ATTACHMENT A

EMISSION REDUCTIONS BY CONTROL MEASURE FOR PM_{10} MILESTONE YEARS - SOUTH COAST AIR BASIN

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 1997 Annual Average
: With 1997 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE	NAME	VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	11.37	4.92	2.31	0.05	0.47
BA-03	Adjustment for PAR 1130.1	-0.03	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	49.60
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	4.90
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	1.05
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	0.00	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	0.00	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.00	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	0.00	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	0.00	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.87	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	0.00	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	2.55	0.00	0.00	0.00	0.96
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.00	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	3.13	1.40	47.09	0.00	0.02
M4,5,6&7	Combination of M-04-05-06-07	0.00	1.89	0.00	0.00	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.00	0.00	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL (NET)		17.90	8.21	49.40	0.05	111.25

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	11.37	4.92	2.31	0.05	0.47
BA-03	Adjustment for PAR 1130.1	-0.03	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	49.60
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	4.90
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	1.05
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	0.00	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	0.00	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.00	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	0.00	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	0.00	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.87	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	0.00	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	2.55	0.00	0.00	0.00	0.96
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.00	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	3.13	1.40	47.09	0.00	0.02
M4,5,6&7	Combination of M-04-05-06-07	0.00	1.89	0.00	0.00	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.00	0.00	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		17.90	8.21	49.40	0.05	111.25

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	SOX	PM10
Point source	94.206	8.856	51.578	0.652	13.948
Area (nonfed)	340.850	59.227	86.078	1.217	377.659
Area (fed)	6.197	0.000	0.000	0.000	0.000
Reclaim		77.848		22.235	
Total Stationary	441.253	145.931	137.656	24.104	391.607
On-road	443.423	605.610	3625.031	14.028	19.638
Off-road (nonfed)	56.189	105.903	948.973	1.858	5.437
Off-road (fed)	55.666	145.315	299.478	30.336	8.508
TOTAL	996.531	1002.759	5011.140	70.326	425.190

EMISSION REDUCTIONS

Point source	12.177	1.404	2.310	0.050	0.474
Area (nonfed)	2.591	3.519	0.000	0.000	110.755
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	14.768	4.923	2.310	0.050	111.229
On-road	3.133	3.282	47.090	0.000	0.019
Off-road (nonfed)	0.000	0.000	0.000	0.000	0.000
Off-road (fed)	0.000	0.000	0.000	0.000	0.000
TOTAL	17.901	8.205	49.400	0.050	111.248

REMAINING EMISSIONS

Point source	82.029	7.452	49.268	0.602	13.474
Area (nonfed)	338.259	55.708	86.078	1.217	266.904
Area (fed)	6.197	0.000	0.000	0.000	0.000
Reclaim		77.848		22.235	
Total Stationary	426.485	141.008	135.346	24.054	280.378
On-road	440.290	602.328	3577.941	14.028	19.619
Off-road (nonfed)	56.189	105.903	948.973	1.858	5.437
Off-road (fed)	55.666	145.315	299.478	30.336	8.508
TOTAL	978.630	994.554	4961.739	70.276	313.942

ERCs	1.380	0.470	0.610	0.020	0.200
HILO (3)	0.090	0.019	0.000	0.014	0.019
NSR Exemption	3.500	1.640	0.380	0.000	0.000
R518.2	1.500	1.500	1.500	0.500	0.500
ODC Conversion	8.840	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	993.940	998.183	4964.229	70.810	314.661
TOTAL LAST 5 LINE ITEMS	15.310	3.629	2.490	0.534	0.719
Mobility Adjustments (4)	0.000	0.000	0.000	0.000	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.

(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.

(3) HILO=Bank for HIgh employment LOw polluting companies.

(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2000 Annual Average
: With 2000 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE	NAME	VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	24.34	10.52	4.99	0.10	1.02
BA-03	Adjustment for PAR 1130.1	-0.12	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	52.25
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	5.38
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	5.77
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.04
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.78	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.51
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	4.52	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.72	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	0.00	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	2.85	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.70	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	8.01
PRC-03	Emission Reductions from Restaurant Operations	0.14	0.00	0.00	0.00	1.34
WST-01	Emissions Reductions from Livestock Waste	3.55	0.00	0.00	0.00	6.43
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.28	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	9.76	4.75	153.64	0.00	0.06
M4,5,6&7	Combination of M-04-05-06-07	0.00	6.95	0.00	0.00	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	1.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	1.10	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.14	0.16	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
		____	____	____	____	____
GRAND TOTAL (NET)		47.99	25.15	158.63	0.10	135.06

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	24.34	10.52	4.99	0.10	1.02
BA-03	Adjustment for PAR 1130.1	-0.12	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	52.25
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	5.38
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	5.77
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.04
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.78	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.51
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	4.52	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.72	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	0.00	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	2.85	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.70	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	8.01
PRC-03	Emission Reductions from Restaurant Operations	0.14	0.00	0.00	0.00	1.34
WST-01	Emissions Reductions from Livestock Waste	3.55	0.00	0.00	0.00	6.43
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.28	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	9.76	4.75	153.64	0.00	0.06
M4,5,6&7	Combination of M-04-05-06-07	0.00	6.95	0.00	0.00	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	1.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	1.10	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.14	0.16	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		47.99	25.15	158.63	0.10	135.06

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	SOX	PM10
Point source	89.765	9.231	51.711	0.636	14.034
Area (nonfed)	333.397	61.162	120.251	1.239	396.046
Area (fed)	6.405	0.000	0.000	0.000	0.000
Reclaim		43.442		16.340	
Total Stationary	429.567	113.835	171.962	18.215	410.080
On-road	349.824	520.495	2963.409	14.042	16.168
Off-road (nonfed)	52.014	102.459	954.227	1.992	5.680
Off-road (fed)	59.782	145.086	315.300	31.380	8.858
TOTAL	891.187	881.875	4404.898	65.629	440.786

EMISSION REDUCTIONS

Point source	27.264	3.065	4.991	0.100	1.538
Area (nonfed)	9.716	9.235	0.000	0.000	133.458
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	36.980	12.300	4.991	0.100	134.996
On-road	9.764	11.699	153.638	0.000	0.063
Off-road (nonfed)	0.000	0.000	0.000	0.000	0.000
Off-road (fed)	1.244	1.156	0.000	0.000	0.000
TOTAL	47.988	25.155	158.629	0.100	135.058

REMAINING EMISSIONS

Point source	62.503	6.166	46.719	0.536	12.496
Area (nonfed)	323.681	51.927	120.251	1.239	262.588
Area (fed)	6.405	0.000	0.000	0.000	0.000
Reclaim		43.442		16.340	
Total Stationary	392.589	101.535	166.970	18.115	275.084
On-road	340.060	508.796	2809.771	14.042	16.105
Off-road (nonfed)	52.014	102.459	954.227	1.992	5.680
Off-road (fed)	58.538	143.930	315.300	31.380	8.858
TOTAL	843.200	856.721	4246.268	65.529	305.728

ERCs	3.540	1.210	1.560	0.050	0.520
HILO (3)	0.090	0.019	0.000	0.014	0.019
NSR Exemption	8.750	4.100	0.950	0.000	0.000
R518.2	1.500	1.500	1.500	0.500	0.500
ODC Conversion	9.350	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	866.430	863.550	4250.278	66.093	306.767
TOTAL LAST 5 LINE ITEMS	23.230	6.829	4.010	0.564	1.039
Mobility Adjustments (4)	0.000	0.000	0.000	0.000	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2003 Annual Average
: With 2003 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE	NAME	VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	34.38	14.16	7.13	0.15	1.50
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	53.33
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	5.65
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	10.49
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.03
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.58	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.84	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.50
CP-02	Mid Term Consumer Product Measure	14.21	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	4.58	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.67	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	17.97	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	15.64	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.62	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	8.30
PRC-03	Emission Reductions from Restaurant Operations	0.88	0.00	0.00	0.00	6.29
WST-01	Emissions Reductions from Livestock Waste	3.41	0.00	0.00	0.00	6.16
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.72	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	13.02	6.69	219.10	0.00	0.10
M4,5,6&7	Combination of M-04-05-06-07	0.00	18.04	0.00	0.00	0.00
M11&M12	Industrial Eq	7.28	4.20	253.53	0.00	0.00
M-13	Marine	0.00	3.07	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	6.45	0.00	0.00	0.00
M-16	Pleasure Water Craft	4.85	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.20	1.61	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.61	0.80	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL (NET)		119.05	57.44	479.76	0.15	146.58

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	34.38	14.16	7.13	0.15	1.50
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	53.33
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	5.65
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	10.49
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.03
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.58	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.84	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.50
CP-02	Mid Term Consumer Product Measure	14.21	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	4.58	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.67	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	17.97	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	15.64	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.62	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	8.30
PRC-03	Emission Reductions from Restaurant Operations	0.88	0.00	0.00	0.00	6.29
WST-01	Emissions Reductions from Livestock Waste	3.41	0.00	0.00	0.00	6.16
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.72	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	13.02	6.69	219.10	0.00	0.10
M4,5,6&7	Combination of M-04-05-06-07	0.00	18.04	0.00	0.00	0.00
M11&M12	Industrial Eq	7.28	4.20	253.53	0.00	0.00
M-13	Marine	0.00	3.07	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	6.45	0.00	0.00	0.00
M-16	Pleasure Water Craft	4.85	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.20	1.61	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.61	0.80	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		119.05	57.44	479.76	0.15	146.58

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	SOX	PM10
Point source	93.463	8.866	54.656	0.659	14.391
Area (nonfed)	347.842	62.546	132.628	1.253	403.676
Area (fed)	6.540	0.000	0.000	0.000	0.000
Reclaim		31.764		11.374	
Total Stationary	447.845	103.176	187.284	13.286	418.067
On-road	271.052	453.810	2458.098	14.687	14.564
Off-road (nonfed)	51.165	94.047	979.886	2.060	5.816
Off-road (fed)	63.989	144.527	335.042	33.352	9.290
TOTAL	834.051	795.560	3960.312	63.385	447.737

EMISSION REDUCTIONS

Point source	37.464	4.048	7.126	0.150	1.993
Area (nonfed)	55.624	12.532	0.000	0.000	144.488
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	93.087	16.580	7.126	0.150	146.480
On-road	13.021	24.723	219.102	0.000	0.099
Off-road (nonfed)	7.041	5.164	244.350	0.000	0.000
Off-road (fed)	5.898	10.974	9.183	0.000	0.000
TOTAL	119.048	57.440	479.762	0.150	146.579

REMAINING EMISSIONS

Point source	55.999	4.818	47.530	0.509	12.399
Area (nonfed)	292.218	50.014	132.628	1.253	259.188
Area (fed)	6.540	0.000	0.000	0.000	0.000
Reclaim		31.764		11.374	
Total Stationary	354.758	86.596	180.158	13.136	271.587
On-road	258.031	429.087	2238.996	14.687	14.465
Off-road (nonfed)	44.124	88.883	735.536	2.060	5.816
Off-road (fed)	58.091	133.554	325.859	33.352	9.290
TOTAL	715.004	738.120	3480.549	63.235	301.158

ERCs	5.830	1.730	2.570	0.090	0.860
HILO (3)	0.090	0.019	0.000	0.014	0.019
NSR Exemption	14.000	6.560	1.520	0.000	0.000
R518.2	1.500	1.500	1.500	0.500	0.500
ODC Conversion	9.900	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	746.324	747.929	3486.139	63.839	302.537
TOTAL LAST 5 LINE ITEMS	31.320	9.809	5.590	0.604	1.379
Mobility Adjustments (4)	9.580	-1.840	56.910	0.030	0.060

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2006 Annual Average
: With 2006 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	42.86	16.15	8.96	0.19	1.91
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	1.34	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	54.40
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	5.88
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	15.21
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.03
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.46	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	3.57	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.48
CP-02	Mid Term Consumer Product Measure	31.45	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	4.69	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.64	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	31.99	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	2.63	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	17.45	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.56	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	8.61
PRC-03	Emission Reductions from Restaurant Operations	1.12	0.00	0.00	0.00	7.87
WST-01	Emissions Reductions from Livestock Waste	3.31	0.00	0.00	0.00	5.96
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.73	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	15.17	9.28	262.25	0.00	0.10
M4,5,6&7	Combination of M-04-05-06-07	4.85	46.04	0.00	0.00	0.00
M11&M12	Industrial Eq	13.37	7.50	512.12	0.00	0.00
M-13	Marine	0.00	11.88	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	11.11	0.00	0.00	0.00
M-16	Pleasure Water Craft	9.08	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	6.13	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	4.72	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	3.39	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	3.85	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	1.02	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.47	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.92	8.51	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	1.45	1.89	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL (NET)		203.20	117.39	783.33	0.19	154.69

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	SOX RED. TPD	PM RED. TPD
BA-01	NSR Impact	42.86	16.15	8.96	0.19	1.91
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	54.24
DPR-01	COE fr Pesticide Applications	1.34	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	54.40
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	5.88
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	15.21
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.03
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.46	0.00	0.00	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	3.57	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.48
CP-02	Mid Term Consumer Product Measure	31.45	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	4.69	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.64	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	31.99	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	2.63	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	17.45	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.56	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	8.61
PRC-03	Emission Reductions from Restaurant Operations	1.12	0.00	0.00	0.00	7.87
WST-01	Emissions Reductions from Livestock Waste	3.31	0.00	0.00	0.00	5.96
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.73	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	15.17	9.28	262.25	0.00	0.10
M4,5,6&7	Combination of M-04-05-06-07	4.85	46.04	0.00	0.00	0.00
M11&M12	Industrial Eq	13.37	7.50	512.12	0.00	0.00
M-13	Marine	0.00	11.88	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	11.11	0.00	0.00	0.00
M-16	Pleasure Water Craft	9.08	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	6.13	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	6.48	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	5.68	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	3.93	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	1.02	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.47	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.92	8.51	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	1.45	1.89	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		207.33	117.39	783.33	0.19	154.69

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	SOX	PM10
Point source	97.263	8.325	57.703	0.681	14.728
Area (nonfed)	355.100	63.376	133.397	1.266	409.847
Area (fed)	6.703	0.000	0.000	0.000	0.000
Reclaim		31.764		11.374	
Total Stationary	459.066	103.465	191.100	13.321	424.575
On-road	207.204	405.528	2010.213	15.490	13.802
Off-road (nonfed)	52.209	86.362	1008.379	2.116	5.922
Off-road (fed)	68.081	144.451	354.158	35.332	9.706
TOTAL	786.560	739.806	3563.852	66.259	454.005

EMISSION REDUCTIONS

Point source	51.422	4.448	8.961	0.190	2.396
Area (nonfed)	105.597	16.731	0.000	0.000	152.203
Area (fed)	1.341	0.000	0.000	0.000	0.000
Total Stationary	158.359	21.179	8.961	0.190	154.599
On-road	20.017	55.325	262.251	0.000	0.096
Off-road (nonfed)	13.222	12.715	491.261	0.000	0.000
Off-road (fed)	11.599	28.175	20.859	0.000	0.000
TOTAL	203.197	117.394	783.332	0.190	154.695

REMAINING EMISSIONS

Point source	45.843	3.877	48.741	0.491	12.332
Area (nonfed)	249.503	46.645	133.397	1.266	257.643
Area (fed)	5.362	0.000	0.000	0.000	0.000
Reclaim		31.764		11.374	
Total Stationary	300.709	82.286	182.138	13.131	269.976
On-road	187.187	350.203	1747.962	15.490	13.706
Off-road (nonfed)	38.987	73.646	517.118	2.116	5.922
Off-road (fed)	56.482	116.276	333.299	35.332	9.706
TOTAL	583.364	622.412	2780.518	66.069	299.310

ERCs	8.260	1.730	3.630	0.120	1.210
HILO (3)	0.090	0.019	0.000	0.014	0.019
NSR Exemption	19.250	9.020	2.090	0.000	0.000
R518.2	1.500	1.500	1.500	0.500	0.500
ODC Conversion	10.470	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	622.934	634.681	2787.738	66.703	301.039
TOTAL LAST 5 LINE ITEMS	39.570	12.269	7.220	0.634	1.729
Mobility Adjustments (4)	14.730	-2.250	93.010	0.090	0.140

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.

(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.

(3) HILO=Bank for HIgh employment LOw polluting companies.

(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

ATTACHMENT B

HISTORICAL YEAR MODELING EMISSIONS

Note:

For these tables, species' fractions of total organic gases (TOG) and NO_x were determined by the UAM speciation profiles. These profiles exclude certain lower reactivity compounds in the definition of VOC compounds, resulting in lower VOC emission totals than reported in the emission inventory appendix. TOG emissions are equivalent. Mobile source emissions are based on DTIM2.

TABLE B-1

Emissions by Source Category for the South Coast Air Basin (tons/day)
First Day of the August 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	0.67	0.27	0.41	1.64	0.00	0.01
130	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00
140	Other Manufacturing/Industrial	16.97	2.23	10.09	30.14	2.68	1.19
150	Electric Utilities	0.00	0.00	0.00	0.00	0.00	0.00
160	Other Service and Commerce	0.34	0.14	0.87	4.64	0.17	0.22
170	Residential	1.30	0.52	3.31	16.49	0.29	0.82
199	Other	0.00	0.00	0.00	0.00	0.00	0.00
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.09	0.00	0.00	0.01
220	Range Management	0.46	0.25	2.49	0.00	0.00	0.37
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.00	0.00	0.00	0.00	0.00	0.00
299	Other	0.00	0.00	0.00	0.00	0.00	0.00
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	6.17	0.16	0.00	0.02	0.00	0.00
320	Degreasing	110.59	67.63	0.00	0.00	0.00	0.00
330	Architectural Coating	78.31	72.64	0.00	0.00	0.00	0.00
340	Other Surface Coating	251.20	230.54	0.20	0.31	0.03	0.56
350	Asphalt Paving	0.57	0.57	0.00	0.00	0.00	0.00
360	Printing	1.35	1.35	0.01	0.03	0.00	0.03
370	Consumer Products	102.54	101.94	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	0.59	0.41	0.00	0.00	0.00	0.00
399	Other	0.27	0.20	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	62.63	19.91	0.00	0.00	0.00	0.00
420	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00
430	Petroleum Marketing	80.83	33.68	0.00	0.00	0.00	0.00
499	Other	0.00	0.00	0.00	0.00	0.00	0.00
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	11.96	8.66	0.00	0.03	0.00	0.15
520	Food and Agricultural	5.33	4.08	0.02	0.06	0.00	6.75
560	Mineral Processes	0.00	0.00	0.00	0.00	0.00	0.00
570	Metal Processes	0.00	0.00	0.00	0.00	0.00	0.00
580	Wood and Paper	0.02	0.01	0.00	0.00	0.00	8.77
599	Other	0.00	0.00	0.00	0.00	0.00	0.00
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	12.06	12.06	0.00	0.00	0.00	0.00
620	Farming Operations	124.27	9.94	0.00	0.00	0.00	12.78
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	180.68
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	162.86
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	55.50
660	Unplanned Fires	0.77	0.54	7.73	0.19	0.00	0.86
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	64.55
680	Waste Disposal	129.39	2.04	0.00	0.00	0.00	3.77
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00
694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00

695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00
699	Other	0.78	0.55	0.04	0.21	0.03	0.80

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	0.00	0.00	0.00	0.00	0.00	0.00
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	34.40	33.02	175.75	3.47	0.14	0.93
815	Commericial Boats	0.50	0.48	2.07	10.29	2.64	0.21
820	Trains	1.41	1.37	4.27	28.41	2.33	0.62
830	Ships	2.35	2.27	3.00	32.19	35.52	3.36
850	Aircraft - Government	0.08	0.08	2.36	0.00	0.00	0.00
860	Aircraft - Other	0.30	0.27	4.68	1.13	0.08	0.00
870	Mobile Equipment	65.97	63.63	1223.12	274.19	7.78	15.82
880	Utility Equipment	22.92	22.01	186.39	0.80	0.04	0.44
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		1127.32	693.46	1626.89	404.24	51.74	522.07

TABLE B-2

Emissions By Source Category for the South Coast Air Basin (tons/day)
First Day of the June 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.01	0.56	0.00	0.01
120	Oil and Gas Production	7.33	0.81	3.28	18.64	0.05	0.08
130	Petroleum Refining	4.53	1.70	6.99	57.99	3.72	4.39
140	Other Manufacturing/Industrial	21.28	3.78	21.21	58.14	4.69	2.77
150	Electric Utilities	8.64	1.80	7.71	36.66	3.47	1.52
160	Other Service and Commerce	9.53	3.14	20.09	27.85	2.71	1.53
170	Residential	1.30	0.52	3.31	16.49	0.29	0.82
199	Other	0.68	0.52	9.99	1.74	0.14	0.11
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.09	0.00	0.00	0.01
220	Range Management	0.46	0.25	2.49	0.00	0.00	0.37
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.08	0.02	0.14	1.10	0.15	0.13
299	Other	0.81	0.38	0.18	0.71	0.43	0.39
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	18.11	0.78	0.00	0.03	0.00	0.01
320	Degreasing	175.55	72.67	0.00	0.04	0.00	0.00
330	Architectural Coating	78.31	72.64	0.00	0.00	0.00	0.00
340	Other Surface Coating	398.76	370.05	0.21	0.50	0.03	2.40
350	Asphalt Paving	0.57	0.57	0.00	0.00	0.00	0.00
360	Printing	7.39	7.39	0.01	0.04	0.00	0.03
370	Consumer Products	102.54	101.94	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	24.97	16.94	0.00	0.00	0.00	0.08
399	Other	3.49	2.59	0.00	0.00	0.00	0.03
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	141.30	73.03	0.03	0.32	2.00	0.02
420	Petroleum Refining	55.73	40.74	5.53	7.76	17.33	2.66
430	Petroleum Marketing	90.47	42.41	0.03	0.23	0.02	0.07
499	Other	1.90	1.72	0.50	0.02	0.06	0.08
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	27.77	19.49	0.45	1.29	3.02	2.02
520	Food and Agricultural	5.44	4.15	0.05	0.18	0.04	7.06
560	Mineral Processes	0.72	0.51	1.60	10.02	2.79	2.31
570	Metal Processes	0.96	0.72	1.06	0.56	0.59	2.74
580	Wood and Paper	0.10	0.07	0.00	0.02	0.00	9.02
599	Other	16.80	11.76	0.01	0.14	0.00	0.38
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	12.06	12.06	0.00	0.00	0.00	0.00
620	Farming Operations	124.27	9.94	0.00	0.00	0.00	12.78
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	180.68
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	162.86
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	55.50
660	Unplanned Fires	0.77	0.54	7.73	0.19	0.00	0.86
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	64.55
680	Waste Disposal	129.39	2.04	0.00	0.00	0.00	3.77
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00
694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00
695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00

699	Other	4.50	3.76	0.14	0.78	0.24	0.95

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	971.45	927.81	6750.37	765.47	34.78	22.47
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	34.40	33.02	175.75	3.47	0.14	0.93
815	Commericial Boats	0.50	0.48	2.07	10.29	2.64	0.21
820	Trains	1.41	1.37	4.27	28.41	2.33	0.62
830	Ships	2.35	2.27	3.00	32.19	35.52	3.36
850	Aircraft - Government	5.65	4.78	11.37	1.87	0.28	1.68
860	Aircraft - Other	11.00	9.67	71.84	11.70	0.88	0.05
870	Mobile Equipment	65.97	63.63	1223.12	274.19	7.78	15.82
880	Utility Equipment	22.92	22.01	186.39	0.80	0.04	0.44
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	29.88	29.88	5.94	8.58	0.64	1.22
TOTAL		2622.05	1976.34	8526.95	1378.96	126.82	569.79

TABLE B-3

Emissions by Source Category for the South Coast Air Basin (tons/day)
First Day of the July 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	0.67	0.27	0.41	1.64	0.00	0.01
130	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00
140	Other Manufacturing/Industrial	16.97	2.23	10.09	30.14	2.68	1.19
150	Electric Utilities	0.00	0.00	0.00	0.00	0.00	0.00
160	Other Service and Commerce	0.34	0.14	0.87	4.64	0.17	0.22
170	Residential	1.30	0.52	3.31	16.49	0.29	0.82
199	Other	0.00	0.00	0.00	0.00	0.00	0.00
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.09	0.00	0.00	0.01
220	Range Management	0.46	0.25	2.49	0.00	0.00	0.37
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.00	0.00	0.00	0.00	0.00	0.00
299	Other	0.00	0.00	0.00	0.00	0.00	0.00
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	6.17	0.16	0.00	0.02	0.00	0.00
320	Degreasing	110.59	67.63	0.00	0.00	0.00	0.00
330	Architectural Coating	78.31	72.64	0.00	0.00	0.00	0.00
340	Other Surface Coating	251.20	230.54	0.20	0.31	0.03	0.56
350	Asphalt Paving	0.57	0.57	0.00	0.00	0.00	0.00
360	Printing	1.35	1.35	0.01	0.03	0.00	0.03
370	Consumer Products	102.54	101.94	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	0.59	0.41	0.00	0.00	0.00	0.00
399	Other	0.27	0.20	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	62.63	19.91	0.00	0.00	0.00	0.00
420	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00
430	Petroleum Marketing	80.83	33.68	0.00	0.00	0.00	0.00
499	Other	0.00	0.00	0.00	0.00	0.00	0.00
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	11.96	8.66	0.00	0.03	0.00	0.15
520	Food and Agricultural	5.33	4.08	0.02	0.06	0.00	6.75
560	Mineral Processes	0.00	0.00	0.00	0.00	0.00	0.00
570	Metal Processes	0.00	0.00	0.00	0.00	0.00	0.00
580	Wood and Paper	0.02	0.01	0.00	0.00	0.00	8.77
599	Other	0.00	0.00	0.00	0.00	0.00	0.00
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	12.06	12.06	0.00	0.00	0.00	0.00
620	Farming Operations	124.27	9.94	0.00	0.00	0.00	12.78
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	180.68
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	162.86
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	55.50
660	Unplanned Fires	0.77	0.54	7.73	0.19	0.00	0.86
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	64.55
680	Waste Disposal	129.39	2.04	0.00	0.00	0.00	3.77
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00
694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00
695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00

699	Other	0.78	0.55	0.04	0.21	0.03	0.80

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	0.00	0.00	0.00	0.00	0.00	0.00
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	34.40	33.02	175.75	3.47	0.14	0.93
815	Commericial Boats	0.50	0.48	2.07	10.29	2.64	0.21
820	Trains	1.41	1.37	4.27	28.41	2.33	0.62
830	Ships	2.35	2.27	3.00	32.19	35.52	3.36
850	Aircraft - Government	0.08	0.08	2.36	0.00	0.00	0.00
860	Aircraft - Other	0.30	0.27	4.68	1.13	0.08	0.00
870	Mobile Equipment	65.97	63.63	1223.12	274.19	7.78	15.82
880	Utility Equipment	22.92	22.01	186.39	0.80	0.04	0.44
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		1127.32	693.46	1626.89	404.24	51.74	522.07

TABLE B-4

Emissions by Source Category for the South Coast Air Basin (tons/day)
First Day of the September 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	0.67	0.27	0.41	1.64	0.00	0.01
130	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00
140	Other Manufacturing/Industrial	16.97	2.23	10.09	30.14	2.68	1.19
150	Electric Utilities	0.00	0.00	0.00	0.00	0.00	0.00
160	Other Service and Commerce	0.34	0.14	0.87	4.64	0.17	0.22
170	Residential	1.30	0.52	3.31	16.49	0.29	0.82
199	Other	0.00	0.00	0.00	0.00	0.00	0.00
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.09	0.00	0.00	0.01
220	Range Management	0.46	0.25	2.49	0.00	0.00	0.37
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.00	0.00	0.00	0.00	0.00	0.00
299	Other	0.00	0.00	0.00	0.00	0.00	0.00
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	6.17	0.16	0.00	0.02	0.00	0.00
320	Degreasing	110.59	67.63	0.00	0.00	0.00	0.00
330	Architectural Coating	78.31	72.64	0.00	0.00	0.00	0.00
340	Other Surface Coating	251.20	230.54	0.20	0.31	0.03	0.56
350	Asphalt Paving	0.57	0.57	0.00	0.00	0.00	0.00
360	Printing	1.35	1.35	0.01	0.03	0.00	0.03
370	Consumer Products	102.54	101.94	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	0.59	0.41	0.00	0.00	0.00	0.00
399	Other	0.27	0.20	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	62.63	19.91	0.00	0.00	0.00	0.00
420	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00
430	Petroleum Marketing	80.83	33.68	0.00	0.00	0.00	0.00
499	Other	0.00	0.00	0.00	0.00	0.00	0.00
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	11.96	8.66	0.00	0.03	0.00	0.15
520	Food and Agricultural	5.33	4.08	0.02	0.06	0.00	6.75
560	Mineral Processes	0.00	0.00	0.00	0.00	0.00	0.00
570	Metal Processes	0.00	0.00	0.00	0.00	0.00	0.00
580	Wood and Paper	0.02	0.01	0.00	0.00	0.00	8.77
599	Other	0.00	0.00	0.00	0.00	0.00	0.00
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	12.06	12.06	0.00	0.00	0.00	0.00
620	Farming Operations	124.27	9.94	0.00	0.00	0.00	12.78
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	180.68
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	162.86
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	55.50
660	Unplanned Fires	0.77	0.54	7.73	0.19	0.00	0.86
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	64.55
680	Waste Disposal	129.39	2.04	0.00	0.00	0.00	3.77
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00
694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00
695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00

699	Other	0.78	0.55	0.04	0.21	0.03	0.80

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	0.00	0.00	0.00	0.00	0.00	0.00
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	34.40	33.02	175.75	3.47	0.14	0.93
815	Commericial Boats	0.50	0.48	2.07	10.29	2.64	0.21
820	Trains	1.41	1.37	4.27	28.41	2.33	0.62
830	Ships	2.35	2.27	3.00	32.19	35.52	3.36
850	Aircraft - Government	0.08	0.08	2.36	0.00	0.00	0.00
860	Aircraft - Other	0.30	0.27	4.68	1.13	0.08	0.00
870	Mobile Equipment	65.97	63.63	1223.12	274.19	7.78	15.82
880	Utility Equipment	22.92	22.01	186.39	0.80	0.04	0.44
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		1127.32	693.46	1626.89	404.24	51.74	522.07

ATTACHMENT C

FUTURE YEAR BASELINE MODELING EMISSIONS

Note:

For these tables, species' fractions of total organic gases (TOG) and NO_x were determined by the UAM speciation profiles. These profiles exclude certain lower reactivity compounds in the definition of VOC compounds, resulting in lower VOC emission totals than reported in the emission inventory appendix.. TOG emissions are equivalent. Mobile source emissions are based on DTIM2.

TABLE C-1

Emissions by Source Category for the South Coast Air Basin for 2000 Baseline First Day of the August 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	3.98	0.54	1.58	3.03	0.07	0.03
130	Petroleum Refining	3.93	1.29	6.96	11.92	4.02	3.61
140	Other Manufacturing/Industrial	21.04	3.33	17.53	35.90	0.98	1.84
150	Electric Utilities	3.30	0.87	2.36	10.08	0.02	0.41
160	Other Service and Commerce	12.08	2.18	22.17	10.43	0.19	1.05
170	Residential	1.41	0.56	3.60	17.93	0.25	0.89
199	Other	1.41	0.38	4.14	1.69	0.10	0.31
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.11	0.00	0.00	0.01
220	Range Management	0.48	0.26	2.60	0.00	0.00	0.38
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.31	0.05	0.19	2.86	0.49	0.13
299	Other	0.13	0.06	0.46	0.71	0.06	0.32
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	9.81	0.13	0.01	0.03	0.00	0.00
320	Degreasing	134.01	77.46	0.00	0.00	0.00	0.00
330	Architectural Coating	93.03	86.29	0.00	0.00	0.00	0.00
340	Other Surface Coating	101.69	93.70	0.22	0.36	0.03	0.79
350	Asphalt Paving	0.62	0.62	0.00	0.00	0.00	0.00
360	Printing	6.44	6.44	0.01	0.04	0.00	0.03
370	Consumer Products	88.83	88.31	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	68.21	24.24	0.00	0.00	0.00	0.00
399	Other	9.56	4.47	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	19.53	11.68	0.00	0.00	0.00	0.00
420	Petroleum Refining	11.31	8.33	4.55	3.60	5.60	2.35
430	Petroleum Marketing	65.05	22.62	0.00	0.00	0.00	0.00
499	Other	2.62	2.21	0.00	0.03	0.00	0.03
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	20.55	14.06	0.03	0.57	1.63	0.47
520	Food and Agricultural	4.92	3.53	0.02	0.06	0.20	5.92
560	Mineral Processes	1.84	1.65	0.90	2.54	2.49	1.18
570	Metal Processes	0.11	0.08	0.06	0.30	0.29	0.87
580	Wood and Paper	0.02	0.01	0.01	0.01	0.00	8.55
599	Other	2.05	1.44	0.00	0.01	0.00	0.06
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	11.52	11.52	0.00	0.00	0.00	0.00
620	Farming Operations	149.33	11.95	0.00	0.00	0.00	15.96
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	83.40
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	180.17
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	53.32
660	Unplanned Fires	0.87	0.61	8.90	0.22	0.00	0.93
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	62.37
680	Waste Disposal	119.12	1.94	0.00	0.00	0.00	3.47
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	5.97	4.47	1.97	1.53	0.06	0.66
692	Hi/LO	0.12	0.09	0.00	0.02	0.01	0.02
693	NSR Exemption	14.75	11.06	1.20	5.18	0.00	0.00
694	Rule 518.2	0.36	0.27	0.03	0.01	0.01	0.04

695	ODC Conversion	12.47	9.35	0.00	0.00	0.00	0.00
699	Other	15.05	7.27	2.34	1.19	0.53	4.39

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	353.90	330.80	2891.25	515.17	14.03	16.60
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	38.69	37.14	193.34	4.72	0.03	1.40
815	Commericial Boats	0.49	0.48	1.97	9.82	1.65	0.17
820	Trains	1.39	1.35	4.21	26.42	1.32	0.49
830	Ships	2.49	2.41	3.18	32.37	24.68	3.02
850	Aircraft - Government	3.49	2.97	8.67	3.03	0.11	0.76
860	Aircraft - Other	14.86	12.97	89.51	16.75	1.11	0.05
870	Mobile Equipment	60.25	58.07	1178.73	203.60	4.39	10.97
880	Utility Equipment	9.89	9.50	104.12	1.54	0.01	0.24
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.32	0.32	0.37	0.76	1.48	0.01
TOTAL		1503.61	971.36	4557.28	924.41	65.84	467.70

TABLE C-2

Emissions by Source Category for the South Coast Air Basin for 2010 Baseline
First Day of the August 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	3.98	0.54	1.58	2.69	0.07	0.03
130	Petroleum Refining	3.93	1.29	6.96	8.66	2.73	3.61
140	Other Manufacturing/Industrial	22.14	3.55	19.24	32.42	0.93	1.99
150	Electric Utilities	3.73	0.99	2.68	7.27	0.03	0.48
160	Other Service and Commerce	15.27	2.83	29.54	9.20	0.24	1.35
170	Residential	1.62	0.65	4.13	20.57	0.29	1.02
199	Other	1.63	0.45	4.82	1.03	0.09	0.34
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.10	0.00	0.00	0.01
220	Range Management	0.45	0.25	2.45	0.00	0.00	0.36
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.34	0.05	0.22	2.23	0.36	0.15
299	Other	0.15	0.07	0.53	0.81	0.06	0.37
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	12.28	0.15	0.01	0.03	0.00	0.00
320	Degreasing	168.72	97.63	0.00	0.00	0.00	0.00
330	Architectural Coating	105.36	97.73	0.00	0.00	0.00	0.00
340	Other Surface Coating	116.43	107.56	0.28	0.45	0.03	1.00
350	Asphalt Paving	0.70	0.70	0.00	0.00	0.00	0.00
360	Printing	8.75	8.75	0.02	0.05	0.00	0.04
370	Consumer Products	92.31	91.72	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	85.01	29.83	0.00	0.00	0.00	0.00
399	Other	12.09	5.56	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	19.55	11.70	0.00	0.00	0.00	0.00
420	Petroleum Refining	11.40	8.42	4.55	2.60	3.77	2.35
430	Petroleum Marketing	70.43	23.20	0.00	0.00	0.00	0.00
499	Other	2.99	2.49	0.00	0.03	0.00	0.03
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	28.10	19.30	0.04	0.54	1.29	0.62
520	Food and Agricultural	4.77	3.44	0.01	0.06	0.20	5.76
560	Mineral Processes	1.98	1.75	0.97	1.85	1.73	1.21
570	Metal Processes	0.13	0.10	0.07	0.25	0.21	0.98
580	Wood and Paper	0.02	0.02	0.01	0.01	0.00	9.71
599	Other	2.71	1.90	0.00	0.01	0.00	0.07
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	12.71	12.71	0.00	0.00	0.00	0.00
620	Farming Operations	138.34	11.07	0.00	0.00	0.00	14.70
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	94.36
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	192.53
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	53.32
660	Unplanned Fires	0.96	0.67	10.02	0.24	0.00	1.00
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	62.37
680	Waste Disposal	134.64	2.10	0.00	0.00	0.00	3.93
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	19.63	14.72	4.56	2.18	0.21	2.00
692	Hi/LO	0.12	0.09	0.00	0.02	0.01	0.02
693	NSR Exemption	44.00	33.00	3.58	15.46	0.00	0.00
694	Rule 518.2	0.36	0.27	0.03	0.01	0.01	0.04
695	ODC Conversion	14.97	11.23	0.00	0.00	0.00	0.00

699	Other	18.60	8.79	2.88	1.10	0.52	5.05

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	159.70	152.19	1769.47	360.97	16.84	15.85
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	46.28	44.43	240.93	6.01	0.04	1.82
815	Commericial Boats	0.51	0.49	2.02	10.22	1.71	0.18
820	Trains	1.35	1.31	4.10	25.70	1.28	0.47
830	Ships	3.08	2.98	3.90	39.87	30.52	3.73
850	Aircraft - Government	3.49	2.97	8.67	3.03	0.11	0.76
860	Aircraft - Other	17.79	15.45	100.82	21.12	1.39	0.06
870	Mobile Equipment	64.48	62.14	1279.42	160.97	4.74	11.47
880	Utility Equipment	4.26	4.09	42.78	1.02	0.01	0.15
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.38	0.38	0.39	0.60	1.00	0.01
TOTAL		1482.64	903.70	3551.80	739.28	70.41	495.31

TABLE C-3

Emissions by Source Category for the South Coast Air Basin for 2020 Baseline First Day of the August 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	3.98	0.54	1.58	2.69	0.07	0.03
130	Petroleum Refining	3.94	1.29	6.96	8.66	2.73	3.61
140	Other Manufacturing/Industrial	23.43	3.80	21.12	31.99	0.90	2.14
150	Electric Utilities	3.81	1.01	2.73	7.27	0.03	0.53
160	Other Service and Commerce	18.61	3.57	38.44	10.84	0.29	1.69
170	Residential	1.87	0.74	4.75	23.65	0.33	1.17
199	Other	1.76	0.50	5.38	1.06	0.09	0.36
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.09	0.00	0.00	0.01
220	Range Management	0.41	0.22	2.25	0.00	0.00	0.33
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.36	0.05	0.24	2.29	0.36	0.16
299	Other	0.16	0.08	0.59	0.89	0.07	0.41
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	14.00	0.15	0.01	0.04	0.00	0.00
320	Degreasing	210.77	122.01	0.00	0.00	0.00	0.00
330	Architectural Coating	121.65	112.83	0.00	0.00	0.00	0.00
340	Other Surface Coating	143.46	132.71	0.34	0.56	0.04	1.25
350	Asphalt Paving	0.73	0.73	0.00	0.00	0.00	0.00
360	Printing	11.24	11.24	0.02	0.06	0.00	0.05
370	Consumer Products	104.81	104.15	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	106.40	37.10	0.00	0.00	0.00	0.00
399	Other	14.54	6.54	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	19.57	11.72	0.00	0.00	0.00	0.00
420	Petroleum Refining	11.46	8.49	4.55	2.60	3.77	2.35
430	Petroleum Marketing	73.86	26.53	0.00	0.00	0.00	0.00
499	Other	3.30	2.72	0.00	0.03	0.00	0.04
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	38.14	26.29	0.05	0.57	1.29	0.80
520	Food and Agricultural	4.59	3.31	0.01	0.06	0.20	5.55
560	Mineral Processes	2.03	1.80	1.04	1.85	1.73	1.22
570	Metal Processes	0.15	0.11	0.07	0.27	0.22	1.09
580	Wood and Paper	0.03	0.02	0.01	0.01	0.00	10.57
599	Other	3.58	2.52	0.01	0.01	0.00	0.08
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	14.02	14.02	0.00	0.00	0.00	0.00
620	Farming Operations	131.14	10.49	0.00	0.00	0.00	14.06
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	98.01
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	202.37
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	53.32
660	Unplanned Fires	1.08	0.76	11.51	0.28	0.00	1.10
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	62.37
680	Waste Disposal	152.18	2.27	0.00	0.00	0.00	4.44
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	19.64	14.73	4.57	2.18	0.21	2.00
692	Hi/LO	0.12	0.09	0.00	0.02	0.01	0.02
693	NSR Exemption	44.03	33.03	3.59	15.48	0.00	0.00
694	Rule 518.2	0.36	0.27	0.03	0.01	0.01	0.04
695	ODC Conversion	14.98	11.24	0.00	0.00	0.00	0.00

699	Other	22.88	10.55	3.51	1.22	0.55	5.93

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	109.40	106.76	1668.80	365.71	19.43	17.93
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	54.93	52.73	284.79	7.18	0.05	2.17
815	Commericial Boats	0.51	0.49	2.02	10.22	1.71	0.18
820	Trains	1.22	1.19	3.70	23.26	1.17	0.43
830	Ships	3.81	3.68	4.80	49.10	37.70	4.59
850	Aircraft - Government	3.49	2.97	8.67	3.03	0.11	0.76
860	Aircraft - Other	17.81	15.46	100.81	21.12	1.39	0.06
870	Mobile Equipment	67.40	64.94	1352.37	164.89	4.79	11.62
880	Utility Equipment	4.82	4.62	48.35	1.15	0.01	0.17
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.42	0.42	0.40	0.60	1.00	0.02
TOTAL		1606.88	973.49	3588.15	760.83	80.26	515.07

ATTACHMENT D

FUTURE YEAR CONTROLLED BASELINE MODELING EMISSIONS

Note:

For these tables, species' fractions of total organic gases (TOG) and NO_x were determined by the UAM speciation profiles. These profiles exclude certain lower reactivity compounds in the definition of VOC compounds, resulting in lower VOC emission totals than reported in the emission inventory appendix.. TOG emissions are equivalent. Mobile source emissions are based on DTIM2.

TABLE D-1

Emisisons by Source Category for the South Coast Air Basin for 2000
with Implementation of Proposed Control Measures (tons/day)
First Day of the August 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	3.09	0.47	1.47	2.97	0.07	0.03
130	Petroleum Refining	2.86	0.94	6.28	11.89	4.02	3.35
140	Other Manufacturing/Industrial	18.95	2.91	16.59	26.34	0.97	1.76
150	Electric Utilities	2.40	0.64	2.13	9.99	0.02	0.38
160	Other Service and Commerce	8.90	1.63	20.12	8.35	0.17	0.99
170	Residential	1.41	0.56	3.60	17.93	0.25	0.89
199	Other	1.03	0.28	3.74	1.36	0.09	0.29
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.11	0.00	0.00	0.01
220	Range Management	0.48	0.26	2.60	0.00	0.00	0.38
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.22	0.03	0.17	2.74	0.48	0.12
299	Other	0.08	0.04	0.41	0.47	0.05	0.29
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	9.38	0.13	0.01	0.03	0.00	0.00
320	Degreasing	131.23	76.96	0.00	0.00	0.00	0.00
330	Architectural Coating	88.56	82.15	0.00	0.00	0.00	0.00
340	Other Surface Coating	85.19	79.28	0.22	0.35	0.03	0.78
350	Asphalt Paving	0.62	0.62	0.00	0.00	0.00	0.00
360	Printing	5.02	5.02	0.01	0.04	0.00	0.03
370	Consumer Products	88.83	88.31	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	48.52	16.80	0.00	0.00	0.00	0.00
399	Other	7.00	3.29	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	16.09	9.52	0.00	0.00	0.00	0.00
420	Petroleum Refining	7.85	5.83	4.11	3.59	5.60	1.70
430	Petroleum Marketing	63.71	21.60	0.00	0.00	0.00	0.00
499	Other	1.86	1.58	0.00	0.02	0.00	0.02
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	19.59	13.58	0.03	0.56	1.63	0.45
520	Food and Agricultural	4.61	3.32	0.02	0.06	0.20	5.36
560	Mineral Processes	1.34	1.20	0.81	2.53	2.49	1.09
570	Metal Processes	0.08	0.06	0.06	0.28	0.28	0.81
580	Wood and Paper	0.02	0.01	0.01	0.01	0.00	0.53
599	Other	1.49	1.05	0.00	0.00	0.00	0.06
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	11.52	11.52	0.00	0.00	0.00	0.00
620	Farming Operations	104.98	8.40	0.00	0.00	0.00	9.49
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	75.06
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	127.92
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	47.46
660	Unplanned Fires	0.87	0.61	8.90	0.22	0.00	0.93
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	0.00
680	Waste Disposal	103.64	1.69	0.00	0.00	0.00	3.47
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	5.97	4.47	1.97	1.53	0.06	0.66
692	Hi/LO	0.12	0.09	0.00	0.02	0.01	0.02

693	NSR Exemption	14.75	11.06	1.20	5.18	0.00	0.00
694	Rule 518.2	0.36	0.27	0.03	0.01	0.01	0.04
695	ODC Conversion	12.47	9.35	0.00	0.00	0.00	0.00
699	Other	11.19	5.45	2.11	1.13	0.48	4.14

700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	344.07	321.71	2740.90	503.83	14.03	16.54
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	37.60	36.10	193.34	4.72	0.03	1.40
815	Commericial Boats	0.49	0.48	1.97	8.82	1.65	0.17
820	Trains	1.39	1.35	4.21	26.42	1.32	0.49
830	Ships	2.49	2.41	3.18	32.37	24.68	3.02
850	Aircraft - Government	3.49	2.97	8.67	3.03	0.11	0.76
860	Aircraft - Other	14.67	12.80	89.51	16.58	1.11	0.05
870	Mobile Equipment	60.25	58.07	1178.73	203.60	4.39	10.97
880	Utility Equipment	9.89	9.50	104.12	1.54	0.01	0.24
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.26	0.26	0.37	0.76	1.48	0.01
TOTAL		1360.90	916.64	4401.70	899.27	65.73	322.19

TABLE D-2

Emissions by Source Category for the South Coast Air Basin for 2010
with Implementation of proposed Control Measures
First Day of the August 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	2.26	0.40	1.43	2.63	0.07	0.03
130	Petroleum Refining	1.22	0.25	6.02	8.60	2.72	3.08
140	Other Manufacturing/Industrial	17.20	2.55	17.68	15.65	0.91	1.81
150	Electric Utilities	1.78	0.47	2.32	7.12	0.02	0.41
160	Other Service and Commerce	7.52	1.45	25.76	5.91	0.19	1.20
170	Residential	1.62	0.65	4.13	13.64	0.29	1.02
199	Other	0.78	0.21	4.17	0.72	0.07	0.29
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.10	0.00	0.00	0.01
220	Range Management	0.45	0.25	2.45	0.00	0.00	0.36
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.07	0.01	0.19	1.95	0.33	0.12
299	Other	0.05	0.02	0.46	0.28	0.04	0.31
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	11.26	0.15	0.01	0.03	0.00	0.00
320	Degreasing	101.12	41.09	0.00	0.00	0.00	0.00
330	Architectural Coating	26.34	24.43	0.00	0.00	0.00	0.00
340	Other Surface Coating	59.18	55.06	0.28	0.44	0.03	0.99
350	Asphalt Paving	0.70	0.70	0.00	0.00	0.00	0.00
360	Printing	4.41	4.41	0.02	0.05	0.00	0.04
370	Consumer Products	19.95	19.86	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	35.59	10.53	0.00	0.00	0.00	0.00
399	Other	5.22	2.22	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	5.66	3.03	0.00	0.00	0.00	0.00
420	Petroleum Refining	1.42	1.07	3.94	2.59	3.77	1.56
430	Petroleum Marketing	17.24	5.56	0.00	0.00	0.00	0.00
499	Other	0.68	0.60	0.00	0.01	0.00	0.03
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	14.47	9.96	0.03	0.54	1.29	0.57
520	Food and Agricultural	3.54	2.58	0.01	0.05	0.20	2.56
560	Mineral Processes	0.53	0.42	0.84	1.82	1.73	1.03
570	Metal Processes	0.06	0.04	0.06	0.19	0.20	0.83
580	Wood and Paper	0.02	0.02	0.01	0.00	0.00	0.61
599	Other	1.29	0.91	0.00	0.00	0.00	0.06
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	6.24	6.24	0.00	0.00	0.00	0.00
620	Farming Operations	97.25	7.78	0.00	0.00	0.00	8.77
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	84.92
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	136.70
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	37.86
660	Unplanned Fires	0.96	0.67	10.02	0.24	0.00	1.00
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	0.00
680	Waste Disposal	90.21	1.40	0.00	0.00	0.00	3.93
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	19.63	14.72	4.56	2.18	0.21	2.00
692	Hi/LO	0.12	0.09	0.00	0.02	0.01	0.02
693	NSR Exemption	44.00	33.00	3.58	15.46	0.00	0.00

694	Rule 518.2	0.36	0.27	0.03	0.01	0.01	0.04
695	ODC Conversion	14.97	11.23	0.00	0.00	0.00	0.00
699	Other	5.56	1.88	2.50	0.97	0.39	4.49

700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	80.22	75.57	1206.69	280.06	16.74	15.37
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	22.09	21.21	205.03	5.90	0.04	1.82
815	Commericial Boats	0.40	0.39	1.72	5.64	1.71	0.18
820	Trains	1.06	1.03	3.49	8.33	1.28	0.47
830	Ships	2.41	2.33	3.32	29.00	30.52	3.73
850	Aircraft - Government	2.73	2.33	7.38	2.97	0.11	0.76
860	Aircraft - Other	11.00	9.56	85.80	15.36	1.39	0.06
870	Mobile Equipment	20.45	19.77	205.63	94.30	4.74	11.47
880	Utility Equipment	3.34	3.21	36.41	1.00	0.01	0.15
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.23	0.23	0.39	0.59	1.00	0.01
TOTAL		764.91	401.82	1846.46	524.29	70.03	330.65

TABLE D-3

Emissions by Source Category for the South Coast Air Basin for 2020 with Implementation of Proposed Control Measures (tons/day) First Day of the August 1987 Episode

CODE	Source Name	TOG	VOC	CO	NOx	SOx	PM10
100	Fuel Combustion	0.00	0.00	0.00	0.00	0.00	0.00
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	2.50	0.42	1.45	2.63	0.07	0.03
130	Petroleum Refining	1.42	0.29	6.17	8.60	2.72	3.12
140	Other Manufacturing/Industrial	18.31	2.78	19.54	15.69	0.89	1.95
150	Electric Utilities	2.10	0.56	2.42	7.13	0.02	0.45
160	Other Service and Commerce	10.52	2.08	34.28	6.76	0.24	1.52
170	Residential	1.87	0.74	4.75	15.68	0.33	1.17
199	Other	0.97	0.28	4.77	0.74	0.07	0.31
200	Waste Burning	0.00	0.00	0.00	0.00	0.00	0.00
210	Agricultural Debris	0.01	0.01	0.09	0.00	0.00	0.01
220	Range Management	0.41	0.22	2.25	0.00	0.00	0.33
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.10	0.01	0.21	1.97	0.34	0.13
299	Other	0.06	0.03	0.52	0.31	0.05	0.36
300	Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
310	Dry Cleaning	13.02	0.15	0.01	0.04	0.00	0.00
320	Degreasing	127.26	51.46	0.00	0.00	0.00	0.00
330	Architectural Coating	30.41	28.21	0.00	0.00	0.00	0.00
340	Other Surface Coating	75.82	70.41	0.34	0.55	0.04	1.23
350	Asphalt Paving	0.73	0.73	0.00	0.00	0.00	0.00
360	Printing	6.34	6.34	0.02	0.06	0.00	0.05
370	Consumer Products	22.65	22.54	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	51.40	15.03	0.00	0.00	0.00	0.00
399	Other	7.22	2.97	0.00	0.00	0.00	0.02
400	Petroleum Process, Storage & Transfer	0.00	0.00	0.00	0.00	0.00	0.00
410	Oil and Gas Extraction	6.00	3.24	0.00	0.00	0.00	0.00
420	Petroleum Refining	1.67	1.26	4.04	2.59	3.77	1.58
430	Petroleum Marketing	18.18	6.47	0.00	0.00	0.00	0.00
499	Other	0.88	0.77	0.00	0.01	0.00	0.04
500	Industrial Processes	0.00	0.00	0.00	0.00	0.00	0.00
510	Chemical	20.10	13.79	0.04	0.56	1.29	0.75
520	Food and Agricultural	3.45	2.52	0.01	0.05	0.20	2.47
560	Mineral Processes	0.64	0.51	0.92	1.82	1.73	1.05
570	Metal Processes	0.08	0.06	0.06	0.20	0.20	0.95
580	Wood and Paper	0.03	0.02	0.01	0.00	0.00	0.69
599	Other	1.98	1.39	0.01	0.00	0.00	0.06
600	Miscellaneous Processes	0.00	0.00	0.00	0.00	0.00	0.00
610	Pesticide Application	6.75	6.75	0.00	0.00	0.00	0.00
620	Farming Operations	92.19	7.38	0.00	0.00	0.00	8.37
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	88.21
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	143.68
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	37.86
660	Unplanned Fires	1.08	0.76	11.51	0.28	0.00	1.10
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	0.00
680	Waste Disposal	101.96	1.52	0.00	0.00	0.00	4.44
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	19.64	14.73	4.57	2.18	0.21	2.00
692	Hi/LO	0.12	0.09	0.00	0.02	0.01	0.02
693	NSR Exemption	44.03	33.03	3.59	15.48	0.00	0.00

694	Rule 518.2	0.36	0.27	0.03	0.01	0.01	0.04
695	ODC Conversion	14.98	11.24	0.00	0.00	0.00	0.00
699	Other	7.86	2.50	3.13	1.08	0.43	5.33

700	On-Road Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
710	Light-Duty Passenger	0.00	0.00	0.00	0.00	0.00	0.00
720	Light- and Medium-Duty Trucks	0.00	0.00	0.00	0.00	0.00	0.00
730	Heavy-Duty Gas Trucks	0.00	0.00	0.00	0.00	0.00	0.00
740	Heavy-Duty Diesel Trucks	0.00	0.00	0.00	0.00	0.00	0.00
750	Motorcycles	0.00	0.00	0.00	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	53.47	51.38	1122.68	269.97	19.12	17.01
800	Other Mobile	0.00	0.00	0.00	0.00	0.00	0.00
810	Off-Road Vehicles	26.19	25.14	242.35	7.05	0.05	2.17
815	Commericial Boats	0.40	0.39	1.72	5.64	1.71	0.18
820	Trains	0.96	0.93	3.15	7.54	1.17	0.43
830	Ships	2.98	2.88	4.08	35.66	37.70	4.59
850	Aircraft - Government	2.73	2.33	7.38	2.97	0.11	0.76
860	Aircraft - Other	11.02	9.57	85.79	15.36	1.39	0.06
870	Mobile Equipment	21.17	20.47	213.77	96.26	4.79	11.62
880	Utility Equipment	3.77	3.62	41.14	1.13	0.01	0.17
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00
900	Unspecified Sources	0.28	0.28	0.39	0.59	1.00	0.01
TOTAL		838.07	430.51	1827.21	526.62	79.68	346.32

ATTACHMENT E

SUBREGIONAL MODEL PERFORMANCE STATISTICS - BASE EMISSIONS

TABLE E-1

Ozone Performance Statistics for August 27, 1987 (87b_01)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	12.00	16.00	11.00	14.00	22.00	24.00	13.00	24.00
Peak station	Simi Vly	Reseda	El Toro	La Habra	Glendora	Rubidoux	Hesperia	Rubidoux
Peak time (PST)	1100	1400	1300	1100	1300	1400	1800	1400
Accuracy (percent):								
Paired peak prediction	-25.917	-32.437	-9.727	-65.571	-66.409	-51.167	-24.692	-51.167
(Peak prediction)	8.89	10.81	9.93	4.82	7.39	11.72	9.79	11.72
Temporally-paired peak pred.	-25.917	-32.437	-9.727	-55.929	-61.182	-50.250	-24.692	-50.250
(Peak prediction)	8.89	10.81	9.93	6.17	8.54	11.94	9.79	11.94
(Station at pred. peak)	Simi Vly	Reseda	El Toro	Anaheim	Pomona	Crestlin	Hesperia	Crestlin
Spatially-paired peak pred.	-3.333	-28.062	-9.727	-50.571	-63.182	-45.875	-12.692	-45.875
(Peak prediction)	11.60	11.51	9.93	6.92	8.10	12.99	11.35	12.99
(Time of pred. peak-PST)	1400	1600	1300	1500	1400	1500	1700	1500
Unpaired peak prediction	-3.333	-28.062	-9.727	-45.429	-61.182	-39.583	-12.692	-39.583
(Peak prediction)	11.60	11.51	9.93	7.64	8.54	14.50	11.35	14.50
(Station at pred. peak)	Simi Vly	Reseda	El Toro	Anaheim	Pomona	Perris	Hesperia	Perris
(Time of pred. peak-PST)	1400	1600	1300	1300	1300	1600	1700	1600
Average peak prediction	5.738	31.199	9.727	40.376	61.087	38.044	13.153	27.641
Normalized systematic bias (%)	-9.455	-19.413	-11.680	-43.973	-51.502	-35.065	-43.923	-35.087
Systematic bias (pphm)	-0.952	-2.505	-1.001	-4.539	-7.328	-5.423	-4.062	-4.517
Variance	4.788	8.454	1.031	5.260	9.441	16.566	10.130	10.781
Normalized gross error (%)	23.270	25.187	11.680	43.973	51.502	39.811	45.553	38.902
Gross error (pphm)	2.141	3.019	1.001	4.539	7.328	5.850	4.208	4.855

TABLE E-2

Ozone Performance Statistics for August 28, 1987 (87b_01)
(concentrations greater than or equal to 10.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	15.00	17.00	11.00	16.00	29.00	24.00	11.00	29.00
Peak station	Simi Vly	Burbank	El Toro	Pico Riv	Glendora	Rubidoux	Hesperia	Glendora
Peak time (PST)	1100	1300	1300	1200	1400	1400	1800	1400
Accuracy (percent):								
Paired peak prediction	-28.000	-38.118	-4.182	-65.313	-62.690	-48.958	-17.273	-62.690
(Peak prediction)	10.80	10.52	10.54	5.55	10.82	12.25	9.10	10.82
Temporally-paired peak pred.	-28.000	-11.118	-4.182	-46.938	-60.310	-26.792	-11.818	-39.414
(Peak prediction)	10.80	15.11	10.54	8.49	11.51	17.57	9.70	17.57
(Station at pred. peak)	Simi Vly	Reseda	El Toro	Anaheim	Pomona	Perris	Lancaste	Perris
Spatially-paired peak pred.	-22.933	-28.706	-4.182	-52.813	-62.103	-42.708	8.000	-62.103
(Peak prediction)	11.56	12.12	10.54	7.55	10.99	13.75	11.88	10.99
(Time of pred. peak-PST)	1200	1400	1300	1400	1300	1600	1500	1300
Unpaired peak prediction	-22.933	-11.118	-4.182	-42.750	-60.310	-26.792	8.000	-39.414
(Peak prediction)	11.56	15.11	10.54	9.16	11.51	17.57	11.88	17.57
(Station at pred. peak)	Simi Vly	Reseda	El Toro	Anaheim	Pomona	Perris	Hesperia	Perris
(Time of pred. peak-PST)	1200	1300	1300	1300	1400	1400	1500	1400
Average peak prediction	22.331	22.118	5.606	32.964	60.803	28.827	8.000	23.734
Normalized systematic bias (%)	-16.153	-15.136	-8.061	-42.342	-45.647	-20.418	-21.865	-25.639
Systematic bias (pphm)	-1.890	-2.276	-0.820	-5.236	-8.469	-3.740	-2.292	-4.043
Variance	2.388	13.288	0.587	8.438	19.985	17.567	13.542	12.828
Normalized gross error (%)	16.776	25.616	8.061	42.342	45.647	26.509	25.385	29.275
Gross error (pphm)	1.954	3.443	0.820	5.236	8.469	4.451	2.672	4.458

TABLE E-3

NO2 Performance Statistics for August 27, 1987 (87b_01)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	7.00	9.00	7.00	13.00	13.00	13.00	8.00	13.00
Peak station	Simi Vly	Burbank	West Los	Los Ange	Pomona	Upland	Barstow	Upland

Peak time (PST)	2100	1100	700	900	1000	900	600	900
Accuracy (percent):								
Paired peak prediction	-47.714	-23.000	-31.143	-43.462	-73.385	-78.769	-95.625	-78.769
(Peak prediction)	3.66	6.93	4.82	7.35	3.46	2.76	0.35	2.76
Temporally-paired peak pred.	-39.429	-23.000	-26.000	-42.308	-53.077	-77.462	-88.375	-42.308
(Peak prediction)	4.24	6.93	5.18	7.50	6.10	2.93	0.93	7.50
(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Pico Riv	Pasadena	San Bern	Palm Spr	Pico Riv
Spatially-paired peak pred.	-40.143	-21.333	-2.714	-42.923	-21.385	-29.077	-94.125	-29.077
(Peak prediction)	4.19	7.08	6.81	7.42	10.22	9.22	0.47	9.22
(Time of pred. peak-PST)	2300	1900	1000	1700	1900	1900	500	1900
Unpaired peak prediction	-37.714	-14.667	-2.714	-30.231	-21.385	-29.077	-85.625	-21.385
(Peak prediction)	4.36	7.68	6.81	9.07	10.22	9.22	1.15	10.22
(Station at pred. peak)	El Rio-R	Reseda	West Los	Pico Riv	Pomona	Upland	Lancaste	Pomona
(Time of pred. peak-PST)	2000	2100	1000	1000	1900	1900	2300	1900
Average peak prediction	41.524	19.111	10.042	22.519	6.722	23.672	88.813	32.566
Normalized systematic bias (%)	2.861	-22.687	65.309	14.878	-20.199	-10.682	-82.116	-3.569
Systematic bias (pphm)	-0.218	-1.047	1.685	0.397	-1.511	-1.617	-2.939	-0.641
Variance	2.122	1.909	2.216	3.336	9.546	10.916	3.472	5.407
Normalized gross error (%)	40.535	29.802	70.528	27.536	40.477	66.217	82.116	47.707
Gross error (pphm)	1.134	1.424	1.946	1.384	2.747	3.053	2.939	2.118

TABLE E-4

NO2 Performance Statistics for August 28, 1987 (87b_01)
(concentrations greater than or equal to 2.0 pphm)

y	1	2	3	4	5	6	7	ALL
Peak station measurement	5.00	13.00	9.00	13.00	15.00	13.00	10.00	15.00
Peak station	Simi Vly	Burbank	Long Bea	Los Ange	Azusa	San Bern	Barstow	Azusa
Peak time (PST)	2100	1000	1100	900	1000	900	600	1000
Accuracy (percent):								
Paired peak prediction	-56.600	-35.923	31.444	-12.077	-62.200	-72.692	-94.500	-62.200
(Peak prediction)	2.17	8.33	11.83	11.43	5.67	3.55	0.55	5.67

Temporally-paired peak pred.	-26.000	-35.923	31.444	-12.077	-62.200	-59.154	-84.800	-25.467
(Peak prediction)	3.70	8.33	11.83	11.43	5.67	5.31	1.52	11.18
(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Los Ange	Azusa	Rubidoux	Palm Spr	Long Bea
Spatially-paired peak pred.	-26.000	-15.692	31.444	-12.077	-18.867	-35.769	-93.400	-18.867
(Peak prediction)	3.70	10.96	11.83	11.43	12.17	8.35	0.66	12.17
(Time of pred. peak-PST)	100	1200	1100	900	1400	0	500	1400
Unpaired peak prediction	-24.600	-15.692	31.444	-12.077	-4.533	-35.769	-84.000	-4.533
(Peak prediction)	3.77	10.96	11.83	11.43	14.32	8.35	1.60	14.32
(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Los Ange	Pasadena	San Bern	Palm Spr	Pasadena
(Time of pred. peak-PST)	2000	1200	1100	900	1300	0	800	1300
Average peak prediction	25.133	15.692	96.012	17.599	13.133	42.827	87.813	50.630

Normalized systematic bias (%)	-0.412	-9.656	111.658	56.184	19.292	-3.948	-74.220	23.957
Systematic bias (pphm)	-0.228	-0.755	3.167	2.069	0.619	-1.752	-3.432	0.338
Variance	1.267	3.229	3.338	5.770	14.178	12.119	6.325	7.447
Normalized gross error (%)	31.541	25.344	112.084	62.761	43.490	58.733	74.220	60.125
Gross error (pphm)	0.863	1.537	3.175	2.568	3.121	3.170	3.432	2.701

TABLE E-5

RHC Performance Statistics for August 27, 1987 (87b_01)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	4.20	11.20	9.80	64.40	18.20	37.80	-9.99	64.40
Peak station	El Rio-R	Reseda	West Los	La Habra	Azusa	Rubidoux	Lancaste	La Habra
Peak time (PST)	800	600	700	500	800	400	2300	500
Accuracy (percent):								
Paired peak prediction	-51.667	-62.321	-26.122	-92.391	-87.473	-92.778	73.510	-92.391
(Peak prediction)	2.03	4.22	7.24	4.90	2.28	2.73	-9.99	4.90
Temporally-paired peak pred.	-51.667	-62.321	-26.122	-90.093	-87.473	-92.778	73.510	-90.093
(Peak prediction)	2.03	4.22	7.24	6.38	2.28	2.73	-9.99	6.38

(Station at pred. peak) El Rio-R Reseda West Los Los Ange Azusa Rubidoux Lancaste Los
Ange
Spatially-paired peak pred. -44.286 -43.661 6.735 -88.307 -50.055 -83.624 73.510 -
88.307
(Peak prediction) 2.34 6.31 10.46 7.53 9.09 6.19 -9.99 7.53
(Time of pred. peak-PST) 2000 2300 2300 1200 2300 1700 2300 1200
Unpaired peak prediction -44.286 -43.661 6.735 -83.385 -50.055 -83.624 73.510 -
83.385
(Peak prediction) 2.34 6.31 10.46 10.70 9.09 6.19 -9.99 10.70
(Station at pred. peak) El Rio-R Reseda West Los Los Ange Azusa Rubidoux Lancaste Los
Ange
(Time of pred. peak-PST) 2000 2300 2300 800 2300 1700 2300 800
Average peak prediction 44.286 43.661 6.735 84.370 50.055 83.624 -9.999 59.005

Normalized systematic bias (%) -1.842 -42.309 154.588 33.192 -53.331 -31.182 -9.999
16.672
Systematic bias (pptm) -0.284 -2.876 2.528 -4.140 -7.141 -9.930 -9.999 -3.864
Variance 0.845 2.801 4.558 162.956 29.962 136.316 -9.999 84.572
Normalized gross error (%) 36.548 43.551 158.518 80.382 55.545 81.865 -9.999
78.645
Gross error (pptm) 0.769 2.928 2.800 6.660 7.274 10.940 -9.999 5.740

TABLE E-6

RHC Performance Statistics for August 28, 1987 (87b_01)
(concentrations greater than or equal to 1.0 pptm)

1 2 3 4 5 6 7 ALL
Peak station measurement 2.80 14.00 28.00 84.00 43.40 29.40 -9.99 84.00
Peak station El Rio-R Reseda West Los La Habra Azusa Rubidoux Lancaste La Habra
Peak time (PST) 1100 600 200 200 600 400 2300 200

Accuracy (percent):
Paired peak prediction -42.857 -63.429 -59.643 -91.321 -87.696 -76.769 -9.999 -
91.321
(Peak prediction) 1.60 5.12 11.30 7.29 5.34 6.83 -9.99 7.29
Temporally-paired peak pred. -42.857 -63.429 -59.643 -84.417 -87.696 -76.769 -9.999 -
84.417
(Peak prediction) 1.60 5.12 11.30 13.09 5.34 6.83 -9.99 13.09
(Station at pred. peak) El Rio-R Reseda West Los Los Ange Azusa Rubidoux Lancaste Los
Ange

Spatially-paired peak pred. -22.143 -43.357 -58.214 -90.429 -77.903 -74.728 -9.999 -
90.429
(Peak prediction) 2.18 7.93 11.70 8.04 9.59 7.43 -9.99 8.04
(Time of pred. peak-PST) 500 400 400 400 1400 500 2300 400
Unpaired peak prediction -22.143 -43.357 -58.214 -81.226 -77.903 -74.728 -9.999 -
81.226
(Peak prediction) 2.18 7.93 11.70 15.77 9.59 7.43 -9.99 15.77
(Station at pred. peak) El Rio-R Reseda West Los Los Ange Azusa Rubidoux Lancaste Los
Ange
(Time of pred. peak-PST) 500 400 400 500 1400 500 2300 500
Average peak prediction 22.143 43.357 58.214 83.067 77.903 74.728 -9.999
60.165

Normalized systematic bias (%) 3.194 -37.458 117.273 -17.556 -40.982 -63.706 -9.999 -
7.230
Systematic bias (pptm) -0.056 -3.019 2.520 -6.846 -11.053 -9.855 -9.999 -5.152
Variance 0.349 6.413 28.616 222.987 139.017 42.605 -9.999 108.422
Normalized gross error (%) 28.631 42.800 125.746 43.398 48.112 63.706 -9.999
56.008
Gross error (pptm) 0.502 3.167 4.570 7.986 11.386 9.855 -9.999 6.680

TABLE E-7

Ozone Performance Statistics for June 24, 1987 (b_01)
(concentrations greater than or equal to 8.0 pphm)

1 2 3 4 5 6 7 ALL
Peak station measurement 14.00 20.00 12.00 14.00 25.00 23.00 14.00 25.00
Peak station Simi Vly Newhall West Los Pico Riv Claremon San Bern Hesperia
Claremon
Peak time (PST) 1200 1400 1300 1400 1400 1400 2000 1400

