FINAL

VENTURA COUNTY
2007
AIR QUALITY
MANAGEMENT PLAN

Adopted by the
Ventura County Air Pollution Control Board

May 13, 2008

VENTURA COUNTY
AIR POLLUTION CONTROL DISTRICT

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ACRONYMS

AB	Assembly Bill
APCB	Air Pollution Control Board
APCD	Air Pollution Control District
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	Air Resources Board
BACT	Best Available Control Technology
BARCT	Best Available Retrofit Control Technology
BY	Base Year
CAAA	Federal Clean Air Act Amendments
Caltrans	California Department of Transportation
CCAA	California Clean Air Act
CE	Control Efficiency
CEFS	California Emission Forecasting System
CEQA	California Environmental Quality Act
CF	Control Factor
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CTG	Control Techniques Guidelines
CURB	City Urban Restriction Boundary
District	Air Pollution Control District
DMV	Department of Motor Vehicles
DPR	Department of Pesticide Regulation
EDPC	Expected Peak Day Concentration
EIC	Emissions Inventory Category
EITAC	Emissions Inventory Technical Advisory Committee
EPA	Environmental Protection Agency
EPP	Early Progress Plan
ERC	Emission Reduction Credit
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FIP	Federal Implementation Plan
FMVCP	Federal Motor Vehicle Control Program
FTA	Federal Transit Administration
FY	Forecast Year
GF	Growth Factor
GHG	Greenhouse Gases
HFC	Hydrofluorocarbons
IP	Implementation Factor
IPCC	Intergovernmental Panel on Climate Change

LAFCO	Local Agency Formation Commission
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standards
NBVC	Naval Base Ventura County
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NSR	New Source Review
OCS	Outer Continental Shelf
PFCs	Perfluorocarbons
PM_{10}	Respirable Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
pphm	parts per hundred million
ppm	parts per million
PUR	Pesticide Usage Report
RACM	Reasonably Available Control Measure
RACT	Reasonably Available Control Technology
RE	Rule Effectiveness
RFP	Reasonable Further Progress
ROG	Reactive Organic Compounds
RP	Rule Penetration
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act A Legacy for Users
SCAG	Southern California Association of Governments
SCC	South Central Coast
SCM	Suggested Control Measure
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOAR	Save Open Space and Agricultural Resources
TCM	Transportation Control Measure
TOC	Total Organic Compounds
UNFCCC	United Nations Framework Convention on Climate Change
VCTC	Ventura County Transportation Commission
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WOE	Weight of Evidence

EXECUTIVE SUMMARY

Purpose

Pursuant to the federal Clean Air Act Amendments of 1990 (CAAA), the Ventura County 2007 Air Quality Management Plan (AQMP) presents Ventura County's: 1) strategy to attain the federal 8-hour ozone standard; 2) attainment demonstration for the federal 8-hour ozone standard; 3) reasonable further progress demonstration for the federal 8-hour ozone standard; and, 4) transportation conformity emissions budget for federal transportation conformity purposes. The 2007 AQMP also presents Ventura County's 2003 – 2005 Triennial Assessment and Plan Update required by the California Clean Air Act of 1988 (CCAA).

Background

The CAAA established clean air plan requirements for areas that exceed the National Ambient Air Quality Standards (NAAQS). These areas, called nonattainment areas, must develop and implement clean air plans to attain the NAAQS by specified dates. Clean air plans are also called nonattainment plans or state implementation plans (SIP).

Each state is responsible for implementing the CAAA within its jurisdiction. California state law designates the California Air Resources Board (ARB) as California's agency for all purposes set forth in the CAAA, including preparation of the California SIP. State law further specifies that the ARB must adopt clean air plans approved by local air districts, unless the ARB finds, after a public hearing, that a local clean air plan will not meet the requirements of the CAAA. ARB must submit SIPs and SIP revisions to the U.S. Environmental Protection Agency (EPA) for approval.

The provisions and commitments in SIPs are federally enforceable. Moreover, the CAAA require that EPA impose sanctions on areas that fail to submit a SIP, fail to submit an adequate SIP, or fail to implement a SIP unless the state corrects such failures. Sanctions include 2-to-1 emission offsets for new air pollution sources and a ban on most federal highway grants. An additional ban on air quality grants is discretionary. Ultimately, EPA may impose a federal clean air plan, called a federal implementation plan (FIP), if EPA finds that the state failed to submit or implement an adequate SIP.

In July 1997, EPA promulgated an 8-hour NAAQS for ozone. Based on Ventura County's ozone levels over the previous three years, EPA designated Ventura County a moderate nonattainment area for the 8-hour ozone standard on June 15, 2004. Moderate ozone nonattainment areas must attain the federal 8-hour ozone standard by June 15, 2010. On February 14, 2008, ARB formally requested that EPA reclassify (bump up) Ventura County up one classification level to a serious 8-hour ozone nonattainment area. This means that Ventura County must meet the federal 8-hour ozone standard by June 15, 2013. Although Ventura County will have more time to attain the 8-hour standard, the serious classification requires Ventura County to meet the requirements for that higher classification, many of which are more stringent than for moderate areas.

Accordingly, in anticipation of becoming a serious area, the 2007 AQMP was prepared to satisfy the CAAA planning requirements for that classification.

The CCAA was enacted on September 30, 1988. The goal of the CCAA is to achieve California's more stringent health-based state clean air standards at the earliest practicable date. Under the CCAA, Ventura County is a severe nonattainment area for the state 1-hour ozone standard, and as such, must meet many of the CCAA's most stringent requirements. For areas not meeting state ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide standards, clean air plans were required by July 1991. The CCAA also requires periodic plan updates and progress assessment reports.

Attainment Strategy

Building on previous Ventura County AQMPs, the 2007 AQMP presents a combined local and state clean air strategy based on concurrent reactive organic compounds (ROG) and nitrogen oxides (NOx) emission reductions to bring Ventura County into attainment of the federal 8-hour ozone standard. ROG and NOx emitted by both anthropogenic and natural sources react in the atmosphere to produce photochemical smog, of which ozone is the principal constituent. Ventura County was the first area in the nation to institute such a strategy for meeting ozone standards. The local strategy includes the 1994 AQMP clean air strategy plus several new and further study emission control measures.

The new control measures are proposed revisions to existing Ventura County Air Pollution Control District (APCD or District) rules that District staff has found practicable for Ventura County. The further study measures are proposals that may help Ventura County achieve the federal and state ozone standards but need additional air quality, feasibility, and environmental scrutiny before District staff can recommend them for adoption as District rules. They will become District rules only if District staff finds them to be practicable and appropriate for Ventura County. Both the new control measures and those further study measures recommended for adoption by District staff will also serve to meet the "every feasible measure" requirement of the CCAA.

