MDAQMD
2004 Ozone Attainment Plan
(State and Federal)

April 26, 2004

Mojave Desert Air Quality Management District
14306 Park Avenue
Victorville, CA 92392-2310

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Abbreviations and Acronyms

AQAP..... Air Quality Attainment Plan
AQMA ..... Air Quality Management Area
AQMP ..... Air Quality Management Plan
CAAQS ..... California Ambient Air Quality Standard
CALGRID..... California Photochemical Grid Model
CARB..... California Air Resources Board
CCAA ..... California Clean Air Act
CO ..... Carbon Monoxide
ERC..... Emission Reduction Credit
FCAA ..... Federal Clean Air Act
FMVCP ..... Federal Motor Vehicle Control Program
FONA..... Federal Ozone Non-attainment Area
MDAQMD..... Mojave Desert Air Quality Management District
MPR ..... Model Performance Ratio
NAAQS ..... National Ambient Air Quality Standard
NO_X ..... Oxides of Nitrogen
NSR..... New Source Review
O_3 ..... Ozone
RACT..... Reasonably Available Control Technology
ROG ..... Reactive Organic Gases
ROP..... Rate of Progress
RRR..... Relative Reduction Ratio
SBCAPCD ..... San Bernardino County Air Pollution Control District
SCAB ..... South Coast Air Basin
SCAG..... Southern California Association of Governments
SCAQMD ..... South Coast Air Quality Management District
SCAQS87..... 1987 Southern California Air Quality Study
SCOS97..... 1997 Southern California Ozone Study
SDAQMA ..... Southeast Desert Modified Air Quality Management Area
tposd..... Tons per Ozone Seasonal Day
UAM ..... Urban Airshed Model
USEPA..... United States Environmental Protection Agency
VMT..... Vehicle Miles Traveled
VOC ..... Volatile Organic Compounds

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Executive Summary

The United States Environmental Protection Agency (USEPA) designated the Southeast Desert Modified Air Quality Management Area (Southeast Desert Modified AQMA) as non-attainment for ozone National Ambient Air Quality Standards (NAAQS) pursuant to the provisions of the Federal Clean Air Act (FCAA). A portion of the Mojave Desert Air Quality Management District (MDAQMD) is included in the Southeast Desert Modified AQMA. The California Air Resources Board has also designated the entire Mojave Desert Air Basin (MDAB) non-attainment for ozone California Ambient Air Quality Standards (CAAQS) pursuant to the provisions of the California Clean Air Act (CCAA). The entire MDAQMD is located within the MDAB. The MDAQMD has adopted State and Federal attainment plans for the region within its jurisdiction. The most recent such plan that was approved by USEPA is the Attainment Demonstration Plan adopted in 1994. The most recently adopted State plan is the 1996 Triennial Revision to the 1991 Air Quality Attainment Plan.

The MDAQMD has reviewed and updated all elements of the ozone plan. The portion of the MDAQMD designated as a Federal ozone non-attainment area will be in attainment of the NAAQS for ozone by the required year, 2007. The entire MDAQMD will show significant progress towards attainment of the ozone CAAQS by that year.

This document includes the latest planning assumptions regarding population, vehicle activity and industrial activity. This document addresses all existing and forecast ozone precursor-producing activities within the MDAQMD through the year 2007. This document includes all necessary information to allow general and transportation conformity findings to be made within the MDAQMD.

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CHAPTER 1 - Introduction and Background

Purpose
Regulatory History
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Pollutant Descriptions
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INTRODUCTION

Purpose

The Southeast Desert Modified AQMA (as defined in 40 CFR 81.167) has been designated non-attainment for the NAAQS for ozone by USEPA (40 CFR 81.305) and the MDAB (formerly known as the Southeast Desert Air Basin) has been designated non-attainment for the CAAQS for ozone by CARB (17 Cal. Code Reg. §60201). The MDAQMD is located within entirely within the MDAB and partially within the Southeast Desert Modified AQMA. The MDAQMD has experienced ambient ozone concentrations in excess of the one-hour ozone NAAQS and the ozone CAAQS. This document: (1) demonstrates that the MDAQMD will meet the primary required Federal ozone planning milestones, attainment of the ozone NAAQS by the end of 2007; (2) presents the progress the MDAQMD will make towards meeting all required State ozone planning milestones, including attainment of the ozone CAAQS; and (3) discusses the 8 hour ozone NAAQS, preparatory to an expected non-attainment designation for the new NAAQS. This document satisfies 42 U.S.C. §§7410, 7502, 7504 and 7511a (FCAA §§110, 172, 174, and 182) regarding implementation plans, non-attainment plan provisions, planning procedures, and ozone plan submissions and requirements for the one-hour NAAQS. This document also satisfies or addresses Health & Safety Code (H&SC) §§40911, 40912, 40913, 40914, 40915, 40918, 40924, and 40925 regarding ozone attainment plans and plan elements.

BACKGROUND

Regulatory History

The USEPA designated a portion of the southwestern desert part of San Bernardino County as non-attainment and classified it as Severe-17 for ozone as part of the Southeast Desert Modified AQMA. This large "maintenance area" was classified based on a 0.24 ppm ozone design value calculated from pre-1990 concentrations in Banning. The Severe-17 classification requires attainment of the one-hour ozone NAAQS by the end of 2007, 17 years after the adoption of the FCAA Amendments in 1990.

The entire MDAB has been designated by CARB as non-attainment of the ozone CAAQS. The entire MDAQMD is located within the MDAB. CARB has classified the MDAQMD as a "moderate" ozone non-attainment area.

The MDAQMD was established on July 1, 1993, pursuant to H&SC §41200 et seq (Statutes 1992 ch. 642). The MDAQMD was a successor agency to the San Bernardino County Air Pollution Control District (SBCAPCD), which had jurisdiction over the desert portions of San Bernardino County commencing in February 1977 through the formation of the MDAQMD. The Palo Verde Valley portion of eastern Riverside County was annexed by the MDAQMD from the South Coast Air Quality Management District (SCAQMD) effective July 1, 1994, pursuant to provisions of H&SC 41210(c) and MDAQMD Resolution 94-03.

Initial air quality planning for the region was the 1991 Air Quality Attainment Plan (AQAP) which was adopted by the SBCAPCD on August 26, 1991 in response to the State of California

ozone planning requirements. Additional ozone plans were adopted by the MDAQMD to address Federal ozone planning requirements. This document replaces or updates all previously submitted plans.

Regional Ozone Planning Chronology

1989 - CARB designates SEDAB (now known as MDAB) as non-attainment for ozone CAAQS
1990 - CARB classifies the SEDAB (now known as MDAB) as moderate ozone non-attainment
November, 1990 - Adoption of Federal Clean Air Act Amendments
August 26, 1991 - Adoption of the 1991 Air Quality Attainment Plan (State) by SBCAPCD
July 1, 1993 - Formation of Mojave Desert Air Quality Management District
July 1, 1994 - Annexation of Palo Verde Valley portion of Riverside County
March 24, 1994 – Adoption of Rate-Of-Progress Plan (Federal) by MDAQMD
October 26, 1994 - Adoption of Attainment Demonstration Plan (Federal) by MDAQMD
January 22, 1996 - Adoption of Triennial Revision to 1991 AQAP (State) by MDAQMD

Statement of Issues

The MDAQMD is downwind of the Los Angeles basin, and to a lesser extent, is downwind of the San Joaquin Valley. Prevailing winds transport ozone and ozone precursors from both regions into and through the MDAB during the summer ozone season. These transport couplings have been officially recognized by CARB.[1] Local MDAQMD emissions contribute to exceedances of both the NAAQS and CAAQS for ozone, but the MDAB would be in attainment of both standards without the influence of this transported air pollution from upwind regions.

Federal Legal Requirements

The MDAQMD must adopt a plan that provides for the implementation, maintenance and enforcement of the NAAQS within three years after promulgation of the NAAQS. The plan is to include enforceable emission limitations, provide for a monitoring program, provide for a permit program (including a new source review program), contingency measures, and air quality modeling (42 U.S.C. §7410(a); FCAA §110(a)). The MDAQMD met this requirement with the 1994 Rate-Of-Progress and Attainment Demonstration plans. This document represents an update to those plans. The MDAQMD has adopted enforceable emission limitations, has a monitoring system in place throughout the populated portions of the Federal Ozone Non-Attainment Area (FONA), maintains a permit program (including a New Source Review program with an ambient air quality modeling requirement), and has performed an attainment demonstration using air quality modeling. This document identifies a contingency measure.

This document incorporates all reasonably available control measures (all such measures have already been adopted for the FONA). This document includes a comprehensive, accurate and

[1] "Ozone Transport: 2001 Review," April 2001, CARB identifies the South Coast Air Basin as having an overwhelming and significant impact on the Mojave Desert Air Basin (which includes the Mojave Desert) and the San Joaquin Valley as having an overwhelming impact on the MDAB.

current inventory of actual emissions (42 U.S.C. §7502(c)(3), 7511a(a)(1); FCAA §§172(c)(3), 182(a)(1)).

This document discusses reasonable further progress (42 U.S.C. §§7502(c)(2), 7511a(b)(1); FCAA §§172(c)(2), 182(b)(1)) for the applicable periodic milestone dates (2002, 2005 and 2007) (42 U.S.C. §7511a(g); FCAA §182(g)). The FONA is not capable of meeting the reasonable further progress milestones on its own; the target levels would require reductions in source categories that are not under the jurisdiction of the MDAQMD (specifically mobile sources).

This document has been coordinated with the transportation planning process (42 U.S.C. §7504; FCAA §174). The document includes an on-road mobile source emission budget for the FONA, and also includes the on-road mobile source emission budget for the entire Southeast Desert Modified AQMA as an appendix.

This document updates the MDAQMD emissions inventory (42 U.S.C. 7511a(a)(1); FCAA §182(a)(1)). The MDAQMD met the original inventory requirement with the 1994 Rate-Of-Progress and Attainment Demonstration plans.

The MDAQMD has an enhanced non-attainment pollutant monitoring program, requires reasonably available control technology within the FONA, has a vehicle inspection and maintenance program, a De Minimis rule, and a gasoline vapor recovery rule. The District participates in the State's Clean-Fuel Vehicle Program, and performs periodic transportation activity consistency demonstrations in conjunction with the Southern California Association of Governments (including a review of vehicle miles traveled growth). The MDAQMD controls oxides of nitrogen (NO_x) in addition to Volatile Organic Compounds (VOC) within the FONA, and is addressing both pollutants in this document. The MDAQMD new source review program defines sources emitting 25 tons per year or more as major and requires offsets at a 1.3 to 1 ratio (42 U.S.C. §§7511a(d), 7511a(d)(2); FCAA §§182(d) 182(d)(2)). Employer trip rules (42 U.S.C. §7511a(d)(1); FCAA §182(d)(1)) have been shown to be not cost-effective for the FONA due to low population density.

State Legal Requirements

H&SC §40911 requires each district that is a receptor of transported air pollutants to prepare and submit a plan to CARB not later than June 30, 1991. The SBCAPCD, the predecessor agency to the MDAQMD, met this requirement for the MDAB with the 1991 Air Quality Attainment Plan. The MDAQMD updated this plan in 1996. This document is a revision to both the initial plan and the 1996 update.

H&SC §40912 requires a downwind district plan to contain sufficient measures to reduce emissions originating in the district below the level at which violations of the CAAQS would occur in the absence of transported contribution. This document addresses this requirement to the extent possible.

This document achieves and maintains the CAAQS by the earliest possible date considering concentrations, violations, transport, emission projections, emission inventories, control measures, emission reductions, military base closures, and cost effectiveness (H&SC §40913).

H&SC §40914 requires specific annual ozone precursor emission reductions relative to 1990 (five percent per year or as otherwise approved), and the adoption of all feasible measures. This document addresses this requirement, but it is not feasible to achieve the reduction specified without reducing sources not under the jurisdiction of the MDAQMD. The MDAQMD has adopted and will adopt all feasible control measures.

H&SC §40915 requires that the plan include contingency measures for use in case of inadequate progress towards attainment. The MDAQMD has identified a contingency measure.

The MDAQMD has a New Source Review program, has implemented Reasonably Available Control Technology on all sources, has an emissions inventory system, and has a public education program (H&SC §40918). Reasonably available transportation control measures, area-wide and indirect source control programs have been shown not to be cost-effective within the MDAQMD due to insufficient population density.

This document includes the required assessment of progress towards attainment of the CAAQS, addressing concentrations, emissions and control measures (H&SC §40924). This document updates previously submitted plans and summaries of progress.

This document corrects deficiencies, updates planning assumptions and addresses emissions reductions and growth since previous plan submissions (H&SC §40925). This document updates all previous plan submissions.

Pollutant Description and Health Effects

Ozone (O_3)- A colorless gas that is a highly reactive form of oxygen. It has a strong odor when highly concentrated. Ozone can occur naturally but can also be formed from other compounds through photochemistry, a complex system of reactions with hydrocarbons and oxides of nitrogen in the presence of sunlight (ultraviolet). The MDAB experiences ozone concentrations in excess of the State and Federal ambient air quality standards.

Ozone can cause respiratory irritation and discomfort, making breathing more difficult during exercise. Ozone can reduce the respiratory system's ability to remove inhaled particles, increase pulse rate, decrease blood pressure and reduce the body's ability to fight infection. After six hours of exposure a healthy person can have significant reduction of lung function. It is an irritant towards the skin, eyes, upper respiratory system, and mucous membranes, although symptoms disappear after exposure. It may also be a carcinogen.

Setting

The MDAQMD includes the desert portion of San Bernardino County and a portion of eastern Riverside County commonly known as the Palo Verde Valley. A portion of the MDAQMD has

been designated non-attainment for the one-hour ozone NAAQS by USEPA as a portion of the Southeast Desert Modified AQMA (herein referred to as the FONA), based on a 240 part per billion (ppb) ozone design value monitored at Banning, California in Riverside County (40 CFR 81.305). The Southeast Desert Modified AQMA was defined using the Los Angeles-Anaheim-Riverside Consolidated Metropolitan Statistical Area, and includes a portion of the counties of Los Angeles, Riverside and San Bernardino (40 CFR 81.167). The 240 ppb ozone design value classifies the area as a Severe-17 non-attainment area with 2007 as the required attainment year (42 U.S.C. 7511(a)(2); FCAA §181(a)(2)). The FONA includes the communities of Phelan, Hesperia, Adelanto, Victorville, Apple Valley, Barstow, Joshua Tree, Yucca Valley and Twentynine Palms (the southwestern portion of the MDAQMD).

The entire MDAQMD (including the eastern end of Riverside County, the Palo Verde Valley) has been designated non-attainment of the ozone CAAQS. CARB has classified the MDAQMD as a moderate ozone non-attainment area based on a 110 ppb ozone design value monitored at Barstow, California on April 29, 1989.

The MDAQMD covers more than 20,000 square miles and included 359,551 persons as of the 1990 census (approximately 445,000 in 2002). The region is characterized by hot, dry summers and cool winters, with little precipitation. The National Training Center at Fort Irwin, the Marine Corps Air Ground Combat Center, and portions of Edwards Air Force Base and the China Lake Naval Air Weapons Station are in the MDAQMD. The MDAQMD also includes the Mojave National Preserve and portions of Death Valley National Park and Joshua Tree National Park

The primary roadways in the MDAQMD are Interstate 15, Interstate 40 and Interstate 395. All of these highways carry a significant amount of transiting heavy duty truck traffic, and Interstate 15 carries a substantial amount of commute traffic into the greater Los Angeles Basin.

The MDAQMD is a growing bedroom community, but does have significant mining and military activity.

Ozone Trend

The MDAQMD has experienced a substantial reduction in the number of days when ozone exceeds the one-hour ozone NAAQS, as displayed in Figure 1. The region has also experienced improvement in the number of days when ozone exceeds the ozone CAAQS, as shown in Figure 2.

The MDAQMD has also experienced a marked reduction in ozone exposure as measured by the State of California's preferred indicators, population- and area-weighted exposure hours (reductions of 92 and 94 percent, respectively, relative to 1988). All supporting data is presented in Appendix D.