Accuracy (percent):
Paired peak prediction -12.000 -23.500 -47.833 -75.643 -65.160 -53.783 -77.357 -
65.160
(Peak prediction) 12.32 15.30 6.26 3.41 8.71 10.63 3.17 8.71
Temporally-paired peak pred. -12.000 -23.500 -47.833 -57.929 -65.160 -32.739 -70.929 -
38.120
(Peak prediction) 12.32 15.30 6.26 5.89 8.71 15.47 4.07 15.47
(Station at pred. peak) Simi Vly Newhall West Los Los Ange Claremon Redlands Palm Spr
Redlands
Spatially-paired peak pred. -12.000 -23.500 -47.000 -72.500 -65.160 -49.435 0.643 -
65.160

(Peak prediction)	12.32	15.30	6.36	3.85	8.71	11.63	14.09	8.71
(Time of pred. peak-PST)	1200	1400	1200	1200	1400	1300	1600	1400
Unpaired peak prediction	-12.000	-23.500	-47.000	-57.929	-65.160	-32.217	0.643	-37.640
(Peak prediction)	12.32	15.30	6.36	5.89	8.71	15.59	14.09	15.59
(Station at pred. peak)	Simi Vly	Newhall	West Los	Los Ange	Claremon	Redlands	Hesperia	Redlands
(Time of pred. peak-PST)	1200	1400	1200	1400	1400	1500	1600	1500
Average peak prediction	17.044	37.556	52.906	47.536	67.007	33.814	3.422	34.390
Normalized systematic bias (%)	-30.265	-53.879	-55.141	-56.135	-68.854	-39.722	-28.154	-44.436
Systematic bias (pphm)	-2.974	-7.906	-5.179	-5.862	-10.875	-6.348	-3.101	-6.112
Variance	2.312	11.646	1.650	6.053	13.952	16.007	26.086	12.678
Normalized gross error (%)	30.596	53.879	55.141	56.135	68.854	41.260	46.422	47.371
Gross error (pphm)	3.004	7.906	5.179	5.862	10.875	6.497	4.696	6.373

TABLE E-8

Ozone Performance Statistics for June 25, 1987 (b_01)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	12.00	21.00	12.00	12.00	23.00	24.00	16.00	24.00
Peak station	Simi Vly	Newhall	West Los	Los Ange	Glendora	San Bern	Palm Spr	San Bern
Peak time (PST)	1300	1300	1300	1000	1200	1400	1800	1400
Accuracy (percent):								
Paired peak prediction	-9.833	-51.333	-52.500	-81.917	-66.043	-52.208	-67.250	-52.208
(Peak prediction)	10.82	10.22	5.70	2.17	7.81	11.47	5.24	11.47
Temporally-paired peak pred.	-9.833	-51.333	-52.500	-62.583	-66.043	-40.292	-35.125	-40.292
(Peak prediction)	10.82	10.22	5.70	4.49	7.81	14.33	10.38	14.33
(Station at pred. peak)	Simi Vly	Newhall	West Los	La Habra	Glendora	Crestlin	Hesperia	Crestlin
Spatially-paired peak pred.	-8.917	-50.810	-48.000	-61.250	-65.783	-48.208	-47.063	-48.208
(Peak prediction)	10.93	10.33	6.24	4.65	7.87	12.43	8.47	12.43
(Time of pred. peak-PST)	1400	1400	1200	1300	1300	1300	1700	1300
Unpaired peak prediction	-8.917	-50.810	-48.000	-49.083	-63.478	-34.542	-21.500	-34.542
(Peak prediction)	10.93	10.33	6.24	6.11	8.40	15.71	12.56	15.71

(Station at pred. peak)	Simi Vly	Newhall	West Los	La Habra	Claremon	Redlands	Barstow	Redlands
(Time of pred. peak-PST)	1400	1400	1200	1200	1300	1500	1900	1500
Average peak prediction	18.676	57.477	55.813	43.992	61.276	33.234	17.807	38.111
Normalized systematic bias (%)	-35.548	-56.711	-53.874	-59.257	-58.646	-31.026	-30.173	-40.249
Systematic bias (pphm)	-3.225	-8.169	-5.114	-5.700	-8.241	-4.497	-3.179	-4.941
Variance	3.615	8.733	0.858	4.357	10.704	11.407	18.882	9.891
Normalized gross error (%)	35.982	56.711	53.874	59.257	58.646	32.246	39.645	42.339
Gross error (pphm)	3.266	8.169	5.114	5.700	8.241	4.605	4.010	5.125

TABLE E-9

NO2 Performance Statistics for June 24, 1987 (b_01)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	5.00	8.00	5.00	8.00	9.00	9.00	10.00	10.00
Peak station	Simi Vly	Burbank	West Los	Lynwood	Pomona	Upland	Barstow	Barstow
Peak time (PST)	1900	900	800	1100	1000	800	600	600
Accuracy (percent):								
Paired peak prediction	-75.600	-32.750	1.600	14.000	-47.000	-45.778	-99.100	-99.100
(Peak prediction)	1.22	5.38	5.08	9.12	4.77	4.88	0.09	0.09
Temporally-paired peak pred.	-75.600	-32.750	29.800	14.000	-7.333	-45.778	-84.900	-44.000
(Peak prediction)	1.22	5.38	6.49	9.12	8.34	4.88	1.51	5.60
(Station at pred. peak)	Simi Vly	Burbank	Long Bea	Lynwood	Pasadena	Upland	Lancaste	Long Bea
Spatially-paired peak pred.	-75.600	22.250	17.800	14.000	-2.000	-0.556	-98.500	-98.500
(Peak prediction)	1.22	9.78	5.89	9.12	8.82	8.95	0.15	0.15
(Time of pred. peak-PST)	1900	1200	900	1100	1900	1900	400	400
Unpaired peak prediction	-66.400	22.250	45.000	36.750	37.667	-0.556	-80.500	23.900
(Peak prediction)	1.68	9.78	7.25	10.94	12.39	8.95	1.95	12.39
(Station at pred. peak)	El Rio-R	Burbank	L.B. Cit	Pico Riv	Pasadena	Upland	Lancaste	Pasadena
(Time of pred. peak-PST)	900	1200	1600	1300	1300	1900	700	1300

Average peak prediction	41.200	22.250	36.406	29.586	38.326	4.250	87.250	38.771
Normalized systematic bias (%)	-69.661	8.474	54.781	34.886	24.206	-8.953	-81.318	10.283
Systematic bias (pphm)	-1.871	0.367	1.229	0.952	0.906	-0.762	-3.257	0.148
Variance	0.714	2.391	3.124	3.535	5.547	4.392	4.900	3.805
Normalized gross error (%)	69.661	25.895	73.243	49.997	41.537	31.918	81.318	50.746
Gross error (pphm)	1.871	1.262	1.738	1.586	2.058	1.742	3.257	1.858

TABLE E-10

NO2 Performance Statistics for June 25, 1987 (b_01)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	6.00	11.00	7.00	11.00	9.00	11.00	11.00	11.00
Peak station	Simi Vly	Burbank	West Los	Los Ange	Pomona	Upland	Barstow	Barstow
Peak time (PST)	700	900	800	900	1200	900	300	300
Accuracy (percent):								
Paired peak prediction	-85.167	-53.545	-25.571	-16.909	-52.444	-61.909	-99.273	-99.273
(Peak prediction)	0.89	5.11	5.21	9.14	4.28	4.19	0.08	0.08
Temporally-paired peak pred.	-85.167	-53.545	-13.429	-16.909	18.000	-61.909	-96.727	-32.818
(Peak prediction)	0.89	5.11	6.06	9.14	10.62	4.19	0.36	7.39
(Station at pred. peak)	Simi Vly	Burbank	Long Bea	Los Ange	Pasadena	Upland	Palm Spr	Upland
Spatially-paired peak pred.	-72.333	17.818	-4.143	-16.909	-7.000	-15.545	-99.091	-99.091
(Peak prediction)	1.66	12.96	6.71	9.14	8.37	9.29	0.10	0.10
(Time of pred. peak-PST)	900	1200	900	900	1900	1900	400	400
Unpaired peak prediction	-72.333	17.818	13.286	8.182	31.111	-15.545	-90.364	17.818
(Peak prediction)	1.66	12.96	7.93	11.90	11.80	9.29	1.06	12.96
(Station at pred. peak)	Simi Vly	Burbank	Long Bea	Pico Riv	Glendora	Upland	Palm Spr	Burbank
(Time of pred. peak-PST)	900	1200	1100	1400	1800	1900	600	1200
Average peak prediction	48.417	17.818	23.286	19.856	35.912	15.846	93.784	38.709

Normalized systematic bias (%)	-64.520	-16.089	56.274	35.185	10.219	-7.096	-85.419	5.960
Systematic bias (pphm)	-1.939	-1.183	1.389	0.916	0.265	-0.888	-3.022	-0.111
Variance	1.038	6.013	3.517	4.627	6.622	5.369	5.913	4.934
Normalized gross error (%)	64.520	33.574	71.003	52.369	36.634	33.403	85.419	51.262
Gross error (pphm)	1.939	2.148	1.879	1.849	2.125	1.933	3.022	2.058

TABLE E-11

RHC Performance Statistics for June 24, 1987 (b_01)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	12.60	5.60	7.00	14.00	19.60	21.00	-9.99	21.00
Peak station	Simi Vly	Reseda	West Los	Lynwood	Azusa	Rubidoux	Lancaste	Rubidoux
Peak time (PST)	900	1000	800	1000	1400	800	700	800
Accuracy (percent):								
Paired peak prediction	-84.127	-10.893	-19.571	-37.429	-67.347	-89.048	-9.999	-89.048
(Peak prediction)	2.00	4.99	5.63	8.76	6.40	2.30	-9.99	2.30
Temporally-paired peak pred.	-84.127	-10.893	-19.571	-37.429	-67.347	-89.048	-9.999	-68.333
(Peak prediction)	2.00	4.99	5.63	8.76	6.40	2.30	-9.99	6.65
(Station at pred. peak)	Simi Vly	Reseda	West Los	Lynwood	Azusa	Rubidoux	Lancaste	Lynwood
Spatially-paired peak pred.	-83.016	-9.821	-19.571	-37.429	-59.694	-80.810	-9.999	-80.810
(Peak prediction)	2.14	5.05	5.63	8.76	7.90	4.03	-9.99	4.03
(Time of pred. peak-PST)	800	1400	800	1000	1500	2000	700	2000
Unpaired peak prediction	-83.016	-9.821	-19.571	-37.429	-59.694	-80.810	-9.999	-58.286
(Peak prediction)	2.14	5.05	5.63	8.76	7.90	4.03	-9.99	8.76
(Station at pred. peak)	Simi Vly	Reseda	West Los	Lynwood	Azusa	Rubidoux	Lancaste	Lynwood
(Time of pred. peak-PST)	800	1400	800	1000	1500	2000	700	1000
Average peak prediction	67.817	9.821	19.571	42.790	59.694	80.810	-9.999	56.856
Normalized systematic bias (%)	-65.530	29.223	-10.399	13.538	-52.451	-24.809	-9.999	-17.909
Systematic bias (pptm)	-5.148	0.073	-0.996	-1.765	-6.800	-4.066	-9.999	-3.124

Variance	17.487	3.307	2.824	11.440	12.217	26.873	-9.999	12.449
Normalized gross error (%)	65.530	63.105	38.690	67.523	52.451	64.707	-9.999	60.969
Gross error (pptm)	5.148	1.480	1.557	3.048	6.800	4.794	-9.999	3.839

TABLE E-12

RHC Performance Statistics for June 25, 1987 (b_01)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	16.80	9.80	9.80	11.20	21.00	16.80	-9.99	21.00
Peak station	Simi Vly	Reseda	West Los	La Habra	Azusa	Rubidoux	Lancaste	Azusa
Peak time (PST)	800	700	800	700	1100	600	700	1100
Accuracy (percent):								
Paired peak prediction	-90.536	-69.082	-28.776	-72.321	-77.571	-80.833	-9.999	-77.571
(Peak prediction)	1.59	3.03	6.98	3.10	4.71	3.22	-9.99	4.71
Temporally-paired peak pred.	-90.536	-69.082	-28.776	-19.107	-77.571	-80.833	-9.999	-55.857
(Peak prediction)	1.59	3.03	6.98	9.06	4.71	3.22	-9.99	9.27
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Lynwood
Spatially-paired peak pred.	-87.976	-54.694	-24.694	-65.625	-58.286	-75.060	-9.999	-58.286
(Peak prediction)	2.02	4.44	7.38	3.85	8.76	4.19	-9.99	8.76
(Time of pred. peak-PST)	900	1000	900	0	1800	400	700	1800
Unpaired peak prediction	-87.976	-54.694	-24.694	-5.982	-58.286	-75.060	-9.999	-49.857
(Peak prediction)	2.02	4.44	7.38	10.53	8.76	4.19	-9.99	10.53
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Los Ange
(Time of pred. peak-PST)	900	1000	900	900	1800	400	700	900
Average peak prediction	68.095	54.694	24.694	17.911	58.286	75.060	-9.999	52.382
Normalized systematic bias (%)	-60.390	-34.781	-5.850	67.079	-48.909	-43.532	-9.999	-6.155
Systematic bias (pptm)	-6.182	-2.739	-0.938	0.720	-6.535	-4.829	-9.999	-2.858
Variance	34.481	5.642	3.432	8.878	14.616	20.913	-9.999	15.510
Normalized gross error (%)	60.390	54.277	34.582	88.188	48.909	54.585	-9.999	63.966
Gross error (pptm)	6.182	3.012	1.487	2.367	6.535	5.006	-9.999	3.990

TABLE E-13

Ozone Performance Statistics for July 14, 1987 (87b_01)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	10.00	21.00	8.00	12.00	22.00	25.00	15.00	25.00
Peak station	Piru - 2	Reseda	West Los	Pico Riv	Glendora	San Bern	Palm Spr	San Bern
Peak time (PST)	1500	1400	1200	1200	1400	1600	1900	1600
Accuracy (percent):								
Paired peak prediction	-25.400	-73.952	-22.625	-63.833	-61.227	-61.400	-45.800	-61.400
(Peak prediction)	7.46	5.47	6.19	4.34	8.53	9.65	8.13	9.65
Temporally-paired peak pred.	-25.400	-59.238	-22.625	-61.083	-61.227	-42.960	-45.800	-42.960
(Peak prediction)	7.46	8.56	6.19	4.67	8.53	14.26	8.13	14.26
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Glendora	Lake Gre	Palm Spr	Lake Gre
Spatially-paired peak pred.	-23.600	-72.952	-22.625	-62.083	-59.727	-36.160	-44.733	-36.160
(Peak prediction)	7.64	5.68	6.19	4.55	8.86	15.96	8.29	15.96
(Time of pred. peak-PST)	1400	1600	1200	1300	1300	1400	2000	1400
Unpaired peak prediction	-23.600	-57.381	-22.625	-61.083	-59.727	-30.320	-26.600	-30.320
(Peak prediction)	7.64	8.95	6.19	4.67	8.86	17.42	11.01	17.42
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Glendora	Redlands	Hesperia	Redlands
(Time of pred. peak-PST)	1400	1500	1200	1200	1300	1500	1700	1500
Average peak prediction	25.290	56.527	51.313	56.947	57.992	32.206	27.307	38.379
Normalized systematic bias (%)	-24.376	-51.713	-41.750	-63.862	-54.922	-39.421	-41.600	-43.705
Systematic bias (pphm)	-2.291	-6.675	-3.340	-5.838	-7.372	-5.791	-4.421	-5.559
Variance	1.725	10.582	4.682	1.351	8.568	20.737	8.733	13.559
Normalized gross error (%)	24.376	51.713	41.750	63.862	54.922	42.066	45.183	45.805
Gross error (pphm)	2.291	6.675	3.340	5.838	7.372	6.061	4.707	5.755

TABLE E-14

Ozone Performance Statistics for July 15, 1987 (87b_01)
(concentrations greater than or equal to 10.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	17.00	-9.99	-9.99	13.00	23.00	17.00	23.00
Peak station	Piru - 2	Newhall-	West Los	La Habra	Glendora	Lake Gre	Hesperia	Lake Gre
Peak time (PST)	1400	1500	1200	1200	1400	1700	1500	1700
Accuracy (percent):								
Paired peak prediction	25.290	-49.118	51.313	56.947	-42.692	-53.130	-40.412	-53.130
(Peak prediction)	-9.99	8.65	-9.99	-9.99	7.45	10.78	10.13	10.78
Temporally-paired peak pred.	25.290	-49.118	51.313	56.947	-42.692	-53.130	-40.412	-53.130
(Peak prediction)	-9.99	8.65	-9.99	-9.99	7.45	10.78	10.13	10.78
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Glendora	Lake Gre	Hesperia	Lake Gre
Spatially-paired peak pred.	25.290	-49.118	51.313	56.947	-42.692	-49.087	-33.235	-49.087
(Peak prediction)	-9.99	8.65	-9.99	-9.99	7.45	11.71	11.35	11.71
(Time of pred. peak-PST)	1400	1500	1200	1200	1400	1400	1400	1400
Unpaired peak prediction	25.290	-49.118	51.313	56.947	-42.692	-36.696	-30.647	-36.696
(Peak prediction)	-9.99	8.65	-9.99	-9.99	7.45	14.56	11.79	14.56
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Glendora	Perris	Palm Spr	Perris
(Time of pred. peak-PST)	1400	1500	1200	1200	1400	1400	1800	1400
Average peak prediction	-9.999	54.662	-9.999	-9.999	40.924	40.065	32.085	39.323
Normalized systematic bias (%)	-9.999	-54.078	-9.999	-9.999	-50.273	-35.911	-28.520	-38.594
Systematic bias (pphm)	-9.999	-6.893	-9.999	-9.999	-5.421	-5.416	-3.576	-5.353
Variance	-9.999	1.455	-9.999	-9.999	0.927	13.509	7.034	9.758
Normalized gross error (%)	-9.999	54.078	-9.999	-9.999	50.273	39.434	32.117	41.340
Gross error (pphm)	-9.999	6.893	-9.999	-9.999	5.421	5.796	3.941	5.646

TABLE E-15

NO2 Performance Statistics for July 14, 1987 (87b_01)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	9.00	8.00	9.00	9.00	9.00	8.00	9.00

Peak station Burbank North Lo Whittier Pomona Upland A Barstow Upland A
Peak time (PST) 0 1100 1100 1200 1400 800 600 800

Accuracy (percent):
Paired peak prediction -9.999 10.000 16.750 36.000 18.556 -48.333 -96.250 -48.333
(Peak prediction) -9.99 9.90 9.34 12.24 10.67 4.65 0.30 4.65
Temporally-paired peak pred. -9.999 10.000 22.375 84.333 59.000 -39.111 -94.500 -
17.667
(Peak prediction) -9.99 9.90 9.79 16.59 14.31 5.48 0.44 7.41
(Station at pred. peak) Burbank Long Bea Los Ange Pasadena Fontana- Lancaste Los
Ange
Spatially-paired peak pred. -9.999 26.667 16.750 46.333 64.778 66.111 -90.500
66.111
(Peak prediction) -9.99 11.40 9.34 13.17 14.83 14.95 0.76 14.95
(Time of pred. peak-PST) 0 1200 1100 1300 1600 1700 0 1700
Unpaired peak prediction -9.999 26.667 22.375 98.778 98.111 66.111 -19.375
98.778
(Peak prediction) -9.99 11.40 9.79 17.89 17.83 14.95 6.45 17.89
(Station at pred. peak) Burbank Long Bea Los Ange Pasadena Upland A Hesperia Los
Ange
(Time of pred. peak-PST) 0 1200 1100 1100 1300 1700 2000 1100
Average peak prediction -9.999 26.667 59.788 94.926 98.422 70.791 26.487
63.193

Normalized systematic bias (%) -9.999 -2.369 65.019 60.627 37.511 52.298 -43.071
40.440
Systematic bias (pphm) -9.999 -0.145 1.661 2.465 2.102 1.650 -2.164 1.469
Variance -9.999 1.650 2.283 4.826 10.072 12.707 10.074 7.024
Normalized gross error (%) -9.999 22.776 67.754 62.056 47.965 73.812 90.996
61.138
Gross error (pphm) -9.999 1.032 1.746 2.541 2.704 3.068 3.123 2.452

TABLE E-16

NO2 Performance Statistics for July 15, 1987 (87b_01)
(concentrations greater than or equal to 2.0 pphm)

1 2 3 4 5 6 7 ALL
Peak station measurement -9.99 7.00 7.00 7.00 7.00 7.00 8.00 8.00
Peak station Reseda North Lo Pico Riv Pomona Upland A Barstow Barstow
Peak time (PST) 0 1100 1600 1900 1600 2100 400 400

Accuracy (percent):
Paired peak prediction -9.999 -67.000 -44.429 -16.714 53.000 15.143 -76.125 -76.125
(Peak prediction) -9.99 2.31 3.89 5.83 10.71 8.06 1.91 1.91

Temporally-paired peak pred.	-9.999	-9.857	-31.000	-1.143	53.000	35.286	-76.125	17.875
(Peak prediction)	-9.99	6.31	4.83	6.92	10.71	9.47	1.91	9.43
(Station at pred. peak)		Burbank	Long Bea	Anaheim	Pomona	Fontana-	Barstow	San Bern
Spatially-paired peak pred.	-9.999	-29.714	-8.429	47.429	76.714	72.429	-76.125	-76.125
(Peak prediction)	-9.99	4.92	6.41	10.32	12.37	12.07	1.91	1.91
(Time of pred. peak-PST)	0	2100	1100	1400	1700	1800	400	400
Unpaired peak prediction	-9.999	-2.000	-8.429	54.143	76.714	75.571	-62.625	54.625
(Peak prediction)	-9.99	6.86	6.41	10.79	12.37	12.29	2.99	12.37
(Station at pred. peak)		Burbank	North Lo	La Habra	Pomona	Claremon	Hesperia	Pomona
(Time of pred. peak-PST)	0	1200	1100	1500	1700	1800	1900	1700
Average peak prediction	-9.999	2.000	14.506	88.743	62.600	85.701	63.975	63.207
Normalized systematic bias (%)	-9.999	-28.143	56.679	83.239	31.526	69.281	-68.203	38.401
Systematic bias (pphm)	-9.999	-1.503	1.189	2.250	1.598	2.210	-2.411	1.086
Variance	-9.999	1.530	1.692	4.282	4.300	6.015	2.755	3.914
Normalized gross error (%)	-9.999	30.045	61.805	86.326	38.585	78.798	74.749	66.029
Gross error (pphm)	-9.999	1.567	1.458	2.397	2.003	2.777	2.542	2.245

TABLE E-17

RHC Performance Statistics for July 14, 1987 (87b_01)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	-9.99	9.80	12.60	21.00	-9.99	-9.99	21.00
Peak station	Piru - 2	Burbank	North Lo	La Habra	Azusa	Claremon	Hesperia	Azusa
Peak time (PST)	1400	1200	700	100	800	1600	2000	800
Accuracy (percent):								
Paired peak prediction	-9.999	-9.999	-52.959	-38.254	-76.000	-9.999	-9.999	-76.000
(Peak prediction)	-9.99	-9.99	4.61	7.78	5.04	-9.99	-9.99	5.04
Temporally-paired peak pred.	-9.999	-9.999	-52.959	-21.667	-76.000	-9.999	-9.999	-54.476
(Peak prediction)	-9.99	-9.99	4.61	9.87	5.04	-9.99	-9.99	9.56
(Station at pred. peak)	Piru - 2	Burbank	North Lo	Los Ange	Azusa	Claremon	Hesperia	Los Ange
Spatially-paired peak pred.	-9.999	-9.999	-6.735	-13.889	-47.238	-9.999	-9.999	-47.238

(Peak prediction) -9.99 -9.99 9.14 10.85 11.08 -9.99 -9.99 11.08
(Time of pred. peak-PST) 1400 1200 1100 1400 1500 1600 2000 1500
Unpaired peak prediction -9.999 -9.999 -6.735 34.286 -47.238 -9.999 -9.999 -19.429
(Peak prediction) -9.99 -9.99 9.14 16.92 11.08 -9.99 -9.99 16.92
(Station at pred. peak) Piru - 2 Burbank North Lo Los Ange Azusa Claremon Hesperia Los
Ange
(Time of pred. peak-PST) 1400 1200 1100 1100 1500 1600 2000 1100
Average peak prediction -9.999 -9.999 6.735 30.206 47.238 -9.999 -9.999 31.340

Normalized systematic bias (%) -9.999 -9.999 52.999 66.223 -5.647 -9.999 -9.999
48.933
Systematic bias (pptm) -9.999 -9.999 1.228 1.982 -4.016 -9.999 -9.999 0.589
Variance -9.999 -9.999 5.914 8.469 58.404 -9.999 -9.999 18.022
Normalized gross error (%) -9.999 -9.999 65.115 76.201 56.691 -9.999 -9.999 70.437
Gross error (pptm) -9.999 -9.999 2.330 2.940 6.689 -9.999 -9.999 3.656

TABLE E-18

RHC Performance Statistics for July 15, 1987 (87b_01)
(concentrations greater than or equal to 1.0 pptm)

1 2 3 4 5 6 7 ALL
Peak station measurement -9.99 5.60 4.20 12.60 8.40 -9.99 -9.99 12.60
Peak station Piru - 2 Reseda North Lo Los Ange Azusa Claremon Hesperia Los Ange
Peak time (PST) 1400 1400 900 700 1200 1600 2000 700

Accuracy (percent):
Paired peak prediction -9.999 -71.786 10.476 -66.270 -28.929 -9.999 -9.999 -66.270
(Peak prediction) -9.99 1.58 4.64 4.25 5.97 -9.99 -9.99 4.25
Temporally-paired peak pred. -9.999 -71.786 10.476 -66.270 -28.929 -9.999 -9.999 -
66.270
(Peak prediction) -9.99 1.58 4.64 4.25 5.97 -9.99 -9.99 4.25
(Station at pred. peak) Piru - 2 Reseda North Lo Los Ange Azusa Claremon Hesperia Los
Ange
Spatially-paired peak pred. -9.999 -51.607 10.476 -40.714 -9.762 -9.999 -9.999 -40.714
(Peak prediction) -9.99 2.71 4.64 7.47 7.58 -9.99 -9.99 7.47
(Time of pred. peak-PST) 1400 2000 900 1200 1700 1600 2000 1200
Unpaired peak prediction -9.999 -51.607 10.476 -32.857 -9.762 -9.999 -9.999 -32.857
(Peak prediction) -9.99 2.71 4.64 8.46 7.58 -9.99 -9.99 8.46
(Station at pred. peak) Piru - 2 Reseda North Lo La Habra Azusa Claremon Hesperia La
Habra
(Time of pred. peak-PST) 1400 2000 900 1400 1700 1600 2000 1400

Average peak prediction	-9.999	51.607	10.476	30.457	9.762	-9.999	-9.999	20.295
Normalized systematic bias (%)	-9.999	-0.565	60.060	74.277	47.162	-9.999	-9.999	63.087
Systematic bias (pptm)	-9.999	-1.155	0.851	0.206	1.517	-9.999	-9.999	0.440
Variance	-9.999	6.104	0.957	12.774	3.588	-9.999	-9.999	9.050
Normalized gross error (%)	-9.999	63.423	63.810	104.337	54.376	-9.999	-9.999	87.861
Gross error (pptm)	-9.999	2.035	0.956	2.755	2.073	-9.999	-9.999	2.370

TABLE E-19

Ozone Performance Statistics for September 8, 1987 (87b_01)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	11.00	22.00	19.00	25.00	33.00	23.00	22.00	33.00
Peak station	El Rio-R	Burbank	West Los	Pico Riv	Glendora	Upland	Hesperia	Glendora
Peak time (PST)	1200	1200	1500	1300	1400	1400	1700	1400
Accuracy (percent):								
Paired peak prediction	-54.091	-72.682	-75.211	-71.520	-63.576	-64.087	-48.000	-63.576
(Peak prediction)	5.05	6.01	4.71	7.12	12.02	8.26	11.44	12.02
Temporally-paired peak pred.	-54.091	-70.818	-66.842	-70.880	-61.000	-31.522	-47.273	-52.273
(Peak prediction)	5.05	6.42	6.30	7.28	12.87	15.75	11.60	15.75
(Station at pred. peak)	El Rio-R	Newhall	El Toro	La Habra	Azusa	Crestlin	Victorvi	Crestlin
Spatially-paired peak pred.	-39.909	-72.364	-65.158	-71.520	-63.576	-54.043	-30.818	-63.576
(Peak prediction)	6.61	6.08	6.62	7.12	12.02	10.57	15.22	12.02
(Time of pred. peak-PST)	1400	1300	1400	1300	1400	1200	1500	1400
Unpaired peak prediction	-13.909	-61.364	-38.895	-70.880	-61.000	-20.130	-30.818	-44.333
(Peak prediction)	9.47	8.50	11.61	7.28	12.87	18.37	15.22	18.37
(Station at pred. peak)	Simi Vly	Reseda	El Toro	La Habra	Azusa	Crestlin	Hesperia	Crestlin
(Time of pred. peak-PST)	1300	1400	1300	1300	1400	1300	1500	1300
Average peak prediction	22.939	65.152	27.502	62.374	56.008	20.142	34.207	36.628
Normalized systematic bias (%)	-19.577	-47.319	-52.725	-68.314	-61.726	-13.141	-23.049	-37.281
Systematic bias (pphm)	-1.818	-6.111	-6.002	-9.527	-9.796	-2.490	-3.002	-5.325

Variance	3.865	16.852	22.636	11.677	17.472	26.018	16.037	18.485
Normalized gross error (%)	20.315	47.584	57.425	68.314	61.726	34.784	35.363	46.724
Gross error (pphm)	1.882	6.132	6.425	9.527	9.796	4.437	4.044	6.163

TABLE E-20

Ozone Performance Statistics for September 9, 1987 (87b_01)
(concentrations greater than or equal to 10.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	10.00	16.00	12.00	17.00	26.00	26.00	22.00	26.00
Peak station	Piru - 2	Burbank	El Toro	Pico Riv	Glendora	Crestlin	Hesperia	Crestlin
Peak time (PST)	1200	1300	1400	1100	1300	1500	1700	1500
Accuracy (percent):								
Paired peak prediction	-17.100	-70.563	-19.000	-77.353	-62.962	-40.308	-44.773	-40.308
(Peak prediction)	8.29	4.71	9.72	3.85	9.63	15.52	12.15	15.52
Temporally-paired peak pred.	-17.100	-70.563	-19.000	-76.059	-62.962	-40.308	-17.909	-34.077
(Peak prediction)	8.29	4.71	9.72	4.07	9.63	15.52	18.06	17.14
(Station at pred. peak)	Piru - 2	Burbank	El Toro	La Habra	Glendora	Crestlin	Victorvi	Hesperia
Spatially-paired peak pred.	-17.100	-70.563	-13.833	-77.353	-62.962	-32.500	-22.091	-32.500
(Peak prediction)	8.29	4.71	10.34	3.85	9.63	17.55	17.14	17.55
(Time of pred. peak-PST)	1200	1300	1300	1100	1300	1300	1500	1300
Unpaired peak prediction	-17.100	-62.938	-13.833	-74.059	-62.962	-32.500	-17.909	-30.538
(Peak prediction)	8.29	5.93	10.34	4.41	9.63	17.55	18.06	18.06
(Station at pred. peak)	Piru - 2	Reseda	El Toro	Anaheim	Glendora	Crestlin	Victorvi	Victorvi
(Time of pred. peak-PST)	1200	1200	1300	1200	1300	1300	1700	1700
Average peak prediction	17.100	68.021	13.833	74.059	61.737	31.640	21.394	38.222
Normalized systematic bias (%)	-17.100	-66.776	-33.520	-72.811	-64.989	-26.178	-27.789	-41.443
Systematic bias (pphm)	-1.710	-9.001	-3.797	-9.369	-10.173	-4.174	-4.064	-6.072
Variance	-9.999	2.867	10.106	4.987	9.540	16.735	25.114	13.789
Normalized gross error (%)	17.100	66.776	33.520	72.811	64.989	32.661	39.460	46.288
Gross error (pphm)	1.710	9.001	3.797	9.369	10.173	4.899	5.395	6.619

TABLE E-21

NO2 Performance Statistics for September 8, 1987 (87b_01)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	5.00	14.00	14.00	14.00	14.00	13.00	6.00	14.00
Peak station	Simi Vly	Burbank	West Los	Pico Riv	Pomona	Upland	Palm Spr	Pomona
Peak time (PST)	2200	800	900	800	800	600	700	800
Accuracy (percent):								
Paired peak prediction	-70.600	-41.857	-0.643	-53.000	-40.214	-27.077	-74.333	-40.214
(Peak prediction)	1.47	8.14	13.91	6.58	8.37	9.48	1.54	8.37
Temporally-paired peak pred.	-4.000	-40.429	-0.643	-20.357	-39.286	-21.846	-74.333	-20.357
(Peak prediction)	4.80	8.34	13.91	11.15	8.50	10.16	1.54	11.15
(Station at pred. peak)	El Rio-R	Reseda	West Los	Los Ange	Azusa	Rubidoux	Palm Spr	Los Ange
Spatially-paired peak pred.	-58.600	61.071	70.500	70.429	21.500	32.385	-67.167	21.500
(Peak prediction)	2.07	22.55	23.87	23.86	17.01	17.21	1.97	17.01
(Time of pred. peak-PST)	1800	1400	1200	1600	1800	1800	1100	1800
Unpaired peak prediction	47.000	61.071	70.500	89.429	95.143	32.385	-67.167	95.143
(Peak prediction)	7.35	22.55	23.87	26.52	27.32	17.21	1.97	27.32
(Station at pred. peak)	El Rio-R	Burbank	West Los	Lynwood	Pasadena	Upland	Palm Spr	Pasadena
(Time of pred. peak-PST)	1200	1400	1200	1400	1500	1800	1100	1500
Average peak prediction	47.000	61.071	53.819	81.500	78.167	32.764	69.525	57.895
Normalized systematic bias (%)	11.766	57.397	81.632	89.017	105.925	113.264	-60.354	73.664
Systematic bias (pphm)	-0.086	1.554	3.146	4.257	4.623	4.994	-1.704	3.152
Variance	4.680	35.180	30.067	29.518	38.954	11.273	0.908	25.264
Normalized gross error (%)	62.943	84.499	126.142	98.915	115.726	116.308	60.354	102.670
Gross error (pphm)	1.724	4.410	4.804	5.277	5.704	5.330	1.704	4.624

TABLE E-22

NO2 Performance Statistics for September 9, 1987 (87b_01)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	8.00	18.00	15.00	30.00	19.00	11.00	6.00	30.00
Peak station	Simi Vly	Burbank	Long Bea	Los Ange	Pasadena	Rubidoux	Lancaste	Los Ange
Peak time (PST)	700	800	1000	900	1100	800	600	900
Accuracy (percent):								
Paired peak prediction	-68.375	-63.556	22.467	-60.767	-40.579	-34.000	-82.667	-60.767
(Peak prediction)	2.53	6.56	18.37	11.77	11.29	7.26	1.04	11.77
Temporally-paired peak pred.	-41.000	-39.722	22.467	-58.533	-13.526	29.818	-66.833	-39.800
(Peak prediction)	4.72	10.85	18.37	12.44	16.43	14.28	1.99	18.06
(Station at pred. peak)	El Rio-R	Reseda	Long Bea	Whittier	Azusa	Upland	Palm Spr	Azusa
Spatially-paired peak pred.	-67.000	-35.778	25.267	-54.400	-2.947	-29.818	-81.333	-54.400
(Peak prediction)	2.64	11.56	18.79	13.68	18.44	7.72	1.12	13.68
(Time of pred. peak-PST)	800	1300	1100	1100	1400	1700	1800	1100
Unpaired peak prediction	-16.750	-35.778	25.267	-38.433	-1.474	35.364	-66.833	-37.367
(Peak prediction)	6.66	11.56	18.79	18.47	18.72	14.89	1.99	18.79
(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Whittier	Glendora	Upland	Palm Spr	Long Bea
(Time of pred. peak-PST)	900	1300	1100	1400	0	0	600	1100
Average peak prediction	69.375	35.778	86.933	34.221	9.414	34.532	70.458	50.738
Normalized systematic bias (%)	2.378	5.158	44.749	42.564	104.661	103.805	-55.076	49.794
Systematic bias (pphm)	-0.514	-1.165	1.844	1.596	4.369	4.129	-1.617	1.886
Variance	5.350	15.667	14.930	20.259	25.465	12.382	1.423	16.273
Normalized gross error (%)	65.774	47.603	86.475	55.841	114.301	108.546	55.076	79.348
Gross error (pphm)	2.009	3.352	3.366	3.522	5.230	4.490	1.617	3.673

TABLE E-23

RHC Performance Statistics for September 8, 1987 (87b_01)
(concentrations greater than or equal to 1.0 pptm)

1 2 3 4 5 6 7 ALL
Peak station measurement -9.99 26.60 18.20 53.20 -9.99 -9.99 -9.99 53.20
Peak station Simi Vly Reseda West Los Lynwood Pasadena Upland Lancaste
Lynwood
Peak time (PST) 100 2300 600 600 1500 2000 500 600

Accuracy (percent):
Paired peak prediction -9.999 -85.226 -54.505 -85.827 -9.999 -9.999 -9.999 -85.827
(Peak prediction) -9.99 3.93 8.28 7.54 -9.99 -9.99 -9.99 7.54
Temporally-paired peak pred. -9.999 -85.226 -54.505 -79.117 -9.999 -9.999 -9.999 -
79.117
(Peak prediction) -9.99 3.93 8.28 11.11 -9.99 -9.99 -9.99 11.11
(Station at pred. peak) Simi Vly Reseda West Los Los Ange Pasadena Upland Lancaste Los
Ange
Spatially-paired peak pred. -9.999 -65.752 9.670 -80.432 -9.999 -9.999 -9.999 -80.432
(Peak prediction) -9.99 9.11 19.96 10.41 -9.99 -9.99 -9.99 10.41
(Time of pred. peak-PST) 100 900 1200 1000 1500 2000 500 1000
Unpaired peak prediction -9.999 -65.752 9.670 -61.053 -9.999 -9.999 -9.999 -61.053
(Peak prediction) -9.99 9.11 19.96 20.72 -9.99 -9.99 -9.99 20.72
(Station at pred. peak) Simi Vly Reseda West Los Los Ange Pasadena Upland Lancaste Los
Ange
(Time of pred. peak-PST) 100 900 1200 1200 1500 2000 500 1200
Average peak prediction -9.999 65.752 9.670 50.234 -9.999 -9.999 -9.999 46.060

Normalized systematic bias (%) -9.999 -35.393 57.263 6.308 -9.999 -9.999 -9.999
9.530
Systematic bias (pptm) -9.999 -5.785 1.990 -6.000 -9.999 -9.999 -9.999 -3.614
Variance -9.999 38.727 37.647 211.816 -9.999 -9.999 -9.999 110.659
Normalized gross error (%) -9.999 58.364 74.280 62.535 -9.999 -9.999 -9.999 64.793
Gross error (pptm) -9.999 6.725 4.602 10.597 -9.999 -9.999 -9.999 7.773

TABLE E-24

RHC Performance Statistics for September 9, 1987 (87b_01)
(concentrations greater than or equal to 1.0 pptm)

1 2 3 4 5 6 7 ALL
Peak station measurement -9.99 22.40 16.80 43.40 -9.99 -9.99 -9.99 43.40
Peak station Simi Vly Reseda West Los Los Ange Pasadena Upland Lancaste Los
Ange
Peak time (PST) 100 700 100 900 1500 2000 500 900

Accuracy (percent):
Paired peak prediction -9.999 -55.268 -42.976 -66.267 -9.999 -9.999 -9.999 -66.267
(Peak prediction) -9.99 10.02 9.58 14.64 -9.99 -9.99 -9.99 14.64

Temporally-paired peak pred.	-9.999	-55.268	-42.976	-66.267	-9.999	-9.999	-9.999	-66.267
(Peak prediction)	-9.99	10.02	9.58	14.64	-9.99	-9.99	-9.99	14.64
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Pasadena	Upland	Lancaste	Los Ange
Spatially-paired peak pred.	-9.999	-51.295	2.798	-56.152	-9.999	-9.999	-9.999	-56.152
(Peak prediction)	-9.99	10.91	17.27	19.03	-9.99	-9.99	-9.99	19.03
(Time of pred. peak-PST)	100	800	700	700	1500	2000	500	700
Unpaired peak prediction	-9.999	-51.295	2.798	-56.152	-9.999	-9.999	-9.999	-56.152
(Peak prediction)	-9.99	10.91	17.27	19.03	-9.99	-9.99	-9.99	19.03
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Pasadena	Upland	Lancaste	Los Ange
(Time of pred. peak-PST)	100	800	700	700	1500	2000	500	700
Average peak prediction	-9.999	51.295	2.798	56.152	-9.999	-9.999	-9.999	46.450
Normalized systematic bias (%)	-9.999	-53.716	29.461	1.768	-9.999	-9.999	-9.999	-6.221
Systematic bias (pptm)	-9.999	-7.044	0.980	-3.855	-9.999	-9.999	-9.999	-3.463
Variance	-9.999	36.356	21.745	62.131	-9.999	-9.999	-9.999	43.482
Normalized gross error (%)	-9.999	56.719	56.526	45.554	-9.999	-9.999	-9.999	51.505
Gross error (pptm)	-9.999	7.212	3.577	5.875	-9.999	-9.999	-9.999	5.640

ATTACHMENT F

SUBREGIONAL MODEL PERFORMANCE STATISTICS - DOUBLED ON-ROAD VOC

TABLE F-1

Ozone Performance Statistics for August 27, 1987 (87b_01adj2)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	12.00	16.00	11.00	14.00	22.00	24.00	13.00	24.00
Peak station	Simi Vly	Reseda	El Toro	La Habra	Glendora	Rubidoux	Hesperia	Rubidoux
Peak time (PST)	1100	1400	1300	1100	1300	1400	1800	1400
Accuracy (percent):								
Paired peak prediction	-15.250	-20.250	34.455	-28.643	-32.545	-41.542	-13.154	-41.542
(Peak prediction)	10.17	12.76	14.79	9.99	14.84	14.03	11.29	14.03
Temporally-paired peak pred.	-15.250	-20.250	34.455	-28.643	-28.273	-28.583	-13.154	-28.375
(Peak prediction)	10.17	12.76	14.79	9.99	15.78	17.14	11.29	17.19
(Station at pred. peak)	Simi Vly	Reseda	El Toro	La Habra	Pomona	Upland	Hesperia	Glendora
Spatially-paired peak pred.	2.167	-7.625	36.455	-28.643	-21.864	-5.583	-3.538	-5.583
(Peak prediction)	12.26	14.78	15.01	9.99	17.19	22.66	12.54	22.66
(Time of pred. peak-PST)	1400	1200	1200	1100	1400	1500	1700	1500
Unpaired peak prediction	2.167	-7.625	36.455	-28.643	-21.864	-5.583	-3.538	-5.583
(Peak prediction)	12.26	14.78	15.01	9.99	17.19	22.66	12.54	22.66
(Station at pred. peak)	Simi Vly	Reseda	El Toro	La Habra	Glendora	Rubidoux	Hesperia	Rubidoux
(Time of pred. peak-PST)	1400	1200	1200	1100	1400	1500	1700	1500
Average peak prediction	5.302	10.275	36.455	25.591	21.296	16.690	5.143	18.125
Normalized systematic bias (%)	-5.628	1.017	16.127	-16.890	-19.004	-12.084	-38.061	-15.019
Systematic bias (pphm)	-0.574	-0.047	1.602	-1.862	-2.838	-2.255	-3.450	-1.995
Variance	5.215	3.967	5.624	3.206	7.295	18.954	11.547	11.263
Normalized gross error (%)	23.365	13.736	25.470	22.142	20.403	26.232	40.782	26.091
Gross error (pphm)	2.116	1.500	2.350	2.283	2.959	3.751	3.697	3.084

TABLE F-2

Ozone Performance Statistics for August 28, 1987 (87b_01adj2)
(concentrations greater than or equal to 10.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	15.00	17.00	11.00	16.00	29.00	24.00	11.00	29.00
Peak station	Simi Vly	Burbank	El Toro	Pico Riv	Glendora	Rubidoux	Hesperia	Glendora
Peak time (PST)	1100	1300	1300	1200	1400	1400	1800	1400
Accuracy (percent):								
Paired peak prediction	-16.467	27.765	2.818	-32.250	-11.310	-46.917	-8.182	-11.310
(Peak prediction)	12.53	21.72	11.31	10.84	25.72	12.74	10.10	25.72
Temporally-paired peak pred.	-16.467	27.765	2.818	-12.750	-11.310	1.875	13.182	-11.310
(Peak prediction)	12.53	21.72	11.31	13.96	25.72	24.45	12.45	25.72
(Station at pred. peak)	Simi Vly	Burbank	El Toro	La Habra	Glendora	Norco	Lancaste	Glendora
Spatially-paired peak pred.	-14.733	27.765	2.818	-31.937	-11.310	-17.375	14.455	-11.310
(Peak prediction)	12.79	21.72	11.31	10.89	25.72	19.83	12.59	25.72
(Time of pred. peak-PST)	1200	1300	1300	1400	1400	1700	1500	1400
Unpaired peak prediction	-14.733	27.765	2.818	-12.750	-11.310	3.458	14.455	-11.310
(Peak prediction)	12.79	21.72	11.31	13.96	25.72	24.83	12.59	25.72
(Station at pred. peak)	Simi Vly	Burbank	El Toro	La Habra	Glendora	Norco	Hesperia	Glendora
(Time of pred. peak-PST)	1200	1300	1300	1200	1400	1500	1500	1400
Average peak prediction	16.139	27.765	4.049	8.901	7.286	11.962	14.455	11.450
Normalized systematic bias (%)	-9.358	20.039	-4.194	-5.223	10.735	5.084	-9.387	2.599
Systematic bias (pphm)	-1.112	2.589	-0.410	-0.885	1.224	0.103	-0.988	0.113

Variance	2.590	6.272	0.773	7.440	10.475	20.454	11.446	11.626
Normalized gross error (%)	12.777	23.028	6.073	17.447	16.248	23.071	24.815	19.393
Gross error (pphm)	1.462	2.955	0.617	2.134	2.532	3.513	2.590	2.676

TABLE F-3

NO2 Performance Statistics for August 27, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	7.00	9.00	7.00	13.00	13.00	13.00	8.00	13.00
Peak station	Simi Vly	Burbank	West Los	Los Ange	Pomona	Upland	Barstow	Upland
Peak time (PST)	2100	1100	700	900	1000	900	600	900
Accuracy (percent):								
Paired peak prediction	-48.429	-17.111	-26.143	-30.769	-72.923	-78.154	-95.625	-78.154
(Peak prediction)	3.61	7.46	5.17	9.00	3.52	2.84	0.35	2.84
Temporally-paired peak pred.	-39.429	-17.111	-20.286	-27.615	-46.923	-75.923	-88.250	-27.615
(Peak prediction)	4.24	7.46	5.58	9.41	6.90	3.13	0.94	9.41
(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Pico Riv	Pasadena	San Bern	Palm Spr	Pico Riv
Spatially-paired peak pred.	-40.857	-17.111	7.429	-30.769	-19.538	-29.846	-94.125	-29.846
(Peak prediction)	4.14	7.46	7.52	9.00	10.46	9.12	0.47	9.12
(Time of pred. peak-PST)	2300	1100	1000	900	2000	2100	500	2100
Unpaired peak prediction	-37.714	-11.556	12.143	-15.231	-14.154	-29.846	-86.000	-14.154
(Peak prediction)	4.36	7.96	7.85	11.02	11.16	9.12	1.12	11.16
(Station at pred. peak)	El Rio-R	Reseda	Costa Me	Pico Riv	Azusa	Upland	Lancaste	Azusa
(Time of pred. peak-PST)	2000	2300	900	1000	1800	2100	2300	1800
Average peak prediction	41.524	15.259	28.757	14.320	10.082	27.206	89.047	36.002
Normalized systematic bias (%)	2.742	-21.524	73.947	20.251	-17.137	-16.084	-82.221	-1.435
Systematic bias (pphm)	-0.222	-0.978	1.952	0.739	-1.303	-1.852	-2.942	-0.514
Variance	2.127	2.053	2.678	2.988	10.952	9.612	3.466	5.384
Normalized gross error (%)	41.154	29.726	78.505	29.490	43.528	63.870	82.221	49.302
Gross error (pphm)	1.148	1.413	2.177	1.444	2.947	3.025	2.942	2.191

TABLE F-4

NO2 Performance Statistics for August 28, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	5.00	13.00	9.00	13.00	15.00	13.00	10.00	15.00
Peak station	Simi Vly	Burbank	Long Bea	Los Ange	Azusa	San Bern	Barstow	Azusa
Peak time (PST)	2100	1000	1100	900	1000	900	600	1000
Accuracy (percent):								
Paired peak prediction	-58.000	-28.923	59.778	17.385	-62.867	-72.077	-94.600	-62.867
(Peak prediction)	2.10	9.24	14.38	15.26	5.57	3.63	0.54	5.57
Temporally-paired peak pred.	-26.200	-28.923	59.778	17.385	-62.867	-58.846	-84.800	-8.200
(Peak prediction)	3.69	9.24	14.38	15.26	5.57	5.35	1.52	13.77
(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Los Ange	Azusa	Upland	Palm Spr	Long Bea
Spatially-paired peak pred.	-26.800	-16.615	59.778	17.385	-30.200	-33.769	-93.600	-30.200
(Peak prediction)	3.66	10.84	14.38	15.26	10.47	8.61	0.64	10.47
(Time of pred. peak-PST)	100	1200	1100	900	1400	100	500	1400
Unpaired peak prediction	-25.000	-16.615	59.778	17.385	0.733	-31.154	-83.900	1.733
(Peak prediction)	3.75	10.84	14.38	15.26	15.11	8.95	1.61	15.26
(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Los Ange	Pasadena	Rubidoux	Palm Spr	Los Ange
(Time of pred. peak-PST)	2000	1200	1100	900	1200	400	800	900
Average peak prediction	25.000	16.615	117.123	19.756	18.413	41.587	87.813	55.550
Normalized systematic bias (%)	-1.474	-7.156	119.241	61.564	17.476	-7.269	-74.865	25.521
Systematic bias (pphm)	-0.255	-0.578	3.512	2.388	0.468	-1.989	-3.446	0.410
Variance	1.292	2.870	3.955	5.742	13.031	13.068	6.272	7.463
Normalized gross error (%)	32.557	24.893	119.733	66.607	41.442	63.004	74.865	62.638
Gross error (pphm)	0.889	1.435	3.522	2.737	3.004	3.456	3.446	2.816

TABLE F-5

RHC Performance Statistics for August 27, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	4.20	11.20	9.80	64.40	18.20	37.80	-9.99	64.40
Peak station	El Rio-R	Reseda	West Los	La Habra	Azusa	Rubidoux	Lancaste	La Habra
Peak time (PST)	800	600	700	500	800	400	2300	500
Accuracy (percent):								
Paired peak prediction	-38.095	-41.964	15.306	-89.161	-83.022	-90.423	73.313	-89.161
(Peak prediction)	2.60	6.50	11.30	6.98	3.09	3.62	-9.99	6.98
Temporally-paired peak pred.	-38.095	-41.964	15.306	-84.984	-83.022	-90.423	73.313	-84.984
(Peak prediction)	2.60	6.50	11.30	9.67	3.09	3.62	-9.99	9.67
(Station at pred. peak)	El Rio-R	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Los Ange
Spatially-paired peak pred.	-23.571	-13.214	65.714	-84.534	-26.209	-79.550	73.313	-84.534
(Peak prediction)	3.21	9.72	16.24	9.96	13.43	7.73	-9.99	9.96
(Time of pred. peak-PST)	2000	2300	2300	1200	2300	1700	2300	1200
Unpaired peak prediction	-23.571	-13.214	65.714	-73.913	-26.209	-79.550	73.313	-73.913
(Peak prediction)	3.21	9.72	16.24	16.80	13.43	7.73	-9.99	16.80
(Station at pred. peak)	El Rio-R	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Los Ange
(Time of pred. peak-PST)	2000	2300	2300	800	2300	1700	2300	800
Average peak prediction	23.571	13.214	65.714	76.037	26.209	79.550	-9.999	46.202
Normalized systematic bias (%)	25.973	-15.620	288.097	91.188	-36.385	-13.512	-9.999	67.171
Systematic bias (pptm)	0.219	-1.153	5.377	-1.708	-5.547	-8.981	-9.999	-1.953
Variance	1.130	2.929	7.786	169.606	40.721	136.428	-9.999	88.884
Normalized gross error (%)	46.296	25.988	288.097	122.686	57.377	90.821	-9.999	112.020
Gross error (pptm)	0.811	1.702	5.377	7.281	6.994	10.742	-9.999	6.101

TABLE F-6

RHC Performance Statistics for August 28, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	2.80	14.00	28.00	84.00	43.40	29.40	-9.99	84.00

Peak station	El Rio-R	Reseda	West Los	La Habra	Azusa	Rubidoux	Lancaste	La Habra
Peak time (PST)	1100	600	200	200	600	400	2300	200
Accuracy (percent):								
Paired peak prediction	-27.857	-42.000	-37.179	-87.083	-83.157	-69.218	-9.999	-87.083
(Peak prediction)	2.02	8.12	17.59	10.85	7.31	9.05	-9.99	10.85
Temporally-paired peak pred.	-27.857	-42.000	-37.179	-75.274	-83.157	-69.218	-9.999	-75.274
(Peak prediction)	2.02	8.12	17.59	20.77	7.31	9.05	-9.99	20.77
(Station at pred. peak)	El Rio-R	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Los Ange
Spatially-paired peak pred.	1.071	-12.143	-33.929	-85.893	-69.793	-65.884	-9.999	-85.893
(Peak prediction)	2.83	12.30	18.50	11.85	13.11	10.03	-9.99	11.85
(Time of pred. peak-PST)	500	400	500	400	0	500	2300	400
Unpaired peak prediction	1.071	-12.143	-33.929	-70.226	-69.793	-65.884	-9.999	-70.226
(Peak prediction)	2.83	12.30	18.50	25.01	13.11	10.03	-9.99	25.01
(Station at pred. peak)	El Rio-R	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Los Ange
(Time of pred. peak-PST)	500	400	500	500	0	500	2300	500
Average peak prediction	1.071	12.143	33.929	73.360	69.793	65.884	-9.999	45.996
Normalized systematic bias (%)	33.869	-4.484	235.553	22.504	-18.950	-51.480	-9.999	36.363
Systematic bias (pptm)	0.432	-0.644	6.556	-3.548	-8.482	-8.371	-9.999	-2.479
Variance	0.440	8.369	33.909	234.651	146.073	36.229	-9.999	113.959
Normalized gross error (%)	42.758	37.778	239.044	65.016	49.772	55.766	-9.999	80.063
Gross error (pptm)	0.643	2.482	7.508	8.684	10.443	8.542	-9.999	6.999

TABLE F-7

Ozone Performance Statistics for June 24, 1987 (87b_01adj2)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	14.00	20.00	12.00	14.00	25.00	23.00	14.00	25.00
Peak station	Simi Vly	Newhall	West Los	Pico Riv	Claremon	San Bern	Hesperia	Claremon
Peak time (PST)	1200	1400	1300	1400	1400	1400	2000	1400

Accuracy (percent):								
Paired peak prediction	0.786	13.650	-40.083	-59.714	-44.400	-8.957	-45.143	-44.400
(Peak prediction)	14.11	22.73	7.19	5.64	13.90	20.94	7.68	13.90
Temporally-paired peak pred.	0.786	13.650	-40.083	-49.500	-42.400	-6.000	-45.143	-9.080
(Peak prediction)	14.11	22.73	7.19	7.07	14.40	21.62	7.68	22.73
(Station at pred. peak)	Simi Vly	Newhall	West Los	Los Ange	Pomona	Redlands	Hesperia	Newhall
Spatially-paired peak pred.	0.786	13.650	-33.333	-51.714	-44.400	-8.957	3.071	-44.400
(Peak prediction)	14.11	22.73	8.00	6.76	13.90	20.94	14.43	13.90
(Time of pred. peak-PST)	1200	1400	1200	1200	1400	1400	1600	1400
Unpaired peak prediction	0.786	13.650	-33.333	-42.929	-42.400	-0.870	3.071	-8.800
(Peak prediction)	14.11	22.73	8.00	7.99	14.40	22.80	14.43	22.80
(Station at pred. peak)	Simi Vly	Newhall	West Los	La Habra	Pomona	Redlands	Hesperia	Redlands
(Time of pred. peak-PST)	1200	1400	1200	1100	1400	1600	1600	1600
Average peak prediction	8.935	19.804	46.115	29.994	44.567	5.978	6.047	19.522
Normalized systematic bias (%)	-25.493	-21.994	-44.774	-41.688	-42.626	-14.720	-18.880	-25.412
Systematic bias (pphm)	-2.456	-3.113	-4.129	-4.431	-6.902	-2.481	-2.103	-3.384
Variance	3.382	14.299	3.076	5.626	12.753	10.961	25.293	11.188
Normalized gross error (%)	27.535	29.816	44.774	41.688	42.626	20.651	43.351	31.671
Gross error (pphm)	2.671	4.241	4.129	4.431	6.902	3.180	4.268	4.044

TABLE F-8

Ozone Performance Statistics for June 25, 1987 (87b_01adj2)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	12.00	21.00	12.00	12.00	23.00	24.00	16.00	24.00
Peak station	Simi Vly	Newhall	West Los	Los Ange	Glendora	San Bern	Palm Spr	San Bern
Peak time (PST)	1300	1300	1300	1000	1200	1400	1800	1400
Accuracy (percent):								
Paired peak prediction	3.000	-10.905	-45.083	-65.833	-36.739	-14.250	-66.500	-14.250
(Peak prediction)	12.36	18.71	6.59	4.10	14.55	20.58	5.36	20.58
Temporally-paired peak pred.	3.000	-10.905	-45.083	-38.833	-36.739	-6.792	-21.188	-6.792
(Peak prediction)	12.36	18.71	6.59	7.34	14.55	22.37	12.61	22.37
(Station at pred. peak)	Simi Vly	Newhall	West Los	La Habra	Glendora	Rubidoux	Hesperia	Rubidoux

Spatially-paired peak pred.	3.000	-10.905	-39.750	-52.000	-34.435	-14.250	-45.750	-14.250
(Peak prediction)	12.36	18.71	7.23	5.76	15.08	20.58	8.68	20.58
(Time of pred. peak-PST)	1300	1300	1200	1300	1300	1400	1700	1400
Unpaired peak prediction	3.000	-10.905	-39.750	-26.167	-28.652	-6.792	-13.625	-6.792
(Peak prediction)	12.36	18.71	7.23	8.86	16.41	22.37	13.82	22.37
(Station at pred. peak)	Simi Vly	Newhall	West Los	La Habra	Claremon	Rubidoux	Barstow	Rubidoux
(Time of pred. peak-PST)	1300	1300	1200	1200	1300	1400	1900	1400
Average peak prediction	13.810	17.291	53.917	23.083	25.950	8.976	12.070	20.548
Normalized systematic bias (%)	-31.497	-32.945	-49.010	-37.008	-25.979	-1.212	-19.711	-20.277
Systematic bias (pphm)	-2.818	-4.685	-4.617	-3.706	-3.822	-0.580	-2.145	-2.416
Variance	5.021	8.589	0.674	7.728	11.708	16.952	21.820	12.696
Normalized gross error (%)	33.543	32.945	49.010	39.008	32.819	25.767	39.815	32.779
Gross error (pphm)	3.010	4.685	4.617	3.865	4.423	3.281	3.913	3.683

TABLE F-9

NO2 Performance Statistics for June 24, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	5.00	8.00	5.00	8.00	9.00	9.00	10.00	10.00
Peak station	Simi Vly	Burbank	West Los	Lynwood	Pomona	Upland	Barstow	Barstow
Peak time (PST)	1900	900	800	1100	1000	800	600	600
Accuracy (percent):								
Paired peak prediction	-76.000	-14.500	14.600	29.500	-43.222	-38.556	-99.100	-99.100
(Peak prediction)	1.20	6.84	5.73	10.36	5.11	5.53	0.09	0.09
Temporally-paired peak pred.	-76.000	-14.500	35.200	29.500	25.222	-38.556	-84.500	-43.600
(Peak prediction)	1.20	6.84	6.76	10.36	11.27	5.53	1.55	5.64
(Station at pred. peak)	Simi Vly	Burbank	Long Bea	Lynwood	Pasadena	Upland	Lancaste	Long Bea
Spatially-paired peak pred.	-76.000	24.625	30.600	29.500	13.111	17.111	-98.500	-98.500
(Peak prediction)	1.20	9.97	6.53	10.36	10.18	10.54	0.15	0.15

(Time of pred. peak-PST)	1900	1100	900	1100	1900	1900	400	400
Unpaired peak prediction	-66.600	24.625	54.200	51.375	58.000	17.111	-79.900	42.200
(Peak prediction)	1.67	9.97	7.71	12.11	14.22	10.54	2.01	14.22
(Station at pred. peak)	El Rio-R	Burbank	L.B. Cit	Pico Riv	Pasadena	Upland	Lancaste	Pasadena
(Time of pred. peak-PST)	900	1100	1600	1300	1200	1900	700	1200
Average peak prediction	41.550	24.625	41.856	40.331	44.458	8.069	86.875	42.807
Normalized systematic bias (%)	-70.647	10.107	57.891	38.846	30.872	-11.392	-82.624	12.772
Systematic bias (pphm)	-1.899	0.497	1.320	1.139	1.276	-0.859	-3.291	0.280
Variance	0.749	1.888	3.296	3.955	7.174	5.590	4.822	4.415
Normalized gross error (%)	70.647	24.029	76.128	52.761	48.125	36.951	82.624	54.056
Gross error (pphm)	1.899	1.169	1.819	1.703	2.389	2.029	3.291	2.010

TABLE F-10

NO2 Performance Statistics for June 25, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	6.00	11.00	7.00	11.00	9.00	11.00	11.00	11.00
Peak station	Simi Vly	Burbank	West Los	Los Ange	Pomona	Upland	Barstow	Barstow
Peak time (PST)	700	900	800	900	1200	900	300	300
Accuracy (percent):								
Paired peak prediction	-85.333	-50.091	-11.571	8.909	-61.000	-63.091	-99.182	-99.182
(Peak prediction)	0.88	5.49	6.19	11.98	3.51	4.06	0.09	0.09
Temporally-paired peak pred.	-85.333	-50.091	-6.000	8.909	18.889	-62.909	-96.727	-24.909
(Peak prediction)	0.88	5.49	6.58	11.98	10.70	4.08	0.36	8.26
(Station at pred. peak)	Simi Vly	Burbank	Hawthorn	Los Ange	Pasadena	San Bern	Palm Spr	Upland
Spatially-paired peak pred.	-74.833	23.273	14.714	8.909	7.000	-2.364	-99.091	-99.091
(Peak prediction)	1.51	13.56	8.03	11.98	9.63	10.74	0.10	0.10
(Time of pred. peak-PST)	900	1200	900	900	1900	2000	400	400
Unpaired peak prediction	-74.667	23.273	22.571	18.091	48.333	-2.364	-90.364	23.273
(Peak prediction)	1.52	13.56	8.58	12.99	13.35	10.74	1.06	13.56

(Station at pred. peak)	El Rio-R	Burbank	Long Bea	Pico Riv	Glendora	Upland	Palm Spr	Burbank
(Time of pred. peak-PST)	800	1200	1100	1400	1900	2000	600	1200
Average peak prediction	49.333	23.273	31.426	21.417	52.287	10.309	94.045	42.095
Normalized systematic bias (%)	-65.403	-14.525	60.036	40.512	13.161	-10.817	-86.547	7.959
Systematic bias (pphm)	-1.971	-1.057	1.531	1.204	0.471	-1.050	-3.045	0.011
Variance	1.102	6.238	3.692	4.952	8.650	7.012	5.843	5.717
Normalized gross error (%)	65.403	33.424	74.009	54.877	40.620	40.377	86.547	54.348
Gross error (pphm)	1.971	2.130	1.974	1.932	2.404	2.335	3.045	2.213

TABLE F-11

RHC Performance Statistics for June 24, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	12.60	5.60	7.00	14.00	19.60	21.00	-9.99	21.00
Peak station	Simi Vly	Reseda	West Los	Lynwood	Azusa	Rubidoux	Lancaste	Rubidoux
Peak time (PST)	900	1000	800	1000	1400	800	700	800
Accuracy (percent):								
Paired peak prediction	-76.190	38.036	21.714	-22.571	-57.959	-84.286	-9.999	-84.286
(Peak prediction)	3.00	7.73	8.52	10.84	8.24	3.30	-9.99	3.30
Temporally-paired peak pred.	-76.190	38.036	21.714	-22.571	-57.959	-84.286	-9.999	-58.619
(Peak prediction)	3.00	7.73	8.52	10.84	8.24	3.30	-9.99	8.69
(Station at pred. peak)	Simi Vly	Reseda	West Los	Lynwood	Azusa	Rubidoux	Lancaste	Lynwood
Spatially-paired peak pred.	-74.127	43.571	21.714	-22.571	-48.418	-73.476	-9.999	-73.476
(Peak prediction)	3.26	8.04	8.52	10.84	10.11	5.57	-9.99	5.57
(Time of pred. peak-PST)	800	900	800	1000	1500	2100	700	2100
Unpaired peak prediction	-74.127	43.571	21.714	-22.571	-48.418	-73.476	-9.999	-48.381
(Peak prediction)	3.26	8.04	8.52	10.84	10.11	5.57	-9.99	10.84
(Station at pred. peak)	Simi Vly	Reseda	West Los	Lynwood	Azusa	Rubidoux	Lancaste	Lynwood
(Time of pred. peak-PST)	800	900	800	1000	1500	2100	700	1000

Average peak prediction	55.754	43.571	21.714	24.575	48.418	73.476	-9.999	46.983
Normalized systematic bias (%)	-55.468	104.418	38.398	64.657	-31.977	-0.715	-9.999	19.290
Systematic bias (pptm)	-4.698	2.302	0.687	0.034	-4.557	-3.044	-9.999	-1.632
Variance	16.045	4.501	3.878	11.910	14.287	27.067	-9.999	12.781
Normalized gross error (%)	56.012	108.810	57.983	92.976	33.567	72.053	-9.999	72.348
Gross error (pptm)	4.706	2.487	1.734	2.790	4.668	4.508	-9.999	3.481

TABLE F-12

RHC Performance Statistics for June 25, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	16.80	9.80	9.80	11.20	21.00	16.80	-9.99	21.00
Peak station	Simi Vly	Reseda	West Los	La Habra	Azusa	Rubidoux	Lancaste	Azusa
Peak time (PST)	800	700	800	700	1100	600	700	1100
Accuracy (percent):								
Paired peak prediction	-85.476	-48.878	6.837	-60.089	-68.714	-71.667	-9.999	-68.714
(Peak prediction)	2.44	5.01	10.47	4.47	6.57	4.76	-9.99	6.57
Temporally-paired peak pred.	-85.476	-48.878	6.837	28.750	-68.714	-71.667	-9.999	-45.381
(Peak prediction)	2.44	5.01	10.47	14.42	6.57	4.76	-9.99	11.47
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Lynwood
Spatially-paired peak pred.	-81.607	-29.286	8.469	-50.357	-43.095	-64.048	-9.999	-43.095
(Peak prediction)	3.09	6.93	10.63	5.56	11.95	6.04	-9.99	11.95
(Time of pred. peak-PST)	900	900	900	0	1800	400	700	1800
Unpaired peak prediction	-81.607	-29.286	8.469	41.161	-43.095	-64.048	-9.999	-24.714
(Peak prediction)	3.09	6.93	10.63	15.81	11.95	6.04	-9.99	15.81
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Azusa	Rubidoux	Lancaste	Los Ange
(Time of pred. peak-PST)	900	900	900	900	1800	400	700	900
Average peak prediction	57.054	29.286	8.469	43.000	43.095	64.048	-9.999	47.536
Normalized systematic bias (%)	-49.117	1.875	43.552	142.788	-26.623	-21.532	-9.999	35.776
Systematic bias (pptm)	-5.800	-1.172	0.886	2.847	-3.990	-3.579	-9.999	-1.268
Variance	33.415	5.737	3.710	13.729	18.742	19.785	-9.999	17.266

Normalized gross error (%)	52.323	47.516	56.795	153.530	32.065	50.555	-9.999	83.363
Gross error (pptm)	5.845	2.044	1.763	3.851	4.472	4.222	-9.999	4.021

TABLE F-13

Ozone Performance Statistics for July 14, 1987 (87b_01adj2)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	10.00	21.00	8.00	12.00	22.00	25.00	15.00	25.00
Peak station	Piru - 2	Reseda	West Los	Pico Riv	Glendora	San Bern	Palm Spr	San Bern
Peak time (PST)	1500	1400	1200	1200	1400	1600	1900	1600
Accuracy (percent):								
Paired peak prediction	-21.000	-69.524	-2.750	4.417	-6.500	-25.320	-44.867	-25.320
(Peak prediction)	7.90	6.40	7.78	12.53	20.57	18.67	8.27	18.67
Temporally-paired peak pred.	-21.000	-44.095	-2.750	9.917	6.182	-8.800	23.000	-8.800
(Peak prediction)	7.90	11.74	7.78	13.19	23.36	22.80	18.45	22.80
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Pomona	Perris	Hesperia	Perris
Spatially-paired peak pred.	-9.300	-66.762	-2.750	4.417	-6.500	-17.520	-38.933	-17.520
(Peak prediction)	9.07	6.98	7.78	12.53	20.57	20.62	9.16	20.62
(Time of pred. peak-PST)	1300	1200	1200	1200	1400	1400	2100	1400
Unpaired peak prediction	-9.300	-43.810	-2.750	9.917	6.182	-4.560	23.000	-4.560
(Peak prediction)	9.07	11.80	7.78	13.19	23.36	23.86	18.45	23.86
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Pomona	Upland A	Hesperia	Upland A
(Time of pred. peak-PST)	1300	1300	1200	1200	1400	1500	1900	1500
Average peak prediction	12.390	33.261	41.000	33.277	8.147	3.291	24.067	17.618
Normalized systematic bias (%)	-19.009	-31.462	-28.250	-14.840	5.815	-6.794	-31.567	-14.414
Systematic bias (pphm)	-1.812	-4.269	-2.260	-1.352	0.837	-1.028	-3.349	-1.694
Variance	2.797	11.709	8.323	9.327	10.669	19.599	11.556	14.565
Normalized gross error (%)	19.320	31.462	28.250	33.301	23.540	28.592	41.434	31.367
Gross error (pphm)	1.839	4.269	2.260	2.889	2.793	3.501	4.220	3.548

