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 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 2003 AQMP is to update the existing plan to ensure continued progress toward attaining all state and national air quality standards and to avoid a transportation conformity lapse and associated federal sanctions. The South Coast Air Basin is required to reach attainment with the federal PM10 standards by 2006 and the federal 1-hour ozone standard by 2010. Significant improvements in air quality will be necessary to bring the Basin into attainment by federal deadlines. The 2003 AQMP will build upon improvements accomplished from the previous AQMPs, and will incorporate all feasible control measures while considering costs and socioeconomic impacts. The few years remaining to attainment deadlines afford little margin for error in developing such a comprehensive control strategy. Further, the SCAQMD has to make sure that the control strategy selected to attain the current federal PM10 and one-hour ozone standards will also complement and in no way conflict with the Basin's future efforts to attain the new federal eight-hour ozone and fine particulate (PM2.5) standards. 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, nitrogen dioxide (NO_2), PM10, sulfur dioxide (SO_2), and lead. 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.

The SCAQMD monitors levels of various criteria pollutants at 32 monitoring stations. Air quality in the District continues to improve, with recent years registering the lowest levels since measurements began five decades ago. Yet the greater Los Angeles area still experiences the worst overall air quality in the nation. The District exceeded the federal health 1-hour standard for ozone on 36 days in 2001, with maximum levels approximately 58 percent higher than the national ambient air quality standard. This represents the number of days a standard was exceeded anywhere in the District. In 2002, the most recent year air quality data are available, the District exceeded the federal health 1-hour standard for ozone on 49 days, with maximum levels approximately 36 percent higher than the national ambient air quality standard. The air quality data collected from the SCAQMD monitoring network are presented in Table 3.1-2.

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 >	0.12, 1-hour average 0.08 ppm, 8-hour average	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals; (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: 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; (c) Vegetation damage; (d) 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 $\mu g/m^3$, annual geometric mean > 50 $\mu g/m^3$, 24-hour average>	50 $\mu g/m^3$, annual arithmetic mean 150 $\mu g/m^3$, 24-hour average	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	--(1)	15 $\mu g/m^3$, annual arithmetic mean 65 $\mu g/m^3$, 24-hour average	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease, decreased lung function, and even premature death
Sulfates	25 $\mu g/m^3$, 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 $\mu g/m^3$, 30-day average>=	1.5 $\mu g/m^3$, calendar quarter	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Hydrogen Sulfide	0.03 ppm, 1-hour average >=	--(2)	Odor annoyance.
Vinyl Chloride	0.010 ppm, 24-hour average >=	--(2)	Known carcinogen.
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) No state standard established.
(2) No federal standard established.

TABLE 3.1-2

2001 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 ≥ 9.5 ppm 8-hour	No. Days Standard Exceeded[(1)] State > 9 ppm 8-hour
LOS ANGELES COUNTY							
1	Central LA	087	362	6	4.57	0	0
2	Northwest Coastal LA County	091	361	4	3.00	0	0
3	Southwest Coastal LA County	094	365	7	5.14	0	0
4	South Coastal LA County	072	361	6	4.71	0	0
6	West San Fernando Valley	074	365	7	6.00	0	0
7	East San Fernando Valley	069	364	6	4.88	0	0
8	West San Gabriel Valley	088	355	7	5.00	0	0
9	East San Gabriel Valley 1	060	361	3	2.88	0	0
9	East San Gabriel Valley 2	591	357	3	2.50	0	0
10	Pomona/Walnut Valley	075	365	5	3.43	0	0
11	South San Gabriel Valley	085	365	6	4.00	0	0
12	South Central LA County	084	365	12	7.71	0	0
13	Santa Clarita Valley	090	361	6	3.14	0	0
ORANGE COUNTY							
16	North Orange County	3177	363	11	4.71	0	0
17	Central Orange County	3176	274*	8*	4.71*	0*	0*
18	North Coastal Orange County	3195	363	6	4.57	0	
19	Saddleback Valley	3812	365	3	2.38	0	0
RIVERSIDE COUNTY							
22	Norco/Corona	4155	--	--	--	--	--
23	Metropolitan Riverside County 1	4144	356	5	3.43	0	0
23	Metropolitan Riverside County 2	4146	329*	6*	4.50*	0*	0*
24	Perris Valley	4149	--	--	--	--	--
25	Lake Elsinore	4158	355 --	2	2.00	0	0
29	Banning Airport	4164		--	--	--	--
30	Coachella Valley 1**	4137	357	2	1.50	0	0
30	Coachella Valley 2**	4157	--	--	--	--	--
SAN BERNARDINO COUNTY							
32	Northwest San Bernardino Valley	5175	364 --	3	1.75	0	0
33	Southwest San Bernardino Valley	5817		--	--	--	--
34	Central San Bernardino Valley 1	5197	--	--	--	--	--
34	Central San Bernardino Valley 2	5203	365	4	3.25	0	0
35	East San Bernardino Valley	5204	--	--	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--	--	--
38	East San Bernardino Mountains	5818	--	--	--	--	--
	DISTRICT MAXIMUM			12	7.71	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 1-hour standards (1-hr avg. CO > 35 ppm and > 20 ppm, respectively) were not exceeded.

TABLE 3.1-2 (Continued)

2001 Air Quality Data – South Coast Air Quality Management District

Ozone										
						No. Days Standard Exceeded				
						Health Advisory	Federal		State
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	≥ 0.15 ppm 1-hour	> 0.12 ppm 1-hour	> 0.08 ppm 8-hour	> 0.09 ppm 1-hour
LOS ANGELES COUNTY									
1	Central LA	087	361	0.116	0.099	0	0	1	8
8	Northwest Coastal LA County	091	365	0.099	0.080	0	0	0	1
3	Southwest Coastal LA County	094	360	0.098	0.080	0	0	0	1
4	South Coastal LA County	072	360	0.091	0.070	0	0	0	0
6	West San Fernando Valley	074	365	0.140	0.117	0	2	7	25
7	East San Fernando Valley	069	356	0.129	0.104	0	2	5	15
8	West San Gabriel Valley	088	361	0.160	0.120	1	1	9	28
9	East San Gabriel Valley 1	060	365	0.189	0.131	3	9	18	36
9	East San Gabriel Valley 2	591	362	0.190	0.135	5	13	31	61
10	Pomona/Walnut Valley	075	363	0.144	0.108	0	1	3	12
11	South San Gabriel Valley	085	365	0.132	0.100	0	1	2	7
12	South Central LA County	084	365	0.077	0.061	0	0	0	0
13	Santa Clarita Valley	090	356	0.184	0.129	2	9	27	49
ORANGE COUNTY									
16	North Orange County	3177	360	0.114	0.090	0	0	2	4
17	Central Orange County	3176	274*	0.107*	0.071*	0*	0*	0*	2*
18	North Coastal Orange County	3195	365	0.098	0.073	0	0	0	1
19	Saddleback Valley	3812	365	0.125	0.098	0	1	2	10
RIVERSIDE COUNTY									
22	Norco/Corona	4155	--	--	--	--	--	--	--
23	Metropolitan Riverside County 1	4144	365	0.143	0.120	0	7	34	41
23	Metropolitan Riverside County 2	4146	--	--	--	--	--	--	--
24	Perris Valley	4149	361	0.152	0.136	5	19	58	73
25	Lake Elsinore	4158	348	0.151	0.120	1	12	46	61
29	Banning Airport	4164	365	0.149	0.129	2	16	49	63
30	Coachella Valley 1**	4137	358	0.137	0.114	0	6	42	53
30	Coachella Valley 2**	4157	365	0.114	0.099	0	0	17	21
SAN BERNARDINO COUNTY									
32	Northwest San Bernardino Valley	5175	365	0.174	0.138	6	14	33	53
33	Southwest San Bernardino Valley	5817	--	--	--	--	--	--	--
34	Central San Bernardino Valley 1	5197	365	0.165	0.136	6	13	31	44
34	Central San Bernardino Valley 2	5203	365	0.184	0.144	5	18	39	55
35	East San Bernardino Valley	5204	327*	0.167*	0.144*	7*	21*	52*	68*
37	Central San Bernardino Mountains	5181	365	0.171	0.139	12	26	74	88
38	East San Bernardino Mountains	5818	--	--	--	--	--	--	--
	DISTRICT MAXIMUM			0.190	0.144	12	26	74	88

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

TABLE 3.1-2 (Continued)

2001 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(2)**	**Max. Conc. in ppm 24-hour**	**Average Compared to Federal Standard(3) AAM in ppm**
LOS ANGELES COUNTY						
1	Central LA	087	365	0.14	0.078	0.0378
2	Northwest Coastal LA County	091	365	0.11	0.080	0.0251
3	Southwest Coastal LA County	094	362	0.11	0.080	0.0250
4	South Coastal LA County	072	364	0.13	0.070	0.0308
6	West San Fernando Valley	074	359	0.09	0.060	0.0266
7	East San Fernando Valley	069	347	0.25	0.091	0.0419
8	West San Gabriel Valley	088	365	0.15	0.086	0.0345
9	East San Gabriel Valley 1	060	365	0.12	0.094	0.0331
9	East San Gabriel Valley 2	591	365	0.12	0.067	0.0274
10	Pomona/Walnut Valley	075	365	0.13	0.095	0.0371
11	South San Gabriel Valley	085	363	0.14	0.076	0.0352
12	South Central LA County	084	363	0.15	0.072	0.0369
13	Santa Clarita Valley	090	351	0.10	0.048	0.0239
ORANGE COUNTY						
16	North Orange County	3177	363	0.13	0.069	0.0275
17	Central Orange County	3176	274*	0.12*	0.069*	0.0293*
18	North Coastal Orange County	3195	365	0.08	0.063	0.0182
19	Saddleback Valley	3812	--	--	--	--
RIVERSIDE COUNTY						
22	Norco/Corona	4155	--	--	--	--
23	Metropolitan Riverside County 1	4144	362	0.15	0.064	0.0247
23	Metropolitan Riverside County 2	4146	--	--	--	--
24	Perris Valley	4149	--	--	--	--
25	Lake Elsinore	4158	352	0.09	0.102	0.0185
29	Banning Airport	4164	343	0.24	0.057	0.0211
30	Coachella Valley 1**	4137	345	0.08	0.043	0.0175
30	Coachella Valley 2**	4157	--	--	--	--
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	5175	347	0.13	0.085	0.0384
33	Southwest San Bernardino Valley	5817	--	--	--	--
34	Central San Bernardino Valley 1	5197	365	0.13	0.084	0.0358
34	Central San Bernardino Valley 2	5203	329*	0.11*	0.066*	0.0303*
35	East San Bernardino Valley	5204	--	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--	--
38	East San Bernardino Mountains	5818	--	--	--	--
	DISTRICT MAXIMUM			0.25	0.102	0.0419

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
(2) The state standard (1-hr avg. > 0.25 ppm) was not exceeded.
(3) The federal standard (annual arithmetic mean NO_2 > 0.0534 ppm) was not exceeded.

TABLE 3.1-2 (Continued)

2001 Air Quality Data – South Coast Air Quality Management District

Source/ Receptor Area No.	Location of Air Monitoring Station	Station No.	No. Days of Data	Max. Conc. in ppm 1-hour(4)	Max. Conc. in ppm 24-hour(4)
	Sulfur Dioxide				
LOS ANGELES COUNTY					
1	Central LA	087	365	0.03	0.010
2	Northwest Coastal LA County	091	--	--	--
3	Southwest Coastal LA County	094	365	0.04	0.012
4	South Coastal LA County	072	364	0.05	0.012
6	West San Fernando Valley	074	--	--	--
7	East San Fernando Valley	069	345	0.01	0.004
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	343	0.01	0.007
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	--	--	--
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	330*	0.01*	0.010*
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			0.09	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
(4) The state standards (1-hr avg. > 0.25 ppm and 24-hr avg. > 0.045 ppm) were not exceeded. The federal standards (annual arithmetic mean SO2) > 0.03 ppm, 3-hr avg. > 0.50 ppm, 24-hr avg. > 0.14 ppm) were not exceeded.

TABLE 3.1-2 (Continued)

2001 Air Quality Data – South Coast Air Quality Management District

Suspended Particulates PM10(5)								
					No. (%) Samples Exceeding Standard		Annual Averages(6)	
Source/ Receptor Area No.	Location of Air Monitoring Station	Station No.	No. Days of Data	Max. Conc. in $\mu g/m^3$ 24-hour	Federal > 150 $\mu g/m^3$ 24-hour	State > 50 $\mu g/m^3$ 24-hour	AAM Conc. $\mu g/m^3$	AGM Conc. $\mu g/m^3$
LOS ANGELES COUNTY								
1	Central LA	087	61	97	0	20(33)	44.2	40.3
8	Northwest Coastal LA County	091	--	--	--	--	--	--
3	Southwest Coastal LA County	094	58	75	0	8(14)	37.1	34.4
4	South Coastal LA County	072	59	91	0	10(17)	37.4	34.8
6	West San Fernando Valley	074	--	--	--	--	--	--
7	East San Fernando Valley	069	61	86	0	14(23)	40.9	36.9
8	West San Gabriel Valley	088	--	--	--	--	--	--
9	East San Gabriel Valley 1	060	58	106	0	22(38)	45.3	39.9
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	61	62	0	4(7)	32.0	28.5
ORANGE COUNTY								
16	North Orange County	3177	--	--	--	--	--	--
17	Central Orange County	3176	46*	93*	0*	9(20)*	36.0*	33.7*
18	North Coastal Orange County	3195	--	--	--	--	--	--
19	Saddleback Valley	3812	57	60	0	3(5)	26.4	24.0
RIVERSIDE COUNTY								
22	Norco/Corona	4155	54	109	0	18(33)	44.8	39.3
23	Metropolitan Riverside County 1	4144	117	136	0	78(67)	63.1	54.3
23	Metropolitan Riverside County 2	4146	--	--	--	--	--	--
24	Perris Valley	4149	60	86	0	16(27)	40.8	36.0
25	Lake Elsinore	4158	--	--	--	--	--	--
29	Banning Airport	4164	54	219	1(1.9)	7(13)	35.1	26.7
30	Coachella Valley 1**	4137	49*	53(7)	0(7)	1(2)(7)	26.7(7)	23.9(7))
30	Coachella Valley 2**	4157	112(7)	149(7)	0(7)	50(45)(7)	50.2(7)	44.3(7)
SAN BERNARDINO COUNTY								
32	NW San Bernardino Valley	5175	--	--	--	--	--	--
33	SW San Bernardino Valley	5817	64	166	1(1.6)	27(42)	52.4	46.2
34	Central San Bernardino Valley 1	5197	60	106	0	34(57)	50.5	43.8
34	Central San Bernardino Valley 2	5203	60	106	0	31(52)	52.0	45.2
35	East San Bernardino Valley	5204	49*	102*	0*	22(45)*	46.6*	39.6*
37	Central San Bernardino Mtns.	5181	--	--	--	--	--	--
38	East San Bernardino Mountains	5818	--	--	--	--	--	--
	DISTRICT MAXIMUM			219	1	78	63.1	54.3

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

(5) PM10 samples were collected every 6 days (every 3 days at Stn. Nos. 4144 & 4157) using the size-selective high volume sampler method, on glass fiber filter media.