Figure 1 - Federal One-Hour Ozone Exceedance Day Trend

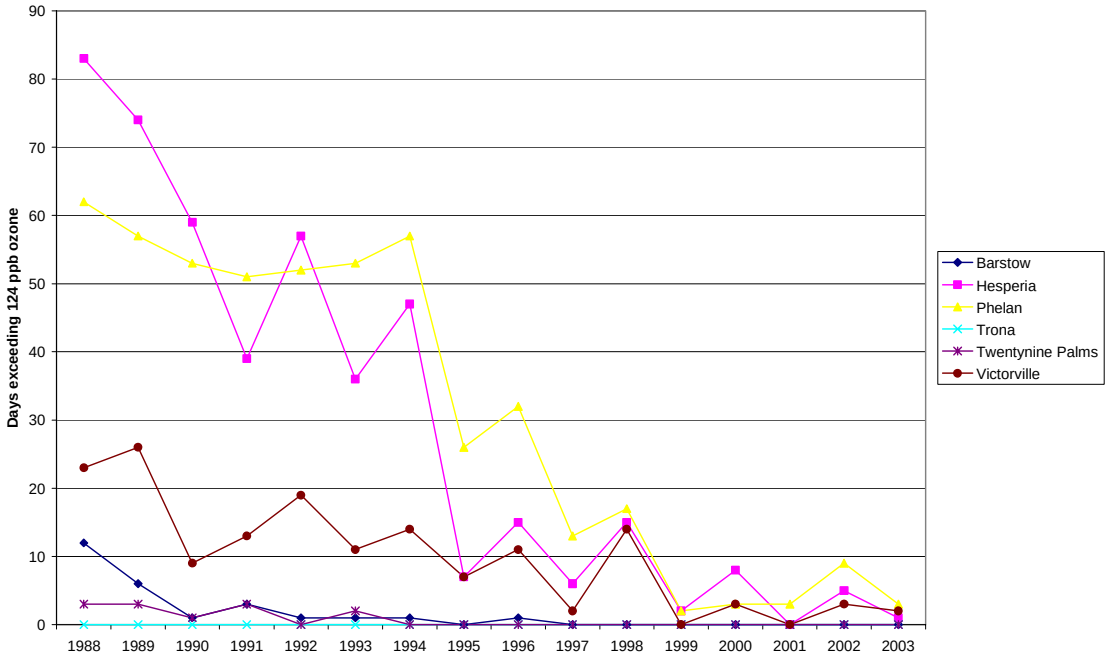
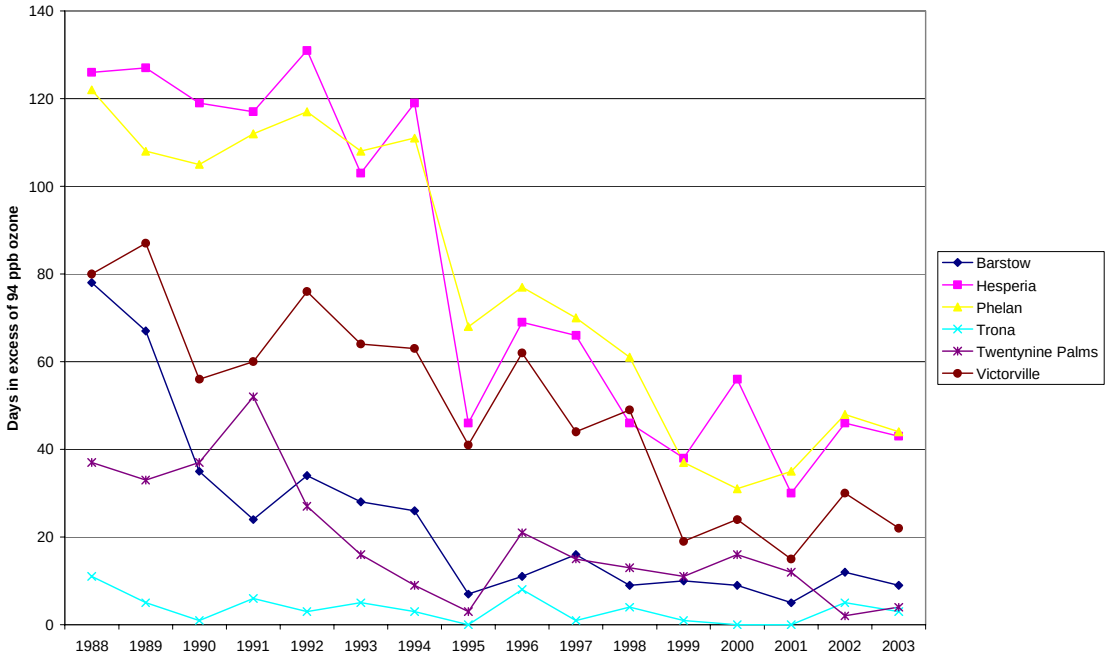
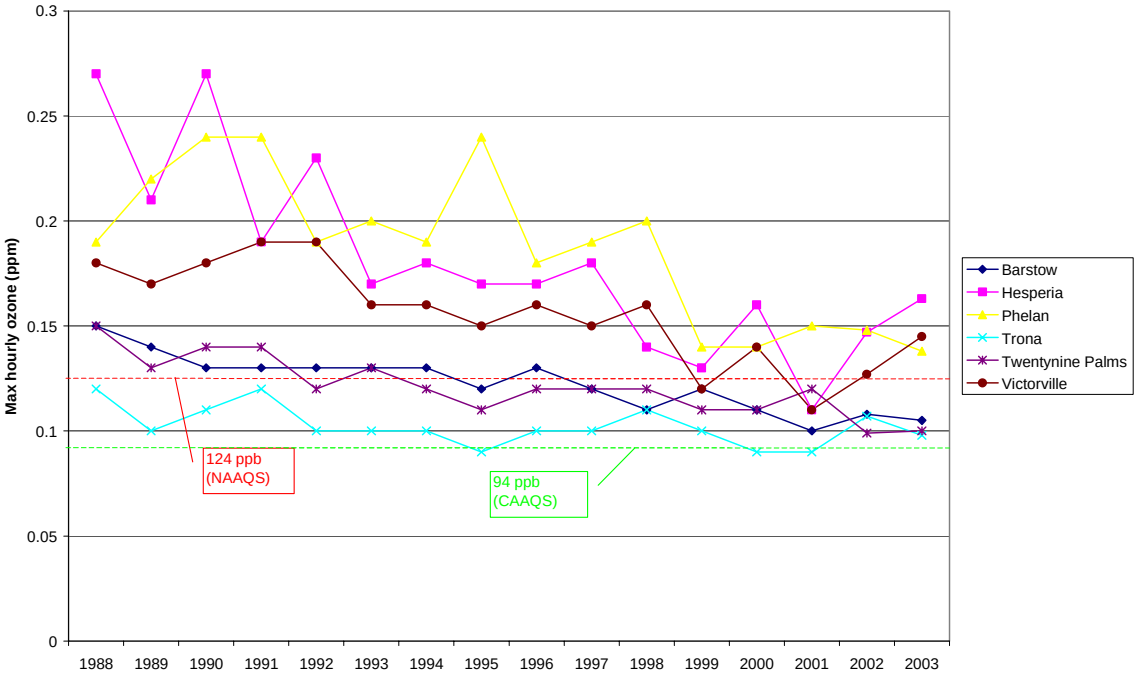


Figure 2 - State Ozone Exceedance Day Trend



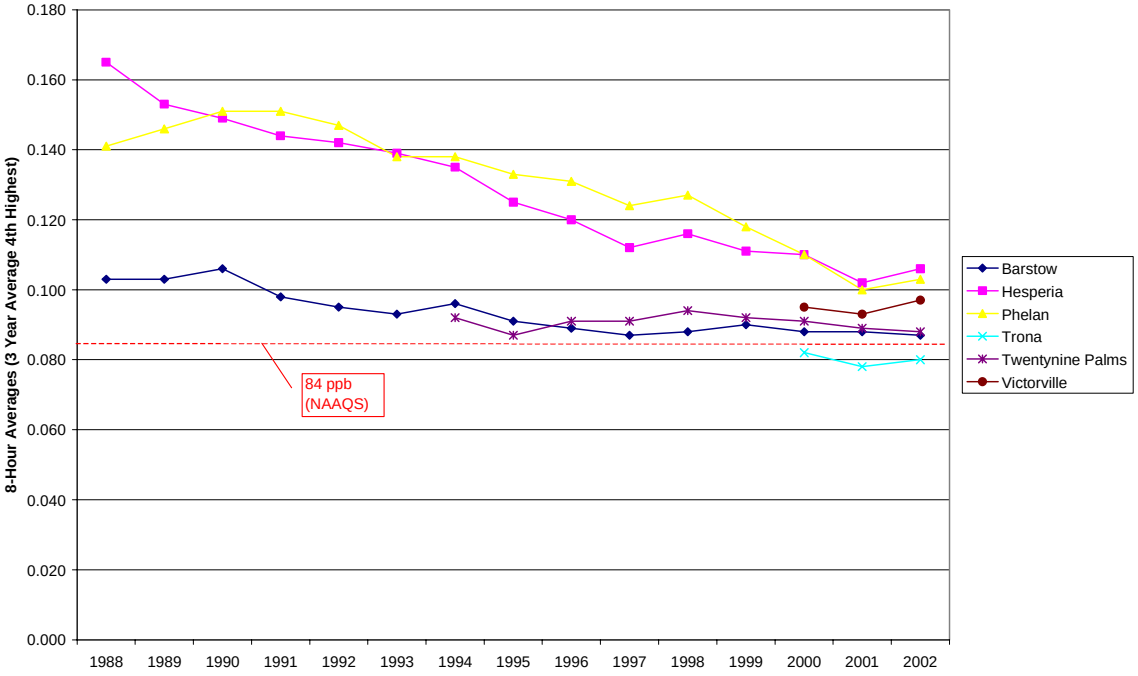
The MDAQMD has experienced a small improvement in its maximum ozone concentration - see Figure 3. Figure 3 also includes lines representing the NAAQS level and the CAAQS level. As is shown in the figure, the MDAQMD is approaching attainment of the one-hour NAAQS. Note that the three stations closest to the South Coast Air Basin (and the source of transported ozone and ozone precursors) have the highest historical ozone concentrations, Phelan, Hesperia and Victorville. The more distant or isolated stations (Barstow, Twentynine Palms and Trona) have much lower concentrations, and are in fact recently experiencing concentrations in attainment of the NAAQS.

Figure 3 - Maximum One-Hour Ozone Concentration Trend



No designations have yet been made for the recently promulgated eight-hour ozone NAAQS. The MDAQMD expects to be designated non-attainment for this standard based on ambient concentrations, presented in Figure 4. Progress towards attainment of the one-hour ozone standards also represents progress towards attainment of the eight-hour standard.

Figure 4 - Maximum Eight-Hour Ozone Concentration Trend



CHAPTER 2 – Emission Inventories

General
Modeled Emission Inventory
Base Year
Future Years

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General

Ozone planning requirements call for the use of seasonal inventories representing emissions during a typical summer day (since ozone concentrations are typically highest under summer weather conditions). This document includes ozone seasonal day inventories, in units of tons per ozone seasonal day (or tons per os day, or tposd), unless otherwise indicated. All emissions presented in this document have been adjusted or calculated in terms of ozone seasonal day emissions with the exception of stationary point source emissions, which have been calculated from annual emissions (and when presented on a daily basis are in annual average day units). Stationary points source emissions do not typically exhibit the kind of seasonal variation commonly associated with heating, travel and evaporative-based activities and emissions. Accordingly, the District finds that this assumption is reasonable and will have a negligible impact, if any, on the attainment demonstration.

Federal ozone planning requirements call for emissions in terms of Volatile Organic Compounds (VOC), while State ozone planning requirements call for emissions in terms of Reactive Organic Gases (ROG). Due to changes in each definition, there is no effective difference between the two terms (for example, ethane is now excluded from both definitions). For purposes of this document and attainment planning, the District considers these terms interchangeable.

Modeled Emission Inventory

Complete documentation of the emission inventory used in the modeled attainment demonstration, and the planning inventory for all milestone years, is available at the following web address:

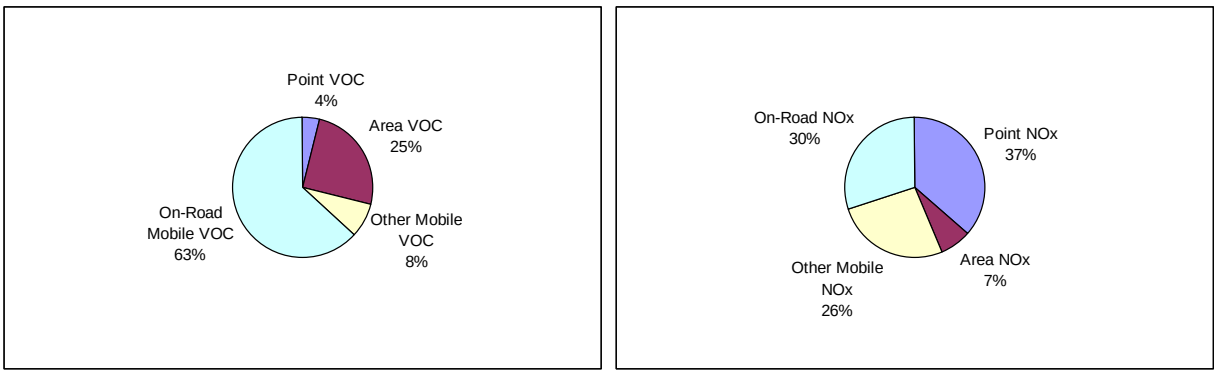
http://www.arb.ca.gov/app/emsinv/scos/index.php

(Contact Martin Johnson at mjohnson@arb.ca.gov or (916) 323-3567 if you have questions pertaining to this website)

Federal Ozone Non-Attainment Area Base Year Emission Inventory

The initial Federal base year for emission inventory purposes was 1990. USEPA has since required that 2002 be used as the base year. 1990 is still used for reasonable further progress requirements. This document includes an updated 1990 inventory and a 2002 inventory. 2002 is used as the base year inventory for all growth scenarios in this document. The base year emission inventory is presented in Appendix A; a summary is presented in Table 1 below. Figure 5 presents the current 1990 base year VOC and NO_x inventory in basic pie chart format (VOC on the left, NO_x on the right). Mobile sources were the primary emitters in the FONA in 1990.

Figure 5 - 1990 Base Year Pie Charts (FONA)



The primary revision to the 1990 base year involves changes to the on-road mobile source emissions inventory - this document includes on-road mobile source emissions calculated using EMFAC2002 version 2.2 with April 2003 activity and other SCAG inputs.[2] This represents the latest planning assumptions available to the MDAQMD.

Table 1 and Figure 6 compare the FONA 1990 base year as presented in the 1994 Federal plans with the current version. Point source data has been improved, reducing 1990 VOC but increasing NO_x (primarily due to corrections to cement kiln data). Area source and other mobile source emissions calculations have been substantially changed and improved, resulting in significantly increased emissions. The most dramatic change is the increase in on-road mobile emissions due to the use of EMFAC2002 - the increased emissions are considered the most accurate available data.