TABLE F-14

Ozone Performance Statistics for July 15, 1987 (87b_01adj2)
(concentrations greater than or equal to 10.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	17.00	-9.99	-9.99	13.00	23.00	17.00	23.00
Peak station	Piru - 2	Newhall-	West Los	La Habra	Glendora	Lake Gre	Hesperia	Lake Gre
Peak time (PST)	1300	1500	1200	1200	1400	1700	1500	1700
Accuracy (percent):								
Paired peak prediction	12.390	-39.588	41.000	33.277	9.077	-30.913	-31.059	-30.913
(Peak prediction)	-9.99	10.27	-9.99	-9.99	14.18	15.89	11.72	15.89
Temporally-paired peak pred.	12.390	-39.588	41.000	33.277	9.077	-30.913	-31.059	-30.913
(Peak prediction)	-9.99	10.27	-9.99	-9.99	14.18	15.89	11.72	15.89
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Glendora	Lake Gre	Hesperia	Lake Gre
Spatially-paired peak pred.	12.390	-37.882	41.000	33.277	9.077	-30.913	-27.118	-30.913
(Peak prediction)	-9.99	10.56	-9.99	-9.99	14.18	15.89	12.39	15.89
(Time of pred. peak-PST)	1300	1400	1200	1200	1400	1700	1400	1700
Unpaired peak prediction	12.390	-37.882	41.000	33.277	9.077	-7.609	-27.118	-7.609
(Peak prediction)	-9.99	10.56	-9.99	-9.99	14.18	21.25	12.39	21.25
(Station at pred. peak)	Piru - 2	Newhall-	West Los	La Habra	Glendora	Perris	Hesperia	Perris
(Time of pred. peak-PST)	1300	1400	1200	1200	1400	1500	1400	1500
Average peak prediction	-9.999	41.366	-9.999	-9.999	12.392	15.445	27.118	20.681
Normalized systematic bias (%)	-9.999	-41.378	-9.999	-9.999	-5.575	-5.650	-21.149	-12.258
Systematic bias (pphm)	-9.999	-5.292	-9.999	-9.999	-0.500	-1.185	-2.653	-1.836
Variance	-9.999	1.657	-9.999	-9.999	5.030	15.157	7.093	11.202
Normalized gross error (%)	-9.999	41.378	-9.999	-9.999	18.869	21.883	27.204	24.774
Gross error (pphm)	-9.999	5.292	-9.999	-9.999	1.968	3.036	3.279	3.250

TABLE F-15

NO2 Performance Statistics for July 14, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	9.00	8.00	9.00	9.00	9.00	8.00	9.00
Peak station		Burbank	North Lo	Whittier	Pomona	Upland A	Barstow	Upland A

	1	2	3	4	5	6	7	ALL
Peak time (PST)	0	1100	1100	1200	1400	800	600	800
Accuracy (percent):								
Paired peak prediction	-9.999	30.444	41.750	61.556	-1.111	-47.444	-96.250	-47.444
(Peak prediction)	-9.99	11.74	11.34	14.54	8.90	4.73	0.30	4.73
Temporally-paired peak pred.	-9.999	30.444	55.625	125.444	64.556	-38.667	-94.500	5.778
(Peak prediction)	-9.99	11.74	12.45	20.29	14.81	5.52	0.44	9.52
(Station at pred. peak)		Burbank	Long Bea	Los Ange	Pasadena	Fontana-	Lancaste	Los Ange
Spatially-paired peak pred.	-9.999	40.556	41.750	74.444	72.444	73.222	-91.250	73.222
(Peak prediction)	-9.99	12.65	11.34	15.70	15.52	15.59	0.70	15.59
(Time of pred. peak-PST)	0	1200	1100	1300	1700	1800	0	1800
Unpaired peak prediction	-9.999	40.556	55.625	162.556	108.111	73.222	-41.000	162.556
(Peak prediction)	-9.99	12.65	12.45	23.63	18.73	15.59	4.72	23.63
(Station at pred. peak)		Burbank	Long Bea	Los Ange	Pasadena	Upland A	Hesperia	Los Ange
(Time of pred. peak-PST)	0	1200	1100	1100	1300	1800	2100	1100
Average peak prediction	-9.999	40.556	99.104	143.171	92.997	76.509	46.025	82.689
Normalized systematic bias (%)	-9.999	3.140	79.042	76.384	49.726	54.525	-52.389	49.526
Systematic bias (pphm)	-9.999	0.195	2.124	3.292	2.723	1.768	-2.355	1.930
Variance	-9.999	2.102	4.261	9.079	11.742	14.778	8.172	9.100
Normalized gross error (%)	-9.999	23.997	81.348	77.198	57.718	78.589	82.639	69.672
Gross error (pphm)	-9.999	1.119	2.191	3.335	3.189	3.323	2.960	2.879

TABLE F-16

NO2 Performance Statistics for July 15, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	7.00	7.00	7.00	7.00	7.00	8.00	8.00
Peak station		Reseda	North Lo	Pico Riv	Pomona	Upland A	Barstow	Barstow
Peak time (PST)	0	1100	1600	1900	1600	2100	400	400
Accuracy (percent):								
Paired peak prediction	-9.999	-66.000	-42.286	-13.714	49.286	42.429	-78.875	-78.875
(Peak prediction)	-9.99	2.38	4.04	6.04	10.45	9.97	1.69	1.69

Temporally-paired peak pred. -9.999 3.000 -28.286 4.286 61.714 58.286 -78.875
22.750
(Peak prediction) -9.99 7.21 5.02 7.30 11.32 11.08 1.69 9.82
(Station at pred. peak) Burbank Long Bea Anaheim Pasadena Fontana- Barstow San
Bern
Spatially-paired peak pred. -9.999 -27.571 8.429 59.000 85.571 91.000 -78.875 -
78.875
(Peak prediction) -9.99 5.07 7.59 11.13 12.99 13.37 1.69 1.69
(Time of pred. peak-PST) 0 2100 1100 1400 1800 1900 400 400
Unpaired peak prediction -9.999 7.714 8.429 74.286 85.571 91.000 -70.250 67.125
(Peak prediction) -9.99 7.54 7.59 12.20 12.99 13.37 2.38 13.37
(Station at pred. peak) Burbank North Lo La Habra Pomona Upland A Hesperia
Upland A
(Time of pred. peak-PST) 0 1200 1100 1400 1800 1900 500 1900
Average peak prediction -9.999 7.714 21.423 114.963 74.257 97.676 71.113
75.196

Normalized systematic bias (%) -9.999 -25.629 63.837 99.377 43.682 80.567 -71.266
48.275
Systematic bias (pphm) -9.999 -1.345 1.381 2.755 2.247 2.601 -2.487 1.464
Variance -9.999 1.709 2.107 5.749 5.024 7.881 2.573 4.883
Normalized gross error (%) -9.999 28.657 68.294 101.469 46.691 90.598 73.866
74.731
Gross error (pphm) -9.999 1.479 1.618 2.854 2.411 3.190 2.539 2.548

TABLE F-17

RHC Performance Statistics for July 14, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	-9.99	9.80	12.60	21.00	-9.99	-9.99	21.00
Peak station	Piru - 2	Burbank	North Lo	La Habra	Azusa	Claremon	Hesperia	Azusa
Peak time (PST)	1300	1200	700	100	800	1600	2000	800

Accuracy (percent):
Paired peak prediction -9.999 -9.999 -33.776 -12.460 -66.952 -9.999 -9.999 -66.952
(Peak prediction) -9.99 -9.99 6.49 11.03 6.94 -9.99 -9.99 6.94
Temporally-paired peak pred. -9.999 -9.999 -33.776 19.365 -66.952 -9.999 -9.999 -
35.000
(Peak prediction) -9.99 -9.99 6.49 15.04 6.94 -9.99 -9.99 13.65
(Station at pred. peak) Piru - 2 Burbank North Lo Los Ange Azusa Claremon Hesperia Los
Ange

Spatially-paired peak pred.	-9.999	-9.999	15.408	11.349	-22.762	-9.999	-9.999	-22.762
(Peak prediction)	-9.99	-9.99	11.31	14.03	16.22	-9.99	-9.99	16.22
(Time of pred. peak-PST)	1300	1200	1100	1400	0	1600	2000	0
Unpaired peak prediction	-9.999	-9.999	15.408	90.873	-22.762	-9.999	-9.999	14.524
(Peak prediction)	-9.99	-9.99	11.31	24.05	16.22	-9.99	-9.99	24.05
(Station at pred. peak)	Piru - 2	Burbank	North Lo	Los Ange	Azusa	Claremon	Hesperia	Los Ange
(Time of pred. peak-PST)	1300	1200	1100	1100	0	1600	2000	1100
Average peak prediction	-9.999	-9.999	15.408	74.968	22.762	-9.999	-9.999	41.144
Normalized systematic bias (%)	-9.999	-9.999	99.172	143.004	33.186	-9.999	-9.999	113.210
Systematic bias (pptm)	-9.999	-9.999	2.971	5.437	-0.795	-9.999	-9.999	3.749
Variance	-9.999	-9.999	6.243	13.503	74.003	-9.999	-9.999	24.440
Normalized gross error (%)	-9.999	-9.999	105.928	144.683	78.873	-9.999	-9.999	125.045
Gross error (pptm)	-9.999	-9.999	3.633	5.630	7.475	-9.999	-9.999	5.740

TABLE F-18

RHC Performance Statistics for July 15, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	5.60	4.20	12.60	8.40	-9.99	-9.99	12.60
Peak station	Piru - 2	Reseda	North Lo	Los Ange	Azusa	Claremon	Hesperia	Los Ange
Peak time (PST)	1300	1400	900	700	1200	1600	2000	700
Accuracy (percent):								
Paired peak prediction	-9.999	-58.750	45.714	-49.127	-3.690	-9.999	-9.999	-49.127
(Peak prediction)	-9.99	2.31	6.12	6.41	8.09	-9.99	-9.99	6.41
Temporally-paired peak pred.	-9.999	-58.750	45.714	-49.127	-3.690	-9.999	-9.999	-49.127
(Peak prediction)	-9.99	2.31	6.12	6.41	8.09	-9.99	-9.99	6.41
(Station at pred. peak)	Piru - 2	Reseda	North Lo	Los Ange	Azusa	Claremon	Hesperia	Los Ange
Spatially-paired peak pred.	-9.999	-23.393	45.714	-19.127	22.976	-9.999	-9.999	-19.127
(Peak prediction)	-9.99	4.29	6.12	10.19	10.33	-9.99	-9.99	10.19
(Time of pred. peak-PST)	1300	2000	900	1600	1700	1600	2000	1600
Unpaired peak prediction	-9.999	-23.393	45.714	-13.175	22.976	-9.999	-9.999	-13.175
(Peak prediction)	-9.99	4.29	6.12	10.94	10.33	-9.99	-9.99	10.94

(Station at pred. peak)	Piru - 2	Reseda	North Lo	La Habra	Azusa	Claremon	Hesperia	La Habra
(Time of pred. peak-PST)	1300	2000	900	1400	1700	1600	2000	1400
Average peak prediction	-9.999	23.393	45.714	21.797	22.976	-9.999	-9.999	27.457
Normalized systematic bias (%)	-9.999	57.515	119.018	144.970	107.443	-9.999	-9.999	129.701
Systematic bias (pptm)	-9.999	-0.050	1.943	2.319	4.073	-9.999	-9.999	2.448
Variance	-9.999	7.956	1.267	13.944	4.724	-9.999	-9.999	10.099
Normalized gross error (%)	-9.999	103.914	119.018	158.452	108.059	-9.999	-9.999	141.205
Gross error (pptm)	-9.999	2.310	1.943	3.544	4.124	-9.999	-9.999	3.381

TABLE F-19

Ozone Performance Statistics for September 8, 1987 (87b_01adj2)
(concentrations greater than or equal to 8.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	11.00	22.00	19.00	25.00	33.00	23.00	22.00	33.00
Peak station	El Rio-R	Burbank	West Los	Pico Riv	Glendora	Upland	Hesperia	Glendora
Peak time (PST)	1200	1200	1500	1300	1400	1400	1700	1400
Accuracy (percent):								
Paired peak prediction	-22.364	-15.682	-60.579	-28.160	-28.697	-38.870	-33.091	-28.697
(Peak prediction)	8.54	18.55	7.49	17.96	23.53	14.06	14.72	23.53
Temporally-paired peak pred.	-22.364	-15.682	-60.579	-23.520	-21.576	-15.870	-33.091	-21.576
(Peak prediction)	8.54	18.55	7.49	19.12	25.88	19.35	14.72	25.88
(Station at pred. peak)	El Rio-R	Burbank	West Los	Los Ange	Azusa	Crestlin	Hesperia	Azusa
Spatially-paired peak pred.	-12.182	11.000	-2.684	-21.240	-23.515	11.826	-25.000	-23.515
(Peak prediction)	9.66	24.42	18.49	19.69	25.24	25.72	16.50	25.24
(Time of pred. peak-PST)	1300	1400	1300	1400	1500	1100	1600	1500
Unpaired peak prediction	-2.455	11.000	-2.684	-21.240	-20.818	11.826	-25.000	-20.818
(Peak prediction)	10.73	24.42	18.49	19.69	26.13	25.72	16.50	26.13
(Station at pred. peak)	Simi Vly	Burbank	West Los	Pico Riv	Pasadena	Upland	Hesperia	Pasadena
(Time of pred. peak-PST)	1300	1400	1300	1400	1300	1100	1600	1300
Average peak prediction	6.061	11.000	66.820	14.926	14.050	10.408	29.088	23.810

Normalized systematic bias (%)	0.775	20.419	-22.725	-29.584	15.368	25.787	-9.103	2.843
Systematic bias (pphm)	0.043	2.084	-2.568	-3.824	1.564	2.222	-1.445	-0.089
Variance	2.425	31.218	29.267	10.992	22.301	26.205	15.469	20.476
Normalized gross error (%)	13.845	40.643	40.989	32.912	28.864	40.066	31.871	34.962
Gross error (pphm)	1.223	4.601	4.352	4.270	3.864	4.463	3.435	4.034

TABLE F-20

Ozone Performance Statistics for September 9, 1987 (87b_01adj2)
(concentrations greater than or equal to 10.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	10.00	16.00	12.00	17.00	26.00	26.00	22.00	26.00
Peak station	Piru - 2	Burbank	El Toro	Pico Riv	Glendora	Crestlin	Hesperia	Crestlin
Peak time (PST)	1200	1300	1400	1100	1300	1500	1700	1500
Accuracy (percent):								
Paired peak prediction	-11.400	-23.688	-7.917	-55.824	-5.346	-21.192	-12.409	-21.192
(Peak prediction)	8.86	12.21	11.05	7.51	24.61	20.49	19.27	20.49
Temporally-paired peak pred.	-11.400	-23.688	-7.917	-43.353	-5.346	-21.192	-3.091	-21.192
(Peak prediction)	8.86	12.21	11.05	9.63	24.61	20.49	21.32	20.49
(Station at pred. peak)	Piru - 2	Burbank	El Toro	La Habra	Glendora	Crestlin	Victorvi	Crestlin
Spatially-paired peak pred.	-11.400	-23.688	17.167	-54.118	-5.346	-16.038	-12.409	-16.038
(Peak prediction)	8.86	12.21	14.06	7.80	24.61	21.83	19.27	21.83
(Time of pred. peak-PST)	1200	1300	1300	1200	1300	1600	1700	1600
Unpaired peak prediction	-11.400	-23.688	17.167	-38.941	-5.346	-6.923	-3.091	-5.346
(Peak prediction)	8.86	12.21	14.06	10.38	24.61	24.20	21.32	24.61
(Station at pred. peak)	Piru - 2	Burbank	El Toro	Anaheim	Glendora	Fontana	Victorvi	Glendora
(Time of pred. peak-PST)	1200	1300	1300	1200	1300	1300	1700	1300
Average peak prediction	11.400	23.688	17.167	38.941	9.568	9.592	10.856	16.570
Normalized systematic bias (%)	-11.400	-27.141	-4.614	-38.036	-6.349	7.809	-7.902	-5.794
Systematic bias (pphm)	-1.140	-3.630	-0.477	-5.044	-0.769	0.415	-1.222	-1.052
Variance	-9.999	1.428	5.458	6.491	21.984	24.787	26.410	19.431
Normalized gross error (%)	11.400	27.141	16.058	38.036	27.072	29.268	35.525	30.447
Gross error (pphm)	1.140	3.630	1.850	5.044	3.786	3.915	4.521	4.043

TABLE F-21

NO2 Performance Statistics for September 8, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	5.00	14.00	14.00	14.00	14.00	13.00	6.00	14.00
Peak station	Simi Vly	Burbank	West Los	Pico Riv	Pomona	Upland	Palm Spr	Pomona
Peak time (PST)	2200	800	900	800	800	600	700	800
Accuracy (percent):								
Paired peak prediction	-70.800	-25.143	34.643	-46.357	-33.143	-18.077	-75.167	-33.143
(Peak prediction)	1.46	10.48	18.85	7.51	9.36	10.65	1.49	9.36
Temporally-paired peak pred.	-3.800	-25.143	34.643	6.857	-29.429	-12.846	-75.167	6.857
(Peak prediction)	4.81	10.48	18.85	14.96	9.88	11.33	1.49	14.96
(Station at pred. peak)	El Rio-R	Burbank	West Los	Los Ange	Pasadena	Rubidoux	Palm Spr	Los Ange
Spatially-paired peak pred.	-59.800	52.643	94.429	107.571	45.071	55.077	-69.500	45.071
(Peak prediction)	2.01	21.37	27.22	29.06	20.31	20.16	1.83	20.31
(Time of pred. peak-PST)	1800	1400	1100	1700	1900	2000	1100	1900
Unpaired peak prediction	62.000	52.643	107.571	130.714	126.214	55.077	-69.500	130.714
(Peak prediction)	8.10	21.37	29.06	32.30	31.67	20.16	1.83	32.30
(Station at pred. peak)	El Rio-R	Burbank	Hawthorn	Lynwood	Pasadena	Upland	Palm Spr	Lynwood
(Time of pred. peak-PST)	1200	1400	1200	1400	1500	2000	1100	1400
Average peak prediction	62.000	52.643	86.920	116.315	105.520	36.157	71.225	75.624
Normalized systematic bias (%)	14.593	64.284	94.351	106.804	121.891	121.487	-61.640	85.433
Systematic bias (pphm)	-0.013	2.068	3.971	5.463	5.606	5.473	-1.738	3.913
Variance	5.171	33.938	40.868	41.739	48.405	14.448	0.881	32.626
Normalized gross error (%)	65.150	86.349	137.846	114.855	129.323	124.074	61.640	112.974
Gross error (pphm)	1.774	4.390	5.508	6.289	6.438	5.748	1.738	5.216

TABLE F-22

NO2 Performance Statistics for September 9, 1987 (87b_01adj2)
(concentrations greater than or equal to 2.0 pphm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	8.00	18.00	15.00	30.00	19.00	11.00	6.00	30.00
Peak station	Simi Vly	Burbank	Long Bea	Los Ange	Pasadena	Rubidoux	Lancaste	Los Ange
Peak time (PST)	700	800	1000	900	1100	800	600	900
Accuracy (percent):								
Paired peak prediction	-66.375	-54.500	60.200	-44.867	-31.421	-29.182	-82.667	-44.867
(Peak prediction)	2.69	8.19	24.03	16.54	13.03	7.79	1.04	16.54
Temporally-paired peak pred.	-37.000	-20.944	60.200	-44.867	-21.105	60.364	-68.333	-28.233
(Peak prediction)	5.04	14.23	24.03	16.54	14.99	17.64	1.90	21.53
(Station at pred. peak)	El Rio-R	Reseda	Long Bea	Los Ange	Azusa	Upland	Palm Spr	Long Bea
Spatially-paired peak pred.	-64.125	-32.889	60.200	-37.700	18.263	-29.182	-82.500	-37.700
(Peak prediction)	2.87	12.08	24.03	18.69	22.47	7.79	1.05	18.69
(Time of pred. peak-PST)	800	1300	1000	1000	1400	800	700	1000
Unpaired peak prediction	-2.750	-18.444	60.200	-24.367	18.263	67.000	-68.333	-19.900
(Peak prediction)	7.78	14.68	24.03	22.69	22.47	18.37	1.90	24.03
(Station at pred. peak)	El Rio-R	Reseda	Long Bea	Whittier	Pasadena	Upland	Palm Spr	Long Bea
(Time of pred. peak-PST)	900	900	1000	1400	1400	1800	600	1000
Average peak prediction	81.042	28.074	138.307	26.328	31.193	67.428	71.875	70.445
Normalized systematic bias (%)	5.965	14.233	57.052	57.881	136.717	121.844	-57.165	65.316
Systematic bias (pphm)	-0.432	-0.487	2.523	2.781	6.365	5.130	-1.664	2.885
Variance	5.935	16.410	22.946	23.231	34.934	19.816	1.356	21.456
Normalized gross error (%)	68.978	50.746	98.519	67.170	142.625	127.002	57.165	92.896
Gross error (pphm)	2.068	3.281	4.031	4.087	6.918	5.472	1.664	4.389

TABLE F-23

RHC Performance Statistics for September 8, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	26.60	18.20	53.20	-9.99	-9.99	-9.99	53.20
Peak station	Simi Vly	Reseda	West Los	Lynwood	Pasadena	Upland	Lancaste	Lynwood
Peak time (PST)	100	2300	600	600	1500	2000	500	600
Accuracy (percent):								
Paired peak prediction	-9.999	-78.045	-26.154	-79.004	-9.999	-9.999	-9.999	-79.004
(Peak prediction)	-9.99	5.84	13.44	11.17	-9.99	-9.99	-9.99	11.17
Temporally-paired peak pred.	-9.999	-78.045	-26.154	-66.711	-9.999	-9.999	-9.999	-66.711
(Peak prediction)	-9.99	5.84	13.44	17.71	-9.99	-9.99	-9.99	17.71
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Pasadena	Upland	Lancaste	Los Ange
Spatially-paired peak pred.	-9.999	-45.489	63.791	-71.992	-9.999	-9.999	-9.999	-71.992
(Peak prediction)	-9.99	14.50	29.81	14.90	-9.99	-9.99	-9.99	14.90
(Time of pred. peak-PST)	100	900	1100	1000	1500	2000	500	1000
Unpaired peak prediction	-9.999	-45.489	63.791	-43.440	-9.999	-9.999	-9.999	-43.440
(Peak prediction)	-9.99	14.50	29.81	30.09	-9.99	-9.99	-9.99	30.09
(Station at pred. peak)	Simi Vly	Reseda	West Los	Los Ange	Pasadena	Upland	Lancaste	Los Ange
(Time of pred. peak-PST)	100	900	1100	1200	1500	2000	500	1200
Average peak prediction	-9.999	45.489	63.791	37.431	-9.999	-9.999	-9.999	43.167
Normalized systematic bias (%)	-9.999	3.150	143.309	59.353	-9.999	-9.999	-9.999	68.144
Systematic bias (pptm)	-9.999	-2.800	7.727	-0.090	-9.999	-9.999	-9.999	1.431
Variance	-9.999	46.592	58.501	254.615	-9.999	-9.999	-9.999	136.766
Normalized gross error (%)	-9.999	62.806	148.139	96.334	-9.999	-9.999	-9.999	102.079
Gross error (pptm)	-9.999	5.805	8.501	12.380	-9.999	-9.999	-9.999	9.420

TABLE F-24

RHC Performance Statistics for September 9, 1987 (87b_01adj2)
(concentrations greater than or equal to 1.0 pptm)

	1	2	3	4	5	6	7	ALL
Peak station measurement	-9.99	22.40	16.80	43.40	-9.99	-9.99	-9.99	43.40
Peak station	Simi Vly	Reseda	West Los	Los Ange	Pasadena	Upland	Lancaste	Los Ange
Peak time (PST)	100	700	100	900	1500	2000	500	900

Accuracy (percent):
Paired peak prediction -9.999 -26.116 -10.238 -45.853 -9.999 -9.999 -9.999 -45.853
(Peak prediction) -9.99 16.55 15.08 23.50 -9.99 -9.99 -9.99 23.50
Temporally-paired peak pred. -9.999 -26.116 -10.238 -45.853 -9.999 -9.999 -9.999 -45.853
(Peak prediction) -9.99 16.55 15.08 23.50 -9.99 -9.99 -9.99 23.50
(Station at pred. peak) Simi Vly Reseda West Los Los Ange Pasadena Upland Lancaste Los Ange
Spatially-paired peak pred. -9.999 -20.938 71.607 -24.654 -9.999 -9.999 -9.999 -24.654
(Peak prediction) -9.99 17.71 28.83 32.70 -9.99 -9.99 -9.99 32.70
(Time of pred. peak-PST) 100 800 700 700 1500 2000 500 700
Unpaired peak prediction -9.999 -20.938 71.607 -24.654 -9.999 -9.999 -9.999 -24.654
(Peak prediction) -9.99 17.71 28.83 32.70 -9.99 -9.99 -9.99 32.70
(Station at pred. peak) Simi Vly Reseda West Los Los Ange Pasadena Upland Lancaste Los Ange
(Time of pred. peak-PST) 100 800 700 700 1500 2000 500 700
Average peak prediction -9.999 20.938 71.607 24.654 -9.999 -9.999 -9.999 31.860

Normalized systematic bias (%) -9.999 -26.771 102.368 48.020 -9.999 -9.999 -9.999 41.718
Systematic bias (pptm) -9.999 -4.366 5.464 0.732 -9.999 -9.999 -9.999 0.572
Variance -9.999 35.812 48.152 39.882 -9.999 -9.999 -9.999 39.884
Normalized gross error (%) -9.999 49.774 111.142 62.184 -9.999 -9.999 -9.999 71.623
Gross error (pptm) -9.999 5.810 6.343 4.461 -9.999 -9.999 -9.999 5.326

ATTACHMENT G

1990 AND 1993 SUMMER PLANNING EMISSION INVENTORIES FOR THE ANTELOPE VALLEY

1990 Summer Planning Emissions by Source Category in Antelope Valley (Tons/Day)

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
100	Fuel Combustion							
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	Petroleum Refining	0.01	0.01	0.15	0.09	0.00	0.01	0.01
140	Other Manufacturing/Industrial	0.06	0.02	0.22	0.28	0.07	0.02	0.02
150	Electric Utilities	0.00	0.00	0.01	0.04	0.00	0.00	0.00
160	Other Service and Commerce	0.04	0.02	0.27	0.36	0.02	0.04	0.03
170	Residential	0.06	0.02	0.15	0.77	0.01	0.04	0.04
199	Other	0.05	0.04	0.35	0.38	0.02	0.03	0.03
Total	Fuel Combustion	0.23	0.12	1.15	1.92	0.13	0.13	0.13
200	Waste Burning							
210	Agricultural Debris	0.00	0.00	0.02	0.00	0.00	0.00	0.00
220	Range Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
299	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Waste Burning	0.00	0.00	0.02	0.01	0.00	0.01	0.01
300	Solvent Use							
310	Dry Cleaning	0.14	0.00	0.00	0.00	0.00	0.00	0.00
320	Degreasing	1.41	0.15	0.00	0.00	0.00	0.00	0.00
330	Architectural Coating	1.33	1.24	0.00	0.00	0.00	0.00	0.00
340	Other Surface Coating	1.88	1.81	0.00	0.00	0.00	0.01	0.01
350	Asphalt Paving	0.01	0.01	0.00	0.00	0.00	0.00	0.00
360	Printing	0.00	0.00	0.00	0.00	0.00	0.00	0.00
370	Consumer Products	1.85	1.84	0.00	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	0.19	0.15	0.00	0.00	0.00	0.00	0.00
399	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Solvent Use	6.81	5.19	0.00	0.00	0.00	0.01	0.01
400	Petroleum Process, Storage & Transfer							
410	Oil and Gas Extraction	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420	Petroleum Refining	0.00	0.00	0.07	0.00	0.00	0.05	0.02
430	Petroleum Marketing	0.65	0.32	0.00	0.00	0.00	0.00	0.00
499	Other	0.01	0.01	0.00	0.00	0.00	0.24	0.10
Total	Petroleum Process, Storage & Transfer	0.66	0.32	0.07	0.00	0.00	0.30	0.12
500	Industrial Processes							
510	Chemical	0.00	0.00	0.00	0.00	0.00	0.00	0.00
520	Food and Agricultural	0.02	0.02	0.00	0.00	0.00	0.13	0.09
560	Mineral Processes	0.01	0.01	0.02	0.01	0.00	0.30	0.21
570	Metal Processes	0.04	0.04	0.00	0.00	0.00	0.02	0.02
580	Wood and Paper	0.00	0.00	0.00	0.00	0.00	0.39	0.27
599	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Industrial Processes	0.07	0.06	0.02	0.01	0.00	0.83	0.59
600	Miscellaneous Processes							
610	Pesticide Application	1.14	1.14	0.00	0.00	0.00	0.00	0.00
620	Farming Operations	10.05	0.80	0.00	0.00	0.00	0.43	0.20
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	16.68	10.67
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	12.46	5.73
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	23.47	14.32
660	Unplanned Fires	0.01	0.01	0.11	0.00	0.00	0.01	0.01
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	1.28	0.64
680	Waste Disposal	2.53	0.04	0.00	0.00	0.00	0.05	0.03
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00	0.00

694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00	0.00
699	Other	0.03	0.02	0.00	0.00	0.00	0.01	0.01
Total	Miscellaneous Processes	13.76	2.01	0.11	0.01	0.00	54.39	31.61

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
700	On-Road Vehicles							
710	Light-Duty Passenger	14.17	13.11	95.92	10.64	0.41	0.30	0.19
720	Light- and Medium-Duty Trucks	6.15	5.60	42.45	5.94	0.20	0.11	0.07
730	Heavy-Duty Gas Trucks	1.09	1.05	8.34	1.38	0.07	0.02	0.01
740	Heavy-Duty Diesel Trucks	0.60	0.58	2.38	4.63	0.17	0.59	0.55
750	Motorcycles	0.13	0.12	0.45	0.03	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	On-Road Vehicles	22.14	20.47	149.55	22.63	0.86	1.03	0.83
800	Other Mobile							
810	Off-Road Vehicles	0.54	0.52	2.47	0.04	0.00	0.02	0.02
815	Commericial Boats	0.00	0.00	0.00	0.00	0.00	0.00	0.00
820	Trains	0.16	0.16	0.55	3.23	0.19	0.08	0.07
830	Ships	0.00	0.00	0.00	0.00	0.00	0.00	0.00
850	Aircraft - Government	0.00	0.00	0.00	0.00	0.00	0.00	0.00
860	Aircraft - Other	0.06	0.06	0.79	0.00	0.00	0.00	0.00
870	Mobile Equipment	0.59	0.57	8.42	3.36	0.06	0.21	0.20
880	Utility Equipment	0.21	0.20	1.71	0.01	0.00	0.00	0.00
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Other Mobile	1.55	1.49	13.94	6.64	0.25	0.30	0.29
900	Unspecified Sources	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Total Stationary and Area Sources		21.53	7.71	1.38	1.94	0.13	55.66	32.46
Total On-Road Vehicles		22.14	20.47	149.55	22.63	0.86	1.03	0.83
Total Other Mobile		1.55	1.49	13.94	6.64	0.25	0.30	0.29
Grand Total		45.21	29.67	164.86	31.20	1.24	56.99	33.58

1993 Summer Planning Emissions by Source Category in Antelope Valley (Tons/Day)

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
100	Fuel Combustion							
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	Petroleum Refining	0.00	0.00	0.00	0.02	0.00	0.00	0.00
140	Other Manufacturing/Industrial	0.15	0.05	0.39	0.50	0.03	0.02	0.02
150	Electric Utilities	0.01	0.00	0.01	0.04	0.00	0.00	0.00
160	Other Service and Commerce	0.12	0.05	0.35	0.43	0.01	0.02	0.02
170	Residential	0.06	0.03	0.16	0.82	0.01	0.04	0.04
199	Other	0.01	0.01	0.10	0.03	0.00	0.00	0.00
Total	Fuel Combustion	0.35	0.13	1.02	1.83	0.05	0.08	0.08
200	Waste Burning							
210	Agricultural Debris	0.00	0.00	0.02	0.00	0.00	0.00	0.00
220	Range Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
299	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Waste Burning	0.00	0.00	0.02	0.00	0.00	0.00	0.00
300	Solvent Use							
310	Dry Cleaning	0.07	0.00	0.00	0.00	0.00	0.00	0.00
320	Degreasing	1.39	0.16	0.00	0.00	0.00	0.00	0.00
330	Architectural Coating	1.39	1.29	0.00	0.00	0.00	0.00	0.00
340	Other Surface Coating	1.34	1.31	0.00	0.00	0.00	0.00	0.00
350	Asphalt Paving	0.01	0.01	0.00	0.00	0.00	0.00	0.00
360	Printing	0.00	0.00	0.00	0.00	0.00	0.00	0.00
370	Consumer Products	1.81	1.80	0.00	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	0.39	0.23	0.00	0.00	0.00	0.00	0.00
399	Other	0.03	0.02	0.00	0.00	0.00	0.00	0.00
Total	Solvent Use	6.41	4.80	0.00	0.00	0.00	0.00	0.00
400	Petroleum Process, Storage & Transfer							
410	Oil and Gas Extraction	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.03	0.01
430	Petroleum Marketing	0.66	0.31	0.00	0.00	0.00	0.00	0.00
499	Other	0.01	0.01	0.00	0.00	0.00	0.01	0.00
Total	Petroleum Process, Storage & Transfer	0.68	0.32	0.00	0.00	0.00	0.04	0.02
500	Industrial Processes							
510	Chemical	0.00	0.00	0.00	0.00	0.00	0.00	0.00
520	Food and Agricultural	0.02	0.02	0.00	0.00	0.00	0.14	0.10
560	Mineral Processes	0.00	0.00	0.00	0.00	0.00	0.15	0.10
570	Metal Processes	0.00	0.00	0.00	0.00	0.00	0.03	0.02
580	Wood and Paper	0.00	0.00	0.00	0.00	0.00	0.42	0.29
599	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Industrial Processes	0.02	0.02	0.00	0.00	0.00	0.74	0.52
600	Miscellaneous Processes							
610	Pesticide Application	1.21	1.21	0.00	0.00	0.00	0.00	0.00
620	Farming Operations	10.79	0.86	0.00	0.00	0.00	0.46	0.21
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	15.59	9.98
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	12.71	5.84
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	24.20	14.76
660	Unplanned Fires	0.01	0.01	0.12	0.00	0.00	0.01	0.01
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	1.16	0.58
680	Waste Disposal	2.72	0.04	0.00	0.00	0.00	0.05	0.04
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00	0.00

694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00	0.00
699	Other	0.02	0.00	0.00	0.00	0.00	0.01	0.00
Total	Miscellaneous Processes	14.76	2.13	0.12	0.00	0.00	54.19	31.43

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
700	On-Road Vehicles							
710	Light-Duty Passenger	12.90	11.80	97.88	9.92	0.26	0.27	0.15
720	Light- and Medium-Duty Trucks	5.66	5.08	43.52	6.06	0.14	0.11	0.06
730	Heavy-Duty Gas Trucks	0.69	0.65	6.46	1.33	0.03	0.04	0.04
740	Heavy-Duty Diesel Trucks	0.52	0.50	2.29	3.66	0.17	0.37	0.35
750	Motorcycles	0.10	0.09	0.47	0.03	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	On-Road Vehicles	19.86	18.13	150.62	21.00	0.61	0.79	0.59
800	Other Mobile							
810	Off-Road Vehicles	0.57	0.55	2.64	0.04	0.00	0.02	0.02
815	Commericial Boats	0.00	0.00	0.00	0.00	0.00	0.00	0.00
820	Trains	0.17	0.17	0.59	3.28	0.20	0.07	0.06
830	Ships	0.00	0.00	0.00	0.00	0.00	0.00	0.00
850	Aircraft - Government	0.53	0.45	1.02	0.46	0.02	0.14	0.14
860	Aircraft - Other	0.99	0.95	1.13	0.07	0.00	0.00	0.00
870	Mobile Equipment	0.63	0.61	9.02	3.17	0.06	0.18	0.17
880	Utility Equipment	0.22	0.21	1.83	0.01	0.00	0.00	0.00
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Other Mobile	3.11	2.92	16.23	7.03	0.29	0.40	0.39
900	Unspecified Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Stationary and Area Sources		22.22	7.39	1.16	1.84	0.05	55.06	32.06
Total On-Road Vehicles		19.86	18.13	150.62	21.00	0.61	0.79	0.59
Total Other Mobile		3.11	2.92	16.23	7.03	0.29	0.40	0.39
Grand Total		45.20	28.44	168.00	29.87	0.94	56.26	33.04

ATTACHMENT H

1990 AND 1993 SUMMER PLANNING EMISSION INVENTORIES FOR THE COACHELLA VALLEY

1990 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
100	Fuel Combustion							
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	Petroleum Refining	0.00	0.00	0.00	0.02	0.00	0.01	0.01
140	Other Manufacturing/Industrial	0.87	0.10	0.68	1.45	0.09	0.05	0.05
150	Electric Utilities	0.16	0.10	0.08	0.28	0.00	0.01	0.01
160	Other Service and Commerce	3.66	0.30	1.77	8.36	0.01	0.04	0.04
170	Residential	0.11	0.04	0.29	1.30	0.01	0.07	0.07
199	Other	0.09	0.03	0.21	0.14	0.00	0.01	0.01
Total	Fuel Combustion	4.89	0.57	3.03	11.55	0.11	0.20	0.19
200	Waste Burning							
210	Agricultural Debris	0.04	0.02	0.22	0.00	0.00	0.03	0.03
220	Range Management	0.02	0.01	0.09	0.00	0.00	0.02	0.01
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.00	0.00	0.00	0.08	0.00	0.01	0.00
299	Other	0.00	0.00	0.03	0.00	0.00	0.01	0.01
Total	Waste Burning	0.06	0.03	0.34	0.08	0.00	0.06	0.05
300	Solvent Use							
310	Dry Cleaning	0.27	0.03	0.00	0.00	0.00	0.00	0.00
320	Degreasing	0.63	0.16	0.00	0.00	0.00	0.00	0.00
330	Architectural Coating	1.82	1.69	0.00	0.00	0.00	0.00	0.00
340	Other Surface Coating	2.66	2.44	0.03	0.23	0.00	0.00	0.00
350	Asphalt Paving	0.02	0.02	0.00	0.00	0.00	0.00	0.00
360	Printing	0.00	0.00	0.00	0.00	0.00	0.00	0.00
370	Consumer Products	2.83	2.81	0.00	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	0.10	0.07	0.00	0.00	0.00	0.00	0.00
399	Other	0.15	0.12	0.00	0.00	0.00	0.00	0.00
Total	Solvent Use	8.49	7.34	0.03	0.23	0.00	0.00	0.00
400	Petroleum Process, Storage & Transfer							
410	Oil and Gas Extraction	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00	0.00
430	Petroleum Marketing	3.05	0.83	0.00	0.00	0.00	0.00	0.00
499	Other	0.02	0.01	0.08	0.00	0.00	0.07	0.03
Total	Petroleum Process, Storage & Transfer	3.07	0.85	0.08	0.00	0.00	0.07	0.03
500	Industrial Processes							
510	Chemical	0.00	0.00	0.00	0.00	0.00	0.00	0.00
520	Food and Agricultural	0.04	0.03	0.00	0.01	0.00	0.25	0.17
560	Mineral Processes	0.00	0.00	0.00	0.00	0.00	0.39	0.19
570	Metal Processes	0.00	0.00	0.00	0.00	0.00	0.01	0.01
580	Wood and Paper	0.00	0.00	0.00	0.00	0.00	0.13	0.09
599	Other	0.01	0.01	0.00	0.00	0.00	0.07	0.05
Total	Industrial Processes	0.05	0.04	0.00	0.01	0.00	0.85	0.51
600	Miscellaneous Processes							
610	Pesticide Application	1.98	1.98	0.00	0.00	0.00	0.00	0.00
620	Farming Operations	2.28	0.18	0.00	0.00	0.00	4.85	2.18
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	5.95	3.81
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	22.12	10.18
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	32.42	19.78
660	Unplanned Fires	0.02	0.02	0.24	0.01	0.00	0.02	0.02
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	121.98	60.99
680	Waste Disposal	1.02	0.02	0.00	0.00	0.00	0.06	0.04
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00	0.00

694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00	0.00
699	Other	0.11	0.07	0.01	0.07	0.00	0.03	0.02
Total	Miscellaneous Processes	5.41	2.26	0.25	0.08	0.00	187.44	97.02

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
700	On-Road Vehicles							
710	Light-Duty Passenger	23.23	21.42	144.49	13.57	0.43	0.32	0.20
720	Light- and Medium-Duty Trucks	14.21	12.84	96.70	10.46	0.29	0.17	0.11
730	Heavy-Duty Gas Trucks	2.38	2.33	15.35	2.46	0.11	0.03	0.02
740	Heavy-Duty Diesel Trucks	1.44	1.40	6.04	13.88	0.46	1.55	1.46
750	Motorcycles	0.15	0.14	0.45	0.04	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	On-Road Vehicles	41.42	38.14	263.03	40.42	1.29	2.07	1.78
800	Other Mobile							
810	Off-Road Vehicles	1.14	1.10	6.67	0.11	0.01	0.03	0.03
815	Commericial Boats	0.00	0.00	0.00	0.00	0.00	0.00	0.00
820	Trains	0.29	0.28	0.93	6.09	0.34	0.15	0.14
830	Ships	0.00	0.00	0.00	0.00	0.00	0.00	0.00
850	Aircraft - Government	0.00	0.00	0.03	0.00	0.00	0.00	0.00
860	Aircraft - Other	0.24	0.21	1.66	0.17	0.01	0.00	0.00
870	Mobile Equipment	0.25	0.24	3.66	1.52	0.02	0.08	0.08
880	Utility Equipment	0.48	0.46	4.03	0.02	0.00	0.01	0.01
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Other Mobile	2.40	2.29	16.98	7.91	0.38	0.27	0.26
900	Unspecified Sources	0.01	0.00	0.01	0.01	0.00	0.01	0.01
Total Stationary and Area Sources		21.98	11.10	3.74	11.97	0.12	188.63	97.81
Total On-Road Vehicles		41.42	38.14	263.03	40.42	1.29	2.07	1.78
Total Other Mobile		2.40	2.29	16.98	7.91	0.38	0.27	0.26
Grand Total		65.80	51.53	283.75	60.29	1.79	190.97	99.85

1993 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
100	Fuel Combustion							
110	Agricultural	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	Oil and Gas Production	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	Petroleum Refining	0.00	0.00	0.00	0.01	0.00	0.00	0.00
140	Other Manufacturing/Industrial	0.91	0.09	0.54	1.31	0.01	0.04	0.04
150	Electric Utilities	0.02	0.00	0.01	0.05	0.00	0.00	0.00
160	Other Service and Commerce	1.87	0.15	0.69	4.66	0.00	0.01	0.01
170	Residential	0.11	0.05	0.31	1.37	0.01	0.07	0.07
199	Other	0.04	0.00	0.02	0.14	0.00	0.00	0.00
Total	Fuel Combustion	2.96	0.30	1.58	7.55	0.03	0.13	0.13
200	Waste Burning							
210	Agricultural Debris	0.04	0.02	0.23	0.00	0.00	0.03	0.03
220	Range Management	0.02	0.01	0.10	0.00	0.00	0.02	0.01
230	Forest Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240	Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00
299	Other	0.00	0.00	0.03	0.00	0.00	0.01	0.01
Total	Waste Burning	0.06	0.03	0.36	0.00	0.00	0.06	0.05
300	Solvent Use							
310	Dry Cleaning	0.17	0.01	0.00	0.00	0.00	0.00	0.00
320	Degreasing	0.50	0.16	0.00	0.00	0.00	0.00	0.00
330	Architectural Coating	1.88	1.74	0.00	0.00	0.00	0.00	0.00
340	Other Surface Coating	0.95	0.91	0.00	0.02	0.00	0.00	0.00
350	Asphalt Paving	0.02	0.02	0.00	0.00	0.00	0.00	0.00
360	Printing	0.00	0.00	0.00	0.00	0.00	0.00	0.00
370	Consumer Products	2.74	2.72	0.00	0.00	0.00	0.00	0.00
380	Industrial Solvent Use	0.27	0.17	0.00	0.00	0.00	0.00	0.00
399	Other	0.04	0.03	0.00	0.00	0.00	0.00	0.00
Total	Solvent Use	6.56	5.76	0.00	0.02	0.00	0.00	0.00
400	Petroleum Process, Storage & Transfer							
410	Oil and Gas Extraction	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00	0.00
430	Petroleum Marketing	2.70	0.67	0.00	0.00	0.00	0.00	0.00
499	Other	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Total	Petroleum Process, Storage & Transfer	2.70	0.67	0.00	0.00	0.00	0.00	0.00
500	Industrial Processes							
510	Chemical	0.00	0.00	0.00	0.00	0.00	0.00	0.00
520	Food and Agricultural	0.04	0.03	0.00	0.00	0.00	0.43	0.28
560	Mineral Processes	0.00	0.00	0.00	0.00	0.00	0.01	0.00
570	Metal Processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00
580	Wood and Paper	0.00	0.00	0.00	0.00	0.00	0.14	0.10
599	Other	0.02	0.01	0.00	0.00	0.00	0.01	0.00
Total	Industrial Processes	0.06	0.05	0.00	0.00	0.00	0.59	0.39
600	Miscellaneous Processes							
610	Pesticide Application	2.08	2.08	0.00	0.00	0.00	0.00	0.00
620	Farming Operations	2.42	0.19	0.00	0.00	0.00	5.16	2.32
630	Construction and Demolition	0.00	0.00	0.00	0.00	0.00	5.50	3.52
640	Entrained Road Dust - Paved	0.00	0.00	0.00	0.00	0.00	22.33	10.27
650	Entrained Road Dust - Unpaved	0.00	0.00	0.00	0.00	0.00	33.16	20.23
660	Unplanned Fires	0.02	0.02	0.25	0.01	0.00	0.03	0.03
670	Fugitive Windblown Dust	0.00	0.00	0.00	0.00	0.00	125.02	62.51
680	Waste Disposal	1.09	0.02	0.00	0.00	0.00	0.06	0.04
685	Natural Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
690	NOx/SOx RECLAIM	0.00	0.00	0.00	0.00	0.00	0.00	0.00
691	ERC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
692	Hi/LO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
693	NSR Exemption	0.00	0.00	0.00	0.00	0.00	0.00	0.00

694	Rule 518.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
695	ODC Conversion	0.00	0.00	0.00	0.00	0.00	0.00	0.00
699	Other	0.07	0.02	0.00	0.00	0.00	0.02	0.02
Total	Miscellaneous Processes	5.68	2.33	0.25	0.01	0.00	191.28	98.93

CODE	Source Category	TOG	VOC	CO	NOx	SOx	TSP	PM10
700	On-Road Vehicles							
710	Light-Duty Passenger	20.44	18.65	149.62	13.62	0.30	0.30	0.17
720	Light- and Medium-Duty Trucks	12.59	11.23	98.69	11.35	0.21	0.16	0.09
730	Heavy-Duty Gas Trucks	1.36	1.32	11.95	2.55	0.05	0.07	0.06
740	Heavy-Duty Diesel Trucks	1.25	1.22	5.79	11.45	0.48	1.03	0.96
750	Motorcycles	0.13	0.12	0.58	0.05	0.00	0.00	0.00
760	Heavy-Duty Diesel - Urban Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
799	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	On-Road Vehicles	35.77	32.54	266.63	39.03	1.04	1.57	1.27
800	Other Mobile							
810	Off-Road Vehicles	1.20	1.15	7.04	0.12	0.00	0.03	0.03
815	Commericial Boats	0.00	0.00	0.00	0.00	0.00	0.00	0.00
820	Trains	0.31	0.30	0.99	6.11	0.36	0.12	0.12
830	Ships	0.00	0.00	0.00	0.00	0.00	0.00	0.00
850	Aircraft - Government	0.00	0.00	0.00	0.00	0.00	0.00	0.00
860	Aircraft - Other	0.09	0.08	1.15	0.03	0.00	0.00	0.00
870	Mobile Equipment	0.26	0.25	3.88	1.39	0.02	0.07	0.07
880	Utility Equipment	0.51	0.49	4.26	0.02	0.00	0.01	0.01
891	Seeps/Biogenics	0.00	0.00	0.00	0.00	0.00	0.00	0.00
892	Channel Shipping	0.00	0.00	0.00	0.00	0.00	0.00	0.00
893	OCS and Related Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
894	Tideland Platforms	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	Other Mobile	2.36	2.27	17.31	7.66	0.39	0.23	0.22
900	Unspecified Sources	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Stationary and Area Sources		18.02	9.14	2.19	7.58	0.03	192.05	99.50
Total On-Road Vehicles		35.77	32.54	266.63	39.03	1.04	1.57	1.27
Total Other Mobile		2.36	2.27	17.31	7.66	0.39	0.23	0.22
Grand Total		56.16	43.95	286.14	54.27	1.46	193.85	101.00

ATTACHMENT I

EMISSION REDUCTIONS BY CONTROL MEASURE FOR ALL MILESTONE YEARS - SOUTH COAST AIR BASIN

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 1999 Planning Inventory
: With 1999 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	24.97	9.39	4.63	9.39	0.00
BA-03	Adjustment for PAR 1130.1	-0.12	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.87	0.00	1.87	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	3.37	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.65	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	0.00	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	3.33	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.76	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	0.00	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	2.54	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.28	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	7.51	3.69	138.59	4.03	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	5.36	0.00	5.36	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.66	0.00	0.66	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.00	0.00	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
		____	____	____	____	____
GRAND TOTAL (NET)		43.30	20.96	143.22	21.30	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	24.96	9.39	4.63	9.39	0.00
BA-03	Adjustment for PAR 1130.1	-0.12	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.87	0.00	1.87	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	3.37	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.65	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	0.00	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	3.33	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.76	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	0.00	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	2.54	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.28	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	7.51	3.69	138.59	4.03	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	5.36	0.00	5.36	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.66	0.00	0.66	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.00	0.00	0.00	0.00	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		43.30	20.96	143.22	21.30	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	109.281	11.148	58.167	11.148	0.000
Area (nonfed)	344.108	52.311	209.902	71.950	0.000
Area (fed)	6.574	0.000	0.000	0.000	0.000
Reclaim		56.640		56.640	
Total Stationary	459.963	120.099	268.069	139.738	0.000
On-road	361.518	535.848	3511.347	563.877	0.000
Off-road (nonfed)	69.995	128.563	1253.294	127.620	0.000
Off-road (fed)	67.290	164.677	310.762	162.790	0.000
TOTAL	958.766	949.187	5343.472	994.025	0.000

EMISSION REDUCTIONS

Point source	27.780	3.122	4.626	3.122	0.000
Area (nonfed)	8.006	8.129	0.000	8.129	0.000
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	35.785	11.252	4.626	11.252	0.000
On-road	7.515	9.051	138.593	9.391	0.000
Off-road (nonfed)	0.000	0.000	0.000	0.000	0.000
Off-road (fed)	0.000	0.662	0.000	0.662	0.000
TOTAL	43.300	20.965	143.218	21.304	0.000

REMAINING EMISSIONS

Point source	81.501	8.026	53.541	8.026	0.000
Area (nonfed)	336.102	44.182	209.902	63.821	0.000
Area (fed)	6.574	0.000	0.000	0.000	0.000
Reclaim		56.640		56.640	
Total Stationary	424.177	108.847	263.443	128.486	0.000
On-road	354.003	526.797	3372.754	554.486	0.000
Off-road (nonfed)	69.995	128.563	1253.294	127.620	0.000
Off-road (fed)	67.290	164.015	310.762	162.128	0.000
TOTAL	915.465	928.222	5200.254	972.721	0.000

ERCs	3.552	1.213	1.555	1.213	0.000
HILO (3)	0.090	0.019	0.000	0.019	0.000
NSR Exemption	8.848	4.146	0.961	4.146	0.000
R518.2	1.500	1.500	1.500	1.500	0.000
ODC Conversion	9.180	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	938.635	935.100	5204.270	979.599	0.000
TOTAL LAST 5 LINE ITEMS	23.170	6.878	4.016	6.878	0.000
Mobility Adjustments (4)	0.000	0.000	0.000	0.000	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2002 Planning Inventory
: With 2002 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE	NAME	VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	38.49	14.35	7.24	14.35	0.00
BA-03	Adjustment for PAR 1130.1	-0.14	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.62	0.00	1.62	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	6.34	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.08	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.92	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	11.79	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	18.21	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.66	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	0.64	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.45	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.72	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	11.81	5.91	226.04	6.45	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	11.75	0.00	11.75	0.00
M11&M12	Industrial Eq	7.29	4.23	238.10	4.23	0.00
M-13	Marine	0.00	2.36	0.00	2.36	0.00
M-14	Locomotives/Trains	0.00	4.12	0.00	4.12	0.00
M-16	Pleasure Water Craft	4.14	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.47	0.53	0.00	0.50	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
		____	____	____	____	____
GRAND TOTAL (NET)		109.88	44.87	471.37	45.37	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	38.49	14.35	7.24	14.35	0.00
BA-03	Adjustment for PAR 1130.1	-0.14	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.62	0.00	1.62	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	0.00	0.00	0.00	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	6.34	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.08	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.92	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	11.79	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	0.00	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	18.21	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.66	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	0.64	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.45	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.72	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	11.81	5.91	226.04	6.45	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	11.75	0.00	11.75	0.00
M11&M12	Industrial Eq	7.29	4.23	238.10	4.23	0.00
M-13	Marine	0.00	2.36	0.00	2.36	0.00
M-14	Locomotives/Trains	0.00	4.12	0.00	4.12	0.00
M-16	Pleasure Water Craft	4.14	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	0.00	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.00	0.00	0.00	0.00	0.00
ADV-M15	Non-Military Aircraft	0.47	0.53	0.00	0.50	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
		____	____	____	____	____
GRAND TOTAL WITH POTENTIAL OVERLAP		109.88	44.87	471.37	45.37	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	113.489	11.000	60.198	11.000	0.000
Area (nonfed)	360.619	53.626	264.024	75.206	0.000
Area (fed)	6.749	0.000	0.000	0.000	0.000
Reclaim		37.077		37.077	
Total Stationary	480.857	101.703	324.222	123.283	0.000
On-road	284.915	464.784	2901.647	487.005	0.000
Off-road (nonfed)	65.132	119.892	1261.806	118.806	0.000
Off-road (fed)	71.894	162.043	321.428	159.968	0.000
TOTAL	902.798	848.422	4809.104	889.062	0.000

EMISSION REDUCTIONS

Point source	42.355	4.747	7.241	4.747	0.000
Area (nonfed)	43.815	11.216	0.000	11.216	0.000
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	86.170	15.963	7.241	15.963	0.000
On-road	11.812	17.665	226.036	18.201	0.000
Off-road (nonfed)	6.942	4.092	230.547	4.092	0.000
Off-road (fed)	4.957	7.147	7.550	7.117	0.000
TOTAL	109.881	44.867	471.374	45.373	0.000

REMAINING EMISSIONS

Point source	71.136	6.253	52.957	6.253	0.000
Area (nonfed)	316.804	42.410	264.024	63.990	0.000
Area (fed)	6.749	0.000	0.000	0.000	0.000
Reclaim	37.077		37.077		
Total Stationary	394.688	85.740	316.981	107.320	0.000
On-road	273.103	447.119	2675.612	468.804	0.000
Off-road (nonfed)	58.189	115.800	1031.259	114.714	0.000
Off-road (fed)	66.938	154.896	313.878	152.851	0.000
TOTAL	792.920	803.555	4337.730	843.689	0.000
ERCs	6.396	2.187	2.806	2.187	0.000
HILO (3)	0.090	0.019	0.000	0.019	0.000
NSR Exemption	15.484	7.255	1.681	7.255	0.000
R518.2	1.500	1.500	1.500	1.500	0.000
ODC Conversion	9.710	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	826.100	814.516	4343.717	854.650	0.000
TOTAL LAST 5 LINE ITEMS	33.180	10.961	5.987	10.961	0.000
Mobility Adjustments (4)	6.950	-1.340	43.890	-1.300	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.

(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.

(3) HILO=Bank for HIgh employment LOw polluting companies.

(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2005 Planning Inventory
: With 2005 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	49.54	16.46	9.37	16.46	0.00
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	1.38	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.50	0.00	1.50	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	2.63	0.00	2.63	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	30.77	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.11	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.87	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	31.34	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	3.54	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	20.33	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.59	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	1.12	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.31	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.73	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	13.29	8.66	283.94	9.44	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	35.13	0.00	35.13	0.00
M11&M12	Industrial Eq	15.85	9.16	595.19	9.16	0.00
M-13	Marine	0.00	11.02	0.00	11.02	0.00
M-14	Locomotives/Trains	0.00	11.10	0.00	11.10	0.00
M-16	Pleasure Water Craft	9.02	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	2.98	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.83	5.45	0.00	5.44	0.00
ADV-M15	Non-Military Aircraft	0.99	1.53	0.00	1.45	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL (NET)		191.59	102.63	888.50	103.32	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	49.55	16.46	9.37	16.46	0.00
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	1.38	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.50	0.00	1.50	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	2.63	0.00	2.63	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	30.77	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	0.00	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.11	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.87	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	31.34	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	3.54	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	20.33	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.59	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	1.12	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.31	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.73	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	13.29	8.66	283.94	9.44	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	35.13	0.00	35.13	0.00
M11&M12	Industrial Eq	15.85	9.16	595.19	9.16	0.00
M-13	Marine	0.00	11.02	0.00	11.02	0.00
M-14	Locomotives/Trains	0.00	11.10	0.00	11.10	0.00
M-16	Pleasure Water Craft	9.02	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	2.98	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	0.00	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	0.00	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	0.00	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	0.00	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	0.00	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	0.83	5.45	0.00	5.44	0.00
ADV-M15	Non-Military Aircraft	0.99	1.53	0.00	1.45	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		191.59	102.63	888.50	103.32	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	117.976	10.428	63.698	10.428	0.000
Area (nonfed)	368.270	54.432	264.980	76.004	0.000
Area (fed)	6.900	0.000	0.000	0.000	0.000
Reclaim		33.035		33.035	
Total Stationary	493.146	97.895	328.678	119.467	0.000
On-road	219.320	412.903	2318.917	431.061	0.000
Off-road (nonfed)	66.543	111.247	1299.942	110.156	0.000
Off-road (fed)	76.738	160.994	339.312	158.731	0.000
TOTAL	855.748	783.039	4286.849	819.415	0.000

EMISSION REDUCTIONS

Point source	57.070	5.299	9.374	5.299	0.000
Area (nonfed)	93.163	15.295	0.000	15.295	0.000
Area (fed)	1.380	0.000	0.000	0.000	0.000
Total Stationary	151.613	20.594	9.374	20.594	0.000
On-road	13.286	43.781	283.939	44.563	0.000
Off-road (nonfed)	15.537	12.342	571.439	12.336	0.000
Off-road (fed)	11.151	25.911	23.750	25.826	0.000
TOTAL	191.587	102.628	888.501	103.320	0.000

REMAINING EMISSIONS

Point source	60.907	5.129	54.324	5.129	0.000
Area (nonfed)	275.107	39.137	264.980	60.709	0.000
Area (fed)	5.520	0.000	0.000	0.000	0.000
Reclaim		33.035		33.035	
Total Stationary	341.534	77.301	319.304	98.873	0.000
On-road	206.034	369.122	2034.978	386.498	0.000
Off-road (nonfed)	51.006	98.905	728.503	97.820	0.000
Off-road (fed)	65.587	135.083	315.562	132.905	0.000
TOTAL	664.161	680.411	3398.349	716.095	0.000
ERCs	9.404	2.187	4.133	2.187	0.000
HILO (3)	0.090	0.019	0.000	0.019	0.000
NSR Exemption	22.120	10.365	2.402	10.365	0.000
R518.2	1.500	1.500	1.500	1.500	0.000
ODC Conversion	10.280	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	707.555	694.482	3406.384	730.166	0.000
TOTAL LAST 5 LINE ITEMS	43.394	14.071	8.035	14.071	0.000
Mobility Adjustments (4)	13.150	-2.680	84.550	-2.600	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2008 Planning Inventory
: With 2008 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE	NAME	VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	59.57	18.60	9.52	18.60	0.00
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	1.43	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.37	0.00	1.37	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	5.53	0.00	5.53	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	33.27	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	1.26	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.26	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.85	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	33.69	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	3.36	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	35.88	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.53	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	1.12	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.30	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.74	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	17.66	13.38	294.54	14.59	0.00
M4,5,6&7	Combination of M-04-05-06-07	6.75	53.23	0.00	53.23	0.00
M11&M12	Industrial Eq	24.11	13.14	875.68	13.14	0.00
M-13	Marine	0.00	13.58	0.00	13.58	0.00
M-14	Locomotives/Trains	0.00	11.18	0.00	11.18	0.00
M-16	Pleasure Water Craft	14.08	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	12.89	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	12.61	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	11.15	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	11.33	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	4.62	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	1.73	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	2.13	21.39	0.00	21.37	0.00
ADV-M15	Non-Military Aircraft	2.60	3.07	0.00	2.90	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
		———	———	———	———	———
GRAND TOTAL (NET)		301.89	154.47	1179.75	155.49	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	59.57	18.60	9.52	18.60	0.00
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	1.43	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.37	0.00	1.37	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	5.53	0.00	5.53	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	33.27	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	1.26	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.26	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.85	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	33.69	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	3.36	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	35.88	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.53	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	1.12	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.30	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.74	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	17.66	13.38	294.54	14.59	0.00
M4,5,6&7	Combination of M-04-05-06-07	6.75	53.23	0.00	53.23	0.00
M11&M12	Industrial Eq	24.11	13.14	875.68	13.14	0.00
M-13	Marine	0.00	13.58	0.00	13.58	0.00
M-14	Locomotives/Trains	0.00	11.18	0.00	11.18	0.00
M-16	Pleasure Water Craft	14.08	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	0.00	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	12.89	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	23.48	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	18.53	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	11.53	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	4.62	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	1.73	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	0.00	0.00	0.00	0.00	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	2.13	21.39	0.00	21.37	0.00
ADV-M15	Non-Military Aircraft	2.60	3.07	0.00	2.90	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		320.35	154.47	1179.75	155.49	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	123.375	9.690	67.428	9.690	0.000
Area (nonfed)	385.650	55.332	266.171	76.855	0.000
Area (fed)	7.138	0.000	0.000	0.000	0.000
Reclaim		33.035		33.035	
Total Stationary	516.163	98.057	333.599	119.580	0.000
On-road	169.762	376.690	1945.464	391.858	0.000
Off-road (nonfed)	68.365	108.662	1331.516	107.526	0.000
Off-road (fed)	81.233	162.923	355.419	160.480	0.000
TOTAL	835.524	746.332	3965.999	779.444	0.000

EMISSION REDUCTIONS					
Point source	75.915	5.724	9.523	5.724	0.000
Area (nonfed)	157.229	19.776	0.000	19.776	0.000
Area (fed)	1.428	0.000	0.000	0.000	0.000
Total Stationary	234.572	25.500	9.523	25.500	0.000
On-road	24.408	66.612	294.539	67.820	0.000
Off-road (nonfed)	24.077	25.492	839.606	25.472	0.000
Off-road (fed)	18.834	36.867	36.078	36.697	0.000
TOTAL	301.891	154.471	1179.747	155.489	0.000

REMAINING EMISSIONS

Point source	47.461	3.966	57.905	3.966	0.000
Area (nonfed)	228.421	35.556	266.171	57.079	0.000
Area (fed)	5.710	0.000	0.000	0.000	0.000
Reclaim		33.035		33.035	
Total Stationary	281.592	72.557	324.076	94.080	0.000
On-road	145.354	310.078	1650.925	324.038	0.000
Off-road (nonfed)	44.288	83.171	491.909	82.054	0.000
Off-road (fed)	62.399	126.055	319.341	123.783	0.000
TOTAL	533.633	591.861	2786.250	623.955	0.000

ERCs	12.577	2.187	4.588	2.187	0.000
HILO (3)	0.090	0.019	0.000	0.019	0.000
NSR Exemption	28.756	13.474	3.122	13.474	0.000
R518.2	1.500	1.500	1.500	1.500	0.000
ODC Conversion	10.870	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	587.426	609.041	2795.460	641.135	0.000
TOTAL LAST 5 LINE ITEMS	53.793	17.180	9.210	17.180	0.000
Mobility Adjustments (4)	15.850	-3.660	109.040	-3.530	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2010 Planning Inventory
: With 2010 Control Factors (1993 Based) - In Basin

Excl. Natural Sources
Base Year : 1993
Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE	NAME	VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	66.31	20.14	9.32	20.14	0.00
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	1.46	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.28	0.00	1.28	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	7.63	0.00	7.63	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	34.02	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	1.32	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.36	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.83	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	35.25	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	3.22	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	39.30	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.50	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	1.11	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.29	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.75	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00
FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	19.41	17.09	301.75	18.62	0.00
M4,5,6&7	Combination of M-04-05-06-07	8.82	61.74	0.00	61.74	0.00
M11&M12	Industrial Eq	32.40	17.44	1038.32	17.44	0.00
M-13	Marine	0.00	15.33	0.00	15.33	0.00
M-14	Locomotives/Trains	0.00	17.22	0.00	17.22	0.00
M-16	Pleasure Water Craft	21.43	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00

MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	42.91	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	20.29	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	20.25	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	19.09	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	18.30	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	8.24	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	2.76	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	36.78	6.25	0.00	6.51	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	4.48	46.55	0.00	46.49	0.00
ADV-M15	Non-Military Aircraft	3.13	5.55	0.00	5.25	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	18.04	3.01	0.00	2.96	0.00
GRAND TOTAL (NET)		469.02	219.23	1349.39	220.61	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-01	NSR Impact	66.31	20.14	9.32	20.14	0.00
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	1.46	0.00	0.00	0.00	0.00
BCM-01	Emissions Reductions from Paved Roads (R403)	0.00	0.00	0.00	0.00	0.00
BCM-06	Ems Red fr Fugitive Dust Sources to meet BACM Requirements (R403)	0.00	0.00	0.00	0.00	0.00
BCM-03	Fur Ems Red fr Unpaved Roads & Parking Lot and Staging Area(R403)	0.00	0.00	0.00	0.00	0.00
BCM-04	Emissions Reductions from Agricultural Activities (R403)	0.00	0.00	0.00	0.00	0.00
CMB-02B	Control of Ems from Small Boil and Proc Heaters	0.00	1.28	0.00	1.28	0.00
CMB-03	Area Source Credits for Commercial & Residential Combustion Equip	0.00	0.00	0.00	0.00	0.00
CMB-04	Area Source Credits for Energy Conservation/Efficiency	0.00	0.00	0.00	0.00	0.00
CMB-06	Emission Red. from Std for New Commercial & Residential Water Htr	0.00	7.63	0.00	7.63	0.00
CMB-07	Ems Red for Petroleum Flares	0.00	0.00	0.00	0.00	0.00
CMB-09	Ems Red from Petro Ref FCCU	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	34.02	0.00	0.00	0.00	0.00
CTS-02E	Fur Ems Red fr Adhesives (R1168)	1.32	0.00	0.00	0.00	0.00
CTS-02H	Fur Ems Red fr Metal Parts and Products (R1107)	5.36	0.00	0.00	0.00	0.00
CTS-02M	Fur Ems Red fr Plastic,Rubber,Glass Coatings (R1145)	0.83	0.00	0.00	0.00	0.00
CTS-02N	Fur Ems Red fr Solvent Degreaser (R1122)	35.25	0.00	0.00	0.00	0.00
CTS-02O	Fur Ems Red fr Usage of Solvents (R442C)	3.22	0.00	0.00	0.00	0.00
CTS-03	Consumer Product Education Labeling Program	0.00	0.00	0.00	0.00	0.00
CTS-04	Public Awareness/Education Programs-Area Sources	0.00	0.00	0.00	0.00	0.00
CTS-07	Further Emission Reductions from Architectural Coatings (R1113)	39.30	0.00	0.00	0.00	0.00
FUG-03	Further Emission Reductions from Floating Roof Tanks	0.00	0.00	0.00	0.00	0.00
FUG-04	Further Emission Reductions from Fugitive Sources (R1173)	0.50	0.00	0.00	0.00	0.00
MSC-01	Promotion of Ligther Color Roofing,Road Materials,Tree Planting	0.00	0.00	0.00	0.00	0.00
MSC-02	In-Use Compliance program for Air Pollution Control Equipment	0.00	0.00	0.00	0.00	0.00
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs	0.00	0.00	0.00	0.00	0.00
PRC-01	Emission Reductions from Woodwork Operations	0.00	0.00	0.00	0.00	0.00
PRC-03	Emission Reductions from Restaurant Operations	1.11	0.00	0.00	0.00	0.00
WST-01	Emissions Reductions from Livestock Waste	3.29	0.00	0.00	0.00	0.00
WST-02	Emissions Reductions from Composting of Dewatered Sewage Sludge	0.00	0.00	0.00	0.00	0.00
WST-03	Emissions Reductions from Waste Burning (Rule 444)	0.00	0.00	0.00	0.00	0.00
WST-04	Disposal of Materials Containing VOC	0.75	0.00	0.00	0.00	0.00
TCM-01	Transportation Improvements	0.00	0.00	0.00	0.00	0.00
ATT-01	Telecommunications	0.00	0.00	0.00	0.00	0.00
ATT-02	Advanced Shuttle Transit	0.00	0.00	0.00	0.00	0.00
ATT-03	Zero-Emission Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-04	Alternative Fuel Vehicles/Infrastructure	0.00	0.00	0.00	0.00	0.00
ATT-05	Intelligent Vehicle Highway Systems (IVHS)	0.00	0.00	0.00	0.00	0.00

FLX-01	Intercredit Trading Program	0.00	0.00	0.00	0.00	0.00
FLX-02	Air Quality Investment Program	0.00	0.00	0.00	0.00	0.00
FSS-02	Market-Based Transportation Pricing	0.00	0.00	0.00	0.00	0.00
FSS-04	Emiss. Charges of $5000/ton of VOC for Stat Srce emit >10t/yr	0.00	0.00	0.00	0.00	0.00
M1&M2	Combination of M-01 & M-02	19.41	17.09	301.75	18.62	0.00
M4,5,6&7	Combination of M-04-05-06-07	8.82	61.74	0.00	61.74	0.00
M11&M12	Industrial Eq	32.40	17.44	1038.32	17.44	0.00
M-13	Marine	0.00	15.33	0.00	15.33	0.00
M-14	Locomotives/Trains	0.00	17.22	0.00	17.22	0.00
M-16	Pleasure Water Craft	21.43	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
ADV-CP-4	Long Term Measures for Consumer Products	68.32	0.00	0.00	0.00	0.00
ADV-CTS	Advance Tech-CTS	20.29	0.00	0.00	0.00	0.00
ADV-1113	Advance Tech-Achitectural Ctgs	40.09	0.00	0.00	0.00	0.00
ADV-CLNG	Advance Tech-Cleaning	31.85	0.00	0.00	0.00	0.00
ADV-FUG	Advance Tech-FUG	18.61	0.00	0.00	0.00	0.00
ADV-PRC	Advance Tech-PRC	8.24	0.00	0.00	0.00	0.00
ADV-MISC	Advance Tech-misc	2.76	0.00	0.00	0.00	0.00
ADV-ON	Market Incentives, Operational Measures (94AQMP : M-19)	45.62	7.98	0.00	8.28	0.00
ADV-M910	Off-Road 2.5g/bhp NOx std. & Ind, Mbl, Farm/NonFarm Equip	4.48	46.55	0.00	46.49	0.00
ADV-M15	Non-Military Aircraft	3.13	5.55	0.00	5.25	0.00
ADV-OFF	Market Incentives, Operational Measures (94AQMP : M-20)	31.37	4.85	0.00	4.79	0.00
		____	____	____	____	____
GRAND TOTAL WITH POTENTIAL OVERLAP		549.53	222.80	1349.39	224.20	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	126.855	9.101	69.920	9.101	0.000
Area (nonfed)	397.280	55.953	266.978	77.421	0.000
Area (fed)	7.297	0.000	0.000	0.000	0.000
Reclaim		33.035		33.035	
Total Stationary	531.432	98.089	336.898	119.557	0.000
On-road	145.739	362.844	1785.275	376.472	0.000
Off-road (nonfed)	60.504	105.543	1276.361	104.578	0.000
Off-road (fed)	84.060	163.934	366.647	161.365	0.000
TOTAL	821.737	730.410	3765.183	761.972	0.000

EMISSION REDUCTIONS

Point source	87.610	5.955	9.320	5.955	0.000
Area (nonfed)	235.472	23.086	0.000	23.086	0.000
Area (fed)	1.459	0.000	0.000	0.000	0.000
Total Stationary	324.542	29.042	9.320	29.042	0.000
On-road	65.006	85.078	301.748	86.874	0.000
Off-road (nonfed)	39.077	44.929	995.285	44.854	0.000
Off-road (fed)	40.398	60.184	43.037	59.836	0.000
TOTAL	469.023	219.233	1349.390	220.606	0.000

REMAINING EMISSIONS

Point source	39.247	3.146	60.599	3.146	0.000
Area (nonfed)	161.808	32.867	266.978	54.335	0.000
Area (fed)	5.838	0.000	0.000	0.000	0.000
Reclaim		33.035		33.035	
Total Stationary	206.892	69.047	327.577	90.515	0.000
On-road	80.733	277.766	1483.527	289.598	0.000
Off-road (nonfed)	21.427	60.615	281.076	59.724	0.000
Off-road (fed)	43.662	103.749	323.610	101.529	0.000
TOTAL	352.714	511.177	2415.791	541.366	0.000

ERCs	14.801	2.187	4.588	2.187	0.000
HILO (3)	0.090	0.019	0.000	0.019	0.000
NSR Exemption	33.180	15.547	3.602	15.547	0.000
R518.2	1.500	1.500	1.500	1.500	0.000
ODC Conversion	11.290	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	413.575	530.430	2425.481	560.619	0.000
TOTAL LAST 5 LINE ITEMS	60.861	19.253	9.690	19.253	0.000
Mobility Adjustments (4)	17.180	-3.250	127.810	-3.050	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.