(6) Federal and state PM10 standards are AAM >50 $\mu g/m^3$ and AGM > 30 $\mu g/m^3$, respectively.

(7) The data for samples on high wind days were excluded in accordance with the U.S. EPA Natural Events Policy.

TABLE 3.1-2 (Continued)

2001 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/m^3 24-hour**	**No. (%) Samples Exceeding Standard** Federal > 65 μg/m^3 24-hour	**Annual Average[9]** AAM Conc. μg/m^3
LOS ANGELES COUNTY						
1	Central LA	087	334	73.4	4(1.2)	22.9
2	Northwest Coastal LA County	091	--	--	--	--
3	Southwest Coastal LA County	094	--	--	--	--
4	South Coastal LA County	072	317	72.9	1(0.3)	21.4
6	West San Fernando Valley	074	109	71.1	1(0.9)	18.5
7	East San Fernando Valley	069	117	94.7	4(3.4)	24.9
8	West San Gabriel Valley	088	110	78.1	1(0.9)	20.9
9	East San Gabriel Valley 1	060	308	79.7	4(1.3)	21.8
9	East San Gabriel Valley 2	591	--	--	--	--
10	Pomona/Walnut Valley	075	--	--	--	--
11	South San Gabriel Valley	085	95	77.3	3(3.2)	26.1
12	South Central LA County	084	116 --	73.1	3(2.6)	24.5
13	Santa Clarita Valley	090		--	--	--
ORANGE COUNTY						
16	North Orange County	3177	--	--	--	--
17	Central Orange County	3176	252*	70.8*	1(0.4)*	22.4*
18	North Coastal Orange County	3195	--	--	--	--
19	Saddleback Valley	3812	102	53.4	0	15.8
RIVERSIDE COUNTY						
22	Norco/Corona	4155	--	--	--	--
23	Metropolitan Riverside County 1	4144	325	98.0	19(5.8)	31.1
23	Metropolitan Riverside County 2	4146	106	74.9	5(4.7)	28.3
24	Perris Valley	4149	--	--	--	--
25	Lake Elsinore	4158	--	--	--	--
29	Banning Airport	4164	--	--	--	--
30	Coachella Valley 1**	4137	107	44.7	0	10.8
30	Coachella Valley 2**	4157	113	33.5	0	12.2
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	5175	--	--	--	--
33	Southwest San Bernardino Valley	5817	113	71.2	2(1.8)	26.2
34	Central San Bernardino Valley 1	5197	114	74.8	4(3.5)	24.8
34	Central San Bernardino Valley 2	5203	111	78.5	5(4.5)	26.2
35	East San Bernardino Valley	5204	--	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--	--
38	East San Bernardino Mountains	5818	57	34.6	0	10.9
	DISTRICT MAXIMUM			98.0	19	31.1

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 3 days at all sites except for Station. Nos. 060, 072, 087, 3176, and 4144, where samples were taken every day, and Station. No. 5818, where samples were collected every 6 days.
(9) Federal PM2.5 standard is AAM > 15 μg/m^3.

TABLE 3.1-2 (Continued)

2001 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/m^3 24-hour**	**Annual Average AAM Conc. μg/m^3**
LOS ANGELES COUNTY					
1	Central LA	087	61	131	75.4
2	Northwest Coastal LA County	091	60	81	46.5
3	Southwest Coastal LA County	094	61	118	71.4
4	South Coastal LA County	072	68	113	67.2
6	West San Fernando Valley	074	--	--	--
7	East San Fernando Valley	069	--	--	--
8	West San Gabriel Valley	088	60	88	49.6
9	East San Gabriel Valley 1	060	59	178	93.9
9	East San Gabriel Valley 2	591	--	--	--
10	Pomona/Walnut Valley	075	--	--	--
11	South San Gabriel Valley	085	59	146	76.9
12	South Central LA County	084	58	385	90.2
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	57	296	123.7
23	Metropolitan Riverside County 2	4146	61	182	86.8
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	58	171	69.7
33	Southwest San Bernardino Valley	5817	--	--	--
34	Central San Bernardino Valley 1	5197	60	237	102.1
34	Central San Bernardino Valley 2	5203	55	224	101.3
35	East San Bernardino Valley	5204	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--
38	East San Bernardino Mountains	5818			
	DISTRICT MAXIMUM			385	123.7

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 6 days by high volume sampler method, on glass fiber filter media.

TABLE 3.1-2 (Continued)

2001 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**	**No. (%) Samples Exceeding Standard: Federal Quarterly Avg. > 1.5 μg/m³**	**No. (%) Samples Exceeding Standard: State Monthly Avg. ≥ 1.5 μg/m³**
LOS ANGELES COUNTY						
1	Central LA	087	0.06	0.05	0	0
2	Northwest Coastal LA County	091	--	--	--	--
3	Southwest Coastal LA County	094	0.04	0.04	0	0
4	South Coastal LA County	072	0.05	0.04	0	0
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	0.07	0.05	0	0
12	South Central LA County	084	0.23	0.12	0	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	0.04	0.03	0	0
23	Metropolitan Riverside County 2	4146	0.03	0.03	0	0
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	0.05	0.04	0	0
33	Southwest San Bernardino Valley	5817	--	--	--	--
34	Central San Bernardino Valley 1	5197	--	--	--	--
34	Central San Bernardino Valley 2	5203	0.05	0.04	0	0
35	East San Bernardino Valley	5204	--	--	--	--
37	Central San Bernardino Mountains	5181	--	--	--	--
38	East San Bernardino Mountains	5818				
	DISTRICT MAXIMUM		0.23	0.12	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
(11) Lead was determined from samples collected every 6 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)

2001 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 μg/m³ 24-hour	≥ 25 μg/m³ 24-hour
LOS ANGELES COUNTY				
1	Central LA	087	15.9	0
2	Northwest Coastal LA County	091	15.6	0
3	Southwest Coastal LA County	094	20.6	0
4	South Coastal LA County	072	15.9	0
6	West San Fernando Valley	074	--	--
7	East San Fernando Valley	069	--	--
8	West San Gabriel Valley	088	13.4	0
9	East San Gabriel Valley 1	060	14.1	0
9	East San Gabriel Valley 2	591	--	--
10	Pomona/Walnut Valley	075	--	--
11	South San Gabriel Valley	085	14.5	0
12	South Central LA County	084	15.4	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	10.7	0
23	Metropolitan Riverside County 2	4146	9.2	0
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	10.7	0
33	SW San Bernardino Valley	5817	--	--
34	Central San Bernardino Valley 1	5197	10.7	0
34	Central San Bernardino Valley 2	5203	11.5	0
35	East San Bernardino Valley	5204	--	--
37	Central San Bernardino Mtns.	5181	--	--
38	East San Bernardino Mountains	5818		
	DISTRICT MAXIMUM		20.6	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 6 days by high volume sampler method, on glass fiber filter media.

3.1.1.2 Current Emission Inventories

As required by CARB, emissions inventories developed for the 2003 AQMP use 1997 as the base year. Future projected emissions incorporate rules and regulations adopted by U.S. EPA, CARB and SCAQMD since 1997 to October 2002. 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 sources (i.e., those associated with human activity).

Currently, air quality standards exist for ozone, CO, NO_2, PM10, SO_2, lead, and sulfate. The emissions inventories include total organic gases (TOG), VOC, NOx, SOx, CO, PM10, and fine suspended particulate less than 2.5 microns (PM2.5). The PM2.5 emissions are included because U.S. EPA is in the process of adopting air quality standards. Ozone is formed from atmospheric, photochemical reactions involving primarily NOx and VOCs, so it is not inventoried. VOC and NOx are precursors of ozone. NOx and VOCs also react to form nitrates and solid organic compounds, which are a significant fraction of PM10. Sulfur dioxide reacts to form sulfates which are likewise significant contributors to the Basin's PM10 and PM2.5. In addition to the PM10 formed by reaction of gaseous precursors, there is directly emitted PM10, most of which is attributed to fugitive dust sources such as re-entrained road dust, construction activities, farming operations and wind-blown dust.

TOG incorporates all gaseous compounds containing the element carbon with the exception of the inorganic compounds, CO, carbon dioxide (CO_2), carbonic acid, carbonates, and metallic carbides. VOC is a subset of TOG and does not include acetone, ethane, methane, methylene chloride, methyl chloroform, perchloroethylene, methyl acetate, p-chlorobenzotrifluoride, and a number of Freon-type gases, because these substances do not generally contribute to ozone formation. In the 2003 AQMP, the amount of VOC in TOG and the amount of PM10 and PM2.5 are calculated for each process primarily using species and size fraction profiles provided by CARB. Besides average annual day emissions that are reported for all criteria pollutants, summer planning inventories (VOC and NOx) are reported for ozone purposes and winter planning inventories (CO and NO_2) are reported for CO and NO_2 purposes. There are separate summer and winter emission inventories for NOx because in the summer, NOx emissions contribute to ozone impacts and in the winter, NOx contributes to NO_2 impacts.

Stationary Sources

Stationary sources of emissions are grouped into two categories: point sources and area sources. Point source emissions are from facilities having one or more pieces of equipment registered and permitted with the District. Therefore, the SCAQMD is able to collect facility emissions related information. Area source emissions are from numerous small facilities or pieces of equipment, such as residential water heaters, consumer products, and architectural coatings, for which locations are not specifically identified.

Point Sources

The 1997 point source emissions inventory is based on the emissions data reported by point source facilities in the 1996/1997 Annual Emissions Reporting (AER) Program. Facilities subject to the AER Program calculate and report their emissions primarily based on their throughput data (e.g., fuel usage, material usage), appropriate emission factors, and control efficiency (if applicable). Under the 1996/1997 AER Program, approximately 3200 facilities reported their annual emissions to the SCAQMD. Emissions from smaller industrial facilities not subject to the AER Program, which represent a small fraction of the overall inventory, are included as part of the area source inventory.

Area Sources

The SCAQMD and CARB shared the responsibility of developing the 1997 area source emissions inventory for approximately 350 area source categories. Specifically, the SCAQMD developed the inventory for approximately 90 categories and CARB developed the inventory for the remainder including approximately 230 categories associated with consumer products, architectural coatings, and degreasing. For each area source inventory, a number of existing methodologies were used with updated activity data such as fuel data or sales data (e.g., fuel combustion categories, landfills, oil/gas production). New methodologies were developed for several categories (i.e., agricultural pumps, residential wood combustion). Three new categories were added to the inventory (i.e., composting, cargo tanks, and gas cans). Other existing methodologies were refined based on more recent studies (e.g., consumer products, architectural coatings).

<u>Comparison of 1993 and 1997 Inventories</u>

The 1997 AQMP used 1993 as the base year for the emission inventory. The 1993 base year point source emissions inventory was based principally on reported data from facilities. The area and off-road emissions were estimated jointly by CARB and the SCAQMD. The on-road emissions were calculated using the CARB EMFAC7G emission factors and 1993 activity data. Figures 3.1-1 and 3.1-2 provide a comparison of the 1993 and 1997 point and area source inventories for all pollutants.

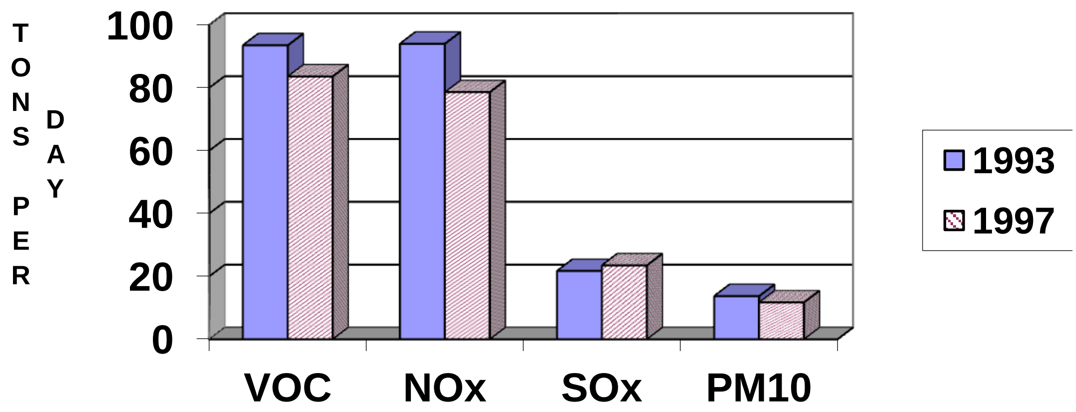

FIGURE 3.1-1

Comparison of 1993 and 1997 Total Point Source Emissions

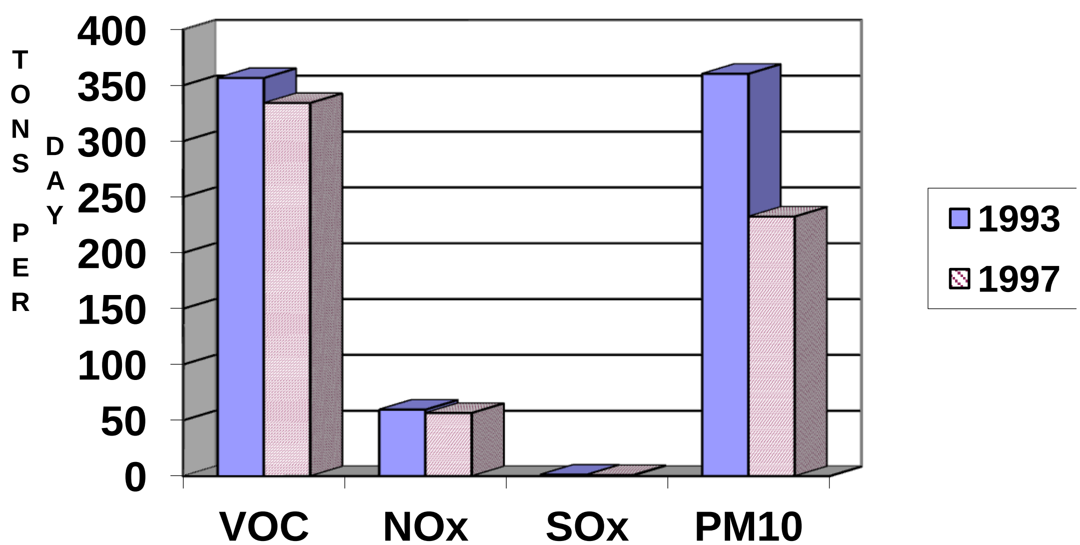

FIGURE 3.1-2

Comparison of 1993 and 1997 Total Area Source Emissions

Changes in Point Sources

The point source inventory (except SOx) continued its downward trend primarily due to the implementation of existing stationary source regulations. As indicated in Figure 3.1-1 above, the 1993 VOC and NOx emissions decreased from 94 and 94 tons per day to 84 and 79 tons per day, respectively in 1997. In addition to the effect of existing regulations, another major reason for the decreased VOC emissions was the use of the U.S. EPA correlation equations for calculating fugitive emissions (i.e., component leaks) by the petroleum industry, which significantly reduced the calculated fugitive emissions.