Several of the local control measures from the 1994 AQMP are not in the 2007 AQMP. In each case, District staff determined that the measure is either obsolete or infeasible for Ventura County based on technological or economic considerations. However, no control measure from previous AQMPs would be deleted from the 2007 AQMP that would slow the county's progress towards attaining either the federal 8-hour ozone standard or the state ozone standards.

Most of the emission reductions that Ventura County needs to attain the federal 8-hour ozone standard, and continue progress towards meeting the state ozone standards, will come from ARB's 2007 State Implementation Plan (State Strategy). The State Strategy is a comprehensive and far-reaching set of emission reduction programs that focus on reducing emissions from mobile sources, consumer products, and pesticides to significantly improve air quality throughout California and meet federal clean air standards for ozone and $PM_{2.5}$.

Attainment Demonstration

Photochemical modeling results indicate a design value of 0.087 parts per million (ppm) for Ventura County by 2013, the attainment date for serious ozone nonattainment areas. Based on photochemical modeling, as well as supporting analyses completed as part of the supplemental Weight of Evidence (WOE) evaluation, Ventura County can expect to reduce its design value to 0.084 ppm and attain the federal 8-hour ozone standard by 2013, the attainment date for serious nonattainment areas. Appendix D contains the entire photochemical modeling protocol and WOE for the 2007 AQMP.

Reasonable Further Progress Demonstration

In addition to showing attainment of the federal 8-hour ozone standard by 2013, the 2007 AQMP also must show steady progress towards attaining the federal 8-hour ozone standard by that date. Such steady progress towards attainment is called reasonable further progress (RFP). EPA defines RFP as "annual incremental reductions in air pollutant emissions as reflected in a State Implementation Plan that EPA deems sufficient to provide for the attainment of the applicable national ambient air quality standards by the statutory deadline." The RFP demonstration shows that Ventura County will meet RFP requirements for the serious area milestone years 2008, 2011, and 2012.

Transportation Conformity

Transportation conformity is a CAAA and SAFETEA-LU regulatory process that coordinates air quality planning and transportation planning to help ensure that highway and transit projects will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Central to transportation conformity are motor vehicle emissions budgets (also referred to as conformity budgets), which set the maximum amount of on-road mobile emissions that nonattainment areas can produce and continue to demonstrate progress towards attainment.

Normally, conformity budgets are set with RFP Plans. However, EPA is revising its RFP regulations for areas whose air quality is dominated by air pollution transported from upwind regions. Ventura County is one of those areas. Until those revisions are complete, EPA will not approve conformity budgets for such areas. Therefore, to not disrupt Ventura County's transportation planning process, nor jeopardize the county's federal transportation funding, ARB has prepared an Early Progress Plan (EPP) for the county for the sole purpose of establishing a conformity budget for 2009, Ventura County's attainment year as a moderate 8-hour ozone nonattainment area.

On April 16, 2008, EPA found that the motor vehicle emissions budgets contained in Ventura County's EPP adequate for transportation conformity decisions. Consistent with the 2004 final amendments to the Transportation Conformity Rule (69 FR 4004), the EPP 8-hour ozone conformity budgets replace the existing 1-hour ozone conformity budgets in the 2004 AQMP. As a result, SCAG and the U.S. Department of Transportation must use these budgets in future conformity analyses in Ventura County.

Notwithstanding the 2009 EPP conformity budget, the 2007 AQMP includes a conformity budget for Ventura County as a serious 8-hour ozone nonattainment area. Once the 2007 AQMP conformity budget is approved by EPA, it will supersede the EPP conformity budget and serve as the conformity budget for future transportation conformity determinations in Ventura County.

Triennial Assessment

The purpose of the Triennial Assessment is to evaluate the county's progress towards meeting the more stringent state 1-hour ozone standard, to incorporate new data and projections, and to identify and correct any deficiencies in meeting interim measures of progress. The Triennial Assessment shows that Ventura County is still making significant progress towards meeting that standard. Furthermore, state and local control programs in the 2007 AQMP for attaining the federal 8-hour ozone standard also will ensure that Ventura County continues making progress towards meeting the more stringent state 1-hour ozone standard. The Triennial Assessment has not identified any deficiencies with respect to meeting progress goals towards the state 1-hour ozone standard. However, the "every feasible measure" assessment conducted for the Triennial Assessment identified several existing District rules with potential for enhancement. The original due date for the Triennial Assessment was December 31, 2006. ARB has officially revised the due date to coincide with 2007 AQMP submittal.

Air Quality Improvement

Air quality in Ventura County has improved dramatically since 1990, the 1994 AQMP base year. In 1990, our air quality exceeded the now revoked federal 1-hour ozone standard 18 times. However, in 2003 there were only two days over the federal 1-hour standard, and none in 2004 and 2005. Likewise, all areas of the county have enjoyed similar reductions in 8-hour ozone levels. In 1990 there were 70 violations countywide of the federal 8-hour ozone standard, but only 11 in 2005, 17 in 2006, and 6 in 2007. These improvements have occurred despite a 23.5 percent increase in Ventura County's population since 1990.

Important Partners

The District has not been working alone to improve Ventura County's air quality. We have benefited greatly from efforts of ARB, EPA, the Southern California Association of Governments (SCAG), the County of Ventura and local cities, the Ventura County Transportation Commission (VCTC), county businesses, and the public. We look forward to these efforts continuing as we work towards attaining the federal and state ozone standards.

1. BACKGROUND

Air pollution is hazardous to human health. It also diminishes the yield and quality of agricultural crops, reduces atmospheric visibility, degrades soils and materials, and damages native vegetation. Federal and state ambient air quality standards are set to protect public health and welfare, and minimize the effects of air pollution. These standards pertain to pollutants in ambient air, the air that people breathe outdoors. This plan focuses on one of those pollutants – ozone. Ventura County is designated an ozone nonattainment area for the state and federal ozone standards.

Although the federal Clean Air Act has significantly improved our nation's air quality, many areas still have serious air quality problems. Ozone, the main constituent of smog, is the most serious and widespread air pollution problem in the country. Ozone forms in the atmosphere by a series of complex chemical reactions and transformations involving reactive organic gases (ROG) and nitrogen oxides (NOx) in the presence of sunlight. These "ozone precursor" pollutants come from a wide variety of sources such as gasoline vapors, fuel combustion, chemical solvents, and household products such as hairsprays, deodorants, and cleaners.