(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.

(3) HILO=Bank for HIgh employment LOw polluting companies.

(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

ATTACHMENT J

EMISSION REDUCTIONS BY CONTROL MEASURE FOR ALL MILESTONE YEARS - ANTELOPE VALLEY

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 1999 Planning Inv - Inv. w/ RME
: With 1999 Control Factors (1993 Based) - Out Basin - Antelope Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.10	0.00	0.10	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL (NET)		0.00	0.10	0.00	0.10	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.10	0.00	0.10	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
GRAND TOTAL WITH POTENTIAL OVERLAP		0.00	0.10	0.00	0.10	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.383	0.763	1.049	0.763	0.000
Area (nonfed)	7.641	1.188	0.511	1.443	0.000
Area (fed)	1.484	0.000	0.000	0.000	0.000
Reclaim	0.000		0.000		
Total Stationary	9.508	1.951	1.560	2.206	0.000

On-road	12.234	15.130	105.358	16.130	0.000
Off-road (nonfed)	0.947	3.265	13.777	3.060	0.000
Off-road (fed)	2.311	7.327	5.503	7.048	0.000
TOTAL	25.000	27.673	126.198	28.444	0.000

EMISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	0.000	0.000	0.000	0.000	0.000
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	0.000	0.000	0.000	0.000	0.000
On-road	0.000	0.097	0.000	0.097	0.000
Off-road (nonfed)	0.000	0.000	0.000	0.000	0.000
Off-road (fed)	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	0.097	0.000	0.097	0.000

REMAINING EMISSIONS

Point source	0.383	0.763	1.049	0.763	0.000
Area (nonfed)	7.641	1.188	0.511	1.443	0.000
Area (fed)	1.484	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	9.508	1.951	1.560	2.206	0.000
On-road	12.234	15.033	105.358	16.033	0.000
Off-road (nonfed)	0.947	3.265	13.777	3.060	0.000
Off-road (fed)	2.311	7.327	5.503	7.048	0.000
TOTAL	25.000	27.576	126.198	28.347	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	25.000	27.576	126.198	28.347	0.000
TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	0.000	0.000	0.000	0.000	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2002 Planning Inv - Inv. w/ RME
: With 2002 Control Factors (1993 Based) - Out Basin - Antelope Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.14	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.20	0.00	0.20	0.00
M11&M12	Industrial Eq	0.08	0.05	2.63	0.05	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	1.02	0.00	0.98	0.00
M-16	Pleasure Water Craft	0.05	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
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GRAND TOTAL (NET)		0.28	1.26	2.63	1.22	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.14	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.20	0.00	0.20	0.00
M11&M12	Industrial Eq	0.08	0.05	2.63	0.05	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	1.02	0.00	0.98	0.00
M-16	Pleasure Water Craft	0.05	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00

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GRAND TOTAL WITH POTENTIAL OVERLAP	0.28	1.26	2.63	1.22	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.448	0.830	1.205	0.830	0.000
Area (nonfed)	8.673	1.332	0.571	1.608	0.000
Area (fed)	1.674	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	10.795	2.162	1.776	2.438	0.000
On-road	10.925	13.115	93.926	13.943	0.000
Off-road (nonfed)	0.957	3.403	15.112	3.184	0.000
Off-road (fed)	2.406	7.894	5.807	7.590	0.000
TOTAL	25.083	26.574	116.621	27.155	0.000

MISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	0.143	0.000	0.000	0.000	0.000
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	0.143	0.000	0.000	0.000	0.000
On-road	0.000	0.196	0.000	0.196	0.000
Off-road (nonfed)	0.079	0.045	2.536	0.045	0.000
Off-road (fed)	0.059	1.024	0.096	0.978	0.000
TOTAL	0.281	1.264	2.632	1.218	0.000

REMAINING EMISSIONS

Point source	0.448	0.830	1.205	0.830	0.000
Area (nonfed)	8.530	1.332	0.571	1.608	0.000
Area (fed)	1.674	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	10.652	2.162	1.776	2.438	0.000
On-road	10.925	12.919	93.926	13.747	0.000
Off-road (nonfed)	0.878	3.359	12.576	3.140	0.000
Off-road (fed)	2.346	6.870	5.711	6.612	0.000
TOTAL	24.802	25.310	113.989	25.937	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	24.802	25.310	113.989	25.937	0.000

TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	0.910	0.450	5.890	0.500	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2005 Planning Inv - Inv. w/ RME
: With 2005 Control Factors (1993 Based) - Out Basin - Antelope Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.37	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.75	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.52	0.00	0.52	0.00
M11&M12	Industrial Eq	0.19	0.11	7.19	0.11	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.75	0.00	2.63	0.00
M-16	Pleasure Water Craft	0.12	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
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GRAND TOTAL (NET)		1.43	3.38	7.19	3.26	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.37	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.75	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.52	0.00	0.52	0.00
M11&M12	Industrial Eq	0.19	0.11	7.19	0.11	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.75	0.00	2.63	0.00
M-16	Pleasure Water Craft	0.12	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00

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GRAND TOTAL WITH POTENTIAL OVERLAP	1.43	3.38	7.19	3.26	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.503	0.884	1.337	0.884	0.000
Area (nonfed)	9.426	1.501	0.634	1.803	0.000
Area (fed)	1.838	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	11.767	2.385	1.971	2.687	0.000
On-road	9.519	11.498	80.763	12.213	0.000
Off-road (nonfed)	1.034	3.037	16.507	2.855	0.000
Off-road (fed)	2.468	7.877	6.044	7.571	0.000
TOTAL	24.788	24.797	105.285	25.326	0.000

EMISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	0.747	0.000	0.000	0.000	0.000
Area (fed)	0.368	0.000	0.000	0.000	0.000
Total Stationary	1.115	0.000	0.000	0.000	0.000
On-road	0.000	0.523	0.000	0.523	0.000
Off-road (nonfed)	0.184	0.104	6.875	0.104	0.000
Off-road (fed)	0.129	2.755	0.319	2.632	0.000
TOTAL	1.428	3.382	7.194	3.259	0.000

REMAINING EMISSIONS

Point source	0.503	0.884	1.337	0.884	0.000
Area (nonfed)	8.679	1.501	0.634	1.803	0.000
Area (fed)	1.470	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	10.652	2.385	1.971	2.687	0.000
On-road	9.519	10.975	80.763	11.690	0.000
Off-road (nonfed)	0.850	2.934	9.632	2.752	0.000
Off-road (fed)	2.339	5.121	5.726	4.939	0.000
TOTAL	23.360	21.415	98.091	22.067	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	23.360	21.415	98.091	22.067	0.000

TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	1.730	0.880	11.290	0.990	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2007 Planning Inv - Inv. w/ RME
: With 2007 Control Factors (1993 Based) - Out Basin - Antelope Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.39	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.82	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.08	0.69	0.00	0.69	0.00
M11&M12	Industrial Eq	0.27	0.15	10.08	0.15	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.98	0.00	2.85	0.00
M-16	Pleasure Water Craft	0.16	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
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GRAND TOTAL (NET)		1.73	3.82	10.08	3.68	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.39	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.82	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.08	0.69	0.00	0.69	0.00
M11&M12	Industrial Eq	0.27	0.15	10.08	0.15	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.98	0.00	2.85	0.00
M-16	Pleasure Water Craft	0.16	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00

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GRAND TOTAL WITH POTENTIAL OVERLAP	1.73	3.82	10.08	3.68	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.545	0.937	1.450	0.937	0.000
Area (nonfed)	10.199	1.618	0.679	1.936	0.000
Area (fed)	1.964	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	12.708	2.555	2.129	2.873	0.000
On-road	8.554	10.608	74.335	11.258	0.000
Off-road (nonfed)	1.086	3.029	17.451	2.847	0.000
Off-road (fed)	2.531	8.320	6.275	7.995	0.000
TOTAL	24.879	24.512	100.190	24.973	0.000

EMISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	0.824	0.000	0.000	0.000	0.000
Area (fed)	0.393	0.000	0.000	0.000	0.000
Total Stationary	1.217	0.000	0.000	0.000	0.000
On-road	0.081	0.688	0.000	0.688	0.000
Off-road (nonfed)	0.260	0.140	9.623	0.140	0.000
Off-road (fed)	0.177	2.988	0.456	2.854	0.000
TOTAL	1.734	3.816	10.080	3.683	0.000

REMAINING EMISSIONS

Point source	0.545	0.937	1.450	0.937	0.000
Area (nonfed)	9.375	1.618	0.679	1.936	0.000
Area (fed)	1.571	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	11.491	2.555	2.129	2.873	0.000
On-road	8.473	9.920	74.335	10.570	0.000
Off-road (nonfed)	0.827	2.889	7.828	2.707	0.000
Off-road (fed)	2.354	5.332	5.819	5.140	0.000
TOTAL	23.145	20.696	90.110	21.290	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	23.145	20.696	90.110	21.290	0.000

TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	2.000	1.060	13.610	1.190	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

ATTACHMENT K

EMISSION REDUCTIONS BY CONTROL MEASURE FOR ALL MILESTONE YEARS - COACHELLA VALLEY

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 1999 Planning Inv - Inv. w/ RME
: With 1999 Control Factors (1993 Based) - Out Basin - Coachella Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.38	0.00	0.38	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
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GRAND TOTAL (NET)		0.00	0.38	0.00	0.38	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.00	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.38	0.00	0.38	0.00
M11&M12	Industrial Eq	0.00	0.00	0.00	0.00	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.00	0.00	0.00	0.00
M-16	Pleasure Water Craft	0.00	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00

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GRAND TOTAL WITH POTENTIAL OVERLAP	0.00	0.38	0.00	0.38	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.641	5.835	0.932	5.835	0.000
Area (nonfed)	7.061	3.199	2.359	3.923	0.000
Area (fed)	2.042	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	9.744	9.034	3.291	9.758	0.000
On-road	21.342	32.749	161.400	32.439	0.000
Off-road (nonfed)	1.093	1.453	10.230	1.398	0.000
Off-road (fed)	1.144	6.431	5.871	6.137	0.000
TOTAL	33.323	49.667	180.792	49.732	0.000

EMISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	0.000	0.000	0.000	0.000	0.000
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	0.000	0.000	0.000	0.000	0.000
On-road	0.000	0.384	0.000	0.384	0.000
Off-road (nonfed)	0.000	0.000	0.000	0.000	0.000
Off-road (fed)	0.000	0.000	0.000	0.000	0.000
TOTAL	0.000	0.384	0.000	0.384	0.000

REMAINING EMISSIONS

Point source	0.641	5.835	0.932	5.835	0.000
Area (nonfed)	7.061	3.199	2.359	3.923	0.000
Area (fed)	2.042	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	9.744	9.034	3.291	9.758	0.000
On-road	21.342	32.365	161.400	32.055	0.000
Off-road (nonfed)	1.093	1.453	10.230	1.398	0.000
Off-road (fed)	1.144	6.431	5.871	6.137	0.000
TOTAL	33.323	49.283	180.792	49.348	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	33.323	49.283	180.792	49.348	0.000

TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	0.000	0.000	0.000	0.000	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2002 Planning Inv - Inv. w/ RME
: With 2002 Control Factors (1993 Based) - Out Basin - Coachella Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.19	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.92	0.00	0.92	0.00
M11&M12	Industrial Eq	0.02	0.01	0.78	0.01	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.95	0.00	0.91	0.00
M-16	Pleasure Water Craft	0.08	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
		--------	--------	--------	--------	--------
GRAND TOTAL (NET)		0.30	1.88	0.78	1.84	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.00	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.19	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	0.92	0.00	0.92	0.00
M11&M12	Industrial Eq	0.02	0.01	0.78	0.01	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	0.95	0.00	0.91	0.00
M-16	Pleasure Water Craft	0.08	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00

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GRAND TOTAL WITH POTENTIAL OVERLAP 0.30 1.88 0.78 1.84 0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.708	6.378	1.002	6.378	0.000
Area (nonfed)	7.691	3.462	2.512	4.239	0.000
Area (fed)	2.088	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	10.487	9.840	3.514	10.617	0.000
On-road	17.737	30.529	140.468	30.057	0.000
Off-road (nonfed)	0.901	1.398	10.047	1.334	0.000
Off-road (fed)	1.221	6.435	6.243	6.140	0.000
TOTAL	30.346	48.202	160.272	48.148	0.000

EMISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	0.192	0.000	0.000	0.000	0.000
Area (fed)	0.000	0.000	0.000	0.000	0.000
Total Stationary	0.192	0.000	0.000	0.000	0.000
On-road	0.000	0.919	0.000	0.919	0.000
Off-road (nonfed)	0.022	0.013	0.754	0.013	0.000
Off-road (fed)	0.081	0.953	0.021	0.910	0.000
TOTAL	0.296	1.885	0.776	1.842	0.000

REMAINING EMISSIONS

Point source	0.708	6.378	1.002	6.378	0.000
Area (nonfed)	7.499	3.462	2.512	4.239	0.000
Area (fed)	2.088	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	10.295	9.840	3.514	10.617	0.000
On-road	17.737	29.610	140.468	29.138	0.000
Off-road (nonfed)	0.879	1.385	9.293	1.321	0.000
Off-road (fed)	1.139	5.482	6.221	5.230	0.000
TOTAL	30.050	46.317	159.496	46.306	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	30.050	46.317	159.496	46.306	0.000

TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	0.320	0.300	1.970	0.290	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2005 Planning Inv - Inv. w/ RME
: With 2005 Control Factors (1993 Based) - Out Basin - Coachella Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.42	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.96	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	2.92	0.00	2.92	0.00
M11&M12	Industrial Eq	0.05	0.03	1.95	0.03	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.56	0.00	2.45	0.00
M-16	Pleasure Water Craft	0.17	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
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GRAND TOTAL (NET)		1.60	5.52	1.95	5.40	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.42	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	0.96	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.00	2.92	0.00	2.92	0.00
M11&M12	Industrial Eq	0.05	0.03	1.95	0.03	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.56	0.00	2.45	0.00
M-16	Pleasure Water Craft	0.17	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00

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GRAND TOTAL WITH POTENTIAL OVERLAP	1.60	5.52	1.95	5.40	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.763	6.861	1.072	6.861	0.000
Area (nonfed)	8.074	3.692	2.630	4.525	0.000
Area (fed)	2.108	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	10.945	10.553	3.702	11.386	0.000
On-road	14.231	28.899	116.823	28.348	0.000
Off-road (nonfed)	0.937	1.250	10.699	1.188	0.000
Off-road (fed)	1.297	6.432	6.629	6.135	0.000
TOTAL	27.410	47.134	137.853	47.057	0.000

EMISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	0.957	0.000	0.000	0.000	0.000
Area (fed)	0.422	0.000	0.000	0.000	0.000
Total Stationary	1.379	0.000	0.000	0.000	0.000
On-road	0.000	2.920	0.000	2.920	0.000
Off-road (nonfed)	0.049	0.030	1.877	0.030	0.000
Off-road (fed)	0.177	2.565	0.069	2.450	0.000
TOTAL	1.604	5.515	1.946	5.400	0.000

REMAINING EMISSIONS

Point source	0.763	6.861	1.072	6.861	0.000
Area (nonfed)	7.117	3.692	2.630	4.525	0.000
Area (fed)	1.686	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	9.566	10.553	3.702	11.386	0.000
On-road	14.231	25.979	116.823	25.428	0.000
Off-road (nonfed)	0.887	1.220	8.822	1.158	0.000
Off-road (fed)	1.121	3.867	6.560	3.685	0.000
TOTAL	25.806	41.619	135.907	41.657	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	25.806	41.619	135.907	41.657	0.000

TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	0.600	0.630	3.830	0.610	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

TITLE : 1997 FINAL AQMP CEPA RUN - SCAB - 2007 Planning Inv - Inv. w/ RME
: With 2007 Control Factors (1993 Based) - Out Basin - Coachella Valley Inv.

Excl. Natural Sources
Base Year : 1993

Reductions Without Overlapping/Double-Counting With Other Control Measures (1)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.43	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	1.02	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.39	4.26	0.00	4.26	0.00
M11&M12	Industrial Eq	0.07	0.04	2.61	0.04	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.61	0.00	2.49	0.00
M-16	Pleasure Water Craft	0.24	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00
		--------	--------	--------	--------	--------
GRAND TOTAL (NET)		2.15	6.90	2.61	6.79	0.00

Reductions With Overlapping/Double-Counting With Other Control Measures (2)

MEASURE NAME		VOC RED. TPD	NOX RED. TPD	CO RED. TPD	NO2 RED. TPD	N/A TPD
BA-03	Adjustment for PAR 1130.1	0.00	0.00	0.00	0.00	0.00
BA-04	Natural Event Policy on Windblown Dust	0.00	0.00	0.00	0.00	0.00
DPR-01	COE fr Pesticide Applications	0.43	0.00	0.00	0.00	0.00
CP-02	Mid Term Consumer Product Measure	1.02	0.00	0.00	0.00	0.00
M4,5,6&7	Combination of M-04-05-06-07	0.39	4.26	0.00	4.26	0.00
M11&M12	Industrial Eq	0.07	0.04	2.61	0.04	0.00
M-13	Marine	0.00	0.00	0.00	0.00	0.00
M-14	Locomotives/Trains	0.00	2.61	0.00	2.49	0.00
M-16	Pleasure Water Craft	0.24	0.00	0.00	0.00	0.00
MOF-07	Polluting Engines	0.00	0.00	0.00	0.00	0.00
MON-09	In Use Vehicle Emission Mitigation	0.00	0.00	0.00	0.00	0.00
MON-10	Emission Reduction Credit for Trucks Stop Electrification	0.00	0.00	0.00	0.00	0.00

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GRAND TOTAL WITH POTENTIAL OVERLAP	2.15	6.90	2.61	6.79	0.00

EMISSION SUMMARY FOR
(POINT, AREA, MOBILE SOURCE, AND OFF-ROAD MV)

BASELINE EMISSIONS	VOC	NOX	CO	NO2	N/A
Point source	0.800	7.185	1.119	7.185	0.000
Area (nonfed)	8.440	3.844	2.723	4.710	0.000
Area (fed)	2.142	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	11.382	11.029	3.842	11.895	0.000
On-road	12.321	28.134	106.811	27.550	0.000
Off-road (nonfed)	0.977	1.201	11.140	1.136	0.000
Off-road (fed)	1.344	6.432	6.869	6.134	0.000
TOTAL	26.024	46.796	128.662	46.715	0.000

EMISSION REDUCTIONS

Point source	0.000	0.000	0.000	0.000	0.000
Area (nonfed)	1.023	0.000	0.000	0.000	0.000
Area (fed)	0.428	0.000	0.000	0.000	0.000
Total Stationary	1.452	0.000	0.000	0.000	0.000
On-road	0.393	4.256	0.000	4.256	0.000
Off-road (nonfed)	0.067	0.040	2.520	0.040	0.000
Off-road (fed)	0.241	2.608	0.094	2.491	0.000
TOTAL	2.152	6.904	2.614	6.786	0.000

REMAINING EMISSIONS

Point source	0.800	7.185	1.119	7.185	0.000
Area (nonfed)	7.417	3.844	2.723	4.710	0.000
Area (fed)	1.714	0.000	0.000	0.000	0.000
Reclaim		0.000		0.000	
Total Stationary	9.930	11.029	3.842	11.895	0.000
On-road	11.928	23.878	106.811	23.294	0.000
Off-road (nonfed)	0.910	1.161	8.619	1.096	0.000
Off-road (fed)	1.103	3.824	6.775	3.643	0.000
TOTAL	23.872	39.892	126.048	39.929	0.000

ERCs	0.000	0.000	0.000	0.000	0.000
HILO (3)	0.000	0.000	0.000	0.000	0.000
NSR Exemption	0.000	0.000	0.000	0.000	0.000
R518.2	0.000	0.000	0.000	0.000	0.000
ODC Conversion	0.000	0.000	0.000	0.000	0.000
GRAND TOTAL (T/D)	23.872	39.892	126.048	39.929	0.000

TOTAL LAST 5 LINE ITEMS	0.000	0.000	0.000	0.000	0.000
Mobility Adjustments (4)	0.690	0.780	4.630	0.760	0.000

(1) Emission reductions for individual measures were estimated based on the sequence of listing contained here. When the sequence changes, reductions from each measure could be affected, but the net total remain the same. The purpose of this table is to estimate total emission reductions without overlapping or double-counting between measures.
(2) Emission reductions for individual measures were estimated in the absence of other measures. Therefore, the sequence of listing does not affect the reduction estimates. The purpose of this table is to provide emission reduction estimates for Appendix IV control measure summary tables as well as cost effectiveness analysis.
(3) HILO=Bank for HIgh employment LOw polluting companies.
(4) Mobility Adjustment includes TCM-01, ATT-01, ATT-02, ATT-05 and adjustments are reflected in the CEPA baseline beyond year 2000.

FINAL
APPENDIX V

MODELING AND ATTAINMENT DEMONSTRATIONS

NOVEMBER 1996

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

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CHAPTER 4 Revision to the Federal Post-1996 VOC Rate-of-Progress Plan

CHAPTER 5 Revision to the Federal Carbon Monoxide Attainment Demonstration Plan

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CHAPTER 1

REVISION TO THE FEDERAL NITROGEN DIOXIDE ATTAINMENT PLAN

Introduction

Oxides of Nitrogen Emissions

Modeling Methodology

Future Predicted Air Quality

Summary and Conclusions

INTRODUCTION

The South Coast Air Basin (Basin) is the only area in the U.S. designated as nonattainment for the federal nitrogen dioxide (NO_2) air quality standard. However, since 1992 the Basin has met the federal NO_2 air quality standard and since 1994 has met the California Ambient Air Quality Standard (CAAQS) for NO_2. Nitrogen dioxide is formed in the atmosphere primarily by the reaction of nitric oxide (NO) with oxygen. These two compounds, NO_2 and NO, are referred to collectively as nitrogen oxides (NO_x). The purpose of the nitrogen dioxide assessment for the 1997 Air Quality Management Plan (AQMP) is to reassess the extent of NO_2 pollution in the Basin and to provide a maintenance plan demonstration for the federal NO_2 air quality standard.

In 1995, nitrogen dioxide concentrations were monitored at 24 locations. All of the Basin was in compliance with the federal and state standards for nitrogen dioxide. The highest annual average concentration in the Basin was 4.64 pphm recorded at both East San Gabriel Valley and Northwest San Bernardino Valley areas. The highest 1-hour average concentration was 24 pphm recorded at Central Los Angeles. The number of stations exceeding the federal annual standard and state 1-hour standard has decreased during the last ten years (1986 through 1995) from a high of 3 and 9, respectively, to none. The reader is referred to Chapter 2 of the main volume and Appendix II for a more detailed discussion of NO_2 air quality in the Basin.

The 1991 AQMP served as the basis for the 1992 Federal Nitrogen Dioxide Attainment Plan for the South Coast Air Basin. The 1994 AQMP addressed the requirements of 1) Title I of the federal Clean Air Act (CAA) and 2) the California Clean Air Act (CCAA). The most significant change in the 1994 AQMP emission control strategy was the adoption of RECLAIM on October 15, 1993 by the District. RECLAIM is an alternative means of achieving further emission reduction of oxides of nitrogen and oxides of sulfur from stationary sources.

OXIDES OF NITROGEN EMISSIONS

This section summarizes the emission inventories developed for the NO_2 linear rollback calculations. The planning emission inventories developed for the historical years (1987, 1990, and 1993) and future planning years (baseline and controlled) are described in Appendix III. Baseline NO_x inventories for both the historical year (1993) and the future years (2000 and 2010) are discussed next. Two emission projections are needed for each of the modeled future years. The first is the projected emissions assuming no further emission controls. These projections are commonly referred to as “baseline emissions” (e.g., 2010 baseline emissions), and reflect the emissions resulting from increases in population and vehicle miles traveled (VMT), as well as the implementation of all air quality rules and regulations adopted as of September 30, 1996. The second emission projections reflect the implementation of the 1997 AQMP control measures on the future baseline emissions. For a detailed description of the 1997 AQMP control measures, the reader is referred to the main volume and Appendices IV-A and IV-B.

Future Baseline Emissions

Present (1993) and future baseline (2000 and 2010) NO_x emissions used to estimate NO_2 concentrations are shown in Table 1-1. Two sets of winter planning emissions (in tons per day) are given, one representing the Basin total and the other representing the Pomona area (historically, the location of the highest measured annual NO_2 concentrations in the Basin). Note that NO_x emissions are projected to decrease more than 40 percent from 1993 to 2010 basin-wide and in the Pomona area.

TABLE 1-1

Present and Future Baseline NO_x Emissions (tpd)
for the South Coast Air Basin and the Pomona Area

Year	South Coast A.B.	Pomona Area
1993	1284	36.7
2000	960	28.0
2010	759	21.9

A separate emission inventory for the Pomona area was included in the analysis of future year concentrations because, as described in Technical Report V-I of the 1991 AQMP, the mechanism for producing high annual NO_2 concentrations is different for Pomona than for other areas in the Basin. In particular, it depends on the injection of fresh NO emissions from local sources. In order to better project the future year NO_2 concentrations at Pomona, emissions local to the Pomona area were used instead of the basin-wide totals. The Pomona emissions are extracted from the gridded winter planning emissions inventory and represent the sum of all emission sources within the 15 km by 15 km square around Pomona.

Future Controlled Emissions

The control factors developed from the Controlled Emission Projection Algorithm (CEPA) program are applied to the future base year emissions to calculate the controlled emission inventories. Future-year controlled emissions, estimated from the baseline emissions using the CEPA control factors, are given in Table 1-2. Note that NO_x emissions are reduced more than 25 percent in 2010 with the implementation of the proposed control strategy.

TABLE 1-2

Future Controlled NO_x Emissions (tpd) for the
South Coast Air Basin and the Pomona Area

Year	South Coast A.B.	Pomona Area
2000	942	26.9
2010	561	15.0

MODELING METHODOLOGY

A linear rollback approach is used to evaluate future NO_2 concentrations. It assumes that the ambient concentrations above background levels are directly proportional to the emissions in the immediately adjacent areas. In mathematical terms, the rollback relationship can be written as follows:

$$C_p = [(C_b - k) \bullet Q_p/Q_b] + k$$

where C_p and C_b are the future year and baseline NO_x concentrations, respectively; Q_p and Q_b are the future year and baseline NO_x emission rates, respectively; and k denotes the global background NO_x concentration. It is assumed that global background NO_x and NO_2 concentrations are negligible; therefore the above equation simplifies to

$$C_p = C_b \bullet Q_p/Q_b$$

Projections are made for several key locations in the Basin representative of areas with historically higher nitrogen dioxide concentrations. Future-year annual average NO_2 concentrations were determined from projected total NO_x concentrations using NO_2/ NO_x ratios averaged from three recent years (1992-1994) of historical annual averaged measurements at each of the locations. The base year emissions inventory is 1993 and thus the three-year period, 1992-1994, is chosen for estimating the NO_2/ NO_x ratios. The ratios used for the analysis are summarized in Table 1-3.

TABLE 1-3

Measured NO_2, NO_x, and NO_2-to-NO_x Ratios for
Selected Sites in the South Coast Air Basin

Year	Pollutant	Los Angeles	Burbank	Pomona	Pico Rivera
1992	NO_2 (pphm)	4.04	5.01	5.07	4.43
	NO_x (pphm)	10.99	11.73	10.73	11.00
	NO_2/NO_x	0.37	0.43	0.47	0.40
1993	NO_2 (pphm)	3.32	4.40	4.99	4.28
	NO_x (pphm)	8.57	10.61	10.13	10.37
	NO_2/NO_x	0.39	0.41	0.49	0.41
1994	NO_2 (pphm)	4.76	4.97	4.80	4.49
	NO_x (pphm)	11.51	11.94	10.31	11.42
	NO_2/NO_x	0.41	0.42	0.47	0.39
1992-94	NO_2/NO_x	0.39	0.42	0.48	0.40

FUTURE PREDICTED AIR QUALITY

Annual Average (NAAQS)

Under the federal Clean Air Act, the South Coast Air Basin must comply with the federal annual NO_2 standard by November 15, 1995 [Section 192(b)]. Since the annual standard is based on the calendar year, attainment must be demonstrated for calendar year 1994. As discussed earlier, the Basin has met the standard since 1992 and according to the modeling described next will continue to meet the standard well into the future.

Figure 1-1 shows the measured annual average NO_2 concentrations for the 1993 base year and the predicted annual average concentrations for the future years 2000 and 2010 with and without implementation of the proposed control strategy. Note that the standard will continue to be met with existing rules and regulations (i.e., the baseline scenarios). Implementation of the proposed control strategy will improve NO_2 air quality but is not necessary to maintain the annual standard.

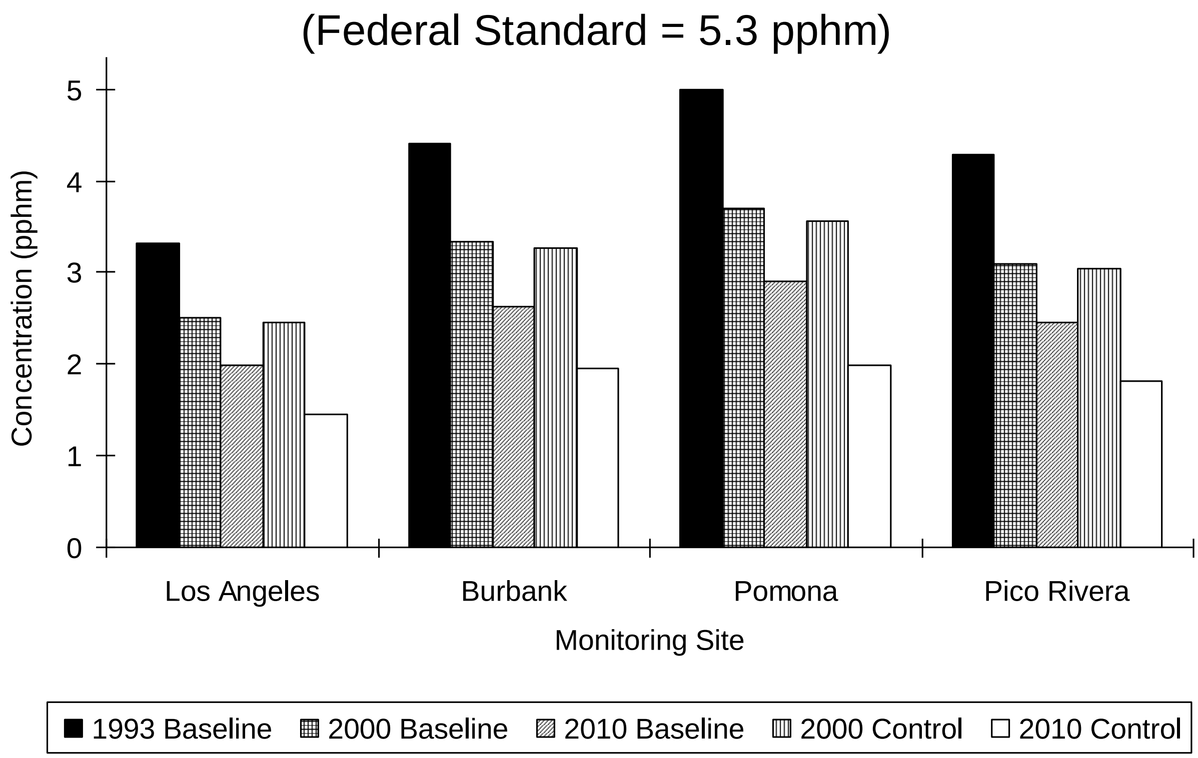


FIGURE 1-1

Annual Average NO_2 Concentration Projections (pphm)

Maximum One-Hour Average (CAAQS)

The California Clean Air Act requires that the District make progress toward the state standards (CAAQS) but does not prescribe an attainment deadline. The South Coast Air Basin has met this standard since 1994 and it is projected that the state air quality standard will continue to be met through the year 2010.

For the projection of maximum hourly NO_2 concentrations, complete transformation from NO to NO_2 is assumed (i.e., the NO_2-to- NO_x ratio is one) and the future maximum 1-hour NO_2 concentration is calculated directly from the hourly baseline NO_2 concentration observed in the base year (1993), using linear rollback.

Figure 1-2 shows the projected maximum 1-hour NO_2 concentrations under the 2000 and 2010 baseline emission scenarios and the 2000 and 2010 controlled emission scenarios along with the measured concentrations in 1993. As with the federal annual NO_2 standard, existing District and ARB NO_x rules and regulations are projected to be sufficient to maintain the 1-hour NO_2 standard in the Basin. The proposed control strategy will result in further improvement to NO_2 air quality.

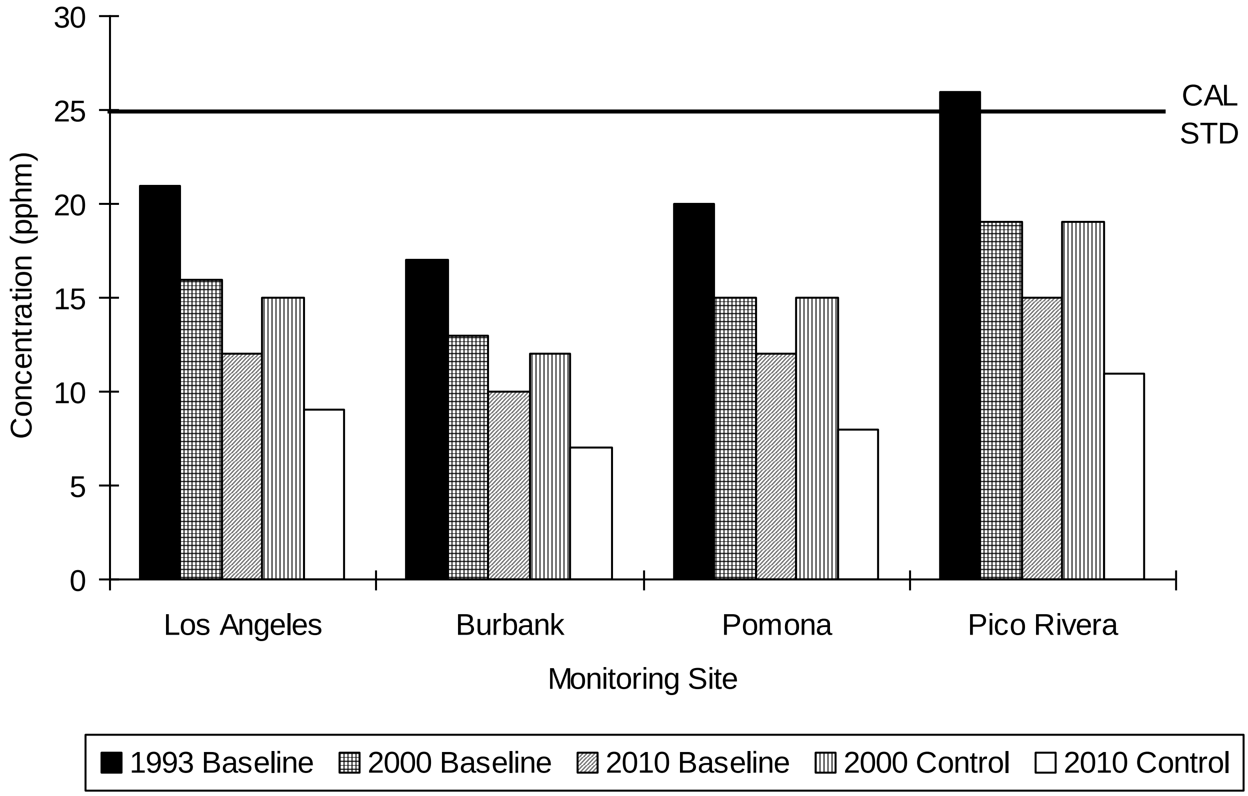


FIGURE 1-2

Maximum 1-Hour NO_2 Concentration Projections (pphm)

SUMMARY AND CONCLUSIONS

Based on the future-year nitrogen dioxide air quality projections presented in this section, the South Coast Air Basin is projected to maintain both state and federal NO_2 air quality standards. Since the Basin is the only area in the U.S. designated as nonattainment for nitrogen dioxide, the region will be requesting a redesignation to attainment. The oxides of nitrogen control measures provided in the 1997 AQMP serve as additional emission reductions which will ensure the maintenance of the federal nitrogen dioxide air quality standard through 2010.

CHAPTER 2

PM_{10} ATTAINMENT DEMONSTRATION AND VISIBILITY

INTRODUCTION

Background

The federal ambient air quality standards for PM_{10} are frequently violated in the Basin, often by a wide margin. PM_{10} is responsible for the significant visibility impairment that exists in the Basin, and when inhaled, can cause both short- and long-term reduction in lung function. It has also been linked to chronic respiratory illness, cancer and premature death. (See 1997 AQMP Appendix I - Health Effects.)

On July 31, 1987, the U.S. Environmental Protection Agency (U.S. EPA) promulgated the National Ambient Air Quality Standard (NAAQS) for PM_{10}, designating the South Coast Air Basin as a Group I nonattainment area. Under the Clean Air Act (CAA) of 1990, the U.S. EPA designated the Basin as 'moderate' nonattainment area for PM_{10}. In response to the CAA, the South Coast Air Quality Management District (District) submitted, as part of the 1991 AQMP, a control strategy to meet the federal PM_{10} standards. In February 1993, EPA redesignated the Basin from a 'moderate' to a 'serious' PM_{10} nonattainment area requiring the District to prepare a 'serious' area PM_{10} SIP, which incorporated best available control measures (BACM) for PM_{10} and PM_{10} precursors; this was done in the 1994 AQMP (1994 PM_{10} BACM SIP).

The CAA also requires a PM_{10} attainment demonstration plan be submitted no later than February 8, 1997. For 'serious' areas, the targeted attainment date is not later than 2001, with provisions for one 5-year extension. The Basin is required to meet the federal PM_{10} air quality standards by 2006. The 1997 AQMP fulfills these CAA requirements.

PM_{10} Air Quality

While Basin PM_{10} air quality has improved since the inception of monitoring in 1985, the area continues to experience some of the worst nationwide PM_{10} pollution. Nine air monitoring stations, distributed throughout the four county area, exceeded the federal 24-hour federal PM_{10} air quality standard (150 $\mu g/m^3$) in 1995. The 1995 peak 24-hour concentration (for a non-high-wind event) reached 210 $\mu g/m^3$ and was measured at Rubidoux, in the eastern half of the Basin on November 17th. Concurrently, annual arithmetic mean concentrations of PM_{10} at four Basin locations in 1995 exceeded the federal PM_{10} air quality standard of 50 $\mu g/m^3$. Once again, the maximum annual average concentration in the Basin (69 $\mu g/m^3$) was observed at Rubidoux. A comprehensive assessment of the observed 1995 PM_{10} is presented in Appendix II of the 1997 AQMP. A summary profile of the speciated components of PM_{10} is provided later in this chapter, under the subsection "PTEP Data Analysis" and also in Kim *et al*. (1996).

PM_{10} Modeling Approach

To establish a control strategy to meet the PM_{10} standards in the future, the relationship between emissions from various source categories and the ambient PM_{10} concentrations must be established. This, in turn, requires air quality modeling techniques to identify PM_{10} sources and quantify their impacts. PM_{10} is a multicomponent pollutant including directly emitted primary particles and secondary particles resulting from the chemical transformations of precursor emissions such as hydrocarbons, nitrogen oxides, and sulfur oxides.

A multi-pronged modeling methodology was employed to fully assess regional PM_{10} and demonstrate future compliance with the federal PM_{10} standards for both annual and 24-hour episodic conditions in the Basin. The modeling methodology relied on a combination of urban airshed modeling and statistical data analytical techniques to characterize both 24-hour and annual PM_{10} distributions from observational data.

Three primary methodologies were used to demonstrate compliance to the annual and 24-hour PM_{10} standards: airshed modeling using the Urban Airshed Modeling with Linear Chemsitry Module (UAM/LC) (Lurmann and Kumar 1996), a version of the Urban Airshed Model that uses an empirical chemistry to describe the particulate chemistry; statistical modeling using the Chemical Mass Balance (CMB) receptor model (discussed extensively in Technical Report V-C of the 1994 AQMP) for source apportionment in the Basin; and speciated rollback based on ambient PM_{10} data characterization and future emissions projections, used to provide an independent assessment of future year PM_{10}.

Supporting analyses for PM_{10} assessments included: the Particle-In-Cell (PIC) model (also discussed extensively in Technical Report V-C of the 1994 AQMP) with the empirical chemistry module; episodic PM_{10} airshed modeling using UAM-Aero (Kurmar and Lurmann, 1996), a version of the urban airshed model that uses a detailed aerosol chemistry module to simulate episodic particulate chemistry; and statistical analyses using pattern recognition techniques and meteorological classification in combination with episodic airshed modeling using UAM-Aero for annual PM_{10} projections.

The 1993 emissions inventory described in Appendix III of the 1997 AQMP was projected to 1995 for the UAM/LC modeling applications. The UAM-Aero efforts are on-going and the model has not been applied for the 1997 AQMP

Seven scenarios were evaluated for base and future year PM_{10} air quality: (1) 1995 baseline, (2) 2000 baseline without controls, (3) 2000 with control measures implemented, (4) 2006 baseline without controls, (5) 2006 with control measures implemented, (6) 2010 baseline without controls, and (7) 2010 with control measures implemented. Projections of future PM_{10} air quality were estimated based on emissions projections by source category for each scenario.

PM_{10} TECHNICAL ENHANCEMENT PROGRAM (PTEP)

Introduction

Comprehensive analyses of gaseous ambient air quality in the Basin have been the subject of numerous field studies, and have provided the cornerstone for urban airshed modeling simulations and regional pollution control strategy development. By comparison, research and analysis of the PM_{10} problem in the Basin has been limited. This is partly due to the short period the program has been in existence (since 1987) but is also due to evolving sampling technology, understanding of aerosol chemistry, and development of methods to inventory emissions. To improve the understanding of the Basin PM_{10} problem, the District initiated a comprehensive program to characterize the fine particulate problem in the Basin: the PM_{10} Technical Enhancement Program (PTEP).

Beginning in November 1994, the PTEP embarked with the goals to establish and implement enhanced ambient monitoring, an improved emissions inventory for PM_{10} and its precursors, and an enhanced modeling program. The information derived from this program provided the framework to characterize more completely the extent of the PM_{10} problem in the Basin, identify the relative sources, and establish more refined tools to develop and evaluate effective control strategies.

Enhanced Ambient Monitoring

The District currently collects 24-hour integrated PM_{10} samples once every six days at twenty locations throughout the Basin. Despite the extensive monitoring network, only limited speciation analyses of sulfate, nitrate, and chloride are performed. Real-time beta attenuation or microbalance devices reporting hourly mass measurement supplement the sixth-day samples to provide data characterization to support air quality forecasting and episode declaration. The PTEP enhanced monitoring program expands this “routine” sampling program, both in its technical complexity and frequency of sampling sampler by using a modified multi-channel “SCAQS” (Southern California Air Quality Study) sampler.

While the current fine particulate network documents progress toward meeting air quality standards, the PTEP enhanced monitoring program was designed to develop a comprehensive ambient profile of fine particulate concentrations throughout the Basin. Monitoring was expanded to include not only PM_{10} and $PM_{2.5}$ mass measurement and speciation but also nitric acid/nitrate/ammonia measurements, for better characterization of the nitric acid and nitrate relationship.

The sampling was performed both upwind and downwind of significant ammonia sources in the Basin. Monitoring was also focused at sources with significant contribution of mobile and stationary source emissions and also at a location representing off-shore background readings. Concurrent meteorological measurements were also taken during the PTEP monitoring program.

Enhanced monitoring was established at six sites including: Downtown Los Angeles; Anaheim; Diamond Bar; Rubidoux; Fontana; and San Nicolas Island as shown in Figure 2-1. The Los Angeles and Anaheim sites are representative of primary vehicle and stationary source emissions areas. Diamond Bar is representative of areas at the urban fringe. Fontana and Rubidoux represent downwind receptor areas. San Nicolas Island some 80 miles off the Southern California coast, characterized PM_{10} data from the upwind clean air mass moving into the Basin.

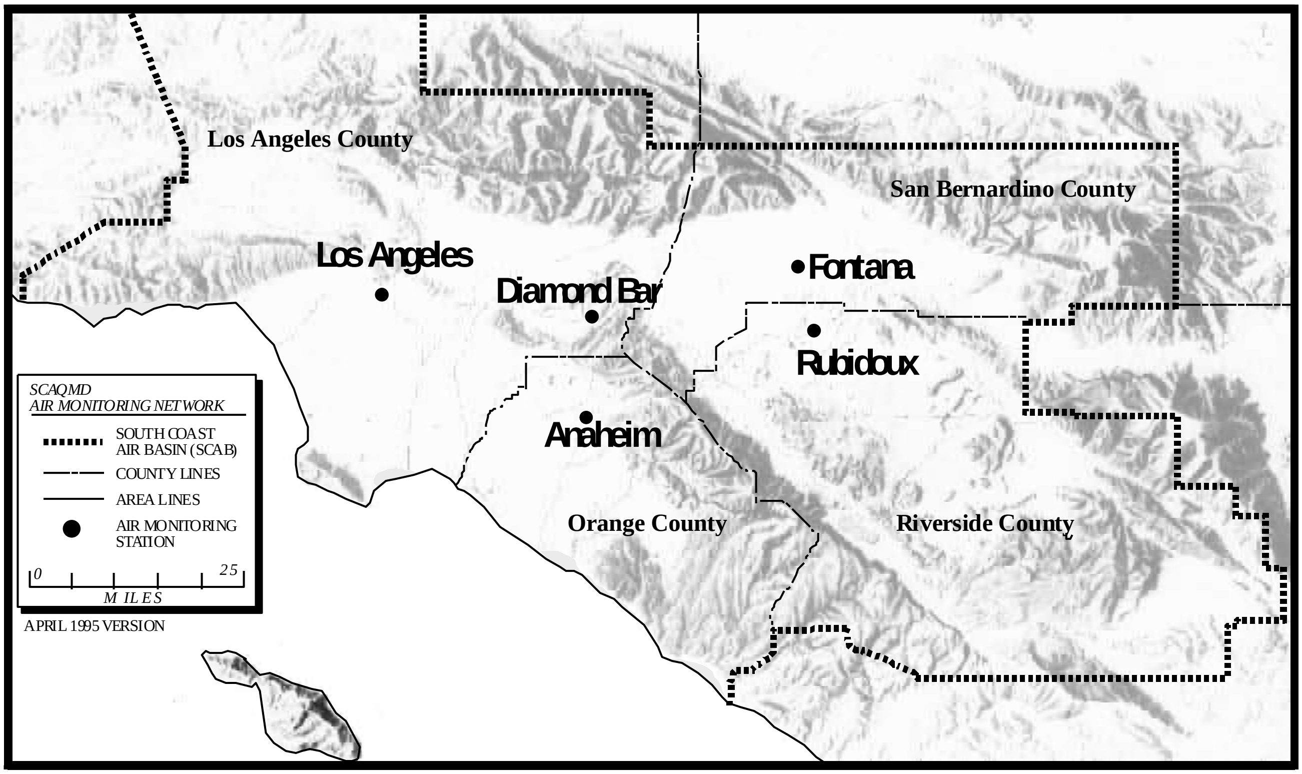


FIGURE 2-1

PTEP Enhanced Monitoring Network (San Nicholas Island not shown)

At each location, state-of-the-science sampling equipment were deployed to collect fine and coarse particulate fractions for speciation as well as nitric acid, elemental carbon, ammonium and metals. More specifically, total mass and 43 species (Mg, Al, Si, P, S, Cl, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, As, Se, Br, Rb, Sr, Y, Mo, Pd, Ag, Cd, In, Sn, Sb, Ba, La, Au, Pb, U, OC, EC, Cl, Na, NO_3, SO_4, NH_4) were analyzed for a full chemical speciation of the particle data. Total mass was determined gravimetrically as collected on teflon filters and the concentrations of 36 trace elements were determined by energy dispersive x-ray fluorescence. Quartz fiber filters were used to collect samples to be analyzed for organic carbon and elemental carbon using an optical thermal carbon analyzer. Water soluble ionic species, such as NO_3, SO_4, NH_4, Na, and Cl, were extracted from the quartz filters and analyzed by ion chromatography. Two gaseous species, nitric acid and ammonia, were determined by the denuder difference method. A more detailed description of sample analysis can be found in Teffera, *et al.* (1996).

PTEP sampling was conducted at all six sites on a one-day-in-six schedule during the first quarter of 1995. The sampling frequency was increased to one-day-in-three during the second quarter of 1995, and during the second half of 1995, sampling frequency was increased to every day. Only San Nicolas Island (due to logistical limitations) remained on a one-day-in-six sampling schedule.

Additional description of the monitoring program is contained in Kim, *et al.*, (1996), including preliminary analysis of the data monitored during the first half of 1996. An expanded description of the PTEP data follows in a later section.

Improved Emission Inventory

Direct emissions of particulate matter account for approximately 30 to 60 percent of the ambient PM_{10} levels measured in the Basin, depending upon location and meteorological conditions. The remainder is comprised of a small background component and secondarily-formed particles from precursor gases. In the Basin, ammonium nitrate, formed from NO_x and ammonia emissions, comprises the dominant fraction of secondary particles. Emission inventory development has typically focused on NO_x, VOC, and SO_x emission sources. The PTEP emissions inventory development was directed to enhance direct PM_{10} emission inventories, especially from geological and mobile sources, as well as PM_{10}-precursor ammonia emissions from local dairies.

The primary objective of the enhanced emissions inventory development program is to improve emissions inventory estimates for primary PM_{10} emissions and ammonia, and to improve source profile "signatures" for input to receptor models. Areas of improved emissions categorization included: fugitive dust (primary particulates), motor vehicles (primary particulates), and dairy feed lots (ammonia). Similarly, motor vehicle source profiles were updated to reflect the current fleet.

Model Enhancements

Both source receptor and dispersion models were used in the 1994 PM_{10} attainment demonstrations. Receptor models utilize the collected data at a receptor site, and by statistically matching these samples with known source "fingerprints" or "profiles," source contributions to PM_{10} can be estimated. However, receptor models cannot distinguish among the various fugitive dust sources, and their accuracy depends upon the availability of appropriate source profiles.

Dispersion models have been developed to analyze both short-term and long-term PM_{10}. In the 1994 AQMP the District used a particle-in-cell (PIC) model, first developed at the California Institute of Technology (Caltech), which provides estimates of both short-term and long-term sulfate and nitrate levels from corresponding sources of SO_x and NO_x emissions. The PIC model uses surface meteorological data only (rather than three-dimensional meteorological fields), does not directly account for the effects of ammonia, and must be periodically recalibrated to reflect current data.

Several key enhancements to the PM_{10} modeling tools are a direct result of PTEP. To address the limitations of the PIC modeling, the UAM was updated to address particulate formation, handling more complex chemical reactions and meteorological input. Two versions of the UAM were developed to address this task: UAM/LC which uses an empirical chemical mechanism to predict nitrate, sulfate, ammonium and primary particulates, and UAM-Aero, which incorporates a full aerosol mechanism for particulate prediction.

PTEP AMBIENT DATA ANALYSIS

Comparison of PTEP and High-Volume Sampling Data

The District program routinely samples PM_{10} every six days as part of a compliance monitoring using size-selective-inlet, high-volume (SSI, Hi-Vol) PM_{10} samplers. The routine PM_{10} is sampled every six days, while the PTEP PM_{10} is sampled on a different sampling schedule as described in the previous section. Therefore, two comparisons are made between the PTEP and routine PM_{10} data. One is for paired PM_{10} data, another is for all PM_{10} data sampled in 1995. Figures 2-2 and 2-3 show the annual average and maximum 24-hour average paired PM_{10} data, respectively. All PTEP stations except Downtown Los Angeles show a very good agreement with the routine PM_{10} mass. Downtown Los Angeles shows a higher PTEP PM_{10} mass than the routine PM_{10} mass.

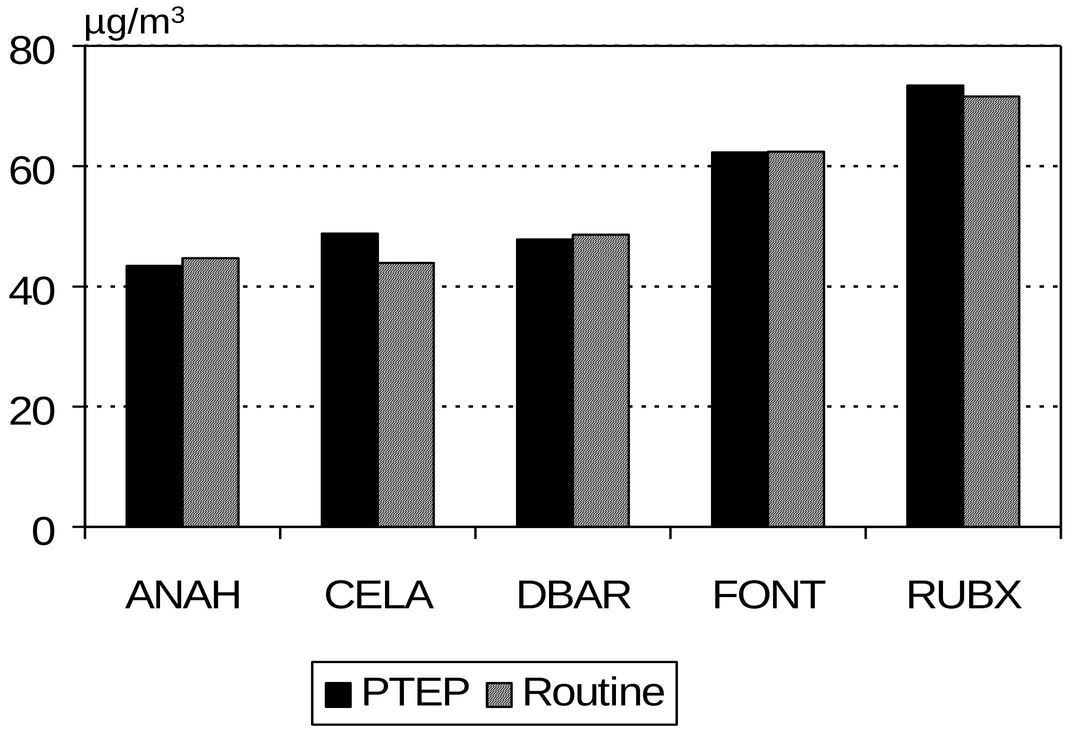


FIGURE 2-2

Annual Average Paired PM_{10} Data: PTEP vs Routine

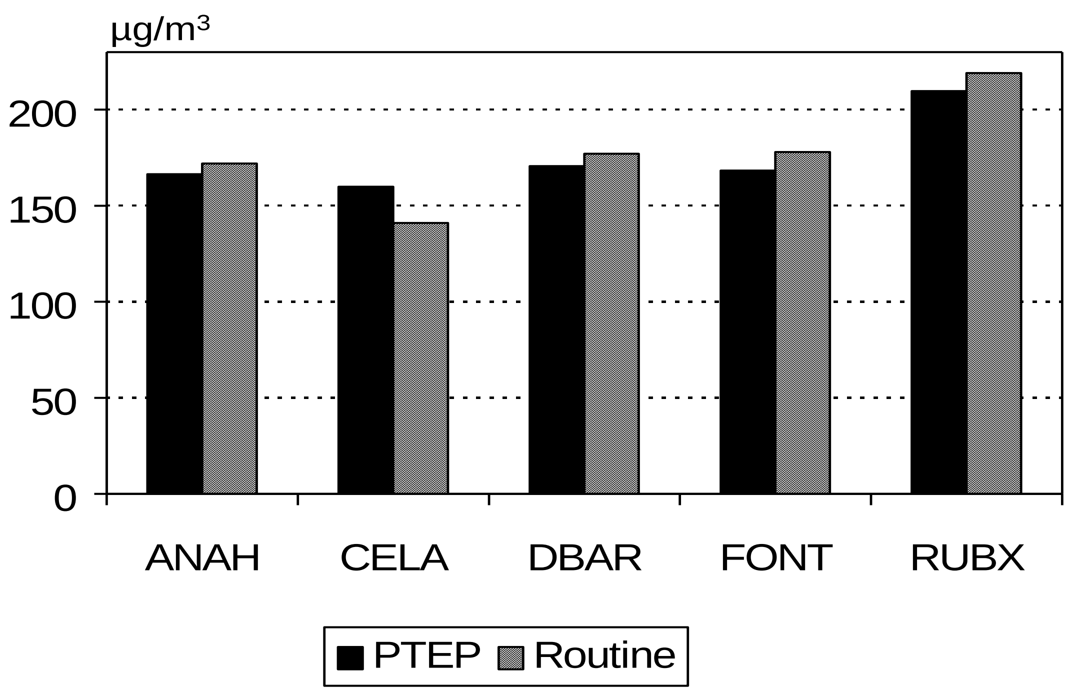


FIGURE 2-3

Maximum 24-Hour Average Paired PM_{10} Data: PTEP vs Routine

Figures 2-4 and 2-5 show the annual average and maximum 24-hour average for all PM_{10} data, respectively. The annual average PM_{10} mass shows good agreement with the routine PM_{10} mass at Anaheim and Diamond Bar. However, in general, PTEP PM_{10} mass is higher than routine PM_{10} mass. There is an expected upward bias in the PTEP annual average because of the more frequent sampling schedule during the high PM_{10} season (July - December) than with the six-day sampling schedule. The maximum 24-hour average of all of the PM_{10} measurements shows an agreement with the routine PM_{10} mass at Anaheim, Diamond Bar, and Rubidoux. However, a larger discrepancy is shown at Downtown Los Angeles and Fontana. Routine monitoring can miss the highest PM_{10} day because it samples only one in every 6 days.

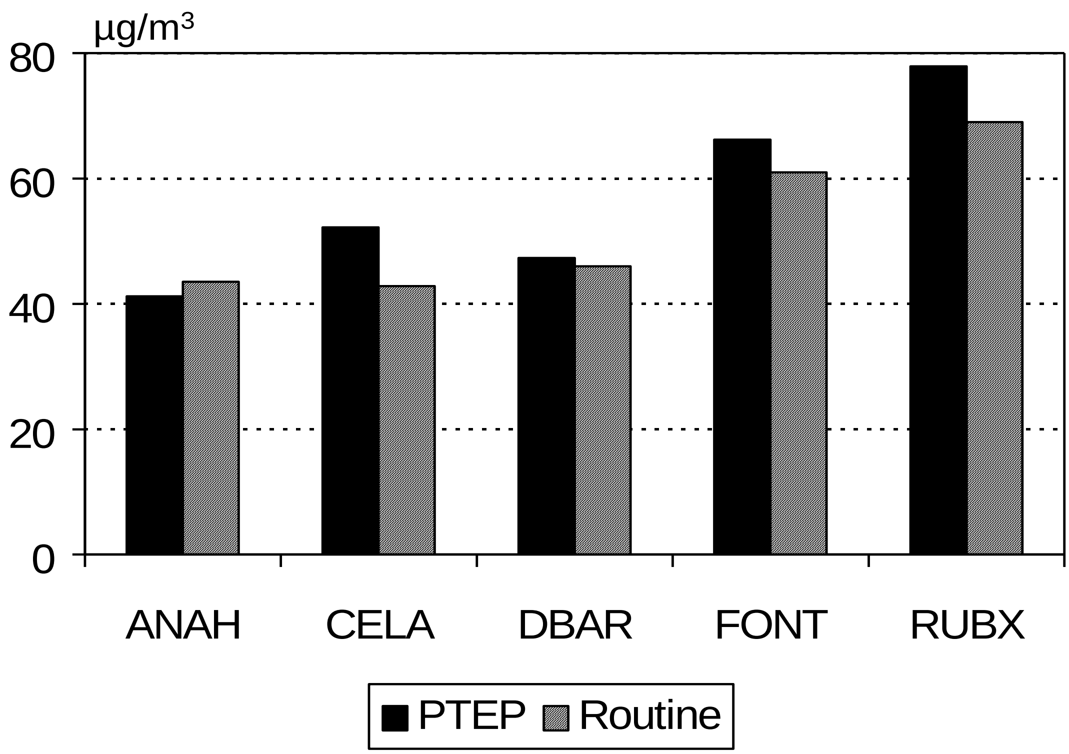


FIGURE 2-4

Annual Average All PM_{10} Data: PTEP vs Routine

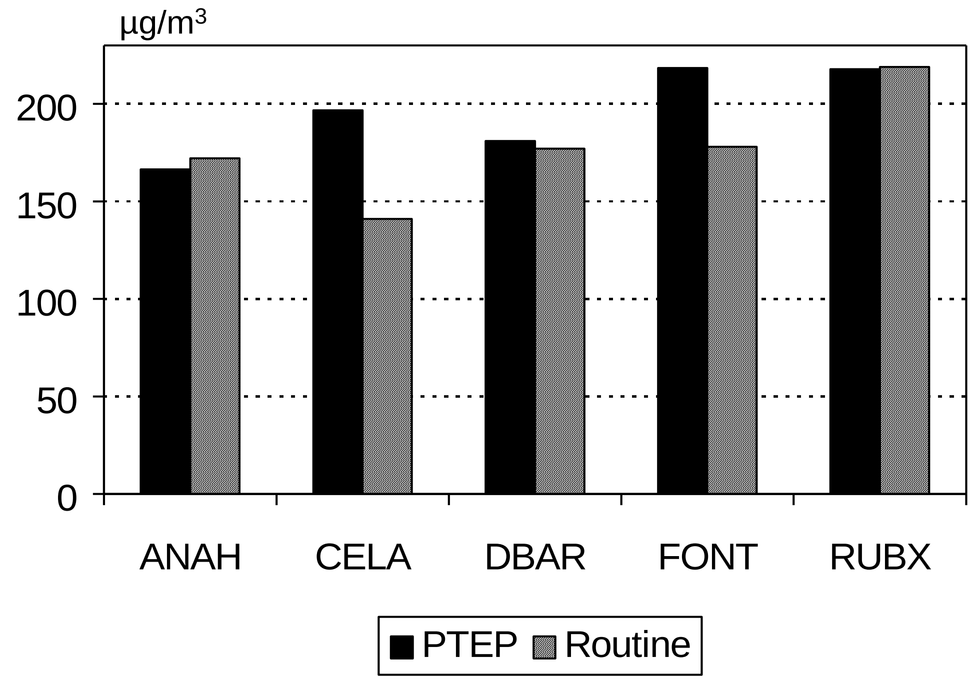


FIGURE 2-5

Maximum 24-Hour Average PM_{10} All Data: PTEP vs Routine

Characterization of PTEP PM_{10} Data

Annual average PM_{10} concentrations at the six PTEP sites are summarized in Table 2-1. Figure 2-6 shows the spatial variation of annual average PM_{10} concentrations. The lowest annual average PM_{10} mass was observed at San Nicolas Island and the near coastal site of Anaheim in the Basin. PM_{10} mass increases as one moves inland, and the highest annual average PM_{10} mass of 78 µg/m^3 was observed at Rubidoux.

TABLE 2-1

Annual Average PM_{10} Species Concentrations at the Six PTEP Sites

	San Nicolas Island		Anaheim		Downtown LA		Diamond Bar		Fontana		Rubidoux	
	Mass	%	Mass	%	Mass	%	Mass	%	Mass	%	Mass	%
PM_{10} mass	18.20		42.16		51.97		46.52		66.84		77.98	
Sulfate	2.10	11.6	4.71	11.2	5.16	9.9	4.38	9.4	3.95	5.9	4.51	5.8
Nitrate	1.61	8.9	10.14	24.1	11.90	22.9	11.98	25.7	14.67	22.0	19.84	25.4
Ammonium	0.53	2.9	3.92	9.3	4.80	9.2	4.67	10.0	5.10	7.6	6.74	8.6
Organic carbon	1.55	8.5	7.16	17	10.18	19.6	8.70	18.7	11.41	17.1	11.90	15.3
Elemental carbon	0.14	0.8	2.78	6.6	4.30	8.3	3.57	7.7	4.02	6.0	3.56	4.6
Sodium	2.46	13.5	1.37	3.3	1.31	2.5	1.04	2.2	0.88	1.3	0.93	1.2
Chloride	2.18	12.0	0.64	1.5	0.62	1.2	0.41	0.9	0.49	0.7	0.56	0.7
Others*	7.63	42.0	11.42	27.0	13.69	26.3	11.77	25.4	26.32	39.4	29.93	38.5

*Primarily Crustal Components

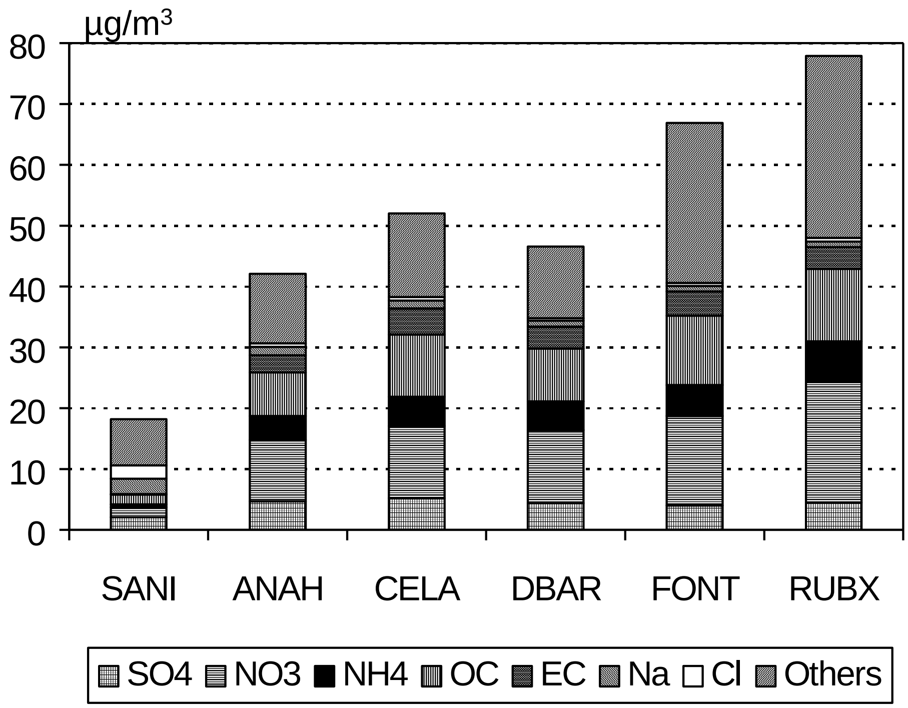


FIGURE 2-6
1995 Annual PM_{10} PTEP Average Speciated Concentrations

Sulfate concentrations show a small spatial variation, from 4 to 5 µg/m^3, at all sampling locations in the Basin. The highest sulfate concentration was observed at Downtown Los Angeles and Anaheim and the lowest sulfate concentration was observed at inland sites.

Nitrate and ammonium concentrations show a strong spatial variation, high concentrations inland and low concentrations at coastal locations. The highest concentrations were observed at Rubidoux and the second highest concentrations were observed at Fontana. The remaining sampling locations show about the same levels of ammonium and nitrate concentrations. In the central part of the Basin, a dense array of dairy farms is the source of significant ammonia emissions. Diamond Bar is located upwind of the dairy ammonia source and Rubidoux is located downwind. Diamond Bar has the highest annual average nitric acid concentration of 4 µg/m^3 whereas Rubidoux has the highest annual average ammonia concentration of 39.4 µg/m^3.

