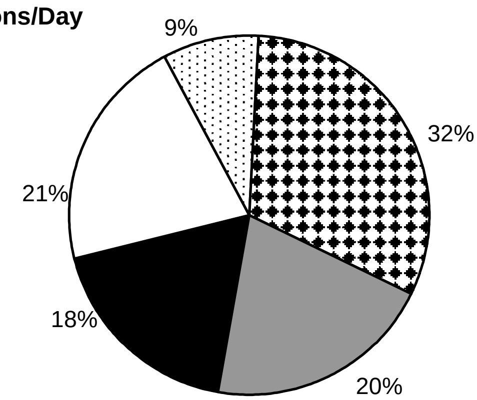
Note: Consumer products and architectural coatings under the area source category represent 110 and 57 tons per day of VOC emissions, respectively.



CO Emissions: 4,819 Tons/Day



SOx Emissions: 53 Tons/Day



Directly Emitted PM2.5 Emissions: 99 Tons/Day

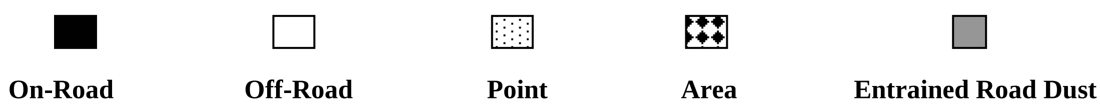


FIGURE 3.1-5
Relative Contribution by Source Category to 2002 Emission Inventory
(VOC & NOx – Summer Planning; CO, SOx & PM2.5 – Annual Average Inventory)

3.1.1.4 Future Emissions

Data Development

The milestone years 2002, 2005, 2008, 2010, 2011, 2014, 2017, 2020, 2023, and 2030 are the target years for emissions rate-of-progress estimates under the federal Clean Air Act and the state Clean Air Act. Future emissions are divided into RECLAIM and non-RECLAIM emissions. Future NOx and SOx emissions from RECLAIM sources are estimated based on their allocations as specified by SCAQMD Rule 2002 –Allocations for NOx and SOx. The forecasts for non-RECLAIM emissions were derived using: 1) emissions from the 2002 base year; 2) expected controls after implementation of SCAQMD rules adopted by June 30, 2006, and most CARB rules adopted as of June 2005; and 3) emissions growth in various source categories between the base and future years. SCAQMD rules adopted after June 30, 2006 are treated as baseline adjustments for emissions reduction accounting purposes. Some CARB rules adopted prior to June 30, 2006 are not yet incorporated into the EMFAC2007 v2.3. A detailed description of the forecasting methodology is provided in Appendix III of the Final ~~Draft~~ 2007 AQMP.

Demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry), developed by SCAG for its interim 2007 RTP, were used in the modified 2004 RTP to estimate future emissions.

Current forecasts indicate that this region will experience a population growth of 22 percent by the year 2020 with a 17 percent increase in vehicle miles traveled (VMT).

As compared to the growth projections from the 2003 AQMP, the 2007 AQMP projections for the year 2020 show about a 200,000 (one percent) increase in population, 300,000 (3.5 percent) decrease in total employment and 47.7 million mile (10 percent) decrease in the daily VMT forecast. The decrease in VMT forecast is primarily due to the redistribution of VMT to the eastern portion of the region outside of the Basin.

The annual average daily amounts of VOC, NOx, CO, SOx, and PM2.5 emissions for the base years of 2014, 2020, and 2023 are shown in Figure 3.1.6. The planning inventories for VOC and NOx Summer and Winter emissions are shown in Figure 3.1.7.

Without any additional controls, VOC, NOx, and CO emissions are expected to decrease due to existing regulations, such as controls on off-road equipment, new vehicle standards, and the RECLAIM program. Figure 3.1-8 illustrates the relative contribution to the 2020 inventory by source category. A comparison between Figures 3.1-5 and 3.1-8 indicates that the on-road mobile category continues to be a substantial contributor to CO and NOx emissions. However, due to the adopted regulations, by 2020 on-road mobile emissions decrease about 25 percent of total VOC emissions from 44 percent in 2002. Meanwhile, area sources become the major contributor to VOC emissions from 30 percent in 2002 to 44 percent in 2020.

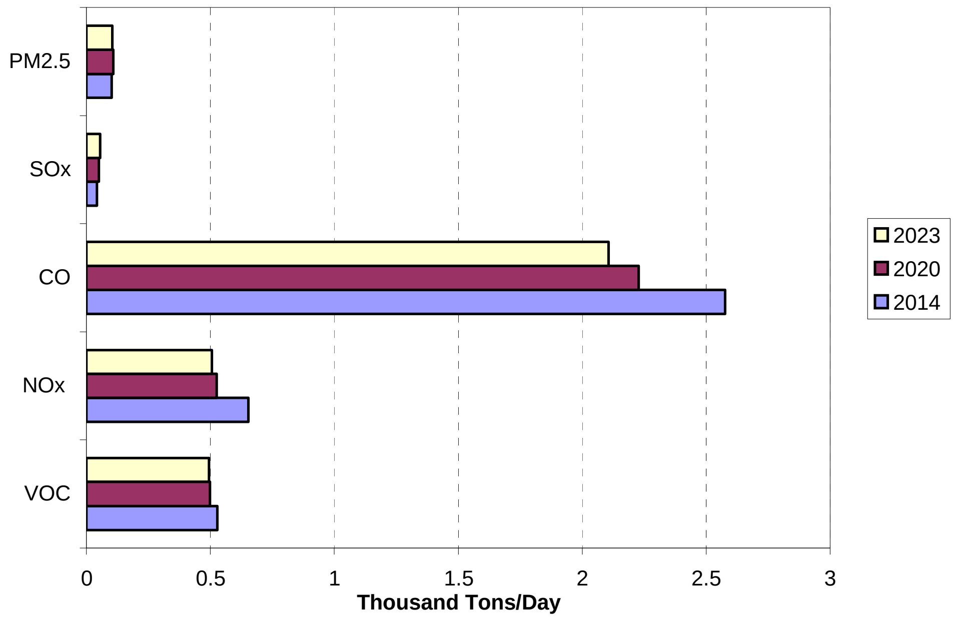


FIGURE 3.1-6
Annual Average Daily Emissions for 2014, 2020, and 2023 Base Years

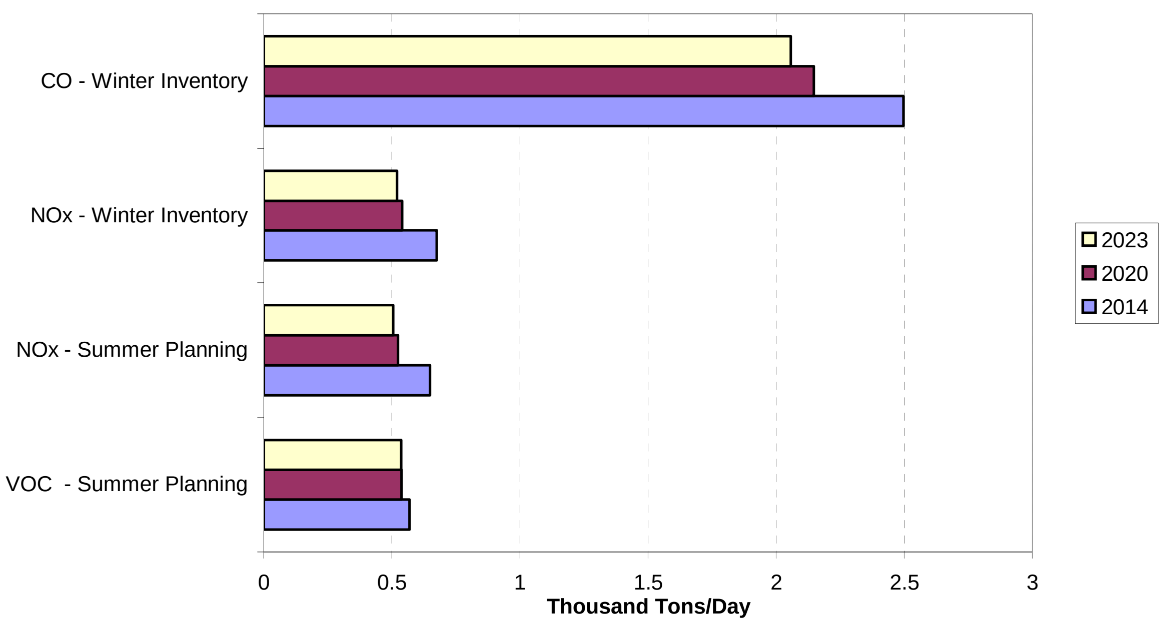
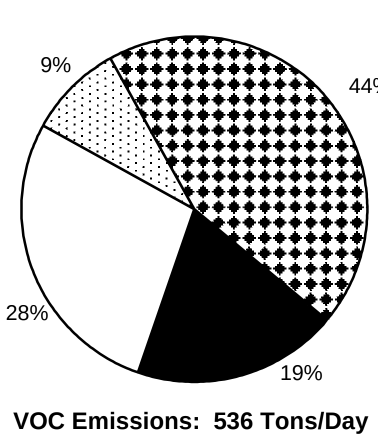
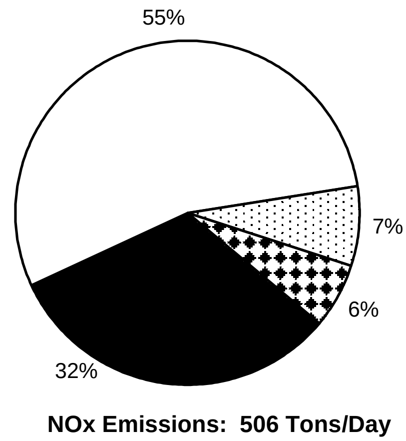


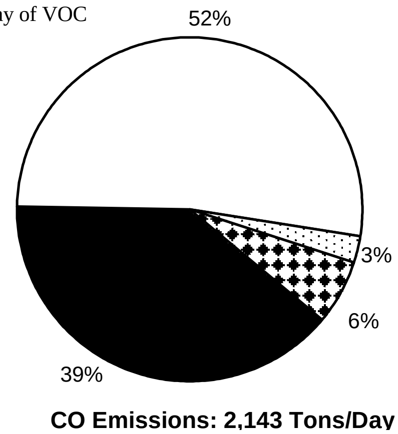
FIGURE 3.1-7

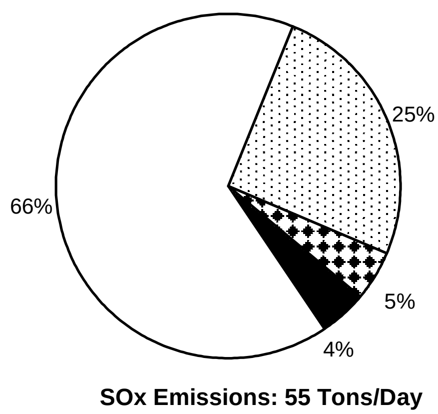
Winter and Summer Planning Inventory Emissions for 2014, 2020, and 2023 Base Years

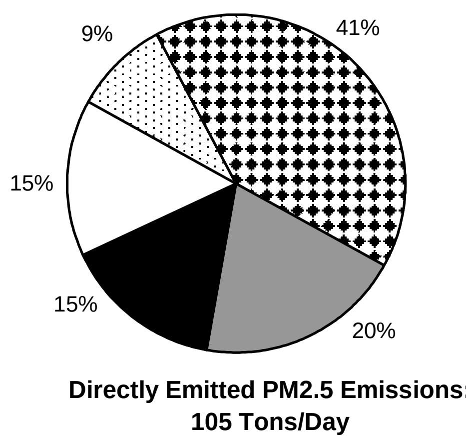




Note: Consumer products and architectural coatings under the area source category represent 114 and 31 tons per day of VOC emissions, respectively.