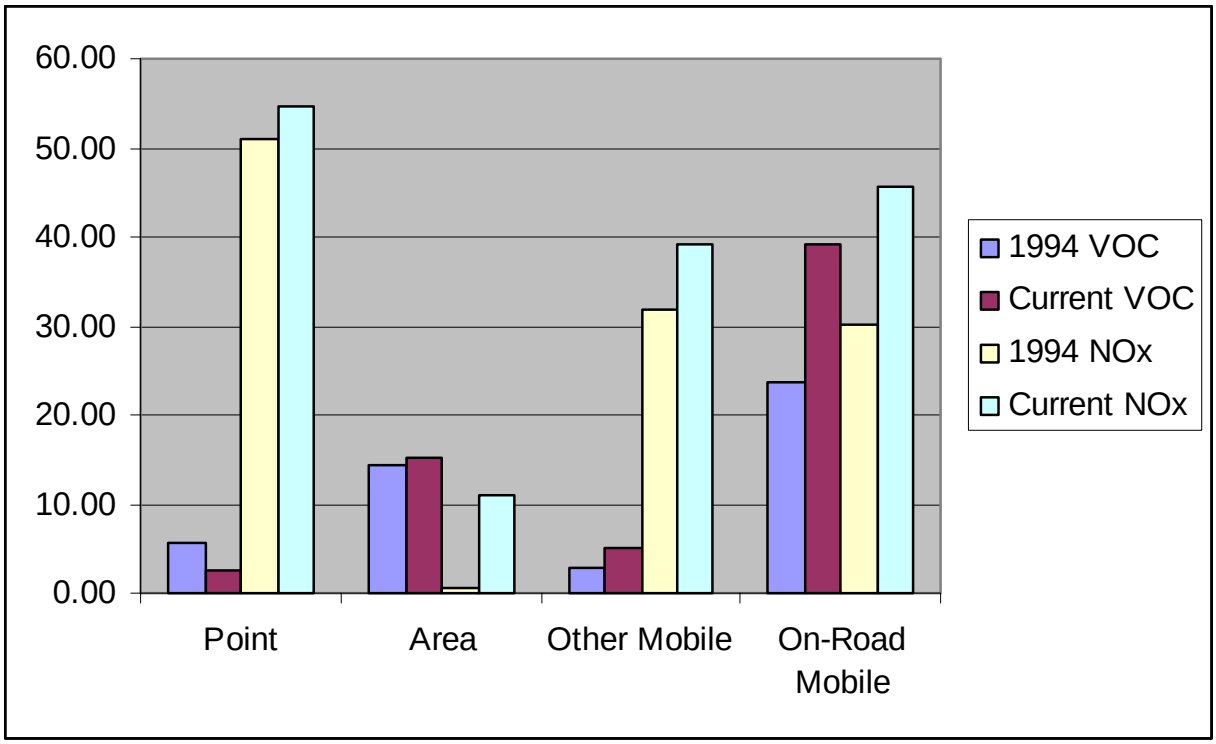
Table 1 - 1990 Base Year Comparison Data (FONA)

1990 Base Year - 1994 Data versus Current (tposd)

	1994 VOC	Current VOC	1994 NOx	Current NOx
Point	5.58	2.66	51.05	54.70
Area	14.37	15.23	0.62	11.06
Other Mobile	2.93	5.03	31.71	39.24
On-Road Mobile	23.60	39.03	30.25	45.71

[2] "Request #441 - Southeast Desert Modified AQMA Ozone SIP Motor Vehicle Inventory," CARB November 5, 2003

Figure 6 - FONA 1990 Base Year Comparison (1994 version versus Current)



State Ozone Non-Attainment Area Base Year Emission Inventory

The State ozone non-attainment area covers the entire MDAQMD, a much larger area than the FONA. The larger area includes military bases and mining operations but relatively little additional population. However the State ozone non-attainment area does include significant additional road miles of highway, and as a result the relative contribution of mobile sources is greater, as can be seen in Table 2 and Figure 7.

Figure 7 - 1990 Base Year Pie Charts (State)

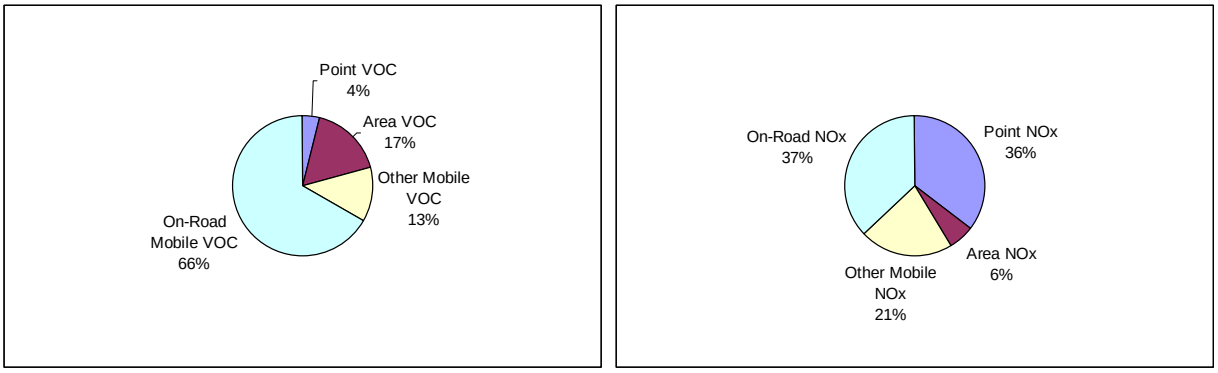


Table 2 - 1990 Base Year Source Contribution (State)

all emissions in tposd

Source Category	VOC	%	NOx	%
Point	4.02	4%	74.35	36%
Area	16.67	17%	12.22	6%
Other Mobile	12.58	13%	44.87	21%
On-Road	66.26	67%	77.60	37%
Totals	*99.53*		*209.05*	

Future Year Emission Inventories

Future year or forecasted emission inventories are estimated by multiplying a base year value for each category by a 'growth code' for a given future year. The 'growth code' is indexed to the base year (2002 for this document), so that its value for the base year is 1.00. This allows the growth code to estimate future activity in terms of emissions; if the growth code for the year 2007 is 1.50, activity in that category (and resulting emissions) is expected to be 50 percent greater than in 2002. The MDAQMD uses the growth codes approved by CARB for such purposes (selected point source growth codes have been modified using historical and local data). The growth codes used to forecast point sources are presented in Appendix B. Forecasted FONA VOC and NO_x inventory summaries for each year of interest are presented in Figures 8 and 9 respectively (the 1990 base year is included in each figure for reference). Forecasted state VOC and NO_x inventory summaries for each year of interest are presented in Figures 10 and 11 respectively. Future year emission inventories are presented for 2005 and 2007 in Appendix B (both FONA and state).

In addition to grown emissions, the future year inventories include the MDAQMD Emission Reduction Credit (ERC) bank as emissions, using the total ERCs in the bank as of February 2004. The District is including ERCs as a separate line item in future years to ensure that credited reductions are not perceived as permanent reductions; in a real sense the ERC bank represents actual historic emissions. For example, the actual reduction in natural gas transmission emissions from 1990 to 2002 is partially balanced by the creation of ERCs. Every ERC is represented in either the MDAQMD 1990 baseline or the upwind SCAQMD 1990 baseline as actual emissions.

The future year inventories also include a New Source Review (NSR) growth allowance, to specifically account for emissions growth in sources below the federal NSR offset threshold of 25 tons. This NSR growth allowance is equivalent to adding 25 additional tons per year of growth (for both NO_x and VOC) each year, and is conservatively estimated using the District's actual history of NSR activity. All pre-2003 NSR growth is reflected with actual stationary point source emissions in 2002. The NSR growth allowance is internally offset through the 1.3:1 mandatory offset ratio for sources above the 25 ton offset threshold. The District NSR program (Regulation XIII) was federally approved at 40 CFR 52.220(c)(239)(i)(A)(1) (11/13/96 61 FR 58133), and the District ERC program (Regulation XIV) was federally approved at 40 CFR 52.220(c)(224)(i0(C) (1/22/97 62 FR 3216 effective 3/21/97).

Figure 8 - Forecasted VOC Emission Inventories (FONA)

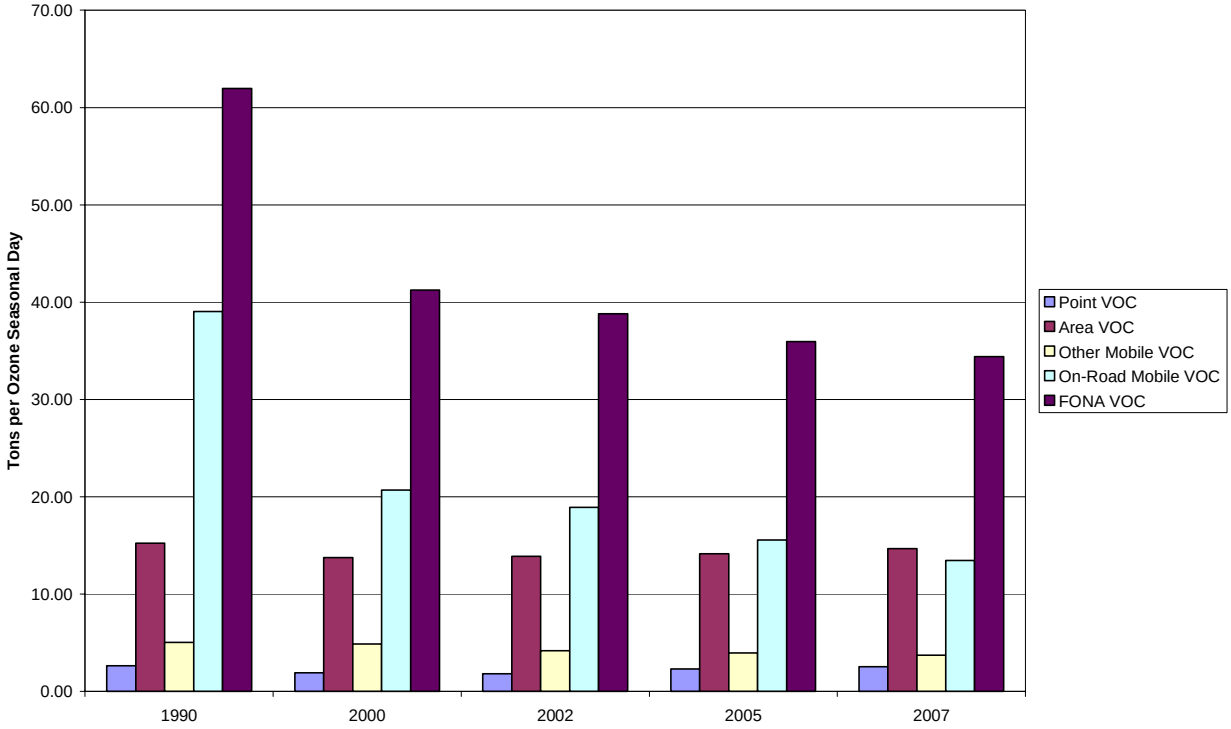


Figure 9 - Forecasted NO_x Emission Inventories (FONA)

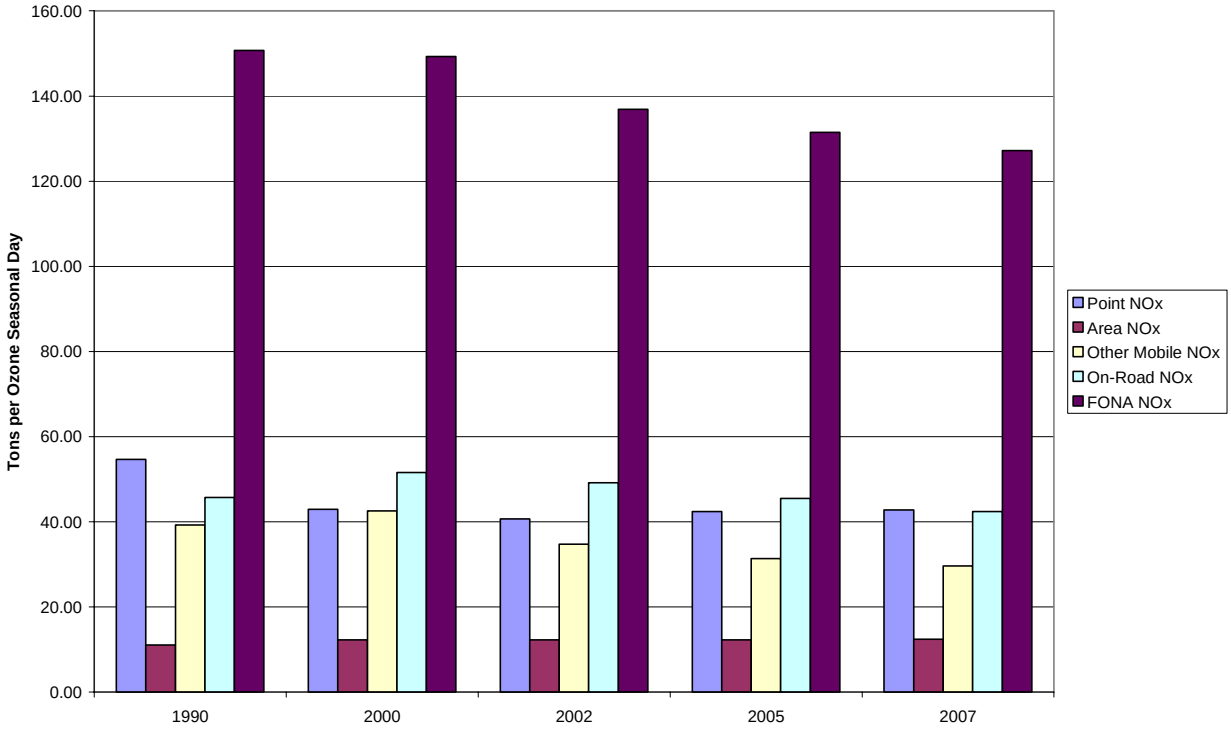


Figure 10 - Forecasted VOC Inventories (State)