Conversely, Rubidoux has the lowest annual average nitric acid concentration of 0.9 µg/m^3. The lowest nitric acid concentration and the highest ammonia concentration at Rubidoux imply that most of the nitric acid is neutralized by ammonia to form ammonium nitrate. This analysis explains the high ammonium and nitrate concentrations at Rubidoux. These findings are consistent with earlier measurements.

The major sources of the elemental carbon in the Basin are heavy-duty motor vehicles and incomplete combustion of fossil fuel. Therefore, as the data shows, elemental carbon concentration does not show a spatial variation. All PTEP sampling stations in the Basin show about the same level of elemental carbon concentrations. It varies from 3 to 4 µg/m^3. Organic carbon concentration ranges from 7.2 µg/m^3 at Anaheim to 11.9 µg/m^3 at Rubidoux and accounts for between 15 percent at Rubidoux and 20 percent at Downtown Los Angeles.

The major component of the "others" (grouped) category is the crustal component. This category varies from 11.4 µg/m^3 at Anaheim to 30 µg/m^3 at Rubidoux. In general, PM_{10} concentration of the "others" category is high inland and low in coastal areas.

Characterization of PTEP $PM_{2.5}$ Data

Annual average $PM_{2.5}$ concentrations at six PTEP sites are summarized in Table 2-2. Figure 2-7 shows a spatial variation of annual average $PM_{2.5}$ concentrations. $PM_{2.5}$ mass varies from 26 µg/m^3 at Anaheim to 41 µg/m^3 at Rubidoux. The annual average $PM_{2.5}$ concentrations show the same characteristics as the PM_{10}.

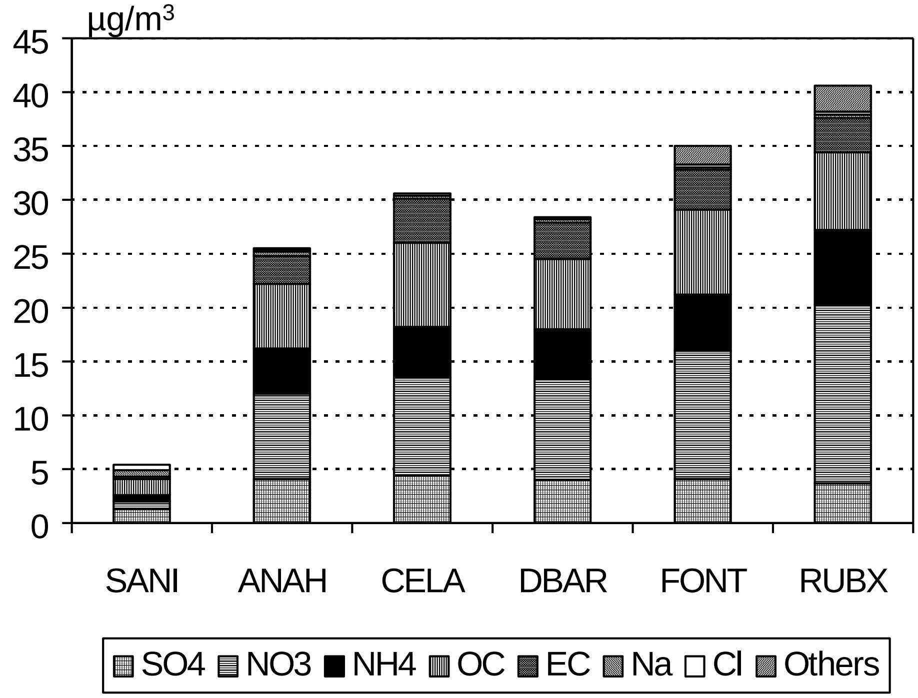
TABLE 2-2

Annual Average $PM_{2.5}$ Species Concentrations at the Six PTEP Sites

	San Nicolas Island		Anaheim		Downtown LA		Diamond Bar		Fontana		Rubidoux	
	Mass	%	Mass	%	Mass	%	Mass	%	Mass	%	Mass	%
$PM_{2.5}$ mass	5.09		25.54		30.15		27.13		35.00		40.52	
Sulfate	1.31	25.7	4.09	16.0	4.41	14.6	4.04	14.9	4.12	11.8	3.66	9.0
Nitrate	0.73	14.3	7.94	31.1	9.05	30.0	9.36	34.5	11.88	34	16.63	41.0
Ammonium	0.57	11.2	4.17	16.3	4.71	15.6	4.62	17.0	5.19	14.8	6.94	17.1
Organic carbon	1.48	29.1	5.99	23.5	7.81	25.9	6.52	24.0	7.93	22.7	7.23	17.8
Elemental carbon	0.18	3.6	2.64	10.3	4.12	13.7	3.35	12.3	3.65	10.4	3.16	7.8
Sodium	0.55	10.8	0.39	1.5	0.32	1.1	0.28	1.0	0.24	0.7	0.28	0.7
Chloride	0.47	9.2	0.20	0.8	0.22	0.7	0.22	0.8	0.29	0.8	0.28	0.7
Others*	-0.19	-3.9	0.12	0.5	-0.49	-1.6	-1.25	-4.5	1.68	4.8	2.35	5.8

*Primarily crustal components

FIGURE 2-7 1995 Annual PTEP Average Speciated $PM_{2.5}$ Concentrations



Sulfate does not show a strong spatial variation. It varies from 3.7 µg/m^3 at Rubidoux to 4.4 µg/m^3 at Downtown Los Angeles. Ammonium and nitrate, however, do show a strong spatial variation. High nitrate and ammonium concentrations were observed at inland locations and low concentrations at coastal locations.

Elemental carbon concentration ranges from 3 to 4 µg/m^3 in the Basin. Organic carbon concentration ranges from 6.0 µg/m^3 at Anaheim to 7.9 µg/m^3 at Fontana and, as a percentage of the total, between 18 percent at Rubidoux and 26 percent at Downtown Los Angeles.

The “others” category shows negative values at three of the PTEP sites. Measurement errors in total mass and the individual chemical species can sometimes cause the sum of the individual chemical species to be greater than the measured total mass. The highest value of 2.4 µg/m^3 from the “others” category was observed at Rubidoux. This accounts for 6 percent of the total $PM_{2.5}$ mass. It confirms that very little crustal material is contained in the $PM_{2.5}$ fraction in the Basin.

Seasonal Variations

$PM_{2.5}$ to PM_{10} ratio for ions, carbon, and “others,” by calendar quarter, are shown in Figures 2-8 to 2-10. These figures show spatial and temporal variations for the $PM_{2.5}$ to PM_{10} ratio. In general, $PM_{2.5}$ to PM_{10} ratios for ions increase by quarter and location, with the highest ratio observed in the fourth quarter at Rubidoux. Carbon does not show a seasonal variation in the $PM_{2.5}$ to PM_{10} ratio, but does show a spatial change ranging from 0.7 at Rubidoux to 0.9 at coastal areas of Anaheim and Downtown Los Angeles. The ratio of the "others" category decreases by quarter, with the highest ratio observed in the first quarter and lowest ratio in fourth quarter. This is consistent with the highest ion concentration observed in the fourth quarter. The highest ratio of 0.2 was observed at Rubidoux and Fontana.

FIGURE 2-8

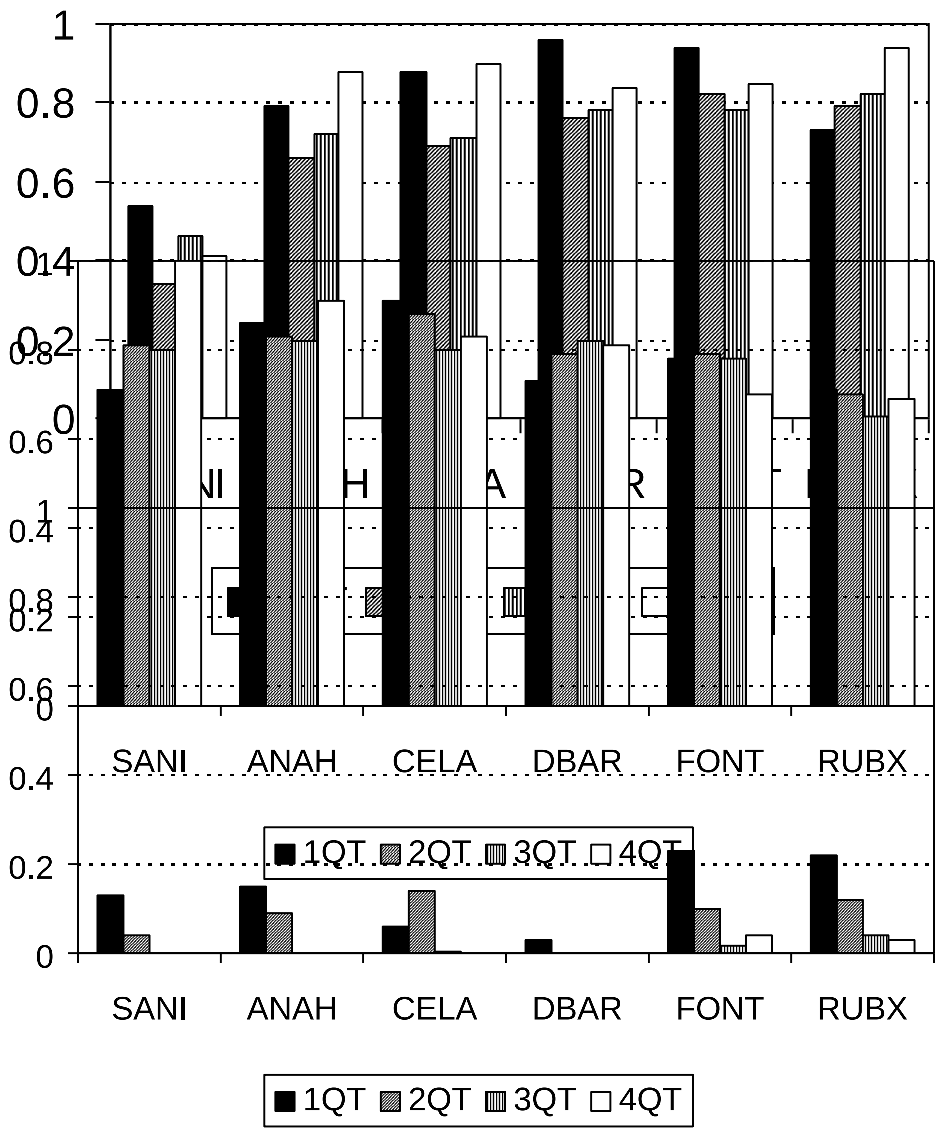
1995 PTEP $PM_{2.5}$ to PM_{10} Ratio for Ions

FIGURE 2-9

1995 PTEP $PM_{2.5}$ to PM_{10} Ratio for Carbon

FIGURE 2-10

1995 PTEP $PM_{2.5}$ to PM_{10} Ratio for "Others"



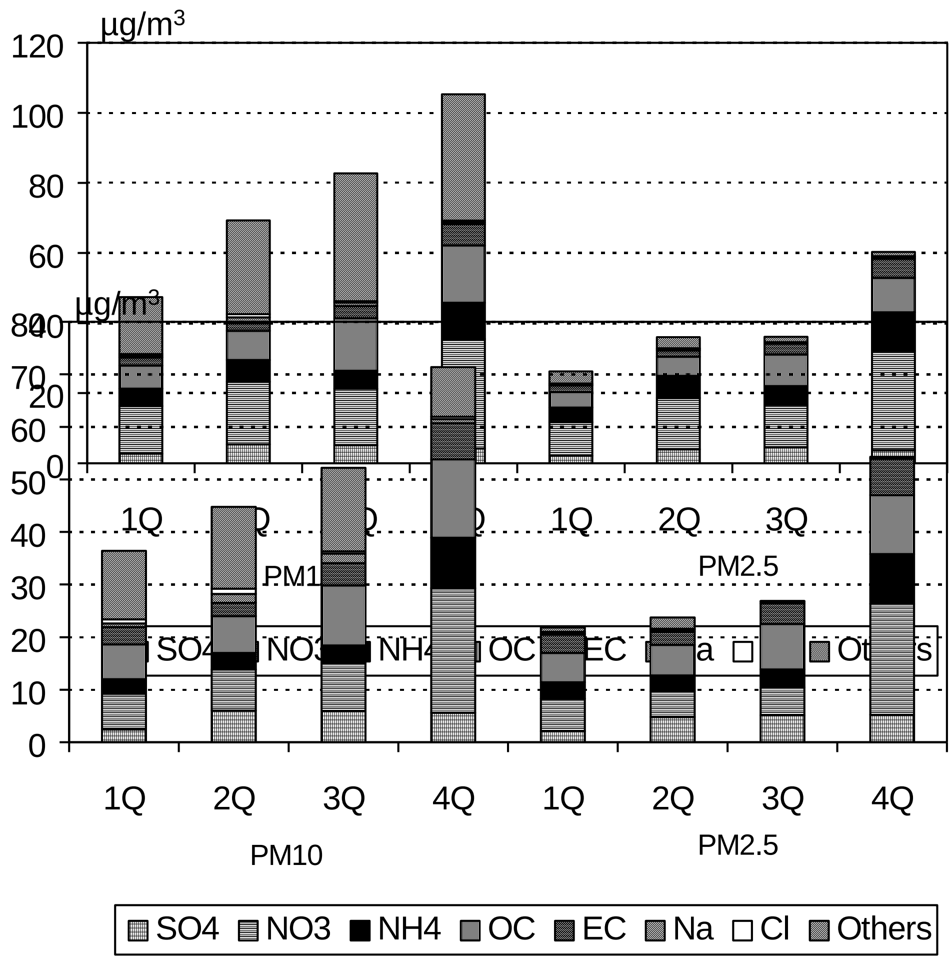
Quarterly average PM_{10} and $PM_{2.5}$ mass and each of the chemical component concentrations at the six PTEP sites are shown in Figures 2-11 to 2-16. Quarterly average PM_{10} and $PM_{2.5}$ mass increases with time at all PTEP locations in the Basin. At San Nicolas Island, the winter period (first and fourth quarters) show higher PM_{10} and $PM_{2.5}$ mass than in the summer period (second and third quarters). The highest PM_{10} and $PM_{2.5}$ mass, nitrate, ammonium, and organic carbon concentrations were observed in the fourth quarter. Since stagnation conditions generally occur in winter and over the entire Basin, the high secondary species (ammonium, sulfate, and nitrate) concentrations and high total mass were observed at all the monitoring stations in the fourth quarter.

FIGURE 2-11

Quarterly Average PM_{10} and $PM_{2.5}$ at Rubidoux

FIGURE 2-12

Quarterly Average PM_{10} and $PM_{2.5}$ at



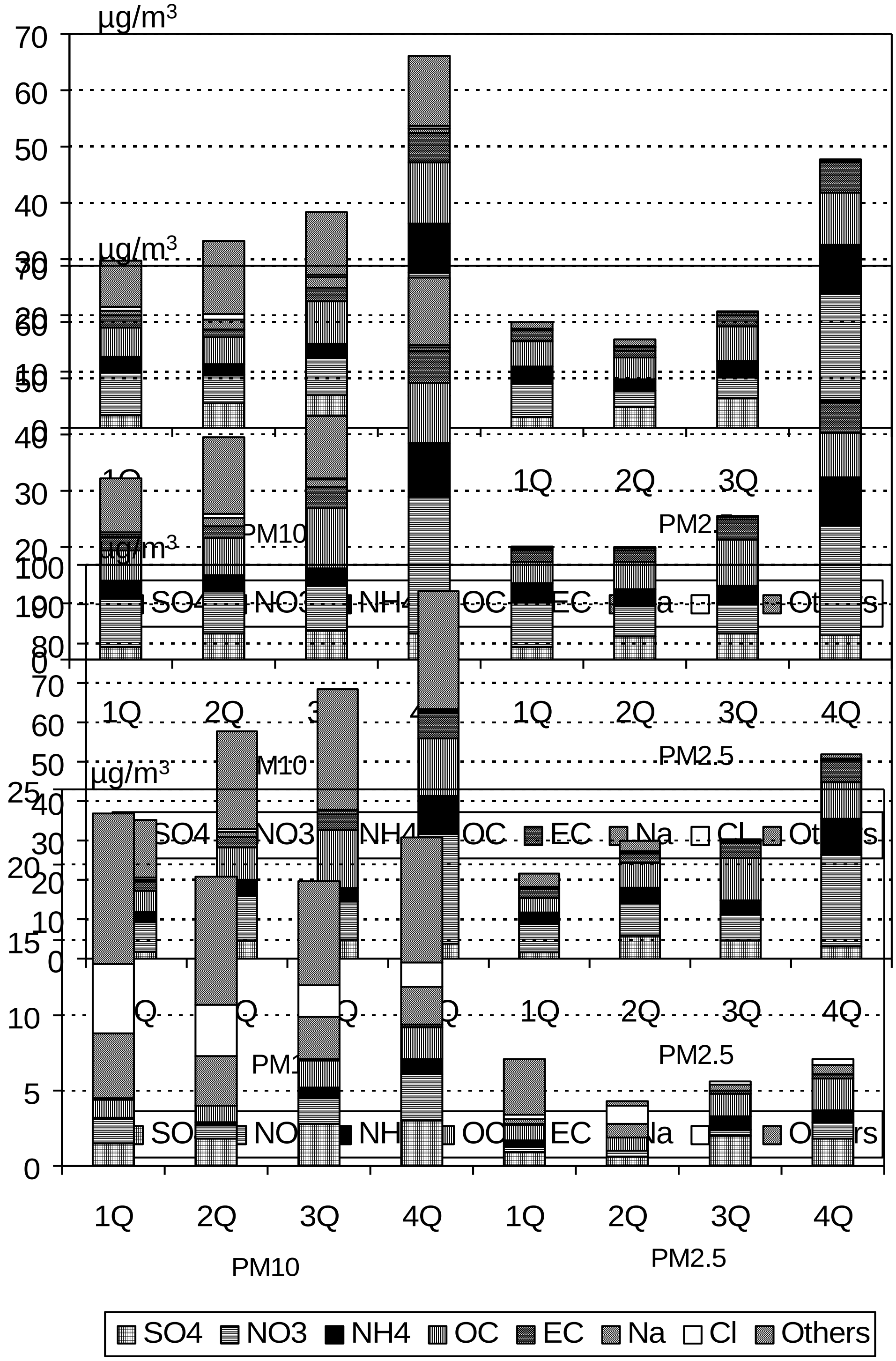
Downtown Los Angeles

FIGURE 2-13
Quarterly Average PM_{10} and $PM_{2.5}$ at Anaheim

FIGURE 2-14
Quarterly Average PM_{10} and $PM_{2.5}$ at Diamond Bar

FIGURE 2-15
Quarterly Average PM_{10} and $PM_{2.5}$ at Fontana

FIGURE 2-16
Quarterly Average PM_{10} and $PM_{2.5}$ at San Nicolas Island



The "others" category, which is mainly composed of crustal components, does not vary quarterly at Anaheim, Downtown Los Angeles, or Diamond Bar. However, the measurements indicate that the concentration increases by quarter at Rubidoux and Fontana. High PM_{10} and $PM_{2.5}$ concentrations occur under stagnation conditions. Locally generated primary particles including crustal components stay suspended in the local atmosphere; they are not flushed out of the local region.

Consequently, the “others” category which is generally higher at Rubidoux and Fontana is higher under the stagnant fall period.

Peak 24-Hour Average PTEP PM_{10} and $PM_{2.5}$

The three highest 24-hour average PM_{10} mass and each of the chemical components at each PTEP sites are provided in Figures 2-17 to 2-22. (Figure 2-17 shows the four highest days at Rubidoux to include a high-wind event PM_{10} profile). $PM_{2.5}$ mass and composition corresponding to the three highest PM_{10} days are also shown in these figures. The highest PM_{10} day is not generally the same as the rank of the $PM_{2.5}$ day. A number on the top of the bar graph represents the highest $PM_{2.5}$ day shown in Figures 2-17 to 2-22. For example, the number “2” in Figure 2-17 represents the second highest $PM_{2.5}$ at Rubidoux. $PM_{2.5}$ comprises more than 50 percent of the PM_{10} mass; however, when the highest PM_{10} day is the same as the highest $PM_{2.5}$ day, $PM_{2.5}$ comprises more than 60 percent of the PM_{10} mass.

FIGURE 2-17

Four Highest 24-Hour Average PM_{10} and $PM_{2.5}$ Days at Rubidoux

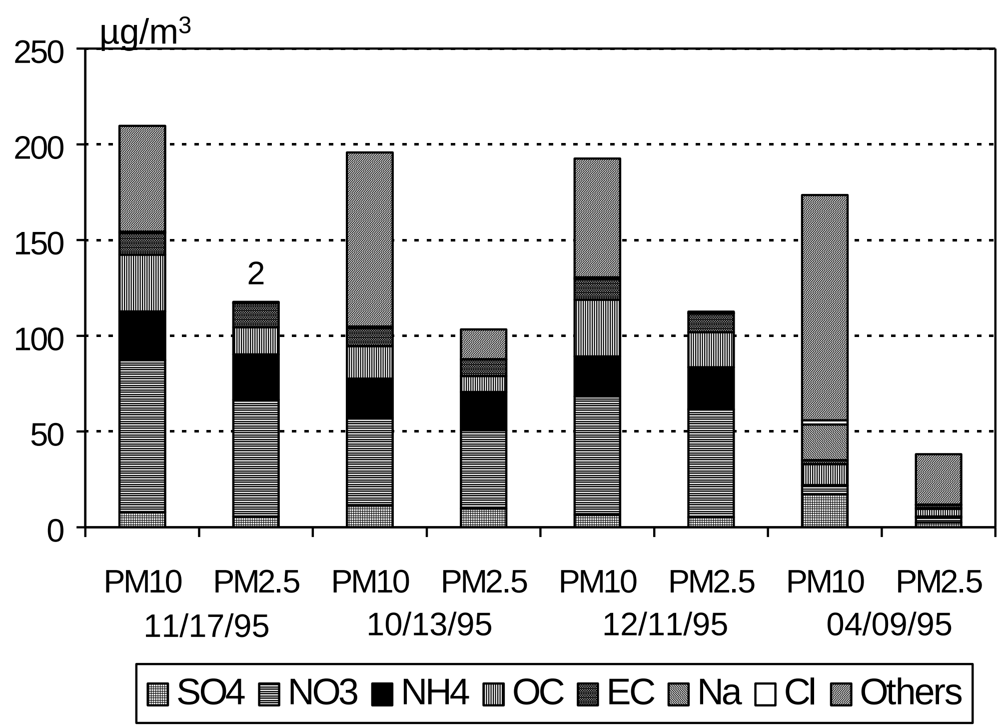
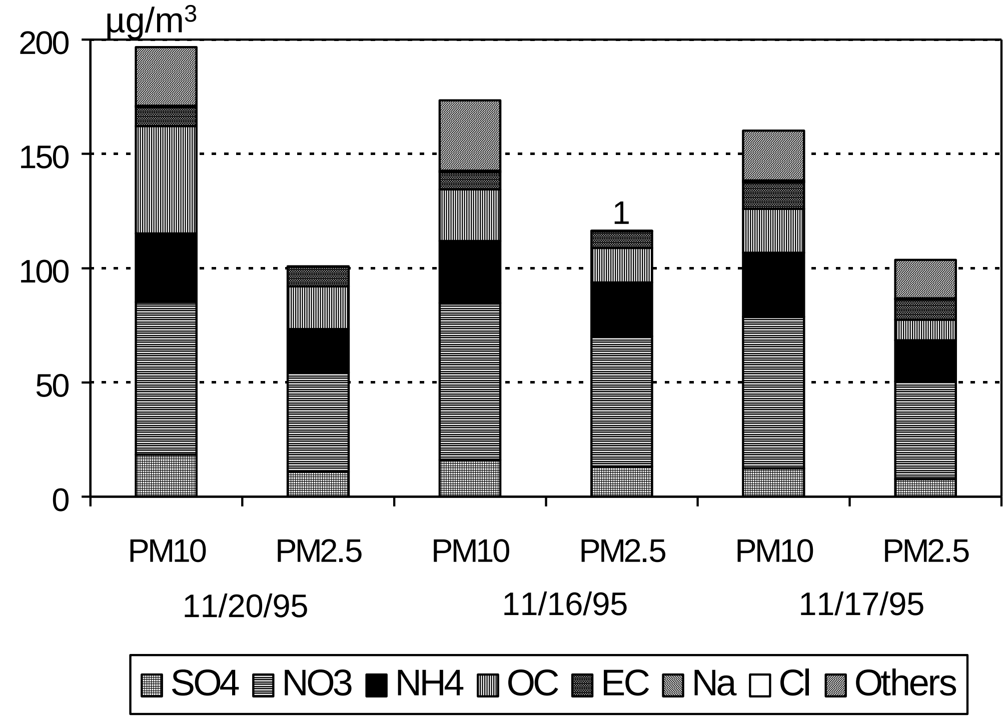


FIGURE **2-18**

Three Highest 24-Hour Average PM_{10} and $PM_{2.5}$ Days at



Downtown Los Angeles

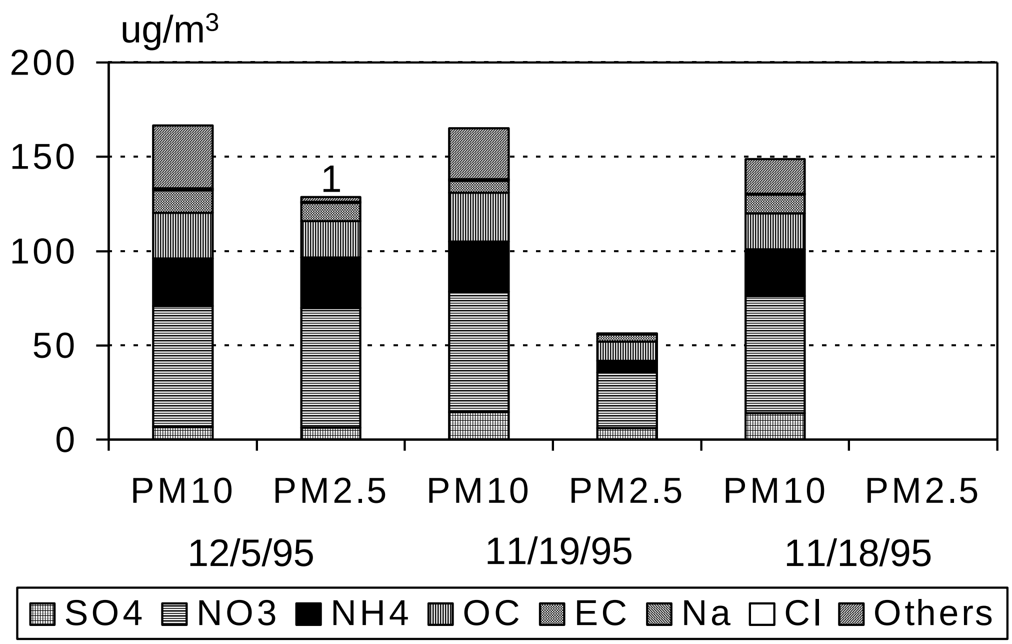


FIGURE 2-19

Three Highest 24-Hour Average PM_{10} and $PM_{2.5}$ Days at Anaheim

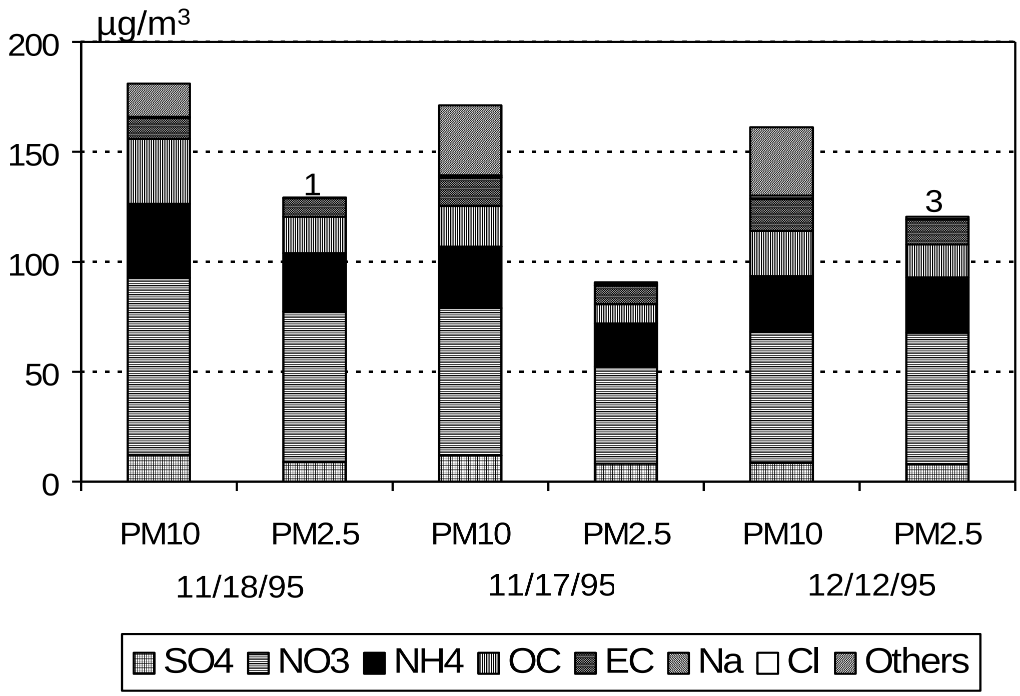


FIGURE 2-20

Three Highest 24-Hour Average PM_{10} and $PM_{2.5}$ Days at Diamond Bar

FIGURE 2-21

Three Highest 24-Hour Average PM_{10} and $PM_{2.5}$ Days at Fontana

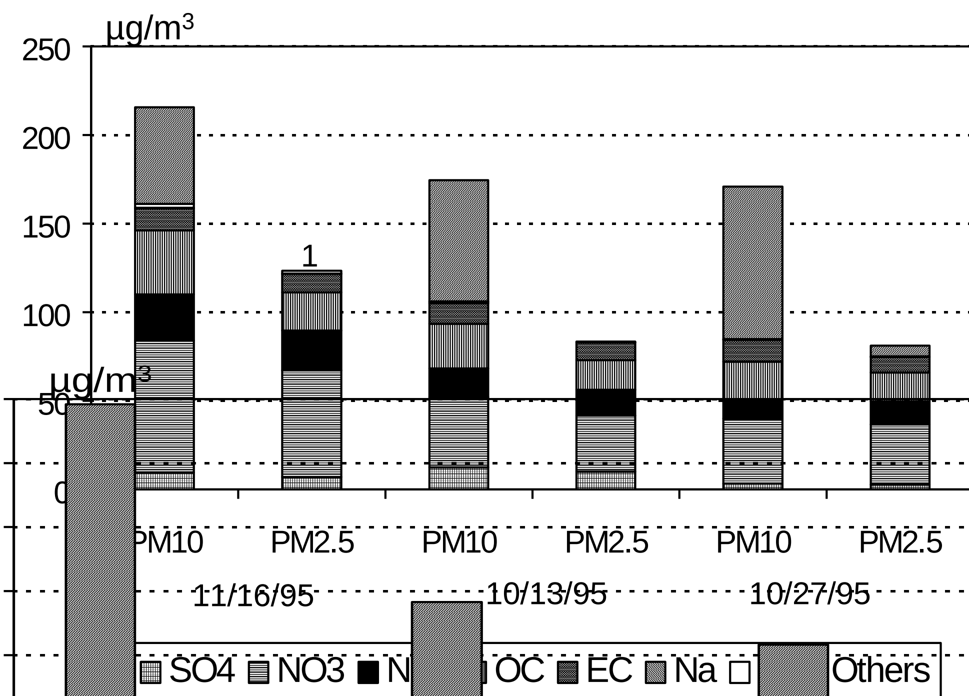
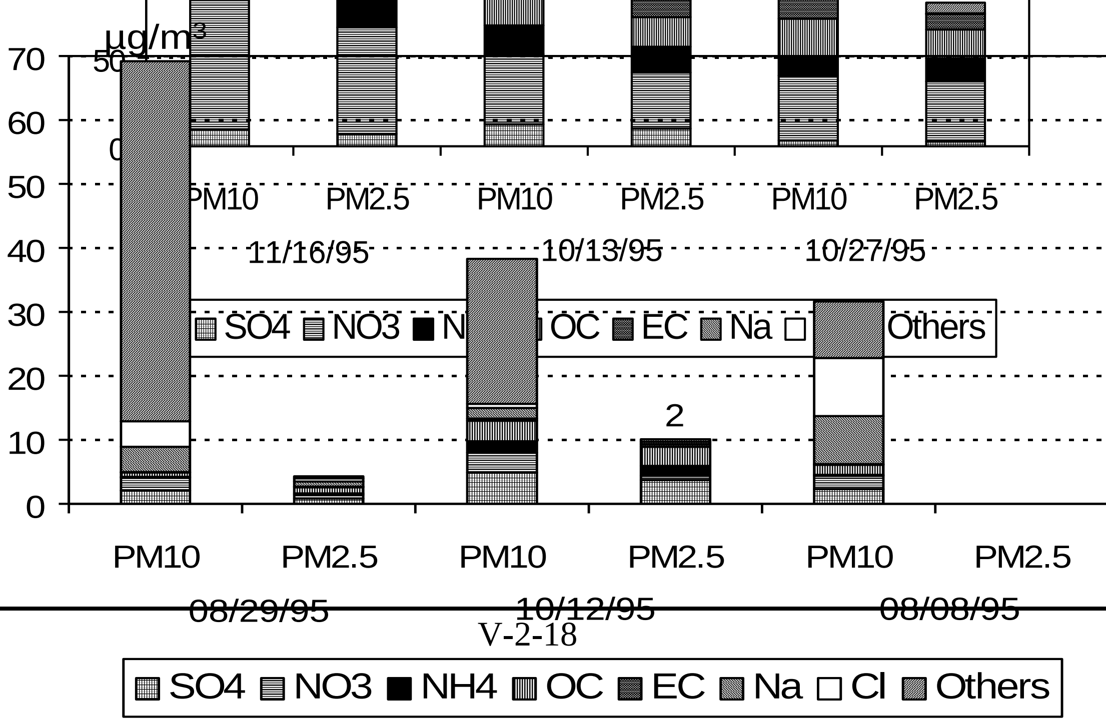


FIGURE 2-22



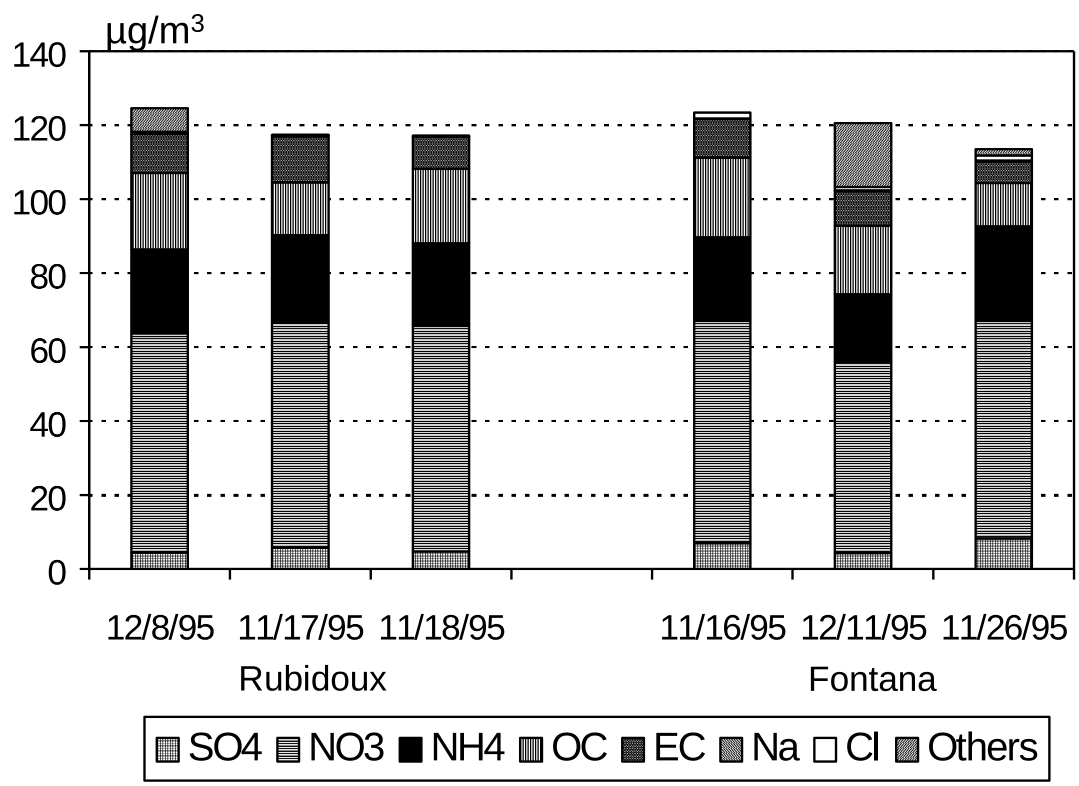
Three Highest 24-Hour Average PM_{10} and $PM_{2.5}$ Days at San Nicolas Island

The peak PM_{10} day occurs under two conditions. The first type of occurrence is under stagnation conditions; the other occurs under high wind conditions. This is shown in Figure 2-17 at Rubidoux. The three highest 24-hour average PM_{10} occurred under stagnation conditions. As a result, the secondary species concentrations are also high. High PM_{10} concentration observed on April 9, 1995 occurred under high wind conditions. $PM_{2.5}$ mass is only about 20 percent of the total PM_{10} mass. In high wind events, in other words, PM_{10} is mainly composed of coarse particles.

The three highest 24-hour average $PM_{2.5}$ mass and each component are shown in Figures 2-23 to 2-25 at various PTEP stations. The high $PM_{2.5}$ days in the Basin occurred in November and December and almost all of the $PM_{2.5}$ mass is explained by ions and carbon. $PM_{2.5}$ mass on the high $PM_{2.5}$ days is mainly composed of secondary species. Ammonium and nitrate alone explains more than 60 percent of the total $PM_{2.5}$ mass.

FIGURE 2-23

Three Highest 24-Hour



Average $PM_{2.5}$ Mass and Components at Rubidoux and Fontana

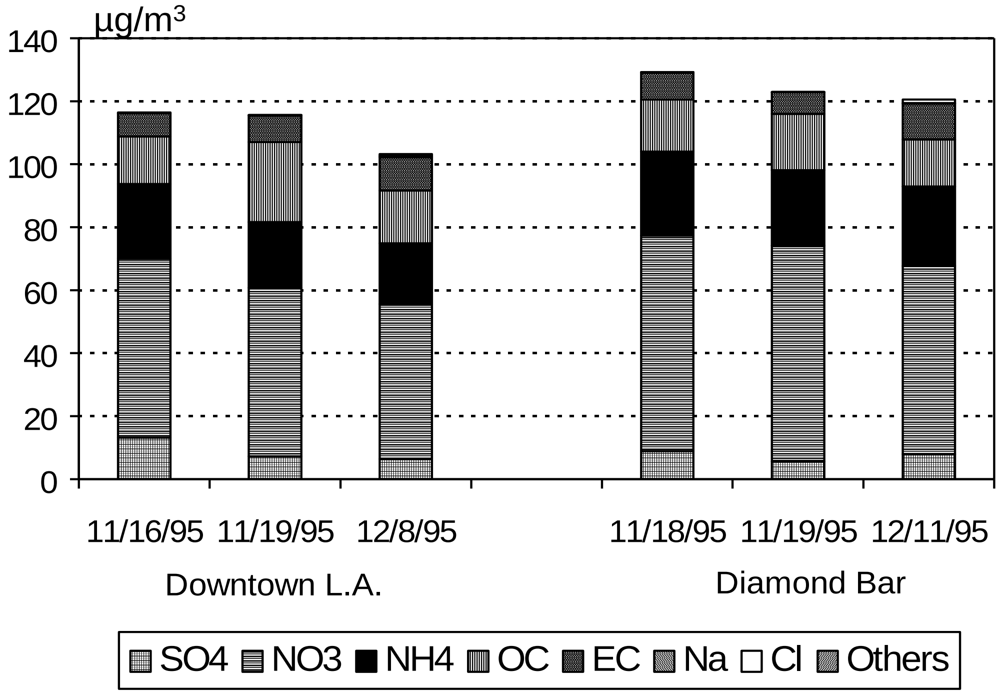


FIGURE 2-24

Three Highest 24-Hour Average $PM_{2.5}$ Mass and Components at Downtown Los Angeles and Diamond Bar

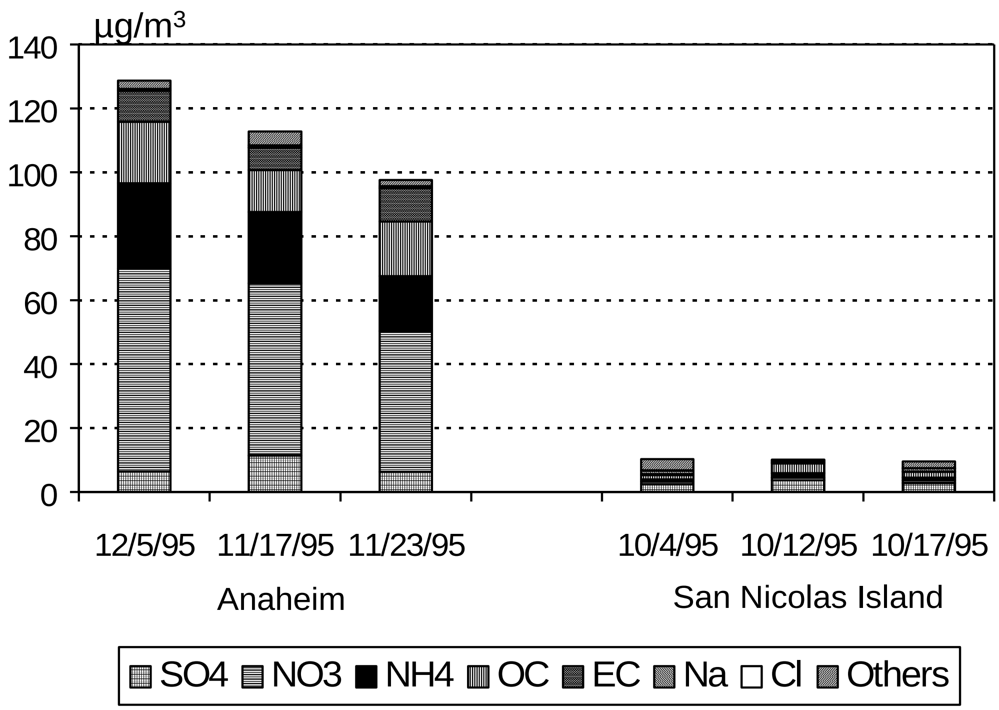


FIGURE 2-25

Three Highest 24-Hour Average $PM_{2.5}$ Mass and Components at Anaheim and San Nicholas Island

METEOROLOGICAL CHARACTERIZATION OF ANNUAL AND EPISODIC PM_{10} CONDITIONS

Characterization and selection of meteorological episodes that contribute to the formation of PM_{10} are key elements in determining the representativeness of 1995 as a modeling year. It is useful from the standpoint of control strategy development, for both annual and episodic analyses, to demonstrate the representativeness of 1995 in reference to past observations and to assess the frequency of future expected events. In this section, 1995 and selected episodes representing the maximum PM_{10} air quality potential are assessed for representativeness.

Classification Techniques

Classification and Regression Tree (CART) pattern recognition techniques were used to develop a PM_{10} meteorological profile of 1995 for Rubidoux, the design site, and to identify candidate meteorological episodes for subsequent analysis and modeling. The CART technique has been used to characterize ozone meteorological episodes for the 1991 AQMP (Horie, 1988) and again for the 1994 AQMP (Zeldin, et al., 1990). One advantage to using CART is its treatment of variables having nonlinear relationships to PM_{10} such as wind direction and pressure gradients.

A data base including SSI Hi-Vol PM_{10} measurements, beta attenuation monitored (BAM) PM_{10} measurements, and an extensive set of meteorological classification variables was constructed for the period 1990 through 1993. Hi-Vol PM_{10} was comprised of sixth day samples taken at 15 stations. Hourly concentrations of BAM PM_{10} were averaged over 24 hours from midnight to midnight. Meteorological classification variables included vertical temperature, humidity and inversion characteristics extracted from the daily coastal sounding profile, morning and 24 hourly surface resultant winds, temperature and humidity, and daily mesoscale pressure gradient and synoptic characterization of the general meteorological profile impacting the southwest U.S.

The output of the CART analysis is a tree that characterizes PM_{10} by sorting air quality data into a set of terminal nodes based on yes/no decisions satisfying selected discrete meteorological conditions. PM_{10} characteristics defined by the terminal node represent a class of meteorological episode potential. Thus, individual days can be ranked meteorologically to determine day-specific PM_{10} potential. Similarly, the frequency of days falling into each node, summed over the course of a year, can provide an assessment of the annual PM_{10} potential.

PM_{10} CART Tree Structure

Figure 2-26 depicts the Rubidoux PM_{10} CART tree constructed from the BAM PM_{10} data and the set of meteorological predictors. The analysis defined 10 terminal nodes, each having a discrete PM_{10} formation path and mean concentration. The meteorological variables defining the splitting criteria are presented in Table 2-3. A measure of the fit of the tree can be estimated by calculating the percentage reduction in the sum of the squares (SSQ -- node case weighted variance) in the PM_{10} distribution. The 10-terminal node tree reduced the SSQ by 51.9 percent. Table 2-4 presents the average node concentrations calculated for 15 SSI PM_{10} monitoring locations for the 1990-1993 period for days on which sampling was conducted. Note that the the ranking order of node average concentrations calculated from SSI Hi-Vol data at Rubidoux is consistent with those calculated from the BAM measurements.

```
         +----------------------------1---------------------------+
         |                 AT850 <= 12.4 oC               |
         |                                        |
         |                                        |
+-------------2-------------+                  +-------------5-------------+
|     TINVB <= 4.0 oC     |                    |     AT900 <= 18.5 oC    |
|                  |                  |                 |
|                  |                  |                 |
|           +----------3-----+         +--------6---------+      +--------8-------+
|           |   AWS6 RIV    |          |  AWS24 RIV     |       |   RH02 ANA    |
|           |  <= 18.1 MPH  |          |   <= 3.0 MPH   |       |   <= 56.5 %   |
|           |          |          |          |      |            |
|       +------4------+       |       +------7------+       |       |       +------9------+
|       |  AWS24 RIV  |       |       |  RH02 ANAH  |       |       |       |  RH9590    |
|       | <= 2.7 MPH  |       |       |  <= 65.5 %  |       |       |       | <= 37.5 %  |
|       |         |       |       |         |       |       |       |         |

1       2         3       4       5         6       7       8       9         10

N: 205   N: 222    N: 129   N: 4    N: 209    N: 15   N: 95   N: 262   N: 28    N: 35
X: 30    X: 59     X: 43    X: 137  X: 74     X: 110  X: 53   X: 85    X: 129   X: 91
S: 17    S: 24     S: 21    S: 39   S: 21     S: 33   S: 19   S: 22    S: 28    S: 21
```

(N: number of samples, X: node mean concentration, S: standard deviation)

FIGURE 2-26

PM_{10} CART Tree for Rubidoux Using BAM Data: 1990 - 1993

TABLE 2-3

CART Meteorological Predictor Variables

Variable	Definition
AT850	850 mb temperature over the coastal plain averaged using day (0) 0400 PST temperature and the following day (0+1) 0400 PST temperature.
AT900	900 mb temperature over the coastal plain averaged using day (0) 0400 PST temperature and the day (0+1) 0400 PST temperature.
TINVB	Temperature at the inversion base height in the 0400 PST coastal sounding.
RH02 ANAH	6-hour averaged surface relative humidity at Anaheim: (0700 - 1200 PST)
RH9590	Average relative humidity between 900 mb and 950 mb in the 0400 PST coastal sounding.
AWS6 RIV	6-hour averaged resultant wind speed at Riverside: (0700 -1200 PST)
AWS24 RIV	24-hour averaged resultant wind speed at Riverside

TABLE 2-4

1990-1993 Averaged PM$_{10}$ Terminal Node Concentrations ($\mu g/m^3$) at 15 Basin Sites

Area	Node 1		Node 2		Node 3		Node 4		Node 5		Node 6		Node 7		Node 8		Node 9		Node 10	
	Avg	Num	Avg	Num	Avg	Num	Avg	Num	Avg	Num	Avg	Num	Avg	Num	Avg	Num	Avg	Num	Avg	Num
Anaheim	25	36	46	43	38	24	N/A	0	49	49	43	4	40	7	52	44	49	6	42	7
El Toro	23	36	36	41	35	24	N/A	0	39	49	39	4	34	8	46	44	50	7	33	7
Rubidoux	30	38	69	42	46	26	N/A	0	84	49	112	4	73	8	100	45	119	8	104	6
Perris	25	34	48	41	38	27	N/A	0	58	49	79	4	47	8	61	45	80	9	69	6
Norco	31	33	42	40	42	23	N/A	0	44	46	84	4	36	5	46	40	54	8	46	7
Ontario	46	36	64	41	48	26	N/A	0	76	47	94	4	67	8	87	43	112	8	89	6
Crestline	20	22	35	25	31	21	N/A	0	38	39	47	4	39	8	43	39	37	7	35	5
Fontana	33	30	56	38	42	25	N/A	0	66	46	102	4	71	8	88	43	89	7	92	9
San Bernardino	30	38	59	39	41	27	N/A	0	69	50	114	4	73	5	74	44	86	8	88	6
Azusa	28	36	47	41	38	26	N/A	0	58	49	74	4	53	8	72	43	87	7	69	6
Burbank	26	39	62	41	44	26	N/A	0	54	47	68	3	49	7	54	42	67	10	58	6
Long Beach	27	34	44	40	41	24	N/A	0	40	45	42	4	37	8	43	40	46	7	42	6
Los Angeles	31	38	50	41	45	25	N/A	0	55	47	57	4	47	8	62	44	73	8	54	6
Newhall	21	36	38	41	32	28	54	1	44	44	62	3	46	6	52	43	56	7	50	5
Hawthorne	25	40	43	38	38	26	N/A	0	39	46	41	4	38	8	39	42	41	8	37	6

* Pacific Standard Time

In general, the meteorological profile defining the potential for PM_{10} is separated into two expanded categories of photochemical potential: low (down the left branch of the tree) and high (down the right branch of the tree).

The node having the lowest average concentration (number 1) represents a cool, no-inversion day with significant vertical mixing, and often rainfall. Nodes 2 through 4, (which are also categorized as low photochemical potential) divide PM_{10} categories by degrees of wind velocity. This is particularly evident in node 4, which characterizes high wind events.

The right side of the tree, nodes 5 through 10, reflect higher photochemical potential, sorted by temperature, wind stagnation and humidity. Nodes 9, 6 and 10 exhibit the greatest meteorological potential for PM_{10} formation. Node 6 requires moderate inversion strength, weak wind velocities and higher surface humidity. Nodes 9 and 10 are characterized by stronger inversions, and higher surface humidity. The separation of nodes 9 and 10 suggests the influence of stratus or moist layers aloft, with node 9, having the highest photochemical potential, favoring clearer sky conditions.

Annual 1995 PM_{10} Representativeness

The CART tree was used to characterize the meteorological potential for PM_{10} formation for each day in 1995. The terminal node frequency distribution for 1995 is presented in Table 2-5. In general, the 1995 percentage of days attributed to each category is reasonably consistent with the frequency distributions developed for the 1990-1993 BAM and SSI Hi-Vol data. Node 8 has the greatest number of samples and nodes 4 and 7 the fewest. The most notable departure from the average frequency distribution is observed in node 3, which is somewhat lower than typically occurs.

Table 2-6 presents the 1995 Rubidoux PM_{10} node mean concentrations calculated for three data sets: SSI Hi-Vol 6th day PM_{10} monitoring (61 samples), PTEP Hi-Vol daily monitoring (222 samples), and the PTEP data for those coincident with SSI Hi-Vol monitoring. Despite the differences in monitoring methodology and sample size, the ranking of the nodes based on average observed mean concentration is again consistent with that observed in the 1990-1993 data set. This confirms that the meteorological pathways for PM_{10} formation at Rubidoux in 1995 were similar to those observed in previous years.

TABLE 2-5

1995 PM_{10} Meteorological Distribution

Node	Number of Days
1	68
2	58
3	17
4	1
5	54
6	21
7	7
8	89
9	29
10	25

TABLE 2-6

1995 Rubidoux Node Mean Concentrations (µg/m^3) From Observations:
PTEP Monitoring Data (222 Samples), SSI 6th-Day Hi Vol Monitoring Data (61 Samples), and PTEP Monitoring Data on 6th-Day Hi Vol Schedule

Node	PTEP	SSI	PTEP(SSI Days)
1	30	19	29
2	59	59	63
3	17	29	17
4	173	219	173
5	90	86	91
6	129	141	148
7	56	34	33
8	89	83	82
9	120	120	113
10	108	85	92

The CART tree was also used to compare the 1995 PM_{10} meteorological potential to preceding years. Using the basic splitting criteria defined by the CART tree, three broad categories of annual PM_{10} meteorological potential were defined. These categories included: (1) low photochemical potential with no inversion, (2) low photochemical potential with an inversion, and (3) moderate-to-high photochemical potential. The annual number of days historically falling into each of the three categories was determined from historical data for the period including 1981-1994. For each year, the frequencies of days, sorted by category, were multiplied by a representative category average PM_{10} concentration. The representative concentration was determined from the 1995 PTEP data base. This procedure resulted in creation of an annual index of meteorological PM_{10} potential (which is depicted in Figure 2-27).

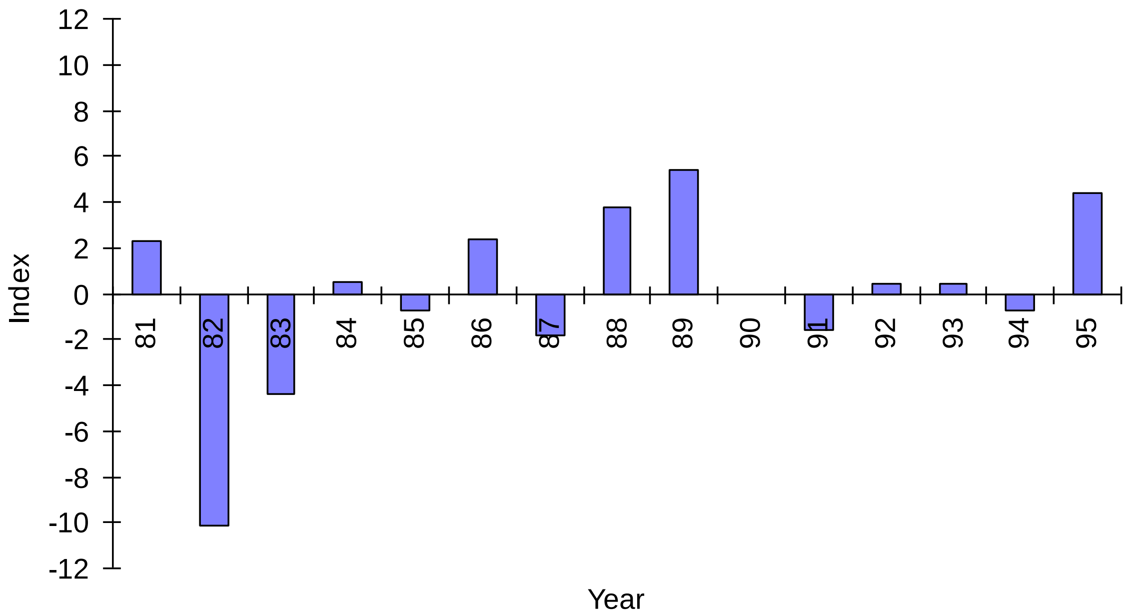


FIGURE 2-27

PM_{10} Normalized Annual Meteorological Potential for Basin PM_{10}: 1981 - 1995

1995 displays a greater potential for PM_{10} formation and accumulation than a majority of the preceding years. Only 1989 presented a higher potential for PM_{10} formation. As a consequence, 1995 is more representative of severe annual PM_{10} meteorological potential.

Fall 1995 PM_{10} Episode Representativeness

During fall 1995, two distinct periods of regional stagnation and corresponding PM_{10} episodes occurred in the South Coast Air Basin. The first meteorological episode took place during the middle of October, from the 17th through 20th. The second fall stagnation period occurred during November 14th through the 18th. November 17th, the highest PM_{10} day for 1995, occurs during this episode. Each of these periods demonstrated similar meteorological characteristics including: a well developed upper level ridge of high pressure, strong elevated subsidence inversions, low level stratus and fog, and a nearly neutral surface and boundary layer wind field. Observed PM_{10} concentrations exceeded the 24-hour federal standard (150 $\mu g/m^3$) at several locations during both periods, with maximum concentrations reaching 210 $\mu g/m^3$ at Riverside-Rubidoux on November 17th.

These two meteorological episodes in 1995 were chosen for episodic PM_{10} modeling. The nine days comprising the two episodes (October 17-20 and November 14-18) were individually characterized using the CART analysis; the node designations and PTEP PM_{10} concentrations are presented in Table 2-7. Total PM_{10} mass measured on October

19th at the Rubidoux station was invalid. Therefore, PM_{10} concentration on October 19th is not included in Table 2-7. The nine days were distributed within the three highest (non-high-wind event) classes. The severity of the meteorological episodes selected for modeling was illustrated by a comparison of the observed PM_{10} concentrations to the corresponding node means. PM_{10} concentrations on the nine days collectively averaged 32 percent higher than the PTEP node mean concentrations. November 17th, featuring the maximum concentration at Rubidoux, was classified to fit node 9, having the highest potential for PM_{10}.

TABLE 2-7

Episode Representativeness:
Rubidoux PTEP Episodes vs. PTEP Node Mean Concentrations

Episode	Node	Concentration (µg/m3)	Ratio Episode/Node Mean
11/14	6	160	1.24
10/18	9	100	0.83
10/20	9	171	1.43
11/17	9	210	1.75
11/18	9	166	1.38
10/17	10	111	1.03
11/15	10	145	1.34
11/16	10	178	1.65

The following subsections describe in more detail the meteorological periods defining the fall high PM_{10} episodes.

Episode Characterization: October 17-20, 1995

The October 17-20, 1995 PM_{10} episode demonstrated the potential for the photochemical development of fine particulates under stagnant “worst case” meteorological conditions. The month of October is typically transitional in southern California, retaining selected summer characteristics such as strong subsidence inversions and warm temperatures throughout the marine layer. In contrast, October also exhibits weaker surface winds with enhanced surface moisture and fog, consistent with nighttime radiative cooling. During the October 1995 episode, both meteorological features were observed, culminating in the development of a particularly stagnant period with substantial low-level moisture available. While gaseous photochemical smog concentrations were relatively low during the October episode (with ozone exceeding the federal standard regionally only on the 19th), PM_{10} concentrations exceeded the federal standard on October 20th (177 µg/m3) at the Rubidoux monitoring site. Regional concentrations of PM_{10} exceeded the 100 µg/m^3 level at several other monitoring stations during the episode. The severity of the 4-day PM_{10} episode is illustrated by analyzing the PM_{10} CART episode classification scheme, which places October 18-20 in the highest meteorological class (node 9) for PM_{10} and October 17 in the third ranked meteorological class (node 10) for episode potential.

Synoptic Setting

The evolution of the October meteorological episode began on October 15, 1995 as an upper level short wave of low pressure moved through the west coast of the U.S. Upper level high pressure rapidly reformed over Southern California in the wake of the short wave with weak northwesterly flow aloft and subsidence. The strength of the high pressure ridge intensified through October 20th as the height of the 500 millibar level measured at San Diego and Vandenberg AFB reached 5900 meters. The subsidence associated with the development of the high pressure ridge was reflected in warming at the 850 mb level (the top of the boundary layer) as temperatures consistently reached 20°C throughout the period. While winds at the 850 mb level did not maintain a consistent pattern throughout the period, velocities remained low (under 5 m/s) regardless of the time of observation.

The surface synoptic pattern was characterized by a high pressure system in the Great Basin and a thermal trough of low pressure over southern California. On the 17th, weak high pressure was centered over northern Nevada with an inverted thermal trough of low pressure situated over the low desert at Yuma, extending to the coast. By midday on the 18th, a weakening dry cold front pushed into southern Nevada, displacing the surface high pressure. This action lead to an increase in the onshore pressure gradient field across southern California. As a consequence, southerly flow advected marine air deep into the inland valleys and fog developed in the coastal and near-coastal valleys on the morning of the 19th. High pressure at the surface again reformed in the Great Basin by the afternoon of the 19th, setting up a weak offshore pressure gradient that was sufficient to stagnate wind flow but not able to push the marine influence offshore.

Mesoscale Setting

Throughout the October 17-20, 1995 meteorological episode, the vertical temperature profile and weak surface pressure gradients across the Basin were persistent. On the 17th, the 0400 PST inversion base was located at approximately 580 m with an inversion strength of 6.2°C. The inversion lowered in base height and strengthened on the 18th, remaining at approximately 490 m with a varying inversion strength measured between 7.4 and 10.2°C.

Surface pressure gradients were consistently weak during the four-day episode with weak morning offshore flow, and weak-to-moderate average onshore flow during the afternoon hours. Wind speeds monitored at the majority of wind sensors registered calm through mid-morning for each of the four days. Afternoon sea breeze winds reached maximum velocities between 4-5 m/s throughout the episode, lower than typical summertime velocities.

Temperature and humidity measured in the Basin also displayed a consistent pattern throughout the four-day episode. Late night and morning low temperatures ranged between the mid 50's to low 60's °F on each day, regardless of location. Daytime maximum temperature varied to a greater extent over the four-day period with daytime maximums reaching the low to mid 80's on the 17th and 19th and 90°F on the 20th. Maximum temperatures basin wide remained in the upper 60's to low 70's on the 18th. Corresponding humidity profiles depicted a moderately moist marine layer with relative humidities between 60-80 percent on each morning, with a slight bias towards higher humidity in the inland valleys. Similarly, daytime humidity showed a slight variability, with the highest daytime humidity being observed on the 18th (45-65 percent) and a trend thereafter towards marginally drier conditions (30-50 percent).

<u>Air Quality Profile</u>

The air quality profile during the October 1995 meteorological episode is focused on concentrations of PM_{10}. The federal standard was exceeded on the 20th (171 µg/m^3) based upon the PTEP samples at Rubidoux. Gaseous contaminants measured in the Basin remained within the federal standard (and California standard for NO_2) with the exception of ozone concentrations measured in the western San Bernardino Valley on the 20th (0.13 ppm maximum 1-hour average).

Episode Characterization: November 14-18, 1995

As with the October 1995 PM_{10} episode, the period of November 14-18, 1995 also demonstrated the potential for the photochemical development of fine particulates under stagnant "worst case" meteorological conditions. During the month of November, surface wind flows were significantly reduced from summer conditions, and the marine influence is typically translated into high humidity, stratus, and radiative fog. Inversion characteristics can vary greatly from low level marine inversions near the coast to radiation inversions in the elevated inland valleys. While less frequent, November can also experience strong subsidence above the marine layer, enhancing the formation of coastal stratus and intensifying the inversion strength. In conjunction with the stagnant wind flow and warm temperatures throughout the marine layer, air mass residence times in the Basin are measured in days.

Ozone concentrations did not exceed the federal standard regionally during the episode. However, PM_{10} concentrations exceeded the federal standard on four of the five days [November 14th (160 µg/m^3), November 16th (177 µg/m^3), 17th (210 µg/m^3) and 18th (166 µg/m^3)] at the Rubidoux monitoring site. Additional standard exceedances were observed at Central Los Angeles, Diamond Bar and Fontana. Based on the PM_{10} CART episode classification scheme, November 17-18 were in the highest meteorological class (node-9) for PM_{10}, November 14 was in the second ranked class (node-6) and November 15-16 were in the third ranked meteorological class (node-10) for episode potential.

Synoptic Setting

The synoptic setting for the November episode presented a complicated pattern of upper air wind flow during the early portion of the episode, which evolved into a stable ridge of high pressure aloft. On the morning of November 14th, the northern west coast was under a ridge of high pressure aloft. Embedded in the southern portion of the ridge was a closed upper air low with well defined cyclonic flow. This pattern remained through the 15th until the upper low shifted first to the south and then eastward. By the late afternoon of the 15th, continuing through the 18th, high pressure and subsidence developed over southern California. The strength of the high pressure, as measured by the height of the 500 millibar level at San Diego and Vandenberg AFB, reached 5880 m by the afternoon of the 17th. The subsidence associated with the development of the high pressure ridge was reflected by warming at the 850 mb level (the top of the boundary layer) as temperatures varied between 17 and 19°C throughout the period. As with the October 1995 episode, winds at the 850 mb level did not maintain a consistent pattern throughout the period, and velocities remained low (under 3 m/sec), particularly during the latter part of the episode.

The surface synoptic pattern was characterized by high pressure in the Great Basin, creating a persistent offshore surface pressure gradient towards southern California. Offshore pressure gradient forcing was evident on the 14th as a 1026 millibar high pressure was centered over northern Nevada and a thermal trough of low pressure split the length of California, extending through the lower Mojave desert. The gradient field remained consistent through the 15th and turned weakly onshore on the morning of the 16th, returning offshore by the 17th. Observations of fog and stratus along the coastline throughout the period punctuated the degree of stagnation observed in the Basin and the extent of the marine air incursion.

Mesoscale Setting

Most notable about the November episode was a consistently strong elevated inversion that lowered and strengthened over the last four days of the episode. The inversion base lifted from 210 on the 14th to a morning height of 670 meters on the 15th. The lifting action in the inversion base (and a moderate surge in the marine influence onshore) resulted from the movement of the upper level low pressure system over southern California. From the afternoon of the 15th, the base lowered continually reaching a base height of 240 meters on the morning of the 18th. The strength of the inversion measured by the difference between the top and base temperature was consistently 10°C on each day, with the exception of the 14th, as the inversion began its initial lift.

Surface pressure gradients were consistently weak during the five-day episode, again with weak morning offshore flow, followed by weak-to-moderate onshore flow during the afternoon hours. Wind speeds monitored at the majority of wind sensors registered calm or 1 m/s through midmorning for each day in the episode. Afternoon sea breeze winds reached maximum velocities between 3-4 m/s on all days, with the exception of the 17th, when speeds increased to 4-5 m/s.

Temperature and humidity measured in the Basin also displayed a consistent pattern throughout the four-day episode. As with the October episode, late night and morning low temperatures ranged between the mid 50's °F to low 60's °F on each day, regardless of location. Daytime maximum temperature gradually increased as the episode progressed with daytime maximums reaching the upper 60's °F to low 70's °F on the 14th through 16th and low to mid 80's °F on the 17th and 18th on the 20th. The surface humidity profiles depicted a consistent morning pattern of a moderately moist marine layer with relative humidities between 60-80 percent. Afternoon humidity showed a trend towards a drier atmosphere as humidity was measured at 40 to 60 percent on the 14th through 16th, 30 to 50 percent on the 17th and 20 to 50 percent on the 18th.

Air Quality Profile

The air quality profile during the November 1995 meteorological episode is focused on concentrations of PM_{10}. The federal standard was exceeded on four of the five days. PM_{10} 24-hour averaged concentrations exceeded 150 $\mu g/m^3$ at three stations in addition to Rubidoux, including: Central Los Angeles [16th (173 $\mu g/m^3$) and 17th (160 $\mu g/m^3$)]; Fontana [16th (216 $\mu g/m^3$)]; and Diamond Bar [17th (171 $\mu g/m^3$) and 18th (181 $\mu g/m^3$)]. Gaseous contaminants measured in the Basin remained below federal standards (and the California standard for NO_2), with the exception of carbon monoxide on the 17th.

EMISSIONS INVENTORY

The UAM/LC model requires several emissions, aerometric, and meteorological data inputs. These input data are similar to those that need to be developed for the UAM ozone simulations. While ozone simulation requires day-specific emissions inventories, which account for variations in observed diurnal traffic patterns and large source emissions profiles, UAM/LC based on the annual average inventory, with adjustments for monthly variations. This chapter provides a brief characterization of the annual day emissions used for the UAM/LC analysis. An extensive discussion of the overall emissions inventory is presented in the 1997 AQMP Appendix III.

The 1993 emissions inventory was projected to 1995 to establish an inventory for the current UAM/LC modeling application. The 1995 emissions inventory is summarized in Table 2-8, along with projected baseline inventories for the years 2000, 2006, and 2010. Also presented in Table 2-8 are the inventories reflecting implementation of the control strategy for 2000, 2006, and 2010. Annual average day emissions are presented for six categories: volatile organic compounds (VOC), oxides of nitrogen (NO_x), oxides of sulfur (SO_x), diesel particulates (Diesel), geological particulates (Geol), and total primary PM_{10} (Primary).

TABLE 2-8

UAM/LC Annual Average Day Emissions Inventory (Tons/Day)

Year	VOC	NO_x	SO_x	Diesel	Geol	Primary
(a) Baseline						
1995	1200.3	1158.6	83.9	16.5	333.1	411.6
2000	913.8	887.7	66.2	9.3	356.1	436.0
2006	825.5	752.1	66.9	6.6	367.4	450.0
2010	820.1	712.3	71.0	6.1	374.3	459.1
(b) Controlled						
2000	865.9	863.6	66.1	9.3	232.0	301.7
2006	622.9	634.7	66.7	6.6	231.7	300.0
2010	378.3	513.6	70.6	6.1	237.0	306.4

Methodology Overview

As with the 1994 AQMP, in this current modeling application a variety of modeling approaches were available to assess future compliance to the annual and 24-hour PM_{10} standards. A discussion of the "PM_{10} Modeling Toolkit" is presented in Draft Working Paper #M-2: PM_{10} Modeling Protocol for the 1997 Air Quality Management Plan Revision (SCAQMD, 1996). Among the analyses explored, the UAM/LC, the CMB model and speciated rollback modeling techniques were directly employed for the attainment demonstration. Additional analyses including the PIC model, UAM-Aero and other alternate statistical models were assessed for their use in both the annual and episodic compliance determination. These additional analyses were deemed not sufficiently developed for attainment demonstration purposes at this time.

The following sections briefly outline the various models and methodologies employed for the PM_{10} attainment demonstrations. Also provided are descriptions of models and methodologies that may be used in future modeling assessments.