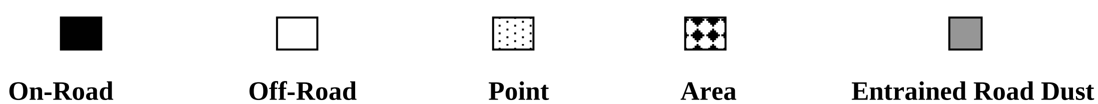


FIGURE 3.1-8

Relative Contribution by Source Category to 2023 Emission Inventory (VOC & NOx – Summer Planning; CO, SOx & PM2.5 – Annual Average Inventory)

3.1.1.5 Comparison to Other U.S. Areas

The severe air pollution problem in the Basin is a consequence of the combination of emissions from the second largest urban area in the nation and especially adverse meteorological conditions. The average wind speed for Los Angeles is the lowest of the ten largest urban areas in the nation. In addition, the summertime maximum mixing height (an index of how well pollutants can be dispersed vertically in the atmosphere) in southern California averages the lowest in the U.S. The southern California area is also an area with abundant sunshine, which drives the photochemical reactions that form pollutants such as ozone.

In the Basin, high concentrations of ozone are normally recorded during the spring and summer months. In contrast, higher concentrations of carbon monoxide are generally recorded in late fall and winter. High PM10 and PM2.5 concentrations can occur throughout the year, but occur most frequently in fall and winter. Although there are changes in emissions by season, the observed variations in pollutant concentrations are largely a result of seasonal differences in weather conditions.

In the year 2005, the one-hour[3] and eight-hour average federal standard levels for ozone were exceeded at one or more Basin locations on 30 and 84 days, respectively. The federal PM2.5 24-hour standard was exceeded on six days sampled[4]. Other criteria pollutants did not exceed the ambient air quality standards.

Figures 3.1-9 and 3.1-10 show maximum pollutant concentrations in 2005 for Basin compared to other urban areas in the U.S. and California. Maximum concentrations in all of these areas exceeded the federal eight-hour ozone standard. The PM10 standard was exceeded in the Basin and in one of the other U.S. urban areas shown (Phoenix). The PM2.5 standard was exceeded in most of the large U.S. urban areas and many California air basins. None of the areas shown in Figures 3.1-9 and 3.1-10 exceeded the carbon monoxide standard or nitrogen dioxide standards.

[3] The federal one-hour ozone standard has been revoked by U.S. EPA. The information is included in this chapter for comparison purposes.

[4] Particulate matter exceedances may have been higher since PM10 samples are collected every 6 days (except for two sites at which samples are collected every 3 days); PM2.5 samples are collected every 3 days at most sites except for a few sites which are sampled every day. The gaseous pollutants, such as ozone and carbon monoxide, are sampled continuously.

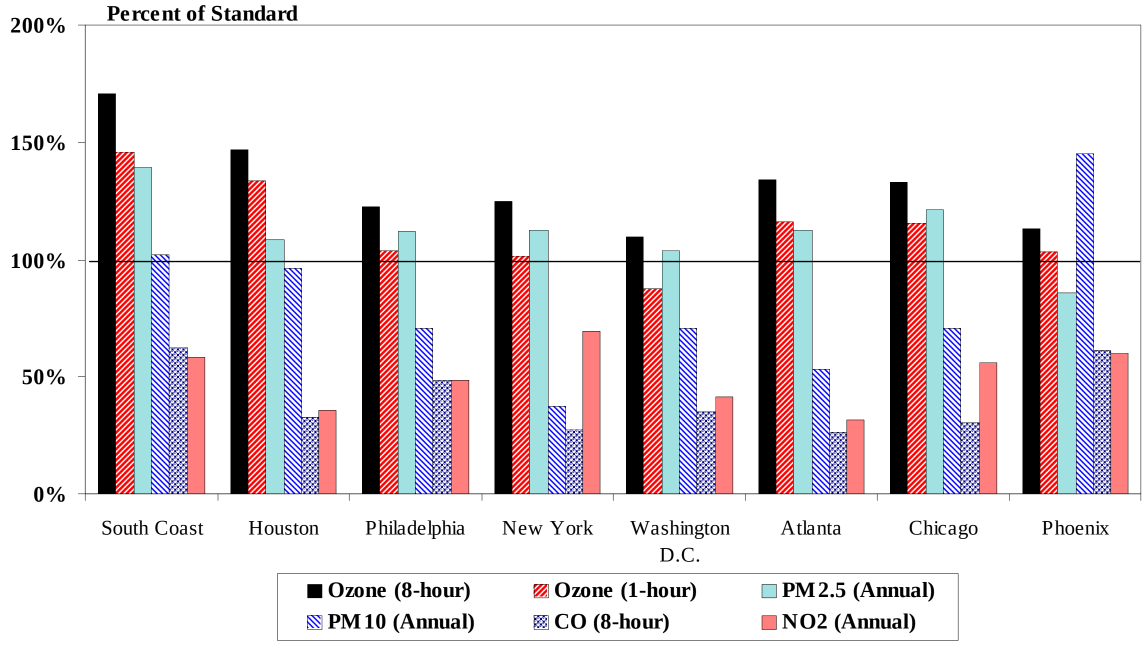


FIGURE 3.1-9

2005 Air Quality
Maximum Pollutant Concentrations as Percentages of the Federal Standard
South Coast Air Basin Compared to other Major U.S. Metropolitan Areas

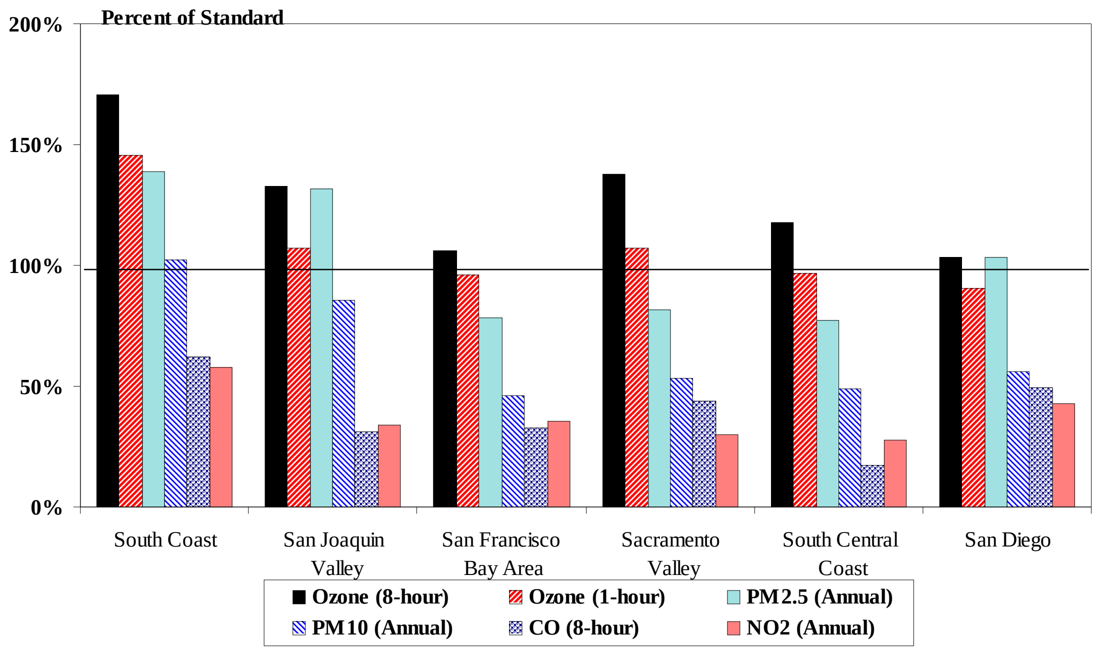


FIGURE 3.1-10

2005 Air Quality
Maximum Pollutant Concentrations as Percentages of the Federal Standard
South Coast Air Basin Compared to Other Air Basins in California

In 2005, the Central San Bernardino Mountains area in the Basin recorded the highest maximum one-hour and eight-hour average ozone concentrations in the nation (0.182 and 0.145 ppm, respectively). The highest eight-hour average concentration was more than one and a half times the federal standard. In 2005, eight out of ten areas with the highest maximum eight-hour average concentrations in the nation were located in the Basin. Outside California, the area with the next-highest ozone concentration is Houston, Texas. Like Los Angeles, Houston is an area with abundant sunshine which creates favorable conditions for the photochemical reactions that yield ozone and other photochemical pollutants.

The urban areas shown in Figure 3.1-10 exceeded the ozone standard but by a smaller margin than the Basin. San Diego and South Central Coast Air Basins, located immediately south and north of the Basin, respectively, are subject to ozone transport from the Basin.

In the year 2005, no location in the Basin or any other area of the U.S. exceeded the nitrogen dioxide standards. The Los Angeles County portion of the Basin was the last area of the U.S. to exceed the federal standard for nitrogen dioxide, but has remained in compliance since 1991. Sulfur dioxide concentrations in the Basin continued to remain well below federal standards. Concentrations of sulfur dioxide in urban areas in the Eastern U.S. have generally been higher than those in the Basin due to the use of fuels such as coal, which have relatively high sulfur content.

