EIGHT-HOUR OZONE ATTAINMENT PLAN FOR SAN DIEGO COUNTY

May 2007

SAN DIEGO COUNTY
AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD
SAN DIEGO, CA 92131

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1.0 INTRODUCTION AND OVERVIEW

Federal clean air standards have been established for common outdoor air pollutants, including ozone, to protect public health and the environment from the harmful effects of air pollution. These standards, called *National Ambient Air Quality Standards* (NAAQS), are established by the U.S. Environmental Protection Agency (EPA) pursuant to requirements of the federal Clean Air Act (CAA).[1] Each area of the nation with air pollution levels violating a NAAQS must be designated by EPA as a "nonattainment area" for that pollutant. Each nonattainment area must submit a "State Implementation Plan" (SIP) outlining the combination of local, State, and federal actions and emission control regulations necessary to bring the area into attainment as expeditiously as practicable.

San Diego County is currently designated a Nonattainment Area for the eight-hour ozone NAAQS. By June 15, 2007, the San Diego County Air Pollution Control District (APCD) must submit to EPA, through the California Air Resources Board (ARB), a SIP identifying control measures and associated emission reductions as necessary to demonstrate attainment by June 15, 2009. This Eight-Hour Ozone Attainment Plan addresses and complies with these requirements.

1.1 BACKGROUND

1.1.1 What is Ozone?

Ozone is a corrosive gas composed of three oxygen atoms linked together. Ozone exists in two layers of the atmosphere. It occurs naturally in the stratosphere (upper atmosphere) where it absorbs and provides a protective shield against the sun's damaging ultraviolet radiation. Ozone also exists in the troposphere (lower atmosphere), even near ground level, as a result of various human activities. "Ground level" ozone—the subject of this Attainment Plan—is an air pollutant that can damage living tissue and break down certain materials.

Ozone is not usually emitted directly into the air, but at ground level is formed by chemical reactions of "precursor" pollutants—oxides of nitrogen (NOx) and volatile organic compounds (VOC)—in the presence of ultraviolet radiation (strong sunlight). NOx and VOC emissions are mostly the result of various human activities such as fossil fuel combustion and solvent use. However, there are also natural sources of VOC emissions (such as trees) and NOx emissions (such as forest fires). Consequently, there are natural background levels of ozone, at levels shown to be well tolerated.

Ozone levels are usually higher during the spring and summer months. Abundant sunshine promotes ozone formation and warm weather increases VOC emissions (an ozone precursor) from fuel and solvent evaporation. Additionally, warm weather is often associated with stable atmospheric conditions and an inversion layer[2] in the lower atmosphere, reducing dispersion of ozone.

[1] Federal Clean Air Act requirements are codified, as amended, in the U.S. Code at 42 U.S.C. Sections 7401, et seq.

[2] An inversion layer is a stable layer of the atmosphere, which does not allow for upward air motion. An inversion often acts like a cap on the atmosphere, trapping air pollution below it.

Concentrations of ozone are not uniform; the amount of ozone in the lower atmosphere varies by hour, day, and place. Ozone molecules in urban areas persist for less than a day, with concentrations usually peaking in mid to late afternoon, after exhaust fumes from morning commutes have had time to react fully in the sunlight. By early evening, ozone production drops as the sunlight's intensity decreases and exhaust fumes from evening commutes react with and break down most of the remaining ozone. This entire cycle repeats itself the following day.

1.1.2 Health and Welfare Effects

A significant body of research has shown that exposure to unhealthful levels of ozone can cause lung and airway inflammation, significant decreases in lung function and capacity, and other respiratory symptoms such as cough and pain when taking a deep breath. Ozone exposure is a particular threat during the summer ozone season for people working, exercising, or playing outdoors or who already have respiratory problems. Long-term exposure to moderate levels of ozone may cause permanent changes in lung structure, leading to premature aging of the lungs and worsening of chronic lung disease.

Plants and crops are also impacted by ground level ozone, slowing plant growth and increasing susceptibility to disease, pests, and harsh weather. The reduced yield hurts the agricultural and forest industries.

Scientific and medical research continue to uncover new information on the effects of ozone air pollution. The California Air Resources Board has prepared a summary of recent research and findings, available on their website at www.arb.ca.gov/research/health/fs/PM-03fs.pdf.

1.1.3 Federal Ozone Air Quality Standards

Eight-Hour Ozone NAAQS. The eight-hour ozone NAAQS was established by EPA in 1997.[3] It is attained when the "three year average" of the "annual fourth highest daily maximum" eight-hour average ozone concentration—called the "design value"—is no greater than 0.084 parts per million (ppm) at each EPA-approved ozone air quality monitor in the region. The "three-year average" and "annual fourth highest daily maximum" are statistical values that provide stability to the standard, moderating the influence of extreme meteorological conditions (over which an area has no control) that could cause the region's ozone compliance status to vacillate between attainment and nonattainment despite ongoing emission reductions.

One-Hour Ozone NAAQS. A one-hour ozone NAAQS (0.12 ppm) was established by EPA in 1979.[4] This ozone standard was attained in San Diego County in 2001,[5] the culmination of decades of emission reduction efforts. Attainment was achieved despite substantial growth in the region's population and motor vehicle fleet, clearly demonstrating that emission control efforts in San Diego County are working. (Refer to Section 1.4 for additional information on emissions and regional growth trends.) One-hour ozone attainment was achieved by reducing emissions of ozone precursors NOx and VOC, setting the stage for continuing efforts to attain the more health-protective eight-hour ozone NAAQS.

[3] Federal Register, Volume 62, Page 38856 (62 FR 38856).
[4] 44 FR 8202.
[5] 67 FR 65043.

The one-hour ozone NAAQS was revoked by EPA, effective June 15, 2005.[6] Although the one-hour standard has been phased out, associated emission control requirements in place on the date of revocation continue to apply pursuant to anti-backsliding provisions of the CAA (Section 172(e)).

1.1.4 Ozone Designation Status

The region's air quality designations for the NAAQS (attainment, nonattainment, or unclassifiable) are listed in federal regulation.[7] San Diego County was designated a Nonattainment Area for the eight-hour ozone NAAQS, effective June 15, 2004, based on ozone air quality measurements over the 2001-2003 three-year period.[8] At that time, the region's nonattainment status was further categorized by EPA as "Basic," a category of eight-hour ozone nonattainment areas whose one-hour ozone design values meet the former one-hour ozone NAAQS.

Boundaries of Nonattainment Area. The outer boundaries of the San Diego Nonattainment Area are contiguous with the boundaries of San Diego County, as illustrated in Figure 1-1.

FIGURE 1-1
San Diego Nonattainment Area Boundaries
For the Eight-Hour Ozone NAAQS

<http://www.epa.gov/ozonedesignations/areamaps/SanDiego.pdf>

[6] 70 FR 44470.
[7] 40 CFR 81.305, "Designation of Areas for Air Quality Planning Purposes – California."
[8] 69 FR 23858.

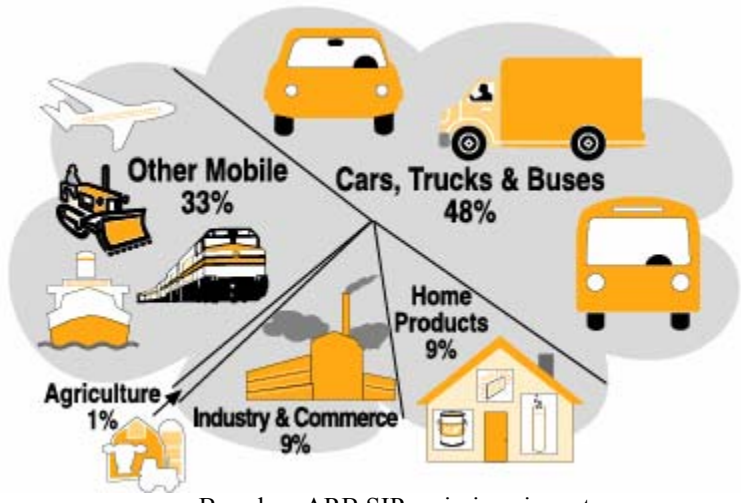
Tribal Nations. The Campo, Cuyapaipe, La Posta, and Manzanita Indian Reservations (near the southeast corner of the county) are excluded from San Diego's Nonattainment Area designation, and are designated as Attainment Areas. In fact, pursuant to federal requirements, none of the region's Tribal Nations are regulated by the District and their ozone status does not affect this Eight-Hour Ozone Attainment Plan, which applies to non-tribal land only.

1.2 EMISSION SOURCES

Ground level ozone is formed by complex chemical reactions of NOx and VOC emissions in the presence of sunlight. NOx is emitted mostly from sources of fossil fuel combustion, including motor vehicles, other mobile sources (such as ships, trains, and aircraft), power plants, and piston engines. VOC emissions are released from fuel combustion as well as fuel and solvent evaporation. Sources of VOC emissions include motor vehicles, gas stations, chemical plants, factories, landfills, and consumer and commercial products. (Natural sources of VOC and NOx emissions also exist, as indicated in Section 1.1.1.)

The percentage contribution of ozone-forming emissions by manmade source type in San Diego County is presented in Figure 1-2. Mobile sources, which are under State and federal jurisdiction, produce over three-quarters of ozone-forming emissions regionwide. Stationary industrial facilities and consumer and home products contribute to a lesser extent. A complete inventory of emission sources in San Diego County is presented in Section 2.0 (Emission Inventories and Trends) and Attachment A.

FIGURE 1-2
Manmade Sources of Ozone-Forming Emissions
(VOC+NOx)
San Diego County, 2002 Base Year



Based on ARB SIP emissions inventory.

1.3 EMISSION CONTROL EFFORTS

Air quality control in California is a shared responsibility among local, State, and federal agencies. Local air districts regulate emissions from non-mobile (stationary) sources, such as stationary

industrial and commercial sources, and some area-wide sources such as coatings and industrial solvents. At the State level, ARB adopts measures to reduce emissions from on-road motor vehicles, off-road vehicles and equipment, fuels, and consumer products. At the national level, EPA regulates off-road equipment and inter-state sources such as ships, trains, aircraft, and out-of-state vehicles.

APCD—in collaboration with federal, State, and local agencies and the citizens, businesses, and civic groups of San Diego County—has worked hard to efficiently and cost-effectively reduce ozone precursor emissions from nearly every source to ensure cleaner air for all San Diegans. Summaries of State and federal control programs and associated regulations are presented in Section 3.2.1. The District has adopted dozens of emission control rules addressing all significant stationary source categories in San Diego County (see Section 3.2.2). These rules implemented previous local planning efforts to attain the NAAQS (such as for the former one-hour ozone standard), coupled with State requirements for adopting every feasible control measure for sources under District jurisdiction. As a result of shared efforts, San Diego's motor vehicles, power plants, factories, gas stations, engines, paints, and solvents are among the cleanest in the nation.

Total regionwide NOx and VOC emissions have been reduced 32% and 46% respectively over the 1990-2005 period (see Section 2.0, Emission Inventories and Trends).[9] Further, ongoing implementation of existing rules and regulations will continue reducing total regionwide ozone precursor emissions for the foreseeable future, as future-year requirements become effective and as new lower-emitting sources replace older, higher-emitting sources at the end of their useful lives. Because ozone-precursor control efforts in the region are working effectively and will continue to provide emission benefits, and because San Diego County's ozone air quality is now close to attaining the eight-hour ozone NAAQS (see Sections 1.4 and 4.4), the strategy to attain as expeditiously as practicable relies heavily on the existing District, State, and federal programs and regulations. The Emission Control Strategy is discussed in detail in Section 3.0.

1.4 OZONE AIR QUALITY IMPROVEMENT

The District operates an extensive air monitoring network, continuously monitoring ambient levels of ozone (and many other air pollutants) at numerous sites throughout the region (Figure 1-3) in compliance with federal requirements.[10] Data generated at these monitors are used to define the nature and severity of ozone and to determine NAAQS attainment status in San Diego County.

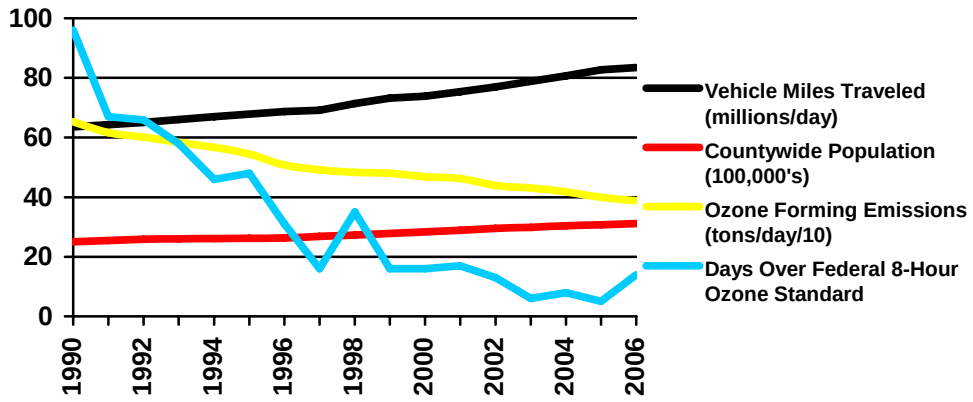
[9] Based on ARB SIP emissions inventory, Version 1.06.
[10] 40 CFR Part 58, "Ambient Air Quality Surveillance."

FIGURE 1-3
Ozone Monitor Locations in San Diego County

1.4.1 Most Improved in the Nation

Although the eight-hour ozone NAAQS was not established until 1997, monitoring data since 1990 show a long-term trend toward attainment even while the region experienced substantial growth in population and vehicle miles traveled, as illustrated in Figure 1-4. Improvements in ozone air quality generally track with reductions in ozone-forming emissions, providing more evidence that emission control programs are successful. In fact, in 2005 the region distinguished itself as the most improved metropolitan area in the nation for reduction in exceedances of the eight-hour ozone NAAQS between 1990 (96 exceedances) and 2004 (eight exceedances). Only one monitoring location (Alpine) has violated the eight-hour ozone standard since 1998.

FIGURE 1-4
Emissions and Growth Trends in San Diego County



1.4.2 Transported Pollution

San Diego's ozone air quality problem is complicated by transported air pollution from the South Coast Air Basin, located immediately north and upwind of San Diego County.[11] South Coast suffers the worst ozone problem in the nation, notwithstanding tremendous ozone air quality improvement over the past two decades. This transported air pollution, over which the District has no control, often increases ozone concentrations measured downwind at San Diego's monitoring sites. Since 2003, transport has played a significant role in all of the county's exceedances of the eight-hour ozone NAAQS, as determined by meteorological analyses of ozone exceedances.

Transported air pollution from South Coast to San Diego follows several different known routes:

1. **Transport Aloft**. Ozone is transported aloft from South Coast when winds from the north move ozone trapped aloft within the inversion layer southward into San Diego County. This transported ozone aloft most often impacts the Alpine monitoring site, in the inland foothills at an elevation of approximately 2,000 feet. The Alpine monitor is the only monitoring site in San Diego County with eight-hour ozone design values exceeding the NAAQS.

2. **Coastal Transport**. Coastal transport can occur when relatively mild Santa Ana winds blowing toward the southwest push South Coast's air pollution over the ocean, and the sea breeze transports air pollution onshore into San Diego County, impacting the coastal monitoring sites.

3. **Inland Transport**. Inland transport can occur when air pollution from South Coast's inland areas blows into San Diego County generally along the Interstate 15 freeway corridor.

Importantly, the South Coast Air Quality Management District (SCAQMD) has implemented an effective emissions control program resulting in a long-term trend of emission reductions and ozone air quality improvement in the South Coast region. In turn, this has led to a reduction in air pollution transported to San Diego.

Substantial emission reductions occurring in San Diego County coupled with a reduction in transported air pollution from South Coast provided for attainment of the former one-hour ozone NAAQS in San Diego County. Similarly, as previously illustrated in Figure 1-4, substantial progress has already been achieved in San Diego toward attaining the more stringent eight-hour ozone NAAQS. Nevertheless, transported air pollution will continue to play a substantial role in the region's ability to expeditiously attain and maintain the ozone NAAQS.

1.5 ATTAINMENT PLANNING REQUIREMENTS

EPA promulgated Phase 1 of its eight-hour ozone implementation rule in April 2004, establishing the nonattainment classification scheme and attainment dates for nonattainment areas.[12] EPA followed up its Phase 1 ozone implementation rule with a final (Phase 2) rule in November 2005,

[11] The South Coast Air Basin includes Orange County and the metropolitan portions of Los Angeles, Riverside, and San Bernardino Counties.
[12] 69 FR 23951.

specifying the planning and emission control requirements regions must address in their implementation plans.[13]

Pursuant to EPA's Phase 1 eight-hour ozone implementation rule, all Basic Nonattainment Areas—including San Diego County—are subject to the general planning and emission control requirements of Subpart 1 (of Part D of Title I) of the CAA. These Subpart 1 requirements are discussed in detail in Section 1.5.2 below. Basic Nonattainment Areas are not subject to the additional, more prescriptive requirements of Subpart 2, which were originally established for the former one-hour ozone NAAQS.

1.5.1 2006 Appeals Court Decision and Implications

Several parties have filed lawsuits challenging various elements of EPA's ozone implementation rules. During development of this Attainment Plan, a federal Appeals Court vacated (voided) EPA's Phase 1 ozone implementation rule.[14] The Appeals Court disagreed with EPA applying Subpart 1 to all eight-hour ozone nonattainment areas that have attained the former one-hour ozone NAAQS, and indicated that some such areas (possibly including San Diego County) must also be subject to Subpart 2 requirements. The Appeals Court remanded the matter back to EPA. However, the Department of Justice (on behalf of EPA) and other parties have appealed the Decision.

Implications. The Appeals Court Decision calls into question whether San Diego County will remain a Subpart 1/Basic Nonattainment Area or be classified in the future under Subpart 2. Regardless, most of the stringent Subpart 2 emission control requirements are already met in San Diego County pursuant to backsliding prohibitions for the former one-hour ozone NAAQS. These requirements, plus additional Subpart 2 requirements that would possibly apply, are discussed in Section 1.5.3.

Resolution of the legal issues associated with EPA's ozone implementation rules will take many months, if not years. In the meantime, the District is proceeding with this Eight-Hour Ozone Attainment Plan to ensure compliance with the June 15, 2007, submittal deadline (which was not vacated by the Appeals Court) and continued ozone air quality improvement in the San Diego region. However, additional or revised ozone planning efforts may be required in the future upon resolution of the legal issues associated with EPA's ozone implementation rules.

1.5.2 Subpart 1/Basic Nonattainment Area Requirements

Subpart 1, Basic Nonattainment Area requirements are fully addressed in this Attainment Plan, pursuant to CAA Section 172 and EPA's previously issued Phase 1 and Phase 2 ozone implementation rules. Major requirements are summarized below.

An **Emission Inventory** (Section 2.0) is a comprehensive tabulation of pollutants emitted into the air as a result of various activities, organized by emission source category. This Eight-Hour Ozone Attainment Plan includes updated inventories of ozone precursor emissions, VOC and NOx, for the

[13] 70 FR 71612.

[14] U.S. Court of Appeals for the District of Columbia Circuit, Case No. 04-1200, South Coast Air Quality Management District v. Environmental Protection Agency; decided December 22, 2006.

2002 base year (the year from which future-year inventories are projected)[15] and the 2008 attainment year, representative of a typical summer weekday. Section 2.0 also identifies **Emission Budgets** for transportation and general conformity purposes.

The **Emission Control Strategy** (Section 3.0) identifies a comprehensive group of stationary and mobile source control measures to lead the region into eight-hour ozone attainment as expeditiously as practicable. The Emission Control Strategy provides for a demonstration of attainment within five years (June 15, 2009) of the nonattainment designation (June 15, 2004). Therefore, pursuant to EPA's Phase 2 implementation rule, Basic Nonattainment Area requirements for Reasonably Available Control Technology (RACT) are fulfilled by the control measures relied on in the Attainment Demonstration.[16] Similarly, the requirement for Reasonable Further Progress (RFP) is fulfilled because all necessary emission reductions will be achieved by the beginning of the 2008 attainment year.[17] Therefore, no separate discussions are needed in this Eight-Hour Ozone Attainment Plan to address RACT and RFP requirements. However, additional RACT and RFP requirements would apply if the region is subsequently classified as a Subpart 2 Nonattainment Area under any rule revisions EPA may be required to issue responding to the court order (see Section 1.5.3).

An analysis of **Reasonably Available Control Measures** (RACM, Section 3.4) is presented pursuant to federal requirements to determine whether additional technologically and economically feasible control measures could advance the ozone attainment date by one or more years. The stringency and comprehensiveness of currently adopted control requirements on emission sources in San Diego County significantly reduces the availability of potential new measures that could provide additional emission reductions to advance the attainment year. The RACM analysis demonstrates there are no additional economically and technologically feasible control measures (alone or in conjunction with others) that could advance the attainment year from 2008 to 2007.

An **Attainment Demonstration** (Section 4.0) was developed pursuant to federal requirements, using photochemical air quality simulation modeling and other approved analytical techniques (collectively called "Weight of Evidence") to demonstrate the ability of the Emission Control Strategy (Section 3.0) to provide for eight-hour ozone attainment as expeditiously as practicable. Ozone nonattainment areas are required to model attainment in the ozone season[18] prior to the area's attainment date.[19] For San Diego County, the demonstrated "attainment year" is 2008, representing the first full ozone season prior to the June 15, 2009, attainment date.

Contingency Measures (Section 5.0) are required, pursuant to CAA Section 172(c)(9), to be implemented in the event of failure to achieve RFP milestones or failure to attain the NAAQS by

[15] EPA established 2002 as the emission inventory base year for eight-hour ozone planning purposes. See "2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, PM2.5 and Regional Haze Programs," Lydia Wegman, Director, Air Quality Standards and Strategy Division, November 18, 2002 (www.epa.gov/ttnchie1/eidocs/2002baseinven_102502new.pdf).

[16] 40 CFR 51.912(c)(1).

[17] 40 CFR 51.910(b)(2)(i).

[18] San Diego's ozone season (when eight-hour ozone exceedances can be expected) has long been specified in federal regulation (40 CFR Part 58, Appendix D, section 2.5) as January through December. However, based on eight-hour ozone levels in recent years, the region's ozone season is more likely May through September (see Section 4.4.5). Regardless, for purposes herein, the full ozone season remains January through December.

[19] 40 CFR 51.908(d).

the attainment deadline. The Contingency Measures requirement is intended to ensure emission reduction progress continues while the failure is being corrected.

Typically, contingency measures are held in reserve and implemented only if required. However, California's stringent emissions control program and on-going emissions reduction trend create a unique situation, allowing this Attainment Plan to identify several mobile source control regulations as contingency measures that will be implemented regardless of contingency measure requirements. These measures provide additional emission reductions, beyond those relied on in the Attainment Demonstration.

New Source Review (NSR) rules are required by the CAA. For purposes of implementing the eight-hour ozone NAAQS, the NSR rules must have applicability thresholds and offset ratios at least as stringent as mandated in the CAA for the nonattainment area's classification. Since San Diego County was designated under Subpart 1 as a Basic Nonattainment Area, the mandated applicability threshold for VOC and NOx emissions is 100 tons per year, and the mandated offset ratio is at least 1-to-1. If in the future the area were classified Moderate under Subpart 2 (see Section 1.5.3), the same 100 tons per year threshold would apply, but the mandated offset ratio would be 1.15-to-1.

The District's current NSR rules (Rules 20.1 – 20.4) were adopted in 1998 when San Diego County was classified as a Serious Nonattainment Area for the one-hour ozone NAAQS, but they have not yet been approved into the SIP. The offset applicability threshold in the current NSR rules is 50 tons per year and the offset ratio is 1.2-to-1. In the District's EPA-approved NSR rules (adopted in 1979) that are included in the federally enforceable SIP, the offset applicability threshold is 100 tons per year and the offset ratio is 1.2-to-1. The District's NSR rules (both versions) also require Lowest Achievable Control Technology and other requirements mandated for nonattainment areas. Thus, both versions of the District's NSR rules fulfill the eight-hour ozone requirements, whether San Diego County remains under Subpart 1 or is classified Moderate under Subpart 2.

1.5.3 Subpart 2/Moderate Nonattainment Area Requirements

Current Subpart 2 requirements are also addressed in this Attainment Plan, in the event the region would be classified as a Subpart 2 nonattainment area under an EPA rule revision. Based on the region's 2003 eight-hour ozone design value (0.093 ppm), Moderate Nonattainment Area requirements would likely apply under this scenario.

Importantly, Subpart 2 requirements have long been implemented in San Diego County pursuant to the region's former status as Subpart 2/Serious Nonattainment Area for the one-hour ozone NAAQS.[20] These requirements continue to be implemented in the region and are required under federal anti-backsliding provisions, and include the following:

1. Enhanced vehicle inspection and maintenance program [CAA Section 182(c)(3)];

2. Stage II gasoline vapor recovery [CAA Section 182(b)(3)];

[20] Subpart 2/Serious Nonattainment provisions were fully satisfied in San Diego County pursuant to the 1994 One-Hour Ozone Attainment Plan, approved by EPA (62 FR 1150). Compliance with Subpart 2 was reaffirmed by EPA when redesignating the region to a Maintenance Area for one-hour ozone (68 FR 13653).

3. Reformulated gasoline [CAA Section 211(k)];

4. New Source Review regulations for new or modified major stationary sources of VOC or NOX, including an offset ratio of 1.2:1 [CAA Section 182(c)(10)];

5. Reasonably Available Control Technology for existing major stationary sources of NOx [CAA Section 182(f)];

6. Periodic emissions inventory and source emission statement regulations [CAA Section 182(a)(3)]; and

7. Enhanced ambient monitoring [Photochemical Assessment Monitoring Stations (PAMS), CAA Section 182(c)(1)].

Limited Further Requirements Under Subpart 2. If in the future San Diego County were to be classified by EPA as a Subpart 2/Moderate Nonattainment Area, at least two additional SIP submittal requirements could apply in addition to those already implemented in the region.

1. Reasonably Available Control Technology [CAA Section 182(b)(2)]: In a separate SIP submittal, a Subpart 2 region must newly reevaluate and assure RACT requirements are met for each applicable category of stationary sources of VOC and NOx.[21]

2. Reasonable Further Progress [CAA Section 182(c)(2)(b)]: Newly classified Moderate areas may be required to submit new RFP demonstrations.

These detailed RACT and RFP requirements do not apply to this Attainment Plan because it is prepared pursuant to Subpart 1 requirements. If EPA subsequently classifies San Diego County under Subpart 2, then reasonable deadlines for compliance with additional requirements will be specified by EPA.

1.5.4 Attainment Finding Versus Attainment Demonstration

The Attainment Demonstration required to be included in this Attainment Plan differs from an "attainment finding" that EPA must issue after an area has actually attained the NAAQS. This Attainment Demonstration is a prediction of clean air quality in the forecasted attainment year (2008). An attainment finding is an after-the-fact determination that the NAAQS has been attained.

An actual attainment finding must be based on three consecutive years of ambient ozone monitoring data. An actual attainment finding in 2008 for San Diego County, based on the 2006-2008 three-year period, is not anticipated due to higher eight-hour ozone levels that occurred during a record-breaking heat wave in 2006.[22]. Nevertheless, pursuant to federal requirements, an

[21] RACT compliance options for Subpart 2 areas include (1) certifying that ongoing RACT rules for one-hour ozone implementation represent RACT for eight-hour ozone purposes; or (2) making a new RACT determination and any associated rule revisions.

[22] See Attachment G for a discussion of unusual meteorological conditions in 2006 that led to higher eight-hour ozone levels.

Attainment Demonstration for 2008 is not required to present three years of ambient ozone data (2006–2008) that provide for attainment in the attainment year (2008).[23] Rather, areas must demonstrate that the attainment year itself (2008) is anticipated to be a "clean" year with respect to eight-hour ozone levels, with a prediction of three or fewer exceedances of the NAAQS at each monitor in that year.[24]

The air quality simulation modeling runs predict 2008 ozone concentrations of 0.086 ppm, just slightly higher than the 0.085 ppm level representing the standard. However, statistical air quality trends analyses included in the Weight of Evidence demonstration indicate that historical eight-hour ozone design values at the Alpine monitoring site have been decreasing at a rate that would lead to attainment years ranging from 2006 to 2008. Thus, the Weight of Evidence predicts 2008 to be a clean year.

If, as predicted, 2008 proves to be a "clean year" for eight-hour ozone levels in San Diego County (as occurred in 2004, with just two exceedances measured at Alpine), then the region will qualify for a one-year attainment date extension provided under CAA Section 172(a)(2)(C), extending the three-year attainment period to 2007-2009. Further, if high ozone concentrations were to occur in 2007 that prevent actual attainment in the 2007-2009 timeframe, but 2009 itself is a "clean year," then a second one-year extension would be available, and attainment must then be achieved based on the 2008-2010 three-year period. Thus, a "2008 attainment demonstration" corresponds to a forecast of clean years in 2008 and 2009 and actual attainment based on either the 2007-2009 or 2008-2010 three-year period.

[23] 66 FR 57163; 71 FR 52678-79.