<u>Annual Arithmetic Average Concentration Projections</u>

The general approach to simulate 1995 and project for future year annual average PM_{10} concentrations is to combine the predictions from the UAM/LC and CMB to provide a comprehensive PM_{10} projection. The UAM/LC analyses were conducted to assess the contributions of ammonium, sulfate, nitrate and primary particulates to annual PM_{10}.

CMB analyses were used to assess secondary organic contributions to annual PM_{10}. Predicted mass concentrations of each of the five PM_{10} component species were summed to determine the total predicted PM_{10} mass.

Speciated rollback techniques are used to provide an independent projection of future year annual PM_{10}. This technique relies on linear rollback of each of the 1995 PM_{10} species including secondary aerosols (nitrate, sulfate, ammonium and organic carbon) and primary particulates, based upon the ratio of the 1995 and projected 2006 emissions and stoichiometric estimations.

> The speciated linear rollback assumes the linear relationships between the precursor emissions and the concentrations of the secondary particulate matter in the atmosphere. The conversion of SO2, NOx and hydrocarbon emissions to secondary particulate matter is inherently nonlinear. However, certain evidence exists that the secondary sulfate and nitrate concentrations are approximately linear with the SO2 and NOx emissions (Lurmann et al, 1996). A source apportionment study of organic particulate matter (Schauer et al, 1996) reveals that on an annual average basis, approximately 85 percent of the organic carbon particles are from primary organic carbon sources. Therefore, any potential effects of nonlinearities between VOC emissions and resulting secondary organic carbon will apply to a fairly small fraction of the total PM10 mass. As a result, the speciated linear rollback model is a valid alternative modeling approach to estimate the future PM10 concentrations.Annual Geometric Mean Projections

The state annual average PM_{10} standard is based on an annual geometric mean (as compared to the federal annual standard, which is based on an arithmetic mean). Annual arithmetic average and annual geometric mean PM_{10} concentrations based on the ambient data are routinely calculated for all Hi-Vol SSI monitoring sites in the Basin. Due to differences in the methods of calculation, there will typically exist a differential between the two averages. This occurs because the geometric mean reduces the influence of singular high values to the total average.

For future-year air quality projections, the PM_{10} annual geometric mean concentrations were calculated by two methods from the UAM/LC-CMB future year simulations. One was directly calculated from the future daily concentrations predicted by the UAM/LC model and another was calculated by multiplying the UAM/LC predicted annual arithmetic average concentrations by specific factors. These factors are the ratio of the 1995 annual average concentration to the annual geometric mean concentration as determined at each site using SSI sampling data (see Table 2-9). Projected annual average concentrations for 2000, 2006, and 2010 were multiplied by the individual site specific factors to provide estimates of the annual geometric mean for those years. The higher value of the two geometric mean concentrations was reported as the annual geometric mean concentration.

TABLE 2-9

PM_{10} Ratio of Geometric Mean to Arithmetic Mean for Basin Sites as Measured in 1995

Sites	Geometric Mean μg/m3	Arthimetric Mean μg/m3	Ratio
Central L.A.	36.4	42.8	0.850
Pomona Walnut Valley	36.6	46.0	0.796
Central Orange County	35.9	43.5	0.825
Riverside-Metro	51.8	69.0	0.750
Central San Bernardino Valley	50.6	61.0	0.829

Maximum 24-Hour Average Projections

The linear chemistry (Lurmann and Kumar, 1996) that the UAM/LC model utilizes is a statistically developed empirical mechanism. It is best when used for the estimation of the PM10 annual average concentrations for each component. Since the appropriate modeling approach is not available for a maximum 24-hour average estimation, the District utilized two approaches. The first approach is a reduction ratio approach. The future-year maximum 24-hour average PM10 concentration was estimated by multiplying reduction ratios to the base year measured maximum 24-hour average concentrations for each component. The reduction ratio is the UAM/LC estimated future-year PM10 concentrations for each component to the measured base year PM10 concentrations for each component.

The second approach is the same speciated linear rollback approach used to estimate annual average PM10 concentrations using the episodic emissions inventory. The District chose the more stringent approach between the two and the first approach was selected to estimate the future-year maximum 24-hour average PM10 concentrations. The UAM-AERO model will be used to estimate the maximum 24-hour average PM10 concentrations in future PM10 modeling.

PM_{10} MODELING METHODOLOGY

UAM/LC

While the Particle-In-Cell (PIC) model was the primary approach to modeling nitrate and sulfate in previous AQMPs, its limitations (discussed previously) paved the way for the development of an upgraded model featuring more robust chemical mechanisms and enhanced treatment of meteorology. Combining the Urban Airshed Model (UAM) (Ames, et al., 1985; and Morris, et al., 1990a, 1990b) with an empirically-based chemistry module (Lurmann and Kumar, 1996), UAM/LC was developed in conjunction with the UAM-Aero model to meet the demand for improved annual PM_{10} prediction capability. UAM/LC, unlike the PIC model, addresses the 3-dimension aspects of transport and diffusion. The empirical chemistry replaced the UAM standard chemical mechanism to provide key predicted components of PM_{10} including nitrates, sulfates, ammonium, and primary particulates.

The UAM/LC was operated in an annual mode, combining hourly air quality, annual average day emissions adjusted by monthly activity factors and 3-dimensional hourly meteorological data to predict four PM_{10} components. Briefly, the empirical chemistry module (Lurmann and Kumar, 1996) was developed from regression analyses that used the output of a series of photochemical box model simulations to relate phased predictions of sulfate, nitrate and ammonium chemistry to emissions and observed ambient air quality. Consequently, the LC module does not fully integrate all photochemical species. It does, however, require spatially resolved hourly air quality data, including ozone, nitric oxide and nitrogen dioxide and gridded emissions to empirically calculate particulate concentrations. The LC module also requires hourly 3-dimensional temperature and humidity data as elements in the particulate parameterization. The UAM/LC simulates primary particulates from gridded emissions through the enhanced advection and dispersion algorithms of the UAM.

The performance of the linear chemistry module was initially evaluated by merging the LC module into the PIC model. A direct comparison to the PIC model was performed using the 1986 data set (used in previous AQMP evaluations). The results of the simulation of sulfate and nitrate compared favorably with the PIC model chemistry. Inclusion of the LC module to the UAM model further enhanced performance by providing a more comprehensive assessment of the interaction of 3-dimensional meteorology as well as spatially and temporally resolved.

Selected model enhancements were incorporated into UAM/LC during model evaluation. Model enhancement focused on three key areas: PM_{10} prediction on rainy days; aqueous phase sulfate chemistry; and the rate of nighttime nitrate chemistry. Each of these areas are discussed below.

Rainy Day Adjustment

The UAM/LC was unable to differentiate high humidity from rain events and as a result, tended to overpredict PM_{10} concentrations on those days. To remedy this problem, the chemistry was suspended and a default PM_{10} concentration was assigned on rainy days. A default rainy day PM_{10} concentration is estimated from an average of measured PM_{10} concentrations for each day rainfall amounts of 0.05 inches or more occurred in Downtown Los Angeles.

Aqueous Phase Sulfate Chemistry Adjustment

Sulfate overpredictions occurred when low level relative humidity was high, but stratus conditions (which can lead to high sulfate concentrations) were not observed. As a consequence, the aqueous phase sulfate chemistry was restricted to days when the observed mixing height ranged between 1000 to 3000 feet, and the strength of the elevated inversion (as measured as the difference between the top and base temperatures) was at least 6°C. This meteorological profile is characteristic of days historically identified for high sulfate potential in the Basin (Zeldin et al., 1976).

Nighttime Nitrate Chemistry Adjustment

A final model enhancement was employed to correct for NO_x to nitrate conversion during nighttime hours. The nighttime rate of NO_x to nitrate conversion in layer 1 (the lowest layer) was set to a minimum value of 1 percent/hr, while in the upper layer was set to a minimum value of 5 percent/hr.

Validation Adjustment

The performance of the UAM/LC model was within or near the performance goals. Site specific adjustment factors for each component are the ratio of measured to UAM/LC estimated concentrations in the 1995 base year (see Table 2-12). UAM/LC estimated future year sulfate, nitrate, ammonium, and primary PM10 concentrations were adjusted by multiplying site specific adjustment factors to each component's concentration to improve the confidence of the model estimates.

9-Cell Averaging

A nearest cell average of predicted concentrations is typically used when comparing gridded concentrations to station measurements, because of possible spatial misalignments of the predicted concentration fields. The UAM/LC modeling results are presented based on a nearest nine-grid-cell average basis. Performance evaluations at each station are based on this average concentration.

Chemical Mass Balance (CMB)

In both the 1991 and 1994 AQMPs, receptor modeling techniques were employed for the primary PM_{10} source apportionment. The receptor modeling technique, using updated particulate species concentrations, has also been used in this 1997 AQMP.

Receptor modeling, or source apportionment, is a technique for determining the emission sources that contribute to the PM_{10} air quality at specific receptor sites. Unlike complex mathematical models that require detailed simulations of physics, chemistry, meteorology, and other processes, receptor models are relatively simple statistical models, which require only the availability of measurement data. Using receptor models, contributions from various emission sources can be identified and quantified.

The receptor model used for source apportionment in the Basin is known as the Chemical Mass Balance (CMB) Model. This U.S. EPA-approved method matches the measured chemical components of the PM_{10} samples with the known chemical profiles, or signatures, of individual sources of PM_{10} particles. The District maintains a library of chemical profiles for more than 170 sources of PM_{10} emissions. The efforts of the PTEP field monitoring program provided updated 1995 chemical speciation of ambient PM_{10} data at the six sites in the Basin.

The CMB model, version 7.0, was applied to the 1995 PTEP data following the application and validation protocols of Pace and Watson (1987). The CMB analyses were applied to five PTEP sampling sites: Downtown Los Angeles, Anaheim, Diamond Bar, Fontana, and Rubidoux. Both annual average and peak 24-hour average source contribution estimates were compiled for comparison with the annual and 24-hour federal PM_{10} standards.

Speciated Rollback

Speciated rollback modeling proved to be a useful tool to predict annual and episodic PM_{10} and to confirm future year projections from the combined UAM/LC and CMB analyses. In the rollback technique, ambient PM_{10} concentrations of individual aerosol species in excess of estimated regional background levels were assumed to be proportional to the particulate emissions of the corresponding species or to the precursor emissions of the secondary species (e.g. NO_x emissions reductions are proportional to nitrate reductions; SO_x reductions are proportional to sulfate reductions, etc.). To predict future year PM_{10} air quality using the speciated rollback models, only the speciated measurements and the projected emissions reductions were used. Speciated rollback is a simple approach that assumes a linear relationship between emissions and air quality. This approach is viable because:

(1) primary emissions (geological, primary organic, and elemental carbon) are generally unreactive, and linearity is reasonable;

(2) nitrate formation from NO_x, while not a linear process, is likely not far off from a linear approximation;

(3) Sulfate formation is likely the most non-linear process, but since SO_x emissions are low at the outset, and are not projected to vary significantly over time, a linear assumption will not strongly affect the overall outcome; and

(4) secondary organics, as determined by CMB, represent a small fraction of the total PM_{10} mass, and hence errors in linearity assumptions will not significantly affect the overall outcome.

Briefly, the speciated rollback calculation can be formulated as follows:

$$\text{Future Year } PM_{10} = \sum_i [((C_{i\ base} - B_i)*E_{i\ future}/E_{i\ base}) + B_i]$$

Where	C_i	=	concentration of species i
	B_i	=	background concentration of species i
	$E_{i\ future}$	=	future year emissions of species i
	$E_{i\ base}$	=	base year emissions of species i

Based on the PTEP data, it is concluded that the design site at Rubidoux is affected by the immediately upwind ammonia-rich dairy operations. To account for this source, and to assess the effectiveness of ammonia reductions from this source, a modification to the speciated rollback was made. For the remaining four Basin PTEP sites (Fontana, Anaheim, Diamond Bar, and Central Los Angeles), the ammonia measurements were averaged. The “excess” measured ammonia at Rubidoux compared to the remaining Basin average was assumed to be a direct result of the dairy ammonia emissions. Once this value was determined, a corresponding concentration of nitrate was ascribed to this source based on the ammonia-nitrate stiochiometry. By separating out this influence, the speciated rollback can be used to determine ammonium nitrate reductions at Rubidoux resulting from future reductions in dairy ammonia emissions.

For the rollback calculations, Table 2-9 shows the nine general species that characterize annual and episodic PM_{10} concentrations, and the emissions category used in the linear rollback. Averaged speciated components of the 1995 PTEP data for the design site, Rubidoux, provided the basis for the annual future-year projection. The speciated PM_{10} profile for November 17, 1995, the day having the maximum monitored concentration for the year at Rubidoux, provided the basis for the 24-hour average standard future-year projection.

TABLE 2-9

PM_{10} Component Species Linkage to Emissions Reductions

Species	Emissions Category
nitrate	oxides of nitrogen (NO_x)
nitrate (dairy)	stoichiometric percentage of nitrates related to dairy ammonia emissions
sulfates	oxides of sulfur (SO_x)
ammonium	N/A
ammonium (dairy)	dairy ammonia
elemental carbon	diesel soot
organic carbon	volatile organic compounds (VOC)
primary crustals	fugitive dust
sea salts	N/A

For the emissions, the annual average day emissions are used to calculate annual PM_{10}. Specific emissions are used to assess episodic 24-hour averaged PM_{10}. In each calculation, no percentage reduction in emissions is assumed for non-dairy ammonium and sea salts, thus leaving the base year concentration the same in future years. Background levels are assumed for elemental carbon and geological components.

Urban Airshed Model - Aerosol Chemistry (UAM-Aero)

The Draft PM_{10} Modeling Protocol for the 1997 Air Quality Management Plan (Draft Working Paper M-2, 1996) identified UAM-Aero (Kumar and Lurmann, 1996) as a possible tool for simulating PM_{10} episodes in the Basin. UAM-Aero uses a full aerosol chemical mechanism, designed to finely evaluate the interactions of emissions, meteorology and aerosol chemistry. The model is designed for episodic application and requires extensive model input data and preparation.

UAM-Aero was used to simulate two meteorological episodes: October 17-20, 1995 and November 14-18, 1995. The episodes, which were discussed previously, exhibited the peak PM_{10} measurements from both the routine and PTEP enhanced particulate measurement programs during 1995. While preliminary simulations of the two episodes were encouraging, the model did not meet adequate performance levels at this time and evaluation is still ongoing. Therefore, the UAM-Aero has not been applied for the 1997 AQMP.

Annual Average Estimation From Episodic Modeling

A methodology was formulated to estimate both annual and episodic PM_{10} for future years using the UAM-Aero model and the expected distribution of meteorological episodes determined from the CART analysis. This methodology is not being used at this time due to the ongoing UAM-Aero performance evaluation. It is, however, appropriate to outline the steps that can be taken to recreate the annual average PM_{10} concentration from the episodic modeling results.

The methodology estimates future annual average concentrations using the meteorologically-determined 1995 frequencies of node occurrence, the PTEP PM_{10} node average concentrations and the modeled percentage air quality improvement (future year - base year) by episode. Four general assumptions are made. First, the PTEP episodes represent the corresponding nodes in which they have been classified, despite their uniqueness within the class. Second, percentage air quality improvements modeled for individual episodes representing the same node class (similar meteorological conditions) are averaged collectively. Third, percentage air quality improvements averaged for all modeled episodes represent the expected improvement for the non-episode represented nodes. Fourth, the projected annual average concentration based on the PTEP data can be adjusted to select an equivalent SSI annual average. The methodology includes several steps:

1. Average the PTEP PM_{10} episode concentrations by terminal node and determine the ratio between the episode average and PTEP terminal node mean for 1995;

2. Determine the individual UAM-Aero modeled future year (2006) predicted PM_{10} episodic concentrations and percentage reductions from the 1995 baseline validation predictions;

3. Average the percentage PM_{10} concentration reduction for the episodes by terminal node grouping;

4. Average percentage PM_{10} concentration reduction for all episodes regardless of terminal node grouping;

5. Adjust the individual 1995 PM_{10} episode concentrations by the average terminal node group specific percentage reductions.

At this point, the adjusted 1995 episodes represent future-year PM_{10} concentrations based on the average expected improvement to result from emissions controls. Continuing the analysis provides the annual assessment:

6. Adjust the 1995 PTEP node average concentration for those nodes represented by episodes by the average percentage reductions determined in Step 3.

7. Adjust the PTEP node average concentrations for those nodes not represented by the episodes modeled by the overall average percentage determined in Step 4.

8. Multiply the 1995 node frequencies by the adjusted node mean concentrations, and sum over the node classes to calculate the future year PTEP annual average.

9. Adjust the future year PTEP annual average to the PTEP/SSI Hi-Vol ratio to estimate an equivalent SSI Hi-Vol annual average concentration.

UAM/LC MODELING

The following sections outline the data input file preparation procedures that were conducted for the UAM/LC and UAM-Aero model simulations. The results of the UAM/LC model runs for the base year and the model performance evaluation for the UAM/LC base case are also presented. Model results for the UAM-Aero simulations are still under evaluation and are not presented at this time.

UAM Model Inputs

The procedures for UAM/LC (and UAM-Aero) input file preparation are presented in this section. Much of the following discussion is based on the ozone/PM_{10} modeling protocol developed for the 1997 AQMP revision (Draft Working Papers #M-1 and M-2, 1996). Parts of this document are based on the EPA and ARB technical guidance on ozone modeling (ARB, 1992) and (EPA, 1991). While the UAM/LC chemical mechanism is significantly different from previous UAM versions, the majority of the input files have the same format and/or information.

A series of procedures and methodologies were defined for the preparation of the UAM meteorological and air quality input files. The model input preparation procedures are discussed in Technical Report V-B of the 1994 AQMP. For the annual and episodic applications of UAM/LC (and episodic applications of UAM-Aero) selected modifications were made to the input fields. Deviations from the procedures used in the 1994 AQMP are noted in the following subsections.

Modeling Domain

A modeling region with horizontal dimensions of 325 km in the east-west direction and 200 km in the north-south direction, beginning at the UTM location of 275 easting and 3670 northing was set for UAM modeling. Horizontal grid cell resolution was 5 km, as was used in previous UAM modeling applications for the Basin. For the UAM/LC applications, a smaller modeling region, 160 km by 110 km region with origin located at

UTM coordinates 350 easting and 3,700 northing, was used to maximize computer resources.

The vertical dimensions of the modeling domain are based on previous experience in UAM applications for the Basin and elsewhere. For annual applications of the UAM/LC, a two layer model was employed to maximize computer resources. The height of the modeling domain for each application was set to a constant 2000 m above ground level. For UAM-Aero applications, five spatially and temporally varying layers (based on the mixing height) are used.

Initial and Boundary Concentrations

Boundary Concentrations

The pollutant boundary conditions at the edges and top of the modeling region remained constant throughout the modeling period for both the UAM/LC and UAM-Aero applications. Concentrations of sulfate, ammonium, nitrate and primary particulates were specified at each boundary. Ozone concentrations were set to 0.04 ppm and total volatile organic compound (VOC) concentrations were set to 0.06 ppmC. Hydrocarbon speciation profiles developed for the 1994 AQMP [Technical Report V-B (1994)] were used. A simple vertical pollutant profile was assumed. The boundary cells below the mixing height were given the gridded ground-level pollutant concentrations, and the concentrations in the boundary cells above this level were assumed equal to their corresponding value at the top of the modeling domain.

Air Quality Data

Hourly air quality data, including 1995 observations of ozone, nitrogen dioxide and oxides of nitrogen from the District's ambient air monitoring data network are used as inputs to the UAM/LC and used in the empirical chemical mechanism. The measured values at the monitoring stations at the beginning hour of the simulation and hydrocarbon concentrations inferred from the emissions profile were used as inputs to the interpolation and vertical profile routines that produce the three-dimensional, gridded concentration fields. The vertical profile was determined as described above for the boundary file. The interpolation scheme used to generate the field was the Poisson smoothing method.

Initial concentration fields for the episodic modeling application using UAM-Aero were constructed using the District ambient air monitoring data for the initial hours of the simulation. Data were interpolated into three-dimensional fields using the procedures described above.

Future Initial and Boundary Conditions

For the future year scenarios, the boundary, region top and ambient air quality concentrations were adjusted to reflect projected emissions reductions. A generalized linear change in the pollutant concentrations above background are assumed for the analysis.

For the UAM/LC applications, future-year ozone concentrations were estimated by multiplying a ratio to the 1995 observed ozone concentrations. A ratio is the future year to base year UAM estimated ozone concentrations

Background Concentrations

Background PM10 concentrations for the Basin are unknown. A reasonable background level for the Basin is needed. To estimate a reasonable background level for the Basin, the measurements made in 1986 at San Nicolas Island were used. In 1995, as part of a PTEP program, PM10 samples were collected at San Nicolas Island; however, the number of samples collected was not sufficient to be statistically sound. Therefore, ammonium (1 ug/m3), nitrate (1.5 ug/m3), sulfate (1.5 ug/m3), and secondary organic carbon (1.7 ug/m3) at the San Nicolas Island measured in 1986 were assumed as the Basin background concentrations for those species. For natural dust, 2 ug/m3 was used which is based on a measured value of 3 ug/m3 obtained at the Palm Springs site. For natural marine background concentrations, 3.5 ug/m3 was used.

Meteorological Inputs

Observational Data Resources

The meteorological databases used by UAM/LC and UAM-Aero to simulate annual PM_{10} and the two fall 1995 meteorological PM_{10} episodes included measurements taken from an extensive network of surface and upper air reporting stations. Different subsets of the total data package available were used for each analysis, dependent upon type of application: annual or episodic. For the first time, continuous wind data from 915 MhZ radar wind profilers and vertical temperature profiles from radio acoustic sounding systems from three locations (LA Airport, San Diego, and Simi Valley) were available for model input data development. Air rawindsonde sounding profiles for standard (and off-hours for episodic conditions) were available for an additional five sites in southern California to provide a composite profile of upper air temperature and moisture characteristics. In addition, daily aircraft temperature profiles were available for one desert site.

Surface temperature, humidity, and winds were available from over 50 District, Ventura County Air Pollution Control District (VCAAPD), San Diego County Air Pollution Control District (SDAPCD) and California Irrigation Management Information System (CIMIS) reporting stations for the two meteorological episodes. These data were complemented with hourly FAA surface observations taken at an additional 30 sites throughout the area.

Temperature and humidity data monitored at 16 representative locations having comprehensive data records were used to develop the surface data field. Upper air data comprising composite profiles of temperature and relative humidity were extracted from daily morning coastal sounding profiles representative of southern California.

Three-Dimensional Temperature and Humidity Fields

The UAM/LC and UAM-Aero models required specific gridded three-dimensional temperature and humidity fields as an input for particulate and gaseous chemistry. Three-dimensional temperature and humidity fields were developed from the available surface and upper air data using Poisson objective analysis techniques. Data from 16 District air monitoring stations and FAA airport observations provided characterization of the daily surface temperature and humidity fields. An additional eight pseudo-stations were created from this data base to characterize offshore temperature and humidity profiles and to represent desert and mountain boundary conditions. The hourly surface fields were subjected to a 5-point filter to smooth gridded temperature variations.

Hourly temperature and humidity profiles through 2000 m aloft were interpolated from morning coastal sounding profiles. The gridded hourly surface fields were merged with the hourly upper level profiles and were vertically averaged by grid to match the two vertical layers determined by the mixing height specification for the UAM/LC application. For the episodic application using UAM-Aero, vertical averaging was expanded two vertical layers: two below the mixing height and three above.

Use of the 3-dimensional temperature field for the UAM/LC and UAM-Aero simulations negated the need to specify temperature lapse rates above and below the mixing height as required by the U.S. EPA version of the UAM during modeling applications.

Mixing Heights

An extended version of an objective model outlined in Cassmassi and Durkee (1990) was used to generate hourly gridded mixing height fields for 1995. Mixing was calculated using a Holzworth (1964) approach, which estimates the extent of buoyant vertical lifting of an air parcel based on the surface temperature of the air parcel and that of the environment lapse rate measured by a nearby sounding or RASS profile. The process is summarized in Technical Report V-B of the 1994 AQMP.

Temperatures at 16 locations were used to develop the hourly mixing height fields for application with the UAM/LC model. Several of those 16 stations were used to fill out the modeling domain where there is no data. For example, coastal stations, such as Long Beach and LAX, were used to fill in the ocean areas of the modeling domain; and desert stations, such as Thermal and Daggett, were used to fill in the high and low desert areas, respectively, of the modeling domain. The interpolated hourly composite temperature profile created for the three dimensional temperature field was used to characterize the environmental vertical structure for the modeling area.

For each analysis, maximum mixing heights were capped at 2000 m; minimum mixing was set at 50 m. The model also used a time-weighted factor to adjust surface temperatures for super adiabatic heating. The factor was developed after analyzing historical surface temperature and sounding data and was set to vary from a minimum of 0.5°C during the mid-morning to a maximum of 3.0°C at 1400 PST. The final gridded mixing height fields were subjected to smoothing with time and space.

For the UAM-Aero applications, temperature data for over 80 surface reporting sites were used to generate the temperature files for the episodic analysis. The mixing height fields for the episodic analyses were constructed using the full complement of upper air stations including rawindsonde, and aircraft measurement of sensible temperature. To provide for measurement consistency, an adjustment was made to calculate sensible temperature from the RASS virtual temperature profile using collocated surface and upper air water vapor characterization.

Wind Fields

The hourly wind fields used by the UAM/LC and UAM-Aero simulations were generated using the Hybrid Diagnostic Wind Model (HDWM) developed by Douglas and Kessler (1988). The HDWM approach, which incorporates a diagnostic wind algorithm with objective analysis, is described in Technical Report V-B of the 1994 AQMP. For wind field generation, the diagnostic model utilized wind barriers to assist in characterizing flow through the complex terrain. Winds were generated for a 5 km square grid with 19 vertical layers. Three-dimensional winds were generated using the diagnostic assumption coupled with objective analysis using all available upper air winds and hourly averaged wind data at the surface.

The District surface wind observations, routinely monitored at 33 locations, were used to characterize hourly wind fields in the mixed layer for the annual UAM/LC modeling application. Winds aloft (1500m) were characterized by synoptic winds extrapolated from the daily 0400 and 1600 PST 850 millibar surface analyses. Key upper air locations included Vandenberg AFB, San Diego, Las Vegas and a mid-basin location, approximately Ontario. These upper air wind data were merged with hourly radar wind profiles measured at LAX.

In the preparation of the HDWM input files for the UAM/LC annual model application, the 1500 m synoptic winds were assigned to characterize all layers above 1000 m. Winds between the surface and the 1000 m level were interpolated from the surface observations using a “power law” profile.

The meteorological data bases used for UAM-Aero wind field development to simulate the two fall 1995 PM_{10} meteorological episodes included measurements taken from an extensive network of surface and upper air reporting stations. Wind data from three continuously operating 915 Mhz radar wind profilers were used, as well as routine upper air rawindsonde sounding profiles at an additional five sites. Surface winds from District, VCAPCD, SDAPCD, and CIMIS reporting stations were complemented with hourly FAA surface observations taken at an additional 30 sites throughout the area.

UAM layer-averaged winds were created from the HDWM wind modeling techniques using a layer matching scheme (UAMWND) developed by Douglas et al. (1990), which weights surface layer wind influence to layers aloft on the basis of stability. For the UAM/LC annual applications, winds were averaged into a 2-layer format (one characteristically below the diffbreak and a second above). The 3-dimensional winds were converted to a 5-layer format using the UAM layer-matching scheme and the gridded matrix of hourly mixing heights for episodic UAM-Aero applications.

Additional post-processing techniques were selectively applied to the UAM wind fields generated using one or more of the above methodologies. These included the use of a 5-point filter to smooth a UAM wind field to dampen horizontal shear, and use of a filtering technique [which follows a profile suggested by O'Brien (1970)] to adjust UAM vertical velocities and dampen mass flow through the top of the modeling domain.

Rain Days

Precipitation summaries were reviewed to determine the dates on which measurable rainfall (0.05 inches or more in Downtown Los Angeles) fell in the Basin during 1995. This data was used by the UAM/LC to assign a default PM_{10} concentration on days with significant rainfall when secondary particulate formation was minimal. A total of 36 days met this criteria in the Basin for 1995. Table 2-10 summarizes the rainfall dates on which this calibration took place.

TABLE 2-10

1995 Rain Days in the Basin:
Days Recording Measurable Precipitation of at least 0.05 Inches of Rain

Month	Dates
January	3, 4, 5, 7, 8, 9, 10, 11, 12, 15, 23, 24, 25, 26
February	8, 13, 14
March	2, 3, 5, 6, 10, 11, 12, 21, 23
April	16, 18
May	15
June	15, 16, 17
November	1
December	13, 14, 23

Aqueous Phase Chemistry Days

Morning upper air temperature profiles characteristic of southern California were evaluated to determine the height of the mixed layer and the strength of the inversion to identify candidate days to initiate aqueous phase chemistry in the UAM/LC model. The criteria used to select those days were a morning mixing height between 1000 and 3000 feet with an inversion strength of at least 6°C. A total of 95 days met this criteria in 1995 (see Table 2-11).

TABLE 2-11

1995 Aqueous Phase Chemistry Days in the Basin:
Days With Morning Mixing Heights Between 1000 and 3000 Feet
and an Inversion Strength of 6.0°C

Month	Dates
February	7
March	18
April	5, 26, 27
May	19, 20, 28-31
June	1, 4, 10, 13, 14, 21-30
July	1-3, 5-9, 12-14, 17, 19-26, 29
August	1-6, 9, 10, 15-17, 20-23
September	9, 10, 16-22, 24
October	4, 5, 9-15, 17-21, 29
November	15-17, 21, 22, 26
December	9, 10, 12

Fog Fields

A final set of hourly 2-dimensional fields of surface fog were developed as an input to UAM-Aero for each of the episodic simulations. The fog fields were developed from fog reports obtained from FAA hourly surface airport observations.

UAM/LC Base Year Model Predictions

UAM/LC was run for the 1995 base simulation using the annual average day emissions presented in the previous emission inventory discussion and the meteorological and air quality data inputs outlined in the preceding section. The UAM/LC base year model results and 1995 base year annual average observations are presented in Table 2-12.

TABLE 2-12

UAM/LC 1995 Base Year Model Predictions (μg/m^3)
Compare to Annual Average Observations (μg/m^3)

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Predicted	Observed	Predicted	Observed	Predicted	Observed	Predicted	Observed	Predicted	Observed
Sulfate	2.9	4.8	3.5	4.3	2.7	3.6	2.6	4.3	2.3	4.0
Nitrate	12.8	10.4	12.4	11.8	12.9	13.4	12.0	9.9	15.5	17.5
Ammonium	4.4	4.0	4.4	4.6	4.2	4.6	4.1	4.0	4.9	5.9
Primary	39.7	20.9	30.1	21.6	34.5	35.3	41.5	21.6	41.0	36.7

UAM/LC Model Performance Evaluation

Draft Working Paper #M-2, "PM_{10} Modeling Protocol for the 1997 Air Quality Management Plan Revision" (Zhang et.al.,) outlines a series of performance goals that were established to estimate the ability of the UAM-Aero to recreate episodic PM_{10}. Because of the differences in modeling assumptions, specifically the use of the empirical statistical chemical mechanism and the annual application, a subset of the UAM-Aero performance goals were used for the annual UAM/LC annual performance evaluation (see Table 2-13).

TABLE 2-13

UAM/LC Performance Goals

Species	Goal (%)	Comparison Basis
Sulfate	30	Annual Average
Nitrate	30	Annual Average
Ammonium	30	Annual Average
Primary	30	Annual Average

In general, UAM/LC model performance targets the ability to predict concentrations of, nitrates and ammonium particulates within 30 percent of the measured annual concentrations with marginal performance for sulfates. The performance goals for the UAM-Aero simulations are more restrictive, focusing upon measures typically used for UAM ozone model predictions including peak prediction accuracy, gross bias, and gross error for gaseous air pollutants as well as measures of particulate prediction accuracy. The UAM/LC tends to overpredict primary particulates. This is expected given the limited information regarding the spatial distribution of primary emissions. Further efforts will focus on improving the model performance for all components of PM_{10} especially primary particulates.

A summary of the performance statistics for the UAM-Aero model is not presented at this time. Evaluation of the UAM-Aero performance statistics for the two fall meteorological episodes indicated that the simulations reached some of the established goals but not all. Several areas of model performance continue to require additional evaluation to address inconsistencies.

The performance statistics for the UAM/LC 1995 base case annual simulation are presented in Table 2-14. Percent prediction error is presented for each of the five PTEP stations having speciated PM_{10} profiles. Data for San Nicolas Island were excluded from the performance evaluation due to the reduced number of measurements at the background characterization site.

TABLE 2-14

UAM/LC Performance Statistics (annual percent error)

	Species			
Location	Sulfate	Nitrate	Ammonium	Primary
Anaheim	39.7	22.8	8.5	89.9
Diamond Bar	18.8	5.2	3.7	39.6
Fontana	24.6	3.4	8.1	2.2
Los Angeles	38.5	21.7	2.4	92.5
Rubidoux	42.9	11.6	17.7	11.5
Average	32.9	12.9	8.1	47.1

Overall, the performance of the UAM/LC averaged over the five stations is within or near the goals defined in Table 2-13 for the secondary components of PM_{10} predicted by the annual model. Predictions of nitrates and ammonium were within the 30 percent error performance criteria at all stations for the base case application, with five station averages of 12.9 percent for nitrate and 8.1 percent from ammonium, respectively. Percentage errors for sulfate prediction at Anaheim, Los Angeles and Rubidoux exceeded the 30 percent threshold. This statistic is somewhat misleading however since the annual average concentrations of sulfates measured at each of these stations were less than 5.0 $\mu g/m^3$, and bias in the prediction performance was typically less than 2 $\mu g/m^3$. When taken collectively, the five station average is calculated at 32.9 percent. Percent errors for primary particulates at Anaheim, Diamond Bar, and Los Angeles reflect uncertainties in the gridded primary particulate emissions inventory for the more urbanized western half of the Basin. Percentage errors in prediction performance at Fontana and Rubidoux, stations located in the eastern half of the Basin that experience greater, and more frequent, primary emissions impacts, are well within the goals set for model performance.

CMB MODELING

The CMB model, version 7.0, was applied to the 1995 PTEP data to determine annual average and peak 24-hour estimations of PM_{10} species for comparison with the annual and 24-hour federal PM_{10} standards. The focus of the CMB analysis was to determine the contributions from secondary organic carbon sources.

The major sources contributing to PM_{10} in the Basin were estimated from the Principal Component Analysis (PCA) (see 1994 AQMP, Appendix V-C) and the correlation matrix of the 1995 PTEP ambient data. Secondary, motor vehicle, geological, and marine sources were identified as major sources in the Basin. Source profiles for each possible source were selected from the enhanced source profile library and applied to the CMB model to estimate their contributions to PM_{10} mass.

Annual Average PM_{10}

Annual average source contributions at the five PTEP sampling locations in the Basin were calculated from the individual CMB results and are summarized in Table 2-15 and Figure 8-1.

TABLE 2-15

Annual Average PM_{10} Source Contribution Estimates (µg/m^3)

	CELA	ANAH	DBAR	FONT	RUBI
Ammonium Sulfate	5.5 (10.6)	4.9 (11.2)	4.9 (10.5)	4.5 (6.3)	5.3 (6.6)
Ammonium Nitrate	12.6 (24.1)	12.9 (29.3)	14.9 (31.8)	18.3 (25.6)	22.8 (28.2)
Secondary Carbon	4.2 (8.1)	3.1 (7.0)	3.7 (8.0)	4.6 (6.4)	5.5 (6.8)
Motor Vehicles	7.0 (13.4)	4.9 (11.1)	5.1 (10.9)	5.4 (7.5)	5.6 (6.9)
Geological	18.8 (36.0)	13.3 (30.2)	14.3 (30.5)	35.3 (49.4)	31.8 (39.3)
Residual Oil	1.9 (3.6)	2.3 (5.3)	1.8 (3.8)	1.6 (2.3)	1.4 (1.7)
Marine	2.2 (4.2)	2.6 (5.8)	2.1 (4.5)	1.8 (2.5)	1.8 (2.3)
Limestone					6.6 (8.2)
Total Mass Predicted	52.3 +- 2.8	44.0 +- 2.9	47.0 +- 3.2	71.5 +- 4.5	80.9 +- 4.8
Total Mass Observed	48.1 +- 3.1	42.3 +- 4.2	46.8 +- 4.7	64.8 +- 4.6	75.7 +- 6.2

Five different source categories (geological; motor vehicles; secondary aerosol such as ammonium nitrate, ammonium sulfate, and secondary carbon; marine; and residual oil burning sources) contributed to PM_{10} concentrations at all Basin sites. At the Rubidoux site, one additional source, calcium (lime or limestone), contributed to PM_{10} concentrations.

Geological and secondary sources such as ammonium nitrate, ammonium sulfate and secondary carbons contribute the greatest portion to the PM_{10} concentrations. The contribution from geological sources ranges from 13.3 µg/m^3 at Anaheim to 35.3 µg/m^3 at Fontana. This accounts for 30 to 49 percent of the total PM_{10} mass. When the limestone source is added to the geological source, Rubidoux shows the highest geological contribution of 38.4 µg/m^3.

The contribution of secondary aerosols varies spatially, ranging from 20.9 µg/m^3 at the coastal site of Anaheim to 33.6 µg/m^3 at the inland site of Rubidoux. The ammonium sulfate contribution is highest at Downtown Los Angeles and lowest at Fontana; however, the contributions are relatively uniform across all PTEP sites. Secondary carbon contributions show spatial variation, with higher concentrations of 5.5 µg/m^3 at Rubidoux and lower concentrations of 3.1 µg/m^3 at Anaheim.

The ammonium nitrate concentrations show the greatest spatial variations, with the highest concentration (22.8 µg/m^3) at Rubidoux and the lowest (12.6 µg/m^3) at Downtown Los Angeles. The ammonium nitrate at Rubidoux is 80 percent higher than the ammonium nitrate at Downtown Los Angeles. Precursor emissions of nitrate have more time to react to form nitric acid at the inland sites and, coupled with a large ammonia emission source located directly upwind of Rubidoux, lead to high ammonium nitrate concentrations at Fontana and Rubidoux. Although Diamond Bar is located closer to the large ammonia sources than Rubidoux, Diamond Bar shows less ammonium nitrate than Rubidoux because Diamond Bar is generally upwind of large ammonia sources. The ammonium nitrate concentration at Diamond Bar is 2 µg/m^3 higher than coastal areas.

The motor vehicle emissions profiles were developed for the 1991 AQMP. Since then, there have been changes in the motor vehicle mix. Leaded gasoline powered vehicles were replaced by unleaded gasoline powered vehicles. Advances in the control technology changed the motor vehicle tailpipe profile. Therefore, the motor vehicle profiles used in the CMB analysis were slightly outdated. However, the motor vehicle profiles were still fitted fairly well although Pb was overpredicted by the CMB model. Directly emitted PM_{10} particles from motor vehicles account for 4.9 µg/m^3 at Anaheim and 7.0 µg/m^3 at Downtown Los Angeles. Motor vehicle sources account for 7 to 13 percent of the PM_{10} mass.

As expected, larger marine contributions are observed at coastal sites and small contributions in the inland areas. The largest concentration (2.6 µg/m^3) is observed at Anaheim and the smallest concentration (1.8 µg/m^3) is observed at Fontana and Rubidoux. Marine sources comprise 2 to 6 percent of the PM_{10} mass in the Basin.

A limestone source is the only other source contributing to PM_{10} concentrations at Rubidoux. Geological sources alone were not sufficient to explain the measured calcium concentrations. Addition of a limestone source in the CMB analysis accounted for the excess calcium. These findings are consistent with earlier studies (Chow, et al., 1992; Kim, et al., 1992). This source contributes 6.6 µg/m^3, or 8 percent of the total PM_{10} concentrations at Rubidoux. The limestone at Rubidoux is likely due to paved and unpaved road dust from nearby cement industries.

There is also a minor direct PM_{10} contribution from residual oil burning sources, such as fuel-driven generators. These sources contribute about 1 to 2 µg/m^3 for all the Basin sites. Although power plants have switched fuels from residual oil to natural gas, fuel-driven generators on marine vessels still use residual oil. Nickel and vanadium (Ni and V) are unique tracers of the residual oil burning sources. The CMB analysis indicates that some of the samples clearly show the lack of Ni and V without the residual oil burning source. In other words, primary sources considered in the CMB analysis were not sufficient to explain the measured Ni and V concentrations. The residual oil burning source category was not always shown in the CMB analysis. The annual average PM10 contributions were estimated with the number of residual oil burning sources that were shown in the

CMB analysis, which is less than the total number of samples. Therefore, residual oil burning contribution estimates are the upper bound of residual oil burning contributions. Secondary organic carbon is estimated from an assumed secondary organic carbon profile. The profile contains zero fraction contributions except for organic carbon. Hydrogen and oxygen molecules in the hydrocarbons are accounted for in the determination of the organic carbon fraction. The estimated secondary organic carbon contribution, therefore, is the remaining organic carbon that is not explained by primary sources such as motor vehicle and geological sources. Therefore, estimates of secondary organic carbons are sensitive to the primary source profiles. Small contributions to organic carbon from primary sources result in a large amount of leftover organic carbon that is attributed to secondary organic carbon. Large contributions to organic carbon from the primary sources result in small secondary organic carbon contributions. The motor vehicle and geological sources are the two major primary sources in the CMB analysis. When considering the uncertainty of the motor vehicle profile, the estimates of the secondary organic carbon are uncertain and the secondary organic carbons were not always present in the CMB analysis. For the same reason as the upper bound of the residual oil burning source, the estimate of the secondary organic carbon contribution is also an upper bound of secondary organic carbon concentrations.

Maximum 24-Hr Average PM_{10}

Source contributions to maximum 24-hr average PM_{10} concentrations are summarized in Table 2-16. The CMB analysis was made on the routine sampling days, therefore, maximum 24-hour average PM_{10} days do not necessarily match with the PTEP maximum 24-hour PM_{10} days.

TABLE 2-16

Maximum 24-hr Average PM_{10} Source Contribution Estimates ($\mu g/m^3$)

	CELA	ANAH	DBAR	FONT	RUBI
Ammonium Sulfate	17.0 (13.7)	7.9 (4.9)	15.3 (11.0)	5.3 (3.0)	9.6 (5.9)
Ammonium Nitrate	92.2 (74.3)	90.4 (56.6)	86.4 (62.0)	72.5 (40.1)	102.4 (63.6)
Secondary Carbon					16.4 (10.2)
Motor Vehicles	12.6 (10.2)	20.7 (13.0)	25.9 (18.6)	16.3 (9.0)	18.8 (11.7)
Geological		35.7 (22.4)	10.0 (7.2)	84.8 (46.9)	5.6 (3.5)
Residual Oil	1.2 (1.0)	4.2 (2.6)	0.6 (0.4)		7.5 (4.7)
Marine	1.0 (0.8)	0.8 (0.5)	1.1 (0.8)	1.9 (1.1)	0.9 (0.5)
Limestone					
Total Mass Predicted	124.0 +- 10.5	159.6 +- 10.7	139.3 +- 13.4	180.8 +- 8.8	161.1 +- 16.0
Total Mass Observed	164.0 +- 13.9	181.9 +- 15.5	170.7 +- 14.5	168.3 +- 14.3	209.7 +- 17.8
Date	Nov. 17	Dec. 5	Nov. 17	Dec. 11	Nov. 17

The largest contributor to maximum 24-hr average PM_{10} mass is from secondary sources which range from 78 $\mu g/m^3$ at Fontana to 128 $\mu g/m^3$ at Rubidoux. These sources account for 43 percent to 88 percent of the total PM_{10} mass. Second in importance are the geological and motor vehicle sources. Direct PM_{10} from motor vehicles accounts for 9 to 13 percent of the maximum 24-hr average PM_{10} concentrations, and ranges from 13 $\mu g/m^3$ at Downtown Los Angeles to 26 $\mu g/m^3$ at Diamond Bar. The geological source contribution is high at Anaheim and Fontana which occurred on December 5 and December 11, respectively. However, on November 17, 1995, the geological source contribution is negligible at downtown Los Angeles to 6 $\mu g/m^3$ at Rubidoux and 10 $\mu g/m^3$ at Diamond Bar. This accounts for 4 and 7 percent of the maximum 24-hour PM_{10} mass, respectively.

FUTURE PM_{10} AIR QUALITY

The federal annual average PM_{10} standard is 50 $\mu g/m^3$, based on an annual arithmetic mean; the federal 24-hour average PM_{10} standard is 150 $\mu g/m^3$. Future-year PM_{10} air quality is projected using the procedures and assumptions described previously. Future PM_{10} air quality in the years 2000 and 2006 using UAM/LC and CMB with emission controls show that the Basin will attain both the federal PM_{10} standards by the year 2006. Model projections using UAM/LC and CMB are included for 2010 also. Speciated rollback model predictions for the annual arithmetic mean and 24-hour average PM_{10} concentrations with emission controls are presented for 2006 at Rubidoux only. The results of the speciated rollback show that both standards will be met with controls in place.

The state PM_{10} air quality standards are stricter than the federal PM_{10} standards. The state annual average PM_{10} standard is 30 $\mu g/m^3$ based on an annual geometric mean, and the state 24-hour average PM_{10} standard is 50 µg/m^3. There is no requirement to comply with the state PM_{10} standards by a specified date. However, future-year annual geometric mean PM_{10} concentrations show the progress toward the attainment of the state PM_{10} air quality standards.

PM_{10} in the Year 2000 (UAM/LC and CMB)

Annual PM_{10}

The annual average PM_{10} air quality in the year 2000 is shown in Table 2-17. Source category contributions to PM_{10} levels with and without controls are shown. PM_{10} concentrations in the year 2000 will be above the federal annual average PM_{10} standard without controls. With the proposed AQMP emission controls, Anaheim, Downtown Los Angeles, Diamond Bar and Fontana will meet the annual standard but Rubidoux will not.

TABLE 2-17

Annual Average PM_{10} Concentrations (µg/m^3) in the Year 2000

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Sulfate	4.23	4.23	3.50	3.48	3.05	3.04	3.61	3.61	3.54	3.53
Nitrate	8.75	8.57	10.07	9.82	11.70	11.37	8.49	8.29	15.15	14.72
Ammonium	3.40	3.34	3.84	3.77	3.99	3.90	3.56	3.29	5.13	5.00
Secondary Carbon	2.74	2.69	3.22	3.14	3.40	3.31	3.09	3.02	4.00	3.88
Primary	22.32	16.65	23.56	18.10	37.36	26.90	22.90	17.19	38.08	25.83
Total PM_{10}	41.44	35.48	44.19	38.32	59.49	48.52	41.64	35.60	65.89	52.96

For the state PM_{10} air quality standards, projected PM_{10} concentrations in the year 2000 are shown in Table 2-18. Results for both the baseline and controlled emission scenarios are shown in Table 2-18. From Table 2-18, the state annual PM_{10} air quality standard will be met only at Anaheim and Los Angeles with implementation of the AQMP control measures.

TABLE 2-18

Annual Geometric Mean PM_{10} Concentrations ($\mu g/m^3$) in the Year 2000

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Total PM_{10}	34.19	29.27	35.18	30.50	49.32	40.22	35.49	30.26	49.42	39.72

Maximum 24-Hr Average PM_{10}

The maximum 24-hour average PM_{10} concentrations for the five sites with and without controls are shown in Table 2-19 for the year 2000. Only Los Angeles will meet the federal maximum 24-hour average PM_{10} standard without controls in 2000. All stations except Rubidoux will attain the federal standard by the year 2000 with the proposed emission controls.

TABLE 2-19

Maximum 24-hr Average PM_{10} Concentrations ($\mu g/m^3$) in the Year 2000

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Total PM_{10}	159.6	140.8	164.4	147.1	171.0	143.6	130.1	117.7	193.8	162.7

The state maximum 24-hour average PM_{10} standard will not be met at any site in the Basin by the year 2000, even with the proposed emission controls.

PM_{10} in the Year 2006 (UAM/LC and CMB)

Annual PM_{10}

The annual average PM_{10} concentrations in the year 2006 for each source category with and without emission controls are shown in Table 2-20. Without controls, the total predicted PM_{10} concentration for 2006 will not meet the federal annual average PM_{10} standard at all Basin sites. With controls, however, the entire Basin will attain the federal annual average PM_{10} standard by the year 2006.

TABLE 2-20

Annual Average PM_{10} Concentrations ($\mu g/m^3$) in the Year 2006

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Sulfate	4.25	4.24	3.34	3.31	2.96	2.94	3.44	3.43	3.49	3.46
Nitrate	8.21	7.37	9.38	8.33	10.89	9.22	7.66	6.53	13.91	11.58
Ammonium	3.24	2.99	3.61	3.32	3.74	3.27	3.24	2.87	4.25	4.06
Secondary Carbon	2.64	2.41	3.08	2.74	3.24	2.86	2.96	2.65	3.78	3.27
Primary	22.79	16.70	24.12	17.84	39.94	27.81	23.46	16.83	38.87	25.72
Total PM_{10}	41.14	33.71	43.52	35.54	60.77	46.09	40.77	32.30	64.79	48.10

Annual PM_{10} air quality in the year 2006, based on the geometric mean, is shown in Table 2-21. Annual geometric mean PM_{10} concentrations will meet the state annual average PM_{10} standard in 2006 at Anaheim, Los Angeles, and at Diamond Bar with the implementation of proposed emission controls. State annual average PM_{10} air quality standards will not be met at Fontana and Rubidoux by the year 2006, even with the implementation of emission controls.

TABLE 2-21

Annual Geometric Mean PM_{10} Concentrations ($\mu g/m^3$) in the Year 2006

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Total PM_{10}	33.94	27.81	34.64	28.29	50.38	38.21	34.65	27.46	48.59	36.08

<u>Maximum 24-Hr Average PM_{10}</u>

The maximum 24-hour average PM_{10} concentrations in the year 2006 for each site with and without emission controls are shown in Table 2-22. Los Angeles will meet the federal 24-hour average PM_{10} standard without emission controls in 2006. With emission controls, the entire Basin will attain the federal 24-hour average PM_{10} standard in 2006.

TABLE 2-22

Maximum 24-hr Average PM_{10} Concentrations (μg/m^3) in the Year 2006

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Total PM_{10}	156.3	130.2	159.7	133.2	172.2	132.6	123.6	101.6	187.8	142.9

None of the sites in the Basin will meet the state maximum 24-hour average PM_{10} standard in the year 2006, even with the proposed emission controls.

PM_{10} in the Year 2006 (Speciated Rollback)

Annual PM_{10}

The annual average PM_{10} concentrations in the base year 1995 and for 2006 with emissions controls for each PM_{10} species at Rubidoux are shown in Table 2-23. The base year annual average PM10 concentration of 69 ug/m3 is an annual average design value which was determined from the District's routine data by taking an average of the most recent three years (from 1993 to 1995) of annual average PM10 concentrations. With controls, Rubidoux will attain the federal annual average PM_{10} standard by the year 2006.

TABLE 2-23

Annual Average PM_{10} Speciated Rollback for the Year 2006

				Rubidoux PM_{10} Concentration (μg/m^3)	
Species	Pollutant	% Reduction	Background (μg/m3)	1995 Base Year	2006 with Controls
Nitrate	NO_x	45.4	0	10.96	5.99
Nitrate (Dairy)	NH_3	50.0	0	6.60	3.30
Sulfate	SO_x	21.4	0	3.99	3.14
Ammonium	NH_3	0	0	4.09	4.09
Ammonium (Dairy)	NH_3	50.0	0	1.87	0.94
Elemental Carbon	EC (Diesel)	60.0	1.0	3.15	1.86
Secondary Carbon	VOC	47.3	1.7	10.53	6.36
Primary	PM_{10}	26.0	2.0	26.49	20.12
Sea Salt	PM_{10}	0	1.32	1.32	1.32
Total PM_{10}				69.00	47.10

Maximum 24-Hr Average PM_{10}

The maximum 24-hour average PM_{10} concentration at Rubidoux for each PM_{10} species for the base year (November 17, 1995) and in the year 2006 with emission controls are shown in Table 2-24. With emission controls, the entire Basin will attain the federal 24-hour average PM_{10} standard in 2006.

TABLE 2-24

Maximum 24-hr Average PM_{10} Speciated Rollback Analysis for the Year 2006

				Rubidoux PM_{10} Concentration ($\mu g/m^3$)	
Species	Pollutant	% Reduction	Background ($\mu g/m^3$)	Nov 17, 1995	2006 with Controls
Nitrate	NO_x	45.6	0	72.51	39.46
Nitrate (Dairy)	NH_3	50.0	0	5.86	2.93
Sulfate	SO_x	21.4	0	7.87	6.18
Ammonium	NH_3	0	0	23.45	23.45
Ammonium (Dairy)	NH_3	50.0	0	1.66	0.83
Elemental Carbon	EC (Diesel)	60.0	1.0	11.28	5.11
Secondary Carbon	VOC	45.2	1.7	29.15	16.73
Primary	PM_{10}	26.0	2.0	54.53	40.87
Sea Salt	PM_{10}	0	0.7	0.70	0.70
Total PM_{10}				207.00	136.26

Sensitivity Analysis for Organic Carbon

Using speciated rollback analysis, the organic carbon portion of the PM_{10} must be estimated as to whether that component is due to primary (e.g., directly emitted) particulates, or secondary (e.g., gas-to-particle conversion) particulates from precursor VOC emissions. In the preceding speciated rollback analysis, it was assumed that all of the organic carbon is secondary carbon, and that future concentrations of organic carbon are proportional to the future levels of VOC emissions. Since it is more likely that the organic portion contains a reasonable level of primary particles, a sensitivity analysis was conducted. Using estimates provided by Schauer et.al. (1996) for primary emissions from meat cooking, reentrained road particles, motor vehicle emissions, and other miscellaneous sources, control measures as applicable to these sources were applied. Estimates of the degree of secondary carbon range from 15 percent (from Schauer, et.al., 1996) to over 50 percent (from Ellis and Zeldin, 1984). For this sensitivity analysis, 30 percent of the organic carbon is attributed to secondary processes, and 70 percent is apportioned to the primary sources.

For the annual average, the base year organic concentration is 10.53 ug/m^3, from Table 2-23; the 2006 projection based on a 100 percent secondary component is 6.36 ug/m^3. Using a control effectiveness of 58 percent for meat cooking, 32 percent from reentrained road particles, 15 percent from motor vehicles, and a 37 percent growth from the small miscellaneous sources, and still assuming a background level of 1.7 ug/m^3 of secondary particles, the 2006 projection for organic particles is 8.16 ug/m^3, and the total PM_{10} level is projected to be 48.9 ug/m^3, which meets the federal standard of 50 ug/m^3. For the 24-hour standard, this analysis produces a level of 18.95 ug/m^3 instead of 16.73 ug/m^3, as shown in Table 2-24, resulting in an a 24-hour value of 138.4 ug/m^3. This, too, is below the federal 24-hour standard for PM_{10}.

In summary, although the future projections increase with the assumption of primary, rather than secondary particulates accounting for the organic portion of the PM_{10}, the change in predicted levels is small, and attainment of the federal standards is still demonstrated.

PM_{10} in the Year 2010

Annual PM_{10}

The annual average PM_{10} concentrations in the year 2010 for each PM_{10} species with and without emission controls are shown in Table 2-25. Without controls, the total predicted PM_{10} concentration for 2010 will meet the federal annual average PM_{10} standard at Anaheim, Diamond Bar and Los Angeles. Fontana and Rubidoux will not meet the federal annual average PM_{10} standard in 2010 without controls. With controls, however, the entire Basin will still attain the federal annual average PM_{10} standard by the year 2010.

TABLE 2-25

Annual Average PM_{10} Concentrations (µg/m^3) in the Year 2010

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Sulfate	4.39	4.32	3.42	3.34	3.02	2.95	3.49	3.45	3.56	3.48
Nitrate	8.01	5.78	9.19	6.46	10.67	7.05	7.39	4.80	13.59	8.67
Ammonium	3.20	2.55	3.58	2.83	3.70	2.71	3.16	2.34	4.67	3.25
Secondary Carbon	2.62	2.13	3.04	2.32	3.20	2.39	2.93	2.27	3.73	2.64
Primary	23.10	16.90	24.51	18.10	41.67	29.01	23.85	17.08	39.64	26.26
Total PM_{10}	41.33	31.68	43.74	33.05	62.27	44.13	40.82	29.94	65.19	44.30

Annual PM_{10} air quality in the year 2010, based on the geometric mean, is shown in Table 2-26. Annual geometric mean PM_{10} concentrations will attain the state annual average PM_{10} standard in 2010 at Anaheim, Los Angeles, and at Diamond Bar with controls implemented. Annual geometric mean PM_{10} concentrations will not attain the state annual average PM_{10} standard at Fontana and Rubidoux by the year 2010 with controls.

TABLE 2-26

Annual Geometric Mean PM_{10} Concentrations (µg/m^3) in the Year 2010

	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Total PM_{10}	34.10	26.14	34.82	26.31	51.62	36.58	34.70	25.45	48.89	33.23

<u>Maximum 24-Hr Average PM_{10}</u>

The maximum 24-hour average PM_{10} concentrations in the year 2010 for each site with and without emission controls are shown in Table 2-27. Only Los Angeles will meet the federal 24-hour average PM_{10} standard without emission controls in 2010. With emission controls, the federal 24-hour average PM_{10} standard is attained at all sites.

TABLE 2-27

Maximum 24-hr Average PM_{10} Concentrations (µg/m^3) in the Year 2010

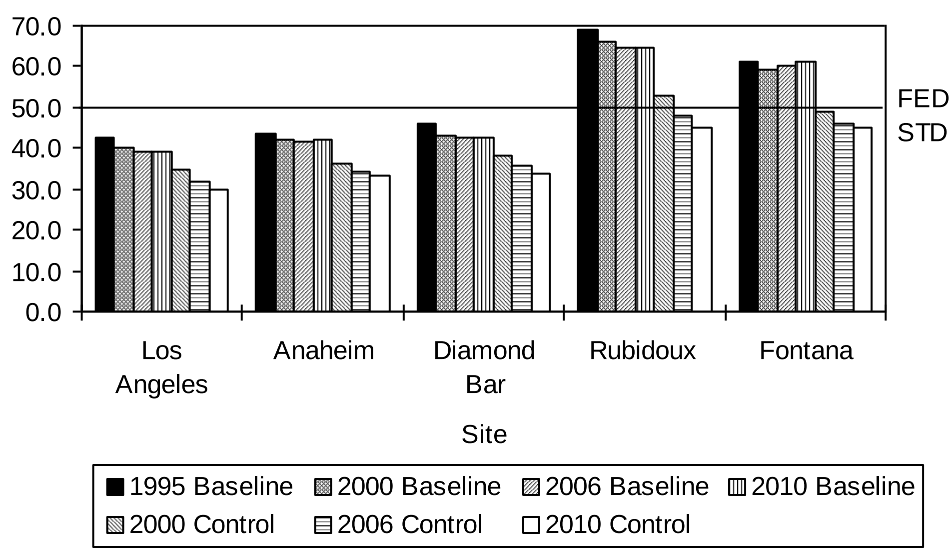
	Anaheim		Diamond Bar		Fontana		Los Angeles		Rubidoux	
	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control	Without Control	With Control
Total PM_{10}	155.8	117.0	159.4	118.3	175.2	122.6	122.3	87.9	187.9	126.2

None of the sites in the Basin will meet the state maximum 24-hour average PM_{10} standard in the year 2010, even with the proposed emission controls.

Conclusions

In the year 2006, and continuing through 2010, PM_{10} concentrations will be reduced to levels such that the entire Basin will comply with both federal PM_{10} standards, annual average and maximum 24-hour average (summarized in Figures 2-27 and 2-28, respectively) with the proposed emission controls. However, neither of the state PM_{10} standards (annual average depicted in Figure 2-29) can be met by 2006 or 2010 with the proposed emission controls. Of the two state PM_{10} standards, the 24-hr average PM_{10} standard is more stringent. Further emission controls will be necessary to meet the state PM_{10} standards.

FIGURE 2-27



Future Projected Annual Average PM_{10} for the Baseline and Control Emissions Scenarios

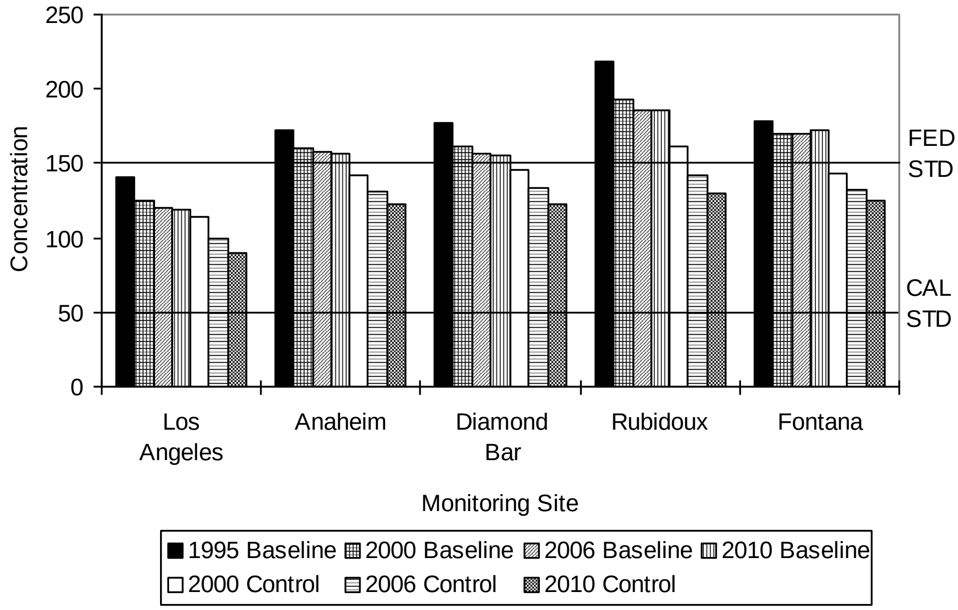


FIGURE 2-28

Future Projected Maximum 24-Hour Average PM_{10} for the Baseline and Control Emissions Scenarios

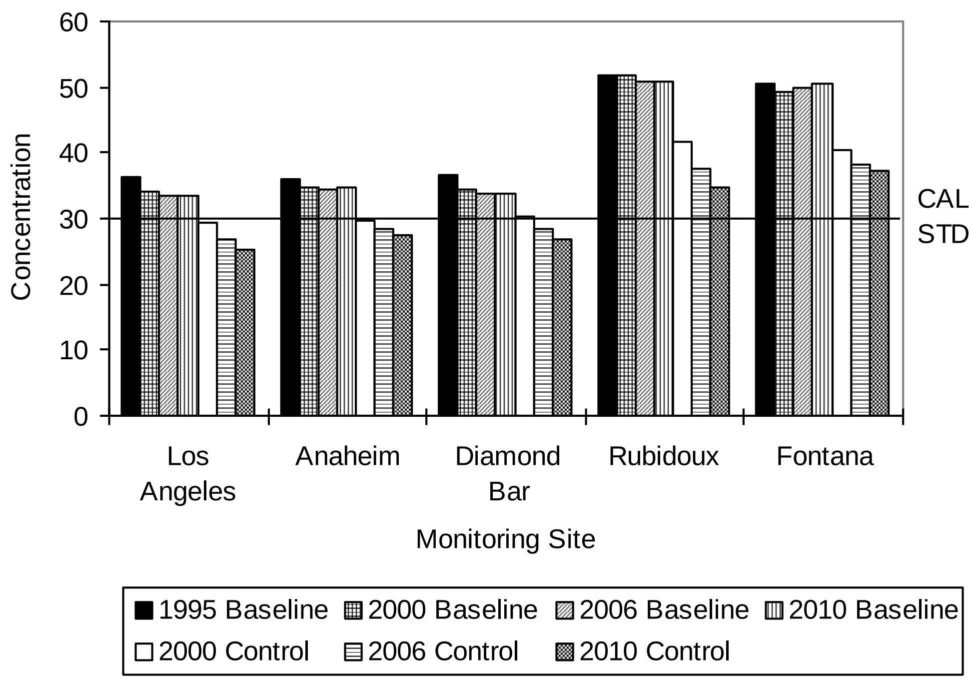


FIGURE 2-29

Future Projected Annual Geometric Mean PM_{10} for the Baseline and Control Emissions Scenarios

As part of the federal Clean Air Act requirements for the PM_{10} attainment demonstration, interim milestone emission reduction targets must be provided for every three years to the attainment year. Attachment A provides the remaining PM_{10} precursor emissions for the years 1997, 2000, 2003, and 2006, and serves as the PM_{10} milestone targets.

VISIBILITY

Visibility impairment plays an important role in the public's perception of the general state of air quality, since it is one of the most obvious indicators of air pollution. In 1969, California promulgated an ambient air quality standard for "visibility-reducing particles," limiting the concentration of these particles to an amount which would not reduce the visibility below 10 miles when the relative humidity was less than 70 percent. On January 13, 1989, the California Air Resources Board (ARB) established a new visibility standard based on instrumental determination of atmospheric extinction coefficient. Effective in October 1989, the new standard states that the concentration of "visibility-reducing particles" violates the standard when it produces an extinction coefficient greater than 0.23 per kilometer (equivalent to visibility less than 10 miles) with relative humidity less than 70 percent, averaged over the period from 10:00 am to 6:00 pm, Pacific Standard Time (ARB, 1989). There is no requirement to comply with the state visibility standard by a specified date; however, future-year visibility is estimated to illustrate the progress toward the attainment of the state standard.

Modeling Overview

To establish the most reasonable control strategy to meet the visibility standard in the future, a relationship between visibility and concentrations of visibility reducing particles must be established. This, in turn, requires visibility modeling techniques to identify sources of visibility reducing particles and to quantify their impacts.

Regression analysis is generally used to characterize the relationship between visibility and ambient air quality of the visibility reducing particles. Multiple linear regression was employed in the 1991 AQMP to develop empirical predictive equations. The empirical visibility model developed for the 1991 AQMP is used in the current AQMP analysis. Empirical predictive equations developed in the 1991 AQMP for Riverside were utilized to estimate future visibilities with new future-year (2000, 2006, and 2010) organic carbon concentrations, sulfate, and nitrate concentrations which were obtained from the UAM/LC. Details of the statistical analysis used to develop the empirical predictive equations can be found in Technical Report V-G of the 1991 AQMP.

Visibility Modeling

The total atmospheric light extinction can be broken down into four basic components: scattering of light by particles, absorption of light by particles, absorption of light by gases, and scattering of light by gases (Rayleigh scattering). In general, total light extinction is dominated by scattering of light due to particles, with light absorption by particles being second in importance. The components other than scattering of light by particles have been well-characterized by theory or from previous studies. Therefore, light extinction by particle scattering is normally estimated either by visibility modeling or by direct measurement.

Multiple linear regression is a statistical tool commonly used for analyzing visibility data. When atmospheric light extinction due to particle scattering is regressed on concentrations of visibility reducing particles, the regression coefficients represent the extinction efficiency due to particle scattering (extinction per unit concentration) for each air pollutant species.

Prior Visibility Modeling Results

In the 1991 AQMP, the regression analysis resulted in several sets of extinction efficiencies for light scattering by particles for Riverside (Rubidoux station) and four additional measurement locations. Combining extinction efficiencies for light scattering by particles with the empirical expressions for the other light extinction component produces a series of empirical predictive equations. Empirical predictive equations relate light extinction to concentrations of visibility reducing air pollutants and have the following form:

$$b_{ext} = \text{Summation}\ (b_i \cdot C_i) + b_{RAY}$$

where b_i = extinction efficiency for ith species ($10^{-4}\ m^{-1}/\mu g/m^3$ or $10^{-4}\ m^{-1}$/pphm)

C_i = mean concentration for ith species ($\mu g/m^3$ or pphm)

b_{RAY} = extinction due to Rayleigh scattering in the Basin ($10^{-4}\ m^{-1}$)

Table 2-28 is a summary of the 1991 AQMP results, showing the extinction efficiency, b_i, for Riverside. (The extinction efficiency, b_i, for the other locations analyzed in the 1994 AQMP can be found in 1994 AQMP, Technical Report V-C).

TABLE 2-28

Riverside Extinction Efficiencies, b_i, Defining Alternate Sets of Empirical Predictive Equations for Light Extinction

Visibility-Reducing Species	Units		Alternate Equations[11] 1	2	3	4
<u>Riverside</u>						
SULF	(10^{-4} m^{-1}/µg/m^3)	b_1				
NITR	(10^{-4} m^{-1}/µg/m^3)	b_2	0.070	0.075		
IONS	(10^{-4} m^{-1}/µg/m^3)	b_3			0.055	0.058
OC	(10^{-4} m^{-1}/µg/m^3)	b_4	0.104		0.089	
CRBN	(10^{-4} m^{-1}/µg/m^3)	b_5		0.062		0.053
EC	(10^{-4} m^{-1}/µg/m^3)	b_6	0.119	0.119	0.119	0.119
NO_2	(10^{-4} m^{-1}/pphm)	b_7	0.033	0.033	0.033	0.033
molecules	(10^{-4} m^{-1})	b_{RAY}	0.114	0.114	0.114	0.114

A baseline light extinction budget was determined for each empirical predictive equation using the mean measured values of the air quality components for the baseline year 1986. The light extinction budget for Riverside during the baseline emission year is summarized in Table 2-29. These show the percent contribution to total extinction from each component for each equation.

At Riverside light scattering by particles accounts for up to 87 percent of the total light extinction with secondary nitrate and carbon particles being dominant.

[1] Alternate equations in the set of empirical predictive equations defined for each measurement location.

TABLE 2-29

Current Light Extinction Budgets for Each Alternate Empirical Predictive Equation at Each Measurement Location[2]
(in percent of total light extinction)

Location	Alt Eq.	SULF	NITR	b_{sp} IONS	OC	CRBN	b_{ap}	b_{ag}	b_{RAY}
Riverside	1		58		29		8	2	3
	2			66		21	8	2	3
	3			62	25		8	2	3
	4		62			25	8	2	3

Predicted Future Air Quality

Future air quality levels are needed to estimate future visual air quality. The concentrations of the inorganic particulate matter species (sulfate and nitrate) for future years 2000, 2006, and 2010 are taken from the results of the UAM/LC modeling analysis.

Future concentrations of particulate organic carbon, particulate elemental carbon, and gaseous NO_2 are estimated from the mean annual concentrations measured during 1986 using linear rollback. Linear rollback assumes that the change in pollutant levels at any location in the Basin is linearly proportional to the expected change in basin-wide emission loading.