3.1.2 CURRENT AIR QUALITY

In 2005, the maximum ozone, PM10 and PM2.5 concentrations in the Basin continued to exceed federal standards by wide margins. Maximum one-hour and eight-hour average ozone concentrations (0.182 ppm and 0.145 ppm, both recorded in Central San Bernardino Mountains areas) were 146 and 171 percent of the federal standards, respectively. Maximum 24-hour average and annual average PM10 concentrations (131 $\mu g/m^3$ recorded in South Coastal Los Angeles County area and 52.0 $\mu g/m^3$ recorded in the Metropolitan Riverside County area) were 87 and 103 percent of the federal 24-hour and annual average standards, respectively. Maximum 24-hour average and annual average PM2.5 concentrations (132.7 $\mu g/m^3$ recorded in East San Gabriel Valley area and 21.0 $\mu g/m^3$ recorded in Metropolitan Riverside County area) were 203 and 139 percent of the federal 24-hour (65 $\mu g/m^3$) and annual average standards, respectively.

Carbon monoxide concentrations did not exceed the standards in 2005. The highest eight-hour average carbon monoxide concentration recorded (5.9 ppm in the South Central Los Angeles County area) was 62 percent of the federal carbon monoxide standard. The maximum annual average nitrogen dioxide concentration (0.0313 ppm recorded in the Northwest San Bernardino Valley area) was 59 percent of the federal standard. Concentrations of the remaining pollutants remained well below the federal standards.

Figure 3.1-11 shows the maximum pollutant concentrations in the Basin as percentages of the federal standards for the past two decades.

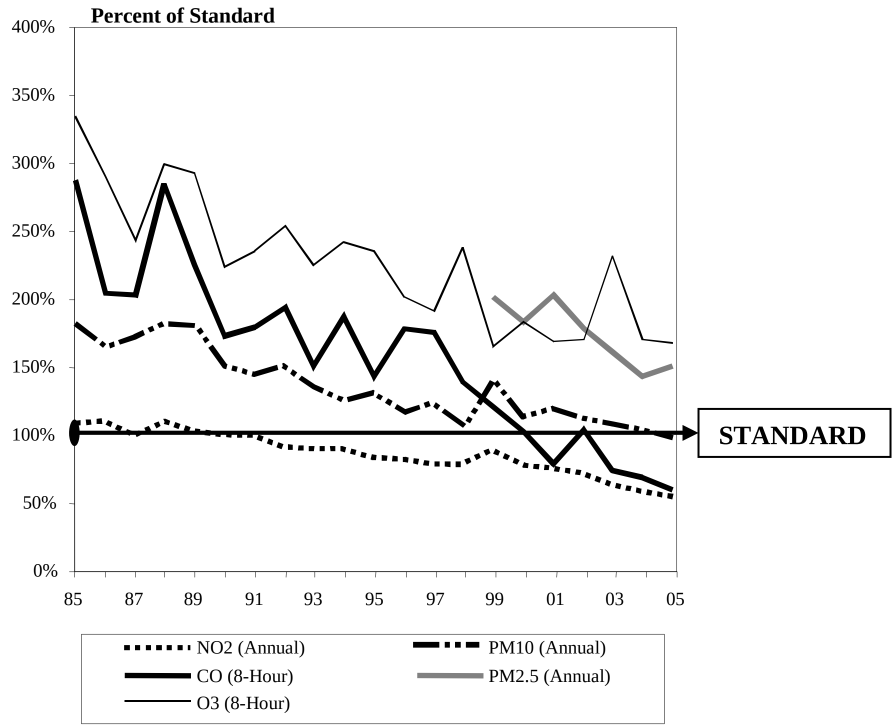


FIGURE 3.1-11

Maximum Pollutant Concentrations as Percent of Federal Standards

Figures 3.1-12 and 3.1-13 show the number of days on which the federal one-hour and eight-hour ozone standards, respectively, were exceeded at the Basin locations which had the most frequent exceedances for the years 1995 to 2005. In the early- and mid-1990s, the short-term one-hour federal ozone standard (which has been revoked) was exceeded most frequently in the East San Gabriel Valley and Santa Clarita Valley areas located in the northern portion of Los Angeles County, extending to the northwest valleys. As emissions were reduced, resulting in a fewer number of days exceeding the ozone standard throughout the Basin, the areas with the highest exceedances shifted towards the eastern portions of the Basin, including the East San Bernardino Valley and Central San Bernardino Mountains areas, mainly due to reduced reactivity of the pollutant cloud and the longer time required to form ozone. The Santa Clarita Valley area and the eastern portions of the San Bernardino Valleys and Mountains remained as the areas most affected by the hourly high ozone concentrations in the Basin for the most recent years.

The highest daily long-term eight-hour average ozone concentration, however, has been consistently recorded in the East San Bernardino Valley and Central San Bernardino Mountains areas since the 1990s. The Central San Bernardino Mountains area has remained as the most affected area in terms of the number of days exceeding the eight-hour federal standard in recent years and the area shows a slower downtrend as compared to the East San Gabriel Valley area where the highest number of exceedances used to occur in the 1980s (Figure 3.1-13).

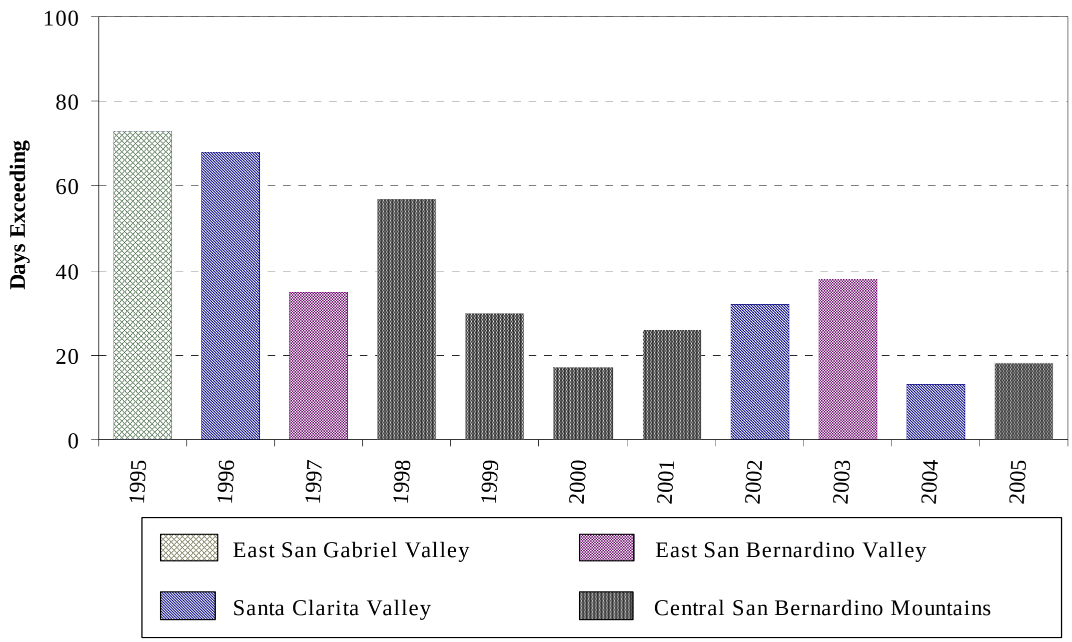


FIGURE 3.1-12

Locations that Exceeded the Federal One-Hour Ozone Standard the Most Days in Each Year

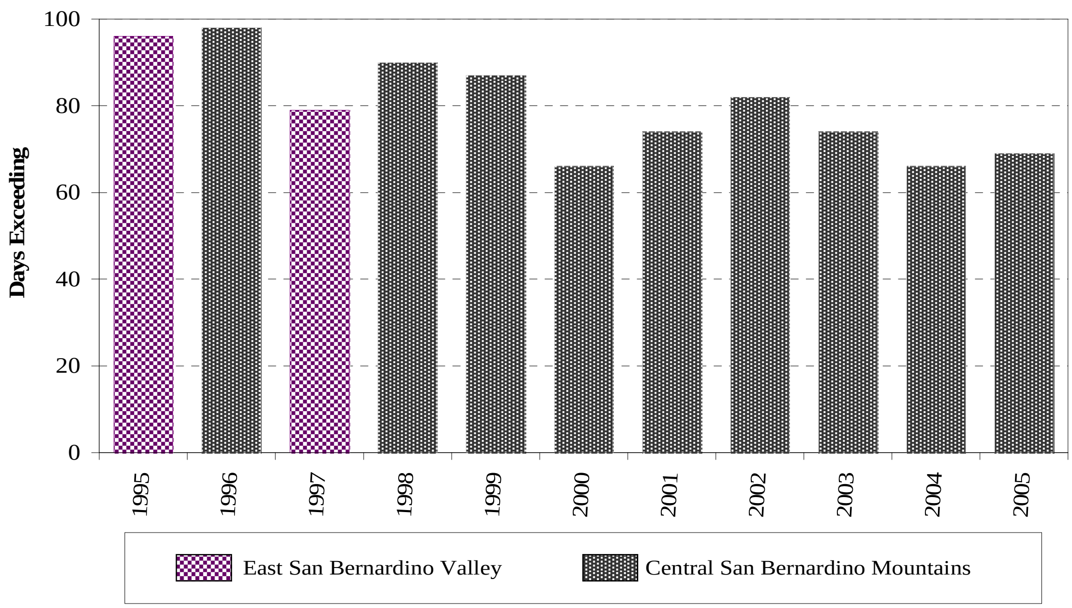


FIGURE 3.1-13

Locations that Exceeded the Federal Eight-Hour Ozone Standard the Most Days in Each Year

3.1.2.1 Ozone

Health Effects

Ozone (O_3), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm).

While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells and ambient ozone concentrations in the Basin are frequently sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection.

Individuals exercising outdoors, children and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible sub-groups for ozone effects. Short-term exposures (lasting for a few hours) to ozone at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high ozone communities. Elevated ozone levels are also associated with increased school absences.

Ozone exposure under exercising conditions is known to increase the severity of the above-mentioned observed responses. Animal studies suggest that exposures to a combination of pollutants which include ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

Air Quality

In 2005, the SCAQMD regularly monitored ozone concentrations at 29 locations in the Basin and SSAB. All areas monitored were below the stage 1 episode level (0.20 ppm), but the maximum concentrations in the Basin exceeded the health advisory level (0.15 ppm). Maximum ozone concentrations in the SSAB areas monitored by the SCAQMD were lower than in the Basin and were below the health advisory level. Tables 3.1-3 and 3.1-4 show maximum one-hour and eight-hour ozone concentrations by air basin and county.