[24] The Attainment Demonstration's focus on a single attainment year, rather than on a three-year attainment period, is consistent with federal requirements to achieve all necessary emission reductions by the beginning of the attainment year, not three years prior to the area's attainment date. This approach is also a function of how the photochemical air quality simulation model operates, predicting air quality for one year.

2.0 EMISSION INVENTORIES AND TRENDS

2.1 INVENTORY DEVELOPMENT PROCESS

Emission inventories, projections, and trends in this Eight-Hour Ozone Attainment Plan are based on the latest Ozone SIP Planning Emission Projections compiled and maintained by ARB.[1] Supporting data were developed jointly by stakeholder agencies, including ARB, the District, SCAQMD, the Southern California Association of Governments (SCAG), and the San Diego Association of Governments (SANDAG). Each agency plays a role in collecting and reviewing data as necessary to generate comprehensive emission inventories. The supporting data include socio-economic projections, industrial and travel activity levels, emission factors, and emission speciation profiles.

ARB compiles annual statewide emission inventories in its emission-related information database, the California Emission Inventory Development and Reporting System (CEIDARS). Emission projections for past and future years were generated using the California Emission Forecasting System (CEFS), developed by ARB to project emission trends and track progress towards meeting emission reduction goals and mandates. CEFS utilizes the most current growth and emissions control data available and agreed upon by the stakeholder agencies to provide comprehensive projections of anthropogenic (human activity-related) emissions for any year from 1975 through 2030.

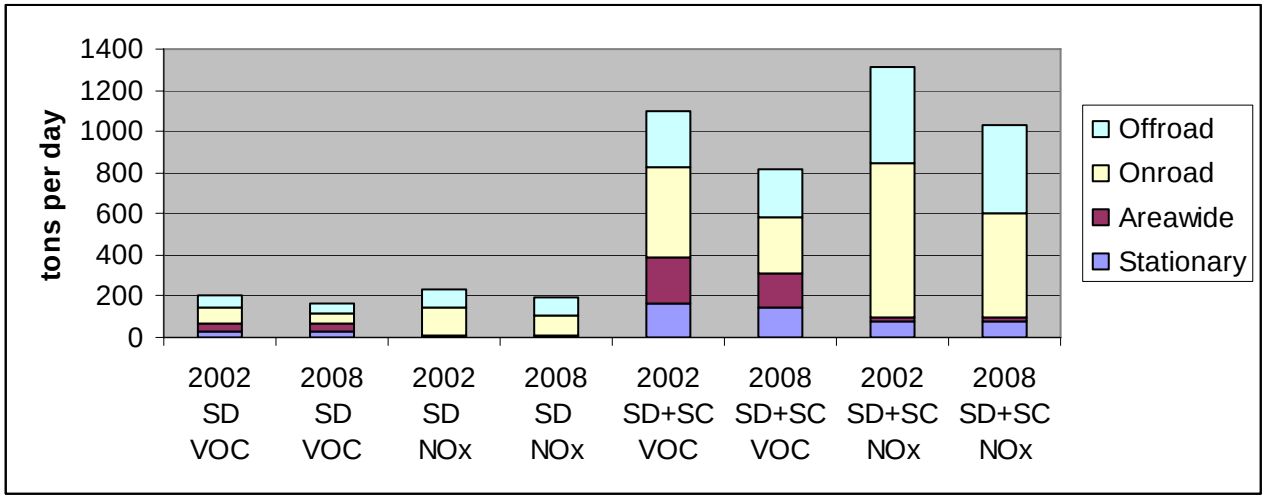
Local air districts are responsible for compiling emissions data for all point sources and many stationary area-wide sources. For mobile sources, CEFS integrates emission estimates from ARB's EMFAC2007 and OFFROAD models. SCAG and SANDAG incorporate data regarding highway and transit projects into their Travel Demand Models for estimating and projecting vehicle miles traveled (VMT) and speed. ARB's on-road emissions inventory in EMFAC2007 relies on these VMT and speed estimates. To complete the inventory, estimates of biogenic (naturally occurring) emissions are developed by ARB using the Biogenic Emissions Inventory Geographic Information System (BEIGIS) model.

2.2 INVENTORIES FOR 2002 BASE YEAR AND 2008 ATTAINMENT YEAR

Detailed inventories (by source category) of ozone-precursor emissions (VOC and NOx) for the 2002 base year and 2008 attainment year are presented in Attachment A and illustrated in Figure 2-1. Because San Diego's ozone air quality is often affected by emissions from the South Coast Air Basin (see Section 1.4.2), both an inventory of San Diego-only emissions and an inventory of combined San Diego plus South Coast emissions are presented. The latter scenario is a general indicator of progress for the South Coast-San Diego transport couple.

[1] Version 1.06 Rf#980.

FIGURE 2-1
Ozone Precursors Emissions in San Diego County and South Coast Air Basin



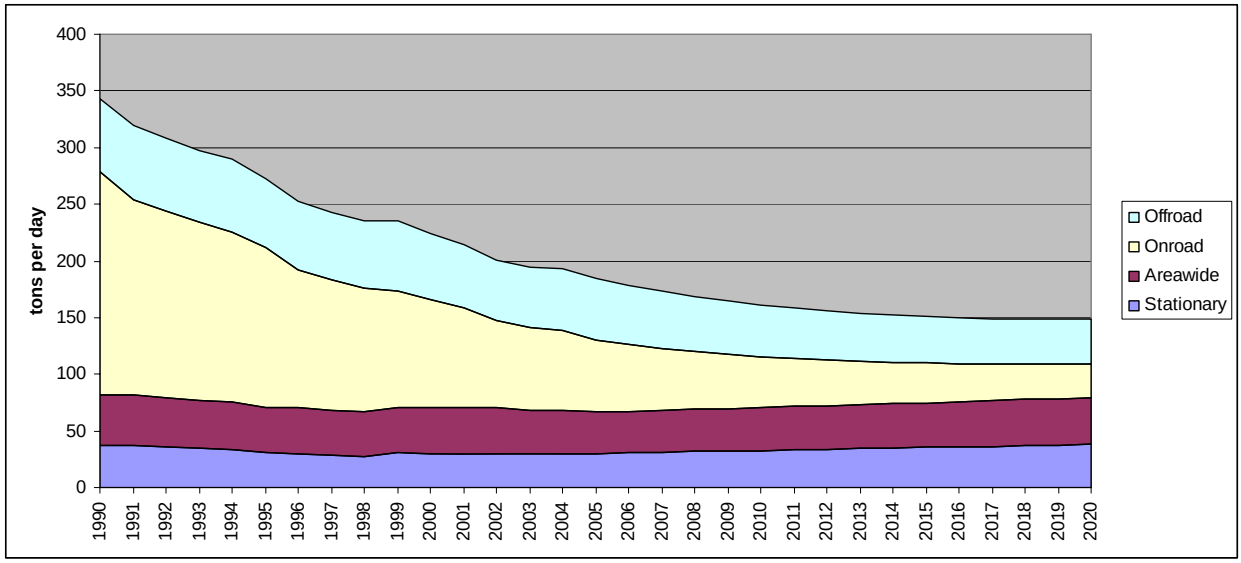
SD = San Diego Air Basin; SC = South Coast Air Basin
Source: ARB SIP emissions inventory.

2.3 LONG-TERM EMISSION TRENDS

Projected emission reduction trends in San Diego County for VOC and NOx are illustrated in Figures 2-2 and 2-3, respectively. A 30-year time period, looking back to 1990 and forward to 2020, is presented. Only currently adopted emission control regulations are reflected in future year projections. The resulting data are disaggregated for onroad, offroad, areawide, and stationary source emissions.

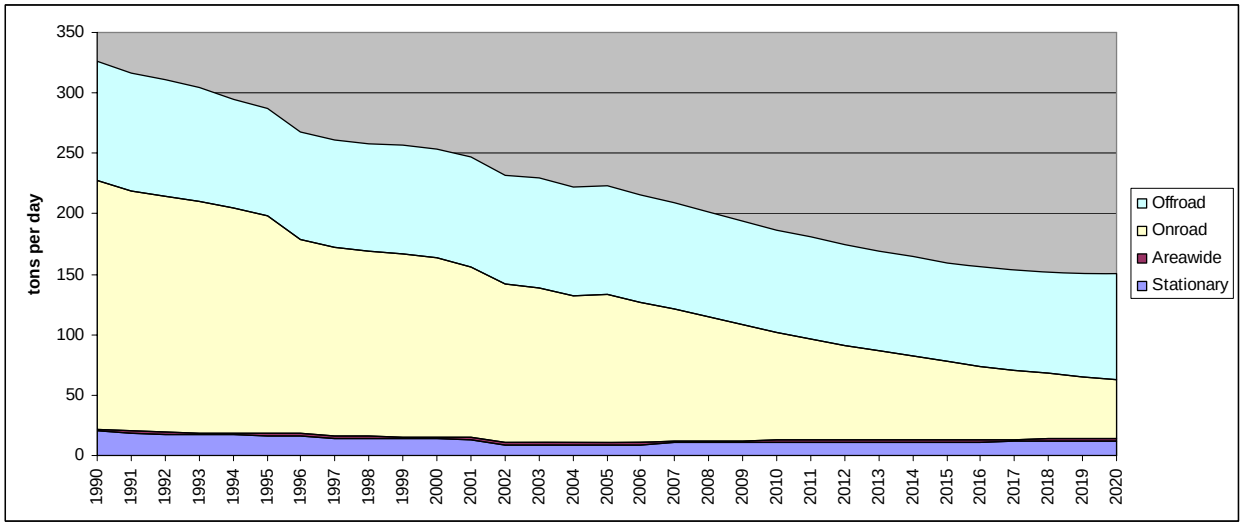
As new lower-emitting motor vehicles (required by State regulations) gradually replace used, higher-emitting vehicles, the share of VOC and NOx emissions from motor vehicles is projected to drop. Stationary source control measures continue to hold stationary source emissions relatively constant despite economic growth. Nevertheless, although not reflected in the figures, future ongoing implementation of the every-feasible-control-measure requirement of State law will likely provide further reductions in emissions as additional cost-effective control technologies become available.

FIGURE 2-2
Volatile Organic Compounds Emissions Trend in San Diego County



Source: ARB SIP emissions inventory.

FIGURE 2-3
Oxides of Nitrogen Emissions Trend in San Diego County



Source: ARB SIP emissions inventory.

2.4 EMISSION BUDGETS

2.4.1 On-Road Motor Vehicle Emission Budgets For Transportation Conformity

The federal transportation conformity regulation[2] requires the Eight-Hour Ozone Attainment Plan to specify on-road motor vehicle emission budgets for the 2008 Attainment Year.[3] The 2008 Attainment Year emission budgets will also apply to all post-2008 future transportation conformity analysis years, as authorized in the federal transportation conformity rule.[4]

TABLE 2-3
On-Road Motor Vehicle Emission Budgets in San Diego County
For 2008 and Subsequent Years
(tons per day)

Pollutant	2008 and Subsequent Years
VOC	53
NOx	98

Note: Emission budgets are based on ARB's EMFAC2007 model with ARB off-model adjustments and reflect "summer day."

The emission budgets presented in Table 2-3 represent the on-road motor vehicle emission levels projected for 2008, as determined by ARB using ARB's EMFAC2007 on-road motor vehicle emissions estimation model and adjusted by ARB to reflect recently adopted emission control programs not reflected in EMFAC2007 and other corrections.

Minor budget adjustments were made to account for imprecision in the on-road motor vehicle emissions modeling process.[5] The emission budgets are expressed as whole numbers, and therefore on-road motor vehicle emission estimates should be rounded to whole numbers (in tons per day) using standard rounding conventions (.49 rounds down; .50 rounds up) prior to being compared to emission budgets for transportation conformity determinations.

2 40 CFR 93 ("Determining Conformity of Federal Actions to State or Federal Implementation Plans").

3 40 CFR 93.118 ("Criteria and Procedures: Motor Vehicle Emissions Budget").

4 40 CFR 93.118(b)(2).

5 To establish the emission budgets, the 2008 on-road motor vehicle emissions estimates were adjusted by rounding up to the next whole number (tons per day), and adding one. This same adjustment procedure was previously used in the approved One-Hour Ozone Maintenance Plan.

2.4.2 Military Growth Increment for General Conformity

The federal general conformity regulation[6] and corresponding District Rule 1501[7] require federal agencies proposing major federal actions to make a determination that proposed actions will conform to the applicable SIP. Specifically, proposed federal actions may not cause or contribute to a NAAQS violation or interfere with the purposes of an applicable SIP. A method for demonstrating conformity is forecasting and accounting for reasonably anticipated emissions from future actions by federal agencies in the applicable SIP (attainment or maintenance plan).[8]

The Department of the Navy (DoN) previously developed, for inclusion in the One-Hour Ozone NAAQS Maintenance Plan (2002), a projection of future mobile source emissions from anticipated military actions that may occur during the twenty-year maintenance period.[9] The NOx emission projections for the Maintenance Plan included a Military Growth Increment of 11.4 tons per day. The ongoing reduction in total regionwide NOx emissions outweighs projected growth in NOx emissions from military activity. Consequently, the Military Growth Increment of NOx emissions in the Maintenance Plan did not jeopardize ongoing maintenance of the one-hour ozone standard. Further, no growth is anticipated in mobile source VOC emissions from future military activities. Rather, VOC reductions from the proposed actions are anticipated.

However, in recognition of the need for further reductions in ozone-precursor emissions to provide for expeditious attainment of the more stringent eight-hour ozone NAAQS, the District has reevaluated whether and what size of a military-growth NOx emissions increment can be accommodated in this Eight-Hour Ozone Attainment Plan. DoN has requested a reduced increment of 2.3 tons per day of NOx emissions (see Attachment B) be included in this Attainment Plan to account for those projects that DoN has planned for implementation during the period in which this Attainment Plan is the applicable SIP (prior to attainment and subsequent replacement of this SIP by a new maintenance plan). The 2.3 tons per day of NOx emissions would result from plans to replace older aircraft at Miramar and Camp Pendleton with new advanced-technology aircraft that produce higher NOx emissions but lower VOC emissions, as well as plans for home-porting a new shallow-water combat ship at Naval Station San Diego. For perspective, military aircraft and ship activities over and offshore of San Diego County currently emit approximately 10 tons per day of NOx.

Attachment B presents preliminary schedules for implementation of the planned military projects through 2015. For purposes of analyzing the potential impact of these projects on 2008 ozone attainment, total emissions from full implementation of these projects were assumed to occur in 2008. The analysis indicates that the emissions growth allowance requested by the military can be accommodated without jeopardizing the demonstration of eight-hour ozone attainment by the 2008 deadline.[10] Consequently, a growth allowance of 2.3 tons per day of NOx emissions is incorporated in this Eight-Hour Ozone Attainment Plan.

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6 40 CFR 51, subpart W ("Determining Conformity of General Federal Actions to State or Federal Implementation Plans).

7 APCD Rule 1501, "Conformity of General Federal Actions," fully approved by EPA on April 23, 1999 (64 FR 19916).

8 40 CFR 51.858(a)(1).

9 "Navy/Marine Corps Mobile Source Emissions Growth Projection and SIP Planning," Department of the Navy, San Diego County, California, June 6, 2002.

10 Comparison of modeling 2008 with and without the planned military projects indicates the combination of NOx emission increases and VOC decreases associated with the projects would result in slightly lower ozone concentrations by a small fraction of a part per billion.

2.5 PRE-BASELINE BANKED EMISSION CREDITS

The District's federally mandated New Source Review Rules require new and modified major stationary sources that increase emissions in amounts exceeding specified thresholds to provide emission reduction offsets to mitigate the emissions growth. Emission reduction offsets represent either on-site emission reductions or the use of banked emission reduction credits (ERCs), which are voluntary, surplus emission reductions previously achieved and registered with the District for future use as offsets. As a result of offset requirements, there should be no net effect on emission inventories from future construction or modification of major sources; in other words, associated emission increases that otherwise would be added to the inventory are effectively canceled out by reductions of other emissions that are in the inventory. The "no net effect on the inventory" result from new or modified major sources holds true only if the emissions that are reduced to provide offsets remain in the inventory.

To ensure construction or modification of major sources has no net effect on emission inventories used for demonstrating eight-hour ozone attainment, banked ERCs derived from pre-2002 emission reductions—which otherwise would not be included as emissions in the baseline and subsequent inventories—must be added back into the inventories as if these emission were still in the air, pursuant to federal requirements.[11] Accordingly, Attachment C presents the pre-baseline ERCs currently in the District's credit bank that have been added to the 2008 Attainment Year Emissions Inventory.

[11] FR 70 71676.

3.0 EMISSION CONTROL STRATEGY

3.1. SUMMARY

Over the past two decades, ozone air quality in San Diego County has improved significantly (see Sections 1.4 and 4.4) due to comprehensive control strategies implemented to reduce pollution from mobile and stationary emission sources. Those controls were primarily designed to address the former one-hour ozone NAAQS. However, ongoing controls and reductions in peak ozone levels have also substantially reduced eight-hour average ozone such that the region is now close to attaining the eight-hour ozone NAAQS. Further, existing District, State, and federal regulations will provide additional reductions in ozone precursors for the foreseeable future (see Sections 2.3 and 4.4.4 for emission trends). Given the success of the existing comprehensive regulatory program, the Emission Control Strategy for this Eight-Hour Ozone Attainment Plan relies primarily on ongoing implementation of existing District, State, and federal regulations to attain the eight-hour ozone NAAQS as expeditiously as practicable. These currently adopted regulations are referred to as the "Existing Control Strategy," which is described in Section 3.2

This Attainment Plan also reflects two additional stationary source control rules being submitted into the SIP, collectively providing an estimated 2.4 tons per day of VOC reduction between 2002 and 2008. First, the newest version of Rule 67.0 (Architectural Coatings) is being submitted into the SIP along with this Attainment Plan (see Section 3.2.2). Second, a new additional control measure (Low VOC Solvent Cleaning) is planned to be implemented in 2008 (see Section 3.3).

3.2 EXISTING CONTROL STRATEGY

3.2.1 State and Federal Control Programs

The California ARB is responsible for controlling emissions from mobile sources (except where federal law preempts ARB's authority) and consumer products, developing fuel specifications, adopting statewide control measures for air toxics, and establishing gasoline vapor recovery standards and certifying vapor recovery systems. ARB has regulated mobile sources since the 1960s and consumer products since the early 1990s, and has added to and significantly tightened those regulations many times over the years.

The State Department of Pesticide Regulation (DPR) is responsible for control of agricultural, commercial and structural pesticides. The State Bureau of Automotive Repair (BAR) runs the State's Smog Check programs to identify and repair higher polluting cars.

EPA is authorized to control emissions from mobile sources, including sources under exclusive federal jurisdiction (such as interstate trucks, some farm and construction equipment, locomotives, aircraft, and marine vessels based in the U.S.). International organizations develop standards for aircraft and marine vessels that operate outside the U.S. Federal agencies have the lead role in representing the U.S. in the process of developing international standards.

Control measures implemented by State and federal agencies pursuant to California's 1994 Ozone SIP (addressing the former one-hour ozone NAAQS) are presented in Table 3-1. In 2003, ARB

identified another series of new statewide mobile and area source control measures to achieve further progress in ozone air quality. These measures are listed in Table 3-2.

The existing State and federal emission control regulations will continue providing significant emission reductions through the coming decade as the regulations are fully implemented. From 2002 to 2008, these regulations will reduce daily ozone precursor emissions in San Diego County by more than 70 tons, as presented in Table 3-3.

TABLE 3-1
State and Federal Control Measures Adopted Since 1994 Ozone SIP

	Responsible Agency	Adopted
Defined Measures in 1994 Ozone SIP		
M1: Light-duty vehicle scrappage	ARB	1998
M2: Low Emission Vehicle II program	ARB	1998
M3: Medium-duty vehicles	ARB	1995
M4: Incentives for clean engines (Moyer Program)	ARB	1999
M5: California heavy-duty diesel vehicle standards	ARB	1998
M6: National heavy-duty diesel vehicle standards	U.S. EPA	1998
M7: Heavy-duty vehicle scrappage	ARB	Replaced with M17
M17: In-use reductions from heavy-duty vehicles	ARB	No
M8: Heavy-duty gasoline vehicle standards	ARB	1995
M9: CA heavy-duty off-road diesel engine standards	ARB	2000
M10: National heavy-duty off-road diesel engine stds	U.S. EPA	1998
M11: CA large off-road gas/LPG engine standards	ARB	1998
M12: National large off-road gas/LPG engine stds	U.S. EPA	2002
M13: Marine vessel standards	U.S. EPA	1999
M14: Locomotive engine standards	U.S. EPA	1997
M15: Aircraft standards	U.S. EPA	No
M16: Marine pleasurecraft standards	U.S. EPA	1996
CP2: Consumer products mid-term measures	ARB	1997/1999
CP3: Aerosol paint standards	ARB	1995/1998
Enhanced I/M (Smog Check II)	BAR	1995
DPR-1: Emission reductions from pesticides	DPR	Voluntary
Adopted measures not originally included in 1994 Ozone SIP		
Clean fuels measures	ARB	Multiple
Marine pleasurecraft (reductions beyond M16)	ARB	1998/2001
Motorcycle standards	ARB	1998
Urban transit buses	ARB	2000
Enhanced vapor recovery program	ARB	2000
Medium/heavy-duty gasoline standards (beyond M8)	ARB	2000
2007 heavy-duty diesel truck standards (beyond M5 and M6)	ARB/U.S. EPA	2001
Small off-road engine standard revisions	ARB	1998

Source: "2003 State and Federal Strategy for the California State Implementation Plan," ARB, September 2003.

TABLE 3-2
State Measures Identified in the 2003 Ozone SIP

Strategy (Agency)	Name	Adoption Years	Implementation Years
LT/MED-DUTY-1 (ARB)	Replace or Upgrade Emission Control Systems on Existing Passenger Vehicles – Pilot Program	2005	2007-2008
LT/MED-DUTY-2 (BAR)	Improve Smog Check to Reduce Emissions from Existing Passenger and Cargo Vehicles	2002-2005	2002-2006
ON-RD HVY-DUTY-1 (ARB)	Augment Truck and Bus Highway Inspections with Community-Based Inspections	2003	2005
ON-RD HVY-DUTY-2 (ARB)	Capture and Control Vapors from Gasoline Cargo Tankers	2005	2006-2007
ON-RD HVY-DUTY-3 (ARB)	Pursue Approaches to Clean Up the Existing and New Truck/Bus Fleet	2003-2006	2004-2010
OFF-RD CI-1 (ARB)	Pursue Approaches to Clean Up the Existing Heavy-Duty Off-Road Equipment Fleet (Compression Ignition Engines) – Retrofit Controls	2004-2008	2006-2010
OFF-RD CI-2 (ARB)	Implement Registration and Inspection Program for Existing Heavy-Duty Off-Road Equipment to Detect Excess Emissions (Compression Ignition Engines)	2006-2009	2010
OFF-RD LSI-1 (ARB)	Set Lower Emission Standards for New Off-Road Gas Engines (Spark Ignited Engines 25 hp and Greater)	2004-2005	2007
OFF-RD LSI-2 (ARB)	Clean Up Off-Road Gas Equipment Through Retrofit Controls and New Emission Standards (Spark-Ignition Engines 25 hp and Greater)	2004	2006-2012
SMALL OFF-RD-1 (ARB)	Set Lower Emission Standards for New Handheld Small Engines and Equipment (Spark Ignited Engines Under 25 hp such as Weed Trimmers, Leaf Blowers, and Chainsaws)	2003	2005
SMALL OFF-RD-2 (ARB)	Set Lower Emission Standards for New Non-Handheld Small Engines and Equipment (Spark Ignited Engines Under 25 hp such as Lawnmowers)	2003	2007
MARINE-1 (ARB)	Pursue Approaches to Clean Up the Existing Harbor Craft Fleet – Cleaner Engines and Fuels	2003-2005	2005
MARINE-2 (ARB)	Pursue Approaches to Reduce Land-Based Port Emissions – Alternative Fuels, Cleaner Engines, Retrofit Controls, Electrification, Education Programs, Operational Controls	2003-2005	2003-2010

Strategy (Agency)	Name	Adoption Years	Implementation Years
FUEL-1 (ARB)	Set Additives Standards for Diesel Fuel to Control Engine Deposits	2006-2009	2006-2010
FUEL-2 (ARB)	Set Low-Sulfur Standards for Diesel Fuel for Trucks/Buses, Off-Road Equipment, and Stationary Engines	2003	2006
CONS-1 (ARB)	Set New Consumer Products Limits for 2006	2003-2004	2006
CONS-2 (ARB)	Set New Consumer Products Limits for 2008-2010	2006-2008	2008-2010
FVR-1 (ARB)	Increase Recovery of Fuel Vapors from Aboveground Storage Tanks	2003	2007
FVR-2 (ARB)	Recover Fuel Vapors from Gasoline Dispensing at Marinas	2006-2009	2006-2010
FVR-3 (ARB)	Reduce Fuel Permeation Through Gasoline Dispenser Hoses	2004	2007
PEST-1 (DPR)	Implement Existing Pesticide Strategy	---	1996-2010
Potential Range for Defined Near-Term State Measures			
Minimum Commitment via Adoption 2003-2006			
LONG-TERM STRATEGY (ARB)	Lead Multi-Agency Effort (State, federal and local) and Public Process Beginning in 2004 to Identify and Adopt Long-Term Measures	2007-2009	2010

Source: "2003 State and Federal Strategy for the California State Implementation Plan," ARB, Sept 2003.

TABLE 3-3
2002-2008 San Diego County Emissions Reductions from Existing State and Federal Control Programs
(tons per day)

Source Category	VOC Reductions	NOx Reductions
Consumer Products	2	--
Onroad Motor Vehicles	26	28
Commercial Boats	<1	2
Recreational Boats	1	0
Res/Ind/Const Equipment	2	7
Farm Equipment	<1	1
Gasoline Cans	2	--
Pesticides	<1	--
TOTAL	**34**	**38**

Source: ARB SIP emissions inventory, Version 1.06.

3.2.2 Local Control Measures

The District is primarily responsible for controlling emissions from stationary and areawide sources (with the exception of consumer products and pesticides) through rules and permitting programs. Examples of stationary and areawide sources include industrial sources such as factories, power plants, and chemical plants; commercial sources such as gas stations, dry cleaners, and paint spray booth operations; and residential sources such as water heaters, furnaces, and house paints. The District implements these control measures through adoption of rules, permits, inspections and testing of a wide variety of stationary sources. In addition, local transportation agencies are responsible for developing and implementing transportation control measures aimed at reducing vehicle activity and associated emissions.

Existing District Rules. The District has already adopted rules to control almost all stationary source categories in San Diego County, as presented in Table 3-4 for NOx rules and Table 3-5 for VOC rules. Most of these rules were fully implemented and achieved their emission reductions before the 2002 base year for this Eight-Hour Ozone Attainment Plan. Enforcement of these rules continues, but they can not be considered as "control measures" for this Attainment Plan because they will not provide new additional emission reductions.[1]

TABLE 3-4
Existing District Rules to Control NOx Emissions

Rule Number	Title	SIP Approval Date
68	Fuel-Burning Equipment-Oxides of Nitrogen	04/09/1996
69	Electrical Generating Steam Boilers, Replacement Units and New Units	Not In SIP*
69.2	Industrial & Commercial Boilers Process Heaters & Steam Generators	02/09/1996
69.3	Stationary Gas Turbine Engines	06/17/1997
69.3.1	Stationary Gas Turbine Engines – Best Available Retrofit Control Technology	Not In SIP*
69.4	Stationary Reciprocating Internal Combustion Engines	01/04/2006
69.4.1	Stationary Reciprocating Internal Combustion Engines– Best Available Retrofit Control Technology	Not In SIP*
69.5	Natural Gas-Fired Water Heaters	Not In SIP*
69.6	Natural Gas-Fired Fan-Type Central Furnaces	Not In SIP*

* The District has adopted and implemented additional rules pursuant to California's stringent requirements for Best Available Retrofit Control Technology (BARCT). The District's BARCT rules have not been submitted into the SIP because they are not required by federal law and are not credited as control measures in this Eight-Hour Ozone Attainment Plan.

[1] For purposes of this Emission Control Strategy section, the term "control measure" refers to new rules and regulations that are submitted into the SIP and provide new additional emission reductions (not previously accounted for) beyond the 2002 base year.