Future NO_2 concentrations are estimated from NO_X emissions, particulate organic carbon from emissions of VOCs and particulate elemental carbon from diesel particulate emissions. Natural background concentrations for each of these are assumed to be negligible for this analysis.

Table 2-30 gives the basin-wide emission totals for VOC, NO_X, SO_X and diesel particulate matter. Totals are given for 1987 (the baseline emission year) and for future years 2000, 2006, and 2010 with two emission control scenarios: baseline (no additional controls) and controlled.

[2] Based on mean annual average concentrations derived from 1986 measurements.

TABLE 2-30

Baseline and Future Controlled Emissions (tons per day)

Pollutant	1987	2000[b]	2006[b]	2010[b]	2000[c]	2006[c]	2010[c]
VOC	1818	914	826	820	866	623	378
NO_X	1303	889	752	712	864	635	514
SO_X	125	66	67	71	66	67	71
Diesel Particulate	20	9	7	6	9	7	6

[b] without AQMP control strategies
[c] with AQMP control strategies

Estimated future baseline and controlled levels for all pollutant species that affect visibility are shown in Tables 2-31.

TABLE 2-31

Riverside Air Quality Levels for the Years 2000, 2006, and 2010
Future Baseline and Controlled

	Units	Baseline	Controlled
2000			
SULF[1]	$\mu g/m^3$	7.9	7.9
NITR[1]	$\mu g/m^3$	30.7	29.8
IONS	$\mu g/m^3$	38.5	37.6
OC[2]	$\mu g/m^3$	5.6	5.3
EC[2]	$\mu g/m^3$	1.2	1.2
CRBN	$\mu g/m^3$	7.9	7.6
NO_2[2]	pphm	1.8	1.7
2006			
SULF[1]	$\mu g/m^3$	7.8	7.7
NITR[1]	$\mu g/m^3$	28.1	23.2
IONS	$\mu g/m^3$	35.8	30.9
OC[2]	$\mu g/m^3$	5.1	3.8
EC[2]	$\mu g/m^3$	0.9	0.9
CRBN	$\mu g/m^3$	6.9	5.5
NO_2[2]	pphm	1.5	1.3
2010			
SULF[1]	$\mu g/m^3$	7.9	7.8
NITR[1]	$\mu g/m^3$	27.4	17.2
IONS	$\mu g/m^3$	35.3	24.9
OC[2]	$\mu g/m^3$	4.9	2.3
EC[2]	$\mu g/m^3$	0.8	0.8
CRBN	$\mu g/m^3$	6.7	3.6
NO_2[2]	pphm	1.4	1.0

[1] From the results of the PM_{10} modeling; SULF = $(NH_4)_2\ SO_4/(1\text{-}RH)$ and NITR = $NH_4NO_3/(1\text{-}RH)$.
[2] Derived from 1986 measurements using linear rollback.

Future Visibility Projections

Riverside Future Mean Visibilities

Tables 2-32 and 2-33 compare the predicted future visibility with the current levels based on measurements. The results for the baseline emission scenario (no further emission controls) are shown in Table 2-32 and the results for the controlled emission scenarios are shown in Table 2-33. Each table shows the predicted annual average light extinction coefficients compared to the total light extinction coefficient derived from 1986 measurements and the mean visual range estimated from the measured and predicted extinction coefficients. Figure 2-30 illustrates the improvement in visibility in terms of the annual visual range for both emission control scenarios.

TABLE 2-32

Projected Future Visibility, Baseline without Future Controls

Year	Alt. Eq.[1]	Total Light Extinction Coefficient (10^{-4} m^{-1})	Calculated Visual Range (miles)
Baseline		3.9	4.8
2000	1	3.048	6.1
	2	3.109	6.0
	3	2.932	6.4
	4	2.968	6.3
2006	1	2.768	6.7
	2	2.806	6.6
	3	2.694	6.9
	4	2.713	6.9
2010	1	2.683	6.9
	2	2.726	6.8
	3	2.633	7.1
	4	2.658	7.0

[1] Alternate equations in the set of predictive empirical equations defined for each measurement location.

TABLE 2-33

Projected Future Visibility, With Controls

Year	Alt. Eq.[1]	Total Light Extinction Coefficient (10^{-4} m^{-1})	Calculated Visual Range (miles)
Baseline		3.9	4.8
2000	1	2.950	6.3
	2	3.019	6.2
	3	2.853	6.5
	4	2.897	6.4
2006	1	2.283	8.2
	2	2.345	7.9
	3	2.302	8.1
	4	2.348	7.9
2010	1	1.685	11.1
	2	1.755	10.6
	3	1.816	10.3
	4	1.877	9.9

[1] Alternate equations in the set of predictive empirical equations defined for each measurement location.

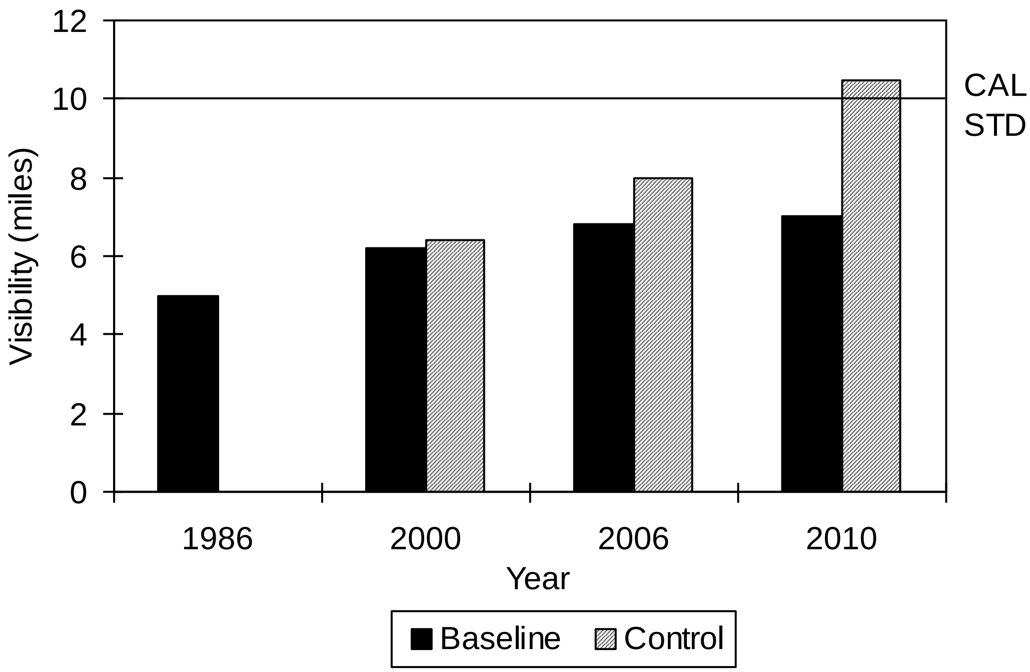


FIGURE 2-30

Annual Average Daytime Visibility Projections, Miles

For the baseline emission control scenario, there is a decrease in the total extinction coefficient from the baseline to the year 2010. The visual range in the Basin is expected to increase by about 2.4 miles from the base year to 6.2 miles in 2000. The visual range will subsequently increase 0.6 miles by 2006 to 6.8 miles and increase an additional 0.2 miles to 7.0 miles in 2010.

For the controlled emission scenario, the total extinction coefficient is reduced to less than half of the base year value. Corresponding visual range improves from 4.8 miles in the base year to approximately 10.0 miles in 2010. The predicted future visibilities are consistent with the observed annual average visual range in areas influenced by marine air (with the attendant marine haze). Without significant air pollution sources, median mid-day visibilities along the California coast are generally less than 25 miles (Trijonis, 1980).

Future Light Extinction Budgets at Riverside

Table 2-34 compares the baseline and future projected light extinction budgets determined from one of the alternate empirical equations for each location to illustrate changes in the importance of each pollutant component to overall light extinction. These changes result from alterations in the future pollutant mix and in the spatial distribution of sources.

TABLE 2-34

Comparison of Baseline and Future Projected Light Extinction
Budgets for Riverside (% contribution)

		Baseline			Controlled		
	1986	2000	2006	2010	2000	2006	2010
Riverside							
NITR	60	71	71	71	71	71	71
OC	29	19	19	19	19	17	14
EC	8	5	4	4	5	5	6
NO_2	2	2	2	2	2	2	2
RAY.	3	4	4	4	4	5	7

The light extinction budget for Riverside changes very little for the future baseline emission cases except for the following: (1) nitrate becomes a greater contributor; and (2) organic carbon contributions decrease from the base year then remain constant through 2010.

For the future controlled emission scenarios, the light extinction budget for the year 2000 is very similar to the future baseline budgets. The projected light extinction budgets for the years 2006 and 2010 with the controlled emission scenarios show much larger changes from the 1986 baseline, most notably from the smaller contribution by organic carbon and a nominal increase due to nitrate.

CONCLUSIONS

In general, visibility is a tangible indicator of air quality. Particulate matter in the atmosphere causes not only visibility reduction but also adverse health effects. In 1987, the U.S. EPA promulgated new National Ambient Air Quality Standards for PM_{10}. The annual average PM_{10} standard is 50 micrograms per cubic meter ($\mu g/m^3$) and the 24-hour average PM_{10} standard is 150 $\mu g/m^3$. Since PM_{10} measurements began in November 1984, PM_{10} concentrations have exceeded both federal PM_{10} standards over a large part of the South Coast Air Basin (Basin).

PM_{10} is a multicomponent pollutant including directly emitted primary particles and secondary particles resulting from the chemical transformations of the precursor gaseous emissions. Component specific modeling approaches are, therefore, required to assess selective contributions to the primary and secondary PM_{10}. The PM_{10} source apportionment of secondary organic particulates can be accomplished by receptor models and the secondary particles such as sulfate, nitrate and ammonium together with primary PM_{10} can be apportioned to its precursors utilizing the Urban Airshed Model with the Linear Chemistry (UAM/LC) module. Methodologies, such as speciated rollback, which infer future year PM_{10} based on component specific ambient data profiles and corresponding projected component emissions reductions, can be used to confirm and substantiate CMB and UAM/LC model predictions.

The Chemical Mass Balance (CMB) receptor model was used for source apportionment in the South Coast Air Basin. This method matches the measured chemical components of the PM_{10} samples with known chemical profiles, or signatures, of individual sources of PM_{10} particles. A special PM_{10} air sampling program was conducted covering the Basin in 1995. The 1995 PM_{10} data base was chosen for base year PM_{10} concentrations for the current PM_{10} modeling because it is the most comprehensive, up-to-date speciated PM_{10} data base available.

A 1995 gridded daily emissions inventory was estimated from the 1993 emissions inventory for the UAM/LC modeling application. The UAM/LC model was used to simulate sulfate, nitrate, ammonium and primary PM_{10} concentrations from precursor emission sources. UAM/LC uses gridded emissions of sulfur oxides, nitrogen oxide, ammonium and primary particulates, with meteorological, air quality, chemical, and physical processes, to calculate hourly estimates of each PM_{10} component, for all hours in the year. Aerosol formation is calculated empirically based on a set of equations that approximate the chemistry mechanism. Primary particulate and aerosol transport and diffusion is estimated using the UAM/LC.

Future PM_{10} air quality was estimated from existing and projected emission inventories. Most sources which are direct emitters of PM_{10} can be linearly related to measured PM_{10}. That is, for each ton of projected changes in PM_{10} emissions from a particular source (for example, unpaved road dust), a corresponding change in ambient PM_{10} can be calculated. Based on the combined UAM/LC and CMB models, and confirmed by the speciated rollback, the Basin will not attain the federal PM_{10} standards by the year 2000. With additional controls, the Basin will attain both standards by the year 2006 -- the latest year allowable under the 1990 revision to the federal Clean Air Act. PM_{10} air quality projections also indicate that both federal PM_{10} standards will be continue to be maintained through 2010.

In 1989, the California Air Resources Board established a new state visibility standard based on instrumental determination of the atmospheric extinction coefficient. The state visibility standard is 0.23 per kilometer of extinction coefficient with relative humidity less than 70 percent, averaged over the period 10 am to 6 pm. This standard is equivalent to the previous standard of 10 miles. Within the South Coast Air Basin (Basin), visibility is generally better in the coastal areas (average daytime visibility of about 8 miles in 1989) than inland (average daytime visibility of about 4 miles at Ontario in 1989).

Visibility in the Basin has shown improvement over the last 30 years; however, the California state visibility standard continues to be violated throughout the Basin. Median daily low visibilities are currently about 8 miles in the coastal areas and about 4 miles in the inland areas. Visibility impairment in the Basin is primarily due to the scattering and absorption of light by fine particles suspended in the atmosphere.

Without emission controls, visibility is predicted to improve only marginally. With the proposed emission controls, annual average visibility will improve from a range of approximately 5 miles at Riverside to 8 miles by 2006 and 10 miles by 2010. This level of improvement is consistent with visibilities experienced in the nonurban coastal areas of California that have little impact from man-made sources but are affected by marine haze.

Total extinction coefficient improves by more than 100 percent by the year 2010 with the implementation of controls. This corresponds to an improvement in the annual average visual range from less than 5 to more than 10 miles at Riverside by 2010.

CHAPTER 3

REVISION TO THE 1994 OZONE ATTAINMENT DEMONSTRATION PLAN

INTRODUCTION

Problem

In 1995 ozone air quality was at its cleanest levels since recording began. The annual maximum one-hour ozone concentration of 26 pphm was the lowest recorded South Coast Air Basin (Basin) maximum; and the Basin experienced the fewest number of violations of the state and federal ozone standards, and the fewest number of health advisories (≥15 pphm) and Stage I episodes (≥20 pphm). In spite of these record clean levels, the Basin continues to have the worst ozone air quality in the nation. In the Basin, the maximum ozone concentration (26 pphm) was 217% of the federal standard and 289% of the state standard. Los Angeles, Riverside, and San Bernardino counties had maxima above the Stage I episode level (20 pphm). Ozone concentrations in Orange county remained below the Stage I episode level, but exceeded the health advisory level (15 pphm). Maximum ozone concentrations in the Antelope Valley of the Mojave Desert Air Basin and Coachella Valley of the Salton Sea Air Basin (see Figure 3-1) were lower than in the Basin; however, peak ozone concentrations reached 14 pphm and 16 pphm in the Antelope Valley and Coachella Valley, respectively.

Regulatory Requirements

Projections of future air quality rely on the use of computer simulation models. The model used to project future ozone air quality and to determine the effectiveness of the proposed control strategies is the Urban Airshed Model (UAM) with the Carbon Bond IV mechanism (Morris and Myers, 1990). The South Coast Air Quality Management District (District) used the latest approved version of the UAM model, as recommended by the U.S. Environmental Protection Agency (U.S. EPA, 1991 & 1994) and the California Air Resources Board (ARB, 1992) for the modeling analysis of the 1997 Air Quality Management Plan (AQMP).

Air quality modeling is required by both the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA). Section 182(b)(1)(A) of CAA requires that moderate and above ozone nonattainment areas must reduce volatile organic compounds (VOC) and oxides of nitrogen (NO_x) emissions sufficiently to attain the national ambient air quality standard for ozone and an attainment demonstration must be performed using photochemical grid modeling. According to Section 181(a)(1) of the CAA, ozone nonattainment areas are classified and given an attainment deadline based on their design values. Within the jurisdiction of the District are the South Coast Air Basin (Basin), Antelope Valley of the Mojave Desert Air Basin, and Coachella Valley of the Salton Sea Air Basin (see Figure 3-1).[1] The Basin is classified as an extreme ozone nonattainment area and therefore has an attainment deadline of November 15, 2010. The attainment demonstration for the Basin is the primary

[1] Figures are placed at the end of the chapter.

subject of this chapter. The Antelope and Coachella valleys are classified as a "severe-17" ozone nonattainment areas and therefore have an attainment deadline of November 15, 2007. The modeling domain used in the photochemical modeling analysis, also shown in Figure 3-1, encompasses the entire Basin, Ventura County, Antelope Valley, and portions of the Mojave Desert Air Quality Management District (MDAQMD), the Coachella Valley, and San Diego county. Ventura county, classified as a severe ozone nonattainment area (attainment year: 2005), experiences pollutant transport from the Basin, and at times is an upwind source of pollution.

The CCAA requires the District to demonstrate reasonable progress towards achieving state ambient air quality standards in the Basin. The CCAA requires per-capita exposure reductions for the years 1994, 1997, and 2000, as compared to a 1986-88 base period. Overall per-capita exposure to ambient ozone must be reduced in accordance with the following schedule: 25 percent by 1994, 40 percent by 1997, and 50 percent by 2000. Photochemical grid modeling is the only tool available to evaluate projected exposure reduction in future years.

Table 3-1[2] shows the four meteorological episodes used for ozone air quality analysis, along with their peak measured ozone concentrations in the Basin and the Antelope and Coachella valleys. All four of these episodes were used for the ozone attainment demonstration in the 1994 AQMP. The June 5-7, 1985 ozone meteorological episode, which was used beginning with the 1989 AQMP, has been dropped from the modeling analysis since the unusually stagnant meteorological conditions associated with this episode rarely occur; the episode is more than ten years old; and model input parameters are more uncertain than for the 1987 episodes which are derived from the Southern California Air Quality Study (SCAQS). U.S. EPA guidelines suggest that meteorological episodes from 1987 to present be used for attainment demonstration.

In addition, the ARB Technical Modeling Guidelines provide a classification ranking of the confidence level of using meteorological episodes based on intensive field measurement data compared to episodes based on routine data collection. The June 1985 episode would not be considered acceptable for attainment demonstration purposes given the lack of upper air data needed to develop the wind fields and mixing height fields.

The meteorological conditions seen in the June 1985 episode may occur once or twice per year. However, the current form of the federal ozone air quality standard allows for one exceedance per year to account for these rare meteorological events. As such, a peak ozone concentration due to meteorological conditions in the June 1985 episode would be accounted for in the current form of the standard.

Note that the attainment demonstration is still based on multiple meteorological episodes. Control strategy decisions formulated in this Plan are based not on one worst-case

[2] Tables are placed at the end of the chapter.

meteorological episode but on a range of meteorological conditions, thereby reducing uncertainty in the control strategy's effectiveness.

As mentioned earlier, there are two downwind areas within the District's jurisdiction which have a CAA deadline of November 15, 2007. As shown in Figure 3-1, the modeling domain encompasses those areas and the June 23-25, 1987 meteorological episode exhibits transport to both the Antelope and Coachella valleys.

Per-capita exposure reductions are estimated using the state-of-the-science model called REHEX (Regional Human Exposure). The REHEX model, developed by Lurmann et al. (1989), accounts for differences in exposure due to indoor/outdoor environment, population mobility, and demographic activities (i.e., age group activity states). The model was updated for the 1994 AQMP specifically for ozone exposure estimates based on UAM results and has been updated for this Plan revision. The enhanced REHEX model uses updated time-activity patterns.

Ozone air quality is projected using the UAM for the following future years: 2000, 2007, 2010, and 2020. The year 2000 was chosen to address per-capita exposure reductions as required by the CCAA. The year 2007 is used in the discussion of federal attainment demonstration for the severe-17 nonattainment areas of Antelope and Coachella valleys. The year 2010 was chosen for UAM modeling to demonstrate attainment of the federal ozone standard in the South Coast Air Basin and the modeling in 2020 is used to provide information about demonstration of maintenance of the federal ozone standard.

EMISSIONS SUMMARY

Introduction

There are specific emission inventories developed for the photochemical modeling. The summer planning emission inventories developed for the historical years (1987, 1990, and 1993) and future planning years (baseline and controlled) are described in Appendix III. Baseline modeling inventories for both the historical year (1987) and the future years (2000, 2007, 2010, and 2020) are discussed next. Two emission projections are needed for each of the modeled future years. The first is the projected emissions assuming no further emission controls. These projections are commonly referred to as "baseline emissions" (e.g., 2010 baseline emissions), and reflect the emissions resulting from increases in population and vehicle miles traveled (VMT), as well as the implementation of all adopted rules and regulations up to December 31, 1995. The second emission projections reflect the implementation of the 1997 AQMP control measures on the future baseline emissions. For a detailed description of the 1997 AQMP control measures, the reader is referred to the main volume and Appendix IV. All tables and figures are placed at the end of the chapter.

The 1987 historical year emissions are summarized first for each of the ozone episodes used for attainment demonstration. This is followed by a discussion of the future-year baseline emission inventories. Finally the future-year emission inventories, assuming implementation of proposed control measures, are presented. Appendix III contains emission summary reports by source category for the historical base year, future baseline, and future controlled scenarios used in this modeling analysis. Attachments B, C, and D of this appendix contain an emissions summary report by source category for the historical base year, future baselines, and future controlled scenarios, respectively, used in this modeling analysis (reported for the first day of the August 26-28, 1987 episode). It should be noted that the inventories reported here may be slightly different than those reported in the 1997 AQMP and Appendix III, since the inventories used for modeling reflect day-specific conditions.

Historical Baseline Emissions

Historical baseline emissions of oxides of nitrogen (NO_x) and volatile organic gases (VOC) are summarized in Table 3-2 for each of the meteorological episodes used for modeling. The summaries of on-road mobile, off-road mobile, and stationary source emissions are reported for the Basin and the modeling region. Emissions for each of the 1987 episodes are similar. The difference is mainly due to day-specific temperature effects on the on-road motor vehicle exhaust and evaporative categories.

Future Baseline Emissions

The 2000, 2007, 2010, and 2020 baseline emissions are summarized in Table 3-3. Table 3-3 presents emissions for the first day of the August 1987 episode. Future-year emission estimation techniques are similar for all episodes. Differences among the episodes, mainly due to differences in temperature-sensitive emissions, are less than 50 tons/day or 5 percent. These inventories reflect the emissions resulting from increases in population and vehicle miles traveled (VMT), as well as the implementation of all rules and regulations adopted as of September 30, 1996. VOC and NO_x baseline emissions decrease from the historical base year through the year 2010 and then increase thereafter. This decreasing trend in emissions reflects the implementation of current state and local air quality rules and regulations. The trend reversal after 2010 for VOC and NO_x is due mainly to population growth overtaking the strides made by air pollution regulations.

Future Controlled Emissions

The control factors developed from the Controlled Emission Projection Algorithm (CEPA) program are applied to the future base year emissions to calculate the controlled emission inventories. Future-year controlled emissions, estimated from the baseline emissions using the CEPA control factors, are given in Table 3-4. Table 3-4 presents emissions for the first day of the August 1987 episode. Basin NO_x emissions in 2010 are proposed to be controlled to about 524 tons/day from projected baseline levels of about 739 tons/day. Basin VOC emissions in 2010 are proposed to be controlled to about 402 tons/day from baseline levels of about 904 tons/day.

MODELING METHODOLOGY

Introduction

The methodology used in modeling ozone is presented next. Since much of the methodology is the same as that used in the 1994 AQMP, the reader is referred to Technical Reports V-A and V-B of the 1994 AQMP for a more complete discussion. Discussion here is limited to the areas in which the procedures used for the 1997 AQMP differ from those used for the 1994 AQMP. First the methods used to develop the inputs are discussed, then the performance of the model is described. This section includes a discussion of some of the uncertainties present in the modeling analysis.

Input Development

The inputs used for ozone air quality modeling for the 1997 AQMP are the same as those used for the 1994 AQMP, with one exception. The exception is the VOC initial conditions for the June 23-25 1987 episode. When this episode was used for the 1994 AQMP, the peak value for the first day was unrealistically high. The predicted peak was 45.4 pphm compared to a measured peak of 20 pphm. Upon closer examination, the high predicted peak value was determined to be the result of high initial concentrations of VOC. These high concentrations were, in turn, caused by a measured value of VOC at West Los Angeles (1.7 ppmC) which was significantly higher than those measured at nearby stations, such as Downtown Los Angeles (0.2 ppmC) during the same time period. As a result, it was determined that the value at West Los Angeles was incorrectly measured or was representative of an anomalous condition. It was therefore not used in developing the initial condition inputs. The peak ozone concentration for the first day was more accurately predicted to be 21 pphm with this modification (i.e., more realistic estimate of initial conditions).

Model Performance

The model performance for each of the four episodes is presented in Tables 3-5 to 3-8. The regional performance statistics are given in Attachment E. The performance goals for regional ozone are as follows:

Statistic for O_3	Criteria (%)	Comparison Basis

Normalized Gross Bias	≤ ±15	Paired in space and time
Normalized Gross Error	≤ 35	Paired in space (+2 grid cells) and time
Peak Prediction Accuracy	≤ ± 20	Unpaired in space and time

In the tables, the columns marked "base" give results using the current best estimate of the emissions inventory. Similar to the 1994 AQMP model performance the episodes do not meet the above goals. However, the August 1987 episode meets the criterion for gross error on August 28. The gross bias is at least 26% for all of the episodes. The error in the peak is at least 32%. It has been speculated that on-road VOC emissions may be significantly underestimated which could explain some of the under-prediction. For the 1994 AQMP, a number of sensitivity studies were performed on the effect of possible under-estimation of motor vehicle emissions on the UAM results. The sensitivity analyses showed that increasing the motor vehicle emissions for the 1987 fleet significantly reduced the underpredictions. The reader is referred to that document for a further discussion of the analysis. This uncertainty will be discussed in more detail in the next section.

Even though the UAM is currently underpredicting the historical base years, the UAM is still the best available computer model for use in demonstrating attainment of the federal ozone air quality standard. It is the U.S. EPA and ARB recommended model and a requirement of the federal Clean Air Act [Section 182 (c)(A)]. The 1991 version of the U.S. EPA Guidelines for Regulatory Application of the Urban Airshed Model provides recommended procedures for the application of the UAM in such circumstances. In addition, the 1991 guidelines states that the attainment demonstration should show that all future ozone levels be at or below 12.0 pphm. However, U.S. EPA has indicated that it may revise previous guidance and the EPA would accept attainment demonstrations which show ozone concentration levels up to 12.4 pphm. This is more consistent with the air quality monitoring approach used to demonstrate attainment.

The 1994 U.S. EPA Guidance on Urban Airshed Model (UAM) Reporting Requirements for Attainment Demonstration, states that "If, after review of the input data, significant uncertainty remains as to the 'best' base case conditions, the State may choose to perform additional modeling to assess the effect of this uncertainty on model performance....While uncertainty analyses are not required by the EPA as part of the model performance evaluation, the results of such tests may provide the State with additional support for various control strategies." Thus, the model can still be used for attainment demonstration purposes. The on-road mobile source emissions uncertainties have focused on older vehicles whereas newer vehicles and future vehicles are expected to be more durable and that with future motor vehicle programs and technological improvements such as on-board diagnostic (OBD) requirements, projected future-year mobile emissions would not have the uncertainties seen with the historical year vehicles.

In addition to the sensitivity studies just mentioned, the 1994 AQMP also contains sensitivity studies on the effects of boundary and initial conditions. The reader is referred to that document for more details.

Effect of Emissions Uncertainties

As a part of the 1987 Southern California Air Quality Study (SCAQS), a tunnel study was performed in Van Nuys, CA, to measure vehicle emission rates for vehicles actually in use in the Basin [Ingalls, et al. (1989, 1990)]. The NO_x emission rates agreed reasonably well with EMFAC7C, the version of the ARB emission factor program used at that time. CO and hydrocarbon emission rates were higher by a factor of 2.7±0.8 and 4.0±1.8, respectively. Previous concerns by modelers and these in-use studies led to emission inventory analyses that compared CO/NO_x and VOC/NO_x ratios seen in ambient measurements with those seen in the emission inventories. These analyses were performed for the peak morning emission hours, before photochemical and other reactions can significantly alter the ambient concentrations. Fujita et al. (1992) concluded that the emission inventory underestimates the ambient VOC/NO_x ratio by a factor of 2.0 to 2.7.

More recently, a study was performed in the Van Nuys and Sepulveda tunnels [Gertler et al. (1996)]. The purpose of this study was to update the previous tunnel studies. The ratio of the observed pollutant concentrations to those obtained from EMFAC7F was calculated for various pollutants for each of the tunnels. The average ratio of predicted to observed pollutant concentrations for the Van Nuys tunnel study was 2.55, 1.39 and 1.14 for CO, VOC and NO_x, respectively. For the Sepulveda tunnel, the corresponding ratios were 2.22, 1.93 and 1.04.

In order to assess the impact of possible under-estimation of mobile vehicle emissions on the UAM performance results, a series of runs was conducted with an increased emissions inventory. For these runs, on-road catalytic and non-catalytic vehicle hot exhaust VOC emissions are increased by a factor of about 3.4. This increase reflects about a factor of 2 increase in overall on-road VOC emissions. The results are shown in Tables 3-5 to 3-8 in the columns labeled "Doubled MV VOC." The regional performance statistics are shown in Attachment F. The results for each episode are briefly summarized below.

For the August 1987 episode, the effect of the enhanced emissions on performance for ozone is dramatic. With the regular emissions inventory, only the gross error criterion was met, and then only on the last day. With the enhanced inventory, all of the criteria are met on all days.

For the June 1987 episode, with the standard inventory, none of the goals were met for ozone. With the enhanced inventory, the unpaired peak and gross error criteria were met for both days.

For the July 1987 and September 1987 episodes, all of the goals were met for ozone with the increased emissions.

Comparisons of the hourly average predictions and observations of ozone at each monitoring station for the August 1987, June 1987, July 1987, and September 1987 episodes are given in Figures 3-2 through 3-5, respectively. Shown in each of the figures are the observed ozone concentrations and the predicted concentrations for the baseline emission scenario and the doubled on-road VOC emissions case.

ARB has a short- and long-term research program to improve the mobile source emission inventory program (Maldonado et al., 1993). The emission factor model (EMFAC) has been systematically improved with each release. For example, EMFAC7G included the following improvements:

- starts redefined and redistributed by vehicle age,
- start emission methodology modified to address variable soak times,
- high emitter adjustment factor added,
- adjustment made for real world driving patterns, and
- benefits of the Enhanced Inspection and Maintenance Program incorporated in the model.

These improvements to EMFAC have resulted in increased VOC, NO_x, and CO emissions. However, there are still a number of areas where improvements are necessary and in most instances forthcoming. For example, ARB continues to look at:

- developing a test cycle that better represents California driving conditions than the Federal Test Procedure (FTP),
- improving off-cycle emissions,
- developing activity and population data at finer spatial resolution than the air basin level, and
- developing the next generation of network simulation models.

The results of some of these studies have been incorporated into EMFAC7G. Many of the remaining uncertainties in the on-road mobile source emissions will be reduced or eliminated through ARB's research program and it is expected that on-road emission sensitivity analyses will not be necessary in the future.

OZONE AIR QUALITY PROJECTIONS

Introduction

The future-year ozone modeling results are discussed in this section. First, the various modeling scenarios are listed and described, followed by the future-year Urban Airshed

Model (UAM) results. The calculated future-year ozone concentrations for each of the projected baseline emission scenarios are discussed, followed by a discussion of the ozone air quality improvements with implementation of the proposed control measures. Calculations of the reduction in per-capita exposure to ozone are also discussed.

Modeling Scenarios

UAM simulations were conducted for the historical base year (1987), future year base emission scenarios (2000, 2007, 2010 and 2020), and future year controlled scenarios (2000, 2007, 2010 and 2020). Historical year modeling and model performance evaluation are discussed earlier. The impact of base and controlled emissions on ozone air quality is projected for all modeling episodes for the years 2000, 2007 2010 and 2020. The baseline and controlled emission projections for the historical and future years are given in Tables 3-2 and 3-3.

Projection of Future Baseline Air Quality

The future baseline results (i.e., no further controls) on the primary day of each meteorological episode are presented in Figure 3-6.

UAM-predicted basinwide maximum hourly ozone concentrations in future years for the August 1987 episode (August 28) are given in Figures 3-7 to 3-10. Regional peak concentrations change by less than 0.5 pphm over the period, 2000 to 2020. Ozone concentrations remain above the state health advisory level for all years.

UAM-predicted basinwide maximum hourly ozone concentrations in future years for the June 1987 episode (June 25) are given in Figures 3-11 to 3-14. The location of the peak impact areas is somewhat different for this episode. There is a peak area north of the San Fernando Valley, which is similar to the August episode. The other peak area is in the east basin, running from Perris to east of Big Bear. This peak area extends much further to the east than the other episodes. This is in agreement with the strong eastward transport associated with the episode (see Technical Reports V-A and V-B of the 1994 AQMP). Ozone concentrations remain at or above the state health advisory level for all years.

UAM-predicted basinwide maximum hourly ozone concentrations for the July 1987 episode (July 14) are given in Figures 3-15 to 3-18. The peak, which is significantly less than the other episodes, occurs in the east basin. Peak concentrations remain between 12 and 13 pphm for all years.

UAM-predicted basinwide maximum hourly ozone concentrations for the September 1987 episode (September 8) are given in Figures 3-19 to 3-22. As in the June 1987 case there is transport to the east, with the peak occurring in the northeast part of the east basin, between Hesperia and Banning. In 2010 and 2020, the peak shifts westward to Orange

County and Los Angeles County, respectively. Ozone concentrations remain below the state health advisory level but above the federal standard.

Estimation of Control Strategy Effectiveness

Future ozone air quality projections using the UAM are calculated for the ozone meteorological episodes with the implementation of proposed control measures. The future years modeled are 2000, 2007, 2010 and 2020. The future controlled scenario results on the measured peak day of each meteorological episode are presented in Figure 3-23. Differences between peak ozone projections for the baseline and controlled emissions scenarios are small (less than 1 pphm) for the year 2000. These differences increase for the year 2007. Levels near the state health advisory of 15 pphm are still seen in two episodes through the year 2000. By the year 2010 with implementation of the proposed control strategy, the federal ozone standard is attained for all episodes. As with the previous section, the future controlled modeling results are discussed individually for each of the episodes. The results are summarized by means of spatial maps of maximum hourly ozone concentrations on the measured peak day of each episode.

UAM-predicted basinwide maximum hourly ozone concentrations for the future years with implementation of the proposed control measures for the August 1987 episode (August 28) are given in Figures 3-24 to 3-27. The basin peak concentration in 2010 is projected to be less than 12 pphm. With the exception of small areas near Norco and Perris, ozone concentrations in the rest of the basin are expected to be below 10 pphm.

UAM-predicted basinwide maximum hourly ozone concentrations for the future years with implementation of the proposed control measures for the June 1987 episode (June 25) are given in Figures 3-28 to 3-31. By the year 2000, the federal ozone standard would be achieved in Orange County and the coastal and foothill portions of Los Angeles County. The federal ozone standard is achieved in 2010, with the Basin peak concentration of less than 12 pphm, located north of Banning. With the exception of an area in Riverside and San Bernardino County, ozone concentrations in the rest of the basin are expected to be below 10 pphm.

UAM-predicted basinwide maximum hourly ozone concentrations for the future years with implementation of the proposed control measures for the July 1987 episode (July 14) are given in Figures 3-32 to 3-35. The federal ozone standard is achieved in 2010. The state ozone standard is achieved everywhere except for one 5 by 5 km grid cell near Redlands.

UAM-predicted basinwide maximum hourly ozone concentrations for the future years with implementation of the proposed control measures for the September 1987 episode (September 8) are given in Figure 3-36 to 3-39. The federal ozone standard is achieved in 2010, with the Basin peak concentration of slightly greater than 10 pphm.

Future-Year Air Quality in Other Areas

As was mentioned earlier, the 1997 AQMP addresses the issue of transport of ozone and precursor pollutants into the Antelope Valley, Coachella, and the Mojave Desert. The attainment year for Antelope Valley is 2007. UAM-predicted maximum ozone concentration maps for the year 2007 are presented in Figures 3-40 through 3-47 for the primary day of each of the four modeling episodes. For the baseline scenario, only the June 1987 episode violates the federal standard. UAM-predicted maximum ozone concentration maps for the year 2007 with the implementation of the proposed control measures are presented in Figures 3-44 through 3-47 for the primary day of each of the four modeling episodes. All areas of the Antelope Valley demonstrate attainment of the federal ozone standard in 2007.

The attainment year for the Coachella Valley is also 2007. UAM-predicted maximum ozone concentration maps for the year 2007 are presented in Figures 3-48 through 3-55 for the primary day of each of the four modeling episodes. For the baseline scenario, only the September 1987 episode violates the federal standard. UAM-predicted maximum ozone concentration maps for the year 2007 with the implementation of the proposed control measures are presented in Figures 3-52 through 3-55 for the primary day of each of the four modeling episodes. All areas of the Coachella Valley demonstrate attainment of the federal ozone standard in 2007.

As with the Antelope and Coachella valleys, the attainment year for the Mojave Desert Air Basin is 2007. UAM-predicted maximum concentration maps for the year 2007 with the implementation of the proposed control measures are presented in Figures 3-25, 3-29, 3-33, and 3-37 for the August 1987, June 1987, July 1987, and September 1987 episodes, respectively. The figures show that the Mojave Desert Air Basin is projected to meet the federal one-hour ozone standard by 2007. However, the state ozone standard may still be exceeded in the southern portion of the air basin near the communities of Victorville, Hisperia, and Barstow (i.e., VICT, HESP, and BARS on the maps). Areas north and northwest of those communities are projected to meet the state standard by 2007.

Pollutant transport to Ventura County is clearly seen in the August 1987 and June 1987 historical year modeling. With implementation of the proposed control strategy, no exceedances of the federal ozone standard are seen for these episodes in the year 2000, and no exceedances of the state ozone standard are seen in the year 2010.

Future-Year Population Exposure Reductions

The CCAA requires assessment of per-capita exposure to ambient ozone. It sets forth a schedule for population exposure reductions based on the average level of exposure experienced during the 1986-88 period. The schedule for exposure reductions is 25 percent reduction by December 31, 1994, 40 percent reduction by December 31, 1997, and 50 percent reduction by December 31, 2000.

The baseline ozone air quality data for the period 1986-1988 and the 1987 population data serve as the basis for the exposure reduction calculations. A set of air quality monitoring stations that measure ambient ozone concentrations continuously during the baseline period is compiled. Gridded population data for 1987 and projections for the years 2000 and 2010 were obtained from the Southern California Association of Governments (see Appendix III). Gridded population estimates for 1997 are estimated by linear interpolation. The meteorological classification (Horie, 1987; Technical Report V-A of the 1991 AQMP) for each day in the base period is also determined. This information is needed so that the proper reduction factor, based on modeling projections, is applied to each day in the three-year period.

The Regional Human Exposure (REHEX) model, was also used to estimate population exposure reductions. The reader is referred to Technical Report V-H of the 1991 AQMP for a detailed description of the REHEX model. The model was recently enhanced to include 1990 Census data.

The 1997 exposure reductions are calculated using ambient measurements from the 1995 period. The 1995 per-capita exposure to ozone satisfies the exposure reduction requirements for 1997. Since emissions will be reduced between 1995 and 1997, this approach predicts that the 1997 goals for exposure reduction will be met. Note that this approach is conservative.

Based on implementation of the proposed control measures, Figure 3-56 shows the calculated reductions in per-capita ozone exposure above the state ozone standard from the 1986-88 base period for the years 2000 and 2010. The CCAA does not have any requirements beyond the year 2000, so only the REHEX estimates are provided for 2010. This confirms that, with the implementation of the proposed control measures, per-capita ozone reductions will exceed the CCAA requirements. Figure 3-57 shows the projected hours of ozone exposure above the state ozone standard by age. Children, which experience the greatest ozone exposure, show the most dramatic reductions in ozone exposure with the implementation of the proposed control measures. Figure 3-58 shows the projected hours of ozone exposure above the state ozone standard by county. Riverside and San Bernardino counties, which experience the greatest ozone exposure, show the most dramatic reductions in ozone exposure with the implementation of the proposed control measures.

SENSITIVITY STUDIES

Introduction

Previous revisions of the AQMP have dealt with the uncertainties in the results caused by uncertainties in the emissions. These issues are revisited in this section. The following areas of uncertainty are considered:

- future controlled on-road emissions,
- biogenic emissions,
- relative importance of stationary source and mobile source control, and
- an alternate land use for the Agricultural Preserve in San Bernardino County, and
- weekend emissions effects.

The results of this set of sensitivity studies are summarized in Table 3-9.

Future On-Road Emissions Uncertainty

Previous studies have indicated that there may be problems in the estimation of mobile source emission inventories. In particular, the amount of VOC emissions may be significantly under-estimated (Technical Report V-B of the 1994 AQMP). In order to assess the impact of this uncertainty on attainment of air quality standards, sensitivity runs were made. For these runs, the 2010 baseline on-road catalytic and non-catalytic vehicles hot exhaust VOC emissions were increased by a factor of about 3.4 (the factor used to analyze the model performance discussed earlier). The AQMP controls are then applied to the enhanced motor vehicle inventory. These runs were made using the June 1987 and August 1987 episodes since these are the last two episodes to attain the ozone standard. Figures 3-59 and 3-60 show the spatial pattern of the maximum ozone concentration for the two episodes simulated. These figures should be compared to Figures 3-26 and 3-30, respectively. With the increased emissions, peak values increased slightly. The June 1987 episode experiences the largest increase with a peak value of 12.1 pphm.

Biogenic Emissions Uncertainty

The other source of uncertainty considered is the biogenic emissions. Sensitivity analyses performed for the 1991 AQMP showed that the future controlled simulations can be very sensitive to biogenic emission uncertainties even though the historical baseline simulations are relatively insensitive (see Technical Reports V-B and V-C of the 1991 AQMP). For these simulations, the amount of biogenic emissions present was doubled in the 2010 controlled scenario and the June 1987 and August 1987 episodes were used. Figures 3-61 and 3-62 show the spatial pattern of the maximum ozone concentrations; compare these to Figures 3-26 and 3-30, respectively. With the increased emissions, both episodes will have peaks values above 12 pphm. Again, the June 1987 episode experiences the largest increase with a peak value above 13 pphm.

Stationary Versus Mobile Source Emissions Impacts Study

The impact of stationary and mobile source emissions is considered in a simple emissions sensitivity study using the August 1987 and June 1987 episodes. For the 2010 baseline emissions scenario (i.e., without implementation of the proposed 1997 AQMP control strategy), emissions from stationary sources or from mobile sources (on-road and off-road) were removed from the baseline emissions. Mobile sources represent nearly 85 percent of the NO_x emissions in the 2010 baseline inventory. Stationary sources represent nearly 70 percent of the anthropogenic VOC emissions. The peak concentration is smaller than the baseline results in both cases (see Table 3-9). Local concentrations increase in the mid-basin, from downtown Los Angeles to Pomona, when all mobile source emissions are removed; concentrations decrease dramatically farther downwind; compare Figures 3-63 and 3-64 to Figures 3-9 and 3-13, respectively. This is consistent with the removal of nearly 85 percent of the NO_x emissions. When stationary source emissions are removed, concentrations in most of the Basin dramatically decrease; compare Figures 3-65 and 3-66 to Figures 3-9 and 3-13, respectively. This is consistent with a large reduction in VOC emissions. Ozone exceedances are projected when mobile source emissions are completely removed; however, if stationary source emissions are completely removed, peak concentrations are predicted to be well below the federal ozone standard (see Table 3-9). Realistically, neither the stationary nor the mobile source emissions can be removed completely. This sensitivity analysis illustrates the relative importance of the stationary and mobile source emissions in 2010 and that by 2010 changes in ozone concentrations may be more sensitive to changes in stationary source VOC emissions.

Modified Land Use for the Agricultural Preserve

Control measure WST-01 (i.e., Emission Reductions from Livestock Waste) proposes a 50 percent reduction of ammonia (NH_3) emissions by 2006 and 2010 either through control or relocation; the reader is referred to Appendix IV for more details. The 1997 AQMP did not propose or speculate on an alternate land use for this agricultural land if the dairies relocate. A sensitivity analysis is provided here to address this issue. It is assumed that the dairy emissions (VOC, PM_{10}, and NH_3) are reduced 50 percent through relocation and their activity is replaced by residential-type activity. To simulate the emission changes of this assumption, on-road emissions from a nearby grid cell, containing the city of Diamond Bar, are added to each of the nine grid cells containing the Agricultural Preserve which contains most of the Basin's dairy farms. The year 2010 is modeled for the August 1987 and June 1987 episodes and the results are summarized in Table 3-9 and Figures 3-67 and 3-68 for the peak day for each episode. These results should be compared to the 2010 controlled scenarios shown in Figures 3-26 and 3-30, respectively. The effects of this emission sensitivity test are not discernible from the figures. However, the Basin peak concentration is increased slightly (by 0.1 pphm) for the August 1987 episode probably due to the increased VOC emissions and the peak is reduced slightly (by 0.2 pphm) for the June 1987 episode possibly due to increases in NO_x emissions.

Sensitivity Analysis of Weekend Emissions Effects

In recent years ambient ozone measurements indicate a faster decrease in Stage I episodes (days with ozone concentrations greater than 20 pphm) on weekdays compared to weekends. Figure 3-69 shows a comparison of the number of federal exceedances on weekdays versus weekends. As shown in the Figure 3-69, the number of weekday exceedances is decreasing faster compared to the weekends. To address concerns that future exceedances may occur more often on weekends, a sensitivity analysis using the August 1987 and June 1987 episodes was conducted. Since meteorology varies independent of the day of the week, differences between weekday and weekend emissions are likely key. During the work week, stationary source emissions are higher as more businesses operate. Motor vehicle emissions peak in the morning and evening rush hours. On weekends, stationary source emissions are lower and motor vehicle emissions build to a plateau sustained through much of the day (see Figure 3-70). Sufficient information to generate a weekend stationary and area source emissions inventory are available. However, information on on-road mobile source travel patterns are not readily available. For the sensitivity analysis, typical weekday emissions patterns (by hour) were used to create an hourly emissions pattern based on the assumption that there are more travel related activity during the afternoon and early evening hours and less travel during the typical weekday morning commute hours. In addition, an assumption that 50 percent of the heavy-duty truck emissions do not occur on weekends was made to represent less commercial activity on weekends. The estimated weekend inventory was used as the emissions for the third day of the air quality simulation. The results of the sensitivity analysis show that the peak ozone would increase to 12.4 pphm (see Table 3-9 and Figures 3-71 and 3-72). Further work is needed to fully quantify the weekend episode phenomena. The field measurement discussed in the next section will provide additional information on the weekend effects for future AQMP revisions.

Future Field Measurement Program

The Air Resources Board, San Diego County Air Pollution Control District, South Coast AQMD, Ventura County Air Pollution Control District, the U.S. Environmental Protection Agency, and the U.S. Navy are proposing the 1997 Southern California Ozone Study (SCOS97). The goals of the study are twofold:

(1) update and improve the existing aerometric and emission databases and model applications for simulating urban-scale ozone episodes in southern California, and

(2) quantify the contributions of upwind air basins to local exceedances of the state and federal ozone standards in southern California.

The District has used SCAQS episodes to evaluate its proposed control strategies beginning with the 1991 AQMP. These episodes are almost ten years old and the air quality improvements since SCAQS have been quite dramatic. Thus, SCOS97 is designed to provide southern California air districts with modeling episodes to satisfy their planning requirements into the next century.

Given the concerns on the on-road mobile emissions, an effort will be made to work closely with SCAG and Caltrans to collect specific vehicle traffic pattern and vehicle activity data to further enhance the mobile emissions inventory. In addition, the proposed 1997 sampling program is designed to capture transport events and thus transport analyses in future plans can be improved by the data collected under SCOS97.

SUMMARY AND CONCLUSIONS

The 1994 Ozone Attainment Demonstration Plan is revised here using the most up-to-date emissions, socioeconomic data, and control strategy. Photochemical modeling using the Urban Airshed Model indicates that the proposed control strategy will eliminate health advisories (≥15 pphm) around the year 2000 and will bring the entire South Coast Air Basin into compliance with the federal ozone standard by the year 2010. Regional maximum ozone concentrations in the year 2010 will be between 9 and 12 pphm for the four meteorological episodes simulated here. Ozone air quality conditions will improve dramatically for the residents of the Basin; per-capita exposure to unhealthful levels of ozone is projected to decrease 90 percent relative to 1986-88 levels.

Transport of ozone and its precursors to the Antelope and Coachella valleys is also addressed here. The attainment deadline for both areas is November 15, 2007. Photochemical modeling indicates that the attainment deadline will be met for both the Antelope and Coachella valleys. Future AQMP revisions will continue to evaluate ozone transport. It is hoped that the SCOS97 sampling program will capture a meteorological episode which better represents transport into the Antelope Valley and other downwind air basins.

TABLE 3-1

Ozone Meteorological Episodes Used for the Ozone Attainment Demonstration

	Peak Ozone Concentration (pphm)			
Episode	South Coast A.B.	Antelope Valley	Coachella Valley	Introduced in the
August 26-28, 1987	29	10	16	1991 AQMP
June 23-25, 1987	24	15	16	1991 AQMP
July 13-15, 1987	25	12	16	1994 AQMP
September 7-9, 1987	33	12	15	1994 AQMP

TABLE 3-2

1987 Historical Episode Emissions (tons/day)*

		South Coast Air Basin			Modeling Region		
Episode	Source Type	VOC	NO_x	CO	VOC	NO_x	CO
August 1987	On-Road	920	765	6733	1019	864	7478
	Off-Road	138	363	1682	150	426	1760
	Stationary	911	251	98	996	307	140
	Total	**1969**	**1379**	**8513**	**2165**	**1597**	**9378**
June 1987	On-Road	928	765	6750	1052	867	7494
	Off-Road	137	363	1678	149	426	1756
	Stationary	911	251	99	995	309	140
	Total	**1976**	**1379**	**8527**	**2196**	**1602**	**9390**
July 1987	On-Road	926	756	6549	1022	858	7282
	Off-Road	137	363	1676	149	426	1754
	Stationary	912	252	99	995	307	140
	Total	**1975**	**1371**	**8324**	**2166**	**1591**	**9176**
September 1987	On-Road	1021	757	6594	1133	859	7348
	Off-Road	137	363	1676	149	426	1754
	Stationary	911	252	100	996	307	140
	Total	**2069**	**1372**	**8370**	**2278**	**1592**	**9242**

* Emissions are for the first day of each episode.

TABLE 3-3

Future Baseline Episode Emissions (tons/day)*

		South Coast Air Basin			Modeling Region		
Year	Source Type	VOC	NO_x	CO	VOC	NO_x	CO
2000	On-Road	331	515	2891	387	599	3351
	Off-Road	125	298	1584	139	377	1693
	Stationary	515	111	82	609	181	119
	Total	**971**	**924**	**4557**	**1135**	**1157**	**5163**
2007	On-Road	190	386	1959	226	454	2299
	Off-Road	136	268	1710	150	348	1831
	Stationary	582	108	94	686	180	133
	Total	**908**	**762**	**3763**	**1062**	**982**	**4263**
2010	On-Road	152	361	1769	183	426	2088
	Off-Road	134	268	1683	148	349	1797
	Stationary	618	110	100	723	184	138
	Total	**904**	**739**	**3552**	**1054**	**959**	**4023**
2020	On-Road	107	366	1669	133	440	2015
	Off-Road	146	280	1806	160	354	1927
	Stationary	720	115	113	840	196	155
	Total	**973**	**761**	**3588**	**1133**	**990**	**4097**

* Emissions are for the first day of the August 1987 episode.

TABLE 3-4

Future Controlled Episode Emissions (tons/day)*

		South Coast Air Basin			Modeling Region		
Year	Source Type	VOC	NO_x	CO	VOC	NO_x	CO
2000	On-Road	322	504	2741	378	587	3201
	Off-Road	124	297	1584	137	375	1693
	Stationary	471	98	77	566	168	114
	Total	**917**	**899**	**4402**	**1081**	**1130**	**5008**
2007	On-Road	155	329	1602	187	386	1918
	Off-Road	101	214	914	114	270	1007
	Stationary	370	84	86	465	156	124
	Total	**626**	**627**	**2602**	**766**	**812**	**3049**
2010	On-Road	76	280	1207	101	331	1495
	Off-Road	60	163	549	71	207	623
	Stationary	266	81	90	365	156	130
	Total	**402**	**524**	**1846**	**537**	**694**	**2248**
2020	On-Road	51	270	1123	74	330	1447
	Off-Road	65	172	599	77	215	677
	Stationary	315	85	105	423	166	146
	Total	**431**	**527**	**1827**	**574**	**711**	**2270**

* Emissions are for the first day of the August 1987 episode.

TABLE 3-5

Comparative Performance Statistics for the August 1987 Episode

Statistic	August 27, 1987		August 28, 1987	
	Base	Doubled MV VOC	Base	Doubled MV VOC
Ozone Threshold (pphm)	8.0	8.0	10.0	10.0
Ratio of Predicted Basin Peak to Peak Observed	0.71	1.05	0.77	1.19
Ratio of Unpaired Station Peaks	0.60	**0.96**	0.59	**0.93**
Systematic Bias (%)	-35	**-14**	-26	**2**
Gross Error (%)	38	**26**	**29**	**20**
NO2 Threshold (pphm)	2.0	2.0	2.0	2.0
Ratio of Unpaired Station Peaks	0.75	0.84	0.90	0.98
Systematic Bias (%)	-7	-5	19	20
Gross Error (%)	47	49	58	60
VOC Threshold (pptm)	1.0	1.0	1.0	1.0
Ratio of Unpaired Station Peaks	0.16	0.22	0.18	0.26
Systematic Bias (%)	12	50	12	21
Gross Error (%)	76	101	54	72

Bold indicates numbers meeting performance goals.

TABLE 3-6

Comparative Performance Statistics for the June 1987 Episode

Statistic	June 24, 1987		June 25, 1987	
	Base	Doubled MV VOC	Base	Doubled MV VOC
Ozone Threshold (pphm)	8.0	8.0	8.0	8.0
Ratio of Predicted Basin Peak to Peak Observed	0.81	1.29	0.88	1.07
Ratio of Unpaired Station Peaks	0.62	**0.91**	0.65	**0.92**
Systematic Bias (%)	-44	-24	-40	-19
Gross Error (%)	47	**30**	42	**32**
NO2 Threshold (pphm)	2.0	2.0	2.0	2.0
Ratio of Unpaired Station Peaks	1.19	1.35	1.13	1.18
Systematic Bias (%)	6	8	2	4
Gross Error (%)	50	52	51	54
VOC Threshold (pptm)	1.0	1.0	1.0	1.0
Ratio of Unpaired Station Peaks	0.40	0.48	0.48	0.64
Systematic Bias (%)	-21	7	-9	22
Gross Error (%)	61	68	64	76

Bold indicates numbers meeting performance goals.

TABLE 3-7

Comparative Performance Statistics for the July 1987 Episode

Statistic	July 14, 1987 Base	July 14, 1987 Doubled MV VOC	July 15, 1987 Base	July 15, 1987 Doubled MV VOC
Ozone Threshold (pphm)	8.0	8.0	8.0	8.0
Ratio of Predicted Basin Peak to Peak Observed	0.74	1.16	0.74	1.24
Ratio of Unpaired Station Peaks	0.68	**1.05**	0.62	**1.01**
Systematic Bias (%)	-44	**-12**	-35	**-6**
Gross Error (%)	46	**32**	38	**29**
NO2 Threshold (pphm)	2.0	2.0	2.0	2.0
Ratio of Unpaired Station Peaks	1.91	2.49	1.48	1.55
Systematic Bias (%)	36	44	33	43
Gross Error (%)	58	66	63	71
VOC Threshold (pptm)	1.0	1.0	1.0	1.0
Ratio of Unpaired Station Peaks	0.76	0.96	0.65	0.80
Systematic Bias (%)	43	94	55	112
Gross Error (%)	66	108	83	127

Bold indicates numbers meeting performance goals.

TABLE 3-8

Comparative Performance Statistics for the September 1987 Episode

Statistic	September 8, 1987		September 9, 1987	
	Base	Doubled MV VOC	Base	Doubled MV VOC
Ozone Threshold (pphm)	10.0	10.0	8.0	8.0
Ratio of Predicted Basin Peak to Peak Observed	0.62	1.11	0.77	1.56
Ratio of Unpaired Station Peaks	0.49	**0.85**	0.68	**0.97**
Systematic Bias (%)	-47	**-2**	-38	**-3**
Gross Error (%)	49	**31**	45	**34**
NO2 Threshold (pphm)	2.0	2.0	2.0	2.0
Ratio of Unpaired Station Peaks	1.88	2.27	0.61	0.79
Systematic Bias (%)	69	80	46	61
Gross Error (%)	99	108	77	89
VOC Threshold (pptm)	1.0	1.0	1.0	1.0
Ratio of Unpaired Station Peaks	0.38	0.49	0.43	0.59
Systematic Bias (%)	**7**	46	-8	25
Gross Error (%)	64	85	51	62

Bold indicates numbers meeting performance goals.

TABLE 3-9

Summary of Results from Sensitivity Studies

	August 1987			June 1987		
	VOC (tpd)	NO_x (tpd)	Peak O_3 (pphm)	VOC (tpd)	NO_x (tpd)	Peak O_3 (pphm)
Increased On-Road Emissions[1]	452	524	11.4	453	524	12.1
Doubled Biogenic Emissions[2]	428	566	12.1	429	565	13.1
Zero Stationary Emissions[3]	315	668	10.8	317	668	10.8
Zero Mobile Emissions[3]	664	123	12.9	664	123	13.3
Modified Land Use for Agricultural Preserve[1]	428	571	11.5	428	572	11.7
Weekend Emissions Effects[4]	360	369	12.4	354	369	11.9
2010 Baseline Simulation	904	739	15.6	905	739	15.1
2010 Controlled Simulation	402	524	11.4	402	524	11.8

[1] Compare the results of this sensitivity simulation to those of “2010 Controlled Simulation”.
[2] Biogenic emissions are increased from approximately 150 tpd to approximately 300 tpd; there are no changes to anthropogenic emissions. Compare the results of this sensitivity simulation to those of “2010 Controlled Simulation”.
[3] Compare the results of this sensitivity simulation to those of the “2010 Baseline Simulation” and the “2010 Controlled Simulation”.
[4] The emissions given in the table are for Saturday, the last day of the episode. Compare the results of this sensitivity simulation to those of the “2010 Controlled Simulation”.

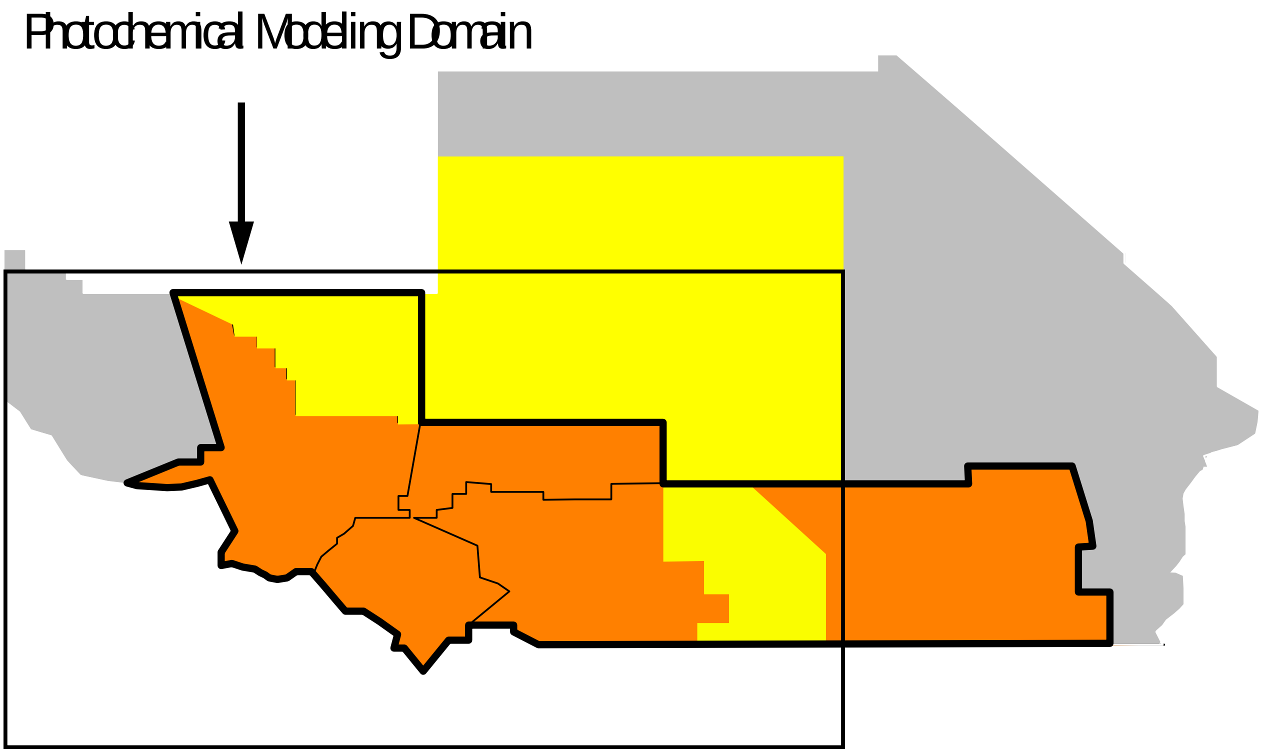


FIGURE 3-1

Jurisdiction, Air Basin, and Modeling Region Boundaries

CHAPTER 4

REVISION TO THE FEDERAL POST-1996 VOC RATE-OF-PROGRESS PLAN

INTRODUCTION

Background

The Clean Air Act (CAA) established interim emission reduction milestones for ozone. The milestones are percent VOC emission reductions. For example, all moderate and above ozone nonattainment areas must reduce VOC emissions at least 15 percent by 1996; serious and above ozone nonattainment areas must reduce VOC emissions at least 3 percent per year averaged over each consecutive three year period until the attainment date.

Unlike the original Act, the Clean Air Act of 1990 anticipates the possible failure to attain. Areas failing to meet milestones or deadlines must institute contingency measures or the area can be "bumped up" to the next higher classification, which means having to meet the more stringent requirements of that classification. Both actions are strong incentives to demonstrating progress.

Purpose

The reasonable further progress requirements in the CAA are intended to ensure that each ozone nonattainment area provide for sufficient precursor emission reductions to attain the ozone national ambient air quality standard. This section illustrates how the South Coast Air Quality Management District (District) plans to satisfy the post-1996 rate-of-progress requirements of the CAA for the areas under its jurisdiction. Areas under District jurisdiction include the South Coast Air Basin (Basin), the Antelope Valley in the Mojave Desert Air Basin, and Coachella Valley of the Salton Sea Air Basin. The rate-of-progress (ROP) calculations contained here updates the calculations provided in the 1994 AQMP. The reader is referred to the 1994 AQMP for a complete discussion of the rate-of-progress requirements of the CAA.

Section 182(c)(2) of the CAA requires that each serious and above ozone nonattainment area, which includes the Basin, the Antelope Valley, and the Coachella Valley, achieves actual VOC emission reductions of at least three percent per year averaged over each consecutive 3-year period beginning 6 years after enactment of the Act until the area's attainment date (i.e., November 15, 2010 for the South Coast Air Basin and November 15, 2007 for the Antelope and Coachella valleys). This is called the "post-1996 rate-of-progress" requirement of the CAA and the plan outlining the approach to achieving the requirement is the "Post-1996 Rate-of-Progress Plan," which is the subject of this section.

RATE-OF-PROGRESS CALCULATIONS

Introduction

The Clean Air Act of 1990 established interim milestones on the path to attainment. For ozone, milestones are percent VOC emission reductions. All moderate and above ozone nonattainment areas, such as the Basin and the Antelope and Coachella valleys, must reduce VOC emissions at least 15 percent by 1996 [Section 182(b)(1)]. Serious and above ozone nonattainment areas, which also include the Basin and the Antelope and Coachella valleys, must reduce VOC emissions at least 3 percent per year averaged over each consecutive three year period until the attainment date [Section 182(c)(2)]. Serious and above ozone nonattainment areas may use actual NO_x emissions reductions, which occur after 1990, to meet the post-1996 rate-of-progress requirements. The proposed control strategy takes advantage of this flexibility in the Act to meet the post-1996 rate-of-progress requirements.

The required VOC and NO_x emission reductions are estimated for the Basin and the Antelope and Coachella valleys. The U.S. EPA has issued guidance for estimating the required emission reductions and that guidance is followed here. The rate-of-progress calculations are shown for each of the milestone years in Tables 4-1 and 4-2 for VOC and NO_x, respectively; the footnotes to the tables summarize the U.S. EPA guidance. The calculations for the South Coast Air Basin are explained step-by-step in the following subsections.

Rate-of-Progress 1990 Base Year Emissions Inventory

Section 182(b)(1)(B) requires a rate-of-progress 1990 base year inventory. The rate-of-progress 1990 base year inventory accounts for the total anthropogenic VOC and NO_x emissions in the South Coast Air Basin. Thus, biogenic emissions and emissions outside the Basin are removed from the Basin totals. As shown in the first row of Tables 4-1 and 4-2, the total VOC and NO_x emissions for the Basin are 1733.3 and 1472.2 tons/day, respectively.

The 1990 base year VOC and NO_x inventories by major source category are provided in the main volume and Appendix III.

TABLE 4-1

Summary of Rate of Progress Calculations for VOC - South Coast Air Basin

		Milestone Year (tons/day)[a]				
Row	Calculation Step	1999	2002	2005	2008	2010
1	1990 ROP Base Year[b]	1733.3	1733.3	1733.3	1733.3	1733.3
2	FMVP/RVP Reductions	205.9	218.1	223.2	223.9	224.4
3	FMVCP/RVP Corrections[c]		12.2	5.1	0.7	0.5
4	Adjusted 1990 Base Year[d]	1527.4	1515.2	1510.1	1509.4	1508.9
5	Required Reduction (%)[e]	24.00	9.00	6.00	0.5	0.5
6	Emission Reductions[f]	366.6	136.4	90.6	7.5	7.5
7	RACT Corrections	0.0	0.0	0.0	0.0	0.0
8	I/M Corrections	0.0	0.0	0.0	0.0	0.0
9	Target Level[g]	1160.8	1012.3	916.6	908.3	900.3
10	Projected Baseline[h]	981.9	942.9	912.3	905.2	899.8
11	Additional Reductions[i]	0.0	0.0	0.0	0.0	0.0
12	Controlled Emissions[j]	938.6	826.1	707.6	587.4	413.6

[a] Units are tons per day unless noted otherwise.

[b] Contains only anthropogenic emissions.

[c] FMVCP/RVP Correction(x) = FMVCP/RVP Reduction(x) - FMVCP/RVP Reduction(y), where x is the current target year and y is the previous target year.

[d] (Row 1) - (Row 2)

[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NO_x reductions) thereafter.

[f] [(Row 4) x (Row 5)]/100

[g] For 1999,
(Row 1) - (Row 2) - (Row 6) - (Row 7) - (Row 8)
For 2002, 2005, ..., 2010
Target level for previous milestone year - (Row 3) - (Row 6) - (Row 7) - (Row 8)

[h] Projected baseline emissions taking into account existing rules and projected growth. It includes emission reduction credits.

[i] (Row 10) - (Row 9)

[j] VOC emission level with the implementation of the 1997 AQMP control strategy.

TABLE 4-2

Summary of Rate of Progress Calculations for NO_x - South Coast Air Basin

		Milestone Year (tons/day)[a]				
Row	Calculation Step	1999	2002	2005	2008	2010
1	1990 ROP Base Year[b]	1472.2	1472.2	1472.2	1472.2	1472.2
2	FMVP/RVP Reductions	0.0	0.0	0.0	0.0	0.0
3	FMVCP/RVP Corrections[c]	0.0	0.0	0.0	0.0	0.0
4	Adjusted 1990 Base Year[d]	1472.2	1472.2	1472.2	1472.2	1472.2
5	Required Reduction (%)[e]	0.00	0.00	3.00	8.50	5.50
6	Emission Reductions[f]	0.0	0.0	44.2	125.1	81.0
7	RACT Corrections	0.0	0.0	0.0	0.0	0.0
8	I/M Corrections	0.0	0.0	0.0	0.0	0.0
9	Target Level[g]	1472.2	1472.2	1428.0	1302.9	1221.9
10	Projected Baseline[h]	956.1	858.0	794.4	759.9	746.4
11	Additional Reductions[i]	0.0	0.0	0.0	0.0	0.0
12	Controlled Emissions[j]	935.1	814.5	694.5	609.0	530.4

[a] Units are tons per day unless noted otherwise.

[b] Contains only anthropogenic emissions.

[c] FMVCP/RVP Correction(x) = FMVCP/RVP Reduction(x) - FMVCP/RVP Reduction(y), where x is the current target year and y is the previous target year.

[d] (Row 1) - (Row 2)

[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NO_x reductions) thereafter.

[f] [(Row 4) x (Row 5)]/100

[g] For 1999,
(Row 1) - (Row 2) - (Row 6) - (Row 7) - (Row 8)
For 2002, 2005, ..., 2010
Target level for previous milestone year - (Row 3) - (Row 6) - (Row 7) - (Row 8)

[h] Projected baseline emissions taking into account existing rules and projected growth. It includes emission reduction credits.

[i] (Row 10) - (Row 9)

[j] NO_x emission level with the implementation of the 1997 AQMP control strategy.

Adjusted 1990 Base Year Emissions Inventory

The methodology for calculation of the 1990 adjusted base year inventory was developed by ARB, according to U.S. EPA guidance. As required by the CAA, expected benefits resulting from the pre-1990 federal motor vehicle control program (FMVCP) and federal 7.8 pounds per square inch (psi) Reid vapor pressure (RVP) gasoline regulations are to be excluded from the rate-of-progress base year inventory in determining the required emission reductions. In addition, the CAA requires that the adjusted inventories at the milestone year account for any growth in emissions after 1990. For example, the on-road motor vehicle emissions for the 1990 adjusted base year inventory for the 1999 milestone year is an inventory based on 1999 emission factors and 1990 activity data excluding the expected benefits of the FMVCP and RVP regulations.

In California, this calculation has an additional complexity in that the California Motor Vehicle Control Program (CMVCP) achieves greater emission reductions than the FMVCP. In order to calculate emission reductions that solely result from the FMVCP, certain adjustments were made to the EMFAC7F/BURDEN7F programs to produce an inventory that mimics the FMVCP and RVP programs for the 1994 AQMP. These calculations were performed by the ARB. For this Plan revision, the ratios are applied to the EMFAC7G on-road mobile emission estimates.

It is estimated that 206 to 224 tons/day of VOC emission reductions in the Basin are attributable to the FMVCP and RVP regulations, accounting for growth (see row 2 of Tables 4-1 and 4-2). Subtracting those reductions from the 1990 rate-of-progress baseline inventory (i.e., row 1) yields the adjusted 1990 base year inventory (i.e., row 4).