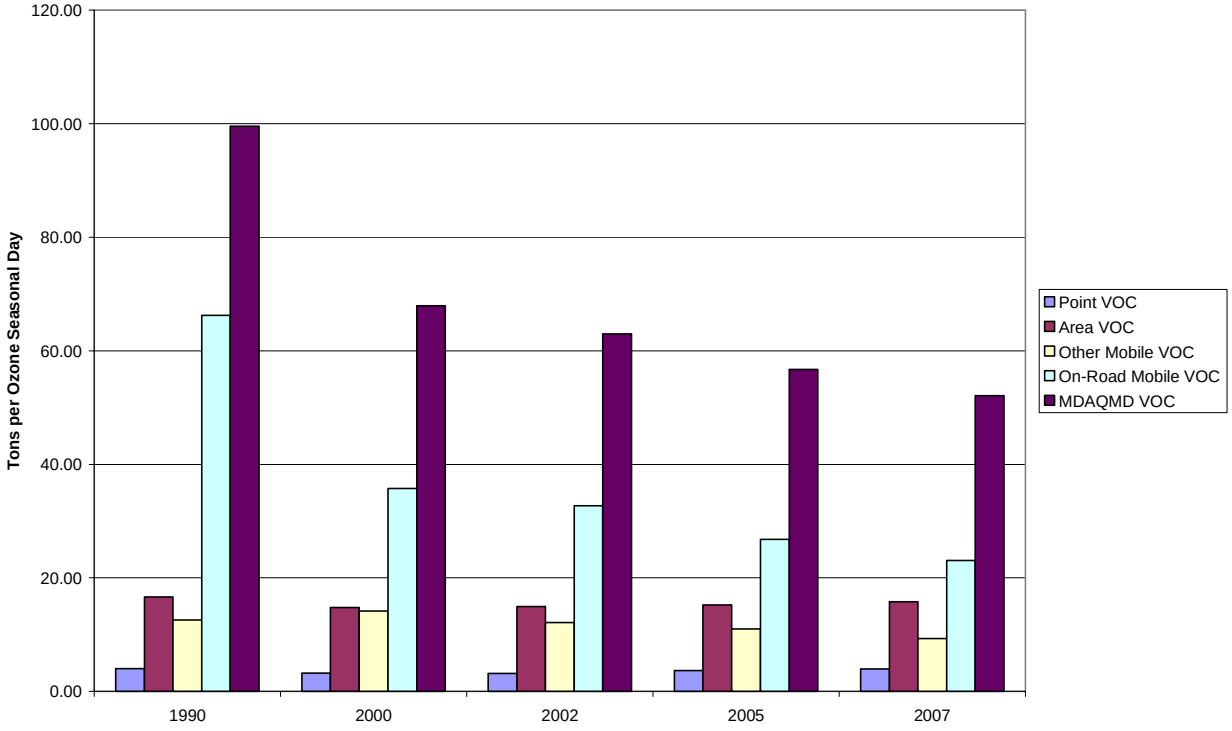
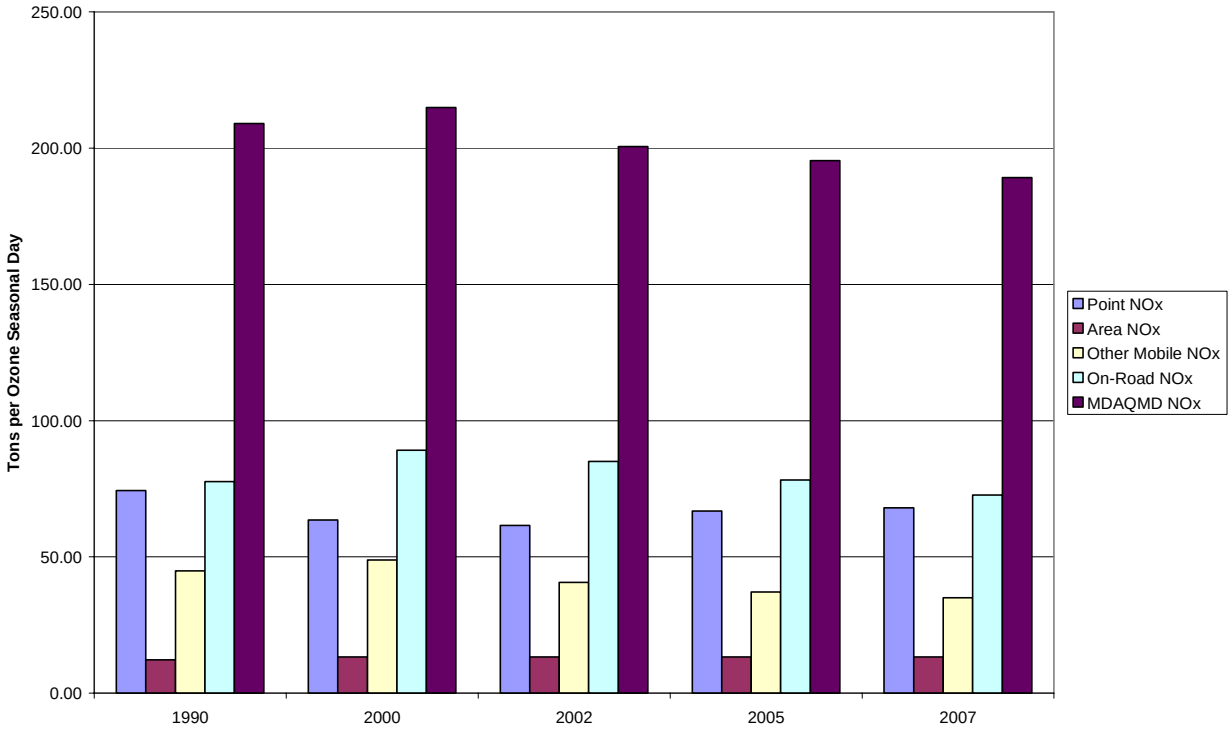


Figure 11 - Forecasted NOx Inventories (State)



CHAPTER 3 – Control and Contingency Measures

Existing Control Measures
Proposed Control Measures
Rule Adoption Schedule
Contingency Measures
Required Progress
Controlled Emission Inventories
Conformity Budgets

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Existing Control Measures

The current MDAQMD set of rules and regulations represents all feasible control measures for MDAQMD sources. The MDAQMD has in place Reasonably Available Control Technology (RACT) requirements for all applicable sources (including gasoline dispensing vapor control), as well as a New Source Review program with a 25 ton per year major source level and a 1.3:1 offset ratio requirement.

Proposed Control Measures

The MDAQMD is not proposing to adopt any additional control measures. The MDAQMD has in place all applicable RACT rules, and is achieving the CAAQS and NAAQS by the earliest practicable date not as a result of local reductions, but as a result of reductions occurring upwind. The MDAQMD will experience additional future emission reductions resulting from existing and proposed Federal and State control measures affecting mobile and area sources.

Rule Adoption Schedule

The MDAQMD is not proposing the adoption of any new control measures affecting ozone precursor emissions, so a rule adoption schedule is not presented here.

Contingency Measures

The MDAQMD reaffirms the use of the State Enhanced Inspection and Maintenance Program as a contingency measure. The MDAQMD would implement the State's version of Enhanced I&M should a contingency measure be triggered.

Required Progress

Both State and Federal law specify that each ozone non-attainment area must demonstrate ongoing emission reductions relative to the base year (1990 for Federal purposes). Federal law requires a three percent (3%) per year reduction in VOC emissions, and does not allow credit to be taken for certain federal motor vehicle control programs (FMVCP). Where both VOC and NO_x emissions have been shown to contribute to high ozone levels, the Clean Air Act allows NO_x emission reductions to be used to augment VOC emission reductions in order to demonstrate reasonable further progress. In the following rate of progress demonstration, the level of NO_x reductions needed to augment the VOC reductions is determined by the ratio of NO_x emissions to VOC emissions in 1990, the base year for federal rate of progress determinations. To meet federal rate of progress requirements, this plan must demonstrate VOC-equivalent reductions of 42 percent in 2005 and 48 percent in 2007, relative to the 1990 base year.

Table 3 demonstrates that the rate of progress projected for the Southeast Desert Modified AQMA meets Federal Clean Air Act requirements. The required rate of progress is met in part by substituting NO_x reductions for VOC reductions at the rate of 1.6 tons of NO_x per ton of VOC shortfall. The Southeast Desert Modified AQMA consists of the Antelope Valley in Los Angeles County, the Mojave and Victor Valley portions of San Bernardino County, and the

Coachella Valley portion of Riverside County. The complete rate of progress demonstration calculations for the Southeast Desert Modified AQMA is presented in Appendix E.

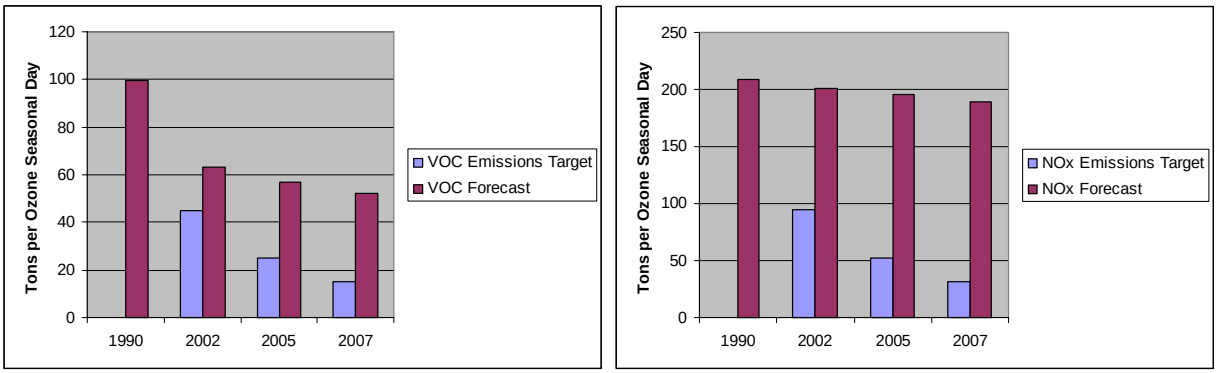
Table 3 - Federal Reasonable Further Progress for the SDMAQMA

(all emissions in tons per ozone season day)

	VOC		NOx	
	2005	**2007**	**2005**	**2007**
1990 Baseline Emissions	136.53	136.53	218.79	218.79
FMVCP Adjustment	-38.30	-38.62	0	0
Adjusted VOC Baseline	98.23	97.91	218.51	218.51
VOC Emission Target	56.97	50.91		
Emissions with Adopted Controls	68.90	66.35	180.35	170.7
VOC Shortfall	11.93	15.44		
NOx Available for Substitution			38.44	48.90
NOx Used for Substitution 2005				
Actual NOx			19.09	
VOC Equivalents	11.93			
Net NOx Available for Substitution 2007				29.00
NOx Used for Substitution 2007				
Actual NOx				24.70
VOC Equivalents		15.44		
Final Progress Shortfall	0	0		

State law requires a five percent per year reduction in ozone precursors, relative to 1990. This equates to a substantial eighty five percent (85%) reduction requirement by 2007. As is shown in Figure 12, the MDAQMD is not meeting this requirement, although significant reductions have been realized relative to 1990 levels. Meeting these reduction targets would require complete shutdown of all sources under the MDAQMD jurisdiction, and substantial reductions from mobile sources and other sources not under the MDAQMD's jurisdiction, which is not feasible.

Figure 12 - State Emissions Targets and Forecasts



Controlled Emission Inventories

As the MDAQMD is not proposing any additional control measures, the controlled emission inventory is identical to the forecasted emission inventory.

Conformity Budgets

The forecasted emission inventories presented in this document are the emission budgets for general conformity purposes, as no additional control measures are proposed. A project subject to the general conformity test must be demonstrated to conform with the applicable portion of the forecasted emission inventory. For a project that falls between forecasted years, a linearly interpolated inventory may be calculated. For a project that falls after 2007, use 2007.

The forecasted on-road mobile source inventory represents the emission budget for transportation conformity purposes, as no transportation control measures are proposed. A project subject to the transportation conformity test must be demonstrated to conform with the forecasted on-road mobile source inventory. The FONA on-road mobile source inventory is presented below, in addition to the appendices. The portion presented In Table 4 is for information only - the MDAQMD is officially adopting the transportation budget for the entire Southeast Desert Modified AQMA as presented in Appendix C.

Table 4 - Transportation Conformity Budget (Mojave Desert Portion)

	1990	2000	2002	2005	2007
(tons per ozone seasonal day)					
On-Road Mobile Source VOC	39.03	20.68	18.92	15.56	13.46
On-Road Mobile Source NOx	45.71	51.60	49.17	45.47	42.43

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CHAPTER 4 – Attainment Demonstration

Modeling Approach Overview
UAM Overview
Modeling Domain
Model Inputs
Modeling Episodes
SCAQMD Discussion of 2007 Attainment Demonstration Modeling Results

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ATTAINMENT DEMONSTRATION

This chapter paraphrases and reiterates information from the most recent SCAQMD/CARB ozone model runs, the runs performed for the 2003 SCAQMD AQMP. For further information, please refer to Appendix V of that document.[3]

Modeling Approach Overview

The MDAQMD is a small portion of the complex greater Southern California airshed. The MDAQMD is also only one section of the larger Southeast Desert Modified AQMA ozone non-attainment area. Ozone and ozone precursors are known to flow (or be transported), under the influence of winds, throughout Southern California. The most technically accurate method of evaluating ozone concentrations, ozone emissions, and future ozone behavior is through a large modeling project that includes all of the affected areas in Southern California (and a portion of northern Mexico). The modeling effort has been performed as a joint project by all of the air districts in the region and CARB, with SCAQMD and CARB staff and resources doing the primary work. This regional modeling effort has allowed the most accurate understanding and prediction of future ozone concentrations for Southern California.

UAM Overview

The UAM is the regional modeling system preferred by USEPA and CARB for analyzing ozone non-attainment areas. The UAM predicts future ambient ozone concentrations under historical conditions that led to high ambient ozone concentrations. These conditions are typically multi-day 'episodes' in which the State and Federal ozone standards were exceeded. The UAM also evaluates ozone precursor emissions, local and regional meteorology, and regional topography to calculate ozone concentrations. These calculations are preformed on an hourly basis throughout the modeled episode, thus allowing the UAM to stimulate changing conditions (i.e. night, day and wind).

Future years are simulated twice using the UAM: first, using the uncontrolled emissions inventory; and second, using a reduced emissions inventory controlled by the proposed ozone control strategy. Comparing the uncontrolled and controlled ambient ozone concentrations identifies the effectiveness of the proposed ozone control strategy. Attainment year ambient ozone concentrations using the reduced emissions inventory controlled by the proposed ozone control strategy should achieve the State and Federal ozone standards.

Modeling Domain

The UAM performed by SCAQMD included the MDAQMD within its model domain. This model domain includes the upwind sources within SCAQMD, which are responsible for the overwhelming ozone transport into the MDAQMD.

[3] "Final 2003 Appendix V - Modeling and Attainment Demonstrations," SCAQMD, August 2003

Model Inputs

SCAQMD performed the UAM attainment demonstration using data maintained by CARB and MDAQMD. The emissions inventory used for the UAM is consistent with the emissions inventory presented in the appendices to this document.

Modeling Episodes and Results

Table 5 presents the two modeling results for the MDAQMD.

Table 5 - 2007 Federal Ozone Attainment Demonstration

All concentrations are in parts per billion		
Episode Day	**SCAB Max 2007 Ozone**	**Mojave Desert Max 2007 Ozone**
August 27, 1987	115	115
August 28, 1987	138	119
August 5, 1997	145	118
August 6, 1997	151	148 (111)*

The August 6, 1997 ozone concentration in the parentheses is the scaled (corrected) value to adjust for the systematic over-prediction in the base year.

The modeling results show that the MDAQMD will attain the one-hour ozone NAAQS (124 ppb) in 2007, and will achieve progress in attaining the ozone CAAQS (94 ppb) by that year.

SCAQMD Discussion of 2007 Attainment Demonstration Modeling Results[4]

The SCAQMD 2003 Air Quality Management Plan provides future-year controlled emissions projections of ozone for the South Coast Air Basin and three adjacent downwind air basins: South Central Coast (Ventura County), Mojave Desert (Antelope Valley and Mojave Desert) and the Salton Sea (Coachella Valley). The 2007 ozone projections were simulated using the Urban Airshed Model (UAM). UAM was selected as the primary modeling tool for the 2003 ozone plan. Additional simulations presented in the 2003 AQMP used the California Photochemical Grid Model (CALGRID). The CALGRID simulations were conducted to support the primary UAM simulations. Detailed discussion of the UAM and CALGRID ozone modeling and attainment plans are provided in Appendix V of the 2003 AQMP.

The UAM simulations were conducted for two historical episodes: the August 4-7, 1997 meteorological episode that occurred during the Southern California Ozone Study (SCOS97) and for the August 27-29, 1987 meteorological episode that occurred during the Southern California Air Quality Study (SCAQS87). The 1987 meteorological episode was previously simulated for the 1991, 1994 and 1997 AQMPs. CALGRID was only simulated for the August 4-7, 1997 meteorological episode. The primary days for the two meteorological episodes included August 5th and 6th for the 1997 episodes and August 27th and 28th for the 1987 episode. Of the two

[4] This section has been prepared and provided by the South Coast Air Quality Management District (Joe Cassmassi)

meteorological episodes simulated, the August 4-7, 1997 episode was ranked to be more severe than the 1987 episode and is considered to be near the upper limit of expected ozone impacts.

Table 6, taken from the 2003 AQMP, Appendix V, (Table 3-14), summarizes the UAM simulated 2007 ozone concentrations for the Basin and its neighbors for the 1997 and 1987 meteorological episodes assuming that all identified projected emissions controls are in place. Table 7, taken from the 2003 AQMP, Appendix V, Attachment-7, provides the CALGRID simulated 2007 ozone concentrations for the Basin and its neighbors for the 1997 meteorological episode using the same emissions. As presented in the 2003 AQMP, the UAM simulations for the Basin fail to reach the federal 1-hour ozone standard in 2007. The projected ozone concentrations for Ventura County and Coachella Valley meet the federal standard on all days simulated. The UAM projections for the Antelope Valley and Mojave Desert meet the federal standard on three of the four days with the sole exception of August 6th. The 2007 CALGRID simulations for the August 1997 meteorological episode indicate that all areas with the exception of the Basin will meet the federal standard.