TABLE 3-5
Existing District Rules to Control VOC Emissions

Rule Number	Title	SIP Approval Date
61.0	Definitions Pertaining to the Storage and Handling of Organic Compounds	09/13/1993
61.1	Receiving and Storing Volatile Organic Compounds at Bulk Plants and Bulk Terminals	08/08/1995
61.2	Transfer of Organic Compounds Into Mobile Transport Tanks	08/26/2003
61.3	Transfer of Volatile Organic Compounds Into Stationary Storage Tanks	06/30/1993
61.3.1	Transfer of Gasoline Into Stationary Underground Storage Tanks	Not In SIP*
61.4	Transfer of Volatile Organic Compounds Into Vehicle Fuel Tanks	05/13/1993
61.4.1	Transfer of Gasoline From Stationary Underground Storage Tanks Into Vehicle Fuel Tanks	Not In SIP*
61.5	Visible Emission Standards for Vapor Control Systems	04/14/1981
61.7	Spillage of Volatile Organic Compounds	03/11/1998
61.8	Certification Requirements for Vapor Control Equipment	03/11/1998
66	Organic Solvents	08/11/1998
67.0	Architectural Coatings	03/27/1997
67.1	Alternative Emission Control Plans	03/27/1997
67.2	Dry Cleaning Equipment Using Petroleum-Based Solvent	03/27/1997
67.3	Metal Parts and Products Coating Operations	11/14/2003
67.4	Metal Container, Metal Closure and Metal Coil Coating Operations	11/03/1997
67.5	Cutback and Emulsified Asphalt	03/27/1997
67.6	Solvent Cleaning Operations	12/13/1994
67.7	Cutback and Emulsified Asphalts	03/27/1997
67.9	Aerospace Coating Operations	08/17/1998
67.10	Kelp Processing and Bio-Polymer Manufacturing	06/22/1998
67.11	Wood Products Coating Operations	Not In SIP*
67.11.1	Large Wood Products Coating Operations	06/05/2003
67.12	Polyester Resin Operations	03/27/1997
67.15	Pharmaceutical & Cosmetic	03/27/1997
67.16	Graphic Arts Operations	03/27/1997
67.17	Storage of Materials Containing Volatile Compounds	03/27/1997
67.18	Marine Coating Operations	03/27/1997
67.19	Coatings and Printing Inks Manufacturing Operations	05/26/2000
67.20	Motor Vehicle and Mobile Equipment Refinishing Operations	Not In SIP*
67.21	Adhesive Materials Application Operations	Not In SIP*
67.22	Expandable Polystyrene Foam Products Manufacturing Operations	Not In SIP*
67.24	Bakery Ovens	03/27/1997

* The District has adopted and implemented additional California BARCT rules that have not been submitted into the SIP because they are not required by federal law and are not credited as control measures in this Eight-Hour Ozone Attainment Plan.

Existing District Control Measure - Architectural Coatings. The District adopted the current version of Rule 67.0 (Architectural Coatings) in December 2001. It requires phased implementation of more stringent VOC content limits for certain coating categories that were implemented in 2003 and 2004. The rule provides an estimated 1.4 tons per day of additional VOC emission reductions.

Since the recently implemented provisions of the Architectural Coatings Rule provided emission reductions after the 2002 baseline, the rule is considered a control measure for this Eight-Hour Ozone Attainment Plan. This version of the rule has not yet been submitted into the SIP. Consequently, it is being submitted into the SIP along with this Eight-Hour Ozone Attainment Plan.

3.3 ADDITIONAL NEW CONTROL MEASURE – LOW VOC SOLVENT CLEANING

The District is adopting a new control measure, as reflected in this Eight-Hour Ozone Attainment Plan, to reduce the VOC content of solvents used in cold solvent cleaning operations, effective in 2008. The control measure will replace current District Rule 67.6 (Solvent Cleaning Operations) with two new rules, Rule 67.6.1 (Cold Solvent Cleaning and Stripping Operations) and Rule 67.6.2 (Vapor Degreasing Operations), which are being adopted simultaneously with this Eight-Hour Ozone Attainment Plan. Proposed new Rule 67.6.1 will require that each solvent utilized in a cold solvent cleaning operation must have a VOC content of 50 grams per liter of material or less, in addition to other requirements. Proposed new Rule 67.6.2 will apply to vapor degreasing operations, with requirements that are generally identical to those in current Rule 67.6.

When new Rule 67.6.1 is implemented in Spring 2008, San Diego County cold solvent cleaning-related VOC emissions are projected to drop by approximately 1 ton per day relative to the 2002 baseline. Because these emission reductions are not fully achieved before January 2008 (the beginning of the first full ozone season prior to the June 15, 2009, attainment deadline), they are not reflected in the Attainment Demonstration (Section 4.0), which shows attainment with the Existing Control Strategy. Nevertheless, the rule is identified as an additional control measure in this Attainment Plan to assist in reducing ozone concentrations in 2008 to below the level of the eight-hour ozone NAAQS.

3.4. REASONABLY AVAILABLE CONTROL MEASURES (RACM)

3.4.1. RACM Requirements

An analysis of Reasonably Available Control Measures (RACM) must demonstrate that the SIP provides for attainment as expeditiously as practicable.[2] Demonstrating attainment as expeditiously as practicable is a two-step process. First, an initial control strategy is developed that can demonstrate attainment by the earliest year that is preliminarily considered to be feasible within the statutory maximum attainment deadline.[3] The RACM analysis is then conducted as a second step, in which additional technologically and economically feasible potential control measures (that were not included in the initial control strategy) must be considered to determine if there is any

[2] CAA Section 172(c)(1).

[3] As a Subpart 1/Basic Nonattainment Area for eight-hour ozone, San Diego's maximum attainment deadline is June 15, 2009, plus up to five additional years, if necessary.

combination of additional control measures that could provide sufficient additional emission reductions in time to advance the attainment date by one or more years. The additional feasible control measures are determined to be "reasonably available" and must be included in the SIP only if implementing the measures can advance the attainment year.

To be able to advance the attainment year, potential control measures must meet two pre-requisites. First, each control measure must be implemented in time to provide the intended emission reductions by the beginning of the ozone season of the earlier—i.e., advanced—attainment year. Second, the cumulative emission reduction potential (in that advanced attainment year) of all the candidate measures together would need to be sufficient to advance the attainment year. As discussed below, the stringency and comprehensiveness of the Existing Control Strategy, and the already early year forecast to reach attainment (2008), limits or eliminates the feasibility of additional measures that can satisfy these criteria. Specifically, such measures would have to advance attainment to 2007, the current year.

3.4.2 Identifying Potential RACM for Stationary Sources

Identifying additional control measures for consideration as potential RACM is challenging in San Diego County because, in response to stringent requirements of State law, the District is already required to adopt every feasible control measure as expeditiously as practicable. Consequently, as previously presented in Table 3-4 for NOx and Table 3-5 for VOC, the District has already adopted rules to control almost all significant stationary source categories in the county. Most rules have been submitted into the SIP to fulfill federal requirements for Reasonably Available Control Technology (RACT). However, because California State law requires Best Available Retrofit Control Technology (BARCT) which is more stringent than RACT, the District has also adopted additional BARCT rules that have not been submitted into the SIP because they are not required by federal law or regulation. The District's existing BARCT rules can not be considered as potential RACM because they have already been implemented and would not provide new additional emission reductions that could advance the attainment year. Nevertheless, those additional BARCT rules have already achieved emission reductions that contribute to the forecast of an early attainment year.

The District has relied on an ongoing control measure evaluation process required under State law to identify potential RACM. Specifically, California local air districts must triennially update their air quality plans to achieve State ozone standards to include "every feasible control measure." Each district is required to consider, for each emission source category, whether adopting some or all of the requirements of the most stringent adopted rule in the State for that source category would be feasible within that district.

The District's current review of the most stringent rules identified 17 source categories (listed in Table 3-6) for which the most stringent rules in the State contain more stringent requirements than San Diego APCD rules. Table 3-6 also indicates the implementation period, in years, that would be necessary to fully realize the emission reductions if the rules were locally adopted. The one- to three-year implementation periods indicated for the VOC control measures, and the two- to 25-year implementation periods for the NOx control measures, represent the time necessary to obtain lower emitting materials, install control equipment, or replace existing units at the end of their useful lives. Thus, even if all measures were adopted concurrent with this Attainment Plan in 2007 (which

is not feasible due to the lead time necessary for rule development and adoption), the reductions could not be fully realized before the beginning of 2007. Consequently, those measures are not available for advancing the attainment year to 2007.

An analysis of each of the potential control measures identified in Table 3-6 is presented in Attachment D.

TABLE 3-6
Stationary Source Categories for Which More Stringent Control Requirements Have Been Adopted by Another District

Control Measure	Other District Rule Number*	San Diego Rule Number	Estimated Emission Reduction Potential (Tons/Day)	Implementation Period (Years)	Pollutant
Low VOC Solvent Cleaning	SC 1122	67.6	1	1	VOC
Architectural Coatings	SC 1113	67.0	5	1	VOC
Automotive Refinishing	ARB SCM	67.20	1	2	VOC
Adhesive and Sealant Applications	SC 1168	67.21	1.4	1	VOC
Solvent Wipe Cleaning Operations	SC 1171	Various Rules	0.57	1	VOC
Wood Products Coating Operations	SC 1136	67.11-67.11.1	0.25	2	VOC
Graphic Arts	SC 1130	67.16	0.23	1	VOC
High Emitting Spray Booth Facilities	SC 1132	Various Coating Rules	0.15	2	VOC
Petroleum Storage Tanks	SC 1178	61.1	0.03	3	VOC
Mobile Transport Tanks Loading	SJV 4621	61.2	0.02	1	VOC
Food Products Manufacturing/Processing	SC 1131	No comparable rule	0.02	2	VOC
Polyester Resins Operations	SC 1162	67.12	0.02	1	VOC
Equipment Leaks	BA 8-18	Various Rules	<0.02	1	VOC
Aerospace Manufacturing Operations	SC 1124	67.9	<0.01	1	VOC
Industrial, Commercial, and Institutional Boilers	SJV 4306	69.2	0.1	2	NOx
Small Boilers and Large Commercial Water Heaters	SC 1146.1 & 1146.2	No comparable rule	0.3	25**	NOx
Residential Water Heaters	SC 1121	69.5	1.5	10**	NOx

*SC = South Coast air district; ARB = Air Resources Board; BA = Bay Area district; SJV = San Joaquin Valley district; SCM = Suggested Control Measure

**Emissions reductions would occur gradually, as new low-emitting units replace existing higher-emitting units at the end of their useful lives.

3.4.3 Identifying Potential RACM for Transportation Sources

Potential RACM also include Transportation Control Measures (TCMs), which are strategies to reduce motor vehicle trips, vehicle miles traveled, or vehicle idling and associated air pollution. Table 3-7 lists the 16 TCMs identified in CAA Section 108(f) and their implementation status in San Diego County. A discussion of each TCM, further describing the status of implementation, follows Table 3-7.

As indicated, 13 of the 16 TCMs have been implemented, including transit and traffic flow improvements, ridesharing, high occupancy vehicle (HOV) lanes, pedestrian-only streets, control of extended idling, and 7 other measures. The agencies responsible for developing and implementing these TCMs include the San Diego Association of Governments (SANDAG, the transportation planning agency for the San Diego region) and other State and local agencies as appropriate.

Five of the implemented TCMs—TCMs 1, 3, 5, 8, and 10—were included in the 1982 SIP Revision for San Diego County.[4] Descriptions herein of any ongoing implementation beyond 1982 SIP commitments does not constitute submittal of additional implementation commitments into the SIP. Submittal of additional TCM commitments into the SIP would be required only if the TCMs meet the RACM qualifications specified in Section 3.4.1. TCMs that have already been implemented can not provide new additional emissions reductions in 2007 that could advance the attainment year from 2008 to 2007. Therefore, they can not be considered RACM and consequently are not required to be submitted into the SIP.

Table 3-7 and the subsequent discussion also address the three TCMs that have not been implemented in San Diego County and the reasons for non-implementation. These measures address trip-reduction ordinances, peak-period vehicle restrictions, and vehicle emissions in extremely cold environments.

[4] In the 1982 SIP, TCMs 3 and 8 (see Table 3-7) were combined into one comprehensive TCM, the "Ridesharing" TCM.

TABLE 3-7
Transportation Control Measures listed in Clean Air Act Section 108(f)
Implementation Status in San Diego County

Transportation Control Measures	Implemented	In 1982 SIP
1. Programs for improved public transit	Yes	Yes
2. Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles	Yes	
3. Employer-based transportation management plans, including incentives	Yes	Yes
4. Trip-reduction ordinances *Adopted in 1994, but rescinded in 1995 when federal and State laws were amended eliminating the mandate for such measures	No*	
5. Traffic flow improvement programs that achieve emission reductions	Yes	Yes
6. Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service	Yes	
7. Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during periods of peak use	No	
8. Programs for the provision of all forms of high-occupancy, shared-ride services	Yes	Yes
9. Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place	Yes	
10. Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas	Yes	Yes
11. Programs to control extended idling of vehicles	Yes	
12. Programs to reduce motor vehicle emissions, consistent with Title II, which are caused by extreme cold start conditions	Not Applicable	
13. Employer-sponsored programs to permit flexible work schedules	Yes	
14. Programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity	Yes	
15. Programs for new construction and major reconstructions of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest	Yes	
16. Program to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model light duty trucks	Yes	

3.4.3.1 Implementation Status of Transportation Control Measures (TCM)

TCM 1 – Improved Public Transit

The Transit measure commitments included in the 1982 SIP were fully implemented by 1995. Transit improvements have continued since that time, as follows. Bus revenue miles[5] in San Diego County increased 7% from 1995 to 2005, totaling nearly 28 million miles. In the last five years, the County's two largest transit providers have redirected service from low-ridership to high-ridership routes. Further, rail transit services, including the San Diego Trolley[6] and the Coaster[7] commuter rail service, have grown by nearly 42% since 1997, reaching over 8.2 million revenue car miles by 2005. The six-mile extension of the San Diego Trolley, from Qualcomm Stadium in Mission Valley to San Diego State University and La Mesa, opened in 2006. Additionally, construction began in 2004 on the 22-mile Sprinter Rail Line, connecting Oceanside to Escondido, and it is scheduled to begin revenue service in December 2007.

Notwithstanding these important improvements, it should be understood that the region's generally low-density land use pattern currently does not support extensive deployment of fixed-rail rapid transit modes that could provide faster travel times that are more comparable to the personal automobile. The San Diego region's existing transit network, although extensive, is mostly composed of lower-speed transit modes (such as conventional transit buses) that are appropriate for the lower-density land use levels that exist. The region's transit strategy, articulated in SANDAG's Regional Comprehensive Plan, is to increase land use densities and transit ridership in town centers and particular corridors. In most parts of the region, this system will take several decades to mature.

SANDAG's Regional Transportation Plan (RTP), MOBILITY 2030, envisions adding a new transit mode called Bus Rapid Transit (BRT). BRT would utilize a new class of coaches to provide shorter travel times and more convenience than current conventional buses, offering service more similar to light rail, but using the streets. Improved travel times will be accomplished by utilizing High Occupancy Vehicle lanes and transit prioritizing schemes for traffic signals.

TCM 2 – High Occupancy Vehicle (HOV) Lanes

Currently, three freeways (I-5, I-15, and SR 54) in the San Diego region have HOV lane segments. HOVs are also provided with preferential lanes at 62% of the 276 metered on-ramps, and there is a buses-only lane at the SR-163 on-ramp from downtown San Diego. The RTP calls for the development of a more robust HOV/Managed Lanes network, as follows:

- Managed lane facilities on:
  - I-5 from I-805 to Vandegrift Blvd;
  - I-15 from SR 163 to SR 78;
  - I-805 from SR 905 to I-5;
  - SR 52 from I-15 to SR 125.

[5] Revenue (car) miles are the total distance that a fleet travels while available for passenger service.

[6] The San Diego Trolley is a 54-mile light rail transit system serving southern San Diego County.

[7] The Coaster is a 42-mile passenger rail line between Oceanside and Downtown San Diego that began service in 1996.

- One HOV lane in each direction on:
  - I-5 from SR 905 to I-805;
  - I-8 from SR 125 to 2nd Street;
  - SR 52 from I-805 to I-15;
  - SR 54/SR 125 from I-5 to SR 94;
  - SR 56 from I-5 to I-15;
  - SR 78 from I-5 to I-15;
  - SR 94/125 from I-5 to I-8.

- Direct HOV to HOV connectors are included at the following freeway interchanges:
  - I-5 to I-805: North to North & South to South;
  - I-15 to SR 78: East to South & North to West;
  - I-15 to SR 94: South to West & East to North;
  - I-805 to SR 52: West to North & South to East.

Managed lanes will provide priority to HOVs such as carpools and vanpools, regular transit services, and a BRT system. Excess capacity in these lanes will be "sold" to solo drivers for a fee, similar to the current FasTrak program on I-15. The managed lanes will be separated from the general purpose lanes by a barrier with access provided at several locations through openings in the barrier.

TCM 3 – Employer-Based Transportation Management Plans
In the 1982 SIP, the Employer-Based Transportation Management Plans measure (TCM 3) was combined with the Shared-Ride Services measure (TCM 8) to form a more comprehensive measure, the "Ridesharing" TCM. The Ridesharing TCM commitments included in the 1982 SIP were fully implemented by 1988.

Traffic Abatement Plan requirements of APCD Rule 132 were included as part of the Ridesharing TCM. Pursuant to federal requirements for abating air pollution emergency episodes,[8] employer-based Traffic Abatement Plan measures are triggered by ozone levels exceeding 0.35 ppm. No ozone concentrations of this level or higher have been recorded in San Diego County since 1979.

TCM 4 – Trip-Reduction Ordinances
A regional trip-reduction ordinance was adopted by APCD as part of the 1994 Ozone SIP, but was rescinded in 1995 when federal and State laws were amended eliminating the mandate for such measures based on public opposition. (It should be noted that this TCM focuses on addressing weekday commute trips, whereas San Diego's exceedances of the eight-hour ozone NAAQS occur disproportionately more frequently on weekends (see Section 4.3.1).

TCM 5 – Traffic Flow Improvements to Reduce Emissions
Traffic Flow Improvements mostly consist of traffic signal improvements to reduce idling and associated emissions. The Traffic Flow Improvements TCM commitments included in the 1982 SIP were fully implemented by 1990.

[8] 40 CFR 51.150 et seq.

Further implementation of the Traffic Flow Improvements TCM continues. All federally funded traffic signal projects selected with the federal transportation funding program (TEA-21) have been implemented (117 projects). SANDAG's 2006 Regional Transportation Improvement Program (RTIP) contains $19.7 million in traffic flow improvements, including eight traffic signal projects (two highway, six local).

TCM 6 – Park-and-Ride Facilities

Currently, there are 66 park-and-ride lots in the San Diego region, with 4,049 spaces available. More lots are anticipated as funding becomes available. In addition, transit parking at commuter rail stations has been developed and is currently available at six stations, with 6,300 spaces available. The San Diego Trolley also provides parking at over half (28) of its stations, with 9,700 confirmed spaces and an undetermined amount of shared-use parking. The future Sprinter rail line will offer parking at 13 stations accommodating 1,500 parking spaces.

TCM 7 – Peak-Period Vehicle Restrictions in Downtown Areas

This measure is feasible only in high-density portions of compact metropolitan areas with an extensive transit system. Given the San Diego region's historically low-density land use pattern, and therefore longer transit travel times, this measure is not yet feasible. However, SANDAG's Smart Growth Incentive Program provides funding to cities for infrastructure projects which enhance alternatives to driving in higher density areas. (It should be noted that this TCM focuses on addressing peak-period (weekday) trips, whereas San Diego's exceedances of the eight-hour ozone NAAQS occur disproportionately more frequently on weekends (see Section 4.3.1)).

TCM 8 – Shared-Ride Services

As mentioned above, in the 1982 SIP, TCM 8 was combined with TCM 3 in a "Ridesharing" TCM. The Ridesharing TCM commitments included in the 1982 SIP were fully implemented by 1988.

Further implementation of Shared-Ride Services TCM continues. SANDAG and APCD are partners in the support of RideLink (www.ridelink.org), the regional transportation assistance program, charged with providing shared ride services and education to employers and individuals on all ridesharing and biking options. Example services include:

- Carpool Ride Matching Service – computerized ride-matching.
- Guaranteed Ride Home Service – qualifying ride sharers are provided with three vouchers per year for $3 taxi fares or 24-hour rental cars to travel home to address a personal unscheduled event.
- Promotion of Teleworking and Alternative Work Schedules (see TCM 13) – RideLink works with employers and employees to create programs for offering alternative work arrangements (such as flex time and teleworking) to reduce commute trips and peak hour traffic congestion.
- Park and Ride Programs (see TCM 6) – Caltrans and other agencies provide park and ride facilities, which are promoted by RideLink.
- Vanpool Program – SANDAG operates a Regional Vanpool Program, funded in part by The District's Vehicle Registration Fund. As of November 1, 2006, 537 vanpools were operating in the San Diego region carrying more than 4,600 passengers daily, a 19%

increase over 2005 levels. Vanpools are anticipated to grow at 6 net vanpools per month. Additional vanpools are anticipated as additional funding becomes available.

TCM 9 – Road Surface Restrictions for Motor Vehicles in Metro Areas

Numerous examples of road surface restrictions exist in the San Diego region. In downtown San Diego, C Street is limited to the Trolley and pedestrian use, and a block of B Street was closed and transformed into the Civic Center Concourse. In Old Town San Diego State Historical Park, portions of San Diego Avenue, Calhoun Street, and Mason Street have been restricted to pedestrian-only use. In Balboa Park, the eastern end of El Prado is also restricted to pedestrian-only use. North of Sorrento Valley, a segment of Sorrento Valley Road is closed to traffic and reserved for bicycle and pedestrian uses. This measure is also implemented on a limited or recurring temporary basis for certain recreational areas, weekly farmer's markets, and yearly festivals/street fairs.

TCM 10 – Bicycle Facilities

The Bicycling TCM commitments included in the 1982 SIP were fully implemented by 1995. However, further implementation of the Bicycling TCM continues. The bikeway system currently includes 1,136 miles of bikeways in the San Diego region, consisting of Class I (exclusive bicycle path separated from roadway), Class II (striped on-street bicycle lane), and Class III (shared with motor vehicles) facilities. Additionally, front-mounted bike racks are available on nearly all transit buses. SANDAG maintains a system of 580 bicycle lockers throughout the region available for commuters at transit centers and park-and-ride facilities.

TCM 11 – Idling Controls

ARB has adopted diesel-fueled vehicle idling limitation programs focusing on school buses (www.arb.ca.gov/toxics/sbidling/sbidling.htm), trucks (www.arb.ca.gov/msprog/truck-idling/truck-idling.htm), and locomotives (www.arb.ca.gov/railyard/ryagreement/ryagreement.htm). More information is available on ARB's website at the specified web addresses.

TCM 12 – Vehicle Cold Start Emissions in Extreme Cold Conditions

This measure is not applicable due to the mild climate in the San Diego region.

TCM 13 – Flexible Work Schedules

This measure has been implemented by the RideLink program, as previously identified under TCM 8. (See www.ridelink.org/Employer_Services/Alternative_Schedules.asp) RideLink staff work with employers and employees to create programs for offering alternative work arrangements (such as flex time and teleworking) to reduce commute trips and peak hour traffic congestion.

TCM 14 – Programs and Ordinances Facilitating Non-Automotive Travel

This measure has been implemented in San Diego via the Regional Comprehensive Plan (RCP), adopted by SANDAG, which emphasizes greater reliance on non-automotive travel through increased development densities, more mass transit usage, and increased bicycling and walking for transportation. Pursuant to the RCP, SANDAG has designated existing and potential Smart Growth Areas, and provides funding incentives for local jurisdictions to increase densities and provide for mixed uses and additional transit, bicycling and walking facilities in these areas. The largest city in the region, the City of San Diego, is in the final stages of adopting a general plan revision consistent with this approach. Developers in the region have responded to these policies, and to market forces, by initiating a number of large-scale smart growth developments ultimately representing over

40,000 new housing units. Additionally, thousands of new units have been added to existing communities well-served by transit and amenable to non-motorized travel.

Additionally, in 2004, voters extended the region's half-cent sales tax ordinance for transportation ("TransNet"), and added additional funding categories, including the Smart Growth Incentive Program, and transit, bicycling, and pedestrian improvements. The ordinance requires routine accommodation of these modes for all TransNet-funded local roadway projects.

TCM 15 – Paths or Areas Encouraging Non-Motorized Travel
The San Diego region has implemented an extensive network of bicycling facilities, many of which also serve pedestrians. Additionally, three regional, multi-use trails are still under development—the Bayshore Bikeway (26 miles around the San Diego Bay), the Inland Rail Trail (22 miles from the Escondido Transit Center to the Oceanside Transit Center), and the Coastal Rail Trail (44 miles from northern Oceanside to downtown San Diego). These three trails are expected to be used by commuters as well as recreational users. Additionally, due to land use plans, regional transportation funding formulas, and the nature of the housing market, a number of new smart growth developments have been built which include paths and trails that encourage non-motorized travel (see TCM 14).

TCM 16 – Removal of Older, Higher-Polluting Light Duty Vehicles
Under a program administered by the District using Vehicle Registration Fee funds, a total of 4,277 older vehicles were permanently retired through 2005, resulting in an estimated reduction of 470 tons of ozone-precursor emissions. Further, a State-run vehicle retirement program continues, administered by the California Department of Consumer Affairs' Bureau of Automotive Repair (www.smogcheck.ca.gov/stdpage.asp?Body=/Consumer/cap_program.htm).

3.4.3.2 Emission Reduction Potential of Transportation Control Measures

Trip Reduction Ordinances alone (TCM 4) have been estimated to reduce on-road vehicle emissions by less than 2%.[9] That analysis also estimated that all other TCMs combined would not be more effective than Trip Reduction Ordinances (i.e., would not provide combined emission reductions exceeding 2%).

Consequently, it is assumed that the maximum emission reduction potential of implementing all unimplemented TCMs (TCMs 4, 7, and 12) would be 2% of on-road vehicle emissions. Projected on-road motor vehicle emissions in San Diego County in 2008 are 51 tons per day of VOC and 102 tons per day of NOx (see Table A-1 in Attachment A). Therefore, the maximum emissions reduction potential of implementing all unimplemented TCMs, assuming a 2% reduction in on-road emissions, is an estimated 1 ton per day reduction of VOC emissions and 2 tons per day reduction of NOx emissions.

3.4.4 RACM Analysis

To determine whether additional control measures could advance the attainment year, the additional emission reduction increment that would be necessary to advance the attainment year must be

[9] "Transportation Control Measures for the Air Quality Plan," San Diego Association of Governments, 1992.

estimated. The potential total emission reductions that could be provided by the additional control measures can then be compared to the necessary emission reduction increment to determine whether implementing the additional control measures could advance the attainment year.

Pollutant transport from the South Coast Air Basin contributes significantly to ozone exceedances in the San Diego nonattainment area (see Section 1.4.2). Due to the effects of the transport contribution, the emission reduction increment that would be necessary from sources within San Diego County to advance the attainment year will be greater (to compensate for transport emissions) than if ozone exceedances were caused solely by local emissions. Thus, for purposes of this RACM analysis, emissions contributing to San Diego's eight-hour ozone nonattainment are assumed to be the total of emissions from San Diego County and South Coast combined.

The increment of additional emission reductions that would be necessary in 2007 to advance the attainment year from 2008 to 2007 is the amount by which total contributing emissions projected for 2007 are greater than projected emissions for 2008 (preliminarily considered to be the earliest attainment year). For San Diego and South Coast combined, projected 2007 emissions are greater than 2008 emissions by 44 tons per day of VOC and 58 tons per day of NOx (see Table 3-8). Thus, 44 tons per day of additional VOC reductions and 58 tons per day of additional NOx reductions would be necessary in 2007 to advance the attainment year from 2008 to 2007.

As shown in Table 3-8, San Diego County-only emissions in 2007 are projected to be higher than 2008 by about 5 tons per day of VOC and 6 tons per day of NOx. Consequently, in the rarer circumstances where exceedances of the eight-hour ozone NAAQS are caused solely by local San Diego County emissions, 5 tons per day of additional VOC reductions and 6 tons per day of additional NOx reductions would be necessary in 2007 to advance the attainment year from 2008 to 2007.

TABLE 3-8
Projected Total Daily Emissions in 2007 versus 2008

	VOC Emissions (tons per day)			NOx Emissions (tons per day)		
Region*	2007	2008	Difference	2007	2008	Difference
SD plus SC	862	818	44	1090	1032	58
SD Only	173	168	5	201	195	6

*SD = San Diego Air Basin; SC = South Coast Air Basin
Source: ARB SIP emissions inventory.

Due to the long lead time required for rule or program development, adoption, and implementation, none of the control measures listed in Tables 3-6 (stationary source measures) and 3-7 (transportation source measures) could be implemented by the beginning of 2007. Consequently, none of those measures are considered "reasonably available" to advance the attainment year from 2008 to 2007. Furthermore, even if the measures in Tables 3-6 and 3-7 could be implemented in time, these measures would cumulatively provide less than 11 tons per day of VOC reductions and less than 4 tons per day of NOx reductions.[10] This is less than the additional emission reduction

[10] The indicated maximum emission reduction potential is derived by summing the reductions listed in Table 3-6 and the values presented in Section 3.4.3.2. The calculations are presented in Attachment E.

increments that would be necessary to advance the attainment year for both the San Diego-only and South Coast plus San Diego scenarios. Consequently, those measures would not be considered reasonably available and are not required to be included in the SIP.

Nevertheless, as discussed in Section 3.3, the District is currently planning to adopt the Low VOC Solvent Cleaning control measure, to be implemented in 2008, to satisfy State requirements for every feasible control measure and to assist in reducing ozone concentrations in 2008 to below the level of the eight-hour ozone NAAQS.