Also, VOC emissions (primarily methanol) from hydrogen plants process vents in refineries were identified for the first time in 1997, which were included in the baseline inventory. This new emission source category contributed to about two tons of VOC emissions per day in 1997 and is currently regulated under SCAQMD Rule 1189. For NOx emissions, the majority of the emission decrease in 1997 (compared to 1993) is attributed to reductions achieved through the RECLAIM Program. The increase in SOx emissions was primarily due to changes in methodology for estimating emissions from refinery flares. The decrease in PM10 was primarily due to implementation of several Best Available Control Measure rules (e.g., Rule 403 and Rule 1186).

Changes in Area Sources

The area source inventory also decreased between 1993 and 1997 for all criteria pollutants due to the effect of rules adopted by SCAQMD and CARB as well as due to the improved or updated area source methodologies used for estimating emissions, which are briefly discussed below.

Rule Implementation

The 1998 Architectural and Industrial Maintenance Coatings Survey conducted by CARB indicated an increase in the use of water-based coatings compared to oil-based coatings between 1990 and 1996 (76 percent versus 82 percent), primarily due to the SCAQMD Rule 1113 – Architectural Coatings. As a result, VOC emissions decreased by five tons per day in 1997 compared to 1993.

In addition, a number of other rules with implementation dates between 1993 and 1997 contributed to some of the emission reductions between these years. Emission source categories mostly affected by rules included:

- adhesive applications (Rule 1168),
- commercial bakery ovens (Rule 1153),
- screen printing operations (Rule 1130.1),
- solvent cleaning operations (Rule 1171),
- marine tank vessel operations (Rule 1142),
- sumps and wastewater separators (Rule 1176),
- organic liquid loading (Rule 462),
- gasoline transfer and dispensing (Rule 461),
- stationary internal combustion engines (Rule 1110.2),
- sulfur content of gaseous fuels (Rule 431.1), and
- consumer products regulated by CARB.

<u>Improved/Updated Methodologies</u>

Eight categories had improved or updated methodologies applied for the 1997 emission inventory. A summary of the categories and emission inventory impacts are presented in Table 3.1-3. Additional details are presented in Appendix III of the 2003 AQMP.

TABLE 3.1-3

Impact of Improved or Updated Methodologies on Selected Categories

Category	Methodology Issue	Impact
Gasoline Dispensing	Underestimated emissions	Increase of 12 tons per day of VOC
Industrial Coatings	Overestimated emissions and included in more specific categories	Emissions reallocated to more appropriate categories
Consumer Products	New product categories identified and emission estimating improved	Increase of 13 tons per day of VOC
Residential Wood Combustion	New methodology based on survey data	Increase of 5.6 and 24 tons per day of PM10 and CO, respectively
Composting	Quantified for the first time in the 2003 AQMP	Increase of 6.8 tons per day of VOC
Truck Stops	Quantified for the first time in the 2003 AQMP	Adds 0.14 and 2.52 tons of VOC and NOx, respectively to the 2010 inventory
Metrolink	Quantified for the first time in the 2003 AQMP and added to the Trains category	Adds 0.11, 2.95, and 0.35 tons of VOC, NOx, and SOx, respectively to the 2010 inventory
Fugitive Dust	Overstated emissions, updated with revised emission factors	Decrease in PM10 emissions of 132.8 tons per day

Special Studies

Three categories had special studies conducted for the 1997 emission inventory. A summary of the categories and emission inventory impacts are presented in Table 3.1-4. Additional details are presented in Appendix III of the 2003 AQMP.

TABLE 3.1-4

Summary of Results from Special Studies Included in the 1997 Emissions Inventory

Category	Purpose of Study
Aircraft	Developed emissions inventory for commercial, general aviation, and military airports.
Marine Vessels	Updated the 1997, 2000, 2010, and 2020 baseline emissions for ocean-going vessels, tugboats, harbor vessels, fishing vessels, and U.S. Navy and Coast Guard vessels.
Ammonia Sources	Updated emissions inventory and added composting emissions to the inventory. The updated inventory increases ammonia the 1997 baseline emissions to 157.1-183.3 tons per day.

<u>Mobile Sources</u>

On-Road Mobile Sources

Caltrans, CARB, SCAG, and the Department of Motor Vehicles (DMV) supply data necessary to evaluate emissions from on-road mobile sources. DMV maintains a count of registered vehicles and Caltrans provides highway network, traffic counts and road capacity data. SCAG maintains the regional transportation model containing the temporal and spatial distribution of motor vehicle activity (travel time, travel speed, and volume of traffic for morning-peak, afternoon-peak, mid-day and night hours). In addition, SCAG periodically conducts origin and destination surveys to validate the regional transportation model, and updates a demographic database for population, housing, employment and patterns of land use within SCAQMD jurisdiction.

CARB estimates on-road motor vehicle emissions from their emissions model called EMFAC. Emission rate data are collected from various sources, such as individual vehicles in a laboratory setting, tunnel studies and certification data, etc. Vehicle activity data are obtained from regional planning agencies, such as SCAG. The EMFAC model calculates exhaust and evaporative emission rates by vehicle type for different temperatures, operating speeds and relative humidity. Temperature and humidity profiles are used to produce month specific, annual average and episodic inventories. Parameters accounted for by EMFAC include the following: type of control technology and fuel usage, distribution of operating speeds, speed and temperature correction factors, and the reduction in emissions resulting from the state's motor vehicle regulatory programs. Their emissions models are periodically reviewed and updated. CARB released the latest emissions model (EMFAC2002) in September 2002 to be used for the development of motor vehicle emissions inventory. EMFAC2002 includes (1) 13 vehicle classes ; (2) two fuel types; (3) three technology groups; (4) 60 calendar years; (5) two exhaust processes; (6) four evaporative processes; (7) seven pollutants; and, (8) fuel consumption.

For planning purposes, emissions from on-road motor vehicles are estimated at grid level, by using Caltrans' Direct Travel Impact Model (DTIM). DTIM calculates emissions based on detailed information regarding each link (roadway segment) in an area for each hour of the day. The required inputs of the model include traffic volume, traffic speed, vehicle fleet characteristics, and ambient temperature. DTIM provides the detailed emission inputs needed by photochemical grid models such as Urban Airshed Model (UAM). DTIM4 has been recently updated to incorporate CARB's EMFAC2002.

CARB's EMFAC7G model was used in the 1997 AQMP. CARB's updated EMFAC 2002 model is used in the 2003 AQMP. Between these two models, CARB released two other EMFAC models; they are EMFAC2001 version 2.02 and EMFAC2001 version 2.08. Major improvements from EMFAC7G to EMFAC2002, in addition to updating all the existing factors from the most current adopted rules and available data and items mentioned previously (13 vehicle classes, two exhaust processes, four evaporative processes, sixty calendar years, etc.) included updated information on unregistered vehicle estimates; updated Inspection/Maintenance benefit estimates; updated idle emission rates; extended idle for heavy-duty trucks; adding EVII and Tier II programs; and adding air conditioning correction factors. A detailed description of EMFAC2002 is available at CARB's website. (www.arb.ca.gov/msei/msei.htm) EMFAC2002 results indicate that EMFAC7G substantially underestimated the on-road mobile source emissions. Figure 3.1-3 provides a comparison of the 1997 on-road annual average emissions (tons/day) by pollutant between EMFAC7G and EMFAC2002.

Off-Road Mobile Sources

All mobile sources not included in the on-road mobile source inventory are considered "off-road" mobile sources including aircraft, ships, commercial boats, recreational vehicles, construction equipment, etc. Currently, all off-road categories except ships, aircraft, locomotives, and recreational vehicles are being estimated from the CARB OFF-ROAD model. The 2003 AQMP is the first time the CARB OFF-ROAD model is used to estimate off-road emissions in an AQMP. This model calculates emissions from more than one hundred equipment types. The OFF-ROAD model incorporates various aspects of off-road elements, such as the effects of various adopted regulations, technology types, and seasonal conditions on emissions. The model combines population, activity, horsepower, load factors, emission factors, and control factors to yield the annual equipment emissions by county, air basin or state. The spatial and temporal features have also been incorporated to estimate the seasonal emissions. The improvements from the OFF-ROAD model versus the methodology used before include: (1) More equipment types, horsepower groups and fuel types are categorized; (2) Average maximum horsepower, load factor and usage estimates are updated based on recent available data; (3) Equipment population in any given calendar year is distributed by age; and (4) All the adopted regulations related to emission reductions are reflected in the emission calculations.