Ozone is a pungent, colorless, toxic gas, consisting of three atoms of oxygen, that can chemically burn and cause narrowing of airways, forcing the lungs and heart to work harder to provide oxygen to the body. A powerful oxidant, ozone is capable of destroying organic matter – including human lung and airway tissue; it essentially burns through cell walls. Ozone damages cells in the lungs, making the passages inflamed and swollen. Ozone also causes shortness of breath, nasal congestion, coughing, eye irritation, sore throat, headache, chest discomfort, breathing pain, throat dryness, wheezing, fatigue, and nausea. It can damage alveoli, the individual air sacs in the lungs where oxygen and carbon dioxide exchange occurs. Ozone also has been associated with a decrease in resistance to infections.

People most affected by ozone include the young, elderly, and athletes. Ozone may pose the worst health threat to people who already suffer from respiratory diseases such as asthma, emphysema, and chronic bronchitis, and those with cardiovascular diseases. Ozone also damages agricultural crops, native vegetation, and various natural and manufactured materials.

California is divided into 15 air basins to regionally manage the state's air resources. An air basin generally has similar meteorological and geographic conditions throughout. Ventura County is in the South Central Coast Air Basin, along with Santa Barbara and San Luis Obispo Counties. Each county in the air basin has its own air pollution control agency. The Ventura County Air Pollution Control District (APCD or District) is the air pollution control agency for Ventura County and, along with the California Air Resources Board (ARB), is charged by state law to protect the people and the environment of Ventura County from the harmful effects of air pollution.

Geographic areas in California that exceed clean air standards are called nonattainment areas. Ventura County is a nonattainment area for the federal 8-hour ozone standard. The Ventura County 8-hour ozone nonattainment area includes all of mainland Ventura County (including ocean areas out to three miles from the mainland shore) but excludes Anacapa and San Nicolas Islands. A map of the Ventura County 8-hour ozone nonattainment area is available on the U.S. Environmental Protection Agency (EPA) website.

Ventura County is also nonattainment for the California 1-hour and 8-hour ozone standards. In Ventura County, ozone generally reaches peak levels by mid-afternoon and, along with ozone precursors, is often blown inland by the prevailing winds. Thus, inland areas such as Simi Valley, Thousand Oaks, Ojai, Fillmore, and Piru often have higher ozone levels and the most days over the federal and state ozone standards than the county's coastal areas. The smoggiest days tend to occur from May through October (smog season) when high temperatures and stable atmospheric conditions produce conditions conducive to ozone formation and accumulation.

Since its formation in 1968, the District has prepared many air quality documents to satisfy federal and state clean air requirements. The most important of these are the air quality management plans (AQMPs). AQMPs are not one-time documents, but are periodically updated and revised in response to changes in governing law and air pollution control science and technology. Moreover, each AQMP builds on its predecessor. Historical Ventura County AQMPs are described in Section 1.3.1. The Ventura County 2007 AQMP is the first Ventura County clean air plan for the federal 8-hour ozone standard.

1.1. Purpose

Pursuant to the federal Clean Air Act Amendments of 1990 (CAAA), the Ventura County 2007 Air Quality Management Plan (AQMP) presents Ventura County's: 1) strategy to attain the federal 8-hour ozone standard; 2) attainment demonstration for the federal 8-hour ozone standard; 3) reasonable further progress demonstration for the federal 8-hour ozone standard; and, 4) transportation conformity emissions budget for federal transportation conformity purposes. The 2007 AQMP also presents Ventura County's 2003 – 2005 Triennial Assessment and Plan Update required by the California Clean Air Act of 1988 (CCAA).

1.2. Federal 8-hour Ozone Attainment Status Reclassification

CAAA Section 181(b)(3) allows federal nonattainment areas to voluntarily reclassify (bump up) to higher nonattainment classifications (e.g., from moderate to serious). This provision gives areas additional time to attain if they are doing everything practicable to attain but are not able to do so by their statutory attainment dates. EPA is obligated to grant voluntary bump-ups, but bumped-up areas must still attain as expeditiously as practicable and meet all CAAA requirements for their new, higher classifications.

On February 14, 2007, ARB formally requested that EPA bump up Ventura County from a moderate 8-hour ozone nonattainment classification to the serious 8-hour ozone nonattainment classification. This means that Ventura County's new attainment deadline for the federal 8-hour ozone standard will be June 15, 2013. The voluntary bump-up is necessary because the photochemical modeling conducted for this plan shows that Ventura County may not attain the federal 8-hour ozone standard until then.

A serious classification means that Ventura County will have to meet all of the requirements for that classification. The primary requirements include attainment as soon as practicable; a major new source threshold of 50 tons per year (down from 100 tons per year); a conformity threshold of 50 tons per year (also down from 100 tons per year); new source review (NSR) emission offset ratios of 1.2 to 1; and, rate of progress ROG/NOx emissions reductions of 18 percent by 2008, 27 percent by 2011, and 30 percent by 2012.

1.3. Federal Clean Air Act and Air Quality Standards

On November 15, 1990, President George Bush signed the CAAA into law. The purpose of the CAAA is to provide clean, healthful air for all citizens of the country. The CAAA specifies dates by which areas of the country must meet the National Ambient Air Quality Standards (NAAQS). The EPA sets NAAQS as the maximum concentrations in the atmosphere for specific air contaminants in order to protect public health and welfare. The EPA has adopted NAAQS for ozone, carbon monoxide (CO), lead, nitrogen dioxide (NO_2), fine particulate matter ($PM_{2.5}$), and coarse particulate matter (PM_{10}), and sulfur dioxide (SO_2). Ventura County is designated nonattainment for the federal 8-hour ozone standard and attainment of all other federal air quality standards.

The CAAA delegates primary responsibility for achieving the NAAQS to the states. The State Implementation Plan (SIP) is the principal mechanism for complying with the CAAA and meeting clean air standards. SIPs are "roadmaps" to clean air. A SIP outlines the actions, programs, and commitments each state will take to carry out its CAAA responsibilities to provide clean air for its citizens. The EPA must approve all SIPs and, once approved, are legally binding documents under both federal and state law.

SIPs are not single documents, rather they are compilations of new and previously submitted plans, programs (such as air quality monitoring and modeling, permitting, etc.), district rules, state regulations, and federal emission controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for motor vehicles and stationary internal combustion engines, fuel regulations, and limits on emissions from consumer products.