4.0 ATTAINMENT DEMONSTRATION

4.1 BACKGROUND

The Attainment Demonstration summarizes the results of photochemical air quality simulation modeling and supplemental Weight of Evidence analyses to demonstrate that the Emission Control Strategy (Section 3.0) to reduce ozone-precursor emissions is sufficient to provide for attainment of the eight-hour ozone NAAQS in San Diego County as expeditiously as practicable, pursuant to CAA requirements. The Attainment Demonstration was developed pursuant to EPA's *Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the eight-hour Ozone NAAQS* (October 2005).

Ozone formation in the atmosphere is a complex photochemical process, and sophisticated photochemical air quality simulation modeling is a valuable tool to help predict the amount of precursor emission reductions needed to provide for attainment of the eight-hour ozone NAAQS. The air quality model is computer-driven and simulates weather patterns, emissions, and photochemical processes in the atmosphere to predict future ozone levels in the region.

As with other predictive tools, photochemical air quality simulation modeling has inherent uncertainties and can not be expected to produce absolutely accurate results. Such models require detailed three-dimensional and time-varying inputs of emissions and meteorological data for the days being considered. Limitations in these inputs, as well as limitations in the model's formulations for simulating photochemical reactions, pollutant dispersion, and deposition lead to uncertainties in model predictions.[1]

To address the inherent modeling uncertainties, EPA Guidance established comprehensive procedures for demonstrating attainment of the eight-hour ozone NAAQS. These procedures differ in two major ways from past attainment demonstrations for the former one-hour ozone NAAQS.

1. The new Modeled Attainment Test is based on relative, rather than absolute, use of the modeling results. That is, the test relies on the ability of the photochemical modeling system to simulate the *change* in ozone due to emission reductions, rather than considering the modeling results to represent exact values for future-year ozone concentrations. Specifically, the model is run for both the 2002 baseline conditions and future 2008 scenario. The results of the baseline and future scenario model runs are compared to derive "Relative Response Factors," which predict the relative reduction in ozone concentrations between 2002 and 2008 resulting from control strategy implementation in the future year. The Relative Response Factors are then applied to monitored base-year (2002) design values to produce predicted future-year (2008) design values. The Modeled Attainment Test is "passed" if the predicted future-year design values at each site are below 85 parts per billion (ppb).[2] The future-year design value represents the fourth highest eight-hour average ozone concentration in the forecast attainment year.

[1] According to EPA's Guidance document, past modeling analyses have shown that future ozone design value uncertainties of 2 to 4 parts per billion can result from use of alternate, yet equally appropriate, emissions inputs, chemical mechanisms, and meteorological inputs.

[2] Equivalent to 0.085 parts per million. Eight-hour ozone levels are usually identified in terms of parts per million (ppm), as reflected in Sections 1 through 3. However, EPA guidance uses parts per billion (ppb) for purposes of discussing photochemical air quality simulation modeling. Accordingly, ozone concentrations are identified in ppb for purposes of this Section 4.0.

2. In recognition of the inherent uncertainties (described above) in the Modeled Attainment Test, the Attainment Demonstration must also include a Weight of Evidence Demonstration incorporating a variety of statistical and other analyses—such as monitored air quality and emissions trends and meteorological analyses—that provide additional persuasive support to a conclusion that the Control Strategy is sufficient to provide for timely attainment. Further, as specified in EPA Guidance, in areas where the Modeled Attainment Test is narrowly failed—that is, showing future-year design values above 85 but below 88 ppb—the Weight of Evidence Demonstration can be used to demonstrate timely attainment.

4.2 RESULTS

As discussed in detail below, the Modeled Attainment Test predicts a 2008 Design Value in San Diego County of 86 ppb, which narrowly exceeds the attainment threshold of less than 85 ppb, but is well within the allowable range (less than 88 ppb) for demonstrating expeditious attainment with supplemental Weight of Evidence analyses. Pursuant to EPA Guidance, this Attainment Demonstration incorporates a supplementary Weight of Evidence Demonstration. The resulting evidence indicates that the Emission Control Strategy is adequate to reduce ozone concentrations to below the level of the eight-hour ozone NAAQS by the statutory attainment deadline of June 15, 2009.

4.3 MODELED ATTAINMENT TEST

The Modeled Attainment Test predicts whether or not estimated ozone design values in the air basin in 2008 (the first full ozone season prior to the June 15, 2009, attainment deadline), under meteorological conditions similar to those simulated in the model, will be less than or equal to the concentration level specified in the ozone NAAQS. Specifically, if estimates of 2008 future-year ozone concentrations are predicted to be below 85 ppb, then the Modeled Attainment Test is satisfied.

The Modeled Attainment Test is site-specific and, therefore, must be performed for each monitoring site in the nonattainment area. In San Diego County, only the Alpine monitoring site violates the eight-hour ozone NAAQS. The Alpine monitoring site is located in the inland foothills at an elevation of approximately 2,000 feet. Other monitoring sites in the county have occasionally recorded exceedances of the eight-hour ozone NAAQS, but not frequently enough to violate the standard.

The 2002 baseline ozone design value used in the Modeled Attainment Test is the average of the design values for 2002 (based on 2000-2002 data), 2003 (2001-2003 data), and 2004 (2002-2004). EPA recommends averaging the three design values to smooth the impact of weather-related variability and provide a more representative air quality baseline. For the Alpine monitoring site, the 2002 baseline ozone design value equates to 92.3 ppb.

4.3.1 Episodes

The Modeled Attainment Test itself must also account for day-to-day variability of meteorology. Several different “episode” days, with representative high eight-hour ozone concentrations, must be

modeled to incorporate a variety of meteorological conditions that are conducive to producing high ozone concentrations in the area. EPA Guidance recommends modeling ten or more episode days if possible, but at least five episode days must be modeled.

As discussed below, six days from two different episodes are reflected in the Modeled Attainment Test for this Attainment Demonstration. The selected episodes were drawn from the 1997 Southern California Ozone Study (SCOS97). SCOS97 was an intensive comprehensive air quality and meteorological data gathering effort, which involved supplemental monitoring sites for ozone and its precursors and meteorological parameters, as well as aircraft-based monitoring. The episodes were selected from the SCOS97 period because the richer database from SCOS97 provides the more detailed three-dimensional time-varying data needed for developing and evaluating adequate air quality simulation modeling applications.

San Diego County experienced a substantial drop in ozone exceedances in the year of the field study, 1997. Nevertheless, the District was able to derive two relatively high-ozone episodes from the SCOS97 database, as described below. These two episodes provide a sufficient number of episode days (six) for modeling purposes.

August 4-7, 1997 (Local Plus Transport), is an ozone episode where both local contributions and transport from the South Coast Air Basin (to the north) contributed to ozone exceedances in San Diego County. The highest eight-hour averaged ozone concentration measured at an EPA-approved official monitor was 87 ppb at Alpine on August 5.

September 27-28, 1997 (Weekend), is a weekend episode. Exceedances of the ozone standard on weekends are important in San Diego County. In 2006, 57% of the days with exceedances of the eight-hour ozone NAAQS were on Saturday or Sunday. Both local sources and transport contributed to the exceedances during this episode. Eight-hour average ozone levels did not reach 85 ppb at EPA-approved monitors during this episode. The highest eight-hour average ozone concentration at Alpine during this episode was 83 ppb on September 28.

Ramp-Up Days. Pursuant to EPA Guidance, additional "ramp-up" days (August 3, September 25-26) just prior to the selected episodes were included in the modeling to allow the modeling system to fully initialize and stabilize before simulating the episode days of concern. As specified by EPA, the modeled results for ramp-up days were excluded from the calculation of relative response factors.

EPA further recommends that the episode days have 2002 model-predicted concentrations of 85 ppb or more, although including episode days with lower concentrations of at least 70 ppb is acceptable. Due to 1997 being such a clean year, only three of the episode days have 2002 model-predicted concentrations greater than 85 ppb. However, all six episode days have 2002 model-predicted concentrations of at least 70 ppb.

Detailed documentation of the photochemical modeling performance evaluation and the 2002 base-year and 2008 attainment-year simulation modeling are presented in Attachment H. The modeling protocols are in Attachment I.

4.3.2 Model-Predicted 2008 Design Value

EPA Guidance specifies the following steps for calculating the Relative Response Factor.

1. Identify the model-predicted daily maximum eight-hour ozone concentration representing the monitoring site for each episode day for 2002 and 2008.

2. Calculate the average of the model-predicted eight-hour ozone concentrations over all the episode days for 2002 and 2008.

3. Calculate the 2002-to-2008 Relative Response Factor by dividing the 2008 averaged model-predicted eight-hour ozone concentration by the 2002 averaged model-predicted eight-hour ozone concentration.

The Model-Predicted 2008 Design Value is then calculated by multiplying the 2002-to-2008 Relative Response Factor by the actual monitored 2002 baseline design value, which is 92.3 ppb at the Alpine site. EPA Guidance specifies that the Model-Predicted 2008 Design Value is truncated to the whole ppb value prior to being compared to the eight-hour ozone NAAQS. Calculations of the Model-Predicted 2008 Design Value at the Alpine Monitoring Site are presented in Table 4-1.

TABLE 4-1
Calculation of Model-Predicted 2008 Design Value at Alpine Monitoring Site
(parts per billion)

Date	2002	2008	RRF*	Baseline	2008 Predicted
August 4	75.1	71.4	0.951	92.3	87
August 5	92.5	87.1	0.942	92.3	86
August 6	106.7	100.4	0.941	92.3	86
August 7	91.8	86.2	0.939	92.3	86
September 27	72.8	68.1	0.935	92.3	86
September 28	73.7	68.3	0.927	92.3	85
6-Day Average of Aug 4,5,6,7,Sep 27,28	85.4	80.3	0.940	92.3	**86**

*RRF = Relative Response Factor

The Modeled Attainment Test predicts a 2008 Design Value of 86 ppb, which is narrowly higher than the attainment threshold of below 85 ppb. However, due to inherent modeling uncertainties as described above, this Attainment Demonstration incorporates a supplementary Weight of Evidence Demonstration that persuasively demonstrates, based on a preponderance of all available evidence, that the Existing Control Strategy is sufficient to reduce ozone concentrations in the area to below the level of the eight-hour ozone NAAQS by the 2008 attainment year.

4.4 WEIGHT OF EVIDENCE DEMONSTRATION

Pursuant to EPA Guidance, a Weight of Evidence Demonstration includes a variety of statistical and other analyses that provide additional persuasive support to a conclusion that the Control Strategy is sufficient to provide for timely attainment. This Weight of Evidence Demonstration

includes additional modeling results, statistical air quality trends analyses, graphical air quality trends analyses, and meteorological analyses of both a recent "clean year" (2004, with eight-hour ozone levels below the level of the NAAQS) and the unusually hot and high ozone season in 2006. Results of each analysis have been considered in concert, along with results of the Modeled Attainment Test, to determine that the Existing Control Strategy is sufficient to reduce ozone concentrations throughout the county to below the level of the eight-hour ozone NAAQS by 2008, thus providing a demonstration of attainment by the June 15, 2009, statutory deadline.

4.4.1 Weight-of-Evidence Analyses Involving Modeling Results

Pursuant to EPA Guidance, this Weight of Evidence Demonstration incorporates several analyses involving modeling results beyond those considered in the Modeled Attainment Test. The supplemental modeling analyses include:

1. Consideration of model-predicted future ozone concentrations in areas not near a monitor.

2. Modeled Ozone Exposure Reduction Metric.

4.4.1.1 Unmonitored Area Analysis

The Modeled Attainment Test is designed to focus on monitoring sites and thus does not consider future ozone concentrations in areas that are not near a monitor. To address this possible discrepancy, EPA Guidance recommends a procedure for predicting future ozone concentrations in areas that are not near a monitor. The focus of the recommended procedure is to identify areas where the model predicts ozone concentrations significantly higher than those predicted near a monitor.

As can be seen in Table 4-2, the maximum 2008 eight-hour ozone concentration predicted within San Diego County was near the Alpine monitoring site on four of the six episode days. On the other two episode days, the maximum 2008 eight-hour concentration in the county is only about 2 ppb greater than the concentration predicted for the Alpine monitoring site. Consequently, the modeling indicates that Alpine adequately represents the maximum eight-hour ozone concentrations predicted within San Diego County. Therefore, no additional analyses are needed to address areas away from a monitor.

TABLE 4-2
Comparison of Maximum Predicted 2008 Ozone Concentration in San Diego County to Concentration Predicted Near Alpine Monitoring Site
(parts per billion)

Episode Day	Countywide Maximum	Near Alpine Monitoring Site
August 4	73.7	71.4
August 5	88.6	87.1
August 6	100.4	100.4
August 7	86.2	86.2
September 27	68.1	68.1
September 28	68.3	68.3

4.4.1.2 Modeled Ozone Exposure Reduction Metric

EPA Guidance identifies various optional metrics that can be considered as part of a Weight of Evidence Demonstration. One such metric—percent change in total amount of ozone ≥ 85 ppb within the nonattainment area—addresses both the frequency and magnitude of eight-hour ozone nonattainment and was evaluated. This metric is defined as the change between 2002 and 2008 in the sum total (in ppb), over all grid cells[3] within the nonattainment area and for all hours of the episode days, of the amount by which the modeled ozone concentration in each grid cell exceeds 85 ppb. Three of the six episode days (August 4, September 27-28) modeled for San Diego County do not have 2002 base-year modeled ozone levels exceeding 85 ppb, and therefore a modified metric using a 70 ppb minimum threshold (in lieu of 85 ppb) was applied to assess the modeled reductions in unhealthful ozone exposure on those three episode days.[4]

The final EPA Guidance does not specify a minimum percent reduction in the metric to support a Weight of Evidence Demonstration of attainment. An early draft version of the Guidance (1999) indicates "[a]n 80% reduction in this measure may be regarded as an example of a 'large' reduction." Since the final EPA Guidance does not specify a suggested benchmark level, this Weight of Evidence Demonstration does not strictly rely on an 80% reduction level as a threshold for evaluating the modeling, but does indicate how many of the modeling days exceed an 80% reduction level.

As shown in Tables 4-3 and 4-4, more than 80% reduction in the ozone exposure metric was predicted on five of the six modeled episode days, with a greater than 50% reduction on the remaining day, reflecting substantial reductions in ozone exposure and supporting this Weight of Evidence demonstration.

[3] For modeling purposes, San Diego County was divided into 5-kilometer squares, called grid cells.

[4] 70 ppb is consistent with the minimum level for selecting episode days (see Section 4.3.1), and is also the level of the California State eight-hour ozone standard.

TABLE 4-3
Total Eight-Hour Averaged Ozone Above 85 ppb
Aggregated Over All Grid Cells in San Diego County
For the August 5-7 Ozone Episode Days

Date	2002 Simulation (ppb)	2008 Simulation (ppb)	Change in Metric (ppb)	Percent Change
August 5	2383	104	-2279	-96%
August 6	3698	1764	-1934	-52%
August 7	328	5	-323	-98%

TABLE 4-4
Total Eight-Hour Averaged Ozone Above 70 ppb
Aggregated Over All Grid Cells in San Diego County
For the August 4 and September 27-28 Ozone Episode Days

Date	2002 Simulation (ppb)	2008 Simulation (ppb)	Change in Metric (ppb)	Percent Change
August 4	1068	75	-993	-93%
Sept 27	65	0	-65	-100%
Sept 28	468	60	-408	-87%

4.4.2 Air Quality Trends Data

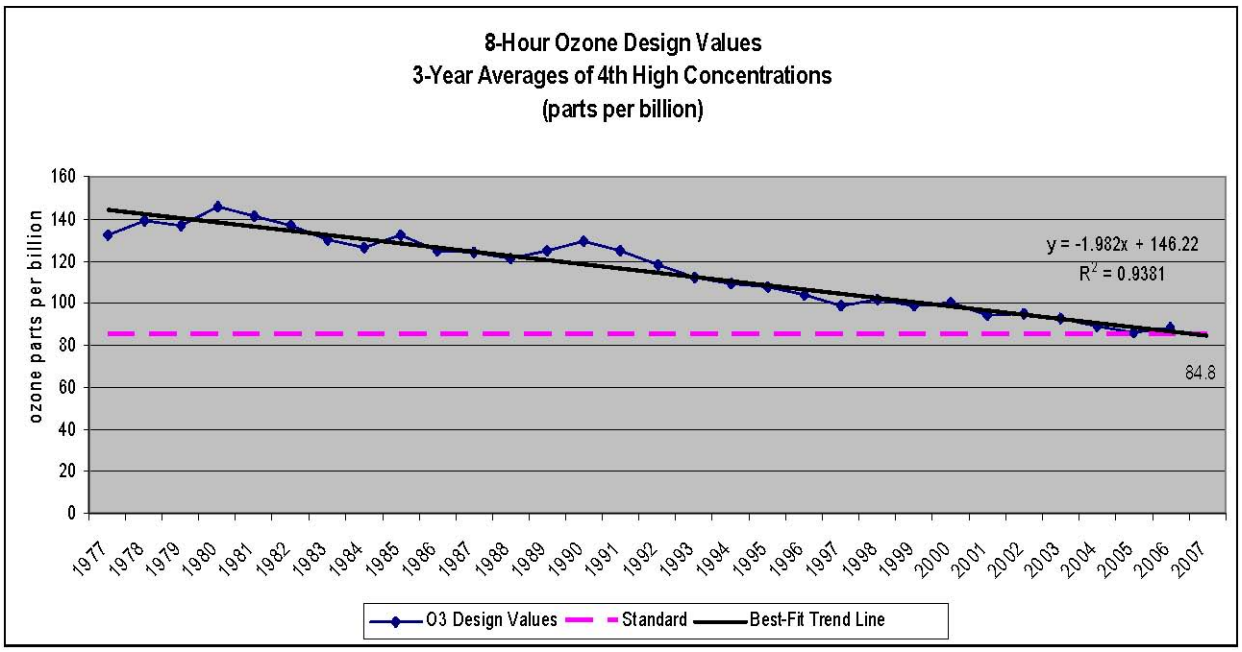
This element of the Weight of Evidence Demonstration includes five statistical analyses of Eight-Hour Ozone Design Values, which indicate ozone levels can be expected to be reduced to below 85 ppb by 2008. Numerous graphical analyses illustrating the continuing downward trends in ozone and precursor concentrations are also presented.

4.4.2.1 Eight-Hour Ozone Design Values Trends Statistical Analyses

The District performed several air quality trends statistical analyses of the monitored eight-hour ozone design values at the Alpine monitoring site (the only site at which violations of the eight-hour ozone NAAQS have been observed), using a variety of ozone data samples reflecting different groups of years. The best-fit trend line through each data sample was calculated, and the formula for that trend line was used to extrapolate the trend line to determine a projected attainment year based on that sample.

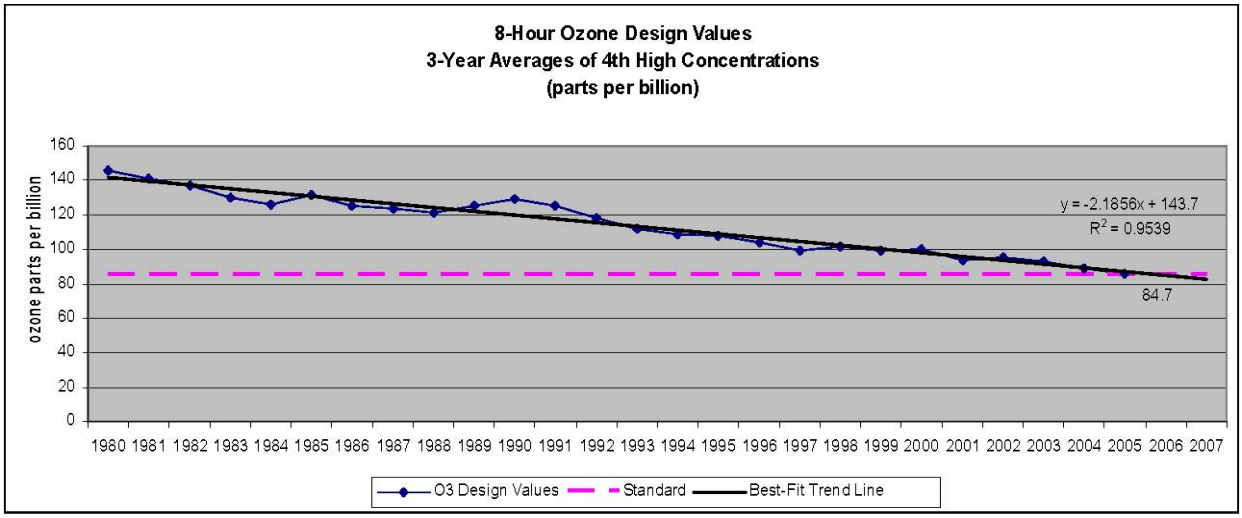
The first sample reflects all years in ARB's monitored air quality database, 1977-2006. (See Figure 4-1 below.) Based on this sample, attainment would be projected to occur in 2007 with an extrapolated ozone design value of 84.8 ppb.

FIGURE 4-1



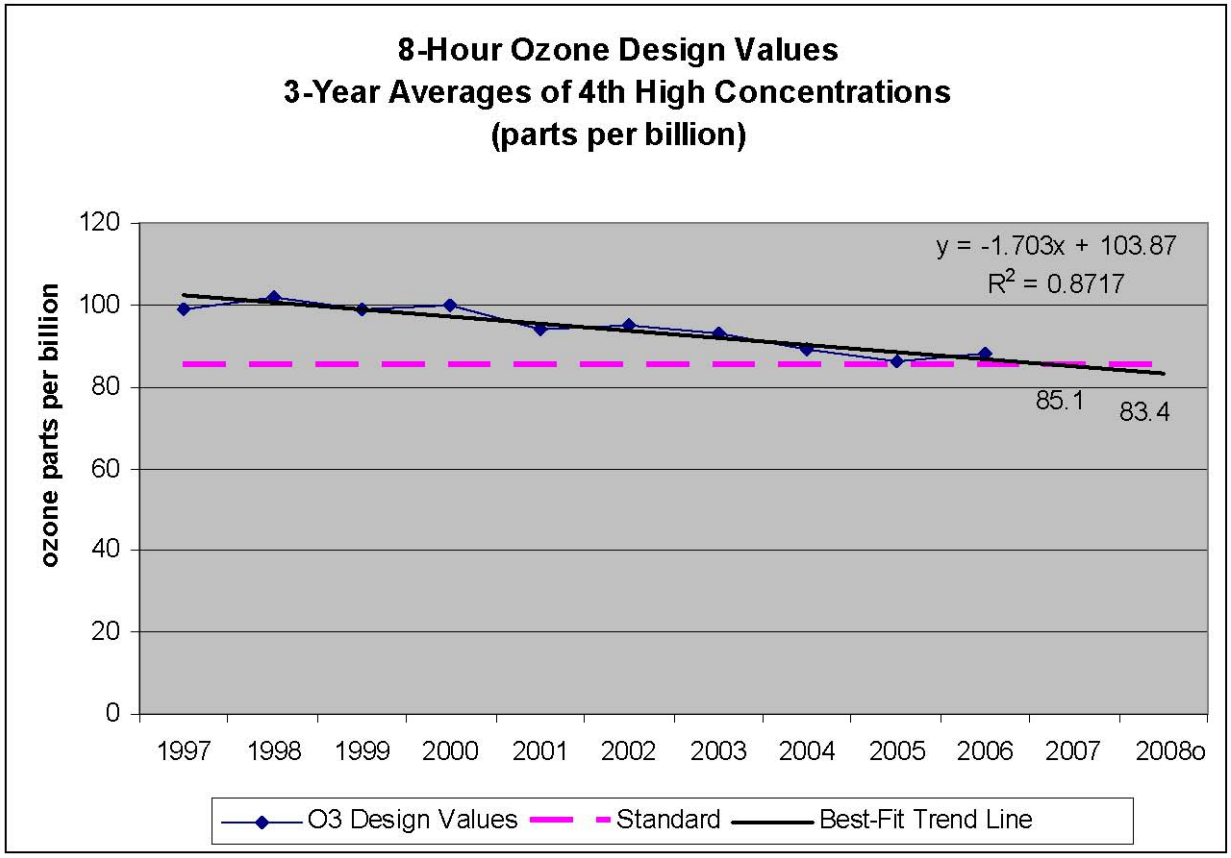
A more optimistic sample providing a slightly steeper trend line, starting with the 1980 peak and ending with the 2005 low value (Figure 4-2), projects attainment in 2006 with an extrapolated ozone design value of 84.7 ppb.

FIGURE 4-2



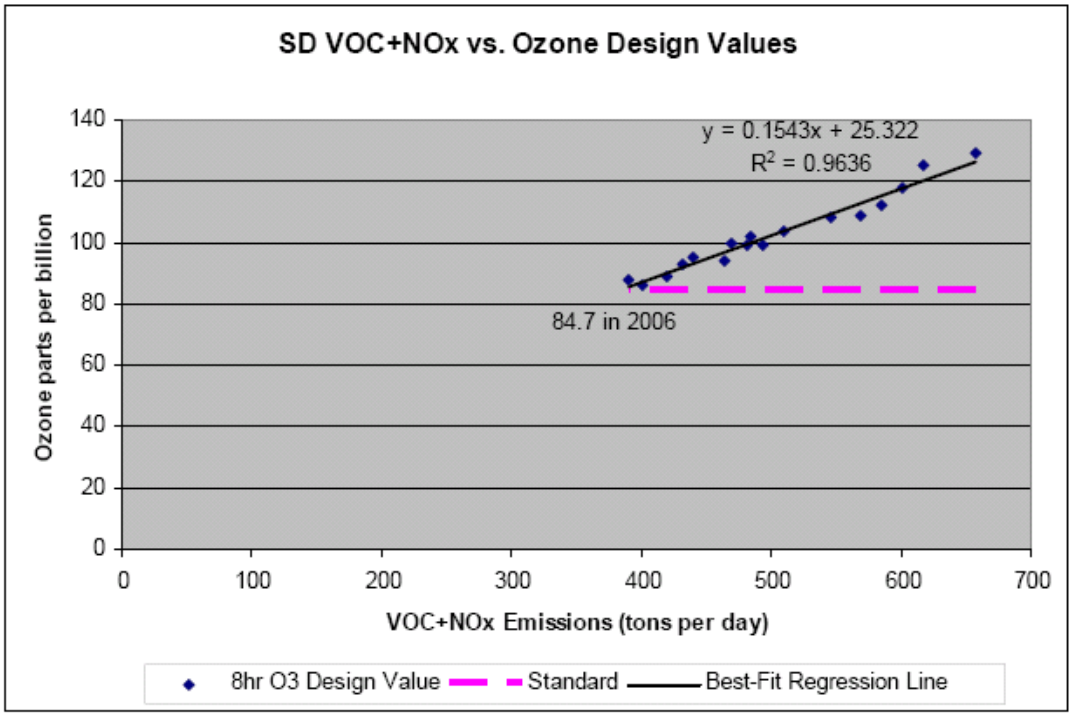
A more conservative sample providing a flatter trend line (Figure 4-3), starting in 1997 and ending in 2006, projects attainment in 2008 with an extrapolated ozone design value of 83.4 ppb.

FIGURE 4-3



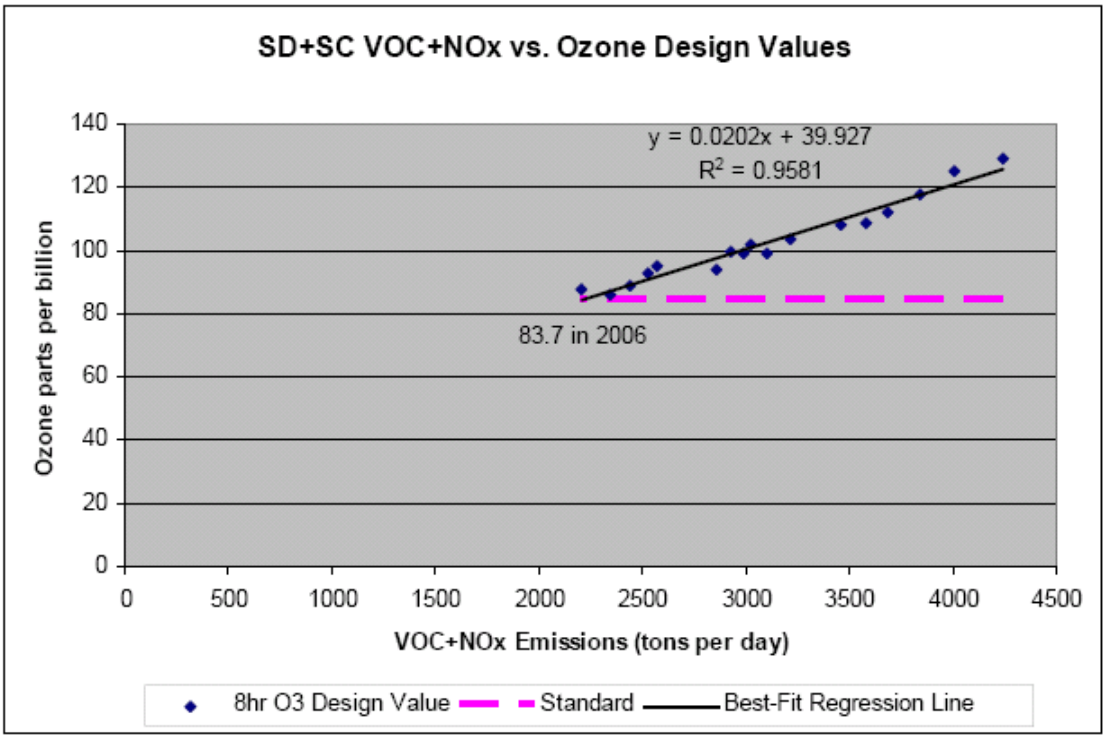
To obtain another perspective on ozone air quality trends, regression analyses were performed relating the eight-hour ozone design values to their associated ozone precursor emissions (VOC + NOx) for 1990 through 2006. Figures 4-4 and 4-5 illustrate that precursor emissions correlate highly with measured ozone design values. In Figure 4-4, considering precursor emissions from within San Diego County only, the best-fit regression line projects attainment in 2006 with a regression-projected ozone design value of 84.7 ppb.