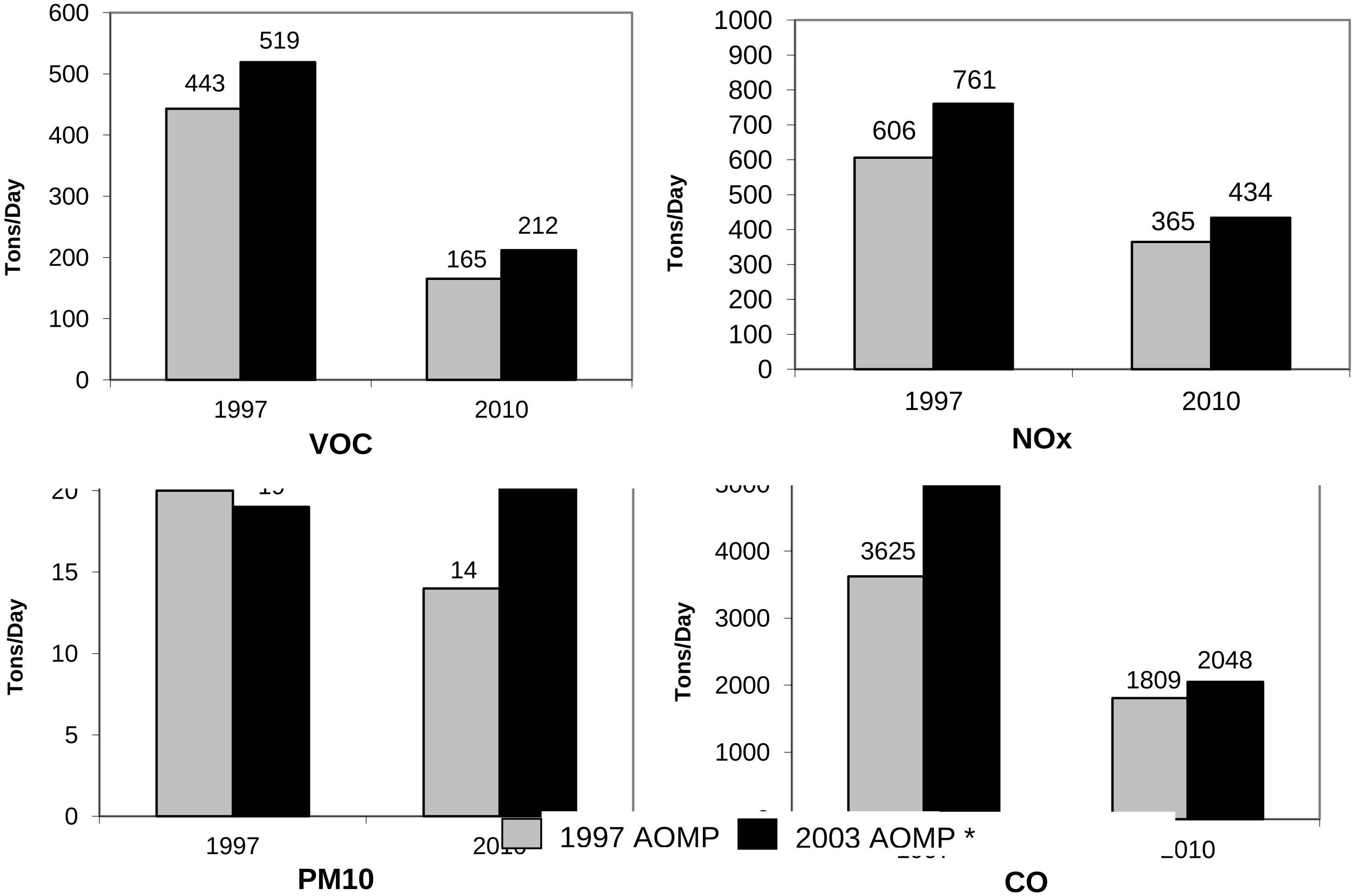

FIGURE 3.1-3

Comparison of 1997 and 2010 Baseline Emissions Between EMFAC7G and EMFAC2002

* Year 2010 inventories incorporated rules adopted since the release of EMFAC7G

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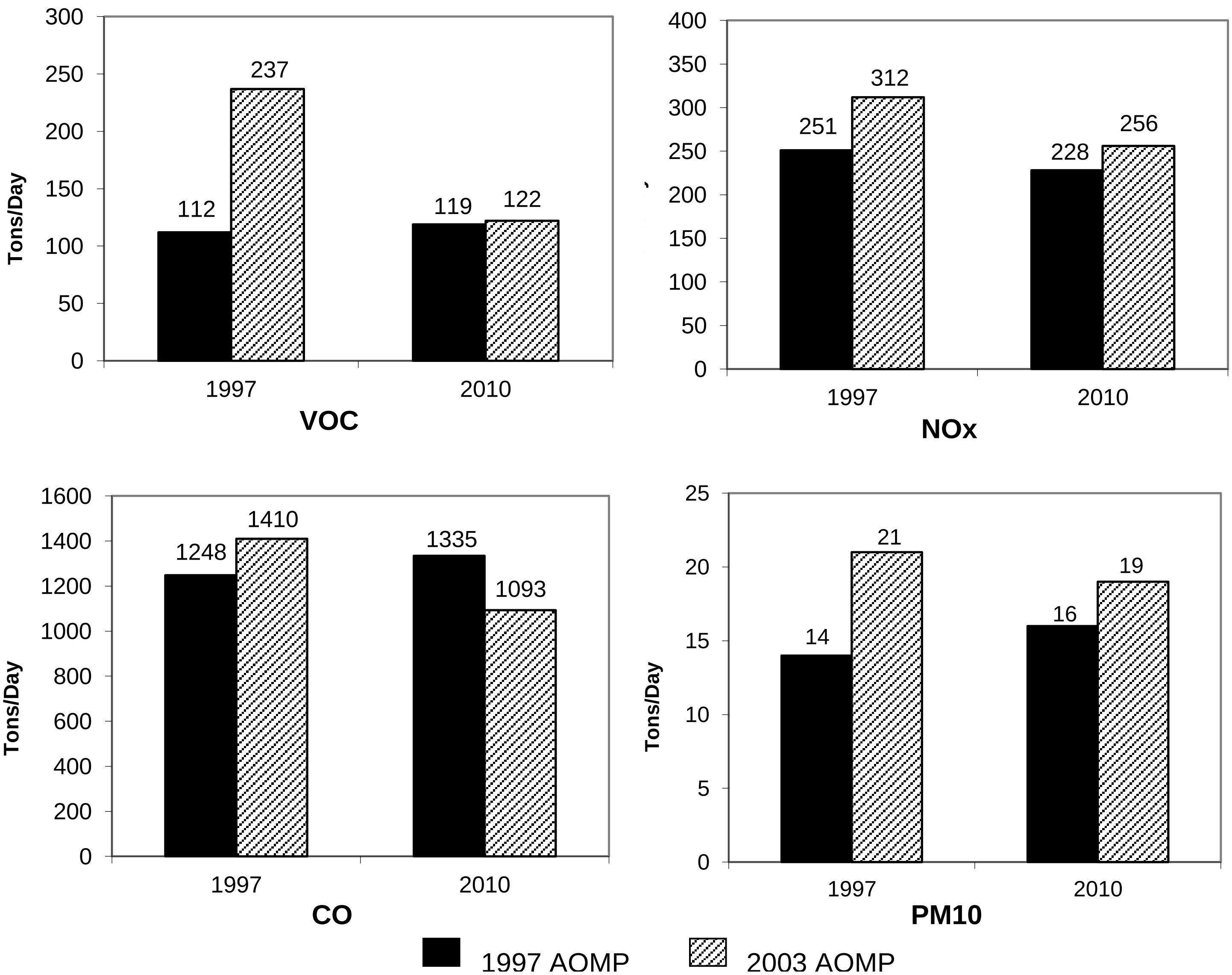


FIGURE 3.1-4

Comparison of Off-Road Baseline Emissions Between 1997 AQMP and 2003 AQMP (OFF-ROAD model) (Annual Average Emissions)

These features make the OFF-ROAD model more accurate in its depiction of emissions. Off-road emissions can be found at CARB's website. (www.arb.ca.gov/msei/off-road/off-road.thm) Continuous effort is being made to improve the off-road mobile source emissions. Figure 3.1-4 illustrates the comparison of emissions presented in the 1997 AQMP and 2003 AQMP.

3.1.1.3 Base Year Emissions

The amount of each of the major pollutants emitted into the atmosphere of the Basin in 1997 is shown in Figure 3.1-5. In 1997, approximately 6653 tons per day of CO; 1204 tons per day of NOx, reported as NO_2; 1172 tons per day of VOC; 58 tons per day of SOx, reported as SO_2; 279 tons per day of directly emitted PM10; 104 tons per day of finer particulate (PM2.5), and 517 tons per day of TSP were emitted into the Basin's atmosphere each day. (Additional PM10 forms by chemical reaction of the gaseous pollutants.) 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.

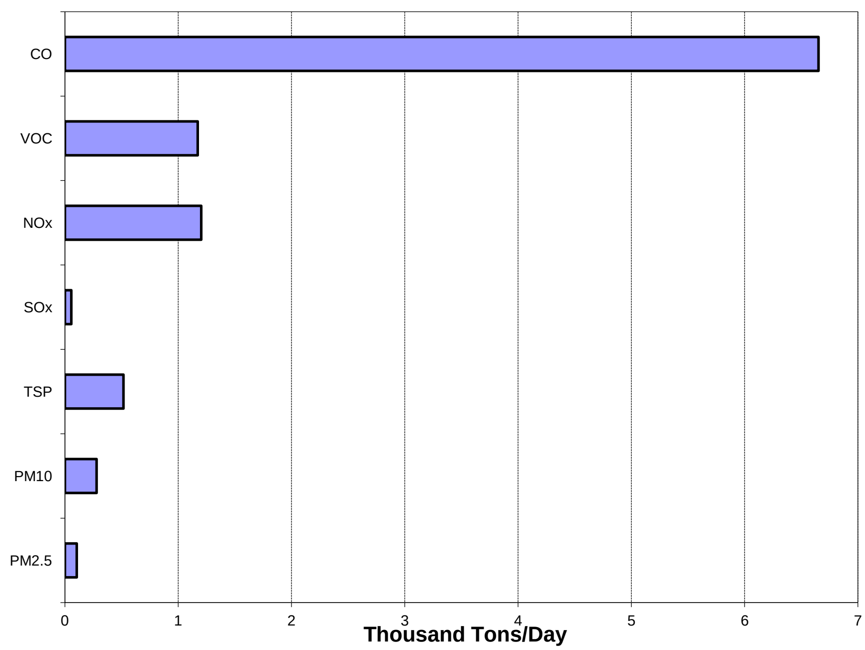


FIGURE 3.1-5

1997 Average Daily Emissions in the Basin

Improvement in inventory methodology has resulted in a significant increase in on-road and off-road emissions estimates as compared to the 1997/1999 SIP. The latest emissions projections for 2010 do not reflect actual emission increases, but rather updated and improved inventory methodologies. Revisions to CARB's on-road emission factor model, for example, have resulted in significantly higher past, present and future estimates of emissions from cars and trucks. However, the trend in emissions over time continues to show a dramatic decline due to cleaner engines and fuels.

Figures 3.1-6 provides the relative contribution by source category for the 2010 emission inventory for VOC and NOx (i.e., ozone precursors). Figure 3.1-7A provides the relative contribution by source category to the 2006 emissions inventory for primary (directly emitted) PM10 and PM2.5. Figure 3.1-7B shows the relative contribution by pollutant species to ambient PM10 and PM2.5 concentrations which demonstrates that secondary species (e.g., nitrates, sulfates, ammonium and organic carbon) play a significant role in the formation of ambient PM2.5, whereas directly-emitted PM10 (e.g. fugitive dust) is the single largest contributor to ambient PM10. Figure 3.1-8 provides the relative contribution by responsible agency (CARB, U.S. EPA, and SCAQMD) for 2010 VOC and NOx emissions inventory and 2006 PM10 emissions inventory.

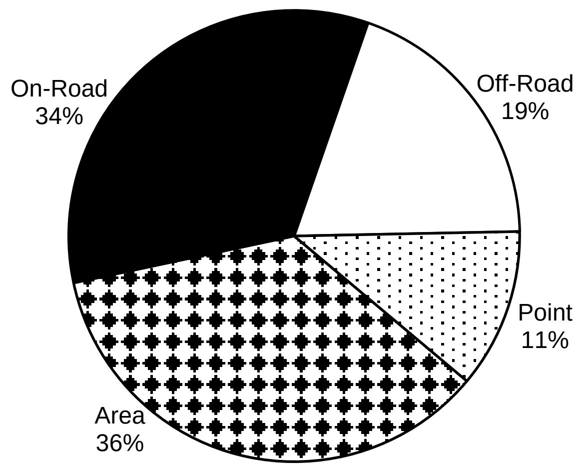
Figures 3.1-9 and 3.1-10 compare the emission reduction commitment by agency in the 1997/1999 SIP; and the 2003 AQMP baseline emission inventory by agency in 2010 for VOC and NOx and in 2006 for PM10. SCAQMD has jurisdiction over stationary and area sources except for consumer products and pesticide applications. CARB is responsible for most mobile sources and consumer products. Federal sources include 49-state vehicles, North American Free Trade Agreement (NAFTA) vehicles, ships, trains, aircraft, and new off-road farm and construction equipment less than 175 horsepower. SCAG is responsible for adopting the Regional Transportation Improvement Plan that includes growth assumptions and transportation improvement projects that could have significant air quality impacts.

3.1.1.4 Comparison to Other U.S. Areas

The severe air pollution problem in the District 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. Sunshine drives the photochemical reactions, which form pollutants such as ozone.

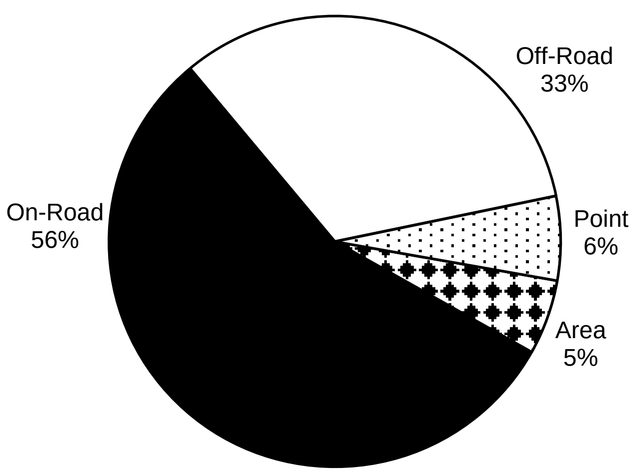
In 2001, the federal one-hour standard for ozone was exceeded on 10 percent of all days at one or more District locations. The federal PM10 24-hour standard was exceeded in a few areas in 2001. No exceedances of standards for CO, NO_2, SO_2, sulfates, or lead occurred in 2001.

Despite the significant downward trend, the District still has some of the worst air quality in the nation in terms of the annual number of days exceeding the federal standards and maximum levels. In 2001, the highest U.S. location in terms of number of days over the federal ozone standard was located in the Basin (Central San Bernardino Mountains, 26 days). Figure 3.1-11 shows the comparison of maximum levels as a percentage of the federal standard for various U.S. Cities.



VOC Emissions: 630 Tons/Day

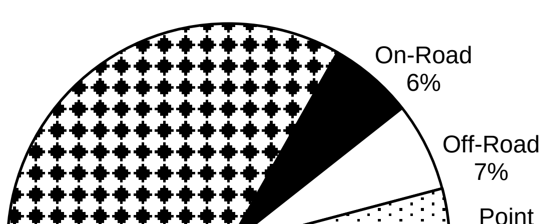
Note: Of the total area source VOC emissions inventory, consumer products represent 108 tons (or 47 percent) per day of emissions which are under CARB's jurisdiction. Also, the 2010 baseline reflects the emission reductions associated with the 2001 RTP.

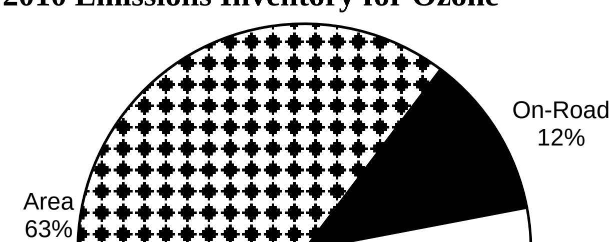


NOx Emissions: 780 Tons/Day

FIGURE 3.1-6

Relative Contribution by Source Category to 2010 Emissions Inventory for Ozone

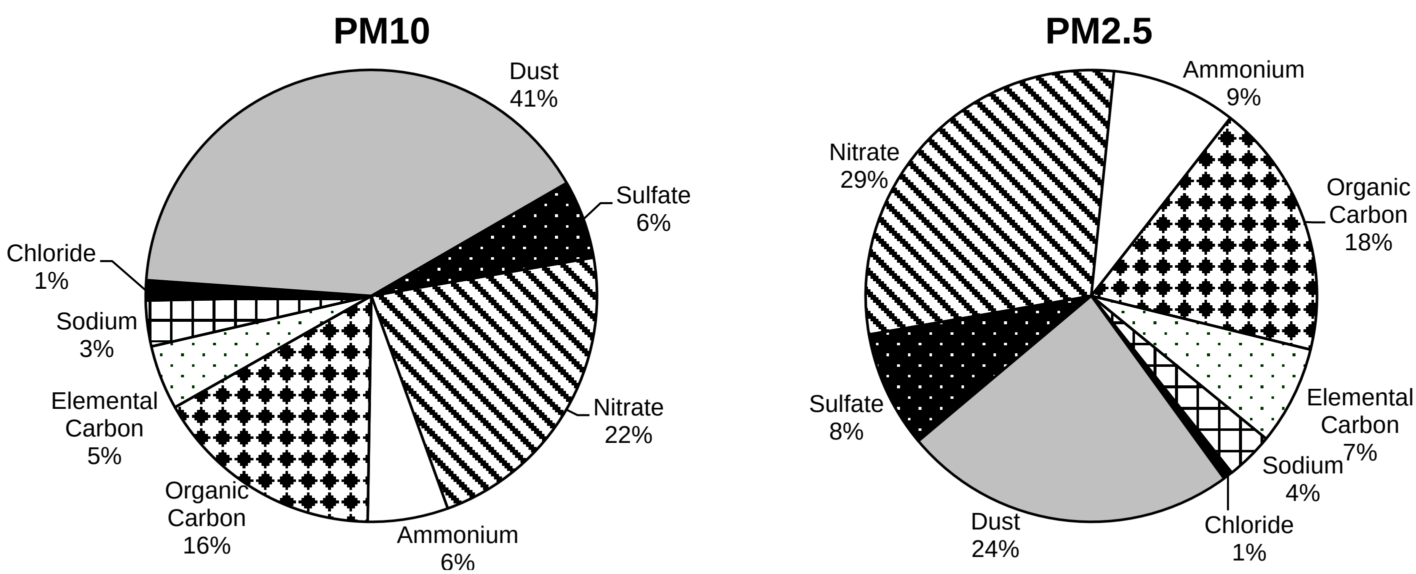




Note: 85 percent of area source PM10 emissions (i.e., 207 tons per day of PM10) and 54 percent of area source PM2.5 emissions (i.e., 38 tons per day of PM2.5) are associated with fugitive dust sources.