In both tables, a scaled projection of the predicted ozone is presented in brackets for the August 6th simulation. The use of a relative reduction ratio (RRR) is designed to calibrate the prediction based upon the model's ability to recreate ozone concentrations in the Antelope Valley and Mojave Desert in the base-year simulation. As depicted, both the UAM and CALGRID simulations are scaled downwards in concentrations using the RRR methodology.

For the UAM simulation, ozone concentrations in the Antelope Valley were scaled downward (by a 0.70 RRR multiplier) to reflect the 42 percent over prediction that occurred at the Lancaster air monitoring station. Similarly, ozone concentrations in the Mojave Desert portion of San Bernardino County were scaled downward (by a 0.75 RRR multiplier) to reflect the 33 percent average over prediction that occurred at the Hesperia and Victorville air monitoring stations.

For the CALGRID simulation, ozone concentrations in the Antelope Valley were scaled downward (by a 0.59 RRR multiplier) to reflect the 70 percent over prediction that occurred at the Lancaster air monitoring station. Similarly, ozone concentrations in the Mojave Desert portion of San Bernardino County were scaled downward (by a 0.91 RRR multiplier) to reflect the 9 percent average over prediction that occurred at the Hesperia and Victorville air monitoring stations.

Table 6 - UAM Simulated 2007 Maximum Ozone: Controlled Emissions

Episode Day	Basin	Coachella Valley	Antelope Valley	Mojave Desert	Ventura County
August 5, 1997	145	122	92	118	89
August 6, 1997	151	83	141 (99)*	148 (111)*	106
August 27, 1987	115	94	99	115	101
August 28, 1987	138	83	105	119	103

* Concentrations for the high desert inside the brackets is the scaled value to adjust for systematic over prediction in the base year

Table 7 - CALGRID 2007 Projected Maximum 1-Hour Ozone Concentrations (ppb)

Episode Day	Basin	Coachella Valley	Antelope Valley	Mojave Desert	Ventura County
August 5, 1997	135	121	107	105	95
August 6, 1997	123	117	123 (72)*	122(112)*	112

* Concentrations for the high desert inside the brackets is the scaled value to adjust for systematic over prediction in the base year

Table 8 summarizes the base year (1997) UAM and CALGRID model performance ratios (MPR) for the August 5th and 6th meteorological episodes in the Antelope Valley and at an expanded number of monitoring sites in the Mojave Desert. In general, the base-year UAM MPRs for the August 5th episode are within 20 percent of unity and meet EPA's recommended model performance criteria. The UAM MPRs for August 6th demonstrate a consistent pattern of over prediction in the high desert areas. The CALGRID MPRs indicate over prediction at all sites for both episode days. Table 9 provides the corresponding RRRs for each model and meteorological episode at the selected sites. The RRR is calculated as the inverse of the MPR at each site (1/MPR).

Figure 13 depicts the 2007 grid level UAM predicted maximum concentration map for the August 6th meteorological episode. Figure 14 focuses on the UAM peak predicted 1-hour maximum ozone concentrations for each jurisdictional area.

As depicted in Figure 13, a limited ozone impact is predicted near Lancaster, with a local peak concentration of less than 130 ppb. The primary impact to the Antelope Valley (141 ppb) occurs in the southeast most grid of the region, at the county line, in an area adjacent to the bulk of transported smog plume impacting the Mojave Desert. The closest monitoring station to the grid having the predicted peak concentration in the Antelope Valley is Phelan, in the Mojave Desert jurisdiction (see Figure 14). The UAM MPR used to calculate the RRR for the Antelope Valley in the 2003 AQMP was 1.43 based on the Lancaster site. Note that the ratios for Phelan and the multi-site Mojave Desert station average are 1.48 and 1.44, respectively. The consistency between the ratios for Lancaster, Phelan and the multi-site average lends confidence that the RRR for the Antelope Valley is not being dominated by a single "outlier" MPR but is reflecting an overall impact to the high desert.

The Phelan and multi-site MPRs for the Mojave Desert jurisdiction are marginally higher than the Hesperia and Victorville average used to generate the RRR for the 2007 UAM predictions presented in the 2003 AQMP. (The Phelan air monitoring site was located in the grid adjacent to the grid with the maximum predicted Mojave Desert ozone concentration). The two-site average provides a more conservative adjustment for the base-year model over prediction with higher predicted ozone concentrations.

Table 10 summarizes the range of adjustments made to the 2007 UAM ozone model simulations. When adjusted using the RRR methodology, the predicted ozone impacts to both jurisdictions in the high desert are below the federal 1-hour standard (125 ppb).

The CALGRID simulations over predict ozone concentrations in the high desert on both days in the Antelope Valley and to a lesser extent in the Mojave Desert. Despite the base year over prediction, the 2007 CALGRID simulations for the August 5th and 6th meteorological episodes are less than the federal 1-hour ozone standard. The MPRs and corresponding RRRs for the high desert jurisdictions effectively lower the predicted impacts further as shown in Table 10. Regardless, the adjusted and unadjusted CALGRID simulations support the use of the RRR for the UAM simulation and concur with the conclusion that the Antelope Valley and Mojave Desert will be in attainment with the federal 1-hour ozone standard in 2007.

Table 8 - Base Year Model Performance Ratio (MPR): Predicted/Observed 1-Hour Maximum Concentration

Location	UAM		CALGRID	
	August 5, 1997	August 6, 1997	August 5, 1997	August 6, 1997
Antelope Valley				
Lancaster	1.03	1.43	1.50	1.70
Mojave Desert				
Phelan	1.13	1.48	1.44	1.24
Cajon (MDAQMD)	0.96	1.60	1.55	1.24
Cajon (AV)	N/A	1.48	N/A	1.15
Hesperia	1.14	1.36	1.51	1.09
Victorville	0.83	1.29	1.31	1.09
Average of Hesperia and Victorville	0.99	1.33	1.41	1.09
Multi-Site Average (excluding Lancaster)	1.02	1.44	1.45	1.16

Table 9 - Model Simulation Relative Reduction Ratios (RRR): [1/MPR]

Location	UAM		CALGRID	
	August 5, 1997	August 6, 1997	August 5, 1997	August 6, 1997
Antelope Valley				
Lancaster	0.97	0.70	0.67	0.59
Mojave Desert				
Phelan	0.88	0.68	0.69	0.81
Cajon (MDAQMD)	1.04	0.63	0.65	0.81
Cajon (AV)	N/A	0.68	N/A	0.87
Hesperia	0.88	0.74	0.66	0.92
Victorville	1.20	0.78	0.76	0.92
Average of Hesperia and Victorville	1.01	0.75	0.71	0.92
Multi-Site Average (excluding Lancaster)	0.98	0.69	0.69	0.86

Table 10 - Relative Reduction Ratio (RRR) Adjusted 2007 Projected Maximum 1-Hour Ozone Concentrations (ppb)

Scenario	RRR	Antelope Valley	Mojave Desert
UAM Simulation			
August 5, 1997	Lancaster	89	---
	Phelan	81	104
	Hesperia-Victorville	93	119
	5-Site Average	90	116
August 6, 1997	Lancaster	99	---
	Phelan	96	101
	Hesperia-Victorville	106	111
	5-Site Average	97	102
CALGRID Simulation			
August 5, 1997	Lancaster	72	---
	Phelan	74	72
	Hesperia-Victorville	76	75
	5-Site Average	74	72
August 6, 1997	Lancaster	73	---
	Phelan	100	99
	Hesperia-Victorville	113	112
	5-Site Average	106	105

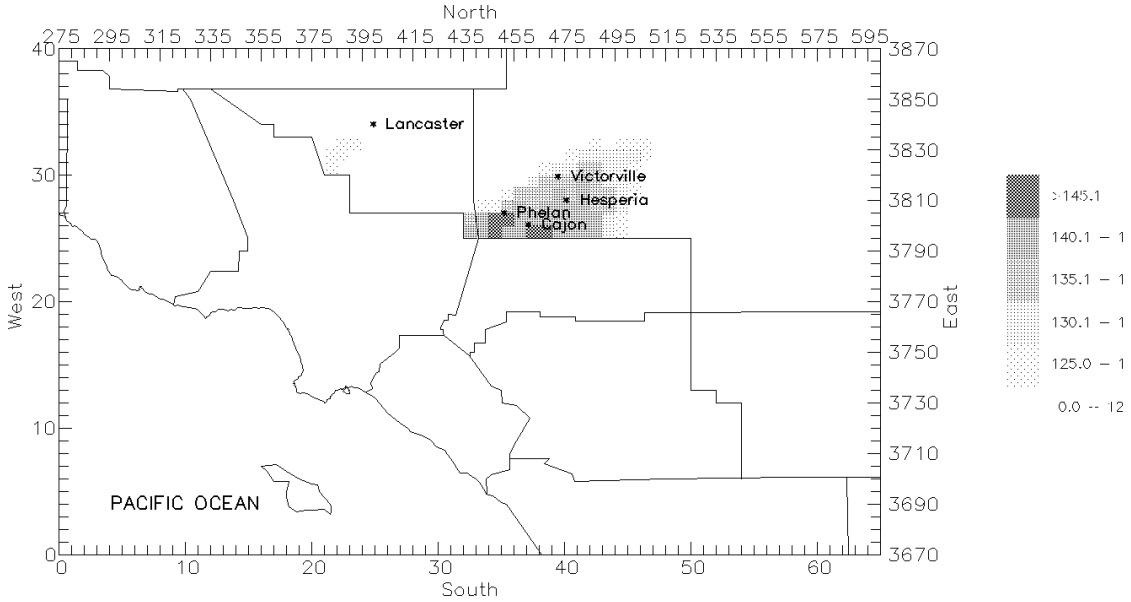

Figure 13 - UAM 2007 simulated ozone concentrations (ppb) for the Antelope Valley and Mojave Desert portion San Bernardino County for the August 6, 1997 meteorological episode

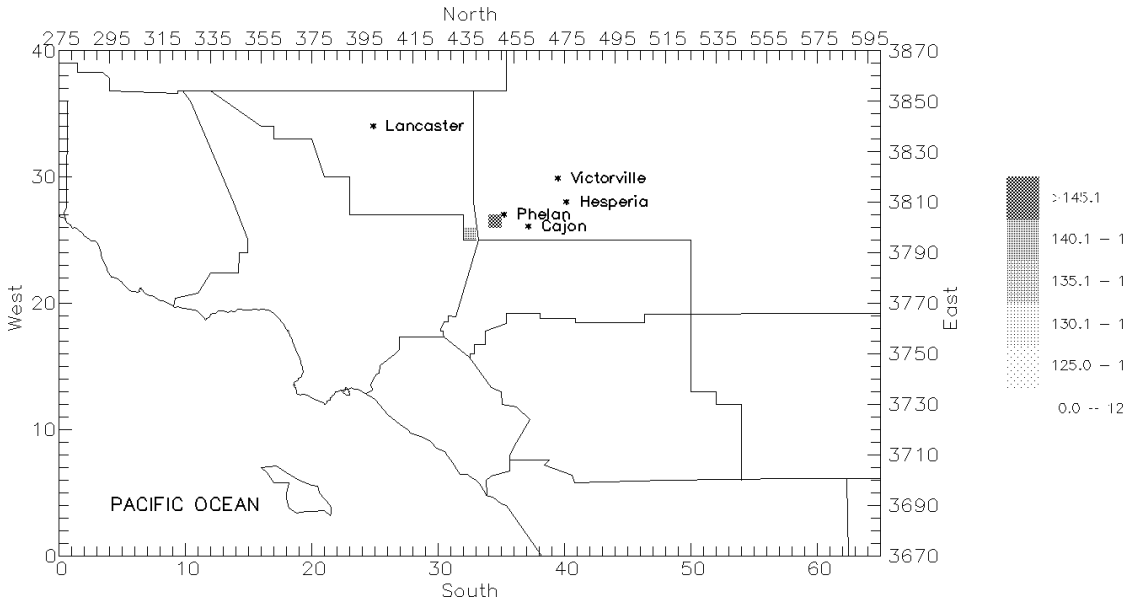

Figure 14 - Grid locations of the UAM 2007 simulated peak ozone concentrations (ppb) for the Antelope Valley and Mojave Desert portion San Bernardino County for the August 6, 1997 meteorological episode

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Appendices

A - Base Year Emission Inventory
B - Future Year Emission Inventories and Point Source Growth Codes
C - Southeast Desert Modified AQMA Transportation Conformity Budget
D - Annual Ambient Monitoring Data Summary

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APPENDIX A - BASE YEAR EMISSION INVENTORY

All emissions are presented in tons per ozone seasonal day(except where noted) for the 1990 base year

Source	**VOC**	**NOx**
FONA Area Sources		
Manuf and Industrial Combustion - Natural Gas	0.97	1.09
Service and Comm Space Heating - Natural Gas	0.00	0.02
Service and Comm Water Heating - Natural Gas	0.00	0.02
Service and Comm Combustion - Propane	0.02	0.44
Service and Comm Combustion - Diesel	0.34	7.39
Concrete Production	0.00	0.01
Misc Mineral Production	0.32	1.71
Residential Space Heating - Natural Gas	0.01	0.05
Residential Water Heating - Natural Gas	0.00	0.23
Residential Cooking - Natural Gas	0.00	0.05
Residential Combustion - Natural Gas	0.00	0.02
Residential Combustion - Propane	0.00	0.00
Residential Combustion - Wood	0.13	0.06
Landfill Gas	0.24	0.00
Cleaning and Degreasing	1.27	0.00
Petroleum Dispensing	1.77	0.00
Surface Blasting	0.02	0.00
Consumer Products	3.17	0.00
Architectural Coatings	1.98	0.00
Pesticides/Fertilizers	0.11	0.00
Asphalt Paving and Roofing	1.00	0.00
Livestock Waste	3.25	0.00
Structural Fires	0.01	0.00
Tumbleweed Fires	0.22	0.00
Commercial Cooking	0.43	0.00
Total FONA Area Sources:	*15.23*	*11.06*
FONA Other Mobile Sources		
Jet Aircraft - Military	0.18	0.22
Locomotives	1.52	31.32
Off-Road Recreational Vehicles	0.97	0.08
Lawn and Garden Equipment	0.81	0.09
Truck Refrigeration Units	0.06	0.27
Mobile Equipment - Commercial	0.21	0.33
Mobile Equipment - Industrial	0.01	0.10
Mobile Equipment - Construction	0.54	4.99
Mobile Equipment - Agricultural	0.08	0.71
Gasoline Can Storage and Handling	0.68	0.00

Total FONA Other Mobile Sources:	*5.03*	*39.24*
FONA On-Road Mobile Sources	*39.03*	*45.71*
FONA Point Sources		
Aerospace	0.9	136.2
Batch Plants	21.7	148.9
Cement Manufacturing	157.8	11813.8
Electric Generation	85.2	1608.7
Fiberglass	34.0	0.0
Glass Manufacturing	0.1	787.0
Institutions	0.7	8.6
Military	47.6	103.2
Mining	0.3	8.7
Miscellaneous Coating/Manufacturing	61.0	12.6
Natural Gas Transmission	455.5	5299.8
Paint & Body	6.6	0.0
Petroleum Pipeline & Terminal	24.4	0.0
Railroad Switching	6.9	1.0
Wastewater/Landfill/Water Pump	0.3	34.4
Wood Coating	66.9	2.7
Total FONA Point Sources (tons per annual day):	*2.66*	*54.70*
	VOC	*NOx*
Total FONA (tons per os day):	*61.95*	*150.71*

FONA Point Sources for 2002 (all emissions in tons per year)