TABLE 3.1-3

2005 Maximum One-Hour Ozone Concentrations by Basin and County

Basin/County	Maximum One-Hour Avg. ppm	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	0.173	138	Santa Clarita Valley
Orange	0.125	100	Saddleback Valley
Riverside	0.149	119	Lake Elsinore
San Bernardino	0.182	146	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	0.139	111	Coachella Valley

TABLE 3.1-4

2005 Maximum Eight-Hour Ozone Concentrations by Basin and County

Basin/County	Maximum Eight-Hour Avg. ppm	Percent of Federal Standard (0.08 ppm)	Area
South Coast Air Basin			
Los Angeles	0.141	166	Santa Clarita Valley
Orange	0.085	100	Saddleback Valley
Riverside	0.131	154	Banning Airport
San Bernardino	0.145	171	Central San Bernardino Mountains
Salton Sea Air Basin			
Riverside	0.095	112	Coachella Valley

The number of days exceeding the federal standards for ozone in the Basin varies widely by area. Figures 3.1-14 and 3.1-15 show the number of days exceeding the one-hour and eight-hour ozone federal standards in different areas of the Basin in 2005. The one-hour federal standard was not exceeded in areas along or near the coast, due in large part to the prevailing sea breeze which transports polluted air inland before high ozone concentrations can be reached. The standard was exceeded most frequently in the Central San Bernardino Mountains extending from Central San Bernardino Valley through the Riverside-San Bernardino area in the east and in the Santa Clarita Valley in the west. The Central San Bernardino Mountains area recorded the greatest number of exceedances of the state standard (80 days), one-hour and eight-hour federal standards (18 days and 69 days, respectively) and health advisory level (seven days).

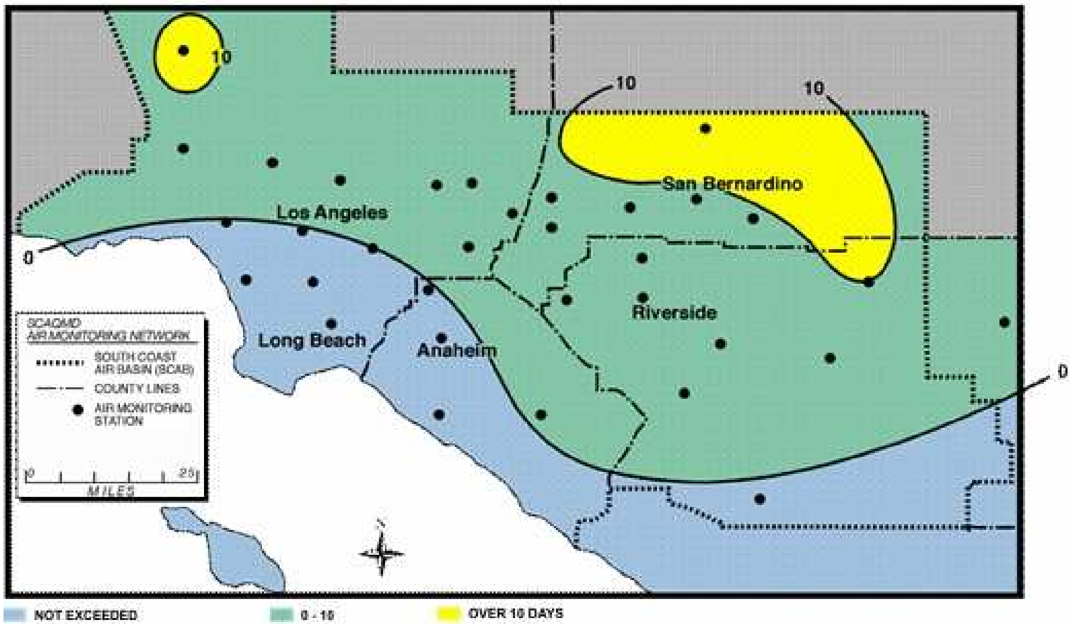


FIGURE 3.1-14

2005 Number of Days Exceeding the Federal Ozone Standard
(One-hour average ozone > 0.12 ppm)

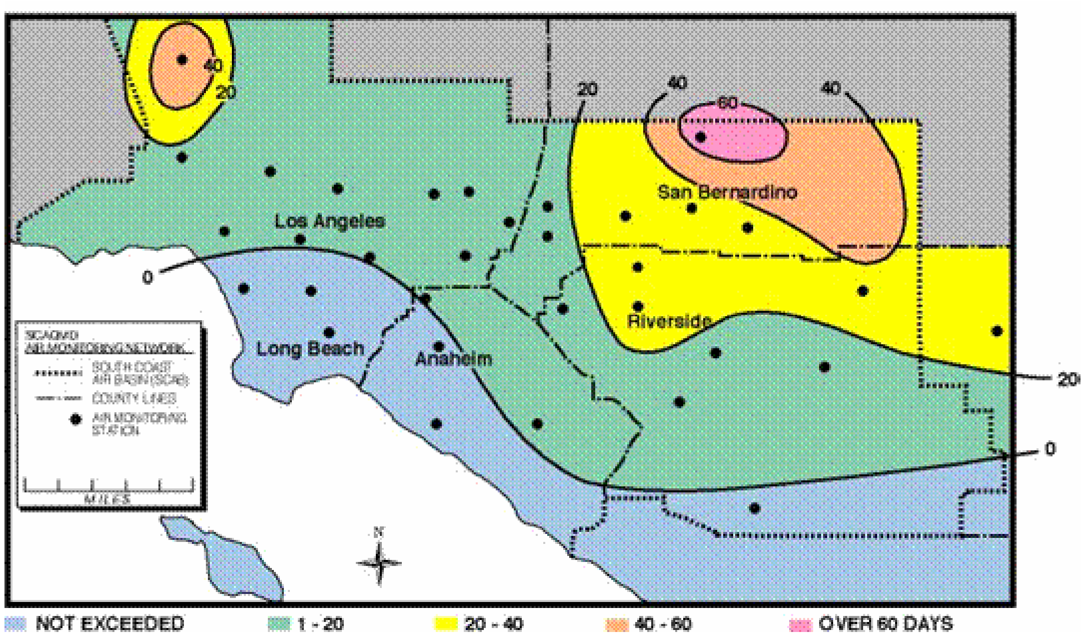


FIGURE 3.1-15

2005 Number of Days Exceeding the Federal Ozone Standard
(Eight-hour average ozone > 0.08 ppm)

The number of exceedances of the eight-hour federal ozone standard was also lowest at the coastal areas, increasing to a peak in the Riverside-San Bernardino Valley and adjacent mountain areas. Additional ozone data analyses are presented in Appendix II of the Draft 2007 AQMP.

3.1.2.2 Particulate Matter (PM10 and PM2.5)

Health Effects

Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter.

The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of PM10 and PM2.5.

Air Quality, PM10

The SCAQMD monitored PM10 concentrations at 20 locations in 2005. Maximum 24-hour and annual average concentrations are shown in Tables 3.1-5 and 3.1-6.

Figure 3.1-16 shows the 2005 annual average PM10 concentrations in different areas of the Basin. The federal annual PM10 standard was exceeded at only one location in the SCAQMD in 2005. Highest PM10 concentrations were recorded in Riverside and San Bernardino counties in and around the Metropolitan Riverside County area and further inland in San Bernardino Valley areas. The federal 24-hour standard was not exceeded at any of the locations monitored in 2005. The much more stringent state standards were exceeded in most areas. Additional PM10 data analyses are presented in Appendix II of the Draft 2007 AQMP.

TABLE 3.1-5

2005 Maximum 24-hour Average PM10 Concentrations by Basin and County

Basin/County	Maximum 24-Hr Avg. µg/m^3	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	131	87	South Coastal Los Angeles County
Orange	65	43	Central Orange County
Riverside	123	81	Metropolitan Riverside County
San Bernardino	108	72	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	106	70	Coachella Valley

TABLE 3.1-6

2005 Maximum Annual Average PM10 Concentrations by Basin and County

Basin/County	Annual Average µg/m^3	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	43.4	86	South Coastal Los Angeles County
Orange	28.2	56	Central Orange County
Riverside	52.0	103	Metropolitan Riverside County
San Bernardino	50.0	99	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	45.7	90	Coachella Valley

U.S. EPA revoked the annual average PM10 standard on September 21, 2006.

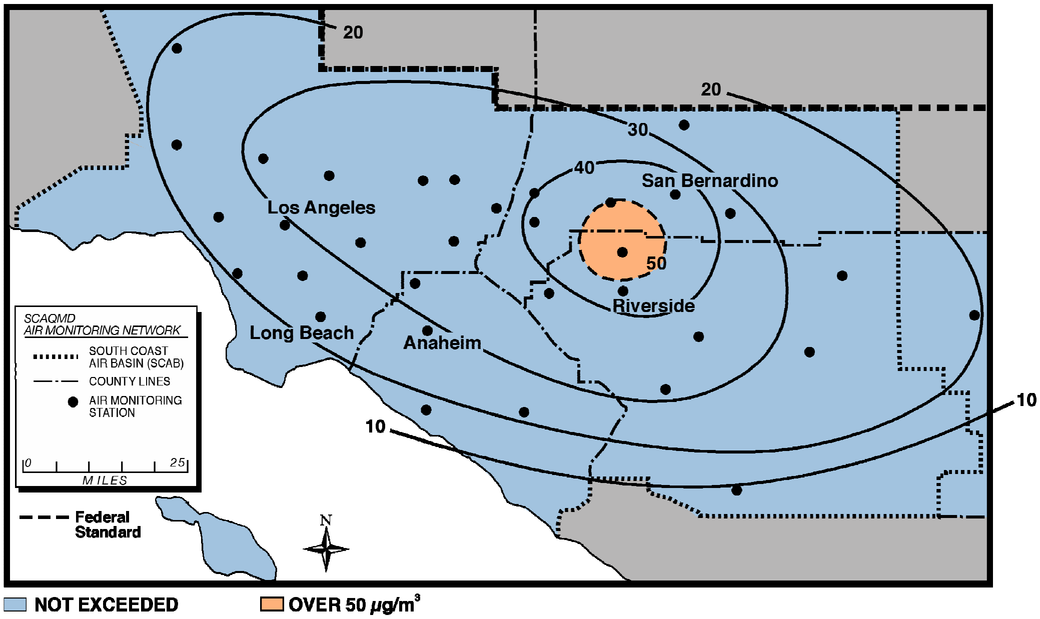


FIGURE 3.1-16

2005 Annual Average Concentration Compared to Federal PM10 Standard
(Federal standard = 50 μg/m^3, annual arithmetic mean)

Air Quality, PM2.5

The SCAQMD began regular monitoring of PM2.5 in 1999 following the U.S. EPA's adoption of the national PM2.5 standards in 1997. In 2005, PM2.5 concentrations were monitored at 19 locations throughout the district. Maximum 24-hour and annual average concentrations are shown in Tables 3.1-7 and 3.1-8. Maximum 24-hour average concentration has increased at some locations compared to 2001, the basis of the 2003 AQMP air quality data. The PM2.5 annual average concentrations and the highest 98th percentile PM2.5 concentrations (which the federal 24-hour PM2.5 standard is based on), however, are lower than 2001 levels at all locations monitored.