The ARB is the lead state agency for the California SIP. Local and regional air agencies, as well as other local and state agencies, such as the Southern California Association of Governments (SCAG) and the Bureau of Automotive Repair, prepare SIP elements and submit them to ARB for review and approval. ARB then forwards the SIP revisions to EPA for approval and publication in the Federal Register. The Code of Federal Regulations Title 40, Chapter I, Part 52, Subpart F, Section 52.220, lists all the items and elements included in the California SIP.

1.3.1. Federal 1-hour Ozone Standard

In 1979, EPA established a NAAQS for ozone at 0.12 parts per million (ppm) in any one-hour period. The CAAA classifies areas based on the severity of each area's respective ozone problem. These classifications are marginal, moderate, serious, severe, and extreme. Areas with more severe air quality problems have progressively more requirements to meet under the CAAA. In addition, areas with higher nonattainment classifications also have later attainment dates. Marginal areas have the least amount of time to attain the standard; extreme areas have the most time. The EPA designated Ventura County a severe nonattainment area for the 1-hour ozone standard with an attainment deadline of November 15, 2005.

The Ventura County Air Pollution Control Board (APCB or Board) last adopted AQMPs for the federal 1-hour ozone standard in 1994 and 1995. These plans committed the District to adopting additional ROG and NOx control measures to further reduce ambient ozone levels throughout Ventura County. Photochemical modeling demonstrated that Ventura County would attain the federal 1-hour ozone standard by 2005, the statutory attainment date. The EPA approved these plans on January 8, 1997 as part of the California SIP.

In 1997, the APCB adopted the 1997 AQMP Revision. The 1997 AQMP Revision updated proposed adoption and implementation dates of several control measures in the 1995 AQMP Revision. The 1997 revision did not make any changes to rate of progress calculations or the District's projected attainment date. EPA approved this plan revision on April 21, 1998.

In 2004, the Ventura County Air Pollution Control Board adopted the 2004 AQMP Revision. That plan updated on-road motor vehicle emissions estimates and forecasts, established a transportation conformity budget for federal transportation conformity purposes, demonstrated that Ventura County would continue to reduce emissions, and that changes to the on-road motor vehicle emissions budget would not delay attainment of the federal 1-hour ozone standard. The EPA approved the 2004 AQMP Revision on May 28, 2004.

In 2002, Ventura County achieved the 1-hour ozone standard. Despite meteorological conditions conducive to ozone formation, Ventura County has continued to meet the federal 1-hour ozone standard.

1.3.2. Federal 8-hour Ozone Standard

Based on medical studies demonstrating that the 1-hour standard was inadequate for protecting public health, the EPA in 1997 replaced the federal 1-hour ozone standard with an 8-hour standard. This change lowered the standard for ozone from 0.12 ppm, averaged over one hour, to

0.08 ppm, averaged over eight hours. The 8-hour standard is more stringent than the federal 1-hour standard and better protects human health from the effects of smog. To attain the federal 8-hour ozone standard, the three-year average of the annual fourth-highest daily maximum 8-hour ozone concentration in the county must not exceed 0.084 ppm.

The American Trucking Association, the U.S. Chamber of Commerce, and other business groups legally challenged the 8-hour standard. The U.S. Court of Appeals upheld the challenges. EPA appealed the decision, and in 2001, the U.S. Supreme Court upheld the 8-hour ozone standard, but determined that EPA's implementation strategy was unreasonable. In June 2003, EPA proposed a revised implementation strategy for the 8-hour ozone standard to address the Supreme Court findings, and finalized phases 1 and 2 of the strategy in the Federal Register on April 30, 2004 and November 29, 2005, respectively. Effective June 15, 2005, the EPA revoked the federal 1-hour ozone ambient air quality standard, including associated designations and classifications, in all areas of the country except 14 early action compact areas, none of which included Ventura County.

The federal 8-hour ozone rule set new planning requirements for nonattainment areas. These requirements address such topics as classification and attainment deadlines, 1-hour ozone standard to 8-hour ozone standard transition, anti-backsliding provisions, reasonably available control technology (RACT), reasonable further progress (RFP) plans for 2002 - 2008, post-2008 RFP plans, transportation control measures (TCMs), including reasonably available control measures (RACM), attainment demonstrations, and transportation and general conformity.

As with the federal 1-hour ozone standard, 8-hour ozone nonattainment areas have increasingly stringent requirements based on the severity of their respective 8-hour ozone attainment status. On April 30, 2004, the EPA determined which areas violate the federal 8-hour ozone standard based on their design values. These attainment status designations became effective June 15, 2004. Ventura County's 8-hour ozone design value is 0.095 ppm. Based on that value, EPA designated Ventura County a moderate nonattainment area for the federal 8-hour ozone standard. Moderate areas must attain the federal 8-hour ozone standard by June 15, 2010.

1.4. California Clean Air Act and Air Quality Standards

The California Clean Air Act (CCAA) was enacted in 1988 and became effective January 1, 1989. The purpose of the CCAA is to achieve the more stringent health-based state clean air standards at the earliest practicable date. The CCAA classifies areas that exceed the state clean air standards within four categories: moderate, serious, severe, and extreme, depending on air pollution levels, with higher classifications having progressively more stringent requirements. California has adopted ambient air quality standards for ozone, respirable particulate matter, fine particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, visibility reducing particulates, sulfates, and vinyl chloride. Ventura County is designated a severe ozone nonattainment area for the state 1-hour ozone standard, and nonattainment for the state PM_{10} and $PM_{2.5}$ standards.

As a severe ozone nonattainment area, Ventura County must meet many of the most stringent requirements of the CCAA. Key CCAA requirements for severe ozone areas are:

- a permitting program designed to mitigate emission increases from new or modified permitted sources;
- application of best available retrofit control technology (BARCT) for existing sources;
- provisions to develop area and indirect source control programs;
- TCMs to substantially reduce the rate of increase in vehicle use;
- TCMs to achieve an average commuter ridership of 1.5 persons per vehicle by 1999, and with no net increase in emissions after 1997;
- measures to increase low-emission vehicle use in vehicle fleets;
- reducing population exposure to unhealthful levels of air pollution; and,
- submittal of an air quality plan to the ARB by July 1, 1991, and triennial updates thereafter.

The CCAA also requires that districtwide air emissions be reduced at least five percent per year for each pollutant or its precursors (beginning in 1988), averaged every consecutive three-year period. A district may use an alternative strategy that achieves a smaller average reduction if: 1) the alternative strategy is equal to or more effective in improving air quality than the five percent per year approach; or, 2) despite the inclusion of every feasible measure in the plan and an expeditious adoption schedule, the district is still unable reduce emissions by at least five percent per year.