FIGURE 3.1-7A

Relative Contribution by Source Category to 2006 Emissions Inventory for Directly Emitted PM10 and PM2.5



Note: Sulfate from SOx (combustion); Nitrate from NOx (combustion); Ammonium from ammonia; Organic Carbon from combustion or formed in atmosphere; Elemental Carbon from combustion, especially diesel; Sodium and Chloride from ocean; Dust from fugitive dust.

FIGURE 3.1-7B

Relative Contribution by Pollutant Species - PM10 and PM2.5 (Annual Average - Rubidoux)

Houston had a slightly higher maximum concentration of ozone than the Basin, which was second with the maximum ozone concentration level at approximately 58 percent greater than the national ambient air quality standard. Philadelphia, New York, and Washington, D.C. also exceeded the standard, but at much smaller percentages. Houston and the Basin are both abundant sunshine areas, which provide favorable conditions for ozone formation.

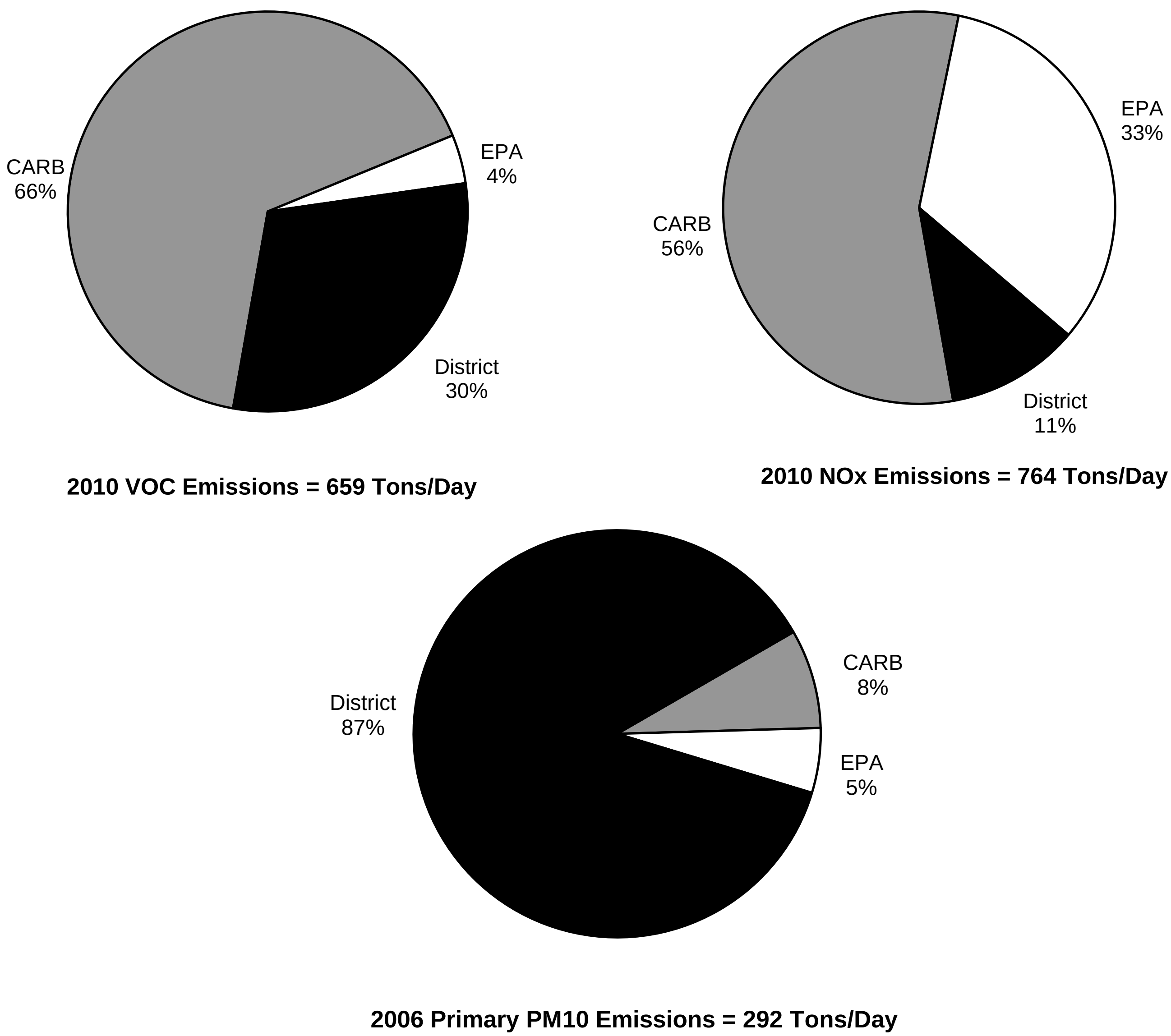
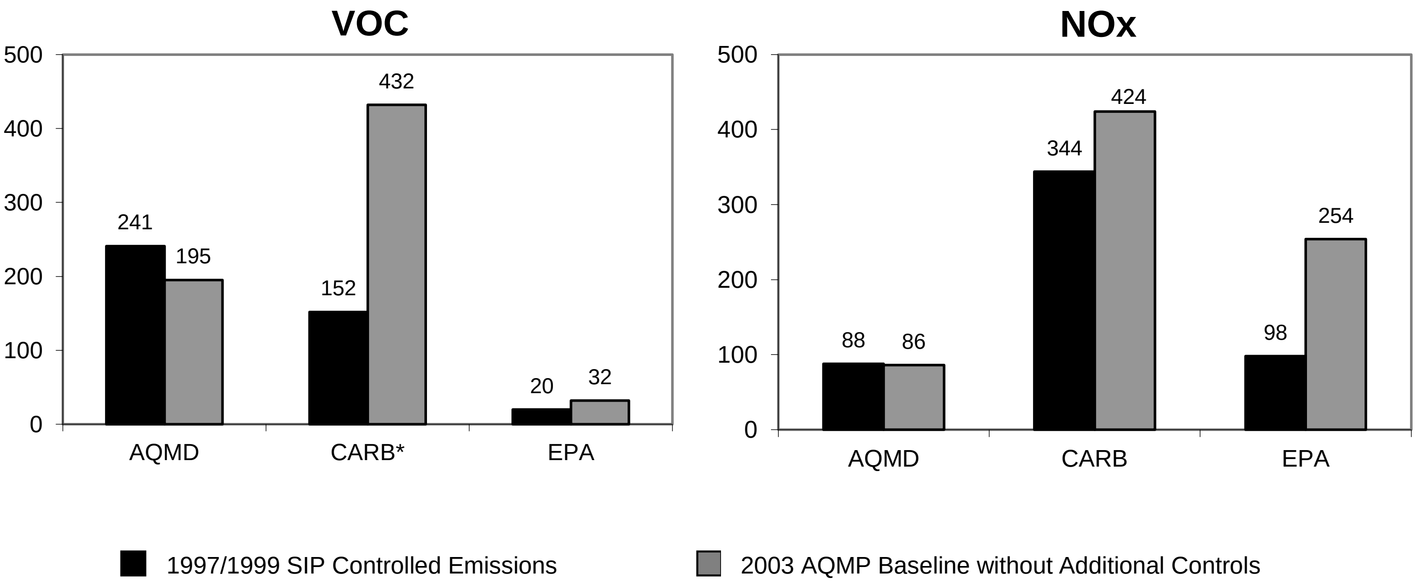


FIGURE 3.1-8

Relative Contribution by Agency to 2010 VOC and NOx and 2006 Directly Emitted PM10 Emission Inventory



* The 1997/1999 SIP controlled emissions and the 2003 AQMP baseline for CARB reflect the emission reductions associated with implementation of SCAG's transportation control measures (i.e., 17 tons per day of VOC in 1997/1999 SIP and approximately 4 tons per day of VOC in 2003 AQMP baseline).

FIGURE 3.1-9

Comparison of the 1997/99 SIP Commitment with the 2003 AQMP Baseline by Agency - 2010

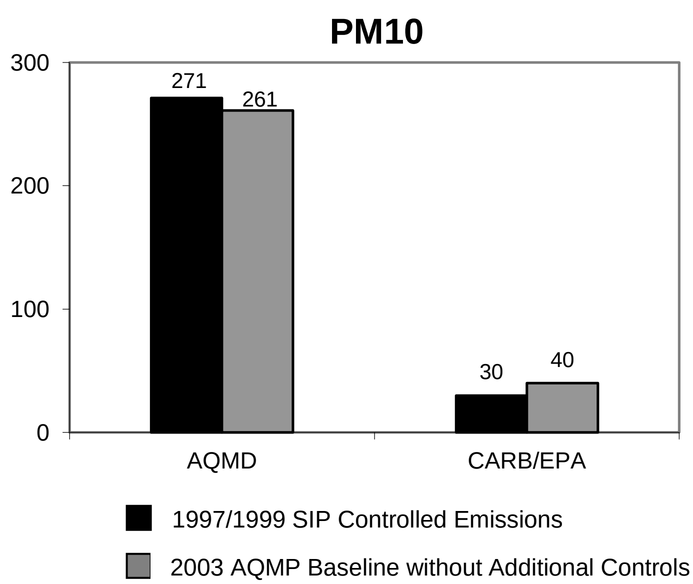


FIGURE 3.1-10

Comparison of the 1997/99 SIP Commitment with the 2003 AQMP Baseline by Agency – 2006

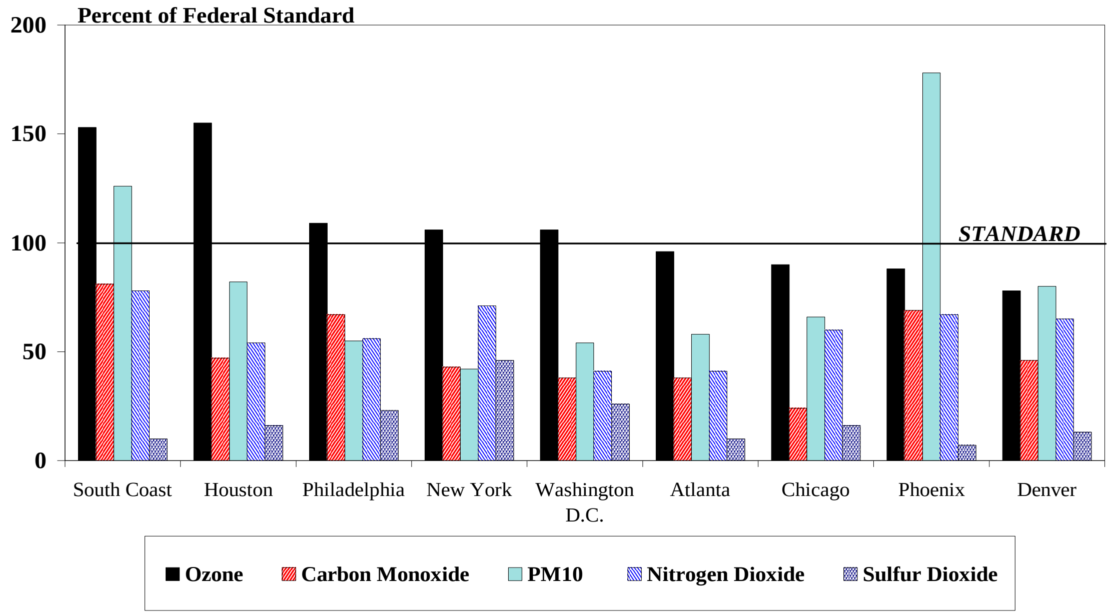


FIGURE 3.1-11

South Coast Air Basin Air Quality in 2001 Compared to Other U.S. Cities

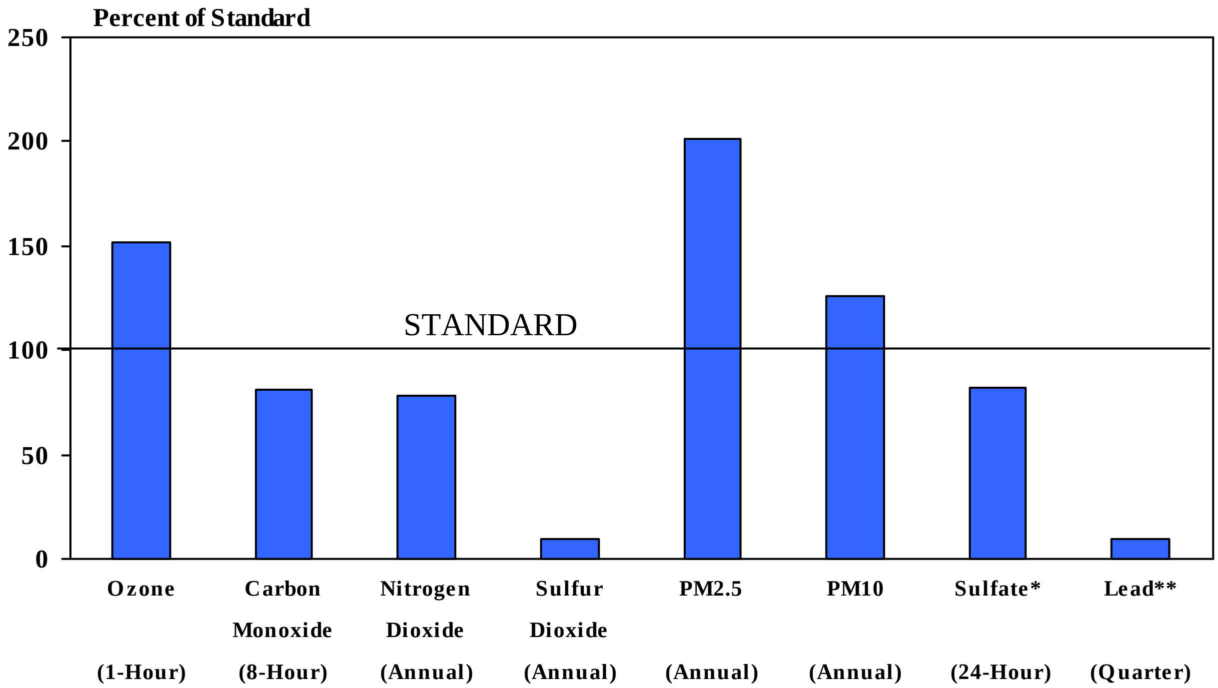
The federal maximum concentration standard for PM10 was exceeded in the Basin by approximately 25 percent. The Basin is second to Phoenix which has an exceedance of approximately 80 percent greater than the federal standard. No other city exceeded the PM10 standard in 2001.