FIGURE 4-4



Lastly, using the combined emissions from both the San Diego and upwind South Coast air districts (Figure 4-5) yields a similar but more optimistic result, with a regression-projected 2006 ozone design value of 83.7 ppb.

FIGURE 4-5



The high R^2 values (0.87 to 0.96) identified in Figures 4-1 through 4-5 indicate the data within each graph are well correlated and each air quality trend line has excellent predictive value. These statistical analyses provide strong evidence that the Existing Control Strategy will reduce ozone levels to below the level of the eight-hour ozone NAAQS by the 2008 attainment year.

4.4.2.2 Graphical Air Quality Trends Analyses

A discussion of 20 additional figures, providing a more in-depth review of long-term trends of monitoring data for ozone and ambient concentrations of ozone precursors, is presented in Attachment F.

4.4.3. Meteorological Representativeness of Recent Years

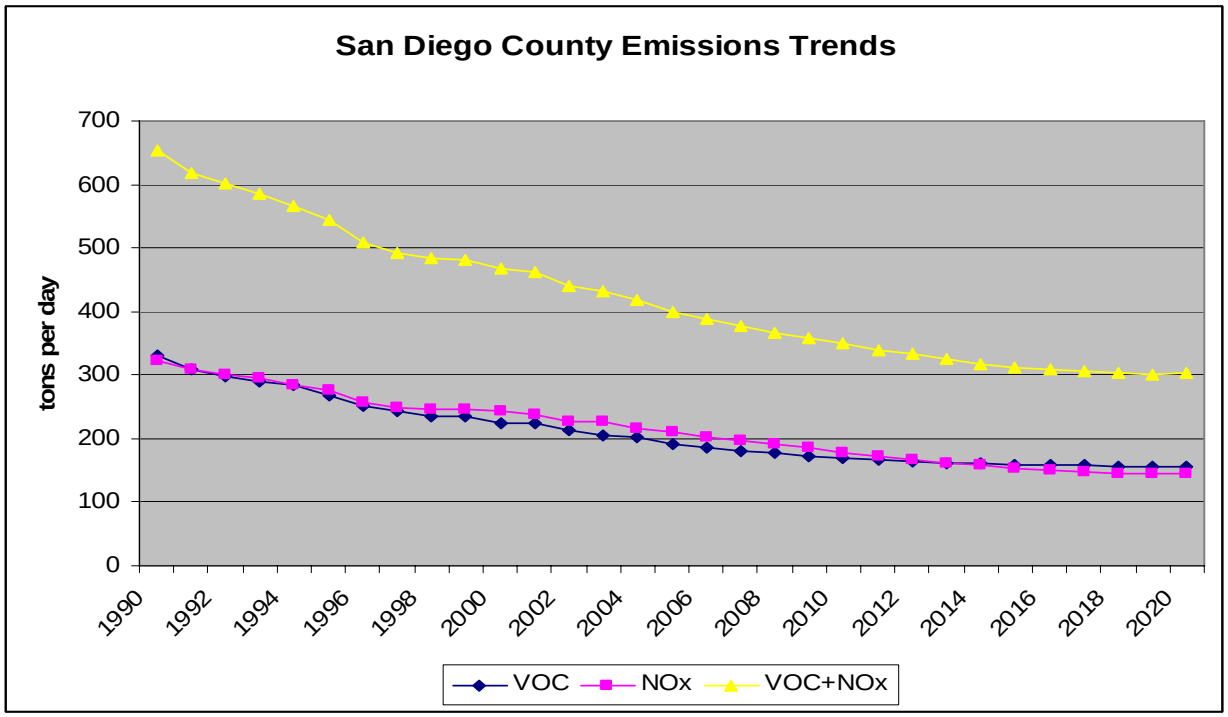
In 2004, the Alpine monitor recorded only two exceedances of the eight-hour ozone NAAQS, and the fourth highest eight-hour concentration was 0.083 ppm, below the level of the standard. In 2005, the standard was exceeded five times and the fourth highest eight-hour concentration was 0.087 ppm, just slightly exceeding the level of the standard. However, due to a record-breaking

heat wave, in 2006 the standard was exceeded 14 times and the fourth highest eight-hour concentration was 0.094 ppm. Attachment G presents a detailed meteorological analysis of those three years (2004, 2005, and 2006), and concludes that the "clean" year 2004 had typical meteorology similar to 2005, and thus could be expected to recur during the attainment period. Conversely, 2006 was quite anomalous and similar conditions are unlikely to recur in the near future.

4.4.4 Emission Trends

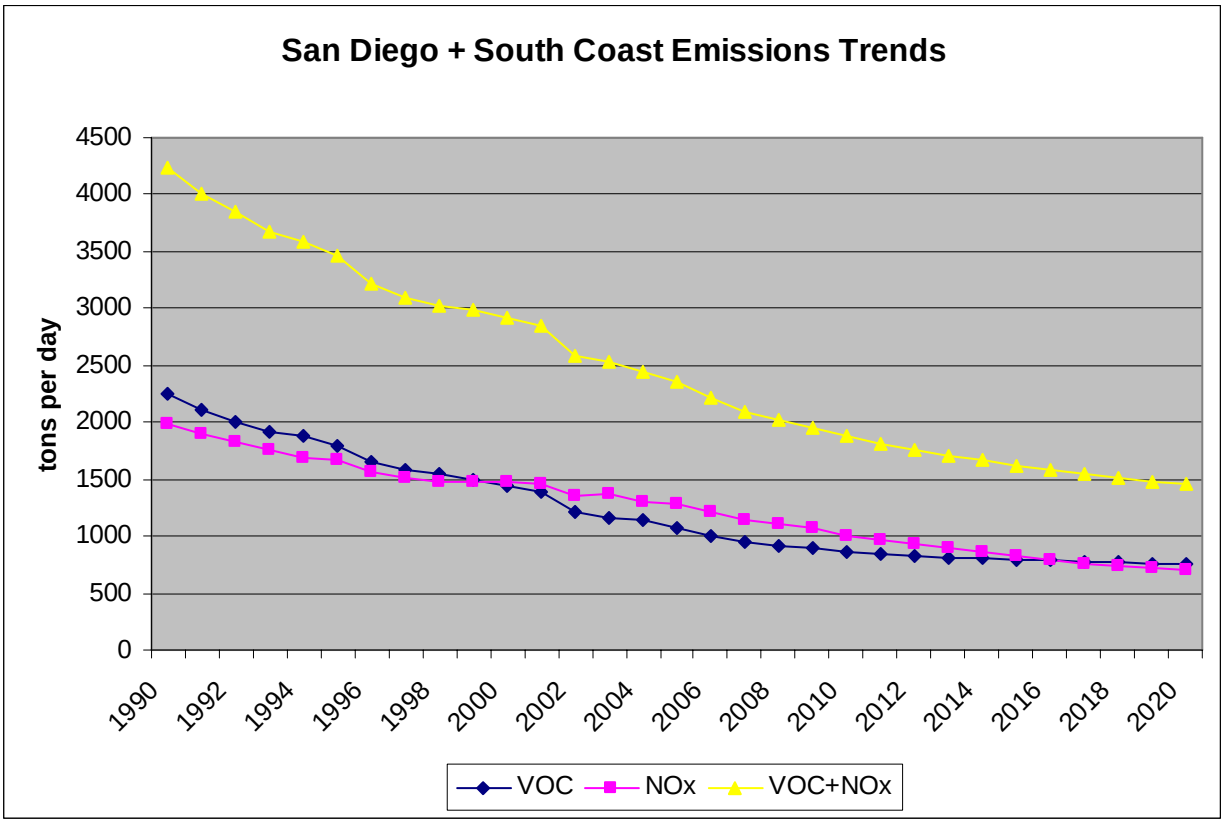
Ozone precursor emissions are projected to continuously reduce through 2020 due to existing, ongoing emission control regulations. Figure 4-6 presents San Diego County emission trends for the ozone precursors VOC plus NOx, based on currently adopted emission control regulations. Figure 4-7 presents combined emission trends for both San Diego County and the South Coast air districts to reflect all emissions contributing to San Diego County's ozone concentrations. These continuous improvement trends provide corroborative evidence of the adequacy of the Emission Control Strategy to provide for timely attainment (and maintenance) of the eight-hour ozone NAAQS in San Diego County.

Figure 4-6



Source: ARB SIP emissions inventory, Version 1.06.

Figure 4-7

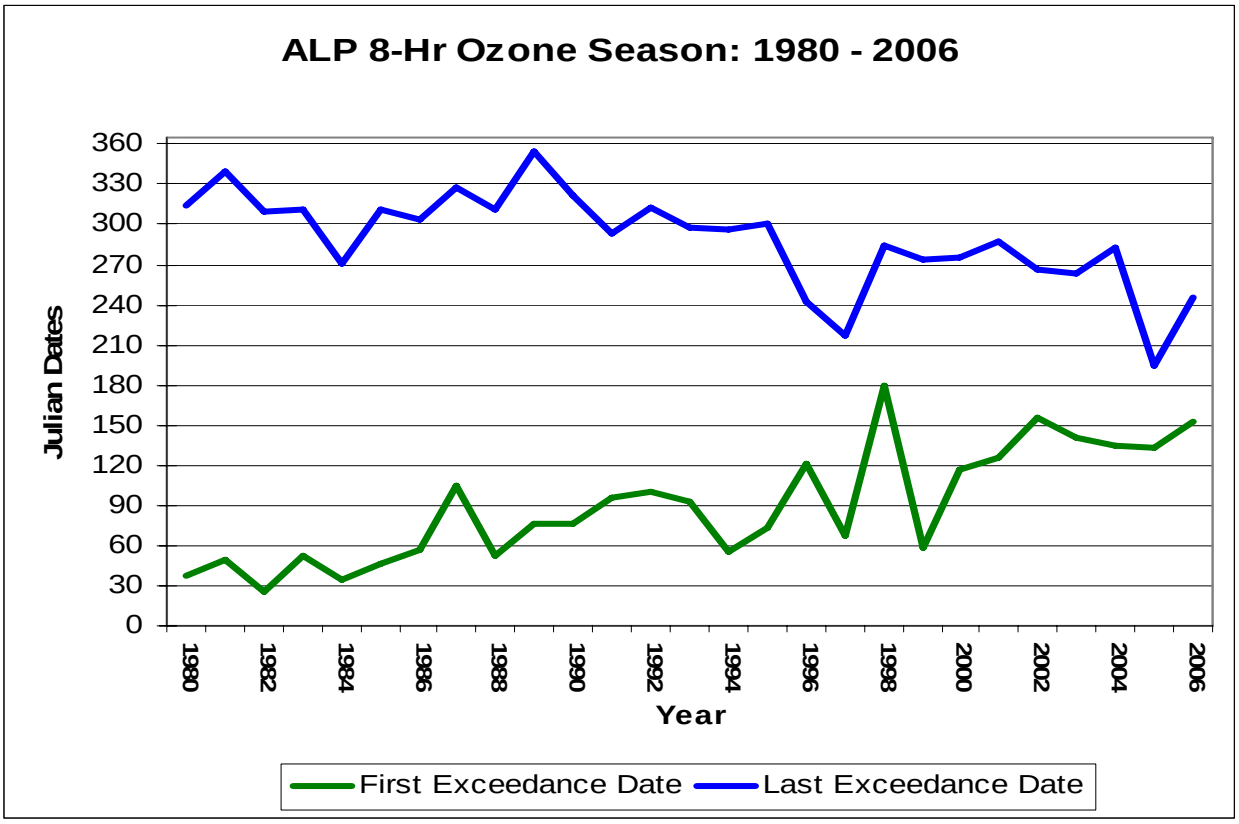


Source: ARB SIP emissions inventory, Version 1.06.

4.4.5 Shortened Ozone Season

EPA has identified San Diego County (and all of California) as having a 12-month ozone season, meaning that ozone levels at any time of year have been capable of exceeding the eight-hour ozone NAAQS. However, as presented in Figure 4-8, over the years the length of the ozone season (number of days) has been shortening, beginning later and ending earlier. Since 2001, there have been no exceedances of the eight-hour ozone NAAQS at the Alpine monitoring site before May or after October. The shortening of the ozone season provides additional positive evidence of the adequacy of the Emission Control Strategy to provide for timely attainment.

Figure 4-8



4.5 CONCLUSION

Pursuant to Clean Air Act requirements and EPA Guidance, the District has conducted numerous and diverse analyses—including the Modeled Attainment Test, the Unmonitored Area Analysis, and several analyses of air quality, emissions, and meteorological data—to judge whether timely attainment of the eight-hour ozone NAAQS in San Diego County is likely. The results of the Weight-of-Evidence analyses, on balance, provide persuasive support to a conclusion that the Existing Control Strategy is sufficient to reduce ozone concentrations throughout San Diego County to below the level of the eight-hour ozone NAAQS by the 2008 ozone season. Accordingly, attainment by the statutory deadline of June 15, 2009, has been demonstrated.

5.0 CONTINGENCY MEASURES

Contingency Measure requirements are not included by EPA in the Code of Federal Regulations, but are discussed in section IV.F. of the preamble of the *Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard.* Areas are required to adopt contingency measures to be implemented in the event of failure to meet a RFP milestone or to attain the eight-hour ozone NAAQS. It should be noted that the CAA requires States to identify contingency measures that will go into effect without further action on the part of the State or EPA.

Since existing mobile source control measures are projected to continue providing additional significant emission reductions for many years beyond the 2008 attainment date as newer vehicles enter the fleet, this Eight-Hour Ozone Attainment Plan relies on the continuing emission reductions from those existing mobile source control measures to fulfill the Contingency Measures requirement. These measures will continue to be implemented regardless of the air basin's attainment status in 2009.

As indicated in Table 5-1, existing mobile source control regulations will continue reducing San Diego County total VOC emissions between 2008 and 2012 by about 2% per year and NOx emissions by about 3% per year. Such continuing emission reductions are ample to ensure reasonable further progress will continue to be achieved in the event that the area would fail to attain the eight-hour ozone NAAQS by the attainment deadline.

TABLE 5-1
Projected VOC and NOx Emissions 2008-2012
(tons per day)

	VOC					NOx				
	2008	**2009**	**2010**	**2011**	**2012**	**2008**	**2009**	**2010**	**2011**	**2012**
Stationary Sources	31.7	32.2	32.8	33.3	33.9	10.4	10.5	11.0	11.0	11.0
Areawide Sources	36.3	36.6	36.9	37.2	37.6	1.8	1.8	1.8	1.8	1.8
Onroad Mobile Sources	51.1	47.9	44.9	42.5	40.2	96.8	92.0	87.0	81.5	75.6
Offroad Mobile Sources	48.5	46.9	45.6	44.3	43.2	85.8	84.3	82.7	82.1	81.4
Total	167.6	163.7	160.2	157.4	154.8	194.8	188.6	182.4	176.4	169.9
Reduction		4.0	3.4	2.8	2.6		6.1	6.2	6.0	6.6
Percent Reduction		2.4%	2.1%	1.8%	1.6%		3.1%	3.3%	3.3%	3.7%

Columns may not sum exactly to totals due to rounding.
Source: ARB SIP emissions inventory.

ATTACHMENT A
EMISSION INVENTORIES FOR 2002 AND 2008

Table A-1
Emission Inventory of Ozone Precursors in San Diego County
(tons per day)

SOURCE CATEGORY	VOC 2002	VOC 2008	NOx 2002	NOx 2008
Electric Utilities	0.43	0.70	2.42	3.58
Cogeneration	1.75	1.84	2.70	2.83
Manufacturing And Industrial	0.07	0.07	1.05	1.11
Food And Agricultural Processing	0.02	0.01	0.12	0.10
Service And Commercial	0.16	0.17	0.99	1.01
Other (Fuel Combustion)	0.18	0.14	1.44	1.25
Sewage Treatment	0.04	0.05	0.06	0.07
Landfills	1.66	1.83	0.17	0.19
Incinerators	0.00	0.00	0.00	0.00
Soil Remediation	0.00	0.00	0.00	0.00
Other (Waste Disposal)	0.23	0.25	0.00	0.00
Laundering	0.07	0.09	0.00	0.00
Degreasing	1.64	1.72	0.00	0.00
Coatings And Related Process Solvents	6.20	6.97	0.00	0.00
Printing	3.76	4.08	0.00	0.00
Adhesives And Sealants	3.06	2.64	0.00	0.00
Other (Cleaning And Surface Coatings)	0.10	0.11	0.00	0.00
Petroleum Marketing	8.07	8.50	0.01	0.01
Other (Petroleum Production And Marketing)	0.00	0.00	0.00	0.00
Chemical	1.32	1.61	0.00	0.00
Food And Agriculture	0.09	0.09	0.00	0.00
Mineral Processes	0.14	0.17	0.13	0.15
Metal Processes	0.00	0.00	0.00	0.00
Electronics	0.00	0.00	0.00	0.00
Other (Industrial Processes)	0.56	0.66	0.08	0.08
Stationary Subtotal	**29.56**	**31.70**	**9.19**	**10.38**
Consumer Products	21.94	19.12	0.00	0.00
Architectural Coatings And Related Process Solvents	11.98	10.54	0.00	0.00
Pesticides/Fertilizers	1.17	0.85	0.00	0.00
Asphalt Paving / Roofing	1.78	1.81	0.00	0.00
Residential Fuel Combustion	0.32	0.33	1.64	1.70
Farming Operations	1.37	1.37	0.00	0.00
Fires	0.05	0.05	0.02	0.02
Managed Burning And Disposal	0.28	0.26	0.09	0.08
Cooking	1.82	2.00	0.00	0.00
Areawide Subtotal	**40.71**	**36.34**	**1.75**	**1.80**

Table A-1 (continued)
Emission Inventory of Ozone Precursors in San Diego County
(tons per day)

	VOC	VOC	NOx	NOx
SOURCE CATEGORY	**2002**	**2008**	**2002**	**2008**
Light Duty Passenger	37.93	21.43	33.41	18.17
Light Duty Trucks - 1	6.70	4.18	7.15	4.14
Light Duty Trucks - 2	13.81	9.54	24.44	14.45
Medium Duty Trucks	5.86	4.19	10.91	7.35
Light Heavy Duty Gas Trucks - 1	4.03	2.50	4.14	3.20
Light Heavy Duty Gas Trucks - 2	0.60	0.45	0.56	0.54
Medium Heavy Duty Gas Trucks	1.38	0.85	1.37	1.12
Heavy Heavy Duty Gas Trucks	0.66	0.46	1.62	1.19
Light Heavy Duty Diesel Trucks - 1	0.01	0.10	0.11	2.54
Light Heavy Duty Diesel Trucks - 2	0.06	0.08	1.27	1.62
Medium Heavy Duty Diesel Trucks	0.22	0.27	11.58	10.92
Heavy Heavy Duty Diesel Trucks	2.15	1.96	27.45	25.01
Motorcycles	2.97	4.41	0.61	1.16
Heavy Duty Diesel Urban Buses	0.09	0.09	2.31	2.09
Heavy Duty Gas Urban Buses	0.04	0.04	0.06	0.07
School Buses	0.11	0.10	1.16	1.23
Other Buses	0.18	0.14	0.95	0.85
Motor Homes	0.56	0.31	1.49	1.10
Onroad Subtotal	**77.35**	**51.10**	**130.60**	**96.77**
Aircraft	3.19	3.24	5.01	5.54
Trains	0.07	0.08	1.38	1.26
Ships And Commercial Boats	1.94	1.82	29.34	31.52
Recreational Boats	19.16	17.89	4.80	6.79
Off-Road Recreational Vehicles	2.45	3.02	0.08	0.07
Off-Road Equipment	21.09	18.65	44.51	36.64
Farm Equipment	1.09	0.83	5.32	3.98
Fuel Storage And Handling	4.52	2.96	0.00	0.00
Offroad Subtotal	**53.51**	**48.49**	**90.44**	**85.81**
Pre-Baseline Emission Reduction Credits Subtotal		**0.63**		**0.22**
Military Growth Increment				**2.33**
TOTAL	**201.13**	**168.25**	**231.96**	**197.30**

Source: ARB SIP emissions inventory.

Table A-2
Emission Inventory of Ozone Precursors in San Diego County and South Coast Air Basin Combined (tons per day)

	VOC	VOC	NOx	NOx
SOURCE CATEGORY	**2002**	**2008**	**2002**	**2008**
Electric Utilities	2.18	2.41	7.54	11.41
Cogeneration	1.88	1.96	3.28	3.31
Oil And Gas Production (Combustion)	0.24	0.24	1.23	0.79
Petroleum Refining (Combustion)	1.31	1.31	7.07	6.11
Manufacturing And Industrial	1.76	1.96	18.44	17.18
Food And Agricultural Processing	0.18	0.11	2.03	1.08
Service And Commercial	1.47	1.57	18.31	16.35
Other (Fuel Combustion)	1.06	0.82	9.46	7.61
Sewage Treatment	0.34	0.38	0.06	0.07
Landfills	1.75	1.93	0.80	0.86
Incinerators	0.09	0.10	1.53	1.63
Soil Remediation	0.00	0.00	0.00	0.00
Other (Waste Disposal)	7.38	7.35	0.00	0.00
Laundering	0.25	0.28	0.00	0.00
Degreasing	21.18	10.72	0.00	0.00
Coatings And Related Process Solvents	35.02	30.16	0.06	0.07
Printing	10.05	8.64	0.00	0.00
Adhesives And Sealants	6.51	6.25	0.00	0.00
Other (Cleaning And Surface Coatings)	1.49	0.79	0.14	0.17
Oil And Gas Production	2.50	0.85	0.05	0.33
Petroleum Refining	4.69	3.75	4.86	4.52
Petroleum Marketing	35.88	35.55	0.06	0.03
Other (Petroleum Production And Marketing)	0.01	0.01	0.00	0.00
Chemical	13.74	12.44	0.09	0.09
Food And Agriculture	2.86	2.93	0.00	0.01
Mineral Processes	0.52	0.55	1.34	0.93
Metal Processes	0.06	0.06	0.36	0.18
Wood And Paper	0.10	0.10	0.00	0.00
Glass And Related Products	0.01	0.01	0.03	0.01
Electronics	0.06	0.09	0.00	0.00
Other (Industrial Processes)	8.38	8.69	0.79	0.92
Stationary Subtotal	**162.96**	**142.04**	**77.57**	**73.68**
Consumer Products	132.34	116.67	0.00	0.00
Architectural Coatings And Related Process Solvents	69.28	37.25	0.00	0.00
Pesticides/Fertilizers	4.05	3.05	0.00	0.00
Asphalt Paving / Roofing	2.67	2.90	0.00	0.00
Residential Fuel Combustion	1.79	1.84	22.11	19.72
Farming Operations	11.24	7.01	0.00	0.00
Fires	0.28	0.29	0.09	0.09
Managed Burning And Disposal	0.53	0.51	0.20	0.19
Cooking	3.61	3.94	0.00	0.00
Areawide Subtotal	**225.80**	**173.46**	**22.40**	**20.00**

Table A-2 (continued)
Emission Inventory of Ozone Precursors in San Diego County and South Coast Air Basin Combined
(tons per day)

	VOC	VOC	NOx	NOx
SOURCE CATEGORY	**2002**	**2008**	**2002**	**2008**
Light Duty Passenger	216.68	110.71	173.63	84.02
Light Duty Trucks - 1	36.98	21.49	34.80	18.64
Light Duty Trucks - 2	74.25	48.79	118.13	66.97
Medium Duty Trucks	36.72	25.05	60.22	38.38
Light Heavy Duty Gas Trucks - 1	22.51	12.37	29.96	18.61
Light Heavy Duty Gas Trucks - 2	3.49	2.27	4.42	3.49
Medium Heavy Duty Gas Trucks	8.91	4.55	8.98	6.18
Heavy Heavy Duty Gas Trucks	5.00	3.20	10.71	7.29
Light Heavy Duty Diesel Trucks - 1	0.02	0.30	0.75	11.71
Light Heavy Duty Diesel Trucks - 2	0.25	0.28	9.66	9.25
Medium Heavy Duty Diesel Trucks	1.35	1.28	82.44	62.81
Heavy Heavy Duty Diesel Trucks	14.71	13.46	174.68	152.12
Motorcycles	12.57	17.28	2.27	4.23
Heavy Duty Diesel Urban Buses	0.53	0.48	15.14	13.10
Heavy Duty Gas Urban Buses	0.59	0.54	0.95	0.84
School Buses	0.46	0.39	5.38	5.35
Other Buses	0.82	0.61	4.50	4.16
Motor Homes	1.82	1.00	5.29	3.99
Onroad Subtotal	**437.64**	**264.04**	**741.89**	**511.13**
Aircraft	9.61	11.41	18.28	23.02
Trains	2.58	2.55	39.29	30.21
Ships And Commercial Boats	5.54	5.44	93.11	108.04
Recreational Boats	87.05	78.51	16.41	23.75
Off-Road Recreational Vehicles	9.83	11.98	0.30	0.24
Off-Road Equipment	127.08	107.71	285.41	229.89
Farm Equipment	3.25	2.52	15.75	12.09
Fuel Storage And Handling	27.96	18.30	0.00	0.00
Offroad Subtotal	**272.89**	**238.42**	**468.56**	**427.26**
Pre-Baseline Emission Reduction Credits Subtotal		**0.63**		**0.22**
Military Growth Increment				**2.33**
TOTAL	**1099.29**	**817.96**	**1310.41**	**1032.07**

Source: ARB SIP emissions inventory.

ATTACHMENT B
PLANNED MILITARY PROJECTS SUBJECT TO GENERAL CONFORMITY

Table 1. Projected Emissions and Preliminary Schedule for Placement of Littoral Combat Ships

Year	Total Ships	Estimated Emissions, 0-3 miles tons per year (tpy)		
		Carbon Monoxide	NO_x	Volatile Organic Compound (VOC)
2007	1	15.31	46.08	1.76
2008	2	13.42	58.56	1.72
2009	1	6.71	29.28	0.86
2011	1	6.71	29.28	0.86
2013	1	6.71	29.28	0.86
2015	1	6.71	29.28	0.86
Totals	7	55.57	221.76	6.92

Table 2. Projected Emissions and Preliminary Schedule for Marine Corps Projects through 2015

Year	Annual Emissions Change, tpy		
	CO	NO_X	VOC
Overall Total	**-1,695.11**	**629.50**	**-688.02**
MC-1: F/A-18 Replacement with JSF			
Total	**-1,470.09**	**235.58**	**-614.86**
2007	-159.50	-22.18	-60.72
2012	-86.12	145.76	-52.57
2013	-253.35	105.90	-114.15
2014	-280.38	44.03	-117.16
2015	-690.73	-37.94	-270.25
MC-2: CH-46 Replacement with MV-22			
Total	**-225.02**	**393.92**	**-73.16**
2009	-64.21	85.91	-19.78
2010	-64.21	85.91	-19.78
2011	-64.21	85.91	-19.78
2012	-48.93	41.02	-14.07
2015	16.55	95.17	0.26

Source: Letters to Air Pollution Control District from the Department of the Navy and from the Marine Corps, dated January 4 and January 5, 2007, respectively.