The CCAA does not expressly require air quality plans for the state particulate matter standards. However, many of the control measures in the AQMP will reduce ambient PM levels by reducing ROG and NOx emissions. ROG and NOx can transform in the atmosphere into aerosols, which are a major constituent of atmospheric PM.

1.4.1. California 1-hour Ozone Standard

In 1988, the ARB adopted the current state 1-hour ozone standard, 0.09 ppm, not to be exceeded. The Ventura County Air Pollution Control Board adopted the 1991 AQMP for the state 1-hour ozone standard on October 8, 1991. That plan contained many new and revised control measures to reduce air pollutants, but did not meet the required five percent per year reduction target. The CCAA requires any air district unable to achieve five percent annual emission reductions to demonstrate to ARB's satisfaction that it has included “every feasible measure” in its plan and an expeditious adoption schedule. Additionally, the 1991 AQMP did not demonstrate attainment of the state 1-hour ozone standard. Therefore, ARB classified Ventura County a severe nonattainment area for the state 1-hour ozone standard. ARB approved the 1991 AQMP on August 13, 1992, and, as part of that approval, ARB determined that the District's proposed control strategy met the “every feasible measure” requirement of the CCAA.

The 1994/5 AQMPs were prepared primarily to satisfy federal Clean Air Act requirements, but also satisfied the triennial assessment and plan update requirements of the California Clean Air Act. The District also submitted triennial assessments and plan updates in 2001 and 2004.

1.4.2. California 8-hour Ozone Standard

In 2005, ARB approved a new state 8-hour-average ozone standard of 0.070 ppm, not to be exceeded. This new state 8-hour ozone standard became effective on May 17, 2006. ARB adopted first-time area designations for the new state 8-hour ozone standard in November 2006. Under state law, designations are by pollutant rather than averaging time. Therefore, there is only one designation for ozone, based on both the 1-hour and 8-hour standards. To be designated attainment, an area must attain both the 1-hour average and 8-hour average ozone standards. Because the District is nonattainment for the California 1-hour ozone standard, the District will continue to be designated a state ozone nonattainment area. No air plans are due for the state 8-hour ozone standard.

1.5. Progress in Improving Ventura County Air Quality

1.5.1. Reduction in Ozone Levels

As shown in Figure 1-1, air quality in Ventura County has improved dramatically since 1990, the base year for the 1994 AQMP. In 1990, Ventura County had 18 days over the now revoked federal 1-hour ozone standard. However, in 2003 there were only two days over the federal 1-hour standard, and none in 2004 and 2005. Likewise, all areas of the county have enjoyed similar reductions in 8-hour ozone levels. In 1990, there were 70 days countywide over the federal 8-hour ozone standard, but only 11 in 2005, 17 in 2006, and 6 in 2007. These improvements have occurred despite a 23.5 percent increase in Ventura County's population since 1990.

Over the same time, the county's 8-hour ozone values used to determine compliance with the federal 8-hour ozone standard fell dramatically as well. The national 8-hour standard is violated when the average of the three annual fourth highest 8-hour averages over three years is greater than or equal to 0.085 ppm (after truncation to three decimal places). As shown in

Figure 1-2, the countywide 8-hour ozone value deceased from 0.13 ppm in 1990 to 0.090 ppm in 2006.

Figure 1-3 through Figure 1-5 present the corresponding 8-hour values for years 1990 through 2006 for each county air quality monitoring station. Ozone data for 2007 is not yet available from ARB. For all stations, 8-hour ozone values have significantly decreased and are approaching, or are now lower than, the federal and state 8-hour standards. These trends should continue as local, state, and federal clean air programs continue to reduce air emissions responsible for ozone formation.

Figure 1-1
Countywide Days Over Federal & State Ozone Standards vs. Population Growth