Figure 3.1-17 shows the distribution of annual average PM2.5 concentrations in different areas of the Basin. Similar to PM10 concentrations, PM2.5 concentrations were higher in the inland valley areas of San Bernardino and Metropolitan Riverside counties. However, PM2.5 concentrations were also high in the metropolitan area of Los Angeles County. The high PM2.5 concentrations in Los Angeles County are mainly due to the secondary formation of smaller particulates resulting from mobile and stationary source activities. In contrast to PM10, PM2.5 concentrations were low in the Coachella Valley area of SSAB. PM10 concentrations are normally higher in the desert areas due to windblown and fugitive dust emissions. Additional PM2.5 data analyses are presented in Appendix II of the Draft 2007 AQMP.

TABLE 3.1-7

2005 Maximum 24-hour Average PM2.5 Concentrations by Basin and County

Basin/County	Maximum 24-Hr Avg. $\mu g/m^3$	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	132.7	203	East San Gabriel Valley
Orange	54.7	84	Central Orange County
Riverside	98.7	151	Metropolitan Riverside County
San Bernardino	106.3	162	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	44.4	68	Coachella Valley

U.S EPA reduced the 24-hour PM2.5 standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ on September 21, 2006. The 2007 AQMP addresses attaining the 65 $\mu g/m^3$ standard.

TABLE 3.1-8

2005 Maximum Annual Average PM2.5 Concentrations by Basin and County

Basin/County	Annual Average $\mu g/m^3$	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	18.1	120	Central Los Angeles
Orange	14.7	97	Central Orange County
Riverside	21.0	139	Metropolitan Riverside County
San Bernardino	18.9	125	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	10.5	70	Coachella Valley

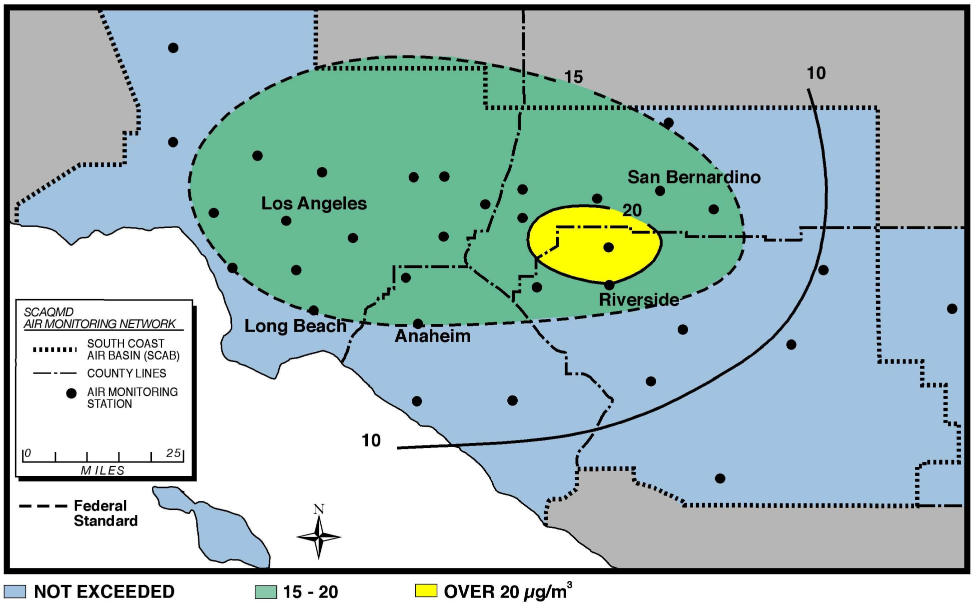


FIGURE 3.1-17

2005 Annual Average Concentration Compared to Federal PM2.5 Standard (Federal standard = 15 µg/m^3, annual arithmetic mean)

3.1.2.3 Carbon Monoxide (CO)

Health Effects

CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. In 2002, approximately 98 percent of the CO emitted into the Basin's atmosphere was from mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations due to variations in the rate at which CO is emitted and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable portion of the day.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart.

Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses (unborn babies), and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes.

Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include pre-term births and heart abnormalities.

Air Quality

Carbon monoxide concentrations were measured at 25 locations in the Basin and neighboring SSAB areas in 2005. Table 3.1-9 shows the 2005 maximum eight-hour average concentrations of carbon monoxide by air basin and county.

TABLE 3.1-9

2005 Maximum Carbon Monoxide Concentrations by Basin and County

Basin/County	Maximum 8-Hr Avg. ppm	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	5.9	62	South Central L.A. County
Orange	3.3	35	North Coastal Orange County
Riverside	2.6	27	Metropolitan Riverside County
San Bernardino	3.4	36	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	1.0	11	Coachella Valley

In 2005, no areas exceeded the carbon monoxide air quality standards. The highest concentrations of carbon monoxide continued to be recorded in the areas of Los Angeles County where vehicular traffic is most dense, with the maximum concentration (5.9 ppm) recorded in the South Central Los Angeles County area. All areas continued to remain below the federal standard level since 2003. Additional carbon monoxide data analyses are presented in Appendix II of the Draft 2007 AQMP.

3.1.2.4 Nitrogen Dioxide (NO_2)

Health Effects

NO_2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N_2) and oxygen (O_2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO_2. NO_2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO_2, are referred to collectively as NOx. In the presence of sunlight, NO_2 reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO_3) which reacts further to form nitrates, components of PM2.5 and PM10.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO_2 at levels found in homes with gas stoves, which are higher than ambient levels found in southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. More recent studies have found associations between NO_2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms and emergency room asthma visits.

In animals, exposure to levels of NO_2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO_2.

Air Quality

In 2005, nitrogen dioxide concentrations were monitored at 24 locations. No area of the Basin or SSAB exceeded the federal or state standards for nitrogen dioxide. Maximum annual average concentrations for 2005 are shown in Table 3.1-10. The Basin has not exceeded the federal standard for nitrogen dioxide (0.0534 ppm) since 1991, when the Los Angeles County portion of the Basin recorded the last exceedance of the standard in any U.S. county.

The nitrogen dioxide state standard was not exceeded at any SCAQMD monitoring location in 2005. The highest one-hour average concentration recorded (0.13 ppm in Central Los Angeles) was 50 percent of the state standard. NOx emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM2.5 and PM10) concentrations. Additional nitrogen dioxide data analyses are presented in Appendix II of the Draft 2007 AQMP.

TABLE 3.1-10

2005 Maximum Nitrogen Dioxide Concentrations by Basin and County

Basin/County	Maximum Annual Avg. ppm	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	0.0312	58	South Central Los Angeles County; Pomona/Walnut Valley
Orange	0.0249	47	North Orange County
Riverside	0.0222	41	Metropolitan Riverside County
San Bernardino	0.0313	59	Northwest San Bernardino Valley
Salton Sea Air Basin			
Riverside	0.0120	22	Coachella Valley

3.1.2.5 Sulfur Dioxide (SO_2)

Health Effects

SO_2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H_2SO_4), which contributes to acid precipitation, and sulfates, which are components of PM10 and PM2.5. Most of the SO_2 emitted into the atmosphere is produced by burning sulfur-containing fuels.

Exposure of a few minutes to low levels of SO_2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO_2. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, is observed after acute higher exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2.

Animal studies suggest that despite SO_2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

Air Quality

No exceedances of federal or state standards for sulfur dioxide occurred in 2005 at any of the seven SCAQMD locations monitored. Though sulfur dioxide concentrations remain well below the standards, sulfur dioxide is a precursor to sulfate, which is a component of fine particulate matter, PM10, and PM2.5. Standards for PM10 and PM2.5 were both exceeded in 2005. Maximum concentrations of sulfur dioxide for 2005 are shown in Table 3.1-11. Sulfur dioxide was not measured at SSAB sites in 2005. Historical measurements showed concentrations to be well below standards and monitoring has been discontinued. Additional sulfur dioxide data analyses are presented in Appendix II of the Draft 2007 AQMP.

Table 3.1-11

2005 Maximum Sulfur Dioxide Concentrations by Basin and County

Basin/County	Maximum 24-hr Avg. ppm	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	0.012	9	Southwest Coastal LA County
Orange	0.008	6	North Coastal Orange County
Riverside	0.011	8	Metropolitan Riverside County
San Bernardino	0.004	3	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	N.D.		

N.D. = No Data. Historical measurements indicate concentrations are well below standards.

3.1.2.6 Sulfates

Health Effects

Sulfates are chemical compounds which contain the sulfate ion ($SO_4^{=}$), and are part of the mixture of solid materials which make up PM10. Most of the sulfates in the atmosphere are produced by oxidation of sulfur dioxide. Oxidation of sulfur dioxide yields sulfur trioxide (SO_3) which reacts with water to form sulfuric acid, which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10 and PM2.5.

Most of the health effects associated with fine particles and sulfur dioxide at ambient levels are also associated with sulfates. Thus, both mortality and morbidity effects have been observed with an increase in ambient sulfate concentrations. However, efforts to separate the effects of sulfates from the effects of other pollutants have generally not been successful.

Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure. Animal studies suggest that acidic particles such as sulfuric acid aerosol and ammonium bisulfate are more toxic than non-acidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to particles remains unresolved.

Air Quality

In 2005, the state sulfate standard was not exceeded anywhere in the Basin. Maximum concentrations by air basin and county are shown in Table 3.1-12. No sulfate data were obtained at SSAB and Orange County stations in 2005. Historical sulfate data showed concentrations in the SSAB and Orange County areas to be well below the standard, and measurements have been discontinued. Additional sulfate data analyses are presented in Appendix II of the Draft 2007 AQMP.

Table 3.1-12

2005 Maximum Sulfate Concentrations by Basin and County

Basin/County	Maximum 24-hr Avg. $\mu g/m^3$	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	17.3	69	South Central Los Angeles
Orange	N.D.		
Riverside	10.3	41	Metropolitan Riverside County
San Bernardino	10.9	44	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	N.D.		