			ROG	NOx
Aerochem Inc	Aerospace	El Mirage	0.9	176.7
Lockheed Martin	Aerospace	Helendale	0.3	0.2
SCLA	Aerospace	Victorville	0.0	0.5
		Aerospace Totals:	*1.2*	*177.4*
Agcon Inc	Batch Plant	Helendale	0.0	0.0
Blue Diamond Materials	Batch Plant	Victorville	0.0	0.0
Calmat Vulcan	Batch Plant	Oro Grande	2.0	6.3
Cornerstone C&M	Batch Plant	Victorville	0.0	0.0
Dan Copp Crushing	Batch Plant	Barstow	0.0	1.2
Diversified Materials	Batch Plant	Hesperia	0.0	0.0
Diversified Materials	Batch Plant	Lucerne Valley	0.0	0.5
Granite Construction	Batch Plant	Twentynine Palms	0.0	0.0
Hanson Aggregate	Batch Plant	Newberry Springs	25.4	168.4
Hi-Grade Materials	Batch Plant	Hesperia	0.0	0.0
Hi-Grade Materials	Batch Plant	Lucerne Valley	0.9	13.7
Kinne Limestone	Batch Plant	Lucerne Valley	0.2	2.6
Robertson's Readymix	Batch Plant	Adelanto	0.1	0.8
Service Rock Products	Batch Plant	Barstow	0.0	0.0
Sierra Aggregate	Batch Plant	Lucerne Valley	0.6	6.9
		Batch Plant Totals:	*29.2*	*200.4*

Cemex Black Mountain Quarry	Cement Manufacturing	Apple Valley	63.3	5383.0
Cemex River Plant	Cement Manufacturing	Victorville	0.0	0.0
Mitsubishi Cement	Cement Manufacturing	Lucerne Valley	17.1	2244.8
TXI Riverside Cement	Cement Manufacturing	Oro Grande	77.4	4186.0
		Cement Manufacturing Totals:	*157.8*	*11813.8*
California Cogeneration	Electric Generation	Victorville	0.0	5.5
Daggett Leasing	Electric Generation	Daggett	6.3	13.0
Harper Lake	Electric Generation	Harper Lake	17.5	23.5
Kramer Junction	Electric Generation	Boron	15.3	62.0
Reliant Energy	Electric Generation	Daggett	15.8	909.5
SCE Victorville	Electric Generation	Victorville	0.0	0.4
US West Financing	Electric Generation	Oro Grande	0.7	35.8
		Electric Generation Totals:	*55.6*	*1049.7*
Cabo Yachts	Fiberglass	Adelanto	18.9	0.0
Hawaiian Fiberglass	Fiberglass	Adelanto	5.6	0.0
Kormil Industries	Fiberglass	Hesperia	1.8	0.0
May Manufacturing	Fiberglass	Victorville	7.1	0.0
Molded Fiber Glass	Fiberglass	Adelanto	16.1	0.0
Pacific Tank	Fiberglass	Adelanto	4.0	0.0
Rainbow Fiberglass	Fiberglass	Adelanto	18.4	0.0
		Fiberglass Totals:	*71.9*	*0.0*

AFG Industries	Glass Manufacturing	Victorville	0.1	578.5
Desert Valley Hospital	Institution	Victorville	0.3	0.7
Hi Desert Medical	Institution	Joshua Tree	0.0	0.7
St. Mary Hospital	Institution	Apple Valley	0.3	4.7
Veterans Home of Barstow	Institution	Barstow	0.1	1.1
Victor Valley Community Hospital	Institution	Victorville	0.1	3.2
Victor Valley Memorial	Institution	Victorville	0.1	0.0
		Institution Totals:	*0.9*	*10.4*
AFFTC Edwards	Military	Edwards	0.0	0.1
US Army Dagget Airfield	Military	Daggett	1.1	1.3
USMC Logistics Base Nebo	Military	Barstow	5.4	11.5
USMC Logistics Base Yermo	Military	Barstow	20.2	35.3
USMCAGCC	Military	Twentynine Palms	3.5	17.3
		Military Totals:	*30.2*	*65.5*
Brubaker-Mann	Mining	Barstow	0.0	0.0
Calico Rock	Mining	Barstow	0.0	0.0
OMYA	Mining	Lucerne Valley	0.1	1.1
Rheox	Mining	Newberry Springs	0.2	9.1
Specialty Minerals	Mining	Lucerne Valley	0.1	1.5
Victorville Industrial Minerals	Mining	Oro Grande	0.0	0.0
		Mining Totals:	*0.4*	*11.7*

Advance Disposal	Misc Coating/Manuf	Hesperia	0.3	0.0
Alrayco	Misc Coating/Manuf	Adelanto	0.0	4.7
Daily Press	Misc Coating/Manuf	Victorville	1.5	0.0
Ennis Paint	Misc Coating/Manuf	Adelanto	0.0	0.0
Fast Tops	Misc Coating/Manuf	Hesperia	15.1	0.0
Induction Technology	Misc Coating/Manuf	Adelanto	0.4	0.0
Jack B. Kelly	Misc Coating/Manuf	Adelanto	0.7	0.0
JPM Product	Misc Coating/Manuf	Hesperia	0.5	0.1
Labelhouse	Misc Coating/Manuf	Adelanto	2.1	0.0
Lead Masters	Misc Coating/Manuf	Hesperia	0.0	0.0
McWelco Products	Misc Coating/Manuf	Hesperia	2.9	0.0
Mobile Pipe Wrap	Misc Coating/Manuf	Adelanto	14.6	0.2
National Arnold Magnetics	Misc Coating/Manuf	Adelanto	13.5	0.8
Northwest Pipe & Casing	Misc Coating/Manuf	Adelanto	11.5	0.0
Sherwin-Williams	Misc Coating/Manuf	Victorville	32.5	0.0
Simtec	Misc Coating/Manuf	Hesperia	0.1	0.0
Spede Tool Mfg	Misc Coating/Manuf	Adelanto	0.9	0.8
Spede Tool Mfg	Misc Coating/Manuf	Adelanto	4.6	0.0
Technique Design	Misc Coating/Manuf	Morongo Valley	0.2	0.0
TPS Technologies	Misc Coating/Manuf	Adelanto	0.2	15.7
World of Leisure	Misc Coating/Manuf	Adelanto	6.9	0.1
		Misc Coating/Manuf Totals:	*108.5*	*22.4*
PG&E Hinkley	Natural Gas Transmission	Hinkley	70.1	578.7
SCG Adelanto	Natural Gas Transmission	Adelanto	0.5	32.8
SCG Kelso	Natural Gas Transmission	Kelso	0.5	80.4
SCG Newberry Springs	Natural Gas Transmission	Newberry Springs	3.0	171.5
SCG Victorville	Natural Gas Transmission	Victorville	0.1	0.0
		Natural Gas Transmission Totals:	*74.2*	*863.4*
Accent Auto Body	Paint & Body	Hesperia	0.6	0.0
Best Auto Body	Paint & Body	Hesperia	0.1	0.0
Daves Auto Body	Paint & Body	Lenwood	0.1	0.0
Doman Auto Body	Paint & Body	Hesperia	0.2	0.0
Mc Geez Auto Body	Paint & Body	Twentynine Palms	1.4	0.0
Monty's Chevrolet	Paint & Body	Victorville	1.0	0.0
Pacific Paint	Paint & Body	Hesperia	0.2	0.0
Rancho Motors	Paint & Body	Victorville	0.3	0.0
Sonshine Auto Body	Paint & Body	Victorville	1.0	0.0
Sunland Ford	Paint & Body	Victorville	0.2	0.0
Sunset Paint and Body	Paint & Body	Hesperia	1.7	0.0
Yucca Auto Body	Paint & Body	Yucca Valley	1.0	0.0
Yucca Valley Ford	Paint & Body	Yucca Valley	0.3	0.0
		Paint & Body Totals:	*8.1*	*0.0*
Beck Oil	Petroleum Pipeline & Terminal	Victorville	0.6	0.0
CalNev Bulk Plant	Petroleum Pipeline & Terminal	Daggett	35.1	0.0
		Petroleum Pipeline & Terminal Totals:	*35.7*	*0.0*
Barstow Railyard	Railroad Switching	Barstow	6.4	0.9
City of Barstow	Wastewater/Landfill/Water	Barstow	0.2	37.8
Lenwood Hinkley	Wastewater/Landfill/Water	Hinkley	0.1	0.8
Victor Valley Wastewater Treatment	Wastewater/Landfill/Water	Victorville	0.0	1.5
		Wastewater/Landfill/Water Totals:	*0.3*	*40.1*

C&M Wood Industries	Wood Coating	Hesperia	6.9	1.2
Commercial Wood Products	Wood Coating	Adelanto	7.9	0.0
Hacker Wallsystems	Wood Coating	Yucca Valley	0.1	0.0
Inland Panel Coatings	Wood Coating	Adelanto	20.9	0.0
Mueller Turner	Wood Coating	Morongo Valley	1.3	0.0
Terrell Industries	Wood Coating	Hesperia	13.3	0.0
Walnut Valley Finishing	Wood Coating	Adelanto	26.7	1.9
		Wood Coating Totals:	*77.1*	*3.1*
FONA		Totals (tpy):	657.6	14837.3
		Totals (tpaad):	**1.80**	**40.65**

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APPENDIX B - FUTURE YEAR EMISSION INVENTORIES AND POINT SOURCE GROWTH CODES

(all emissions in tons per ozone seasonal day unless otherwise indicated)

FONA Only:

	1990	2002	2005	2007
Point VOC	2.66	1.80	2.31	2.52
Area VOC	15.23	13.74	13.89	14.16
Other Mobile VOC	5.03	4.88	4.19	3.94
On-Road Mobile VOC	39.03	18.92	15.56	13.46
FONA VOC	61.95	39.34	35.95	34.08
	1990	2002	2005	2007
Point NOx	54.70	40.65	42.37	42.76
Area NOx	11.064	12.234	12.29	12.262
Other Mobile NOx	39.236	42.531	34.757	31.358
On-Road NOx	45.71	49.17	45.47	42.43
FONA NOx	150.71	144.58	134.89	128.81

Total MDAQMD:

	1990	2002	2005	2007
Point VOC	4.02	3.18	3.70	3.93
Area VOC	16.67	14.79	14.93	15.22
Other Mobile VOC	12.58	14.15	12.15	11.02
On-Road Mobile VOC	66.26	32.72	26.78	23.06
MDAQMD VOC	99.535	64.837	57.559	53.234
	1990	2002	2005	2007
Point NOx	74.35	61.59	66.84	68.01
Area NOx	12.22	13.26	13.29	13.26
Other Mobile NOx	44.87	48.93	40.74	37.15
On-Road NOx	77.60	85.02	78.27	72.70
MDAQMD NOx	209.05	208.81	199.14	191.12

FONA Point Sources Grown Years:

	1990		Base Year 2002		2005		2007	
Point Category	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
Aerospace	0.9	136.2	1.2	177.4	1.2	181.8	1.2	177.7
Batch Plants	21.7	148.9	29.2	200.4	30.5	209.0	31.7	217.6
Cement Manufacturing	157.8	11813.8	157.8	11813.8	157.8	11813.8	157.8	11813.8
Electric Generation	85.2	1608.7	55.6	1049.7	72.7	1372.2	75.2	1418.9
Fiberglass	34.0	0.0	71.9	0.0	81.5	0.0	87.3	0.0
Glass Manufacturing	0.1	787.0	0.1	578.5	0.1	578.5	0.1	578.5
Institution	0.7	8.6	0.9	10.4	0.9	10.7	1.0	11.0
Military	47.6	103.2	30.2	65.5	28.5	61.8	28.6	62.0
Mining	0.3	8.7	0.4	11.7	0.4	12.2	0.4	12.7
Misc Coating/Manuf	61.0	12.6	108.5	22.4	124.1	25.6	134.7	27.8
Natural Gas Transmission	455.5	5299.8	74.2	863.4	77.6	903.2	80.6	938.1
Paint & Body	6.6	0.0	8.1	0.0	8.4	0.0	8.5	0.0
Petroleum Pipeline & Terminal	24.4	0.0	35.7	0.0	34.4	0.0	35.1	0.0
Railroad Switching	6.9	1.0	6.4	0.9	6.7	0.9	7.0	1.0
Wastewater/Landfill/Water	0.3	34.4	0.3	40.1	0.3	42.6	0.3	44.4
Wood Coating	66.9	2.7	77.1	3.1	77.1	3.1	79.9	3.2
ERCs	0	0	0	0	64.5	175.8	64.5	175.8
NSR Growth Allowance	0	0	0	0	75	75	125	125
Totals (tons per year):	**970**	**19965**	**658**	**14837**	**842**	**15466**	**919**	**15608**
Total (tons per average annual day):	**2.66**	**54.70**	**1.80**	**40.65**	**2.31**	**42.37**	**2.52**	**42.76**

MDAQMD Point Sources Grown Years:

	1990		Base Year 2002		2005		2007	
Point Category	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
Aerospace	3.2	223.7	4.2	291.4	4.3	298.7	4.2	292.0
Batch Plants	21.7	148.9	29.2	200.4	30.5	209.0	31.7	217.6
Cement Manufacturing	157.8	11813.8	157.8	11813.8	157.8	11813.8	157.8	11813.8
Electric Generation	72.0	1737.5	55.8	1346.6	76.0	1834.8	78.6	1897.2
Fiberglass	34.0	0.0	71.9	0.0	81.5	0.0	87.3	0.0
Glass Manufacturing	0.1	787.0	0.1	578.5	0.1	578.5	0.1	578.5
Institutions	2.2	10.1	2.7	12.2	2.8	12.6	2.9	13.0
Military	619.8	1376.9	337.1	749.0	318.0	706.5	319.1	708.9
Mining	42.8	1494.7	57.6	2012.1	60.1	2098.3	62.5	2184.6
Misc Coating/Manuf	61.0	12.6	108.5	22.5	124.1	25.7	134.7	27.9
Natural Gas Transmission	333.0	9480.6	189.3	5388.8	198.0	5636.9	205.7	5855.2
Paint & Body	16.9	0.0	20.7	0.0	21.4	0.0	21.8	0.0
Petroleum Pipeline & Terminal	28.1	13.4	41.1	19.6	39.7	18.9	40.4	19.3
Railroad Switching	6.9	1.0	6.4	0.9	6.7	0.9	7.0	1.0
Wastewater/Landfill/Water	1.3	36.3	1.5	42.4	1.6	45.1	1.7	48.1
Wood Coating	66.9	2.7	77.1	3.1	77.1	3.1	79.9	3.2
ERCs	0	0	0	0	74.2	1037.5	74.2	1037.5
NSR Growth Allowance	0	0	0	0	75	75	125	125
Totals (tons per year):	**1468**	**27139**	**1161**	**22481**	**1349**	**24395**	**1435**	**24823**
Total (tons per average annual day):	**4.02**	**74.35**	**3.18**	**61.59**	**3.70**	**66.84**	**3.93**	**68.01**

Aerospace	SIC_372&6out	1.176	0.514	0.522	0.535	0.523
	MDAQMD Gen	0.77	0.96	1.00	1.02	1.00
Batch Plant	SIC_14-out	0.052	0.067	0.07	0.073	0.076
		0.74	0.96	1.00	1.04	1.09
Cement Manufacturing	SIC_324-out	0.138	0.163	0.171	0.179	0.184
	MDAQMD Gen	1.00	1.00	1.00	1.00	1.00
Electric Generation	TOTAL_UTIL	39629	42454	67474	69400	71759
	FONA Gen	1.53	1.09	1.00	1.31	1.35
	MDAQMD Gen	1.29	1.05	1.00	1.36	1.41
Fiberglass	SIC_308-out	0.366	0.705	0.775	0.879	0.941
		0.47	0.91	1.00	1.13	1.21
Glass Manufacturing	District Gen	787	593.5	578.5	578.5	578.5
		1.36	1.03	1.00	1.00	1.00
Institution	SIC_806-I20	6.827	8.004	8.283	8.536	8.797
		0.82	0.97	1.00	1.03	1.06
	MDAQMD Data	1377	794.6	749	706.5	709
Military	FED_MIL-out	3.803	2.493	2.414	2.277	2.285
	MDAQMD Gen	1.84	1.06	1.00	0.94	0.95
Mining	SIC_14-out	0.052	0.067	0.07	0.073	0.076
		0.74	0.96	1.00	1.04	1.09
Misc Coating/Manuf	DUR_MFG-out	5.398	8.726	9.609	10.99	11.92
		0.56	0.91	1.00	1.14	1.24
Natural Gas Transmission	SIC_492&3out	0.597	0.521	0.543	0.568	0.59
	FONA Gen	6.14	1.86	1.00	1.05	1.09
	MDAQMD Gen	1.76	1.13	1.00	1.05	1.09
Paint & Body	SIC_752-4out	3.291	3.899	4.024	4.155	4.246
		0.82	0.97	1.00	1.03	1.06
Petroleum Pipeline & Terminal	SIC_46-out	0.039	0.057	0.057	0.055	0.056
		0.68	1.00	1.00	0.96	0.98
Railroad Switching	SIC_40-out	0.091	0.081	0.085	0.089	0.093
		1.07	0.95	1.00	1.05	1.09
Wastewater/Landfill/Water	SIC_494+-out	0.096	0.107	0.112	0.119	0.124
		0.86	0.96	1.00	1.06	1.11
Wood Coating	SIC_393+-out	0.072	0.081	0.083	0.083	0.086
		0.87	0.98	1.00	1.00	1.04

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APPENDIX C - SOUTHEAST DESERT MODIFIED AQMA TRANSPORTATION CONFORMITY BUDGET

This budget is presented in units of tons per summer planning inventory day (or tons per ozone seasonal day).