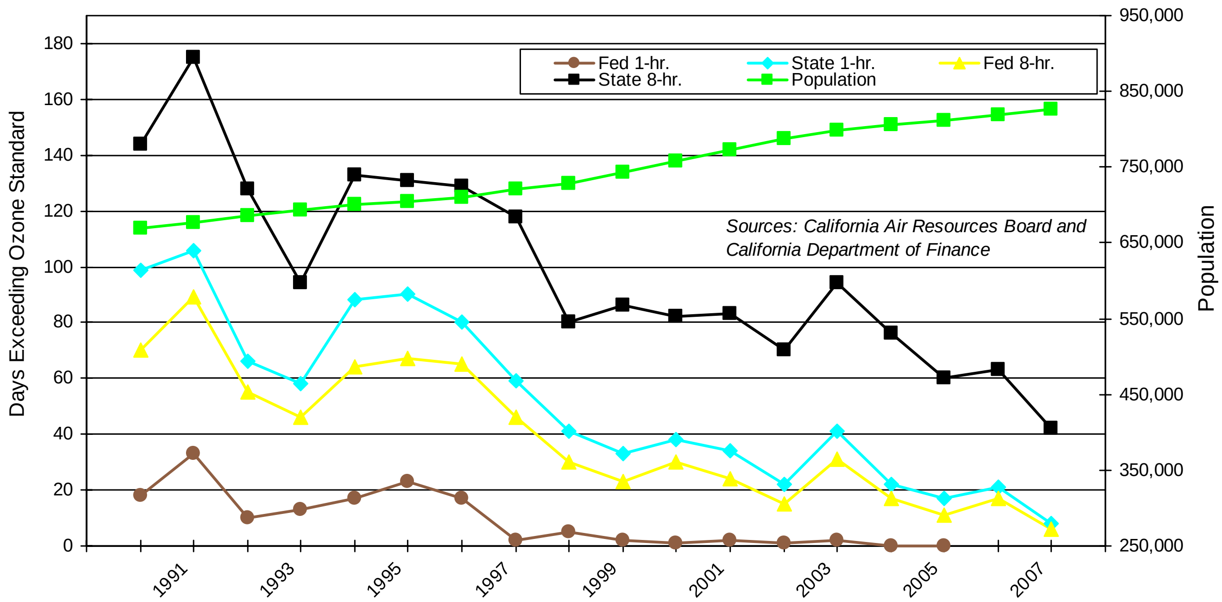


Figure 1-2
Countywide 8-Hour Ozone Values

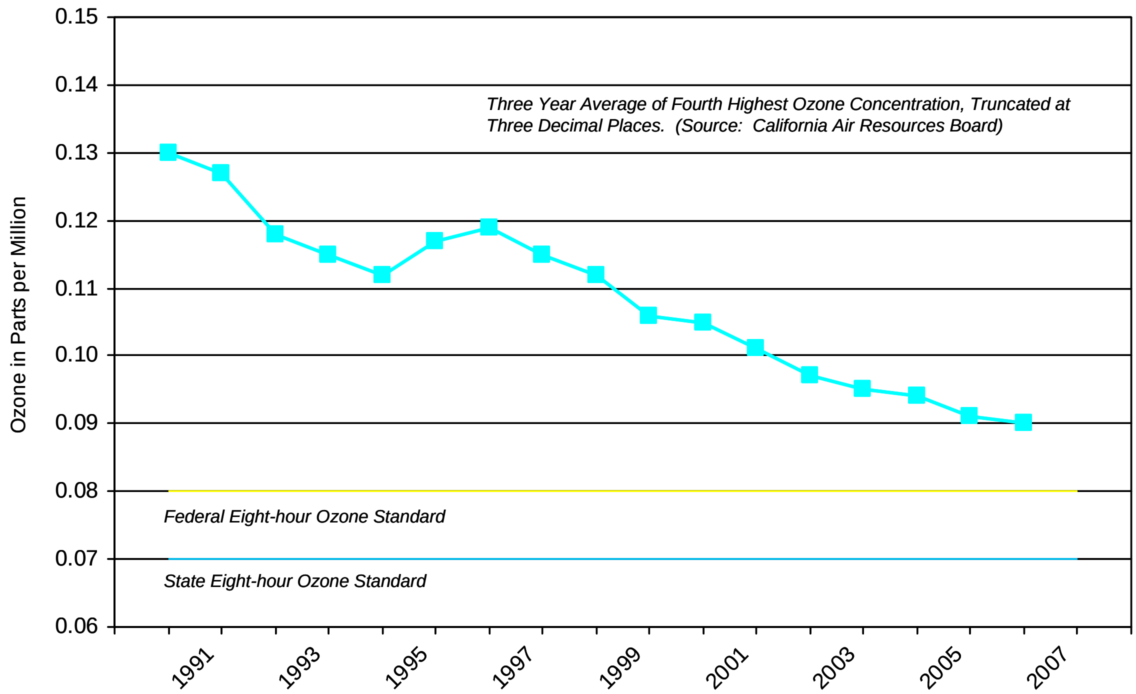


Figure 1-3
8-Hour Ozone Values for Simi Valley & Ojai Valley

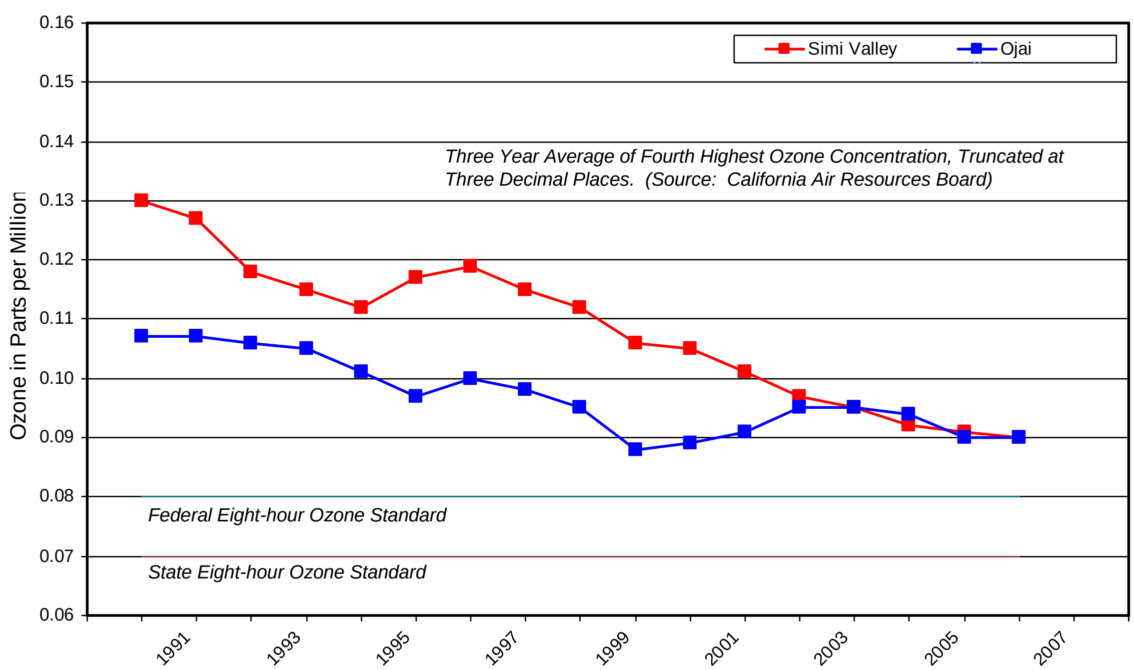


Figure 1-4
8-Hour Ozone Values for Piru & Thousand Oaks

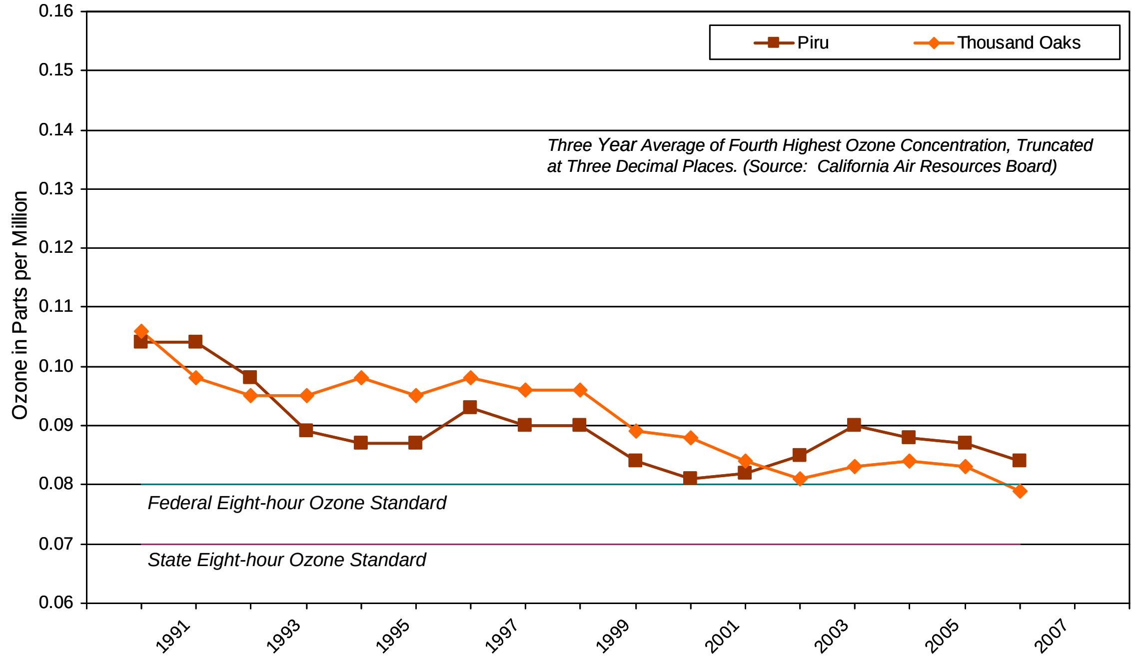
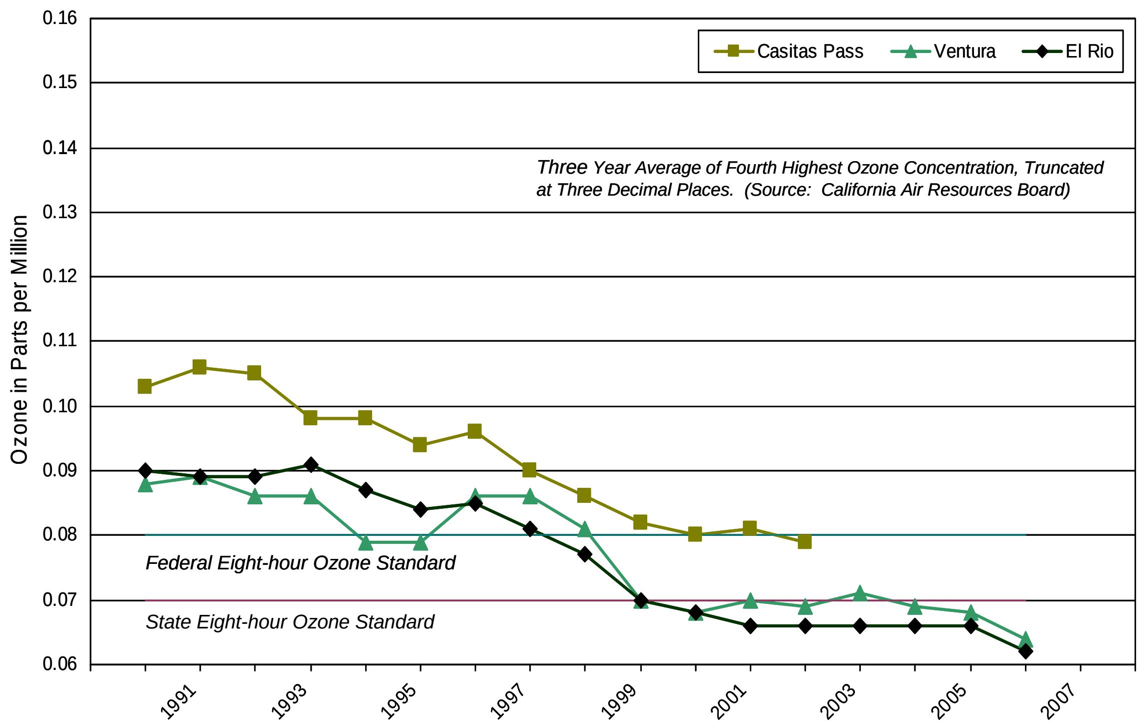


Figure 1-5
8-Hour Ozone Values for Casitas Pass, Ventura, & El Rio



2. 2002 BASELINE EMISSIONS INVENTORY

An emissions inventory is a large dataset that, as a whole, describes emission sources and quantifies pollutants released into the atmosphere. Ozone nonattainment areas, such as Ventura County, must develop and continue to update baseline inventories to evaluate federal, state, and local control programs and report emission reduction progress. A baseline year is a specific year used to gauge and evaluate past or future emission estimates. The 2002 emissions inventory is the baseline for forecasting future year emissions and from which the SIP inventories are derived. EPA identifies 2002 as the emissions inventory base year for the SIP planning process in the November 8, 2002 EPA memorandum, *2002 Base Year Emission Inventory SIP Planning: 8-Hour Ozone, $PM_{2.5}$ and Regional Haze Programs*.

This chapter summarizes the 2002 baseline ROG and NOx emissions inventory for the Ventura County ozone nonattainment area, and reports those pollutants in tons per day (TPD). Calculations are based on the ozone summer season (May – October), when temperature inversions and ozone formation potential are the greatest. Emission categories inactive or less active during the ozone summer months do not carry as much weight in the SIP inventory. Examples of inactive summer month emissions are activities such as orchard heating or wood fireplace heating. Focusing on the May through October months increases the analysis of ROG and NOx emissions, which are the concern of this plan.