The federal standards for CO, NO_2, and SO_2 were not exceeded by any of the cities in the U.S. in 2001. The maximum concentration levels of CO and NO_2 in the Basin are the highest in the U.S. New York has the highest SO_2 maximum concentration level, while the Basin has almost the lowest maximum level.

3.1.2 CURRENT AIR QUALITY

In 2001, the SCAQMD monitored ambient air quality for criteria pollutants (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matters, lead and sulfate) at 32 locations in the Basin and in the neighboring areas of the SSAB that are within the District's jurisdiction. Pollutant concentrations exceeded federal and/or state standard(s) for ozone and particulate matters (PM10 and PM2.5). Figure 3.1-12 shows the maximum pollutant concentrations for 2001 as a percentage of the federal standards.

Maximum 1-hour average ozone concentration in 2001 (0.190 ppm) was 152 percent of the federal one-hour standard .The average PM10 concentration (63.1 $\mu g/m^3$) was 125 percent of the federal annual standard. The annual average PM2.5 concentration (31.1 µg/m^3) was 201 percent of the federal annual standard. The CO concentration did not exceed the standards in 2001. The highest 8-hour average CO concentration of the year (7.71 ppm) was 81 percent of the federal standard.



* There is no federal standard for sulfate.
** Higher measurements were recorded at special monitoring sites immediately adjacent to sources.

FIGURE 3.1-12

2001 Maximum Pollutant Concentrations as Percent of Federal Standards

In 2001, the annual average federal NO_2 standard was not exceeded, with a maximum concentration (0.0419 ppm) which was 78 percent of the federal standard. The maximum 24-hour sulfate concentration (20.6 µg/m^3) was 82 percent of the state standard. (There is no federal sulfate standard.) The SO_2 and lead concentrations continued to remain well below the federal and state standards in 2001.

In 2001, the SCAB locations exceeded one or more of the federal standards on 37 days (excluding PM2.5 exceedances).

The maximum pollutant concentrations recorded at SCAQMD monitoring stations in 2001 (see Figure 3.1-12) were all recorded in the densely populated South Coast Air Basin. However, air quality in the Basin varies widely by season and by area.

The prevailing daytime sea breeze tends to transport pollutants from coastal areas into the Basin's inland valleys, and from there, still further inland into neighboring areas of SSAB of the District as well as the MDAB. Concentrations of primary pollutants (those emitted directly into the air) are typically highest close to the sources that emit them. However, secondary pollutants (those formed in the air by chemical reaction of precursors) reach maximum concentrations some distance downwind of the sources that emit the precursors, due to the fact that the polluted air mass is moved inland many miles by the prevailing winds before maximum concentrations are reached.

The air quality in the Basin varies with season due to seasonal differences in the weather. In Figure 3.1-13, the number of days exceeding federal standards for each criteria pollutant is shown for each month of 2001. All of the ozone exceedances occurred during the May to October "smog season." The PM10 and PM2.5 standards are exceeded at times throughout the year and do not have a clear pattern like ozone and carbon monoxide. The PM2.5 exceedances, however, typically occur more frequently during late fall and early winter months. The standards were exceeded on a total of 54 days in 2001 (37 days excluding PM2.5).

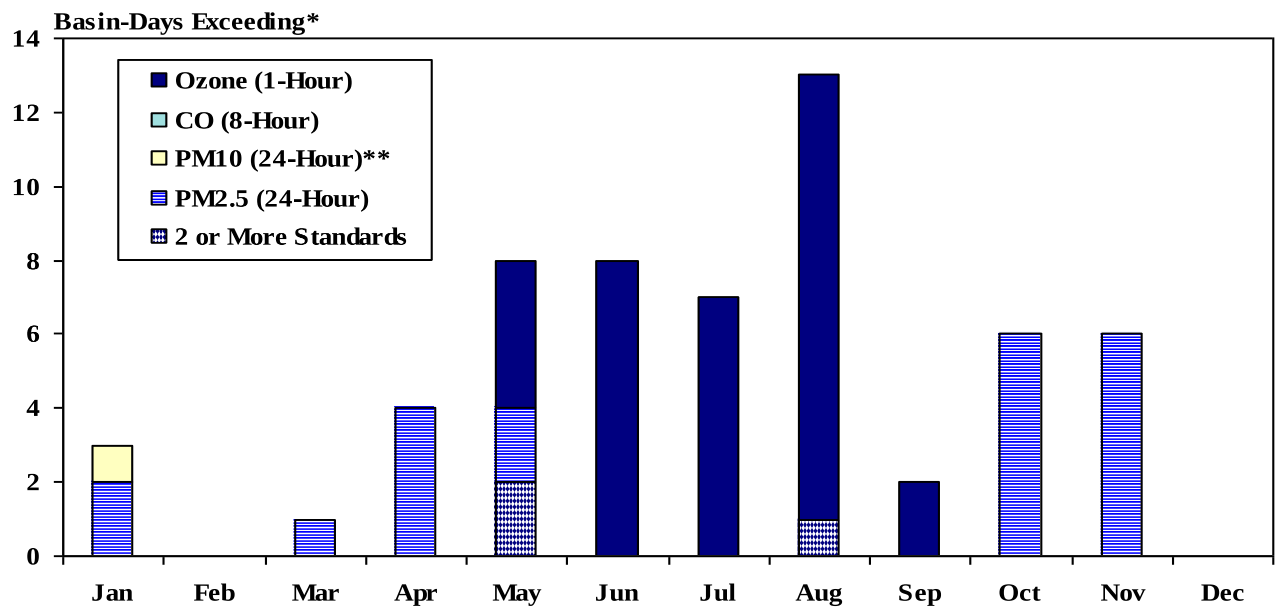


FIGURE 3.1-13

Monthly Number of Days Exceeding Federal Standards in 2001

3.1.2.1 Ozone

<u>Health Effects</u>

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. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are sensitive to ozone at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

Air Quality

In 2001, the SCAQMD measured ozone concentrations at 28 regular ambient monitoring locations. The maximum 1-hour average and 8-hour ozone concentrations in the Basin in 2001 (0.190 ppm and 0.144) were 152 percent and 169 percent of the federal 1-hour and 8-hour standards, respectively, and 190 percent of the state standard. The federal 1-hour ozone standard was exceeded at one or more Basin locations on a total of 36 days, the 8-hour standard was exceeded on 100 days. The California state standard was exceeded on 121 days, and the health advisory level on 15 days. The stage 1 episode level was not exceeded anywhere in the Basin for the third consecutive year.

Figure 3.1-14 is a contour diagram of the number of days exceeding the 1-hour federal ozone standard in different areas of the Basin in 2001. The standard was exceeded most frequently in the Basin's Central San Bernardino Mountains and adjacent valleys. The coastal areas of Los Angeles and Orange counties and areas near the boundary between the Basin and San Diego county did not exceed the 1-hour federal ozone standard.

The more stringent state standard was exceeded almost everywhere in the Basin with the greatest number of exceedances occurring in the Central San Bernardino Mountains and adjacent valleys (not shown).

A decade ago, only the coastal areas of the Basin did not record exceedances of the stage 1 episode level (1-hour average O_3 greater than or equal to 0.20 ppm). In 2001, stage 1 episodes were not recorded anywhere in the Basin. In addition, there have been no exceedances of the stage 2 episode level (1-hour average O_3 greater than or equal to 0.35 ppm) since 1988 and the stage 3 episode level (1-hour average O_3 greater than or equal to 0.50 ppm) has not been exceeded since 1974.

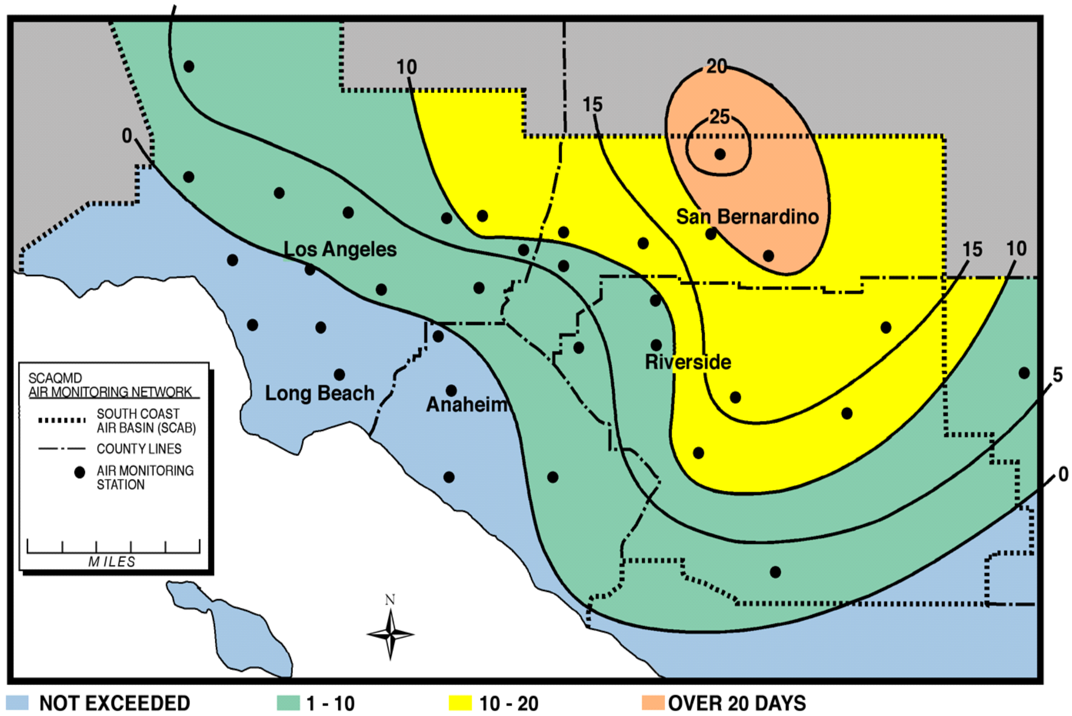


FIGURE 3.1-14

OZONE – 2001
Number of Days Exceeding 1-Hour Federal Standard
(1-hour average ozone > 0.12 ppm)

Figure 3.1-15 shows the number of days exceeding the 8-hour federal standard in the Basin in 2001. The 8-hour federal ozone standard was also exceeded most frequently in the Basin's Central San Bernardino Mountains and adjacent areas. The federal standards were not exceeded in the coastal areas. Additional analysis of the ozone monitoring data is presented in Appendix II of the 2003 AQMP.

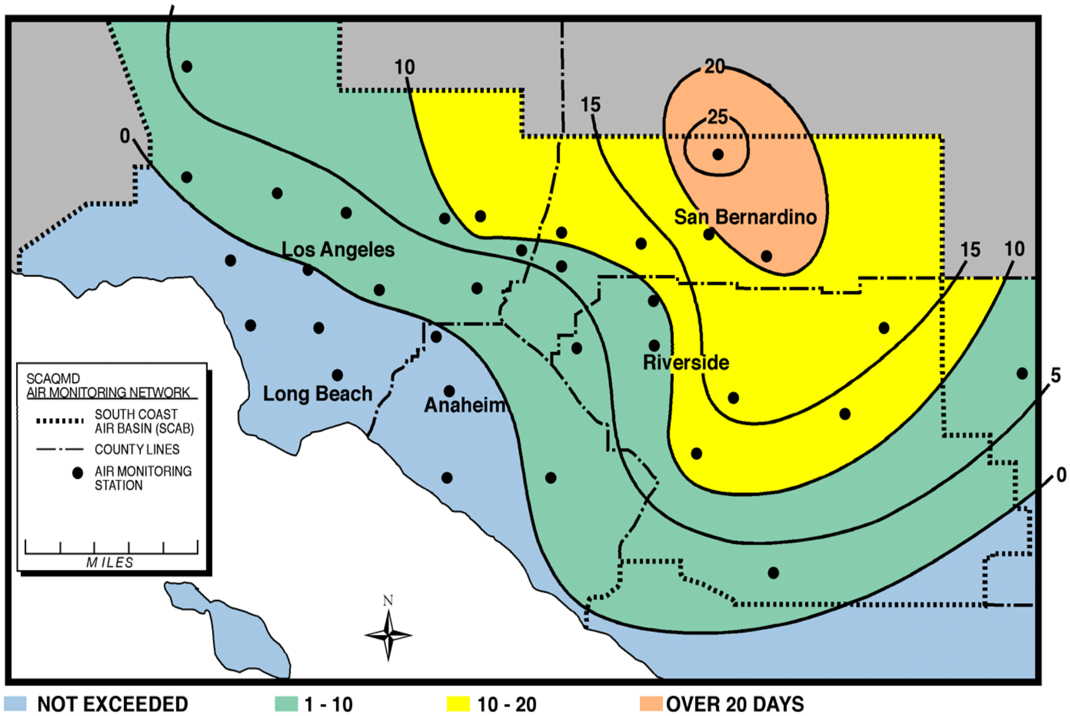


Figure 3.1-15

OZONE – 2001
Number of Days Exceeding 8-Hour Federal Standard
(8-hour average ozone > 0.08 ppm)

3.1.2.2 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 1997, 97 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.