ROG/VOC	*2005*	*2007*
Riverside County portion (Coachella Valley)	4.61	4.05
Los Angeles County portion (Antelope Valley)	6.26	5.52
San Bernardino County portion (Mojave Desert)	15.56	13.46
Total SEDAQMA ROG/VOC Budget	**26.43**	**23.03**

NO_x	*2005*	*2007*
Riverside County portion (Coachella Valley)	12.28	11.14
Los Angeles County portion (Antelope Valley)	10.47	9.58
San Bernardino County portion (Mojave Desert)	45.47	42.43
Total SEDAQMA NO_x Budget	**68.22**	**63.15**

Note that portions of the Southeast Desert Modified AQMA transportation conformity budget are presented for information only. The total for the AQMA is the budget.

On-Road Mobile Source Emissions Inventory Detail
Mojave Desert Federal Ozone Non-attainment Area Portion of the
Southeast Desert Modified AQMA

ROG (tons per ozone seasonal day)				
ON-ROAD MOTOR VEHICLES	**1990**	**2002**	**2005**	**2007**
LIGHT DUTY PASSENGER (LDA)	16.24	6.41	4.97	4.11
LIGHT DUTY TRUCKS - 1 (LDT1)	7.39	3.22	2.59	2.23
LIGHT DUTY TRUCKS - 2 (LDT2)	4.36	2.02	1.74	1.55
MEDIUM DUTY TRUCKS (MDV)	1.15	1.01	0.86	0.77
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	3.77	1.68	1.24	1.08
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.46	0.16	0.14	0.14
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	1.77	1.09	0.91	0.76
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	1.09	1.35	1.22	1.08
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.04	0.04	0.04
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.03	0.06	0.06	0.06
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.05	0.14	0.13	0.12
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.80	0.83	0.76	0.70
MOTORCYCLES (MCY)	1.41	0.51	0.51	0.51
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.00	0.01	0.01	0.01
HEAVY DUTY GAS URBAN BUSES (UB)	0.09	0.11	0.12	0.12
SCHOOL BUSES (SB)	0.05	0.04	0.04	0.04
MOTOR HOMES (MH)	0.37	0.24	0.22	0.13
TOTAL*	39.03	18.92	15.56	13.46

NOx (tons per ozone seasonal day)				
ON-ROAD MOTOR VEHICLES	**1990**	**2002**	**2005**	**2007**
LIGHT DUTY PASSENGER (LDA)	11.77	6.47	5.09	4.30
LIGHT DUTY TRUCKS - 1 (LDT1)	6.78	3.85	3.05	2.60
LIGHT DUTY TRUCKS - 2 (LDT2)	4.26	3.24	2.78	2.46
MEDIUM DUTY TRUCKS (MDV)	1.26	1.74	1.49	1.32
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	1.43	1.19	1.12	1.19
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.50	0.25	0.25	0.27
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.83	0.87	0.82	0.75
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	2.77	3.26	2.87	2.57
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.08	1.17	1.35	1.31
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.34	1.52	1.42	1.30
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	2.19	5.48	5.45	5.20
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	12.35	18.74	18.37	17.71
MOTORCYCLES (MCY)	0.20	0.10	0.12	0.14
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.12	0.20	0.21	0.21
HEAVY DUTY GAS URBAN BUSES (UB)	0.06	0.11	0.12	0.12
SCHOOL BUSES (SB)	0.30	0.38	0.43	0.46
MOTOR HOMES (MH)	0.50	0.54	0.53	0.51
TOTAL*	45.71	49.17	45.47	42.43

* Total may not agree due to roundoff error

On-Road Mobile Source Emissions Inventory Detail
Antelope Valley Portion of the
Southeast Desert Modified AQMA

ROG (tons per ozone seasonal day)				
ON-ROAD MOTOR VEHICLES	**1990**	**2002**	**2005**	**2007**
LIGHT DUTY PASSENGER (LDA)	10.96	3.46	2.71	2.26
LIGHT DUTY TRUCKS - 1 (LDT1)	4.04	1.48	1.27	1.12
LIGHT DUTY TRUCKS - 2 (LDT2)	2.80	1.01	0.90	0.83
MEDIUM DUTY TRUCKS (MDV)	0.63	0.48	0.42	0.38
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	1.06	0.19	0.13	0.12
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.09	0.03	0.03	0.03
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.44	0.16	0.14	0.12
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.19	0.14	0.16	0.16
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.00	0.01	0.01
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.01	0.01	0.01
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.01	0.01	0.01	0.02
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.16	0.09	0.09	0.09
MOTORCYCLES (MCY)	0.80	0.26	0.26	0.26
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.00	0.01	0.01	0.01
HEAVY DUTY GAS URBAN BUSES (UB)	0.06	0.05	0.05	0.05
SCHOOL BUSES (SB)	0.02	0.01	0.02	0.02
MOTOR HOMES (MH)	0.12	0.05	0.05	0.04
TOTAL*	21.38	7.44	6.26	5.52

NOx (tons per ozone seasonal day)				
ON-ROAD MOTOR VEHICLES	**1990**	**2002**	**2005**	**2007**
LIGHT DUTY PASSENGER (LDA)	8.03	3.23	2.47	2.06
LIGHT DUTY TRUCKS - 1 (LDT1)	3.55	1.62	1.28	1.09
LIGHT DUTY TRUCKS - 2 (LDT2)	2.80	1.53	1.28	1.15
MEDIUM DUTY TRUCKS (MDV)	0.74	0.79	0.66	0.59
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.45	0.17	0.16	0.18
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.12	0.04	0.04	0.04
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.23	0.12	0.11	0.10
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.69	0.48	0.42	0.36
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.02	0.17	0.20	0.20
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.07	0.16	0.16	0.15
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.50	0.64	0.65	0.63
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	2.91	2.41	2.40	2.36
MOTORCYCLES (MCY)	0.11	0.05	0.06	0.06
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.12	0.16	0.16	0.16
HEAVY DUTY GAS URBAN BUSES (UB)	0.04	0.03	0.02	0.02
SCHOOL BUSES (SB)	0.18	0.20	0.22	0.23
MOTOR HOMES (MH)	0.18	0.18	0.17	0.17
TOTAL*	20.72	11.99	10.47	9.58

* Total may not agree due to roundoff error

On-Road Mobile Source Emissions Inventory Detail
Coachella Valley Portion of the
Southeast Desert Modified AQMA

ROG (tons per ozone seasonal day)				
ON-ROAD MOTOR VEHICLES	**1990**	**2002**	**2005**	**2007**
LIGHT DUTY PASSENGER (LDA)	8.30	2.84	2.08	1.77
LIGHT DUTY TRUCKS - 1 (LDT1)	2.71	1.07	0.84	0.75
LIGHT DUTY TRUCKS - 2 (LDT2)	1.96	0.63	0.45	0.40
MEDIUM DUTY TRUCKS (MDV)	0.50	0.34	0.26	0.24
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.87	0.17	0.11	0.09
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.11	0.03	0.03	0.03
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.57	0.25	0.22	0.20
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.33	0.24	0.21	0.19
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.01	0.01	0.01
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.01	0.01	0.01	0.01
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.02	0.03	0.03	0.03
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.21	0.15	0.15	0.14
MOTORCYCLES (MCY)	0.37	0.12	0.12	0.12
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.01	0.01	0.01	0.01
HEAVY DUTY GAS URBAN BUSES (UB)	0.10	0.05	0.05	0.05
SCHOOL BUSES (SB)	0.06	0.02	0.01	0.01
MOTOR HOMES (MH)	0.14	0.03	0.03	0.02
TOTAL*	16.28	6.00	4.61	4.05

NOx (tons per ozone seasonal day)				
ON-ROAD MOTOR VEHICLES	**1990**	**2002**	**2005**	**2007**
LIGHT DUTY PASSENGER (LDA)	6.17	2.69	1.99	1.70
LIGHT DUTY TRUCKS - 1 (LDT1)	2.52	1.17	0.86	0.73
LIGHT DUTY TRUCKS - 2 (LDT2)	1.98	1.04	0.76	0.66
MEDIUM DUTY TRUCKS (MDV)	0.59	0.61	0.46	0.41
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.37	0.17	0.16	0.17
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.12	0.06	0.05	0.05
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.29	0.22	0.20	0.19
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.89	0.78	0.58	0.46
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.01	0.24	0.27	0.25
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.08	0.26	0.26	0.24
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.69	1.42	1.40	1.32
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	3.52	4.98	4.77	4.45
MOTORCYCLES (MCY)	0.05	0.02	0.03	0.03
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.30	0.16	0.15	0.14
HEAVY DUTY GAS URBAN BUSES (UB)	0.07	0.06	0.06	0.06
SCHOOL BUSES (SB)	0.13	0.13	0.13	0.13
MOTOR HOMES (MH)	0.21	0.16	0.14	0.13
TOTAL*	17.99	14.19	12.28	11.14

* Total may not agree due to roundoff error

On-Road Mobile Source Emissions Inventory Detail

Southeast Desert Modified AQMA Ozone Planning Inventory
Summer On-road Emissions and Vehicle Miles Traveled
(tons per day)

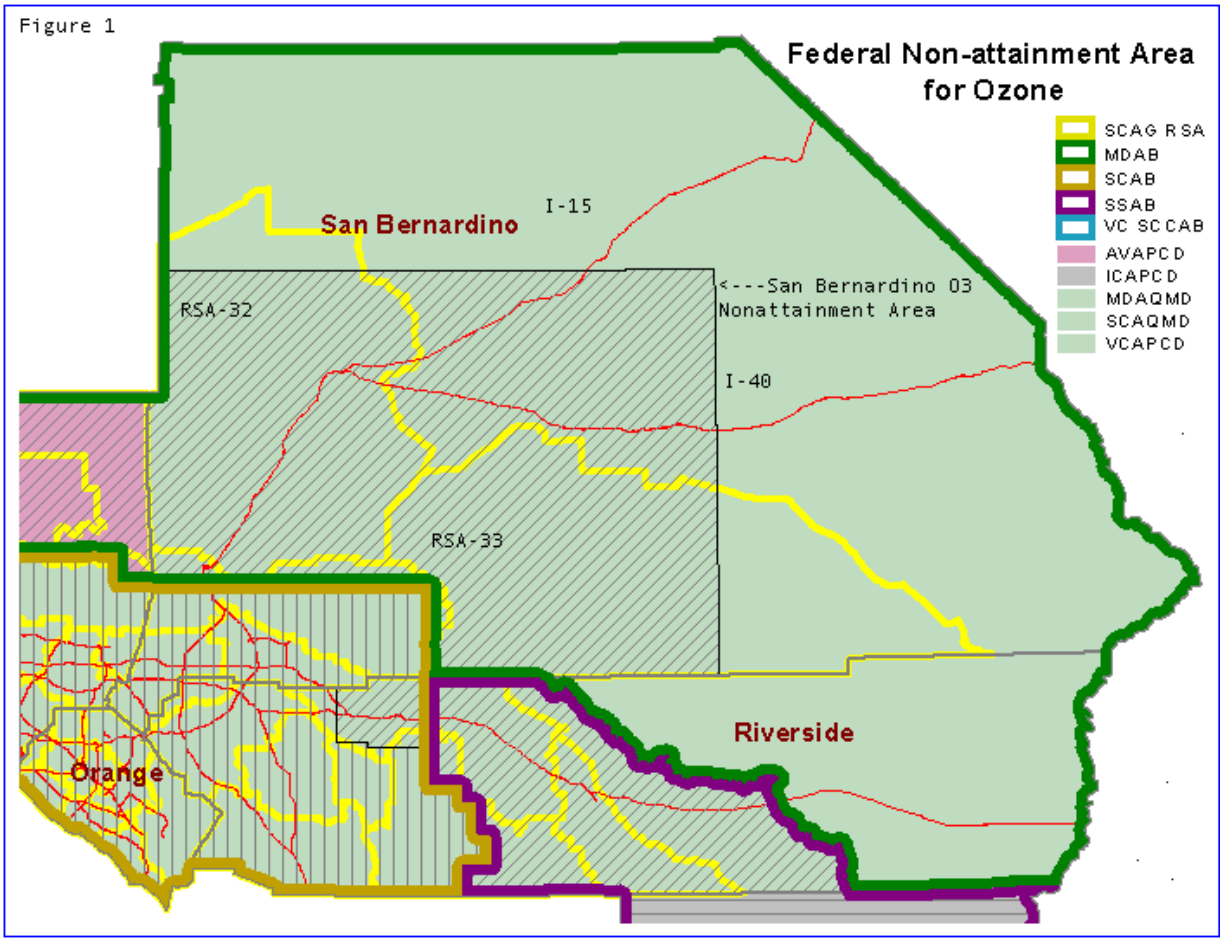
		1990	2000	2002	2005	2007
ROG	**Los Angeles MDAB (AV)**	21.38	8.42	7.44	6.26	5.52
	Riverside SSAB (CV)	16.28	7.99	6.00	4.61	4.05
	San Bern MDAB (VV)	31.36	15.95	14.48	11.76	10.26
	San Bern MDAB (MV)	7.67	4.73	4.44	3.80	3.20
	TOTAL	**76.69**	**37.09**	**32.36**	**26.43**	**23.03**
NOx	**Los Angeles MDAB (AV)**	20.72	12.90	11.99	10.47	9.58
	Riverside SSAB (CV)	17.99	15.85	14.19	12.28	11.14
	San Bern MDAB (VV)	34.49	32.82	31.33	28.18	25.96
	San Bern MDAB (MV)	11.22	18.78	17.84	17.29	16.47
	TOTAL	**84.42**	**80.35**	**75.35**	**68.22**	**63.15**
VMT	**Los Angeles MDAB (AV)**	6,300	6,634	7,302	8,336	9,018
(1000s)	**Riverside SSAB (CV)**	5,241	7,368	7,616	7,990	8,281
	San Bern MDAB (VV)	8,474	11,744	12,644	14,046	14,968
	San Bern MDAB (MV)	1,853	2,778	2,953	3,229	3,410
	TOTAL	**21,868**	**28,524**	**30,515**	**33,601**	**35,677**
HD VMT*	**Los Angeles MDAB (AV)**	365	395	441	501	543
(1000s)	**Riverside SSAB (CV)**	437	582	638	723	766
	San Bern MDAB (VV)	903	1,249	1,359	1,492	1,590
	San Bern MDAB (MV)	461	1,069	1,126	1,294	1,404
	TOTAL	**2,166**	**3,295**	**3,564**	**4,010**	**4,303**

*Vehicles ≥ 8500 lbs. GVWR, including buses and motor homes

San Bern MDAB (MV) refers to the Mojave Valley portion of the federal nonattainment area that ARB staff estimated outside the EMFAC model.