ATTACHMENT C
PRE-BASELINE BANKED EMISSION CREDITS

Table C-1
San Diego APCD ERC Banking Registry Summary
Emission Reduction Credits Issued in 2002 and Earlier

Company Name	Certificate Number	NOx (TPY)	VOC (TPY)	Cumulative NOx	Totals VOC
Carpenter Special Products Corporation	973125-01		7.2	0.00	7.20
Caspian, Inc.	890712-07		16.90	0.00	24.10
City of San Diego, Metropolitan Wastewater Dept.	950766-06		0.38	0.00	24.48
	970821-02		22.76	0.00	47.24
General Dynamics Properties, Inc.	970809-02	1.26		1.26	47.24
	970809-05		0.23	1.26	47.47
Hughes-Aircraft Co., Electro-Opti Cal Systems	940261-01		1.06	1.26	48.53
	940261-02		0.22	1.26	48.75
Muht-Hei, Inc.	981002-01		0.18	1.26	48.93
	981002-02		0.18	1.26	49.11
	981002-03		0.18	1.26	49.29
	981002-04		0.18	1.26	49.47
	981002-05		0.57	1.26	50.04
	981002-06		0.19	1.26	50.23
	981002-07		2.23	1.26	52.46
	981002-08		1.28	1.26	53.74
	981002-09		0.18	1.26	53.92
	981002-10		2.07	1.26	55.99
	981002-11		1.28	1.26	57.27
	981002-12		0.57	1.26	57.84
National Steel & Shipbuilding	40995-02	0.18		1.44	57.84
	40995-03		0.60	1.44	58.44
	40996-02	0.04		1.48	58.44
	40997-02	0.32		1.80	58.44
	40997-03		0.02	1.80	58.46
Naval Air Station, North Island	991014-01	8.00		9.80	58.46
	991015-01	3.30		13.10	58.46
	991016-01	18.70		31.80	58.46
Naval Station, San Diego	950949-01	4.83		36.63	58.46
	940206-01	0.67		37.30	58.46
	940206-03		0.05	37.30	58.51
Navy Region Southwest	990223-01	12.02		49.32	58.51
Northrop-Grumman Ryan Aeronautical Center	975000-01		1.20	49.32	59.71
Otay Mesa Generating Co., LLC	990902-01	1.21		50.53	59.71
	991123-01		17.05	50.53	76.76
	000128-01		25.00	50.53	101.76
	000427-01	1.30		51.83	101.76
	000427-02		30.10	51.83	131.86
	000918-01		10.30	51.83	142.16
	000224-01	4.40		56.23	142.16
	010629-01	0.32		56.55	142.16
	010629-02	2.39		58.94	142.16

Table C-1 continued
San Diego APCD ERC Banking Registry Summary
Emission Reduction Credits Issued in 2002 and Earlier

	Certificate	NOx	VOC	Cumulative	Totals
Company Name	**Number**	**(TPY)**	**(TPY)**	**NOx**	**VOC**
PGET	020906-01		20.70	58.94	162.86
Rohr, Inc., a subsidiary of BFGoodrich Co.	972754-01		5.30	58.94	168.16
Sempra Energy Resources	020620-02		0.40	58.94	168.56
Solar Turbines	970123-04	10.00		68.94	168.56
	950562-01		0.60	68.94	169.16
Sony Electronics, Inc.	940652-01		0.54	68.94	169.70
	977590-01		2.90	68.94	172.60
Sony Electronics, Inc.	977589-08		0.30	68.94	172.90
	977589-09	2.20		71.14	172.90
	977589-02	1.90		73.04	172.90
	977589-04		0.10	73.04	173.00
Southern California Edison Company	950171-01	0.51		73.55	173.00
	950171-03		0.02	73.55	173.02
Surface Technologies	990325-01		1.48	73.55	174.50
United States Marine Corps	030507-01	3.00		76.55	174.50
US Foam	974375-03		0.10	76.55	174.60
SW Division, Naval Facilities Engineering Cmd.	954185-01		2.00	76.55	176.60
	960709-01		9.00	76.55	185.60
	970311-01		13.00	76.55	198.60
	980511-03		3.15	76.55	201.75
	980521-02		13.25	76.55	215.00
	980529-02		7.40	76.55	222.40
Unisys Corporation	901238-01		3.66	76.55	226.06
	921410-01		1.25	76.55	227.31
	940577-01		2.95	76.55	230.26
USN Communications Station	940560-01	2.40		78.95	230.26
	940560-04		0.05	78.95	230.31
	940561-01	0.12		79.07	230.31
	940561-03		0.00	79.07	230.31
	940562-01	0.12		79.19	230.31
	940562-03		0.00	79.19	230.31
TOTALS (tons/year) =				**79.19**	**230.31**

ATTACHMENT D
ANALYSES OF POTENTIAL ADDITIONAL STATIONARY SOURCE CONTROL MEASURES

D.1 Low VOC Solvent Cleaning

Existing Rule 67.6 (Solvent Cleaning Operations) addresses VOC emissions generated by the application of solvents (held in a tank or reservoir) to remove unwanted materials, such as dirt and oils, from a surface. SCAQMD Rule 1122 is more stringent and contains the following requirements that are not in District Rule 67.6:

- Solvent VOC limit of 25 grams per liter for cold cleaners, including remote reservoirs and open-top dip tanks; or airless or air-tight cleaning systems for cold cleaners using high-VOC solvents;
- freeboard ratio of 0.75 for all open-top dip tanks;
- requirement for a superheated vapor system or secondary freeboard chiller for open-top vapor degreasers;
- freeboard ratio of 1.0 for all open-top vapor degreasers; and
- automated parts handler.

Several other air districts have adopted and implemented similar control measures, but with a VOC content limit of 50 grams per liter. These and other potential control requirements were evaluated to determine their technological feasibility, potential VOC reductions, and cost-effectiveness for San Diego County sources.

The cost-effectiveness of water-based or low-VOC cleaning systems is primarily affected by the VOC emission rate of the unit being replaced and the increased electricity needed to heat and pump aqueous solvents in the new replacement unit. Over 86% of the approximately 5,100 degreasing units in San Diego are small remote reservoirs with VOC emissions of less than 0.324 pounds per day, or 118 pounds per year, each. The lowest and average cost-effectiveness values calculated for these units were $4.36 and $5.26, respectively, per pound of VOC reduced.

The Low VOC Solvent Cleaning control measure has taken longer to develop than other control measures. Rule 67.6, which was initially adopted in 1979, needed to be substantially rewritten and was split into two rules, one addressing cold solvent cleaners and the other addressing vapor degreasers. Most importantly, due to the large number of small businesses affected by the rule, the public input process for this rule development needed to be extensive. The new replacement Rules 67.6.1 (Cold Solvent Cleaning and Stripping Operations) and 67.6.2 (Vapor Degreasing Operations), are being adopted simultaneously with this 8-Hour Ozone Attainment Plan.

New Rule 67.6.1 will require that each solvent utilized in a cold solvent cleaning operation must have a VOC content of 50 grams per liter of material or less, in addition to other requirements. New Rule 67.6.2 will apply to vapor degreasing operations, and the requirements are generally identical to those in current Rule 67.6, because more stringent requirements on vapor degreasers would have only negligible emissions reductions. When new Rule 67.6.1 is implemented in 2008, San Diego County cold solvent cleaning VOC emissions are projected to be reduced by about 1 ton per day, relative to the 2002 baseline. Although these emissions reductions are not

available in time to advance the attainment year to 2007, they will assist in reducing ozone concentrations in 2008 to the level of the national 8-hour ozone standard.

D.2 Further Control of Architectural Coatings

Following the District adoption of the existing version of the Architectural Coatings Rule 67.0 (discussed in Section 3.2.2), the South Coast Air Quality Management District (SCAQMD) amended its Rule 1113 in 2006 to further tighten VOC content limits for Architectural Coatings in years 2007 and 2008. Adopting similar limits in San Diego County could potentially reduce VOC emissions from Architectural Coatings by an estimated 50% or approximately 5 tons per day, based on very preliminary ARB estimates.

ARB is updating its estimates of Architectural Coatings emissions based on a new 2005 survey of architectural coating products sold in California during 2004. Further, ARB is developing a statewide Suggested Control Measure (SCM)[1] that will be similar, but not necessarily identical, to SCAQMD Rule 1113. ARB intends to adopt the Architectural Coatings SCM in September 2007, with local rule adoption and compliance anticipated in 2009. Consequently, the anticipated additional emission reductions are not available in time to advance San Diego County's eight-hour ozone attainment year to 2007.

D.3 Automotive Refinishing

This source category is regulated by District Rule 67.20 (Motor Vehicle and Mobile Equipment Refinishing Operations). Total VOC emissions from the more than 400 facilities in this source category are an estimated 275 tons per year, based on the 1996 rule development emission inventory and projected emission reductions from rule adoption.

ARB adopted an SCM for Automotive Coatings on October 20, 2005. This measure has more stringent future VOC limits in several coating categories than Rule 67.20. These more stringent limits will likely result in the use of waterborne coatings for many topcoats, which have additional equipment surface preparation and application requirements compared to existing solvent-borne topcoats used in this industry, which is comprised mostly of small businesses.

This SCM has since been adopted by at least two California air districts. If adopted by the District, this control measure could potentially result in an estimated VOC emission reduction of an 0.6 ton per day. However, based on evaluation of the future availability of compliant coatings in California as a whole, and considering the equipment upgrades and training necessary to use these compliant coatings, the recommended compliance date in the SCM is not until January 1, 2009, or 2010 for some coating categories. The most recently adopted California air district rule based on the SCM—San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rule 4612 Motor Vehicle And Mobile Equipment Coating Operations, Phase II (September 2006)—retains these 2009 and 2010 compliance dates. SCAQMD Rule 1151–Motor Vehicle and Mobile Equipment Nonassembly Line Coating Operations, which was adopted very shortly after the SCM, has a slightly earlier compliance date of July 1, 2008. Regardless, because of the limited availability of compliant coatings and the necessary equipment upgrades and operator training, adoption of this measure would result in little if any emission reductions before 2008.

[1] A Suggested Control Measure (SCM)is a "model rule", developed by ARB for source categories where statewide consistency in control requirements is particularly desirable, that local air districts can copy for their rules for the covered source category. .

For existing rules with VOC limits already in place, the District compared Rule 67.20 to SJVUAPCD Rule 4602 (Motor Vehicle and Mobile Equipment Refinishing Operations). SJVUAPCD Rule 4602 has lower VOC limits than Rule 67.20 for this source category in the following coating categories: Group I Vehicle primers and primer surfacers, Group II Vehicle primers and primer surfacers, and Group II Vehicle primer sealers. Estimated emissions in San Diego County from these coating categories comprise a small fraction of total emissions from the source category (estimated emissions are less than 11 tons per year from the affected coating categories). If SJVUAPCD 4602 limits were incorporated in Rule 67.20 the estimated emission reduction potential would be about 6.1 tons per year, or 0.02 tons per day. However, SJVUAPCD Rule 4602 allows a higher ratio of high VOC precoat to primer usage than Rule 67.20 (1 gallon of precoat to 1 gallon of primer as compared to 1 gallon of precoat to 4 gallons of primer for Rule 67.20) and higher allowable usage of high VOC specialty coatings (1 gallon per day compared to 3 gallons per month for Rule 67.20). Therefore the overall emission reductions achieved by Rule 67.20 may be equivalent or greater than SJVUAPCD Rule 4602.

D.4 Adhesive and Sealant Applications

This source category is regulated by District Rule 67.21 (Adhesive Material Application Operations). Potential emission reductions were estimated by comparison with South Coast Rule 1168 (Adhesive and Sealant Applications), which has more stringent VOC content limits than Rule 67.21 in several adhesive categories. Total VOC emissions in San Diego County from this category are estimated at approximately 1302 tons per year, based on the 1998 Rule 67.21 rule development emission inventory and projected emission reductions from adoption of Rule 67.21 in 1998. Nearly all of the emissions (1249 tons per year) and potential emission reductions (512 tons per year, or 1.4 tons per day) that would be affected by adoption of Rule 1168 requirements are from nonpermitted sources such as construction operations. Although the estimated emission reductions are relatively large, the estimate does not account for penetration of the current San Diego market by low VOC adhesives sold in South Coast. Information from adhesive suppliers indicates that they typically provide all of Southern California with the same products. Emission reductions from permitted sources are not anticipated to be significant (total estimated emissions are only 53 tons per year). This category will be given a high priority for evaluation for future rule development, especially with regards to refining the emission inventory and assessing availability of low VOC adhesives.

D.5 Solvent Wipe Cleaning Operations

Solvent wipe cleaning (also called surface preparation or solvent cleaning) is defined in Rule 67.6 (Solvent Cleaning Operations) and similar rules in other California air districts as a method of cleaning a surface by physically rubbing it with a material such as a rag wetted with a solvent. This source category does not include the cleaning of coating application equipment, which has separate standards. It also does not include cleaning of parts in tanks or basins regulated by Rule 67.6. Further VOC reductions under Rule 67.6 are currently being evaluated.

Presently there are a variety of solvents used in San Diego County for cleaning and preparing surfaces for painting or for general maintenance cleaning. These solvents include isopropyl alcohol (IPA), methyl ethyl ketone (MEK), mineral spirits, xylene, lacquer thinner, etc. The VOC content of surface preparation and cleaning solvents are regulated under the District's source-specific coating Rules 67.3 (metal parts and products), 67.4 (can and coil), 67.5 (paper, film, and fabric), 67.9 (aerospace), 67.11 (wood), 67.12 (polyester resin), 67.18 (marine coating),

67.20 (automotive refinishing) and 67.21 (adhesives). These rules limit either the VOC content or vapor pressure (or boiling point) of solvents used for wipe cleaning operations. Those wipe cleaning operations that are not covered by source-specific rules are regulated by Rule 66 (organic solvents). Rule 66 does not limit the VOC content of solvents. Instead it requires the use of add-on control equipment for sources emitting certain quantities of specified organic solvents.

Based on available emission inventory data and, in some cases, engineering permit files, the estimated VOC emissions from wipe cleaning operations subject to Rule 66 are about 48 tons per year. The estimated VOC emissions from wipe cleaning operations subject to the source-specific coating rules are approximately 128 tons per year. The bulk of the emissions from operations subject to source-specific coating rules (about 65%) are from marine coating operations (67.18). Some coating operations such as can and coil coating (Rule 67.4), paper, fabric and film coating (Rule 67.5), and adhesive material application operations (Rule 67.21) do not use significant amounts of cleaning solvents containing VOCs. In addition, emissions from aerospace coating operations (Rule 67.9) are not included in the total. Aerospace coating operations are specifically exempt from general wipe cleaning solvent limits in the rules of other districts and the standards for wipe-cleaning in District Rule 67.9 are consistent with the limits in South Coast Rule 1124 (Aerospace Assembly and Component Manufacturing Operations) for aerospace coating operations.

The total estimated VOC emissions from wipe cleaning operations are about 177 tons per year. The estimated potential emission reductions for this source category are about 142 tons per year, or 0.57 tons per day, based on requiring use of wipe cleaning solvents with a VOC content of 50 grams per liter or less. This would be consistent with the standards for this source category in rules of several other air districts. This category will be given a high priority to be investigated for future rule development.

D.6 Wood Products Coating Operations

This source category is regulated by District Rules 67.11 (Wood Products Coating Operations) and 67.11.1 (Large Coating Operations For Wood Products). Rule 67.11 applies to all sources while Rule 67.11.1 only applies to sources emitting more than 25 tons per year of VOCs. Rule 67.11 contains technology forcing VOC content limits for wood coatings. Although the District is currently reviewing their feasibility, these limits were scheduled to be implemented July 1, 2005. Based on emission inventory information, total estimated VOC emissions from this source category are about 335 tons per year of which 12 tons per year are from sources exempt from Rule 67.11. If successful, the projected emission reductions from implementation of the 2005 VOC limits are about 112 tons per year from current emission levels.

South Coast Rule 1136 (Wood Products Coatings) regulates this source category and has lower technology forcing VOC content limits than those in Rule 67.11 in several coating categories. These technology forcing limits were to be implemented on July 1, 2005, and affect the following coating categories: conversion varnishes, fillers, high-solid stains, sealers and low-solids stains, toners or washcoats. If the lower limits in South Coast Rule 1136 were incorporated in Rule 67.11, the potential emission reductions are estimated to be about 57 tons per year, over and above the projected emission reductions from the technology forcing 2005 limits already in Rule 67.11.

In addition, South Coast Rule 1136 limits rule applicability to those sources using more than one gallon per day of wood coating while Rule 67.11 limits rule applicability to those sources using 500 gallons per year or more of wood coatings. If the applicability limit in Rule 67.11 were reduced to the South Coast Rule 1136 limit, which was assumed to be equivalent to an annual limit of 125 gallons per year, the estimated potential emission reductions would be 5.6 tons per year. Thus, the total estimated potential emission reductions would be 63 tons per year, or 0.25 tons per day.

The District anticipates that an evaluation of the effect of the mid-2005 limits can be made in 2007. This allows for the use of coatings complying with the mid-2005 standards in Rule 67.11 and South Coast Rule 1136 for one full calendar year.

D.7 Graphic Arts

This source category is regulated by District Rule 67.16 (Graphic Arts Operations). Based on emission inventory information, total estimated VOC emissions from this source category are about 82 tons per year. The emissions result from printing processes or related coating processes.

South Coast Rule 1130 (Graphic Arts) has lower VOC limits than Rule 67.16 for this source category for fountain solutions. In addition, South Coast Rule 1171 (Solvent Cleaning Operations) has lower VOC limits than Rule 67.16 for cleaning ink application equipment for roller washes and general ink cleaning. If the South Coast Rule 1130 and Rule 1171 VOC limits were incorporated in Rule 67.16, the estimated potential VOC emission reductions would be about 57 tons per year, or 0.23 tons per day. Nearly all (about 98%) of the emission reductions would result from reducing the VOC content of cleaning materials. This assumes that the lower VOC content cleaning materials are as effective as the current cleaning materials and that increased usage is not required. Both South Coast Rules 1130 and 1171 also have lower VOC limits than Rule 67.16 in several specialty ink or solvent cleaning categories (for example, flexographic ink on porous substrates and flexographic printing cleanup) and for adhesives. However, none of these materials have been identified as being used in San Diego County for this source category.

The District is assigning this category a medium priority for evaluation for future rule development, including estimating cost effectiveness and feasibility of more stringent standards. Because nearly all the emission reductions result from cleaning materials, the District may consider those changes as part of possible rule making for the wipe-cleaning source category.

D.8 High Emitting Spray Booth Facilities

South Coast Rule 1132 (Further Control of VOC Emissions from High-Emitting Spray Booth Facilities) applies to spray booths emitting more than 20 tons per year of VOCs. This rule requires a further 65% VOC emissions reduction from these operations beyond that required by South Coast coating VOC content rules. The District currently has no comparable rule. The District emission inventory information indicates that there may be five operations in San Diego for which VOC emissions from one spray booth (or a combination of spray booths) exceed 20 tons per year. However, four of these are wood coating operations and the estimated emission reductions resulting from implementation of Rule 67.11's technology forcing VOC content limits for wood coating operations that took effect July 1, 2005, would bring three of these operations well below the 20 ton per year threshold. Emissions from the remaining two facilities

(after adjustment for projected Rule 67.11 reductions in 2005) are about 59 tons per year combined, and the estimated emissions reduction potential is about 39 tons per year, or 0.15 tons per day (65% additional control).

The District views this as a low to medium priority measure because more than half the emissions from the remaining two facilities are from one large wood coating operation. These wood coating emissions may be reduced more than projected by the technology forcing 2005 limits in Rule 67.11. Therefore, emission reductions from add-on controls may be significantly less than the projected 39 tons per year. The District is currently evaluating the feasibility of the Rule 67.11 technology forcing limits. If it is determined that some or all of the limits are not feasible or if the residual emissions warrant further control, the District will reevaluate the priority of this measure.

D.9 Equipment Leaks

Bay Area AQMD's Rule 8-18 (Equipment Leaks) establishes vapor and liquid leak standards to reduce emissions of volatile organic compounds from leaking equipment at refineries, bulk terminals, bulk plants and chemical plants. It exempts facilities with fewer than 100 valves or fewer than 10 pumps and compressors (Rule 8-22, Valves and Flanges at Chemical Plants, applies in these cases). It also exempts equipment handling organic liquids having initial boiling points above 302º F. It does not apply to connections between the loading racks at bulk terminals and bulk plants and the vehicle (mobile transports) being loaded. It sets inspection frequency criteria (daily visual, quarterly instrument checks for most components), repair requirements, and leak standards – 3 drops per minute for liquid leaks, 100 parts per million by volume (ppmv) as methane for most vapor leaks, and 500 ppmv as methane for pumps, compressors and pressure relief devices.

The Rule 8-18 definition of Chemical Plants includes any facility engaged in producing organic or inorganic chemicals or the manufacturing of products by chemical processes and having "325" as the first three digits in the applicable North American Industry Classification code. This code applies to dozens of facilities in San Diego County but likely few would have 100 or more valves or 10 or more pumps or compressors in VOC service. San Diego has no petroleum refineries that would be subject to such a rule. Possibly, a rule such as Rule 8-18 could apply to the major gasoline bulk terminals, some of the bulk plants, and two kelp-processing facilities. However, a valve, pump and compressor count would be needed to determine if the rule would apply to facilities in San Diego.

Rule 8-18 establishes the same liquid leak standard (3 drops per minute) as San Diego rules applicable to gasoline bulk terminals and bulk plants (Rules 61.1, 61.2 and 61.7), kelp processing (Rule 67.10), coating and printing ink manufacturers (Rule 67.19), and pharmaceutical and cosmetics manufacturers (Rule 67.15). However, the San Diego rules have a more stringent allowable leak repair period than Rule 8-18 (0-3 days versus 7 days). Rule 8-18 has a more stringent vapor leak standard for equipment at bulk terminals and bulk plants than do San Diego Rules 61.1 and 61.2 (100-500 ppmv @1.0 cm versus 1375 ppmv @1.3 cm as methane). However, San Diego Rule 61.1 applies to the vapor transfer path including the connection to a mobile transport while Bay Area Rule 8-18 specifically exempts such connections. Inspectors in San Diego County generally do not find vapor leaks at the bulk terminals and bulk plants along the hard-piped components. Typically, if vapor leaks are found,

it is at the loading rack/mobile transport interface, and from the vapor fittings (e.g. drybreaks) on the mobile transport themselves (under ARB jurisdiction).

More detailed evaluation would be needed to determine the extent to which a rule such as Rule 8-18 would apply to local chemical plants and whether the standards for fugitive vapor leaks are technologically feasible and cost-effective. However, likely emission reductions from bulk plants and bulk terminals would be expected to be far less than 10 tons per year. The most recent inventory of these sources showed approximately 13 tons per year total VOC emissions from loading rack operations, and fugitive vapor and liquid leak emissions from hard-piped components, pumps and compressors are likely far less than this amount. As to kelp processing facilities, most fugitive vapor emissions are not associated with equipment or piping leaks. Lines used to transport VOC/air streams are operated at only a few inches of water gauge pressure.

Based on this initial evaluation, it does not appear that there is a significant emission reduction potential and therefore this item should be given a low priority for evaluation for future rule development.

D.10 Petroleum Storage Tanks

This source category is regulated by District Rule 61.1 (Receiving and Storing Volatile Organic Compounds at Bulk Plants and Bulk Terminals), which is applicable to large storage tanks for gasoline and other high volatility motor vehicle fuels. Based on emission inventory information and updated equipment descriptions, estimated emissions from this source category are about 46 tons per year. Rule 61.1 has standards for fittings for internal floating roof tanks, external floating roof tanks, and fixed roof tanks and requires Best Available Control Technology (BACT) for new or replacement rim seals for external and internal floating roof tanks.

South Coast 1178 (Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities) has further control measures for this source category. This rule is applicable to above ground storage tanks at petroleum facilities emitting more than 20 tons per year of VOCs. The rule specifies rim seal types and fittings for external and internal floating roof tanks and fixed roof tanks. The rule also requires all external floating roof tanks subject to the rule be domed by July 1, 2008.

San Diego County has two petroleum storage facilities that emit more than 20 tons per year. Examination of the existing rim seals and fittings for the storage tanks at these facilities indicates that most of the existing seals and fittings at these facilities would meet the standards in South Coast Rule 1178. Based on emission factors in the South Coast Rule 1178 staff report, if the standards of South Coast Rule 1178 were incorporated in Rule 61.1 the estimated emission reduction potential would be about 21 tons per year. About 40% of the emission reduction potential (9 tons) would result from upgrading rim seals. However, since BACT is required by Rule 61.1 for rim seal replacement, these emission reductions will be achieved over time by existing Rule 61.1. The remaining potential emission reduction benefit of the Rule 1178 standards would be approximately 12 tons per year, or 0.03 tons per day, from the more stringent requirements for fittings and the requirement for external floating roof tanks to be domed. Based on this initial evaluation, the District does not plan further evaluation for rule development for this source category because of the very limited VOC emission reduction potential.

D.11 Mobile Transport Tanks Loading

This source category is regulated by District Rule 61.2 (Transfer of Organic Compounds into Mobile Transport Tanks). Rule 61.2 controls vapors displaced by loading of mobile transport tanks with gasoline and other high volatility fuels from bulk terminals and vapor and liquid leaks during the loading process. The primary standard of Rule 61.2 requires a 90% emission reduction for all VOC vapors displaced during the transport tank loading process. Based on emission inventory information, total estimated VOC emissions in San Diego County due to vapor displacement are about 13 tons per year from four bulk terminal loading rack facilities. San Joaquin Valley Rule 4621 (Gasoline Transfer into Stationary Storage Containers, Delivery Vessels and Bulk Plants) requires a 95% emission reduction for displaced VOC vapors. Source testing data for the largest San Diego facility shows that it consistently achieves greater than 99% control of VOC vapors released in the loading process. The estimated emission reduction potential for the three remaining facilities is about 6.4 tons per year, or 0.02 tons per day, if they were required to meet a 95% control level instead of the 90% control level in existing Rule 61.2. Based on this initial evaluation, the District does not plan further evaluation for rule development for this source category at this time because of the very limited VOC emission reduction potential.

D.12 Food Products Manufacturing/Processing

This source category is regulated by South Coast Rule 1131 (Food Product Manufacturing and Processing Operations), which requires use of solvents with less than 120 grams per liter VOC or an 85% emission reduction for nonsterilization operations (emission reductions of about 75% are required for sterilization operations). The staff report for South Coast's Rule 1131 indicates that the two solvents most often used for processing operations and sterilization processes in the food industry are hexane and IPA. Based on AB 2588 Hot Spots program information, total solvent use in San Diego County for facilities that manufacture or process food products is about 0.06 tons per year for hexane and 80 tons per year for IPA. However, more than 90% of these IPA emissions are from two kelp-processing facilities already regulated by District Rule 67.10 (Kelp Processing and Bio-Polymer Manufacturing Operations). Under Rule 67.10, the kelp processing facilities have reduced their VOC emissions more than 90%. If a rule incorporating South Coast standards for VOC emissions for food processing facilities were adopted, estimated potential VOC emission reductions from the remaining unregulated IPA emissions would be about 5.9 tons per year, or 0.02 tons per day. Based on this initial evaluation, the District does not plan further evaluation for rule development for this source category at this time because of the very limited VOC emission reduction potential.

D.13 Polyester Resins Operations

This source category is regulated by District Rule 67.12 (Polyester Resin Operations). Based on emission inventory information, total estimated VOC emissions for this source category are 79 tons per year from resins and gel coats.

South Coast Rule 1162 (Polyester Resins Operations) has slightly lower monomer content limits than Rule 67.12 for some resins and gel coats. If the South Coast monomer content limits were adopted the estimated potential emission reduction would be about 5.7 tons per year, or 0.02 tons per day, for resins and gel coats combined. Based on this initial evaluation, the District does not plan further evaluation for rule development for this source category at this time because of the very limited VOC emission reduction potential.

D.14 Aerospace Manufacturing Operations

Emissions in this category have greatly declined in San Diego County since 1990 due to implementation of District Rule 67.9 (Aerospace Coating Operations), the decline in government funding for aerospace operations and, in particular, the closing of one large facility. Based on emission inventory information, total VOC emissions from this source category are only 35 tons per year.

South Coast Rule 1124 (Aerospace Assembly and Component Manufacturing Operations) has lower VOC limits in several coating categories: adhesive bonding primers, antichafe coatings, dry lubricative materials (nonfastener), form release coatings, fuel tank coatings, and sealants. In addition, South Coast Rule 1124 has a lower VOC limit for paint strippers. Total estimated VOC emissions in San Diego for materials in these coating categories and for strippers that exceed the limits in South Coast Rule 1124 are less than two tons per year. Emission reductions have not been estimated but would be less than two tons per year, or less than 0.01 ton per day.

Based on this initial evaluation, the District does not plan further evaluation for rule development for this source category at this time because of the very limited VOC emission reduction potential.

D.15 Further Control of Industrial and Commercial Boilers, Process Heaters, and Steam Generators

Rule 69.2 (Industrial and Commercial Boilers, Process Heaters and Steam Generators) regulates NOx emissions from boilers with rated heat inputs of 5 million (MM) BTU per hour or more. Currently, Rule 69.2 exempts from NOx emission standards any unit with an annual heat input of less than 220,000 therms (for units with a heat input rating of less than or equal to 50 MMBTU per hour). These units are subject only to operational standards, such as unit maintenance, recordkeeping, and an annual boiler tune-up to minimize NOx emissions to the extent feasible. Facilities with annual heat inputs of 220,000 therms or more (or greater than 10% capacity factor for units with heat input ratings greater than 50 MMBtu per hour) must comply with NOx emission standards of 30 ppmv for gas-fired units and 40 ppmv for oil-fired units. Estimated NOx emissions from this source category are about 69 tons per year with over 99% of the emissions from gas-fired units.

The District has evaluated the feasibility, cost-effectiveness and emissions reduction potential of amending Rule 69.2 to lower the exemption level to 90,000 therms per year (consistent with ARB's Reasonably Available Control Technology/Best Available Retrofit Control Technology (RACT/BARCT) Guidance Document for boilers), to determine whether the resulting emission reductions would be cost-effective. The District also evaluated the local feasibility of more stringent emission limits in SJVUAPCD Rule 4306.