Required Emission Reductions

As stated above, the Basin must reduce VOC emissions by at least 15 percent by 1996 and at least 3 percent per year thereafter. However, Section 182(c)(2)(C) of the CAA allows substitution of NO_x emission reductions for the post-1996 VOC emission reduction requirements. The District's control strategy has extensive NO_x reductions to maintain compliance with the NO_2 NAAQS and to make progress toward attainment of the PM_{10} NAAQS. These NO_x reductions in the strategy are used to satisfy the post-1996 requirements of the Act [i.e., Section 182(c)(2)]. In order to establish the target VOC and NO_x emission levels at each milestone year after 1996, it is convenient to establish the reduction percentage at the beginning of the calculations. The proposed reduction rates were determined by applying <u>all</u> creditable VOC reductions at each milestone and providing sufficient NO_x reductions to satisfy the VOC emission reduction requirements of Section 182(c)(2).

The percent reductions are shown in row 5 of Tables 4-1 (for VOC) and 4-2 (for NO_x) for each of the milestone years. Applying these percentages to the adjusted 1990 base year emissions (i.e., row 4) yields the required VOC and NO_x emission reductions (i.e., row 6).

VOC and NO_x Emissions Target Levels by Milestone Year

The target level of emissions is determined by subtracting the total VOC and NO_x emission reductions from the rate-of-progress 1990 base year inventory. The total emission reductions include the required reductions for each milestone year (i.e., row 6); FMVCP and RVP reductions (i.e., row 2); RACT corrections (i.e., row 7); and I/M corrections (i.e., row 8). Note in footnote g of Table 4-1 that the VOC target levels are calculated differently for milestone year 1999 and the subsequent years as per U.S. EPA guidance.

Emission reductions from RACT rule corrections must also be calculated and subtracted from the adjusted 1990 base year inventory. They are not creditable toward the emission reduction requirements. These corrections are necessary if there is a deficiency in any current RACT rule. The RACT corrections have been determined to be zero for the South Coast Air Basin because District rules are more stringent than the RACT requirements.

Corrections to the I/M program are necessary when either the area's I/M program does not meet the reductions achieved by EPA's minimum requirements, or an area's program does not meet the standards of its current SIP. The I/M corrections have been determined to be zero for the Basin; EMFAC7G accounts for actual I/M efficiency.

According to Tables 4-1 and 4-2, the VOC emission target levels for the years 1999, 2002, 2005, 2008, and 2010 are 1160.8, 1012.3, 916.6, 908.3, and 900.3 tons/day, respectively (see row 9 of Table 4-1). The NO_x emission target levels are 1472.2, 1472.2, 1428.0, 1302.9, and 1221.9 tons/day for the years 1999, 2002, 2005, 2008, and 2010, respectively (see row 9 of Table 4-2).

Projected Emissions Inventories for the Milestone Years

The 1999, 2002, 2005, 2008, and 2010 emissions inventories are projected from the 1993 base year inventory. It includes anticipated population, economic, and VMT growth in the Basin; currently adopted control measures; and emission reductions from the adopted CMVCP regulations. The South Coast Air Basin VOC and NO_x totals for 1999, 2002, 2005, 2008, and 2010 are shown in row 10 of Tables 4-1 and 4-2, respectively.

Additional Emission Reductions by Milestone Year

Comparing the projected emissions inventories with the target emission levels for each milestone year indicates that additional emission reductions are not necessary to achieve the target levels. The projected VOC and NO_x baseline emission levels are below the VOC and NO_x target levels for all the milestone years. In other words, current rules and regulations are sufficient to meet the VOC and NO_x target levels; additional VOC and NO_x reductions from the proposed control strategy can be used as contingency in those years.

Rate-of-Progress Calculations for the Antelope Valley

The rate-of-progress calculations for the Antelope Valley are shown for each of the milestone years in Tables 4-3 and 4-4 for VOC and NO_x. The proposed reduction rates by milestone year are shown in row 5 of Table 4-3 for VOC and row 5 of Table 4-4 for NO_x. Comparing the projected emission inventories (row 10) with the target emission levels (row 9) for each milestone year indicates that additional emission reductions are necessary to achieve target levels. Subtracting the VOC emission target levels from the projected inventories indicates that an additional 1.1, 3.1, and 3.8 tons/day of VOC emission reductions (row 11 of Table 4-3) and an additional 1.3, 1.2, and 2.8 tons/day of NO_x emission reductions (row 11 of Table 4-4) are necessary for the years 2002, 2005, and 2007, respectively. The 1997 AQMP control measures proposed for the Antelope Valley are discussed later.

The 1990 and 1993 baseline emission inventories by major source category are contained in Attachment G.

TABLE 4-3

Summary of Rate of Progress Calculations for VOC - Antelope Valley

Row	Calculation Step	Milestone Year (tons/day)[a]			
		1999	2002	2005	2007
1	1990 ROP Base Year[b]	29.7	29.7	29.7	29.7
2	FMVP/RVP Reductions	0.0	0.2	0.2	0.4
3	FMVCP/RVP Corrections[c]		0.2	0.0	0.2
4	Adjusted 1990 Base Year[d]	29.7	29.5	29.5	29.3
5	Required Reduction (%)[e]	15.0	0.5	5.0	0.5
6	Emission Reductions[f]	4.5	0.1	1.5	0.1
7	RACT Corrections	0.0	0.0	0.0	0.0
8	I/M Corrections	0.0	0.0	0.0	0.0
9	Target Level[g]	25.2	24.9	23.4	23.1
10	Projected Baseline[h]	25.0	26.0	26.5	26.9
11	Additional Reductions[i]	0.0	1.1	3.1	3.8
12	Controlled Emissions[j]	25.0	24.8	23.4	23.1

[a] Units are tons per day unless noted otherwise.

[b] Contains only anthropogenic emissions.

[c] FMVCP/RVP Correction(x) = FMVCP/RVP Reduction(x) - FMVCP/RVP Reduction(y), where x is the current target year and y is the previous target year.

[d] (Row 1) - (Row 2)

[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NO_x reductions) thereafter.

[f] [(Row 4) x (Row 5)]/100

[g] For 1999,
(Row 1) - (Row 2) - (Row 6) - (Row 7) - (Row 8)
For 2002, 2005, ..., 2010
Target level for previous milestone year - (Row 3) - (Row 6) - (Row 7) - (Row 8)

[h] Projected baseline emissions taking into account existing rules and projected growth. It includes emission reduction credits.

[i] (Row 10) - (Row 9)

[j] VOC emission level with the implementation of the control strategy given in Table 4-8.

TABLE 4-4

Summary of Rate of Progress Calculations for NO_x - Antelope Valley

		Milestone Year (tons/day)[a]			
Row	Calculation Step	1999	2002	2005	2007
1	1990 ROP Base Year[b]	31.2	31.2	31.2	31.2
2	FMVP/RVP Reductions	0.0	0.0	0.0	0.0
3	FMVCP/RVP Corrections[c]		0.0	0.0	0.0
4	Adjusted 1990 Base Year[d]	31.2	31.2	31.2	31.2
5	Required Reduction (%)[e]	9.00	8.50	4.00	5.50
6	Emission Reductions[f]	2.8	2.7	1.2	1.7
7	RACT Corrections	0.0	0.0	0.0	0.0
8	I/M Corrections	0.0	0.0	0.0	0.0
9	Target Level[g]	28.4	25.7	24.5	22.8
10	Projected Baseline[h]	27.7	27.0	25.7	25.6
11	Additional Reductions[i]	0.0	1.3	1.2	2.8
12	Controlled Emissions[j]	27.6	25.3	21.4	20.7

[a] Units are tons per day unless noted otherwise.

[b] Contains only anthropogenic emissions.

[c] FMVCP/RVP Correction(x) = FMVCP/RVP Reduction(x) - FMVCP/RVP Reduction(y), where x is the current target year and y is the previous target year.

[d] (Row 1) - (Row 2)

[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NO_x reductions) thereafter.

[f] [(Row 4) x (Row 5)]/100

[g] For 1999,
(Row 1) - (Row 2) - (Row 6) - (Row 7) - (Row 8)
For 2002, 2005, ..., 2010
Target level for previous milestone year - (Row 3) - (Row 6) - (Row 7) - (Row 8)

[h] Projected baseline emissions taking into account existing rules and projected growth. It includes emission reduction credits.

[i] (Row 10) - (Row 9)

[j] NO_x emission level with the implementation of the control strategy given in Table 4-8.

Rate-of-Progress Calculations for the Coachella Valley

The rate-of-progress calculations for the Coachella Valley are shown for each of the milestone years in Tables 4-5 and 4-6 for VOC and NO_x, respectively. The VOC and NO_x emission reductions from existing rules are sufficient to meet the CAA rate-of-progress requirements for the Coachella Valley. The rate-of-progress requirements for all milestone years are met by a combination of VOC and NO_x reductions from existing District and ARB rules. The proposed reduction rates by milestone year are shown in row 5 of Tables 4-5 (for VOC) and 4-6 (for NO_x).

The 1990 and 1993 baseline emission inventories by major source category are contained in Attachment H.

TABLE 4-5

Summary of Rate of Progress Calculations for VOC - Coachella Valley

		Milestone Year (tons/day)[a]			
Row	Calculation Step	1999	2002	2005	2007
1	1990 ROP Base Year[b]	51.5	51.5	51.5	51.5
2	FMVP/RVP Reductions	11.7	10.8	9.2	8.5
3	FMVCP/RVP Corrections[c]		0.0	0.0	0.0
4	Adjusted 1990 Base Year[d]	39.8	40.7	42.3	43.0
5	Required Reduction (%)[e]	16.3	6.5	6.4	3.0
6	Emission Reductions[f]	6.5	2.6	2.7	1.3
7	RACT Corrections	0.0	0.0	0.0	0.0
8	I/M Corrections	0.0	0.0	0.0	0.0
9	Target Level[g]	33.3	30.7	28.0	26.7
10	Projected Baseline[h]	33.3	30.7	28.0	26.7
11	Additional Reductions[i]	0.0	0.0	0.0	0.0
12	Controlled Emissions[j]	33.3	30.1	25.8	23.9

[a] Units are tons per day unless noted otherwise.

[b] Contains only anthropogenic emissions.

[c] FMVCP/RVP Correction(x) = FMVCP/RVP Reduction(x) - FMVCP/RVP Reduction(y), where x is the current target year and y is the previous target year.

[d] (Row 1) - (Row 2)

[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NO_x reductions) thereafter.

[f] [(Row 4) x (Row 5)]/100

[g] For 1999,
(Row 1) - (Row 2) - (Row 6) - (Row 7) - (Row 8)
For 2002, 2005, ..., 2010
Target level for previous milestone year - (Row 3) - (Row 6) - (Row 7) - (Row 8)

[h] Projected baseline emissions taking into account existing rules and projected growth. It includes emission reduction credits.

[i] (Row 10) - (Row 9)

[j] VOC emission level with the implementation of the control strategy given in Table 4-8.

TABLE 4-6

Summary of Rate of Progress Calculations for NO_x - Coachella Valley

		Milestone Year (tons/day)[a]			
Row	Calculation Step	1999	2002	2005	2007
1	1990 ROP Base Year[b]	60.3	60.3	60.3	60.3
2	FMVP/RVP Reductions	0.0	0.0	0.0	0.0
3	FMVCP/RVP Corrections[c]		0.0	0.0	0.0
4	Adjusted 1990 Base Year[d]	60.3	60.3	60.3	60.3
5	Required Reduction (%)[e]	7.7	2.5	2.6	3.0
6	Emission Reductions[f]	4.6	1.5	1.6	1.8
7	RACT Corrections	0.0	0.0	0.0	0.0
8	I/M Corrections	0.0	0.0	0.0	0.0
9	Target Level[g]	55.7	54.1	52.6	50.8
10	Projected Baseline[h]	49.7	48.5	47.8	47.6
11	Additional Reductions[i]	0.0	0.0	0.0	0.0
12	Controlled Emissions[j]	49.3	46.3	41.6	39.9

[a] Units are tons per day unless noted otherwise.

[b] Contains only anthropogenic emissions.

[c] FMVCP/RVP Correction(x) = FMVCP/RVP Reduction(x) - FMVCP/RVP Reduction(y), where x is the current target year and y is the previous target year.

[d] (Row 1) - (Row 2)

[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NO_x reductions) thereafter.

[f] [(Row 4) x (Row 5)]/100

[g] For 1999,
(Row 1) - (Row 2) - (Row 6) - (Row 7) - (Row 8)
For 2002, 2005, ..., 2010
Target level for previous milestone year - (Row 3) - (Row 6) - (Row 7) - (Row 8)

[h] Projected baseline emissions taking into account existing rules and projected growth. It includes emission reduction credits.

[i] (Row 10) - (Row 9)

[j] NO_x emission level with the implementation of the control strategy given in Table 4-8.

CONTROL STRATEGY

Introduction

This section presents the overall strategy for meeting the ROP requirements of the federal Clean Air Act. As shown in the previous section, no additional VOC or NO_x emission reductions are needed in the South Coast Air Basin and the Coachella Valley. Additional VOC and NO_x emission reductions are needed in the Antelope Valley at each milestone year after 1999 as shown in Table 4-7.

TABLE 4-7

Additional VOC and NO_x Emission Reductions for the Antelope Valley
Per the Rate-of-Progress Requirements of the Clean Air Act

	Emission Reductions (tons/day)	
Milestone Year	VOC	NO_x
1999	0.0	0.0
2002	1.1	1.3
2005	3.1	1.2
2007	3.8	2.8

Unhealthful ozone air quality in the Antelope and Coachella valleys is primarily due to transport of ozone and its precursors from the upwind source region of the South Coast Air Basin and attainment in these downwind valleys is only possible with substantial emission reductions in the Basin (see Chapter 8 of the 1997 AQMP). With this in mind, the proposed control strategy consists of two components: 1) an aggressive control strategy for VOC and NO_x emission sources in the South Coast Air Basin; and 2) control of locally generated emissions via proposed control measures implemented by state and federal actions.

The overall control strategy for the South Coast Air Basin is briefly described next; more detail on the Basin's control strategy is provided in Chapters 4 and 7 of the main volume. Then, the control strategy for the downwind areas of Antelope Valley and Coachella Valley is presented in more detail. Each of the proposed control measures is listed, including information about implementing agency and adoption and implementation dates. The reader is referred to Appendix IV for more detail on each of the control measures.

Control Strategy for the South Coast Air Basin

The overall control strategy for this Plan is designed to meet applicable state and federal requirements and to demonstrate attainment with ambient air quality standards. Similar to the 1994 AQMP, the 1997 AQMP proposes two tiers of emission reduction measures, based on availability and readiness of technology.

Short- and intermediate-term measures propose the application of available technologies and management practices between 1997 and the year 2005. These measures rely on known technologies and proposed actions to be taken by several agencies that currently have statutory authority to implement such measures. These measures are designed to satisfy the federal Clean Air Act requirement of reasonably available control technologies [Section 172(c)], and the California Clean Air Act Requirements of Best Available Retrofit Control Technologies (BARCT) [Health and Safety Code Section 40919, Subsection C].

To ultimately achieve ambient air quality standards, additional emission reductions will be necessary beyond the implementation of short- and intermediate-term measures. Long-term measures rely on the advancement of technologies and control methods that can reasonably be expected to occur between 2000 and 2010. These long-term measures rely on further development and refinement of known low- and zero-emission control technologies in addition to technological breakthroughs. The control strategy for the Basin is described in detail in Chapters 4 and 7 of the main volume. The reader is referred to Appendix IV for detailed discussions on each of the control measures.

A summary of emission reductions available by the year 2008 (note that the attainment date for the Antelope and Coachella valleys is 2007) for short-, intermediate-, and long-term measures is provided in Figure 4-1 for VOC and Figure 4-2 for NO_x. Emission reductions represent the difference between the projected baseline and the remaining emissions. Total VOC emission reductions in the Basin from the proposed control strategy are estimated to be 302 tons/day. More than 75 percent of the reductions are from stationary sources, primarily the area source category (see Figure 4-1). It is estimated that the proposed control strategy will reduce NO_x emissions in the Basin by 154 tons/day. Nearly 85 percent of these reductions are projected to come from mobile sources (see Figure 4-2).

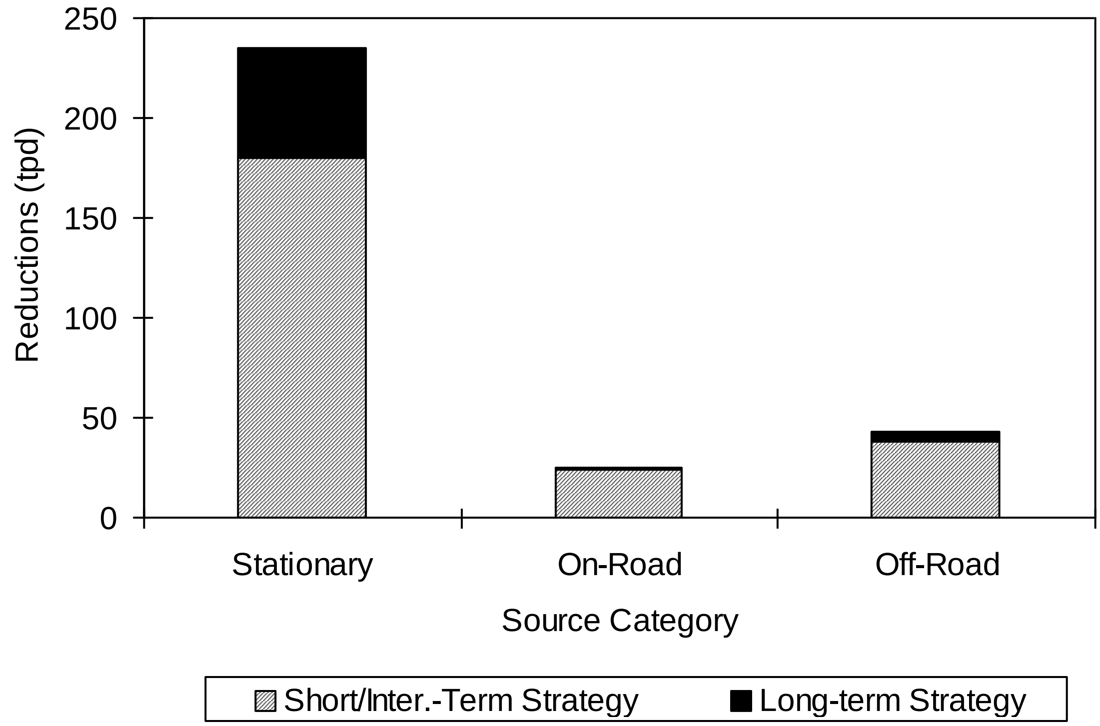


FIGURE 4-1
VOC Emissions Reductions in the South Coast Air Basin by 2008

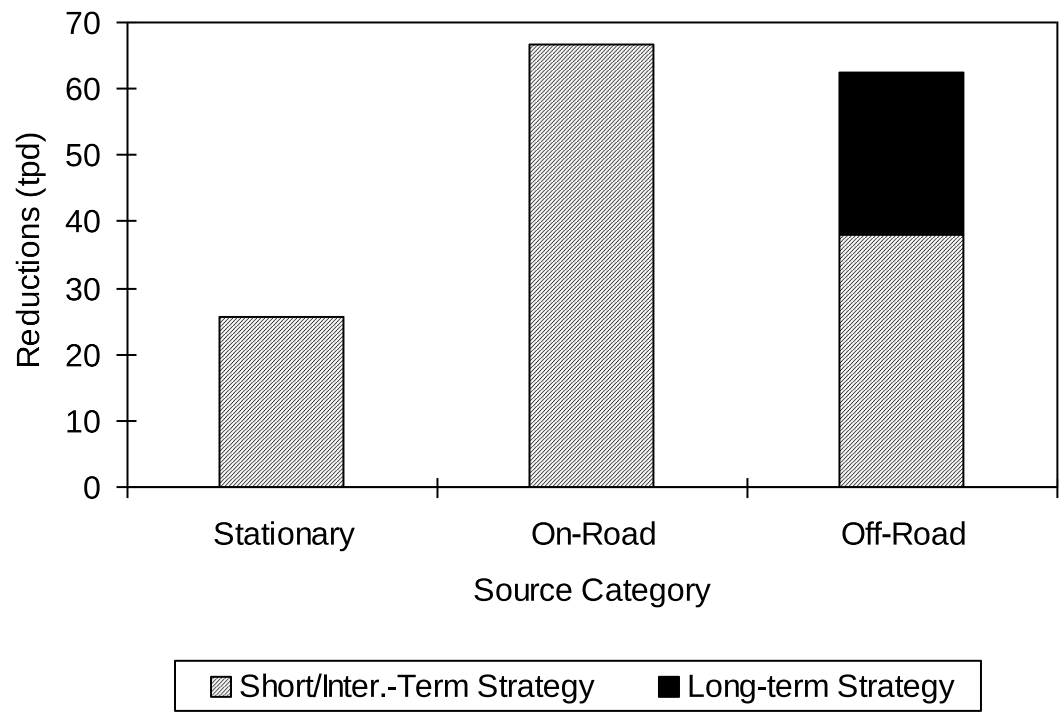


FIGURE 4-2
NO_x Emissions Reductions in the South Coast Air Basin by 2008

Figure 4-3 shows the maximum controlled VOC and NO_x emission levels projected under the proposed control strategy (denoted by "Controlled Emissions"), which includes short-, intermediate-, and long-term control measures. (The controlled emission levels are also shown in row 12 of Tables 4-1 and 4-2.) The long-term control measures are implemented after 2005 in accordance with Section 182(e)(5) of the CAA. Also shown in the figures are the CAA VOC and NO_x target levels (denoted by "Target Level") and the projected baseline VOC and NO_x emissions (denoted by "Projected Baseline"). As pointed out in the prior chapter, the projected VOC and NO_x baseline emission levels are below the VOC and NO_x target levels for all the milestone years. Thus, current District and ARB rules and regulations are sufficient to meet the CAA rate-of-progress requirements. The control strategy provides excess VOC and NO_x reductions for all the years beginning with 1999. These excess emissions can be used as contingency in the event of a milestone failure. The VOC and NO_x emission reductions by milestone year for each control measure are given in Attachment I.

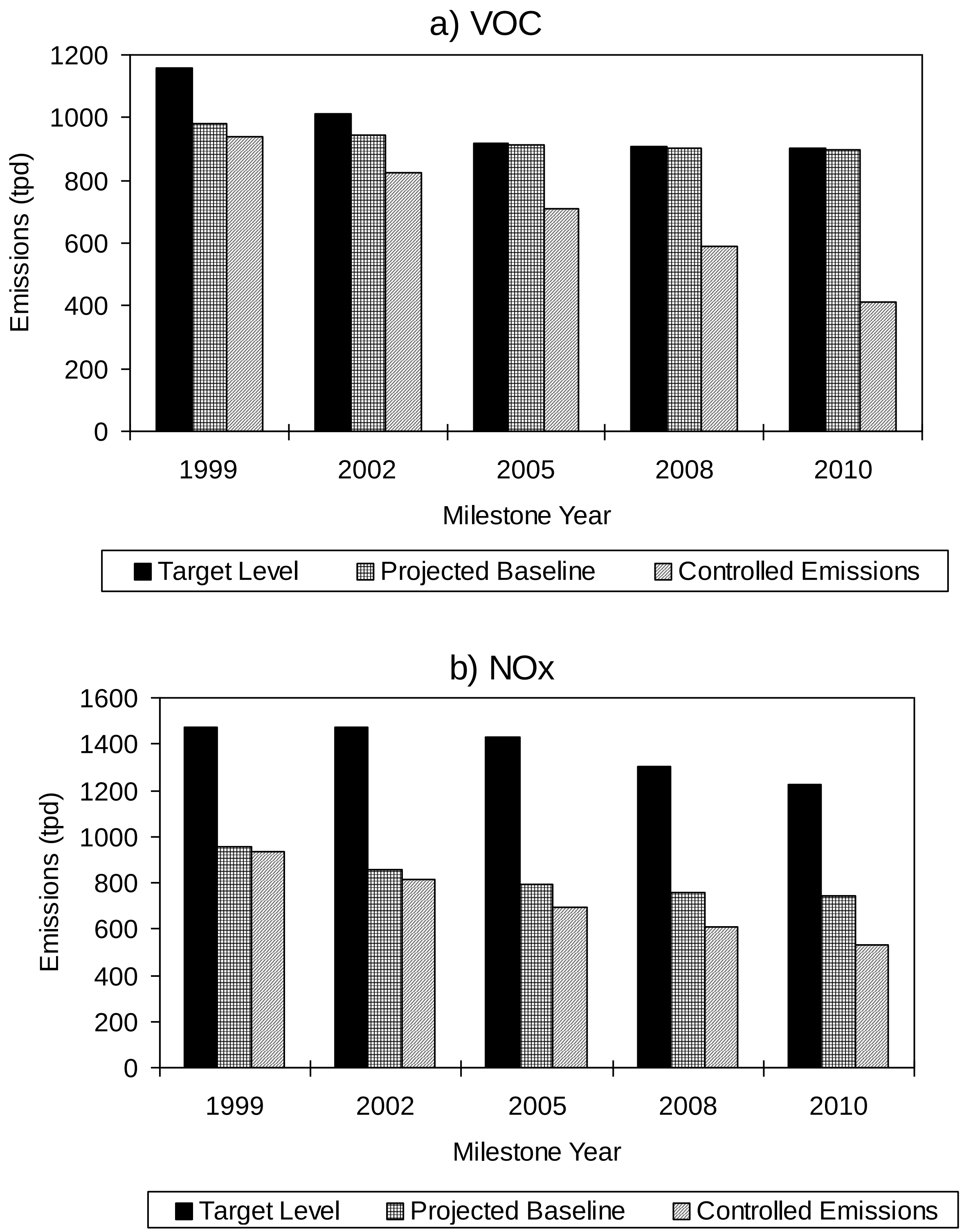


FIGURE 4-3

Comparison of Baseline and Controlled Emissions and the
CAA Target Levels for the South Coast Air Basin

Control Strategy for the Antelope and Coachella Valleys

As discussed earlier, scientific evidence and ozone trends strongly suggest that ozone exceedances in the Antelope and Coachella valleys are the result of transport of South Coast Air Basin precursor emissions, thus the control of local VOC and NO_x emissions will have minimal effect. Improved regional ozone air quality will only result with improved conditions upwind as confirmed by the attainment demonstration in Chapter 3 of this appendix. For these reasons, the 1997 AQMP is proposing that additional emission reductions in the Antelope and Coachella valleys would come from control measures to be implemented by state and federal actions, principally in the area of on- and off-road sources, as shown in Table 4-8. Some sources such as consumer products and pesticides are regulated statewide. Each of the proposed state and federal control measures listed includes information about implementing agency, and adoption and implementation dates. The VOC and NO_x emission reductions by milestone year for each control measure listed in Table 4-8 are given in Attachments J and K for the Antelope Valley and Coachella Valley, respectively.

TABLE 4-8

VOC and NO_x Control Measures for the Antelope and Coachella Valleys

Measure Number	Control Measure Name	Implementing Agency	Adoption Date	Implementation Period
Surface Coating and Solvent Use				
DPR-01	Emission Reduction from Pesticide Application	DPR	1997	2005-2005
CP-02	Mid-term Consumer Product Measure	ARB	1997	2005-2008
On-Road Mobile Sources				
M-04	Heavy-Duty Diesel Vehicle; 2.5 g/bhp-hr NO_x engines	ARB		1997-2010
M-05	Heavy-Duty Diesel Vehicle; additional NO_x reductions in CA	ARB		1997-2010
M-06	Heavy-Duty Diesel Vehicle; 2.5 g/bhp-hr NO_x std - national	EPA		1997-2010
M-07	Accelerated Retirement of HDVs	ARB		1997-2010
Off-Road Mobile Sources				
M-11	Industrial Equipment, Gas & LPG - CA; three-way catalyst technology (ARB)	ARB		1997-2010
M-12	Industrial Equipment, Gas & LPG - CA; three-way catalyst technology (U.S. EPA))	EPA		1997-2010
M-13	Marine Vessels; nationwide stds., new and rebuilt	EPA; IMO; USCG		1997-2010
M-14	Locomotives; nationwide stds., new and rebuilt	EPA; ARB		1997-2010
M-16	Pleasure Craft; nationwide emission stds.	EPA		1997-2010

Antelope Valley

Figure 4-4 shows the maximum controlled VOC and NO_x emissions levels projected under the proposed control strategy for the Antelope Valley, along with the CAA target levels and projected baseline emissions at each milestone year for the Antelope Valley. Comparing the baseline emissions with the target levels for each milestone year indicates that additional emission reductions are necessary to achieve target levels. However, with the implementation of the local control strategy, summarized in Table 4-8, the post-1996 rate-of-progress requirements are satisfied at all milestone years as shown by the controlled emissions levels in Figure 4-4.

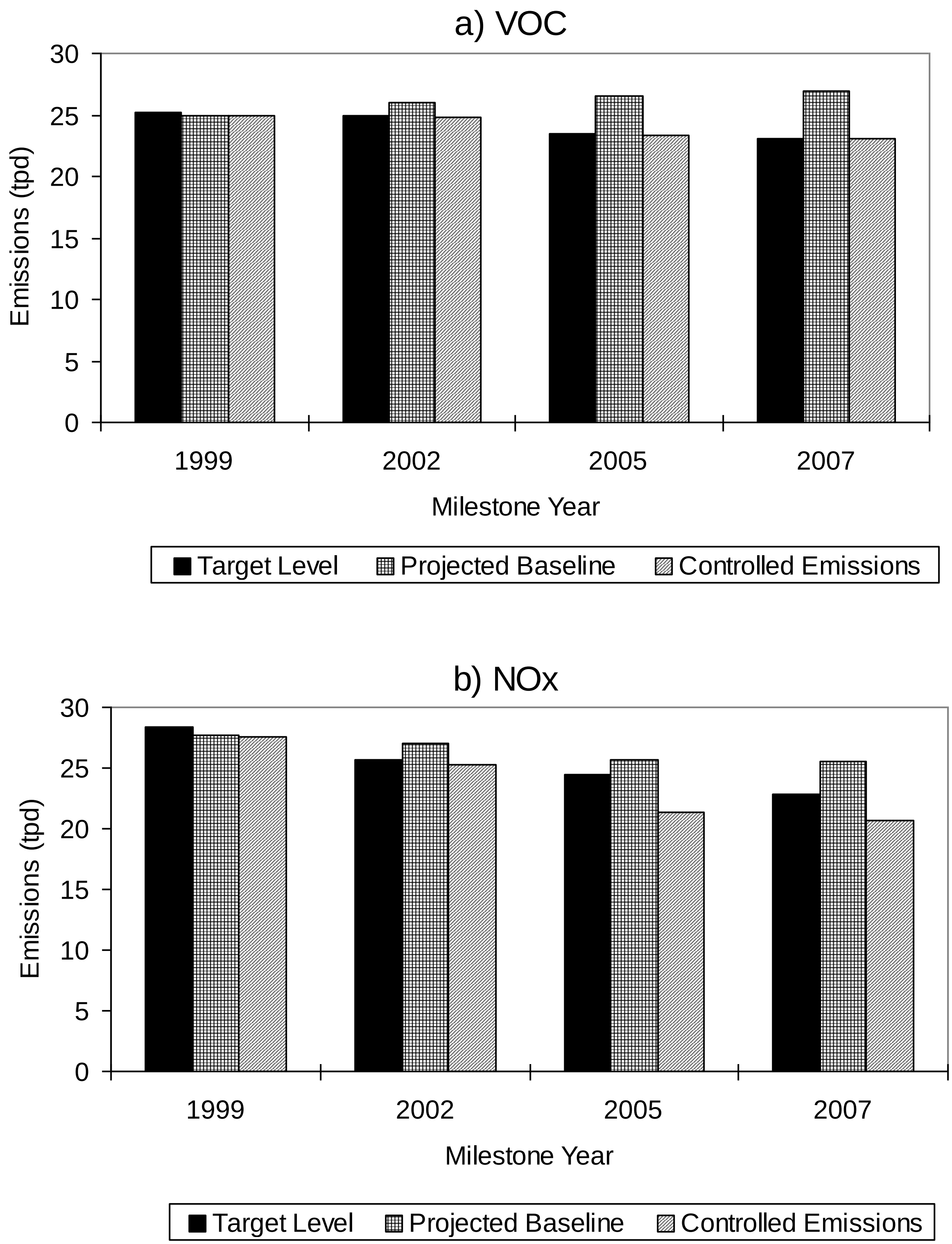
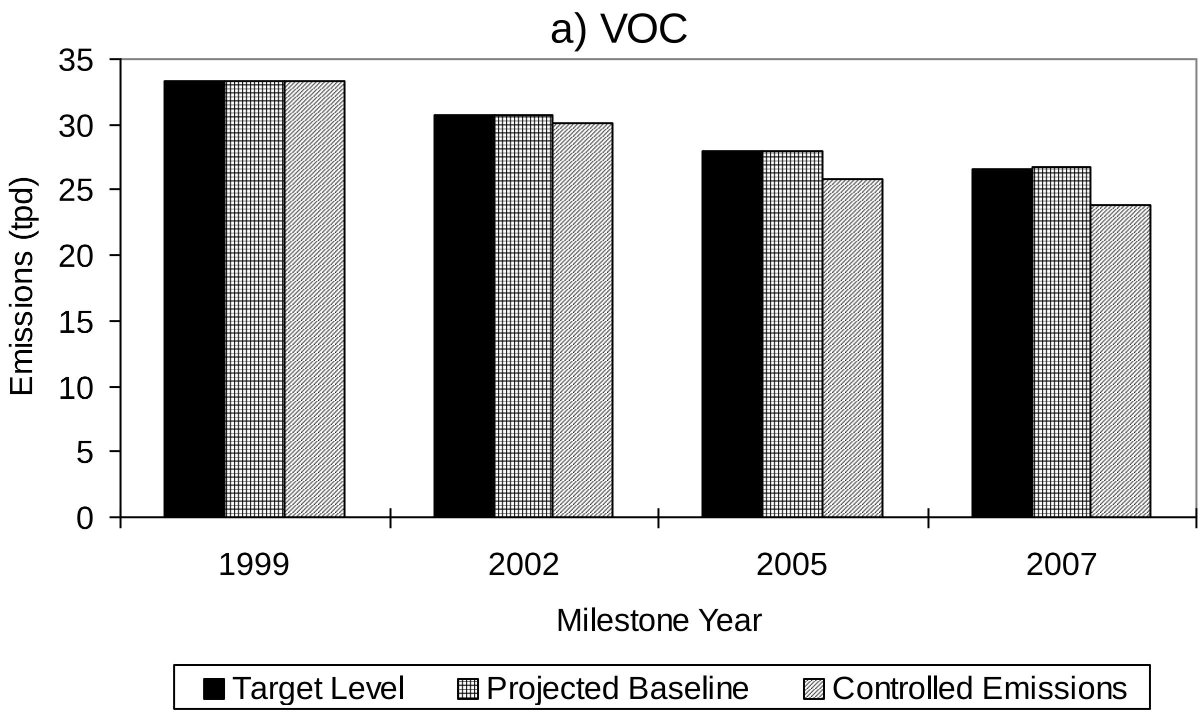


FIGURE 4-4

Comparison of Baseline and Controlled Emissions and the CAA Target Levels for the Antelope Valley

Coachella Valley

Figure 4-5 summarizes the District's approach to satisfying the post-1996 rate-of-progress requirements in the Coachella Valley. As demonstrated in the prior chapter, the VOC and NO_x emission reductions from existing rules are sufficient to meet the CAA rate-of-progress requirements for the Coachella Valley. The rate-of-progress requirements for all milestone years are met by a combination of VOC and NO_x reductions from existing rules and regulations. The control strategy provides additional VOC and NO_x reductions for all the years beginning with 1999. The projected emission reductions beyond the target levels can be used as contingency in the event of a milestone failure.



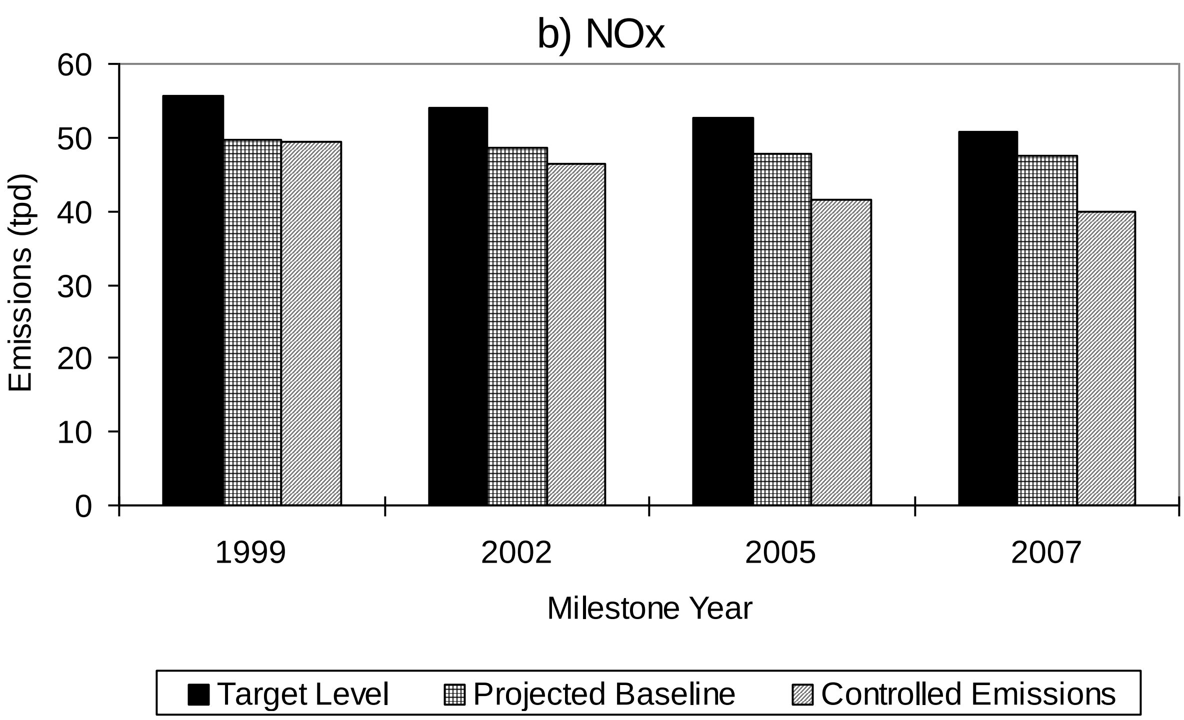


FIGURE 4-5

Comparison of Baseline and Controlled Emissions and the
CAA Target Levels for the Coachella Valley

Emissions Budget

Tables 4-9, 4-10, and 4-11, for the Basin, Antelope Valley, and Coachella Valley, respectively, show the emissions budget for stationary, on-road, and off-road sources for each milestone year. These budgets are to be used by federal agencies and local transportation agencies for determining conformity of their respective projects/actions relative to the SIP. As mentioned earlier, the intent of conformity is to ensure that federal agencies do not take or support actions which interfere with the reasonable further progress or attainment demonstrations contained in the SIP, or fail to take advantage of opportunities to help in the effort to achieve the NAAQS. The emissions budgets, shown below, are based on the controlled VOC and NO_x levels given in Tables 4-1 through 4-6.

TABLE 4-9

South Coast Air Basin Emissions (tons/day) Budget by Milestone Year

	Stationary		On-Road		Off-Road		Total	
Year	VOC	NO_x	VOC	NO_x	VOC	NO_x	VOC	NO_x
1999	447.3	115.7	354.0	526.8	137.3	292.6	938.6	935.1
2002	427.9	96.7	273.1	447.1	125.1	270.7	826.1	814.5
2005	385.0	91.4	206.0	369.1	116.6	234.0	707.6	694.5
2008	335.4	89.7	145.4	310.1	106.7	209.2	587.4	609.0
2010	267.8	88.3	80.7	277.8	65.1	164.3	413.6	530.4

TABLE 4-10

Antelope Valley Emissions (tons/day) Budget by Milestone Year

	Stationary		On-Road		Off-Road		Total	
Year	VOC	NO_x	VOC	NO_x	VOC	NO_x	VOC	NO_x
1999	9.5	2.0	12.2	15.0	3.3	10.6	25.0	27.6
2002	10.7	2.2	10.9	12.9	3.2	10.2	24.8	25.3
2005	10.7	2.4	9.5	11.0	3.2	8.0	23.4	21.4
2007	11.5	2.6	8.4	9.9	3.2	8.2	23.1	20.7

TABLE 4-11

Coachella Valley Emissions (tons/day) Budget by Milestone Year

	Stationary		On-Road		Off-Road		Total	
Year	VOC	NO_x	VOC	NO_x	VOC	NO_x	VOC	NO_x
1999	9.8	9.0	21.3	32.4	2.2	7.9	33.3	49.3
2002	10.3	9.8	17.8	29.6	2.0	6.9	30.1	46.3
2005	9.6	10.5	14.2	26.0	2.0	5.1	25.8	41.6
2007	10.0	11.0	11.9	23.9	2.0	5.0	23.9	39.9

CONTINGENCY MEASURES

Introduction

In order to achieve the improvement in air quality specified in the AQMP, the control measures listed in the Plan must be adopted and implemented within the timeframes set forth. The expected progress in meeting the AQMP attainment goals, measured in terms of emission reductions, is verified through the annual auditing program called the Reasonable Further Progress (RFP) reporting procedure. In the event the RFP shows that the implementation of the AQMP is not providing adequate progress and the interim emission reduction goals have not been met, the District must take action to bring forward measures that are scheduled for later adoption or implementation, or to implement certain "contingency" control measures. These contingency measures are control options that could be instituted in addition to, or in place of, the AQMP control measures. Both state and federal Clean Air Acts require that district plans include contingency measures.

A total of six control measures, shown in Table 4-12, have been identified for contingency purposes here. The measures listed in Table 4-12, called Level I or contingency measures, are actions that can be implemented given existing statutory authority. Such measures would need to be developed and adopted as rules. The responsibility to adopt and implement the Level I measures falls on the District, ARB, and the U.S. EPA. The measures will be adopted in the order specified in the 1997 AQMP until the shortfall is eliminated. A ranking of the importance of each measure relative to ozone, carbon monoxide, and/or PM_{10} planning requirements under the federal Clean Air Act is provided in Table 4-12 for the Level I measures.

TABLE 4-12

Level I - Contingency Control Measures

AQMP Measure Number	Title	Priority to Meet CAA Requirements			Responsible Agency	Issues
		Ozone	CO	PM_{10}		
CTY-1	Accelerated Implementation of Control Measures	1	2	3	District	Resource Availability
CTY-2	Command and Control Rules in Place of Educational Outreach Program Measures	2	3	4	District	Resource Availability/ Cost Effectiveness
CTY-4	Enhanced Oxygenated Fuel Content for CO	--	1	--	ARB	Potential NO_X Emission Increases
CTY-12	Emission Reductions from Paved Roads (Curb and Gutter/Chemical Stabilization) (Formerly BCM-01 (1D & 1E))	--	--	1	District	Emissions Reduction Effectiveness
CTY 13	Further Emission Reductions from Construction and Demolition Activities (Rule 403) (Formerly BCM-02)	--	--	2	District	Emissions Reduction Effectiveness
CTY 14	Emission Reductions from Miscellaneous Sources (Weed Abatement) (Rule 403) (Formerly BCM-05)	--	--	3	District	Unquantified Emission Reductions

As mentioned often here, unhealthful ozone air quality in the Antelope and Coachella valleys is due to transport of ozone and its precursor emissions from the South Coast Air Basin. For this reason, the contingency measures for the Antelope and Coachella valleys are based on the control of the upwind sources and are addressed by the contingency measures for the South Coast Air Basin as described above.

SUMMARY AND CONCLUSIONS

Section 182(c)(2) of the CAA requires that each serious and above ozone nonattainment area, which includes the South Coast Air Basin, the Antelope Valley, and the Coachella Valley, achieve actual VOC emission reductions of at least three percent per year averaged over each consecutive 3-year period beginning 6 years after enactment of the Act until the area's attainment date (November 15, 2010 for the Basin and November 15, 2007 for the Antelope and Coachella Valleys). This is called the "post-1996 rate-of-progress" requirement of the CAA.

According to Section 182(c)(2)(C), actual NO_x emission reductions which occur after 1990 can be used to meet post-1996 VOC emission reduction requirements provided that NO_x reductions satisfy the following criteria. First, the control strategy used to demonstrate attainment must be consist of both VOC and NO_x control measures. More specifically, the mix of VOC and NO_x emission reductions used to satisfy the post-1996 rate-of-progress requirements of the CAA must be consistent with the controlled VOC and NO_x emission levels used in the modeling demonstration. And lastly, the combined annual VOC and NO_x reductions must average 3 percent per year. The Basin and the Antelope and Coachella valleys use NO_x substitution at various milestone years to satisfy the post-1996 rate-of-progress requirements.

VOC and NO_x emission reductions from existing rules and regulations are sufficient to meet the post-1996 rate-of-progress requirements for the South Coast Air Basin and the Coachella Valley. However for the Antelope Valley, it is necessary to implement the local control strategy in order to satisfy the post-1996 rate-of-progress requirements.

CHAPTER 5

REVISION TO THE FEDERAL CARBON MONOXIDE ATTAINMENT DEMONSTRATION PLAN

INTRODUCTION

The South Coast Air Basin (Basin) has historically had a persistent carbon monoxide (CO) problem. However, there has been considerable improvement in CO air quality in the Basin from 1976 to 1990 (SCAQMD, 1991). In 1990 CO concentrations exceeded the federal and state standards at 10 of 24 monitoring stations. In 1995, only 4 of 20 monitoring stations in the Basin exceeded the respective standards. Also in 1995, the state 1-hour CO standard (20 ppm) was met for the first time. Carbon monoxide concentrations were measured at 22 locations in the Basin and neighboring areas in 1995. The highest 1-hour average CO concentration was 17 ppm, measured at Lynwood. Lynwood also recorded the highest 8-hour average CO concentration with 13.9 ppm, which is about one and one-half times the federal standard of 9 ppm. A full description of current CO air quality is contained in Appendix II of the 1997 AQMP.

In November 1990, Congress enacted a series of amendments to the Clean Air Act intended to intensify the air pollution control effort across the nation. One of the primary goals of the 1990 Clean Air Act (CAA) was an overhaul of the planning provisions for those areas not currently meeting the National Ambient Air Quality Standards (NAAQS). The CAA identifies specific emission reduction goals, requires demonstration of reasonable further progress, and incorporates more stringent sanctions for failure to attain or to meet interim milestones. Under the CAA, the South Coast Air Basin is designated as a serious nonattainment area for carbon monoxide and is required to implement emissions reduction measures as "expeditiously as practicable" in order to attain federal carbon monoxide standards by December 31, 2000.

A Federal Attainment Plan for Carbon Monoxide (CO Plan) was approved by the District Governing Board on November 12, 1992 and submitted to the U.S. Environmental Protection Agency (EPA). The CO Plan was designed to demonstrate the attainment of the NAAQS by 2000. The Plan was revised in the 1994 Air Quality Management Plan (AQMP) to incorporate updated VMT and emissions projections and a revised control strategy. The 1994 AQMP was approved by the District Governing Board on September 9, 1994.

The 1997 AQMP reflects an updated forecast of VMT, revisions to the Direct Travel Impact Model (DTIM2) (Systems Applications International, 1994), and ARB's on-road emissions factor program (ARB, 1996). The modeling methodology and CO episode employed for the attainment demonstration remained the same. A detailed discussion on the modeling methodology and CO episode can be found in Appendix I-E of the 1994 AQMP (SCAQMD, 1994).

CARBON MONOXIDE EMISSIONS

Introduction

In order to propose effective control measures, it is first necessary to identify the sources of pollution and to quantify the type and amount of emissions they contribute. This chapter summarizes the updated carbon monoxide emissions inventory for the Basin. A more detailed description of inventory requirements and procedures can be found in the 1992 CO Plan and the 1997 AQMP, Appendix III.

Planning Inventory

The planning emissions inventory is developed based on the winter period (defined as November through April) in which ambient concentrations of carbon monoxide in the Basin are highest.

The 1992 CO Plan was based on the 1990 carbon monoxide emission inventory submitted to U.S. EPA by the California Air Resources Board (ARB) in May 1992. This inventory was developed based on U.S. EPA guidance (EPA, 1991). The ARB also submitted 1989 and 2000 modeling emissions inventories in May 1992, which were used in the 1992 CO Plan attainment demonstration. The 1992 CO Plan used the EMFAC7EP emission factor program and vehicle miles traveled (VMT) estimates and projections from the 1991 AQMP. The District committed to revising the CO Plan when updated emission factors and VMT forecasts became available. The 1994 Revision to the CO Plan uses emissions factors generated by the ARB EMFAC7F program and VMT forecasts prepared by the Southern California Association of Governments (SCAG) for the 1994 AQMP. For the 1997 AQMP, SCAG's latest VMT forecast and ARB's latest on-road emissions factor program, EMFAC7G, are used.

<u>VMT Forecast</u>

SCAG is responsible for preparing the VMT forecasts, estimating actual VMT, and annual reporting. The emission forecasts for all future years reflect demographic and economic growth forecasts by SCAG. Section 187(a)(2)(A) of the CAA requires carbon monoxide nonattainment areas to forecast VMT for each year prior to the attainment year. The first set of forecasts was generated with the SIP revision (November 15, 1992) and included forecasts for all subsequent years up to the year of attainment. The revised VMT forecast is presented in Table 5-1. The values in years 1994, 1996, and 1998 are interpolated.

TABLE 5-1

Annual Vehicle Miles Traveled (VMT) Forecasts (x 100,000 miles) from 1993 through 2000 for the South Coast Air Basin

Year	Light-Duty Passenger Cars	Light-Duty Trucks	Medium-Duty Trucks	Heavy-Duty Trucks	Urban Bus	Motor-cycles	All Vehicles
1993	1913	713	75	216	4	12	2933
1994	1884	707	80	214	4	13	2902
1995	1854	702	85	212	3	14	2870
1996	1914	727	94	219	4	13	2971
1997	1973	752	103	228	4	12	3072
1998	1989	762	110	230	4	12	3107
1999	2004	771	117	233	4	12	3141
2000	2021	781	125	235	4	13	3179

Emissions Projection

The future year baseline emissions are projected from the 1993 emission inventory and include emission reductions from rules and regulations adopted as of September 30, 1996. On-road mobile source carbon monoxide emissions have increased about 18 percent in the 1993 base year relative to the earlier submittals due to refinements in VMT and emissions factors. Table 5-2 presents the on-road vehicle emissions for each year out to 2000. The values in years 1994, 1996 and 1998 are interpolated.

TABLE 5-2

Carbon Monoxide Emissions (tons/day) Projected from 1993 through 2000 for the South Coast Air Basin

Year	Light-Duty Passenger Cars	Light-Duty Trucks	Medium-Duty Trucks	Heavy-Duty Trucks	Urban Bus	Motor-cycles	All Vehicles
1993	3759	1674	130	328	1	17	5909
1994	3518	1556	130	300	1	17	5522
1995	3277	1437	131	272	1	17	5135
1996	2905	1280	138	255	1	17	4596
1997	2532	1125	145	237	1	17	4057
1998	2350	1039	149	228	1	17	3784
1999	2167	955	152	219	1	17	3511
2000	2019	894	154	213	1	17	3298

Planning Emissions Inventory

Table 5-3 shows a summary of the carbon monoxide planning emissions by major source category for the years 1993, 1995 and 2000. Note that other mobile sources contribute almost 30 percent of the carbon monoxide emissions in the year 2000, up from 20 percent in 1993. The relative contribution of on-road mobile sources decreases in the year 2000, as adopted regulations and vehicle fleet turnover reduce emissions despite the increase in VMT.

Section 187(d)(1) of the Clean Air Act requires a milestone demonstration by March 31, 1996 to determine whether the CO emissions reductions required by December 31, 1995 have been achieved. The District provided a 1995 CO emission inventory to the U.S. EPA by the required deadline. A revised estimate is given in Table 5-3.

TABLE 5-3

Carbon Monoxide Emissions By Major Source Category for the Years 1993, 1995 and 2000
Carbon Monoxide Planning Inventories (tons/day)

Source Category	1993	1995	2000
Stationary Sources			
Fuel Combustion	77	77	77
Waste Burning	34	77	200
Solvent Use	0	0	0
Petroleum Process Storage			
& Transfer	5	5	5
Industrial Processes	1	1	1
Miscellaneous Processes	10	10	14
Total Stationary Sources	127	170	297
Mobile Sources			
On-Road Vehicles	5908	5381	3298
Other Mobile	1538	1637	1550
Total Mobile Sources	7446	7018	4848
Total	7573	7188	5145

MODELING METHODOLOGY

Introduction

U.S. EPA guidance requires that the modeling analysis include both areawide and hot-spot modeling. An areawide analysis is performed to determine regional CO concentrations by applying the U.S. EPA recommended Urban Airshed Model (UAM). A "hot-spot" analysis provides CO concentrations at specified heavily traveled intersections. This chapter briefly describes the carbon monoxide (CO) modeling approach used to demonstrate attainment of the federal 8-hour CO standard of 9 ppm. The 1992 CO Plan and 1994 AQMP fully described the modeling procedures.

Regional Modeling Analysis

Areawide CO modeling was conducted according to the U.S. EPA's "Guidance for Application of Urban Areawide Models for CO Attainment Demonstrations," (EPA, 1992). The 1994 CO Plan described the episode selection, meteorological and air quality characterization of the episode, and input preparation procedures. This chapter only details changes in the modeling inputs and the model performance evaluation.

Inputs to UAM

The only change in the meteorological data inputs is the minimum mixing height used at nighttime. Based on a review of tethered balloon data (ARB, 1991) and observed temperature measurements in the Lynwood area, it was determined that a minimum mixing height of 50 m is most appropriate for the model application, as compared to 15 m, used previously.

As mentioned earlier, EMFAC7G is used to estimate on-road emissions for the 1997 AQMP, whereas EMFAC7F was used for the 1994 AQMP. A comparison of 1989 historical base year CO emissions as estimated by EMFAC7F and EMFAC7G is shown in Table 5-4. On-road CO emissions are increased by 22 % with the use of EMFAC7G.

TABLE 5-4

Baseline Carbon Monoxide Emissions Predicted by EMFAC7F and 7G in the Modeling Region

Case	Emissions Factor Model	On-Road Mobile Emissions (tons/day)
1989 Base	EMFAC7F	6262
1989 Base	EMFAC7G	7612

Model Performance

Table 5-5 shows the performance statistics for the UAM simulation using the 1989 baseline emissions inventory. Also shown in Table 5-5 are the paired peak prediction accuracy (paired in space) and U.S. EPA-suggested three statistical performance measures. The accuracy of the peak prediction was +1 percent and -25 percent for unpaired and paired peak prediction, respectively. The paired absolute error is within the performance goal of 25 to 30 percent. The simulation is within the temporal absolute error of two hours.

TABLE 5-5

Performance Statistics for the December 6-7, 1989 CO Episode

Performance Measure	UAM	U.S. EPA-Suggested Measures
Peak 8-Hour Station Prediction	16.4 ppm	--
Peak 8-Hour Regional Prediction	22.1 ppm	--
Peak 8-Hour Measurement	21.8 ppm	--
Paired Highest 8-Hour Prediction Accuracy	-25%	--
Unpaired Highest 8- Hour Prediction Accuracy	+1 %	+/- 30-35 %
Average Absolute Error in 8-Hour Peak Prediction	22 %	25-30 %
Accuracy for Pairs > 5.0 ppm		
Average Absolute Error in the Predicted Time of the 8-Hour Peak Concentration for Station Pairs > 5.0 ppm	1.8 hours	2 hours

Hot Spot Analysis

The hot-spot analysis was performed using CAL3QHC. CAL3QHC is a model developed to predict the level of CO or other inert pollutant concentration emitted from motor vehicles at roadway intersections. CAL3QHC inputs include roadway geometry, receptor locations, meteorological conditions and vehicular emissions rate. A general description of the selection of the hot spot intersection, model input assumptions, and model application was presented in the 1992 CO Plan and is not repeated here.

The CAL3QHC model was applied to the four intersections listed in Table 5-6 to estimate the CO impacts from motor vehicles traveling at roadway intersections. CO concentrations were estimated for both the 1989 base year and for the year 2000 based on projected traffic volume and emission factors. Relative to EMFAC7F, the intersection emissions factors in the 1989 base year are 1.4 times as high in EMFAC7G and in the year 2000 are 2.0 times as high in EMFAC7G (see Table 5-7). These emissions changes are the only revisions to the hot spot modeling conducted in the 1994 AQMP. Table 5-8 and 5-9 shows the model predicted CO concentration at the selected intersection in the years 1989 and 2000.

TABLE 5-6

Selected Intersections for the CAL3QHC
Hot Spot Modeling Analysis

Intersection	Receptor	Description
Long Beach Blvd. /Imperial Highway	Lynwood Air Monitoring Station	The peak CO concentration occurred at this station in 1989. The station recorded 31 ppm and 21.8 ppm for 1-hour and 8-hour average. The second highest concentration was 18.3 ppm. ARB's Lynwood CO study is used to develop certain model inputs.
Wilshire Blvd./ Veteran Ave.	No Air Monitoring	The most congested intersection in Los Angeles county. The average daily traffic volume is about 100,000 vehicles/day. The intersection study has been conducted and traffic data is available.
Highland Ave./ Sunset Blvd.	No Air Monitoring Station	One of the most congested intersections in the city of Los Angeles. The intersection study has been conducted and traffic data is available.
Century Blvd./ La Cienega Blvd.	No Air Monitoring Station	One of the most congested intersections in the city of Los Angeles. The intersection study has been conducted and traffic data is available.

TABLE 5-7

Emissions Predicted by EMFAC7F and 7G in Year 1989 and 2000

	Wilshire - Veteran		Sunset - Highland		La Cienega - Century		Long Beach - Imperial	
	AM	PM	AM	PM	AM	PM	AM	PM
a) EMFAC7F Emission Variables (1989)								
Running Exhaust Emission Factor (g/mile)	16.1	13.9	15.1	14.0	15.7	14.2	16.9	14.1
Idling Emission Factor (g/min)	6.63	5.69	6.22	5.69	6.44	5.80	6.98	5.75
b) EMFAC7F Emission Variables (2000)								
Running Exhaust Emission Factor (g/mile)	3.1	3.0	3.0	3.0	3.1	3.0	3.2	3.0
Idling Emission Factor (g/min)	1.19	1.12	1.15	1.12	1.17	1.12	1.22	1.12
c) EMFAC7G Emission Variables (1989)								
Running Exhaust Emission Factor (g/mile)	20.83	17.88	19.53	17.88	20.27	18.22	21.94	18.11
Idling Emission Factor (g/min)	9.44	7.92	8.8	7.92	9.16	8.13	9.97	8.06
d) EMFAC7G Emission Variables (2000)								
Running Exhaust Emission Factor (g/mile)	5.52	5.09	5.31	5.09	5.44	5.12	5.71	5.11
Idling Emission Factor (g/min)	2.27	2.05	2.17	2.05	2.23	2.08	2.35	2.07

TABLE 5-8

1989 1-Hour Average Carbon Monoxide Concentrations
Calculated from the CAL3QHC Model

	Morning*	Afternoon+	Peak++
Wilshire - Veteran	15.0	14.3	--
Sunset - Highland	14.3	19.1	--
La Cienega - Century	18.4	13.3	--
Long Beach - Imperial	11.5	13.9	7.8

* Morning : 7-8 a.m. for La Cienega - Century, 8-9 a.m. for Sunset - Highland and Wilshire-Veteran, and 9-10 a.m. for Long Beach - Imperial

\+ Afternoon : 2-3 p.m. for Sunset - Highland, 3-4 p.m. for Wilshire - Veteran and Long Beach - Imperial, and 6-7 p.m. for La Cienega - Century

++ Peak : 9-10 p.m. (concentration at the hour of the observed peak). Peak is only provided for the Long Beach/Imperial intersection since it is intersection associated with the regional peak at Lynwood.

TABLE 5-9

Year 2000 1-Hour Average Carbon Monoxide Concentrations
Calculated from the CAL3QHC Model

	Morning*	Afternoon+	Peak++
Wilshire-Veteran	3.7	3.6	--
Sunset-Highland	3.6	5.0	--
La Cienega-Century	4.6	3.5	--
Long Beach-Imperial	3.0	3.2	2.0

* Morning : 7-8 a.m. for, La Cienega - Century, and. Wilshire - Veteran, 9-10 a.m. for Long Beach - Imperial, and 10-11 a.m. for Sunset - Highland

\+ Afternoon : 1-2 p.m. for Sunset - Highland, 3-4 p.m. for Wilshire - Veteran and Long Beach - Imperial, and. 6-7 p.m. for and La Cienega - Century

++ Peak : 9-10 p.m. (concentration at the hour of the observed peak)). Peak is only provided for the Long Beach/Imperial intersection since it is intersection associated with the regional peak at Lynwood.

CARBON MONOXIDE CONTROL STRATEGY

Mobile sources, which are regulated primarily by ARB or U.S. EPA, produce the largest amount of carbon monoxide emissions in the Basin. The on-road motor vehicle control strategy is primarily based on adopted regulations, such as the 1990 ARB Low-Emission Vehicles and Clean Fuels (LEV/Clean Fuels) regulations, Phase 2 Reformulated Gasoline Program, oxygenated fuel regulation, and enhancements to the Inspection and Maintenance (I/M) or Smog Check program. The emission reduction resulting from these already adopted regulations are sufficient to demonstrate attainment in the year 2000, as discussed in a later section. However, control measures from the 1994 California Ozone SIP which have concurrent CO emission reductions are provided in the Plan revisions to ensure attainment of the federal CO air quality standards.

Control measures M1 and M2 (i.e., the accelerated retirement of LDVs) has the effect of reducing CO emissions by 173 tpd. The reader is referred to Appendix IV-A of the 1997 AQMP for more details on these control measures.

The year 2000 remaining CO emissions level are shown in Table 5-10.

TABLE 5-10

Remaining CO Emissions for the Year 2000 (tons/day)

CO Emissions	Baseline	Reductions	Remaining
Point Source	58	0	58
Area Source	239	0	239
Total Stationary	297	0	297
On-road	3298	173	3125
Off-road	1550	0	1550
Total	55145	173	4972

Contingency Measures

Section 187(a)(3) of the 1990 CAAA requires that adopted and enforceable contingency measures be included in the attainment plan submission. A deviation from the forecasted

VMT of more than a given percentage will trigger implementation of contingency measures to offset either excess VMT or carbon monoxide emissions due to the additional VMT. According to the EPA General Preamble [Sect. 532(c)(1)], this percentage is 5 percent in 1994, 4 percent in 1995, and 3 percent for 1996 and subsequent years. The cumulative VMT growth cannot be greater than or equal to 5 percent above the VMT forecast used as the basis of the attainment demonstration.

District Rule 1504 was adopted to serve as contingency for carbon monoxide. Table 5-11 lists the control measures which will also serve as contingency measures for carbon monoxide. These measures are described further in Appendix IV-A of the 1997 AQMP.

TABLE 5-11

Level I - Contingency Measures from the 1997 AQMP Which May Serve as Carbon Monoxide Contingency Measures

AQMP Measure Number	Title	Priority to Meet CAA Requirements	Responsible Agency	Issues
CTY-4	Enhanced Oxygenated Fuel Content for CO	1	ARB	Potential NO_X Emission Increases
CTY-1	Accelerated Implementation of Control Measures	2	District	Resource Availability
CTY-2	Command and Control Rules in Place of Educational Outreach Program Measures	3	District	Resource Availability/ Cost Effectiveness

FUTURE AIR QUALITY PROJECTIONS

Introduction

Air quality modeling is an integral part of the planning process to achieve clean air. Based on U.S. EPA's modeling guidelines, the Urban Airshed Model (UAM) is used for the areawide analysis, and CAL3QHC, a roadway intersection model, is used to calculate carbon monoxide concentrations near intersections. The UAM model results are used to evaluate the effectiveness of control measures in attaining the federal 8-hour air quality standard for carbon monoxide in the year 2000. U.S. EPA's modeling guidelines recommend that the results from CAL3QHC and UAM be combined to give a total concentration which is used for attainment demonstration purposes. However, conclusions from a 1989 study, conducted by ARB and the District in the vicinity of the Lynwood area, indicate that the areawide and 'hot-spot' model results should not be combined. The study indicates that the CO measurements at the Lynwood monitoring station are representative of the entire Lynwood area. Based on the conclusions of the Lynwood study, the areawide analysis and the "hot-spot" analysis results for the attainment demonstration are not combined. A more detailed discussion of this subject can be found in the 1992 CO Plan.

Emissions

The modeling emission inventory normally consists of area, point and mobile sources. More than 90 percent of CO emissions are from mobile sources. Area source CO emissions are only 5 percent of the total inventory. Point sources contribute less than 1 percent to total CO emissions. Therefore, only mobile and area source emissions are considered at this time. The carbon monoxide modeling analysis for the Basin uses a gridded emission inventory representing day-specific mobile source emissions. As in the 1992 CO Plan and the 1994 AQMP, the origin for the modeling domain is 350 kilometers Easting and 3700 kilometers Northing in UTM Zone 11. There are 33 cells in the west-east direction and 22 cells in the south-north direction; each grid cell is 5 kilometers in resolution.

The 1989 baseline and projected 2000 carbon monoxide emissions used in the UAM modeling analysis are shown in Table 5-12. Two sets of emissions estimates are presented for the year 2000. The first (2000 Base) represents the projected baseline emissions in 2000, which includes the emission reductions from all air quality rules and regulations adopted prior to September 30, 1996, including the effect of the enhanced I/M program and the oxygenated fuel regulation. The second (2000 controlled) represents the effect of the control strategy provided in the 1997 AQMP that will be implemented by the year 2000. The emissions presented in this table reflect the revised

VMT forecast from SCAG and the latest version of ARB's on-road emission factor program, EMFAC7G.

TABLE 5-12

Baseline and Projected Future Carbon Monoxide Emissions in the Modeling Region (tons/day)

Case	Emissions Scenario	On-Road Mobile	Other Mobile	Area	Total
1989 Base	Base case	7612	1488	39	9140
2000 Base	Base case	3118	1350	43	4511
2000 Cntrl	With controls	2956	1350	43	4349

UAM Modeling Results

Table 5-13 presents the projected carbon monoxide concentrations for the Basin and at the Lynwood station in the years 1989 and 2000. The predicted maximum 8-hour concentration of 22.1 ppm occurred in the Lynwood area at the same time as the measured maximum 8-hour concentration of 21.8 ppm on December 7, 1989. The predicted maximum 8-hour concentration is within the model peak performance goal recommended by the U.S. EPA. The predicted regional 1-hour average concentration is 26.1 whereas the observed value was 31 ppm. The maximum predicted 8-hour carbon monoxide concentration at the Lynwood station is 16.4 ppm.

The future year modeling analysis indicates that the federal carbon monoxide air quality standard will be achieved by the year 2000 without implementation of additional controls. For the 2000 baseline emissions scenario, the peak predicted 8-hour CO concentration is 7.7 ppm, which is below the federal 8-hour standard of 9 ppm. This regional peak is located within 10 km of Lynwood. With the implementation of the 1997 AQMP control strategy the peak is reduced to 7.4 ppm. The projected maximum 8-hour carbon monoxide concentration at the Lynwood station is 6.6 ppm and 6.4 ppm for the base and controlled case, respectively.

TABLE 5-13

Peak Carbon Monoxide Concentrations (ppm) Predicted by the Urban Airshed Model for the South Coast Air Basin

Scenario	Regional Maximum (8-hour Average)	Maximum Lynwood (8-hour Average)	Regional Maximum (1-hour Average)
1989 Base	22.1	16.4	26.1
2000 Base	7.7	6.6	10.7
2000 Control	7.4	6.4	10.3

Note: Federal Standards: 9 ppm, 8-hour average; 35 ppm, 1-hour average

CAL3QHC Modeling Results

Maximum 8-hour UAM and maximum CAL3QHC 8-hour average concentrations projected at the four roadway intersections are presented in Table 5-14. The projected maximum concentrations reported for the UAM are from the grid cell where the intersection is located. The CAL3QHC analysis was conducted under two assumptions: 1) the actual meteorological conditions for the episode; and 2) "worst-case" meteorological conditions. The "worst-case" meteorology assumes a 1 m/s wind speed, neutral stability conditions, and a wind direction resulting in the highest predicted carbon monoxide concentration. It should be noted that the projected maximum concentrations from the UAM and CAL3QHC do not occur at the same time of the day.

Projected maximum "hot-spot" concentrations in the year 2000 are between 3.5 and 5.3 ppm. Projected areawide carbon monoxide peak 8-hour average concentrations in the year 2000 are between 2.3 and 6.4 ppm. Although the highest carbon monoxide concentration occurs at Lynwood, the highest "hot-spot" concentration does not occur at Lynwood, but at intersections in Hollywood and Westwood. As discussed in the 1992 CO Plan, peak carbon monoxide concentrations are due to unique meteorological and topographical conditions, and not due to the impact of particular intersections. This is based on the results of a 1991 Lynwood Carbon Monoxide Study prepared for the ARB. Based on the conclusions of this study, and as in the 1992 CO Plan, the areawide analysis and the "hot-spot" analysis results are not combined in the attainment demonstration.

TABLE 5-14

Projected 8-hour Carbon Monoxide Concentrations (ppm)
at Various Intersections Located in the South Coast Air Basin

Scenario	Maximum Areawide	Maximum "Hot-spot"[a]	Maximum "Hot-spot"[b]
Long Beach Blvd. and Imperial Hwy. located in Lynwood			
1989 Base	16.0	8.3	13.7
2000 Base	6.6	2.1	3.5
2000 Control	6.4	2.1	3.5
Wilshire Blvd. and Veteran Ave. located in Westwood			
1989 Base	4.5	13.0	16.8
2000 Base	2.3	3.2	4.2
2000 Control	2.3	3.2	4.2
Sunset Blvd. and Highland Ave. located in Hollywood			
1989 Base	7.7	12.2	20.2
2000 Base	3.5	3.2	5.3
2000 Control	3.4	3.2	5.3
La Cienega Blvd. and Century Blvd. located in Inglewood			
1989 Base	14.9	8.5	16.8
2000 Base	5.4	2.2	4.3
2000 Control	5.2	2.2	4.3

a Base case episode meteorology

b "Worst-case" meteorology

CONCLUSION

The Clean Air Act requires that an attainment demonstration be performed as part of a plan submittal. Per the U.S. EPA recommendation, a regionwide modeling analysis using the UAM and a hot-spot modeling analysis using CAL3QHC were performed. Based on this analysis, the Basin is projected to achieve the NAAQS by 2000 without additional control of CO. The CO emission reductions in the 1997 AQMP, while not needed for CO attainment at this time, further improve CO and ozone air quality.