When carbon monoxide is inhaled in sufficient concentration, it can displace oxygen and bind with the hemoglobin in the blood, reducing the capacity of the blood to carry oxygen. Individuals most at risk from the effects of CO include heart patients, fetuses (unborn babies), smokers, and people who exercise heavily. Normal healthy individuals are affected at higher concentrations, which may cause impairment of manual dexterity, vision, learning ability, and performance of work. The results of studies concerning the combined effects of CO and other pollutants in animals have shown a synergistic effect after exposure to CO and ozone.

Air Quality

The SCAQMD currently monitors carbon monoxide air quality at 23 of its 32 air monitoring stations. The highest CO concentrations are found in coastal and central Los Angeles county. The highest 8-hour average CO concentration in 2001 (7.71 ppm) was recorded in South Central Los Angeles county and was 81 percent of the federal standard and 85 percent of the state standard. This was the lowest maximum concentration recorded in the Basin since carbon monoxide monitoring began in this region. The highest one-hour average concentration in 2001 (12.0 ppm) was 33 percent of the federal and 57 percent of the state one-hour standards. Concentrations in the less urbanized areas of the Basin and in the SSAB were well below the standards.

In 2001, for the first time since monitoring began, carbon monoxide standards were not exceeded anywhere in the Basin. The Basin, however, continued to rank in the nation among the locations with the highest carbon monoxide concentrations. Highest concentrations were recorded in Los Angeles County areas, in the areas of South Central Los Angeles County and West San Fernando Valley. There have been no exceedances of the stage 1 episode (federal alert) level (eight-hour average CO greater than or equal to 15 ppm) since 1994.

Figure 3.1-16 shows maximum eight-hour concentration of CO in the Basin in 2001. The federal standards were not exceeded in the coastal areas. Additional CO data analyses are presented in Appendix II of the 2003 AQMP.

3.1.2.3 Particulate Matter (PM10)

Health Effects

Of greatest 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

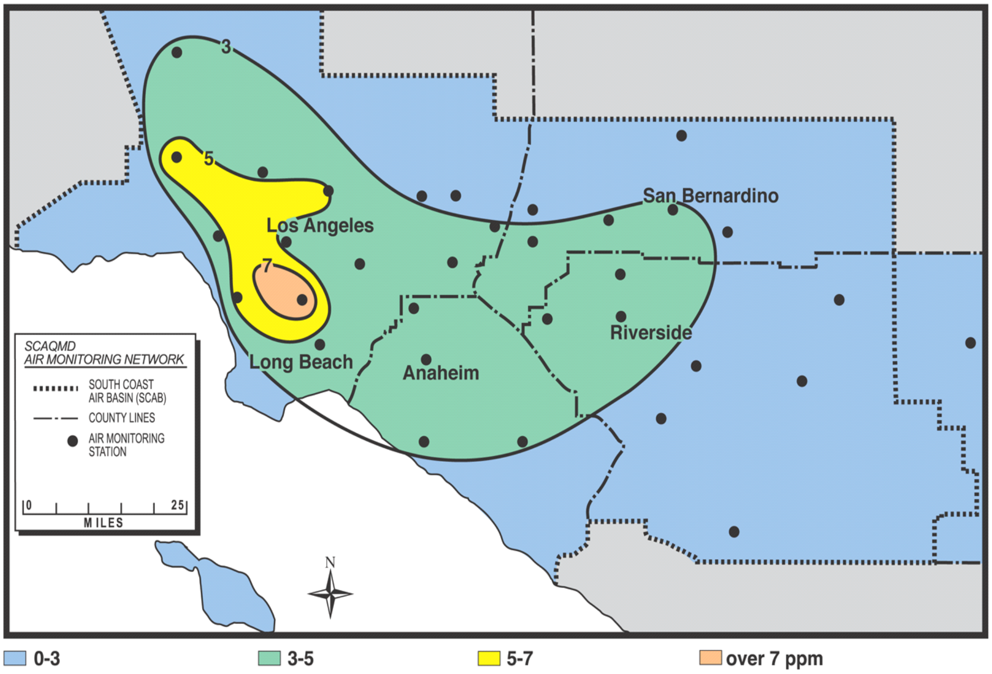


FIGURE 3.1-16

CARBON MONOXIDE – 2001
Maximum 8-Hour Average Concentration (ppm)

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.

PM10 particles are both directly emitted or formed from diverse emission sources. Major sources of directly emitted (primary) PM10 include re-suspended road dust or soil entrained into the atmosphere by wind or activities such as construction and agriculture. Other components of PM10 form in the atmosphere (secondary PM10) from precursor emissions of the gaseous pollutants.

In 2001, the SCAQMD measured PM10 concentrations at 18 locations. At the seven locations where both PM10 and TSP were monitored, PM10 averaged 50 to 76 percent of TSP. PM10 samples are routinely analyzed for sulfate and nitrate, and in 2001 sulfates constituted an average of 7 to 18 percent of PM10, and nitrates constituted 4 to 18 percent of PM10.

An intensive study of PM10 was conducted at six locations in 1995, using special samplers designed to allow detailed chemical analyses of PM10. The study sites included five Basin locations in Central Orange County (CEOC), Central Los Angeles County (CELA), Pomona/Walnut Valley (PWV), Central San Bernardino Valley (CSBV), and Metropolitan Riverside County (MRIV) areas and one remote area in San Nicolas Island (SANI).

Figure 3.1-17 shows the average amounts of sulfate ($SO_4^{=}$), nitrate (NO_3^-), ammonium (NH_4^+), organic carbon (OC), elemental carbon (EC), sodium (Na^+), chloride (Cl^-), and other materials such as soil components in the PM10 samples which were collected during 1995. Sulfates, nitrates, and organic carbon are typically formed in the air by reaction of gaseous precursors such as NOx, SOx, VOC, and ammonia, which are emitted by a variety of sources. Soil-related materials tend to be larger particles which are suspended in the air by human activity or by wind.

San Nicolas Island, 80 miles offshore and remote from the Basin's urban areas, recorded a very low average PM10 concentration (18 µg/m^3), which contained a relatively large fraction of Na^+ and Cl^- (25 percent of the PM10). The relatively high Na^+ and Cl^- is due to the influx of sea salt from the surrounding ocean. The concentrations of, and in most cases percentages of, the other components (NH_4^+, NO_3^-, $SO_4^=$, OC, EC, crustal material) were low compared to mainland Basin sites.

PM10 annual concentrations measured at the five Basin locations recorded PM10 concentrations from 42 µg/m^3 to 78 µg/m^3. These Basin sites contain relatively high proportions of sulfates (6 to 11 percent), nitrates (22 to 26 percent), organic carbon (15 to 20 percent), and elemental carbon (5 to 8 percent). These materials derive from stationary or mobile sources of pollution in the Basin. The amount of soil-related material in the air is also greater (17 percent to 31 percent), due to suspension of soil in the air by human activities such as re-entrainment of road dust and construction dust.

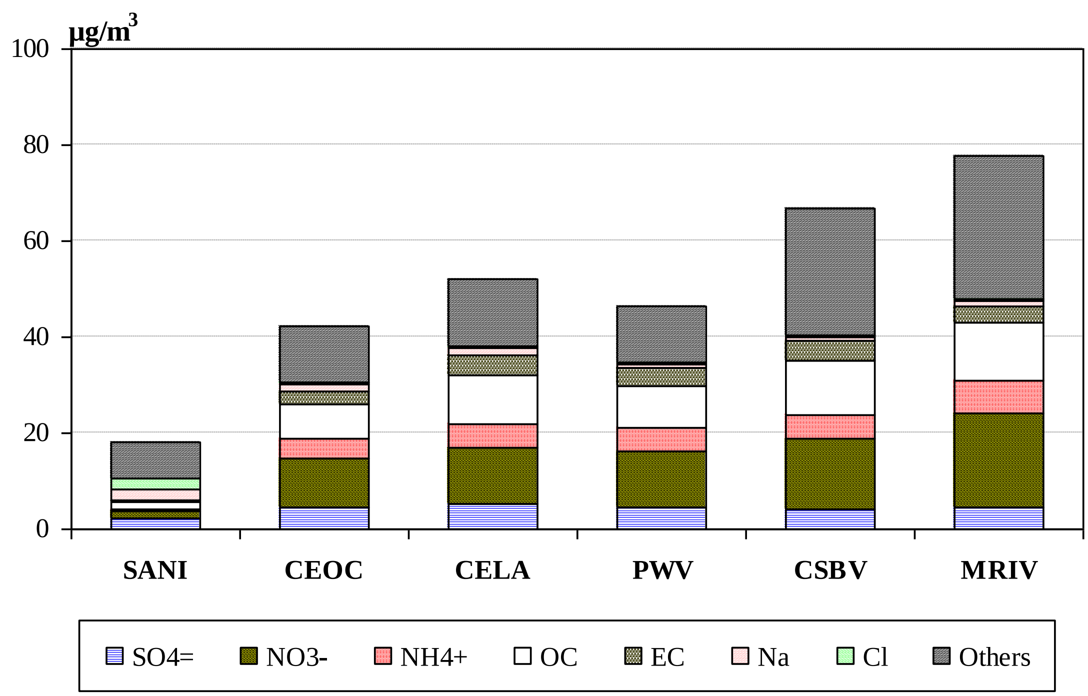


FIGURE 3.1-17

Chemical Composition of PM10, 1995

<u>Air Quality</u>

In 2001, the SCAQMD measured PM10 concentrations at 18 locations throughout the South Coast and SSAB. Figure 3.1-18 shows for 2001 the annual average (arithmetic mean) PM10 concentrations in the Basin. The area which exceeded the federal standard (inside the dashed line) is limited to the areas of Riverside and San Bernardino counties close to Metropolitan Riverside County. The maximum annual average recorded (63.1 µg/m^3 in the Metropolitan Riverside County area) was 125 percent of the federal standard.

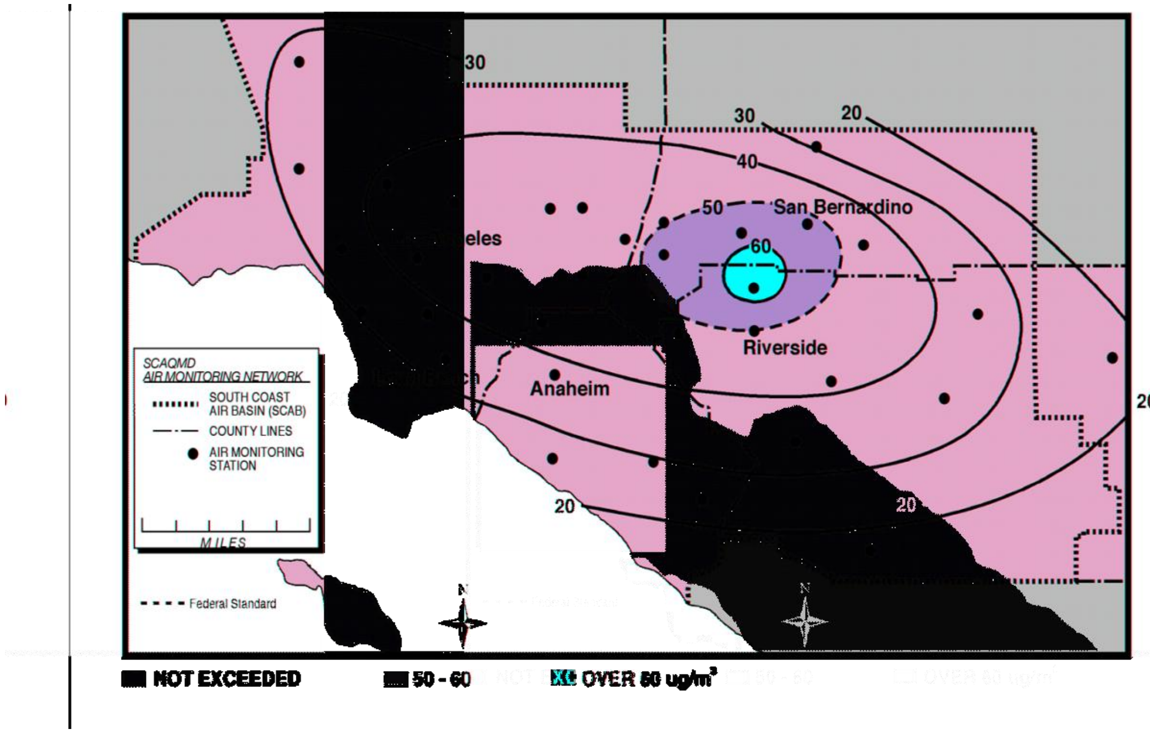


FIGURE 3.1-18

Suspended Particulate Matter (PM10) – 2001
Annual Arithmetic Mean, µg/m^3

The federal 24-hour standard was exceeded at two Basin locations in the inland valley areas 2001 (not shown). The maximum 24-hour average concentration (219 µg/m^3 recorded in Metropolitan Riverside County) was 146 percent of the federal 24-hour standard.

The more stringent state annual standard was exceeded in a much larger area than the federal annual standard, with most of the Basin and part of the Riverside County SSAB recording annual average concentrations above the standard. The maximum annual average (annual geometric mean PM10 54.3 µg/m^3, recorded at Metropolitan Riverside County) was 180 percent of the state annual standard.

The state 24-hour PM10 standard was exceeded at all locations monitored in the District. The standard was exceeded most frequently in the Basin's inland valleys, centering in Metropolitan

Riverside County. The maximum 24-hour average was 429 percent of the state 24-hour standard.