The additional analyses have been conducted. To determine local feasibility of these measures, the District evaluated the cost-effectiveness for the following three cases for gas-fired boilers:

1. Lower Exemption Threshold/Retain Existing Emission Standards. Require that all boilers with annual heat input between 90,000 and 220,000 therms meet the 30-ppmv NOx standard of existing Rule 69.2, and retain the existing 30-ppmv NOx standard for higher usage boilers. This measure would apply to about 40 units with annual heat input

between 90,000 and 220,000 therms, requiring installation of low NOx burners and/or flue gas recirculation to meet the 30-ppmv NOx standard.

2. Lower Exemption Threshold/Tighten Emission Standards. Require that all boilers with annual heat input of 90,000 therms or more meet more stringent standards of 15 ppmv NOx for units rated at less than or equal to 20 MMBtu per hour heat input, and 9 ppmv NOx for units rated at greater than 20 MMBtu per hour heat input. These NOx standards are consistent with those for San Joaquin Valley Rule 4306, adopted on September 18, 2003. This measure would require about 110 units with annual heat input of 90,000 therms or more to install emission controls such as ultra-low NOx burners and flue gas recirculation to meet the more stringent limits.

3. Retain Existing Exemption Threshold/Tighten Emission Standards. Require that boilers with annual heat input of 220,000 therms or more meet the more stringent (15 ppmv / 9 ppmv) NOx standards. Units with annual heat input rates of less than 220,000 therms would remain subject to the current exemption. This measure would require only the approximately 70 units with annual heat input of 220,000 therms or more to install additional or replacement emission controls to meet the more stringent limits.

For each case, cost-effectiveness values were estimated for each affected boiler. The potential emission reductions (averaged over 365 days of operation per year) and overall cost-effectiveness values for each of the three cases are summarized in Table D-1.

Table D-1
Overall Cost-Effectiveness

Case	Potential NOx Emission Reductions (tons/day)	Overall Cost-Effectiveness ($/lb NOx reduced)
1	0.03	12
2	0.10	24
3	0.05	18

For all three cases, the estimated overall cost-effectiveness significantly exceeds (by 100% to 300%) the District's rule development cost-effectiveness reference level of $6 per pound of NOx emission reductions for BARCT for small sources. An investigation of whether there is any subset of units for which further controls would be cost-effective determined that none of the further control measures were cost-effective for any individual boiler. Based on the poor cost-effectiveness and small emission-reduction potential, none of these further control measure combinations are feasible and therefore none will be further considered at this time.

D.16 Small Boilers and Large Commercial Water Heaters

SCAQMD Rule 1146.1 controls NOx emissions from Small Boilers with rated heat inputs between 2 MMBtu per hour to 5 MMBTU per hour. SCAQMD Rule 1146.2 controls NOx emissions from large commercial water heaters 75,000 BTU per hour to 2 MMBTU per hour.

The District is developing a rule to control NOx emissions from small boilers and large commercial water heaters with rated heat inputs between 1 MMBtu per hour to 5 MMBTU per hour, provided additional analyses during rule development show these measures to be feasible based on technology availability, emission reduction potential, and cost-effectiveness.

Control requirements can take three general forms, 1) requiring installation of retrofit control equipment, 2) requiring early replacement of existing units with new controlled units, or 3) focusing control requirements only on new units, and allowing new controlled units to gradually replace existing units, year after year, at the end of each existing unit's 25 years useful life. The ultimate emissions reduction potential is the same for all three options. The advantage of the first two options is that the emissions reductions can be required to occur within a relatively short time period (about 2 years), whereas with the third option, the emissions reductions accumulate gradually over 25 years. However, the first two options are considerably more costly.

Control feasibility and cost investigations concluded that requiring retrofitting or early replacement would not be cost-effective for existing boilers in the 1 – 5 MMBtu per hour size range. The estimated average cost-effectiveness to retrofit a 5 MMBtu per hour boiler with low-NOx burners is approximately $10 per pound of NOx reduced, which substantially exceeds the District's standard rule development cost-effectiveness threshold of $6 per pound. The cost-effectiveness becomes increasingly unfavorable with decreasing boiler size, reaching approximately $30 per pound for a 1 MMBtu per hour boiler.

An option was considered to require retrofits for only the few largest of the small boilers, for which cost-effectiveness would be the least unfavorable. However, that option would yield NOx emission reductions estimated to be only 0.08 ton per day, and some of those emission reductions will likely be achieved even without a retrofit requirement, through market penetration of low-NOx boilers in this size range. Consequently, a retrofit requirement for existing small boilers will not be further pursued at this time.

The cost-effectiveness of requiring immediate replacement of small boilers with new low-NOx boilers is even more unfavorable. Consequently, a replacement requirement for small boilers will not be further pursued at this time.

However, requiring low-NOx burners on <u>new</u> small boilers may be feasible, providing emission reductions when existing small boilers are replaced at the end of their useful life. New Rule 69.2.1 is under development to address this boiler size range that, as currently conceived, would require all new boilers meet a NOx limit of 30 ppmv. Upon full implementation, which would be after all current boilers are replaced at the end of their estimated 25 year average useful lifetimes, this measure would provide an estimated 0.3 ton per day reduction in NOx emissions.

The District also investigated the feasibility of controlling emissions from Large Commercial Water Heaters 75,000 BTU per hour to 1 MMBTU per hour. Standard retrofit low-NOx burners have not been developed for this size range, based on information provided by the South Coast Air Quality Management District. Consequently, the only possible option is requiring full replacement of the units with new low-NOx units. The cost-effectiveness for requiring replacement exceeds $16 per pound and therefore is not feasible at this time. The District will continue to investigate the cost-effectiveness of controlling NOx emissions for this size range of units.

D.17 Further Control of Residential Water Heaters Smaller Than 75,000 BTU per hour

Existing District Rule 69.5 (Natural Gas-Fired Water Heaters), adopted in 1998, limits emissions from new residential-type water heaters in San Diego County to 40 nanograms per Joule (ng/J) of heat output. SCAQMD's Rule 1121 requires most new water heaters sold in the South Coast region on or after January 1, 2006, to meet a 10 ng/J NOx limit. For certain specific kinds and sizes of units, the compliance deadline is delayed to 2007 or 2008.

The District intends to assess the commercial availability in San Diego County, and the cost-effectiveness, of units complying with the 10 ng/J emissions limit of SCAQMD's rule. If sufficient complying units are found to be commercially available and cost-effective, then the District will schedule amendment of Rule 69.5 to incorporate the 10 ng/J limit for new residential water heaters sold in San Diego County. Assuming a ten-year useful life for water heaters, it would take ten years after the requirement is adopted and becomes effective for all the water heaters in the County to be replaced with units that comply with the tightened standard. Tightening the water heater NOx emissions limit from the current 40 ng/J to 10 ng/J has been estimated to reduce San Diego County NOx emissions by approximately 1.5 tons per day. This emission reduction estimate is subject to refinement during future rule development.

ATTACHMENT E

CALCULATION OF CUMULATIVE POTENTIAL EMISSION REDUCTIONS FOR POSSIBLE REASONABLY AVAILABLE CONTROL MEASURES

Control Measure	VOC Emission Reduction Potential (Tons/Day)	NOx Emission Reduction Potential (Tons/Day)
Low VOC Solvent Cleaning	1	
Architectural Coatings	5	
Automotive Refinishing	1	
Adhesive and Sealant Applications	1.4	
Solvent Wipe Cleaning Operations	0.57	
Wood Products Coating Operations	0.25	
Graphic Arts	0.23	
High Emitting Spray Booth Facilities	0.15	
Petroleum Storage Tanks	0.03	
Mobile Transport Tanks Loading	0.02	
Food Products Manufacturing/Processing	0.02	
Polyester Resins Operations	0.02	
Equipment Leaks	<0.02	
Aerospace Manufacturing Operations	<0.01	
Industrial, Commercial, and Institutional Boilers		0.1
Small Boilers and Large Commercial Water Heaters		0.3
Residential Water Heaters		1.5
Stationary Sources Subtotal	**9.7**	**1.9**
Transportation Control Measures Subtotal	**1**	**2**
Total	**10.7**	**3.9**

ATTACHMENT F
GRAPHICAL AIR QUALITY TRENDS ANALYSES

Ozone concentrations and the number of ozone exceedances in San Diego County have decreased dramatically over the past thirty years. These decreases are attributable to reductions in ozone precursor emissions in the San Diego and adjoining air basins (i.e., the South Coast Air Basin). Further emissions reductions will lead to further decreases in ozone concentrations in San Diego County, resulting in attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) by the year 2008. This document uses weight of evidence to illustrate air quality improvements in San Diego County and how this rate of progress will continue in future years as ozone precursor emissions continue to decrease due to current and future air pollution control measures.

Continuous, hourly ozone concentrations are measured at nine monitoring stations in San Diego County. These measurements show that ozone concentrations have been decreasing for the past twenty-five plus years as air pollution controls have effectively removed large quantities of ozone precursor emissions from the atmosphere. Figure F-1 below shows the number of exceedances of the 1-hour NAAQS for ozone and the three-year running average of 1-hour exceedances, along with the best-fit linear trend line. As the graph indicates, San Diego County attained the 1-hour ozone NAAQS in 2001, a major milestone in the region's air quality improvement.

Figure F-1

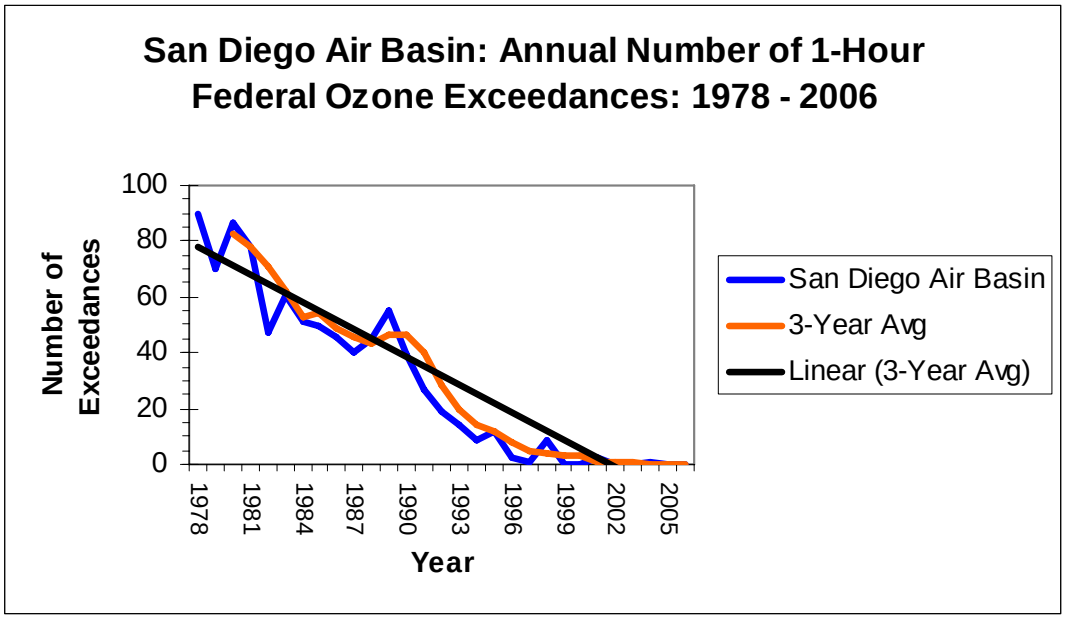
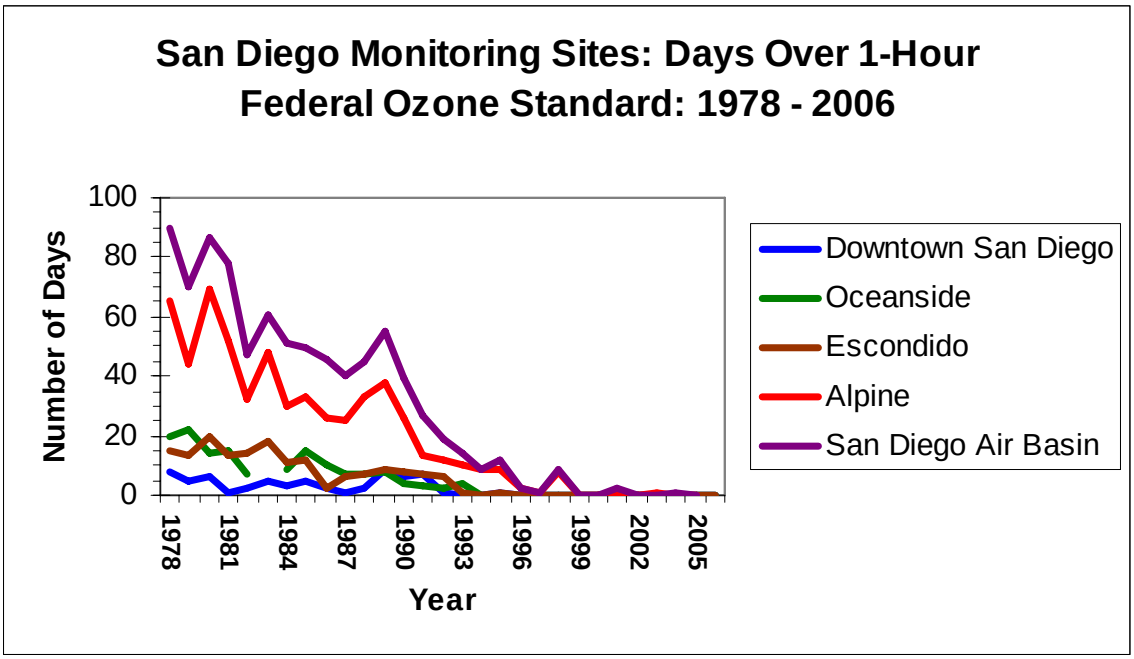


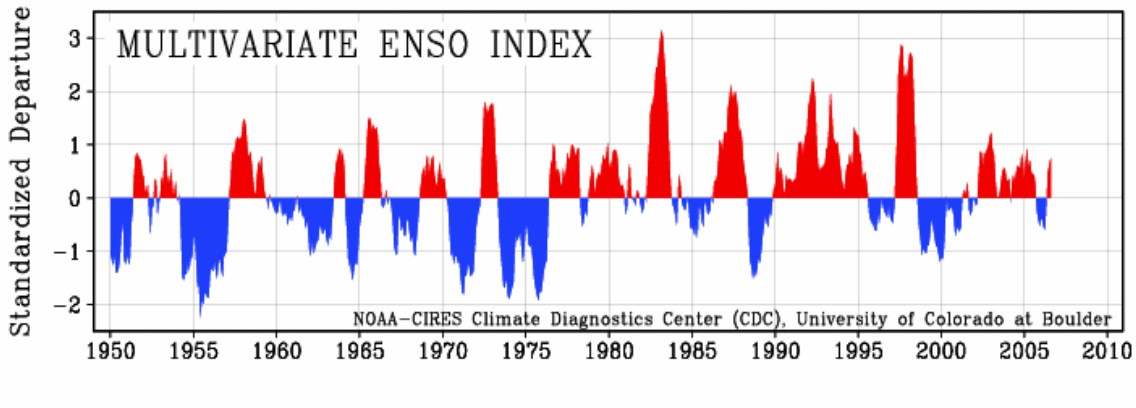
Figure F-2 below shows greater detail about when different portions of San Diego County attained the 1-hour NAAQS for ozone. This graph shows that since the mid-1990s, attainment of the 1-hour ozone standard in San Diego County was achieved in all areas except the Alpine monitoring station. This elevated site in the foothills east of metropolitan San Diego is impacted by local and transported emissions, keeping ozone concentrations higher than at all other monitoring stations in the county.

Figure F-2



The figures above show that the number of exceedances has decreased steadily over the years. The graphs also show that although the exceedance trend has been primarily downward, perturbations in the downward trend are evident. These occasional upward and downward spikes in the overall trend are caused, in part, by changes in weather patterns. Downward spikes in the trend are strongly associated with El Niño conditions (warm water anomalies in the tropical eastern Pacific Ocean), while upward spikes are likewise associated with La Niña conditions (cold water anomalies in the tropical central and eastern Pacific Ocean). Figure F-3 below illustrates the El Niño/Southern Oscillation (ENSO) pattern for the tropical Pacific Ocean. In this figure the positive departures (red) represent El Niño conditions while negative departures (blue) represent La Niña conditions.

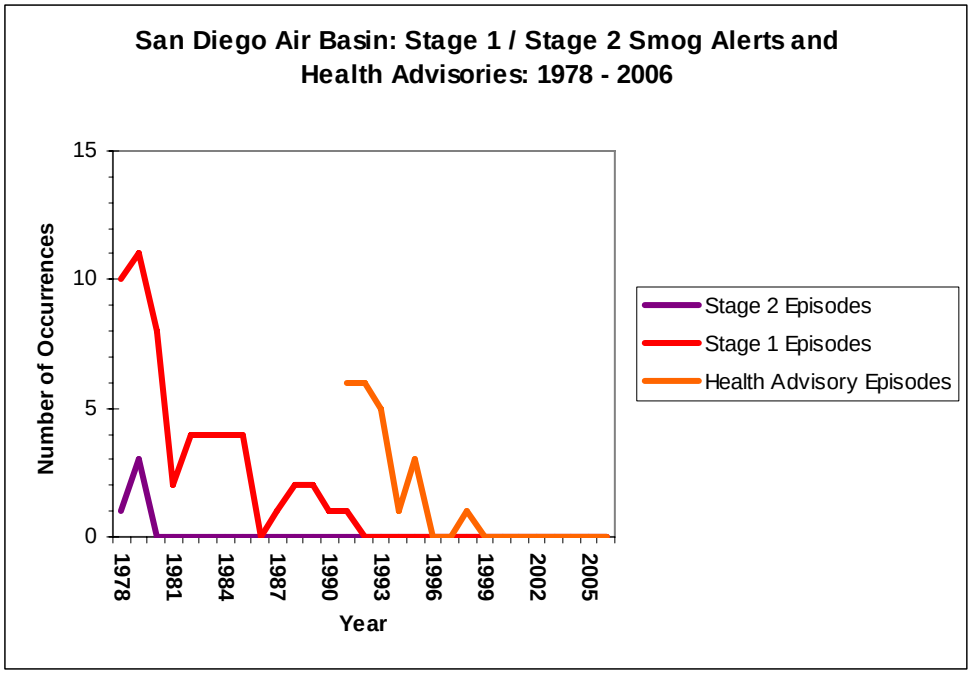
Figure F-3



These weather/climate fluctuations are normal and do influence air quality conditions over the course of an ozone season. These natural fluctuations are important as they have caused perturbations in the otherwise steady downward trend of peak concentrations and ozone exceedances.

Figure F-4 below is provided to show that the decreasing ozone concentrations have eliminated smog alerts and Health Advisory episodes. The last Stage II smog alert (0.35 ppm) in San Diego County was in 1979, the last Stage I smog episode (0.20 ppm) was in 1991, and the last Health Advisory (0.15 ppm) was in 1998. Lower ozone concentrations are decreasing health impacts for everyone in San Diego County.

Figure F-4



It is important to note that once the occurrence of Health Advisories first hit zero (1996), there has been only one Health Advisory after that year. This last Health Advisory was in 1998, a La Niña year. Decreasing emissions have since eliminated Health Advisories in San Diego County.

The 1-hour ozone concentrations shown above were presented to illustrate the ozone trends over the past decades. Since the 8-hour ozone standard is written differently than the older 1-hour standard, it is more appropriate to look at the actual 8-hour ozone concentrations. As with the 1-hour ozone standard, the attainment status of San Diego County for the 8-hour ozone standard is and has been driven in recent years by the Alpine monitoring station. Figure F-5 below shows the four highest 8-hour ozone concentrations measured in San Diego County for the years 1977 through 2006. This graph shows a general downward trend in peak ozone concentrations, along with the up and down spikes associated with climatic conditions. The graph further shows a convergence of the four highest values as concentrations have decreased to nearly the attainment point.

Figure F-5

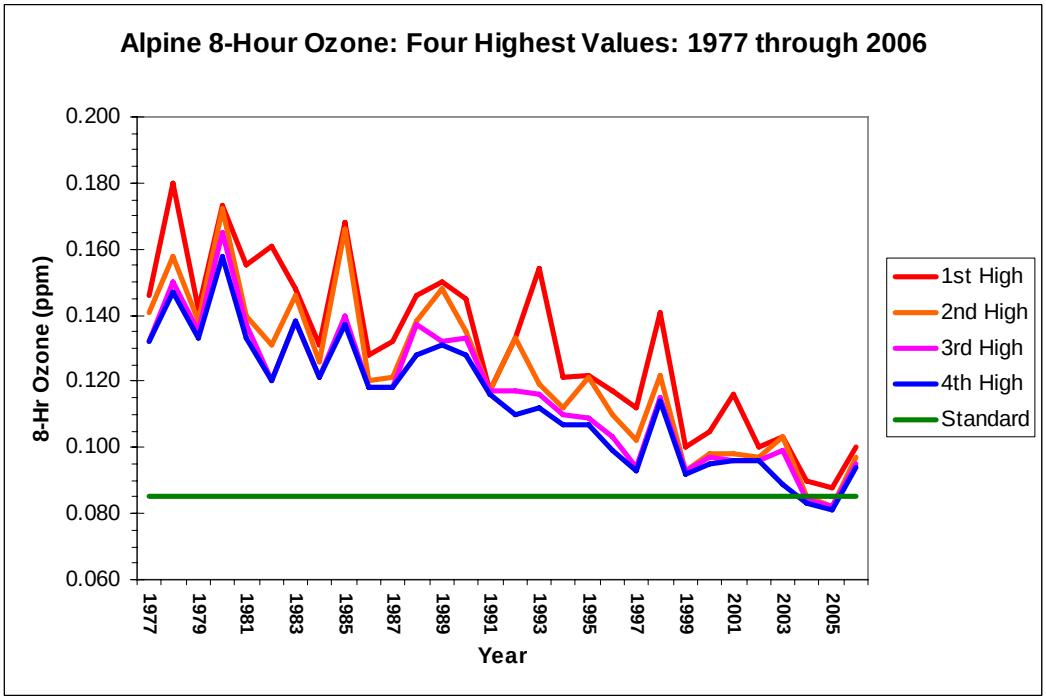
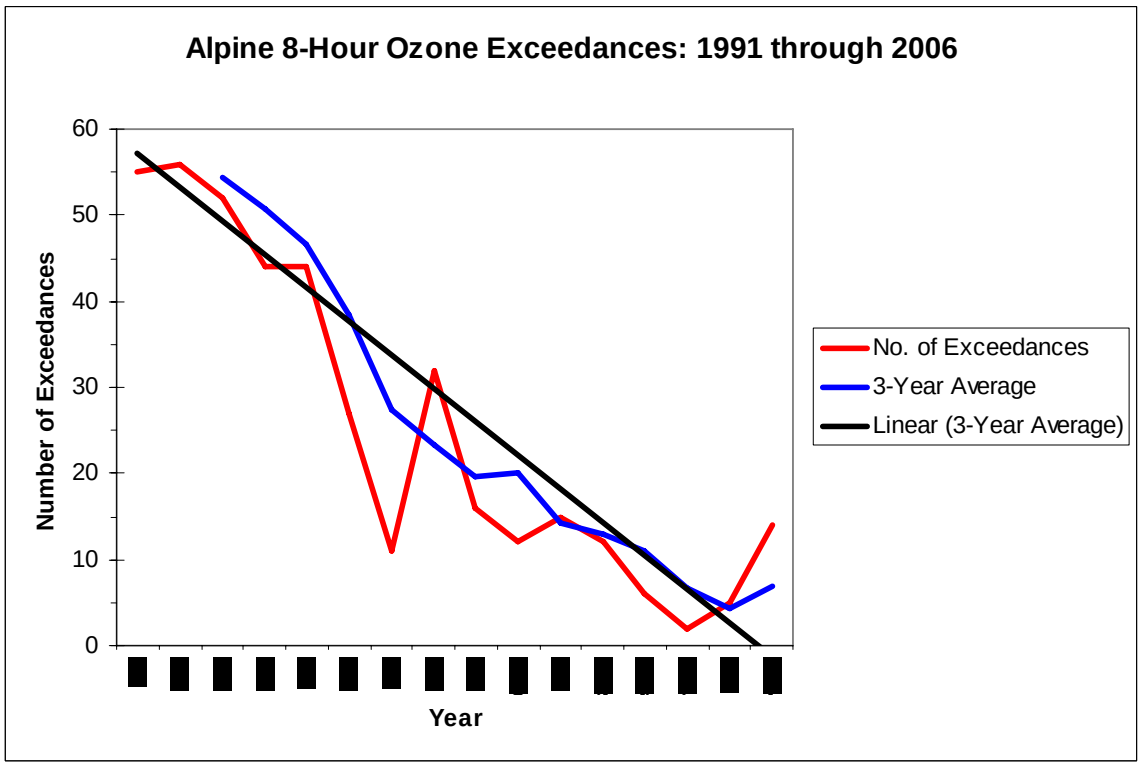


Figure F-6 below shows a large decrease in the total number of annual exceedances of the 8-hour ozone standard at the Alpine monitoring station.

Figure F-6



Since the 8-hour ozone standard is not written in terms of the numbers of exceedances, it is more appropriate to look at the 8-hour Design Value (i.e., three year average of the fourth highest concentration). Figure F-7 below shows the annual 4th highest value along with the 8-hour design value through 2006. This graph shows a downward trend in both the 4th highest values and the design value. This graph shows that San Diego County is nearing attainment of the 8-hour ozone standard. The upward spike in 2006 will affect the design value for two more years. However, the up and down spikes in the historic data suggest that subsequent years will trend even further downward.

Figure F-7

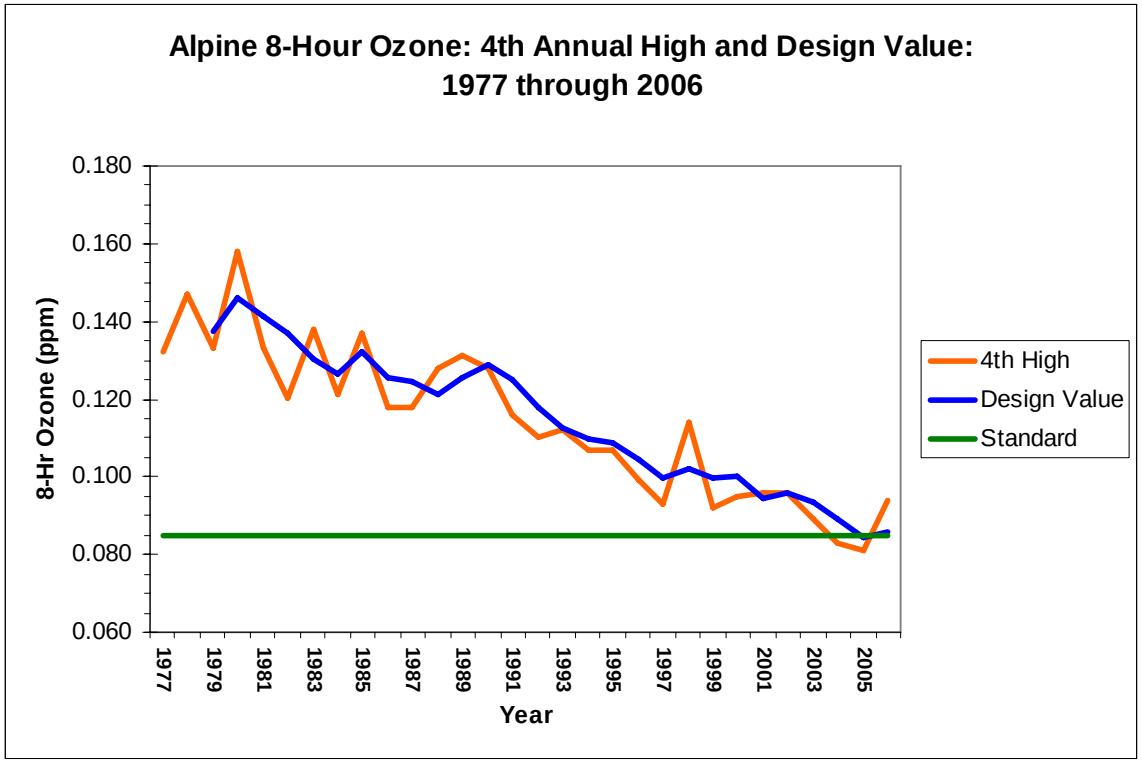
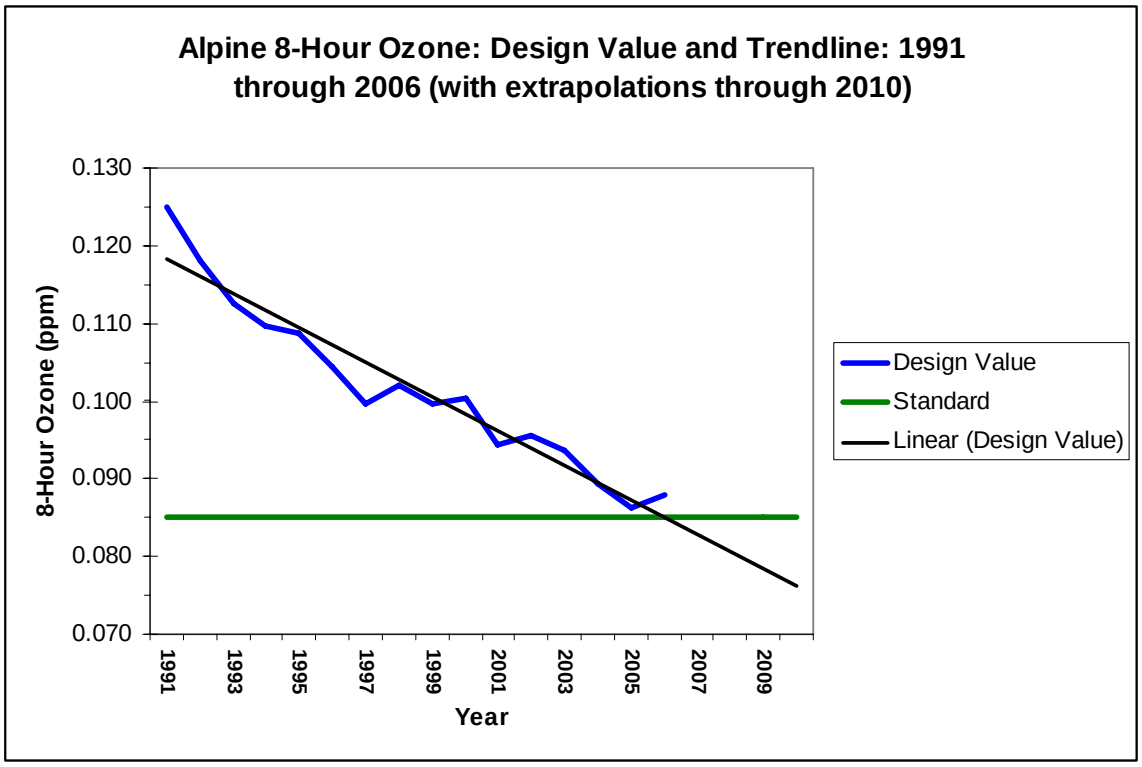


Figure F-8 below shows the 8-hour design value for the years 1991 through 2006 along with a best-fit trend line showing that a linear interpolation during this time period would put the design value below the 8-hour standard in 2007. In reality this will not occur due to the slight increase in the 4th highest 8-hour concentration in 2006.