N.D. = No Data. Historical measurements indicate concentrations are well below standards.
State standard = 25 $\mu g/m^3$

3.1.2.7 Lead

Health Effects

Lead in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters have been the main sources of lead emitted into the air. Due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric lead in the Basin over the past two decades.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Lead poisoning can cause anemia, lethargy, seizures, and death. It appears that there are no direct effects of lead on the respiratory system. Lead can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland), and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

Air Quality

The federal and state standards for lead were not exceeded in any area of the SCAQMD in 2005. There have been no violations of the standards at the SCAQMD's regular air monitoring stations since 1982, as a result of removal of lead from gasoline. Table 3.1-13 shows the maximum concentrations recorded at SCAQMD air monitoring stations in 2005. The maximum quarterly average lead concentration (0.03 $\mu g/m^3$) was two percent of the federal standard. Additionally, special monitoring stations immediately adjacent to stationary sources of lead (e.g., lead smelting facilities) have not recorded exceedances of the standards in localized areas of the Basin since 1991 and 1994 for the federal and state standards, respectively. The maximum monthly and quarterly average lead concentration (0.44 $\mu g/m^3$ and 0.34 $\mu g/m^3$ in Central Los Angeles), measured at special monitoring sites immediately adjacent to stationary sources of lead were 29 and 23 percent of the state and federal standards, respectively. No lead data were obtained at SSAB and Orange County stations in 2005, and because historical lead data showed concentrations in SSAB and Orange County areas to be well below the standard, measurements have been discontinued. Additional lead data are presented in Appendix II of the Draft 2007 AQMP.

3.1.2.8 Summary

In 2005, the Basin exceeded federal and state standards for ozone, PM10, and PM2.5. The Salton Sea Air Basin areas continued to exceed standards for ozone and PM10. Maximum concentrations of PM2.5 and ozone exceeded the federal standards by the widest margins nationwide. In 2005, carbon monoxide concentrations did not exceed the standards anywhere in the Basin for the third consecutive year. Maximum concentrations for nitrogen dioxide, sulfur dioxide, sulfate, and lead continued to remain below the state and federal standards.

Table 3.1-13

2005 Maximum Lead Concentrations by Basin and County

Basin/County	Maximum Quarterly Average μg/m^{3}*	Percent of Federal Standard	Area
South Coast Air Basin			
Los Angeles	0.03	2	South Central Los Angeles County
Orange	N.D.		
Riverside	0.02	1	Metropolitan Riverside County
San Bernardino	0.02	1	Northwest San Bernardino Valley
Salton Sea Air Basin			
Riverside	N.D.		

N.D. = No Data. Historical measurements indicate concentrations are well below standards.
* Higher concentrations (0.44 μg/m^{3}) were measured in localized areas near sources known to emit lead.

3.1.3 CONTROL OF EMISSIONS FROM PORTS AND PORT-RELATED FACILITIES

Emissions from sources associated with the ports – marine vessels, harbor craft, cargo handling equipment, locomotives, and trucks – have historically been regulated primarily by international, federal, or state authorities. The IMO, an agency of the United Nations, has established NOx emissions limitations and fuel sulfur specifications for oceangoing vessels; the federal U.S. EPA has adopted emission standards for new locomotives, new trucks and some vessels; and CARB has adopted standards for new on-road trucks and recently voted to adopt standards for new on-road trucks and cargo handling equipment and marine auxiliary engine fuels. Neither federal nor international law explicitly requires U.S. EPA or IMO regulations to be sufficiently stringent to meet the needs of a particularly polluted region such as the district, and the rules adopted by those bodies have not met those needs.

Key regulatory and other actions taken to date are as follows:

IMO Emissions and Fuel Standards – IMO NOx standards for new "Category 3" vessels (including the container vessels responsible for the greatest share of emissions from local ports) will achieve only a six percent reduction in emissions. IMO fuel rules allow up to 45,000 parts per million (ppm) sulfur content and actual sulfur content form main engine fuels averages approximately 27,000 ppm.

U.S. EPA Marine Vessel Regulations – The vast majority of oceangoing vessels calling on local ports are foreign flagged. The emissions have not been regulated by U.S. EPA.

U.S. EPA Emission Standards for Locomotives – Under current U.S. EPA "Tier 2" regulations, the newest locomotives must achieve an approximate 57 percent reduction in NOx emissions.

U.S. EPA and CARB Emission Standards for Trucks – While stringent standards have been adopted, the full effect of the standards will not be in effect immediately as the fleet of vehicles has a long service life and the standards apply to new vehicles manufactured in 2010 and subsequent years.

CARB Marine Auxiliary Engine and Cargo Handling Rules – The majority of marine vessel emissions are created by main propulsion engines, but auxiliary engines emissions are important because they occur both when underway and at dock. In December 2005, the CARB Board adopted fuel sulfur standards for marine auxiliary engines, including those on foreign-flagged vessels, in waters out to 24 nautical miles. The rule will limit fuel sulfur content to 5,000 ppm, with the potential to require 1,000 ppm sulfur content by 2010 pending a technology and fuel availability review. The rule has not completed all administrative review processes, and industry has filed arguments that CARB does not have the authority to adopt or enforce the rule against foreign-flagged vessels beyond California waters. The CARB Board also adopted emission standards for cargo handling equipment such as yard tractors.

3.1.4 NON-CRITERIA AIR POLLUTANTS

Although the primary mandate of the SCAQMD is attaining the State and National Ambient Air Quality Standards (NAAQS) for criteria pollutants within the SCAQMD jurisdiction, the SCAQMD also has a general responsibility pursuant to the Health and Safety Code, §41700, to control emissions of air contaminants and prevent endangerment to public health. As a result, over the last few decades, the SCAQMD regulated pollutants other than criteria pollutants such as toxic air contaminants (TACs), greenhouse gases (GHGs), and stratospheric ozone depleting compounds. The SCAQMD has developed a number of rules to control non-criteria pollutants from both new and existing sources. These rules originated through State directives, CAA requirements, or the SCAQMD rulemaking process.

In addition to promulgating non-criteria pollutant rules, the SCAQMD has been evaluating AQMP control measures as well as existing rules to determine whether or not they would affect, either positively or negatively, emissions of non-criteria pollutants. For example, rules in which VOC components of coating materials are replaced by a non-photochemically reactive chlorinated substance would reduce the impacts resulting from ozone formation, but could increase emissions of TACs or other substances that may have adverse impacts on human health.

The following sections summarize the existing setting for the two major categories of non-criteria pollutants: TACs and compounds that contribute to ozone depletion and global warming.

3.1.4.1 Toxic Air Contaminants (TACs)

Historically, the SCAQMD has regulated criteria air pollutants using either a technology-based or an emissions limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emission limit approach establishes an emission limit and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of TACs requires a different regulatory approach as explained in the following subsections.

TACs are regulated in the district through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific National Emission Standards for Hazardous Air Pollutants (NESHAPs) were promulgated under §112 of the CAA for certain sources of radionuclides and six HAPs. These NESHAPs are summarized in Table 3.1-14.

TABLE 3.1-14

NESHAP Regulations – Pre-1990 CAA

Substance	Regulated Process or Operations
Asbestos	Asbestos mills, roadways, asbestos manufacturing, demolition and renovation, spray applications, fabrications, asbestos waste disposal
Benzene	Benzene transfer operations, waste operations, equipment leaks, maleic anhydride plants, ethyl benzene/styrene plants, storage vessels, coke by-product recovery plants
Beryllium	Rocket motor firing, extraction plants, ceramic plants, foundries, incinerators, propellant plants, and machine shops processing beryllium-containing material
Inorganic Arsenic	Glass manufacturing plants, primary copper smelters, and arsenic trioxide and metallic arsenic production facilities
Mercury	Mercury ore processing plants, wastewater treatment plant sludge incineration and drying, and mercury chlor-alkali cell plants
Vinyl Chloride	Ethylene dichloride, vinyl chloride, and polyvinyl chloride plants

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost, and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards must be made by the years 1992 (at least 40 source categories), 1994 (25 percent of the listed categories), 1997 (50 percent of remaining listed categories), and 2000 (remaining balance). The 1992 requirement was met; however, many of the four-year standards were not promulgated as scheduled. Promulgation of those standards has been rescheduled based on court ordered deadlines or the aim to satisfy all §112 requirements in a timely manner. Table 3.1-15 lists NESHAPs that are promulgated to date under the 1990 CAA Amendments.

TABLE 3.1-15

NESHAPs Promulgated Under the 1990 Amendments of the CAA

Regulated Operations Under the Federal NESHAPs	Date NESHAP Promulgated
General Provisions	April 1994
Perchloroethylene Dry Cleaners	September 1993
Coke Ovens	October 1993
Industrial Process Cooling Towers	July 1994
Hazardous Organic NESHAP (HON)	February 1994
Halogenated Solvent Cleaning	December 1994
Chromium Emissions from Hard and Decorative Electroplating and Anodizing Operations	January 1995
Stage 1 Gasoline Distribution Facilities	December 1994
Ethylene Oxide Emissions from Commercial Sterilizers and Fumigation Operations	December 1994
Magnetic Tape Manufacturing	December 1994
Petroleum Refineries	July 1995
Aerospace Manufacturing and Rework Facilities	July 1995
Shipbuilding and Ship Repair Facilities (Surface Coating)	December 1995
Wood Furniture Manufacturing Operation	December 1995
Secondary Lead Smelter Industry	May 1995
Polymers and Resins Production Group II	February 1995
Printing and Publishing Surface Coating	May 1996
Polymers and Resins Production Group IV	June 1996
Polymers and Resins Production Group I	September 1996
Pharmaceuticals Production	August 1998
Polyurethane Foam Production	October 1998
Phosphoric Acid Manufacturing and Phosphate Fertilizers Production	April 1999
Polyether Polyols	April 1999
Ferroalloys Production : Ferromanganese and Silicomanganese	May 1999
Oil and Natural Gas Production and Natural Gas Transmission and Storage	May 1999
Mineral Wood Production	May 1999
Wool Fiberglass Manufacturing	May 1999
Portland Cement Manufacturing Industry	May 1999
Generic Maximum Achievable Control Technology (MACT)	May 1999
Pesticide Active Ingredient Production	May 1999
Steel Pickling – Hydrochloric Acid (HCl) Process Facilities and HCl Regeneration Plants	June 1999
Primary Lead	July 1999
Publicly Owned Treatment Works	November 1999

TABLE 3.1-15 – (Continued)