Additional analysis of the PM10 monitoring data is presented in Appendix II of the 2003 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, which are a component of PM10.

NO_2 is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

Air Quality

In 2001, the SCAQMD monitored nitrogen dioxide concentrations at 23 locations. Federal and state standards for nitrogen dioxide were not exceeded at any location. The federal standard has not been exceeded in the Basin since 1991.

Table 3.1-5 shows the 2001 maximum annual average nitrogen dioxide concentrations by basin and county. The maximum annual average nitrogen dioxide concentration (0.0419 ppm recorded in the East San Fernando Valley area of Los Angeles County) was 78 percent of the federal standard. Concentrations in the downwind SSAB areas were much lower. The maximum 1-hour average concentration in the Basin (0.25 ppm in East San Fernando Valley) was 96 percent of the state standard.

Additional NO_2 data analyses are provided in Appendix II of the 2003 AQMP.

Though the state and federal standards were not exceeded in 2001, NO_2 is still a concern since it is a precursor to both ozone and particulate matter. Further control of NOx will be required to attain the ozone and particulate matter standards.

TABLE 3.1-5

2001 Maximum Annual Average Nitrogen Dioxide Concentrations(1)

Basin/ County	Maximum Annual Average ppm	Percent Federal Standard	Area
South Coast Air Quality Basin			
Los Angeles	0.0419	78%	East San Fernando Valley
Orange	0.0293	55%	Central Orange County
Riverside	0.0247	46%	Metropolitan Riverside County
San Bernardino	0.0384	72%	Northwest San Bernardino Valley
Salton Sea Air Basin			
Riverside	0.0175	33%	Coachella Valley

(1) Federal standard = 0.0535 ppm

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 a component of PM10 and PM2.5. Most of the SO_2 emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO_2 affects breathing and the lungs' defenses, and can aggravate respiratory and cardiovascular diseases. Asthmatics and people with chronic lung disease or cardiovascular disease are most sensitive to its effects. SO_2 also causes plant damage, damage to materials, and acidification of lakes and streams.

Air Quality

In 2001, SO_2 was measured at seven Basin locations. No violations of federal or state standards occurred. The federal standards were last exceeded in the 1960's and the state standard was last exceeded in 1990.

The maximum 24-hour average SO_2 concentrations recorded in the District in 2001 are shown in Table 3.1-6. The highest 24-hour average SO_2 concentration (0.012 ppm in South and Southwest Coastal Los Angeles county areas) was eight percent of the federal 24-hour standard. The highest one-hour average (0.05 ppm in South Coastal Los Angeles county) was 19 percent of the state standard. The maximum annual average concentration (0.0041 ppm in the Southwest Coastal Los Angeles county area) was 13 percent of the federal standard.

TABLE 3.1-6

2001 Maximum 24-Hour Average Sulfur Dioxide Concentrations(1)

Basin/ County	Maximum 24-Hour Average ppm	Percent Federal Standard	Area
South Coast Air Quality Basin			
Los Angeles	0.012	8%	Southwest Coastal LA Valley
Orange	0.007	5%	North Coastal Orange County
Riverside	0.011	8%	Metropolitan Riverside County
San Bernardino	0.010	7%	Central San Bernardino Valley
Salton Sea Air Basin	ND(2)		

(1) Federal standard = 0.14 ppm
(2) ND = No Data. Historical measurements indicate concentrations are below standard.

Additional data analyses are presented in Appendix II of the 2003 AQMP.

While SO_2 concentrations in the Basin no longer exceed standards, SO_2 is a precursor of PM10 and sulfate.

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 and TSP. 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 give sulfuric acid, which contributes to acid precipitation. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10.

Air Quality

In 2001 sulfate concentrations were measured at 13 Basin locations. Table 3.1-7 shows the 2001 maximum 24-hour average concentrations in the District by Basin and county. The maximum sulfate concentration (20.6 $\mu g/m^3$) recorded in the District was 82 percent of the state standard.

TABLE 3.1-7

2001 Maximum 24-Hour Average Sulfate Concentrations

Basin/ County	**Maximum 24-Hour Average μg/m³**	**Percent Federal Standard**	**Area**
South Coast Air Quality Basin			
Los Angeles	20.6	82%	Southwest Coastal LA County
Orange	ND(1)		
Riverside	10.7	43%	Metropolitan Riverside County
San Bernardino	11.5	46%	Central San Bernardino Valley
Salton Sea Air Basin	ND		

(1) ND = No Data. Historical measurements indicated concentrations are below standard.

Additional sulfate data analyses are presented in Appendix II of the 2003 AQMP.

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. However, lead concentrations in excess of the standards have been recorded since 1990 in very localized areas near stationary sources of lead.

Air Quality

In 2001, lead concentrations were measured at nine Basin air monitoring stations, none of which exceeded the state or federal standards. Table 3.1-8 shows the maximum quarterly average lead concentrations in the District by Basin and county in 2001. The maximum quarterly average lead concentration (0.12 μg/m^3) was eight percent of the federal standard. The maximum monthly average lead concentration (0.23 μg/m^3) was 15 percent of the state standard.

In addition to lead measurements at SCAQMD air monitoring stations, special monitoring was done in the immediate vicinity of several stationary sources of lead. Data from the special monitoring sites showed that higher concentrations were reached in very localized areas near sources, with a maximum quarterly average (0.49 μg/m^3) 32 percent of the federal standard, and a maximum monthly average (0.57 μg/m^3) 38 percent of the state standard.

TABLE 3.1-8

2001 Maximum Quarterly Average Lead Concentrations

Basin/ County	Maximum Qtr. Avg.[1] μg/m^3	Percent Federal Standard	Area
South Coast Air Quality Basin			
Los Angeles	0.12	8%	South Central LA County
Orange	ND[2]		
Riverside	0.03	2%	Metropolitan Riverside County
San Bernardino	0.04	3%	Northwest and Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	ND		

(1) Higher concentration (0.49 μg/m^3) were measure in localized areas near sources.
(2) ND = No Data. Historical measurements indicate concentrations are below standard.

Additional lead data are presented in Appendix II of the 2003 AQMP.

3.1.2.8 Visibility

The results of the visibility analysis for Rubidoux are illustrated in Figure 3.1-19. Without the proposed AQMP control measure, annual average visibility is projected to improve at Rubidoux to approximately 7.9 miles in the year 2010.

With the implementation of all proposed emission controls for 2010, the annual average visibility would improve to over 9 miles at Rubidoux.

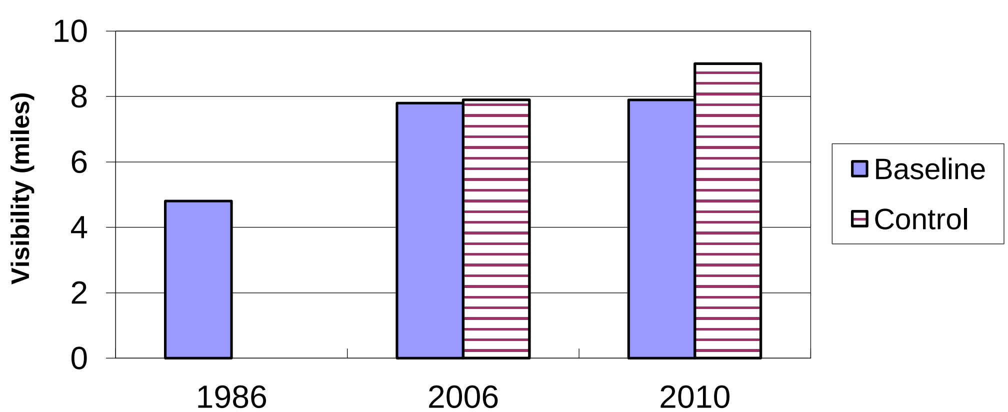


FIGURE 3.1-19

Annual Average Daytime Visibility Projections at Rubidoux

3.1.2.9 Summary

In 2001, there were a total of 37 days on which the federal standards for one-hour ozone and 24-hour PM10 were exceeded at one or more Basin locations. The recently adopted federal 24-hour PM2.5 standard was exceeded on 23 days in the Basin.

The number of days exceeding the federal ozone standard varied widely by area, from zero to 26 exceedances, depending on location. Exceedances were fewest at the coast, increasing to a maximum in the Basin's Central San Bernardino Mountains and inland valleys, and then decreasing further downwind in the Basin's far inland areas. The Central San Bernardino Mountains area exceeded the federal ozone standard most frequently (26 days). The more stringent state standard was exceeded on 88 days in the same area. The highest one-hour average and eight-hour average ozone concentration recorded in 2001 (0.190 ppm and 0.144 ppm) were 152 percent and 169 percent of the federal one-hour and eight-hour standards, respectively.

In 2001, CO concentrations did not exceed the standards anywhere in the Basin. The highest CO concentrations were recorded in coastal and central Los Angeles county areas. The maximum eight-hour average concentration of 7.71 ppm, recorded in South Central Los Angeles County, was 81 percent of the federal standard.

Exceedances of the federal annual PM10 standard were confined to Riverside and San Bernardino counties, primarily in and around the Metropolitan Riverside County area. The more stringent state annual PM10 standard was exceeded in a much larger area, covering most of the Basin. The federal 24-hour PM10 standard was also exceeded at a few locations in the inland valley areas in 2001. The state 24-hour standard, however, was exceeded at all locations monitored, with the Metropolitan Riverside County area exceeding most frequently (67 percent of sampling days). The maximum 24-hour average and annual PM10 concentrations (219 $\mu g/m^3$ and 63.1 $\mu g/m^3$) were 146 percent and 125 percent of the federal 24-hour and annual standards, respectively.

PM2.5 concentrations were monitored in the District in 2001 in accordance with the adopted federal PM2.5 standards. Maximum 24-hour average and annual average PM2.5 concentrations (98.0 $\mu g/m^3$ and 31.1 $\mu g/m^3$) were 150 percent and 201 percent of the federal 24-hour and annual standards, respectively, both recorded in the Metropolitan Riverside county area.

3.1.3 NON-CRITERIA AIR POLLUTANTS

Although the primary mandate of the SCAQMD is attaining the National Ambient Air Quality Standards for criteria pollutants within the SCAQMD jurisdiction, the SCAQMD also has a general responsibility pursuant to the Health and Safety Code, Section 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, 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, whether 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: compounds that contribute to ozone depletion and global warming, and TACs.

3.1.3.1 Ozone Depletion and Global Warming

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.

In support of these polices, the SCAQMD Governing Board has adopted several rules to reduce ozone depleting compounds (Rules 1411, 1415, and 1418). These policies 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.

3.1.3.2 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 Section 112 of the CAA for certain sources of radionuclides and six HAPs. These NESHAPs are summarized in Table 3.1-9.

TABLE 3.1-9

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 bee rescheduled based on court ordered deadlines, or the aim to satisfy all Section 112 requirements in a timely manner. Table 3.1-10 lists NESHAPs that are promulgated to date under the 1990 CAA Amendments.

TABLE 3.1 –10

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

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.

<u>Control of TACs Under the TAC Identification and Control Program</u>

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 ACTMs 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 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 Section 112 of the federal CAA. Table 3.1-11 lists the rules that have been proposed or adopted pursuant to AB 1807.

TABLE 3.1-11

SCAQMD Rules Adopted or Proposed for Adoption Pursuant to AB 1807

Rule	Title	Description
1169	Hexavalent Chromium – Chrome Plating and Chromic Acid Anodizing	Establishes emission control requirements for chrome plating and chromic acid anodizing operations
461	Gasoline Transfer and Dispensing	Reduces benzene emissions from the retail sale of gasoline
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
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.
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
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

<u>Control of TACs Under the Air Toxics "Hot Spots" Act</u>

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 are 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 consists 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 consists 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 consists 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 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 complete its review of the 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.

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. It has been estimated that about 200 cancer cases per year in the district are attributable to carcinogenic air contaminants.

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 may 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 a risk reduction plan 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 in five years following SCAQMD approval.

SCAQMD Rule 1402 which implements the requirements of SB 1731, requires facilities identified as exceeding action risk levels of a maximum increased cancer risk (MICR) of 25 in one million, a cancer burden of one, 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 and a total hazard index of five.

SCAQMD Rule 1402 provides benefits to public health in terms of reduction in the risk of cancer and other health effects by requiring air toxics reductions from a diverse range of existing industries and businesses and limiting future increases in health risk due to air toxic emissions from new, modified, or relocated sources.

The SCAQMD is monitoring a number of future federal and state program developments that concern 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 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, 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 district 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.

Health Effects

The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there is not "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk to causing 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 1987, the SCAQMD conducted the Multiple Air Toxics Exposure Study (MATES), a modeling and monitoring study, which 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 TACs to 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 has released a Final Report from this study which indicate 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 Plan. 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 plan seeks to identify measures that are technically feasible or are expected to be technically feasible and cost-effective in the next ten years. The final draft Air Toxics Control Plan identifies potential strategies to reduce toxic levels in the Basin over the next ten years. To the extent the strategies are implemented by the relative agencies, the plan 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 at mitigation. The toxics plan reviews the current air toxic levels and key toxic pollutants that contribute to the overall risk levels. The plan projects the future air toxics levels taking into consideration existing federal, state, and local programs that potentially affect future toxic emissions, including implementation of the 2003 AQMP. The control strategies identified in the air toxics plan go beyond the current ongoing toxics reduction efforts. These strategies are either currently feasible or will be feasible over the next ten years. The plan, 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.

3.1.4 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 2003 AQMP does not specifically address the control requirements for these adjacent areas. However, the control measures in the 2003 AQPM meet both the CAA and CCAA transport requirements and will assist downwind areas in complying with the federal ozone air quality standard.

The Coachella Valley is classified as a "severe-17" ozone non-attainment area under the CAA and must comply with the federal ozone air quality standard by 2007. The CAA requires separate attainment and post-1996 rate-of-progress demonstrations for each severe air basin under the SCAQMD's jurisdiction. Such demonstrations were provided in Chapter 8 and Appendix V of the 1997 AQMP. Revisions to the attainment demonstration for the Coachella Valley area are provided in Chapter 8 and Appendix V of the 2003 AQMP.

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).