Table 2-1 presents the 2002 summary of summer day emissions, also referred to as "planning day emissions" for ROG and NOx, which are the most important pollutants in terms of the air chemistry and creation of ozone. ROG is not a pollutant that is directly measured but is the reactive fraction of the total organic compounds (TOC). Therefore, ROG excludes methane and other compounds with inconsequential effects on ozone photochemical reactivity. For a complete list of compounds that are considered non-reactive, refer to District Rule 2, under *Definitions, Exempt Organic Compounds*.

Emissions data are compiled into major source categories and Ventura County emissions are also distinguished by onshore and offshore geographic areas. Onshore emissions include sources out to the 3-mile State Tidelands boundary area referred to in this document as the South Central Coast (SCC) Air Basin of Ventura County. Offshore emissions include sources in the Outer Continental Shelf (OCS) Air Basin, in waters beyond the 3-mile state boundary. Geographic boundaries distinguish the emissions in this chapter and Chapter 4. The analysis of emissions control responsibility falls into this geographic air basin division.

2.1. Emissions Inventory Reporting Requirements

This document complies with both state and federal emissions inventory reporting requirements in the update of the 2002 base year actual emissions (Chapter 2) and future year forecast methodology (Chapter 4). The federal emissions inventory requirements are included in the EPA document, *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations*. In addition, the California Health and Safety Code Sections 40913(4)(5), 40914(c), 40918(a) 40924(b) and 40925(a) require emissions inventory review, correction, and incorporation of the most current emissions factors and growth and control data and future year forecast estimates.

Table 2-1
2002 Baseline Summer Planning Day Emissions

Both SCC and OCS Air Basins	(tons/summer day) ROG	NOx
Total Stationary and Area-wide Sources	24.83	7.74
Total On-road Vehicle Sources	20.31	30.00
Total Other Mobile Sources	15.22	37.45
Total Emissions	**60.36**	**75.19**

NOTES:
Source: CEFS v1.06 (November 2006).
Totals include ARB external adjustments (3/06/2008).