However, past downward trends in 1-hour ozone concentrations show that the decreasing values result from decreasing emissions and an isolated year with anomalous weather will not reverse the decrease in ozone concentrations or design values (see Section 2.4.3 for additional information).

Figure F-8



It is also important to look at average concentrations, not just peak values, to see the effectiveness of emission controls on ozone concentrations in San Diego County. Figure F-9 below shows hourly averaged ozone data from the Alpine monitoring station (ALP) for 1995, 2000, and 2005. This graph shows that hourly averaged data have steadily decreased over the past ten years at this monitoring station, with peak hour concentrations decreasing by 0.009 ppm (roughly 1 ppb per year).

Figure F-9

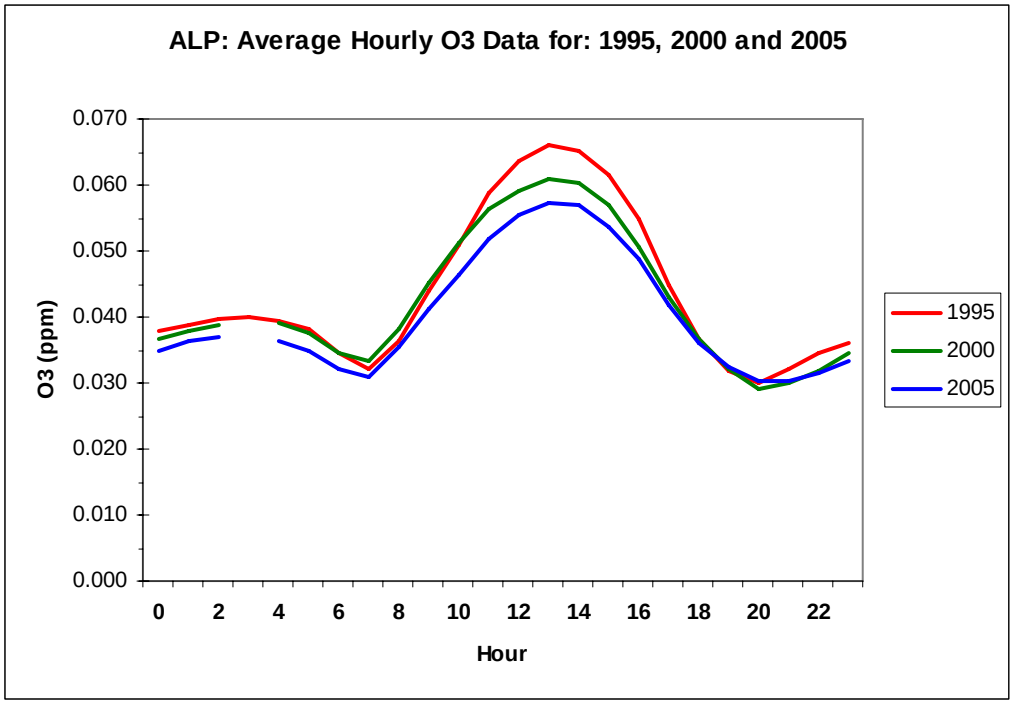
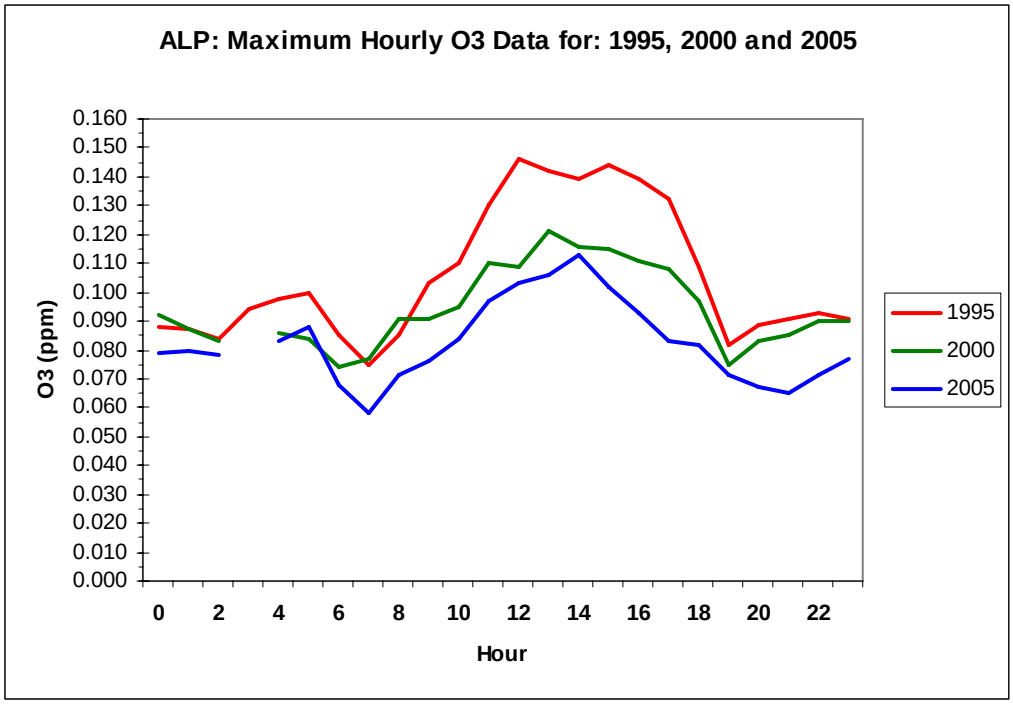


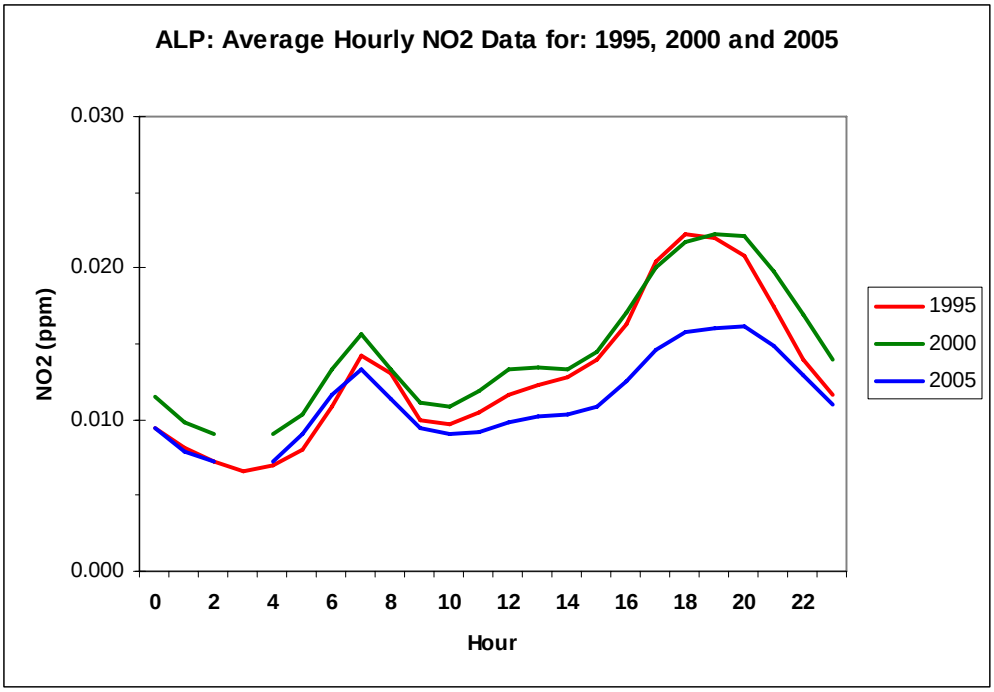
Figure F-10 below shows the hourly maximum ozone data for the years 1995, 2000, and 2005. This graph shows that peak values have fallen significantly at this monitoring station over the past ten years (peak values decreased 0.033 ppm between 1995 and 2005), as well as a shortening of the length of the "ozone day".

Figure F-10



Ozone values have decreased in the past as a result of precursor emissions reductions. Figure F-11 below shows hourly averaged NO2 data from the Alpine monitoring station (ALP) for 1995, 2000, and 2005. This graph shows that hourly averaged data have decreased significantly over the past ten years at this monitoring station, especially evening and nighttime concentrations (i.e., no photochemistry).

Figure F-11



This decrease in precursor emissions is also reflected in the decrease in 8-hour ozone concentrations at the Alpine monitoring stations. Figure F-12 below shows 8-hour averaged ozone data for 1995, 2000, and 2005. This graph shows that average 8-hour concentrations have steadily decreased over the past ten years at this monitoring station, with a decrease of 0.007 ppm between 1995 and 2005. The data suggest that this trend will continue in future years as ozone precursor emissions decrease.

Figure F-12

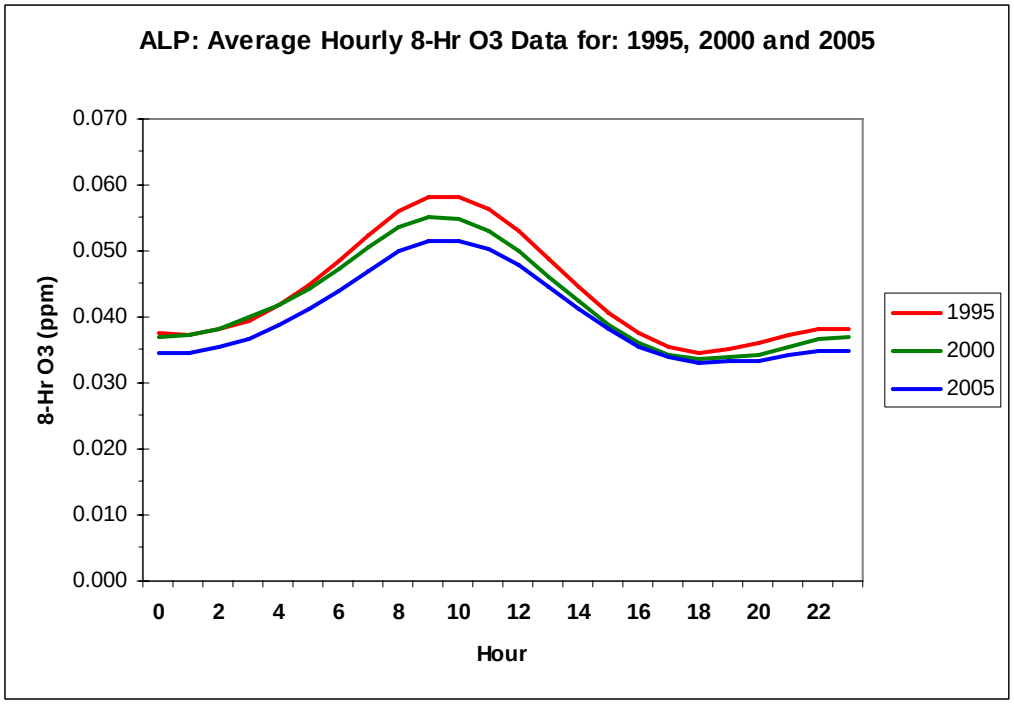
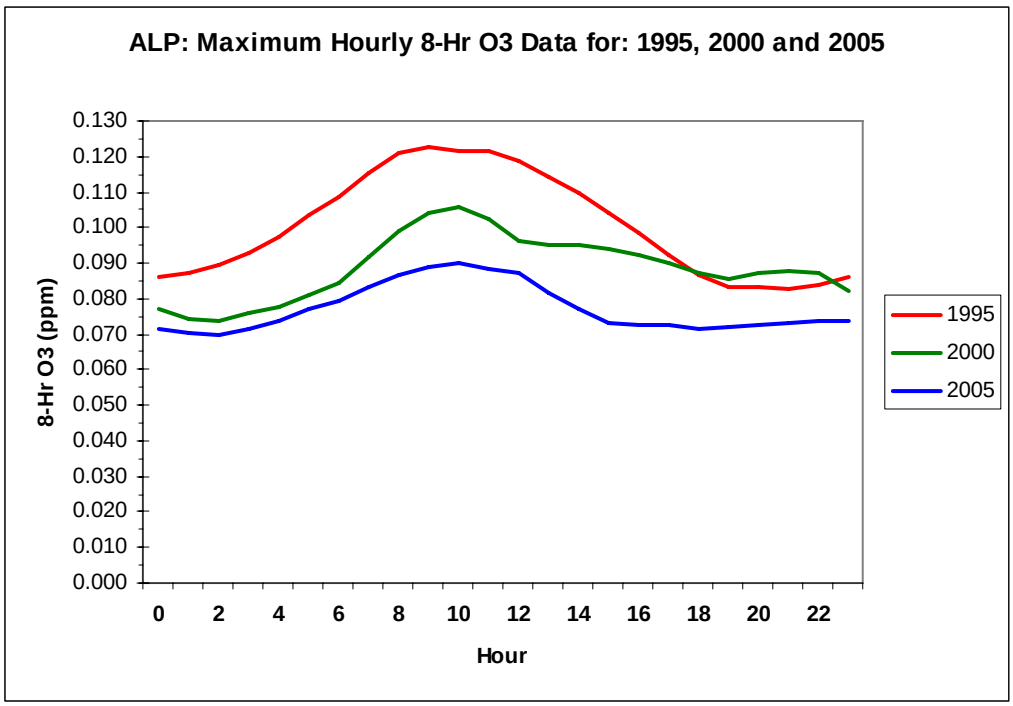


Figure F-13 below shows the hourly maximum 8-hour ozone data for the years 1995, 2000, and 2005. This graph shows that peak values have fallen significantly (0.034 ppm) at this monitoring station over the past ten year, as has the length of the "ozone day".

Figure F-13



As indicated in Figure F-2 above, other regions of the county attained the 1-hour ozone standard many years before the Alpine area of the county. Figure X-14 below shows hourly averaged ozone data from the Downtown San Diego monitoring station (DTN) for 1995, 2000, and 2005. This graph shows that hourly averaged data have markedly decreased over the past ten years at this urbanized coastal region monitoring station.

Figure F-14

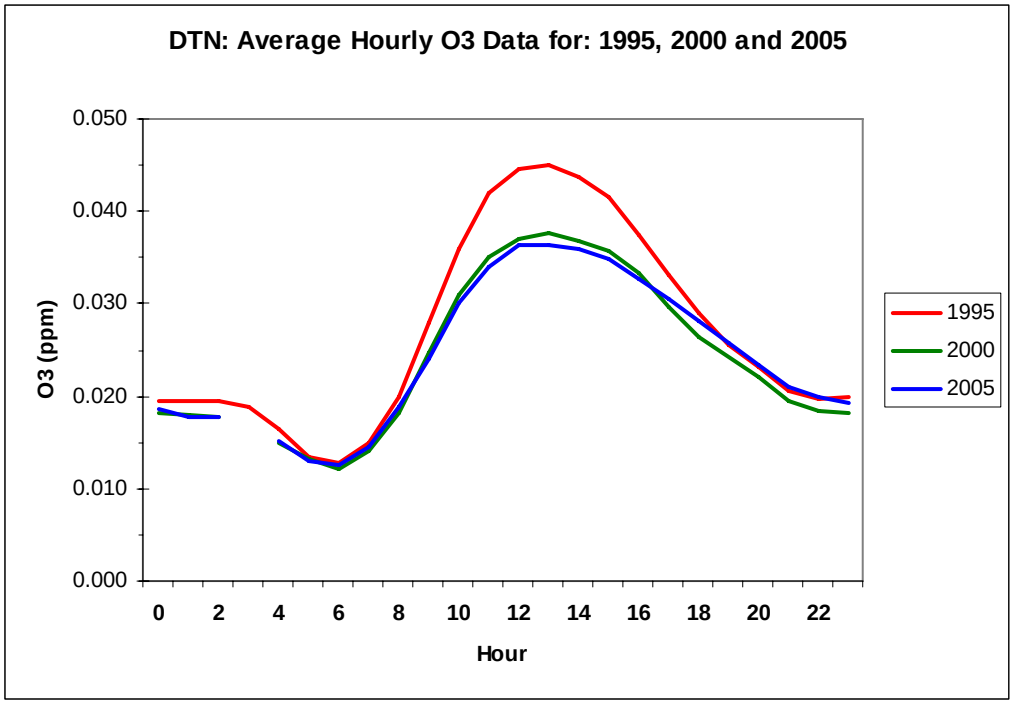
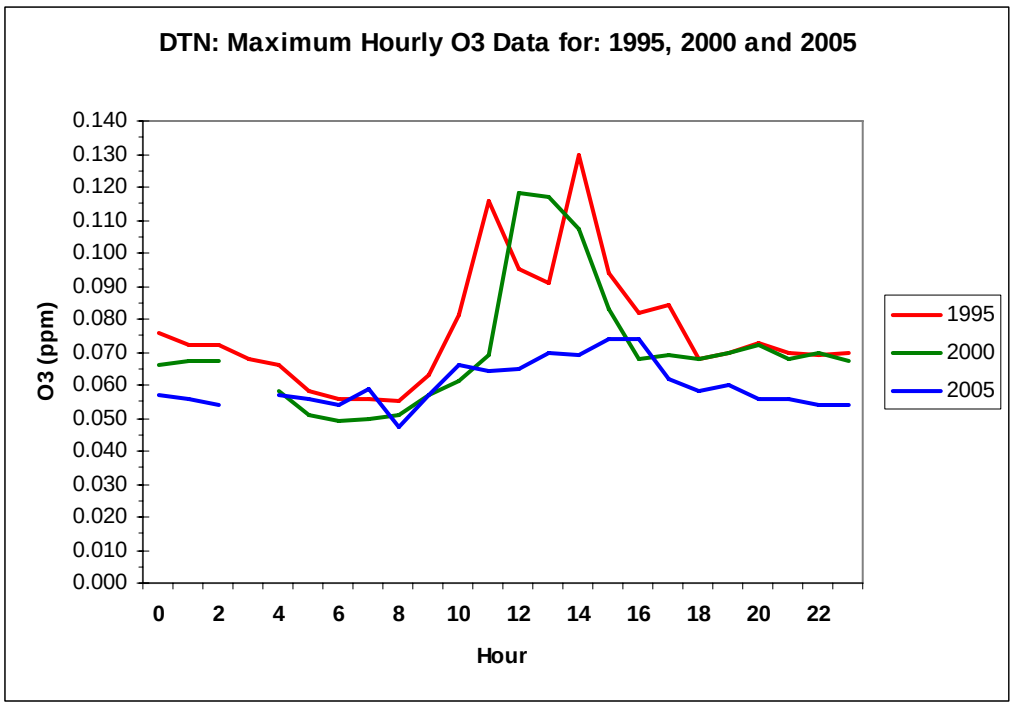


Figure F-15 below shows hourly maximum ozone data from the Downtown San Diego monitoring station (DTN) for 1995, 2000, and 2005. This graph shows that hourly maximum data have decreased over the past ten years at this monitoring station, as has the length of the "ozone day".

Figure F-15



Precursor emissions at the Downtown monitoring station have also shown a steady decrease over the past ten years. This is shown in Figure F-16 below, with average hourly NO2 data for the years 1995, 2000, and 2005.

Figure F-16

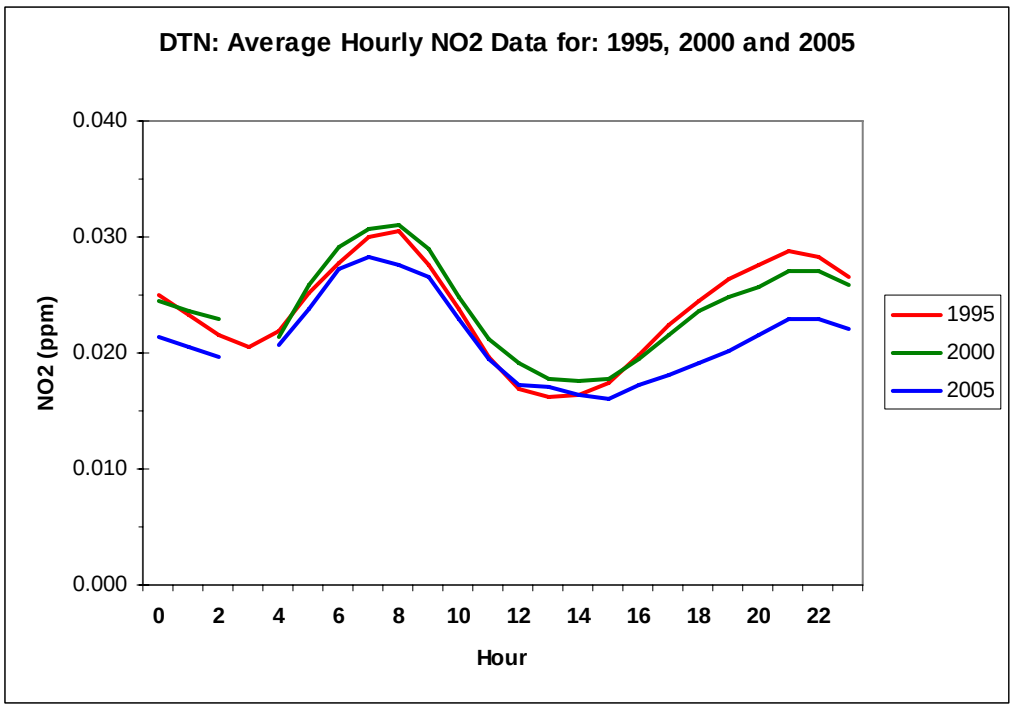
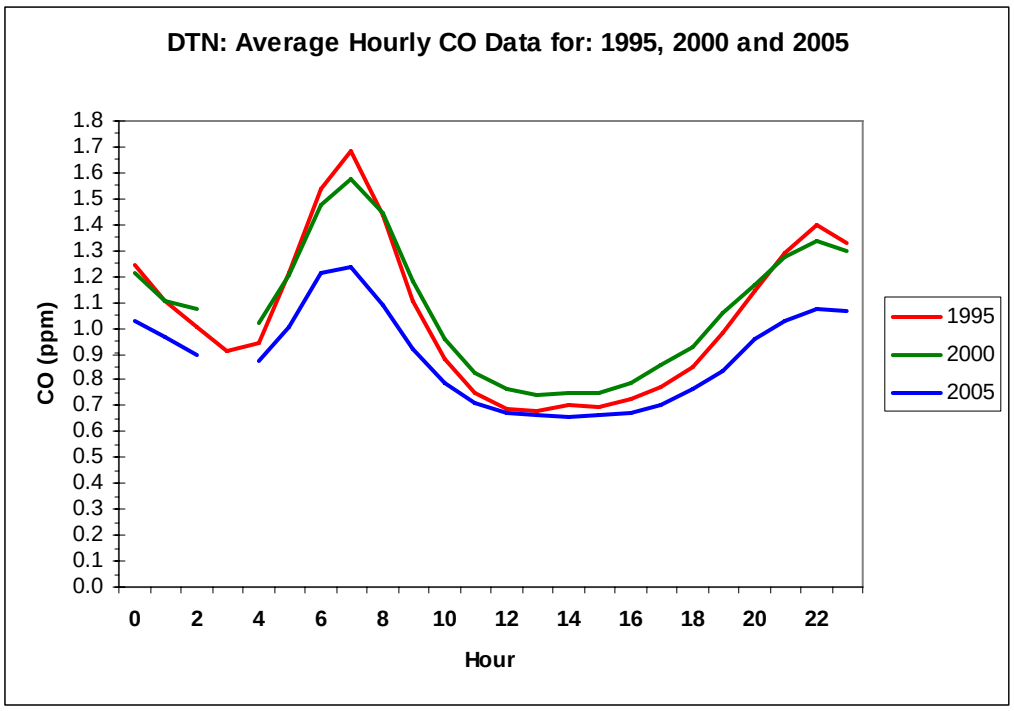


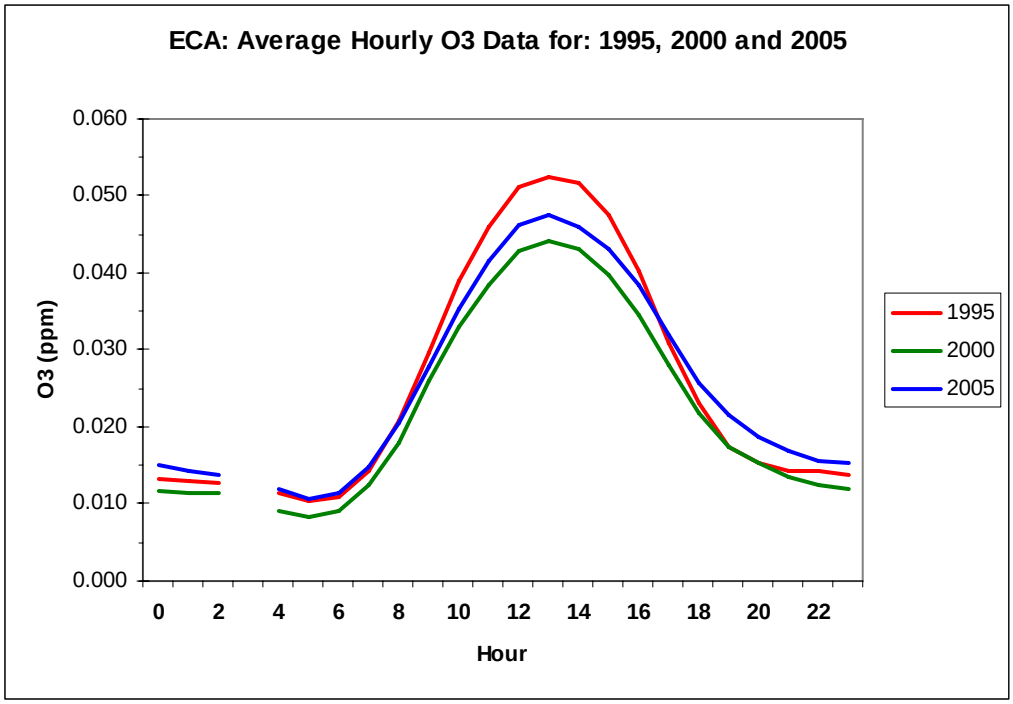
Figure F-17 below shows a similar trend for CO at the Downtown monitoring site. Although CO is not a significant precursor to atmospheric ozone formation, it can be considered a surrogate marker for mobile sources of Volatile Organic Compounds precursor emissions.

Figure F-17



El Cajon, a major metropolitan area located in an inland valley upwind of the Alpine monitoring station also attained the 1-hour ozone standard many years before the Alpine site. Figure F-18 below shows the hourly averaged ozone data from the El Cajon monitoring station (ECA) for 1995, 2000, and 2005. This graph shows that hourly averaged data have steadily decreased from the higher values measured in 1995, although the 2005 data show a small increase in ozone concentrations over 2000.

Figure F-18



However, the maximum hourly concentrations in Figure F-19 below show a decrease over the years for this monitoring site, consistent with decreasing peak ozone concentrations throughout the county, as well as a shortening of the "ozone day".

Figure F-19