NESHAPs Promulgated Under the 1990 Amendments of the CAA

Regulated Operations Under the Federal NESHAPs	Date NESHAP Promulgated
Amino and Phenolic Resins	December 1999
Secondary Aluminum Production	December 1999
Pulp and Paper Industry	January 2001
Vegetable Oil Production	April 2001
Yeast Manufacturing	May 2001
Boat Manufacturing	August 2001
Friction Materials Manufacturing	October 2001
Leather Finishing	February 2002
Surface Coating of Metal Coil	May 2002
Primary Copper Smelters	May 2002
Rubber Tire Manufacturing	May 2002
Cellulose Products Manufacturing	May 2002
Surface Coating of Large Appliances	July 2002
Polyvinyl Chloride (PVC) and Copolymers Production	July 2002
Paper and Other Web Coating	November 2002
Municipal Solid Waste Landfills	November 2002
Engine Test Cells/Stands	March 2003
Refractory Products	March 2003
HCl Prodution	March 2003
Brick and Structural Clay Products Manufacturing	March 2003
Coke Ovens: Pushing, Quenching, and Battery Stacks	March 2003
Surface Coating of Metal Furniture	March 2003
Integrated Iron and Steel Manufacturing	March 2003
Printing, Coating, and Dyeing of Fabrics and Other Textiles	March 2003
Reinforced Plastic Composites	March 2003
Asphalt Processing and Asphalt Roofing Manufacturing	March 2003
Surface Coating of Wood Building Products	March 2003
Flexible Polyurethane Foam Fabrication Operations	March 2003
Surface Coating of Metal Cans	August 2003
Miscellaneous Metal Parts and Products (Surface Coating)	August 2003
Site Remediation	August 2003
Taconite Iron Ore Processing	August 2003
Miscellaneous Organic Chemical Manufacturing	August 2003
Organic Liquids Distribution (Non-Gasoline)	August 2003
Mercury Emissions from Mercury Cell Chlor-Alkali Plants	August 2003
Primary Magnesium Refining	August 2003
Lime Manufacturing	August 2003
Iron and Steel Foundries	September 2003

TABLE 3.1-15 – (Concluded)

NESHAPs Promulgated Under the 1990 Amendments of the CAA

Regulated Operations Under the Federal NESHAPs	Date NESHAP Promulgated
Plastic Parts and Products (Surface Coating)	September 2003
Miscellaneous Coating Manufacturing	September 2003
Stationary Combustion Turbines	September 2003
Chlorine and Hydrochloric Acid Emissions from Chlorine Production	September 2003
Stationary Reciprocating Internal Combustion Engines	March 2004
Surface Coating of Automobiles and Light-Duty Trucks	March 2004
Industrial, Commercial, and Institutional Boilers and Process Heaters	March 2004
Plywood and Composite Wood Products	March 2004

Many of the sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed three regulatory programs for the control of TACs. Each of the programs is discussed in the following subsections.

Control of TACs Under the TAC Identification and Control Program

California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), is a two-step program in which substances are identified as TACs and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources. Since adoption of the program, CARB has identified 18 TACs and CARB adopted a regulation designating all 189 federal HAPs as TACs.

ATCMs are developed by CARB and implemented by the SCAQMD and other air districts through the adoption of regulations of equal or greater stringency. Generally, the ATCMs reduce emissions to achieve exposure levels below a determined health threshold. If no such threshold levels are determined, emissions are reduced to the lowest level achievable through the use of best available control technology unless it is determined that an alternative level of emission reduction is adequate to protect public health. In addition to developing ATCMs, California Health and Safety Code §39658(b) requires CARB to adopt an ATCM for hazardous air pollutants adopted by U.S. EPA pursuant to §112 of the federal CAA. Table 3.1-16 lists the rules that have been proposed or adopted pursuant to AB 1807.

TABLE 3.1-16

SCAQMD Rules Adopted or Proposed for Adoption Pursuant to AB 1807 and AB 1731

Rule	Title	Description
461	Gasoline Transfer and Dispensing	Reduces benzene emissions from the retail sale of gasoline
1402	Control of Toxic Air Contaminates from Existing Sources	Reduces the health risk associated with emissions of TAC from existing sources by specifying limits applicable to total facility emissions and requires implementation of risk reduction plans to achieve specified risk limits, as required by the Hot Spots Act and this rule
1403	Asbestos Emissions from Demolition/Renovation Activities	Limits asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials
1404	Hexavalent Chromium Emissions from Cooling Towers	Bans use of additives containing hexavalent chromium in industrial and comfort cooling towers
1405	Control of Ethylene Oxide from Sterilization/Fumigation Processes	Limits ethylene oxide emissions from commercial and medical sterilization equipment, and from quarantine equipment and areas
1406	Control of Dioxin Emissions from Medical Waste Incinerators	Requires the use of toxics best available control technology (T-BACT) for all medical waste incinerators to limit dioxin and other toxic emissions
1407	Control of Emissions of Arsenic, Cadmium, and Nickel for Non-Ferrous Metal Melting Operations	Regulates emissions from non-ferrous metal melting operations such as foundries, smelters, die-casters, etc.
1414	Control of Asbestos Emissions from Asbestos-Containing Serpentine Rock in Surface Applications	Eliminates any future use of asbestos-containing serpentine material for the surfacing of unpaved areas
1421	Control of Perchloroethylene Emissions from Dry Cleaning Operations	Reduces perchloroethylene emissions from dry cleaning systems by transitioning them to non-perchloroethylene alternatives
1469	Hexavalent Chromium – Chrome Plating and Chromic Acid Anodizing	Establishes emission control requirements for chrome plating and chromic acid anodizing operations
1470	Requirement for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines	Establishes operating requirements and emission standards for stationary diesel-fueled internal compression engines

Control of TACs Under the Air Toxics "Hot Spots" Act

The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656) establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with those emissions. Facilities were phased into the AB 2588 program based on their emissions of criteria pollutants or occurrence on a list of toxic emitters compiled by the SCAQMD. Phase I consisted of facilities that emit over 25 tons per year (tpy) of any criteria pollutant and facilities present on the SCAQMD's toxics list. Phase I facilities entered the program by reporting their toxics emissions for calendar year 1989. Phase II consisted of facilities that emit between 10 and 25 tpy of any criteria pollutant. Phase II facilities submitted air toxic inventory reports for calendar year 1990 emissions. Phase III consisted of certain designated types of facilities which emit less than 10 tpy of any criteria pollutant and submitted inventory reports for calendar year 1991 emissions. Inventory reports are required to be updated every four years under current state law. In addition to the three phases described, SCAQMD staff has required inventories and other measures as appropriate per Rule 1402.

In October 1992, the SCAQMD Governing Board adopted public notification procedures for facilities required to submit health risk assessments. These procedures specify that facilities required to report their emission under the AB 2588 program must provide public notice when exceeding the following risk levels:

Maximum Individual Cancer Risk	$\geq$ 10 in 1 million (10×10^{-6})
Total Hazard Index	$\geq$ 1.0 for TACs except lead, or $\geq$ 0.5 for lead

Public notice is to be provided by letters mailed to parents of all children attending school within one-quarter mile radius of the facility and each address within a radius of 750 feet from the outer property line of the new or modified facility. In addition, facilities must hold a public meeting and provide copies of the facility risk assessment in all school libraries and a public library in the impacted area.

The SCAQMD continues to review health risk assessments submitted to date and may require revision and resubmission as appropriate before final approval. Notification will be required from facilities with a significant risk under the AB 2588 program based on their initial approved health risk assessments and will continue on an ongoing basis as additional and subsequent health risk assessments are reviewed and approved.

In January 2007, the SCAQMD Governing Board also adopted public notification procedures for emergency diesel internal combustion engines, dry cleaners using perchloroethylene, and gas stations.

Control of TACs with Risk Reduction Audits and Plans

The health risk to the population of the Basin from exposure to TACs is currently high. Ambient concentrations of TACs in the district are consistently higher than state average concentrations and higher than concentrations in some other urban areas in the United States.

The health risks are especially high for persons residing or working in close proximity to sources emitting high level of air toxics. Many persons are also exposed to emissions and risks from more than one source if they reside or work near multiple sources with air toxic emissions.

In addition, persons in many areas of the district may experience an increased risk for noncancer health effects such as respiratory illness, reproductive toxicity, and neurological effects due to exposure to TACs. The facilities that pose high cancer and noncancer health risks consist of a wide variety of sources ranging from large industrial operations to small commercial operations.

Senate Bill (SB) 1731, enacted in 1992 (California Health and Safety Code §44390, et seq.), amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement risk reduction plans, which will reduce the risk below a defined significant risk level within specified time limits. The SCAQMD Rule 1402 – Control of Toxic Air Contaminants from Existing Sources, was adopted on April 8, 1994, to fulfill the requirements of Senate Bill (SB) 1731. In general, risk reduction plans must be implemented as soon as feasible, but within three years following SCAQMD approval.

SCAQMD Rule 1402, which implements the requirements of SB 1731, requires operation of facilities identified as exceeding action risk levels of a maximum individual cancer risk (MICR) of 25 in one million (25×10^{-6}), a cancer burden of 0.5, or a total hazard index of three for noncancer health effects, to submit and implement a risk reduction plan to reduce risks below the action levels if it is technically feasible and does not pose an economically unreasonable burden. Facilities for which it is not technically and economically feasible to reduce below the action risk levels would be required to reduce their health risk to the lowest feasible level. At a minimum, such facilities must, as quickly as feasible, reduce below the significant risk levels of a MICR of 100 in a million (100×10^{-6}) and a total hazard index of five.

The SCAQMD is monitoring a number of future federal and state program related to air toxics. These future program developments include the provisions of Title III of the federal CAA, which will establish certain requirements for state and local air toxics programs, the Title V provisions, as they relate to implementation of Title III requirements; further implementation of the state AB 1807 process, which establishes certain source specific control requirements for air toxics; the development of risk assessment guidelines by the state Office of Environmental Health Hazard Assessment (OEHHA) under SB 1731; and the implementation of the public notice requirements of AB 2588.

In addition to the TAC rules adopted by the SCAQMD under authority of AB 1807 and AB 1731 (Table 3.1-16), the SCAQMD has adopted source-specific TAC rules, based on the specific level of TACs emitted and the needs of the area. These rules are similar to the state's ATCM requirements in that they are source-specific and only address emissions and risk from specific compounds and operations.

SCAQMD Rule 1420 – Emission Standards for Lead, was adopted to reduce emissions from stationary sources that process lead. New and modified sources of carcinogenic air contaminants in the SCAQMD are subject to Rule 1401 – New Source Review of Carcinogenic Air Contaminants and Rule 212 – Standards for Approving Permits. Rule 212 requires notification of the SCAQMD 's intent to grant a permit to construct a significant project, defined as a new or modified permit unit located within 1,000 feet of a school; a new or modified permit unit posing a MICR of one in one million (1×10^{-6}) or greater or a chronic or acute hazard index exceeding one; or a new or modified facility with criteria pollutant emissions exceeding specified daily maximum. Distribution of notices is required to all addresses within a quarter-mile radius, or other area deemed appropriate by the SCAQMD.