Documentation of speed and vehicle miles traveled (VMT) estimates for Mojave Valley portion of San Bernardino County, including Interstates 15 and 40[5]

While researching the data available to produce a motor vehicle emissions budget for the federal ozone non-attainment area portion of the Mojave Desert Air Quality Management District, ARB staff discovered that the travel activity data used in EMFAC2002 for the San Bernardino County portion of the Mojave Desert Air Basin does not include a significant portion of the ozone non-attainment area, including about 118 miles of interstate highway. The activity data provided by the Southern California Association of Governments is limited to regional statistical areas 32 and 33 (bordered in yellow on the map). This limitation results in underestimation of emissions when an EMFAC user requests emissions for San Bernardino County, Mojave Desert Air Basin.



To correct this problem, ARB staff developed VMT and speed estimates for the missing area, termed the "Mojave Valley," for calendar years 1990, 2000, 2002, 2005, 2007, 2010, 2020 and 2030. The activity is to be used in conjunction with activity for surrounding areas to produce a motor vehicle emissions inventory for the full ozone non-attainment area.

[5] This section has been prepared and provided by the California Air Resources Board

Methodology
SCAG data for this region covers only about two-thirds of the San Bernardino County portion of the ozone non-attainment area. The SCAG areas in this region are regional statistical areas (RSA) 32 and 33. According to SCAG, the post miles on Interstates 15 and 40 where they *leave* the SCAG modeling domain are post mile 89.142 and post mile 7.806, respectively. The post miles where these highways *leave* the non-attainment area were estimated by examining roadmaps for the area in relation to Caltrans data. For I-15, this was estimated to be at the junction of Highway 127 and I-15 in Baker (post mile 136.57). For I-40, this point was estimated to be at the intersection of I-40 with Kelbaker road (post mile 78.17). These two points on each highway define the segments that contain most of the missing travel.

The Caltrans traffic data website (http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm) contains historical count data for 1992 through 2002 for all vehicles. Staff downloaded data for the desired highways into an Excel spreadsheet. Count locations near the above post mile locations were used for VMT calculation. Staff calculated VMT by multiplying the highway segment length between the count locations by the recorded traffic volumes.

The Caltrans website includes separate count data for heavy-duty trucks for the period 1992 through 2001, except 1999 (1998 and 2000 counts were used to interpolate a 1999 estimate). Staff used these data to estimate heavy-duty truck VMT, then subtracted it from total VMT to estimate the VMT for light and medium-duty vehicles. Heavy-duty truck VMT has grown at a faster rate than light and medium-duty VMT, and this trend is carried forward.

Interpolation/Extrapolation
The Caltrans count program does not count every location every year. According to Caltrans staff, resource limits in Caltrans District 8 prevented counts from being completed for some locations in some years. For this reason, data for some years is repeated from subsequent years when no other data are available. (This can be readily seen in the "Raw VMT" section of the spreadsheet.) To smooth the trend for years 1992-2002, values for years in which the data were repeated from earlier years were linearly interpolated.

To extend the trend to 2030, staff first calculated the average annual VMT growth for each highway. Growth was calculated for all vehicle travel and heavy-duty travel independently. For all vehicle travel, average growth was calculated over the period 1992 to 2000 for I-15 and 1992 to 2002 for I-40. (No new data has been reported for I-15 since 2000.) For heavy-duty VMT on both highways, the period for average growth was 1992 through 2001. Staff added these figures for miles of average growth to each successive year out to 2030, for all vehicle travel and separately for heavy-duty travel. To estimate 1990 travel, the figures were *subtracted* from the 1992 estimates, again separately for heavy duty and all vehicle travel.

This "decaying growth rate" method was selected following discussion of several alternatives with SCAG modeling staff, because it uses the vigorous growth of recent years but results in a level of growth that does not compound over time. Staff judged that a compounding rate based on very high recent growth may not be sustainable over a 28-year period.

The preceding method accounts for travel on the two interstate highways only. Examination of maps shows that in the area east of Daggett on the western edge of the region between the two highways, there is a Marine Corps Supply Station, the Barstow airport, and about 80 square miles of suburban/semi-rural development. Further east there is no evidence of development. To account for travel on these local roads and the servicing of local facilities along the interstate highways, staff increased overall travel estimates for all years by 10 percent.

Speeds

For the purposes of emissions estimation using EMFAC, estimates of travel by speed group were made. Lacking empirical speed data for this sparsely populated area, staff judged that almost all traffic would be at free-flow highway speeds. For "peak" period travel (6 to 9 a.m. and 3 to 7 p.m.) staff assumed 85 percent of VMT for all classes travels at 65 mph, and 15 percent travels at 35 mph. For remaining hours, staff assumed 90 percent of VMT at 65 mph and 10 percent at 35 mph.

Results

Below is a summary of the VMT estimated through this assessment for the Mojave Valley area, along with SCAG's estimates for Victor Valley (RSAs 32 and 33).

VMT for San Bernardino County Portion of SE Desert Ozone Non-attainment Area	**1990**	**2000**	**2010**	**2030**
		(in thousands)		
Victor Valley (RSAs 32 and 33)				
L./MDV	7,649	10,588	14,719	22,806
HDV	618	763	1,037	1,609
Mojave Valley (I-15 and 40)				
L./MDV	1,407	1,725	2,134	2,861
HDV	447	1,052	1,551	2,655
Total	10,121	14,128	19,441	29,931

The detailed spreadsheet with results can be found at:
http://www.arb.ca.gov/planning/sip/sedsip04/sedsip04.htm

APPENDIX D - ANNUAL AMBIENT MONITORING DATA SUMMARY

	State Ozone Exceedance Days					
	Barstow	Hesperia	Phelan	Trona	Twentynine Palms	Victorville
1988	78	126	122	11	37	80
1989	67	127	108	5	33	87
1990	35	119	105	1	37	56
1991	24	117	112	6	52	60
1992	34	131	117	3	27	76
1993	28	103	108	5	16	64
1994	26	119	111	3	9	63
1995	7	46	68	0	3	41
1996	11	69	77	8	21	62
1997	16	66	70	1	15	44
1998	9	46	61	4	13	49
1999	10	38	37	1	11	19
2000	9	56	31	0	16	24
2001	5	30	35	0	12	15
2002	12	46	48	5	2	30
2003	9	43	44	3	4	22

	Federal Ozone Exceedance Days					
	Barstow	Hesperia	Phelan	Trona	Twentynine Palms	Victorville
1988	12	83	62	0	3	23
1989	6	74	57	0	3	26
1990	1	59	53	0	1	9
1991	3	39	51	0	3	13
1992	1	57	52	0	0	19
1993	1	36	53	0	2	11
1994	1	47	57	0	0	14
1995	0	7	26	0	0	7
1996	1	15	32	0	0	11
1997	0	6	13	0	0	2
1998	0	15	17	0	0	14
1999	0	2	2	0	0	0
2000	0	8	3	0	0	3
2001	0	0	3	0	0	0
2002	0	5	9	0	0	3
2003	0	1	3	0	0	2

	Maximum One Hour Ozone (ppm)					
	Barstow	Hesperia	Phelan	Trona	Twentynine Palms	Victorville
1988	0.15	0.27	0.19	0.12	0.15	0.18
1989	0.14	0.21	0.22	0.10	0.13	0.17
1990	0.13	0.27	0.24	0.11	0.14	0.18
1991	0.13	0.19	0.24	0.12	0.14	0.19
1992	0.13	0.23	0.19	0.10	0.12	0.19
1993	0.13	0.17	0.20	0.10	0.13	0.16
1994	0.13	0.18	0.19	0.10	0.12	0.16
1995	0.12	0.17	0.24	0.09	0.11	0.15
1996	0.13	0.17	0.18	0.10	0.12	0.16
1997	0.12	0.18	0.19	0.10	0.12	0.15
1998	0.11	0.14	0.20	0.11	0.12	0.16
1999	0.12	0.13	0.14	0.10	0.11	0.12
2000	0.11	0.16	0.14	0.09	0.11	0.14
2001	0.10	0.11	0.15	0.09	0.12	0.11
2002	0.11	0.15	0.15	0.11	0.10	0.13
2003	0.11	0.16	0.14	0.10	0.10	0.15

8-Hour Averages (MDAQMD)		
	Maximum	3-Yr Av 4th H
1988	0.116	0.103
1989	0.113	0.103
1990	0.102	0.106
1991	0.102	0.098
1992	0.103	0.095
1993	0.114	0.093
1994	0.107	0.096
1995	0.103	0.091
1996	0.109	0.089
1997	0.106	0.087
1998	0.090	0.088
1999	0.107	0.090
2000	0.088	0.088
2001	0.099	0.088
2002	0.096	0.087

Area Weighted Exposure (ppm-hrs)			
	AWE	**3 YR AVG**	
1985	7.378		
1986	7.269		
1987	5.272	6.640	
1988	**6.125**	**6.222**	Base
1989	5.597	5.665	
1990	4.016	5.246	
1991	3.473	4.362	
1992	2.970	3.486	
1993	2.473	2.972	
1994	3.006	2.816	
1995	0.787	2.089	
1996	1.795	1.863	
1997	1.435	1.339	
1998	1.647	1.625	
1999	0.616	1.232	
2000	0.481	0.915	
2001	0.354	0.484	
2002	**0.738**	**0.524**	Current

Population Weighted Exposure (ppm-hrs)			
	PWE	**3YR AVG**	
1985	18.623		
1986	26.190		
1987	17.174	20.662	
1988	**16.365**	**19.909**	Base
1989	14.984	16.174	
1990	11.402	14.250	
1991	7.702	11.362	
1992	7.069	8.724	
1993	5.942	6.904	
1994	6.161	6.391	
1995	1.891	4.665	
1996	3.768	3.940	
1997	2.455	2.705	
1998	3.318	3.180	
1999	0.895	2.223	
2000	1.205	1.806	
2001	0.681	0.927	
2002	**1.675**	**1.187**	Current

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APPENDIX E - RATE OF PROGRESS DETAIL

SOUTHEAST DESERT ROP CALCULATIONS -- VOC EMISSIONS

Table 1 - Antelope Valley ROP

	1990	2005	2007
1990 VOC	39.38	39.38	39.38
FMVCP Adjustment		-9.01	-9.33
Adjusted VOC Baseline		30.37	30.05
Percentage Reduction Target		42.00	48.00
Emissions Target		17.61	15.63
Forecast Emissions		20.25	20.27
Excess/Shortfall		-2.64	-4.64

Source: Draft 2004 AVAQMD Ozone Attainment Plan, February 2004, pg. 23

Table 2 - Mojave Desert ROP (Victor Valley & Mojave Valley)

	1990	2005	2007
1990 VOC	61.95	61.95	61.95
FMVCP Adjustment		-20.69	-20.69
Adjusted VOC Baseline		41.26	41.26
Percentage Reduction Target		42.00	48.00
Emissions Target		23.93	21.46
Forecast Emissions		35.95	34.08
Excess/Shortfall		-12.02	-12.62

Source: Draft 2004 MDAQMD Ozone Attainment Plan, February 2004, pg. 24

Table 3 - Coachella Valley ROP

	1990	2005	2007
1990 VOC	35.20	35.20	35.20
FMVCP Adjustment		-8.60	-8.60
Adjusted VOC Baseline		26.60	26.60
Percentage Reduction Target		42.00	48.00
Emission Reduction Target		11.20	12.80
Emissions Target		15.43	13.83
Forecast Emissions		12.70	12.00
Excess/Shortfall		2.73	1.83

Source: SCAQMD AQMP, September 2003, pg. 8-9

Table 4 - SOUTHEAST DESERT MODIFIED AQMA (Combined)

	1990	2005	2007
1990 VOC	136.53	136.53	136.53
FMVCP Adjustment		-38.30	-38.62
Adjusted VOC Baseline		98.23	97.91
Percentage Reduction Target		42.00	48.00
Emissions Target		56.97	50.91
Forecast Emissions		68.90	66.35
Excess/Shortfall		-11.93	-15.44

SOUTHEAST DESERT ROP CALCULATIONS -- NOx EMISSSIONS

Table 1 - Antelope Valley ROP

	1990	2005	2007
1990 NOx	36.06	36.06	36.06
FMVCP Adjustment		0	0
Adjusted NOx Baseline		36.06	36.06
Percentage Reduction Target		N/A	N/A
Emissions Target		36.06	36.06
Forecast Emissions		25.41	23.41
Excess/Shortfall		10.65	12.65

Source: Draft 2004 AVAQMD Ozone Attainment Plan, February 2004, pg. B-1

Table 2 - Mojave Desert FONA ROP

	1990	2005	2007
1990 NOx	151.71	151.71	151.71
FMVCP Adjustment		0	0
Adjusted NOx Baseline		151.71	151.71
Percentage Reduction Target		N/A	N/A
Emissions Target		151.71	151.71
Forecast Emissions		134.89	128.81
Excess/Shortfall		16.82	22.90

Source: Draft 2004 MDAQMD Ozone Attainment Plan, Pg. B-1

Table 3 - Coachella Valley ROP

	1990	2005	2007
1990 NOx *	31.02	31.02	31.02
FMVCP Adjustment		0.00	0.00
Adjusted NOx Baseline		31.02	31.02
Percentage Reduction Target		N/A	N/A
Emissions Target		31.02	31.02
Forecast Emissions		20.05	18.48
Excess/Shortfall		10.97	12.54

Source: Letter from SCAQMD dated December 9, 2003
**Baseline source: SCOS inventory value.*

Table 4 - SOUTHEAST DESERT MODIFIED AQMA (Combined)

	1990	2005	2007
1990 NOx	218.79	218.79	218.79
FMVCP Adjustment		0.00	0.00
Adjusted NOx Baseline		218.79	218.79
Percentage Reduction Target		N/A	N/A
Emissions Target		218.79	218.79
Forecast Emissions		180.35	170.70
Excess/Shortfall		38.44	48.09

SOUTHEAST DESERT NOx SUBSTITUTION CALCULATIONS

Projected Inventories

	1990		2005		2007	
	VOC	NOx	VOC	NOx	VOC	NOx
Antelope Valley	39.38	36.06	20.25	25.41	20.27	23.41
Mojave Desert FONA	61.95	151.71	35.95	134.89	34.08	128.81
Coachella	35.20	31.02	12.70	20.05	12.00	18.48
Total	136.53	218.79	68.90	180.35	66.35	170.70

Target Emission Levels

	VOC	NOx	VOC	NOx	VOC	NOx
Antelope Valley			17.61	36.06	15.63	36.06
Mojave Desert FONA			23.93	151.71	21.46	151.71
Coachella			15.43	31.02	13.83	31.02
Total	0.00	0.00	56.97	218.79	50.91	218.79

Excess reductions (+) and shortfalls (-)

	VOC	NOx	VOC	NOx	VOC	NOx
Antelope Valley			-2.64	10.65	-4.64	12.65
Mojave Desert FONA			-12.02	16.82	-12.62	22.90
Coachella			2.73	10.97	1.83	12.54
Total			-11.93	38.44	-15.43	48.09

1990 NOx/VOC Substitution ratio 1.60
(1990 Total NOx/VOC)

2005 NOx reductions needed to offset VOC shortfall 19.09 tpd NOx
(1990 NOx/VOC ratio X 2005 VOC Shortfall)

Remaining excess NOx reductions in 2007 29.00 tpd NOx
(2007 excess NOx reduction **-** reductions used in 2005 NOx substitution)

2007 NOx reductions needed to offset VOC shortfall 24.73 tpd NOx
(1990 NOx/VOC ratio X 2007 VOC Shortfall)

Excess 2007 NOx reductions with 2005 NOx Substitution 4.25 tpd NOx

The NOx emissions remaining after subtracting the total NOx reductions used for substitution in 2005 and 2007 from the 1990 base year inventory is 175.0 tpd, while the 2007 NOx attainment inventory is 170.7 tpd. This comparison demonstrates that all of the NOx reductions used for substitution in the ROP calculation are necessary for attainment.

Attainment Demonstration Inventory
2007 Ozone Planning Day

	VOC	NOx
Antelope Valley	20.27	23.41
Mojave Desert FONA	34.08	128.81
Coachella	12.00	18.48
Total	66.35	170.7