TABLE 3.1-17

SCAQMD Rules Adopted for Control of TACs

Rule	Title	Description
1401	New Source Review of Toxic Air Contaminants	Establishes allowable risks from new permit units, relocations, or modifications to existing permit units which emit TAC
1401.1	Requirements for New and Relocated Facilities Near Schools	Provides additional health protection to children at schools or schools under construction from new or relocated facilities emitting TACs
1410	Hydrogen Fluoride Storage and Use	Rule suspended in 1992 as a result of a court decison
1420	Emission Standards for Lead	Reduces emissions of lead from non-vehicular sources
1425	Film Cleaning and Printing Operations	Reduces perchloroethylene emissions from film cleaning and printing operations
1426	Emissions from Metal Finishing Operations	Requires emissions reporting and reduces fugitive emissions caused by the storage, handling and transport of nickel, cadmium, lead or copper in powder or metal salt form
1469.1	Spray Operations Using Toxic Chemicals	Reduces hexavalent chromium from spray coating operations

Health Effects

The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer. It is currently estimated that about one in four deaths in the U.S. is attributable to environmental pollution (Doll and Peto, 1981). The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods. In 1986, SCAQMD conducted the first Multiple Air Toxics Exposure Study (MATES) to determine the Basin-wide risks associated with major airborne carcinogens. The MATES study estimated the cancer risk due to 13 carcinogenic air contaminants in the Basin (Shikiya et al., 1987). The MATES study estimated 200 cancer cases per year in the Basin population as a result of exposure to airborne carcinogens excluding, mobile source emissions.

A follow-up study to MATES was performed by the SCAQMD and is referred to as the MATES-II study. The purpose of the study is to provide a complete estimate of exposure to TACs of individuals within the Basin. The SCAQMD conducted air sampling at about 24 different sites for over 30 different toxic air contaminants between April 1998 and March 1999. The SCAQMD released a Final Report from this study which indicates the following: (1) cancer risk levels appear to be decreasing since 1990 by about 44 percent to 63 percent; (2) mobile source components dominate the risk; (3) about 70 percent of all risk is attributed to diesel particulate emissions; (4) about 20 percent of all risk is attributed to other toxics associated with mobile sources; (5) about 10 percent of all risk is attributed to stationary sources; and (6) no local "hot spots" have been identified. The average carcinogenic risk in the Basin is about 1,400 per million people. This means that 1,400 people out of a million are susceptible to contracting cancer from exposure to the known TACs over a 70-year period of time. The cumulative risk averaged over the four counties (Los Angeles, Orange, Riverside, San Bernardino) of the Basin is about 980 in one million when diesel sources are included and about 260 in one million when diesel sources are excluded. The complete Final Report on the MATES-II Study is available from the SCAQMD (SCAQMD, 2000b).

In March 2000, the SCAQMD issued the final draft Air Toxics Control Plan for the next ten years (ATCP). The goal of the plan is to reduce air toxic exposures in an equitable and cost-effective manner that will promote clean, healthful air for Basin residents and businesses. As such, the ATCP seeks to identify measures that are technically feasible or are expected to be technically feasible and cost-effective in the ten years after adoption. The final draft Air Toxics Control Plan identifies potential strategies to reduce toxic levels in the Basin over the ten years after adoption. To the extent the strategies are implemented by the relative agencies, the ATCP will improve public health by reducing health risks associated with both mobile and stationary sources (SCAQMD, 2000c).

Although exposure to environmental pollution only accounts for an estimated two percent of cancer cases, this exposure is largely involuntary and preventable and therefore warrants reasonable attempts to reduce exposures. The ATCP reviews the current air toxic levels and key toxic pollutants that contribute to the overall risk levels. The ATCP projects the future air toxics levels taking into consideration existing federal, state, and local programs that potentially affect future toxic emissions. The control strategies identified in the ATCP go beyond the current ongoing toxics reduction efforts. These strategies are either currently feasible or will be feasible over the next ten years. The ATCP, if fully implemented, in conjunction with existing emission reduction programs, will result in significant reductions in air toxics risks from both mobile and stationary sources.

In September, 2003 the SCAQMD Governing Board approved several enhancements to the District's Environmental Justice program. Initiative I-5 of these enhancements calls for a one year sampling program for air toxics., which is part of the MATES-III study. The objective of MATES-III is to characterize the ambient air toxic concentrations and potential exposures in the South Coast Air Basin. The MATES-III study will develop an updated toxics emissions inventory and conduct air dispersion modeling to estimate ambient levels and the potential health risks of air toxics. The results of this effort will determine the spatial concentration pattern of important hazardous air pollutants in the Basin, will assess the effectiveness of current air toxic control measures, provide trend data of air toxic levels, and be used to update and develop appropriate control strategies for reducing exposures to toxics associated with significant public health risks.

Air monitoring has been completed for the period April, 2004 through March, 2006 at ten sites, which are essentially the same as those used in MATES II. Samples were collected every 3 days, and the analyses focus on the major contributors to toxics risk as determined by previous studies. Laboratory analyses are being completed and a preliminary summary of the monitoring data are expected by mid-2007. The update to the emissions inventory and initial modeling of air toxic levels throughout the Basin are expected toward the end of 2007.

3.1.4.2 Greenhouse Gases (GHGs) and Ozone Depletion

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the AQMP. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- phase out the use and corresponding emissions of chlorofluorocarbons (CFCs), methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;

- phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons (HCFCs) by the year 2000;

- develop recycling regulations for HCFCs;

- develop an emissions inventory and control strategy for methyl bromide; and,

- support the adoption of a California greenhouse gas emission reduction goal.

<u>Greenhouse Gases (GHGs)</u>

Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. The six major GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide N_2O), sulfur hexafluoride (SF_6), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHGs absorb longwave radiant energy emitted by the earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect."

The current scientific consensus is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHGs in the atmosphere due to human activities. Events and activities, such as the industrial revolution and the increased consumption of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHGs emissions (CEC, 2004). The GHG inventory for California is presented in Table 3.1-18 (CEC, 2006t). Approximately 80 percent of GHGs in California are from fossil fuel combustion (see Table 3.1-8).

In June 2005, Governor Schwarzenegger signed Executive Order #S-3-05 which established the following greenhouse gas targets:

- By 2010, reduce to 2000 emission levels,
- By 2020, reduce to 1990 emission levels, and
- By 2050, reduce to 80 percent below 1990 levels.

In September 2006, Governor Schwarzenegger signed Califonia's Global Warming Solutions Act of 2006 (AB32), which expanded on Executive Order #S-3-05. AB32 will require CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions, by January 1, 2008,
- Adopt mandatory reporting rules for significant sources of GHG by January 1, 2008,
- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions, and
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHGs by January 1, 2011.

The combination of Executive Order #S-3-05 and AB32 will require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

<u>Ozone Depletion</u>

The SCAQMD Governing Board has adopted several rules to reduce ozone depleting compounds (Rules 1411, 1415, and 1418). Policies related to ozone depleting compounds were further implemented as part of the 1997 AQMP within the constraints of the resources of the SCAQMD. The SCAQMD will also regulate the ozone depleting compounds by implementing Title VI of the 1990 amendments to the CAA.

TABLE 3.1-18
California GHG Emissions and Sinks Summary
(Million metric tons of CO_2 equivalence)

Gas/Source	1990	2004
Carbon Dioxide (Gross)	**317.4**	**355.9**
Fossil Fuel Combustion	306.4	342.4
Residential	29.0	27.9
Commercial	12.6	12.2
Industrial	66.1	67.1
Transportation	161.1	188.0
Electricity Generation (In State)	36.5	47.1
No End Use Specified	1.1	0.2
Cement Production	4.6	6.5
Lime Production	0.2	0.1
Limestone & Dolomite Consumption	0.2	0.3
Soda Ash Consumption	0.2	0.2
Carbon Dioxide Consumption	0.1	0.1
Waste Combustion	0.1	0.1
Land Use Change & Forestry Emissions	5.5	6.1
Land Use Change & Forestry Sinks	(22.7)	(21.0)
Carbon Dioxide (Net)	**294.7**	**334.9**
Methane (CH4)	**26.0**	**27.9**
Petroleum & Natural Gas Supply System	1.0	0.5
Natural Gas Supply System	1.6	1.4
Landfills	8.1	8.4
Enteric Fermentation	7.5	7.2
Manure Management	3.3	6.0
Flooded Rice Fields	0.4	0.6
Burning Ag & Other Residues	0.1	0.1
Wastewater Treatment	1.4	1.7
Mobile Source Combustion	1.2	0.6
Stationary Source Combustion	1.3	1.3
Nitrous Oxide (N2O)	**32.7**	**33.3**
Nitric Acid Production	0.4	0.2
Waste Combustion	0.0	0.0
Agricultural Soil Management	14.7	19.2
Manure Management	0.8	0.9
Burning Ag Residues	0.1	0.1
Wastewater	0.9	1.1
Mobile Source Combustion	15.6	11.8
Stationary Source Combustion	0.2	0.2
High Global Warming Potential Gases (HFCs, PFCs & SF6)	**7.1**	**14.2**
Substitution of Ozone-Depleting Substances	4.5	12.6
Semiconductor Manufacture	0.4	0.6
Electricity Transmission & Distribution (SF6)	2.3	1.0
Gross California Emissions (w/o Electric Imports)	**383.3**	**431.3**
Land Use Change & Forestry Sinks	**(22.7)**	**(21.0)**
Net Emissions (w/o Electric Imports)	**360.6**	**410.3**
Electricity Imports	**43.3**	**60.8**
Gross California Emissions with Electricity Imports	**426.6**	**492.1**
Net California Emissions with Electricity Imports	**403.9**	**471.1**

Source: CEC, 2006t

3.1.5 TRANSPORT OF AIR POLLUTANTS

The Basin both transports to and receives air pollutants from the coastal portions of Ventura and Santa Barbara counties in the South Central Coast Air Basin. The South Coast Air Basin also receives air pollutants from oil and gas development operations on the outer continental shelf. The 2007 AQMP does not specifically address the control requirements for these adjacent areas. However, the control measures in the 2007 AQMP meet both the CAA and CCAA transport requirements and will assist downwind areas in complying with the federal ozone air quality standard.

Areas upwind of the Basin (primarily Ventura County, but also including Santa Barbara County and the outer continental shelf) will need to reduce emissions to allow those areas to come into compliance with all air quality standards. If the Basin is to comply, sources in these upwind areas may need to reduce emissions further (i.e., reduce emissions beyond what may be required to achieve the standards in these areas).