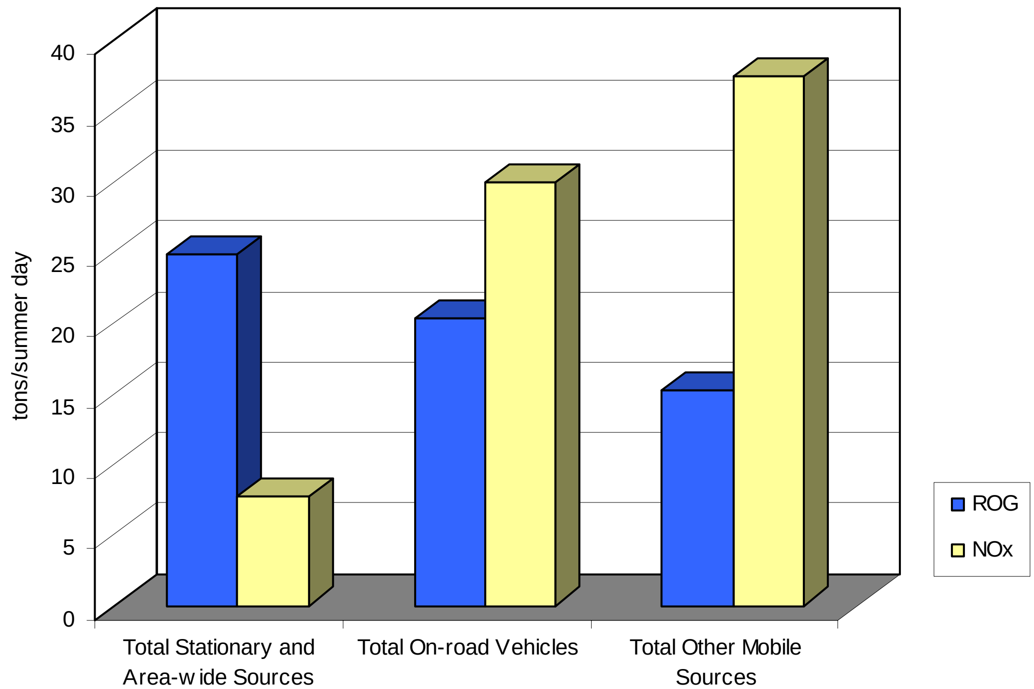
2.2. Emissions Inventory Major Categories

The 2002 base year emissions inventory is an aggregate of two very general emission release types: 1) Stationary Sources, comprised of point sources and stationary area-wide sources, and 2) Mobile Sources, comprised of on-road mobile sources and other mobile sources. Stationary Sources are those that have a static geographic location and Mobile Sources are mobile in nature. ARB maintains the California Emission Inventory Development and Reporting System (CEIDARS), the statewide emissions inventory database, which includes the current reactive fractions used for ROG estimates. The air pollution control districts, such as Ventura County, provide updates to many categories using local, unique data. Figure 2-1 displays the pollutant distribution from these major categories and reflects the 2002 Baseline Summer Planning Day Emissions.

2.2.1. Stationary Sources

Point sources are stationary emission sources identified on an individual basis due to the quantity or nature of their emissions. Examples of point sources include electrical power generating plants, large surface coating operations, and petroleum production facilities. Initially, point sources are identified through the District's Permit to Operate evaluation or during the rule development process. Permitted stationary sources are inspected annually, subject to air pollution rules applicable to specific facility operation. In addition, the District surveys the point source facilities annually to document changes to equipment and gather activity data and uses that data to calculate and update annual emissions. There were eight NOx point sources emitting greater than 25 tons per year and four ROG point sources emitting greater than 25 tons per year in 2002; these are considered “major” sources under CAAA Section 182(d). The District accounted for approximately 1,400 stationary sources in the 2002 baseline emissions inventory. Those major stationary sources are in the point source inventory and smaller sources are reflected in the stationary area-wide source categories.

Figure 2-1
2002 Baseline Summer Planning Day Emissions
Pollutant Distribution



Stationary area-wide sources are groups of similar emission sources that do not individually contribute significant amounts of pollutants, but when aggregated can contribute significant air emissions. Examples include consumer products (hairspray), gasoline station emissions, and residential heating emissions.

Emissions from area sources are determined in a variety of ways. One accepted estimation method, generally referred to as the "bottom-up" method, surveys local end users of an emission source product, such as organic solvents, to obtain specific countywide data by those industries using the product. Another estimation method, referred to as the "top-down" approach, evaluates the emissions based on a single emission source, such as architectural painting. The larger national or statewide data are gathered and apportioned down to the county level based on distribution factors representative of Ventura County.

Every year District staff evaluates the data and methods used in order to improve and update the emissions inventory. ARB and District staff coordinates the update process through the state's Emissions Inventory Technical Advisory Committee (EITAC). Currently, hundreds of new emission categories are available since the previous AQMP (1990 base year) was developed. The refinement of the emissions categories is ongoing and necessary to better classify and quantify the emissions, and to evaluate feasibility of new control technologies and cost-effectiveness of controls when developing state or local rules. Summaries of the area source methodologies are posted on the ARB's Index of Methodologies website.

2.2.2. Mobile Sources

There are two major source categories for mobile sources, On-Road Motor Vehicles, and Other Mobile Sources. ARB calculates mobile source emissions with input from detailed mobile source emission models known as the EMFAC On-road Model and the OFFROAD emissions model. Mobile sources, as a whole, contribute the largest amount of criteria air pollutants into the air statewide. Appendix C of this document includes a summary and general description of the On-Road Motor Vehicle emissions by Emissions Inventory Code (EIC). Complete documentation for mobile source category emissions is available at the following website: http://arb.ca.gov/msei/msei.htm, on the ARB mobile source main page for the EMFAC on-road mobile source model, and the OFFROAD mobile source model.

2.2.2.1. On-Road and Off-Road Emissions

The on-road mobile emissions are updated to reflect changes from the latest SCAG 2008 Regional Transportation Plan (RTP), California Department of Transportation (Caltrans), and the Department of Motor Vehicles (DMV) motor vehicle related data used in the ARB emissions model.

The 2002 base year and future year emissions are calculated using the current socioeconomic data in the SCAG regional transportation model for the 2008 RTP. The SCAG transportation model outputs are used in the EMFAC models. On-road motor vehicle emissions are based on ARB's EMFAC07v2.3 runs, dated March 12, 2008.

2.2.2.2. Other Mobile Sources

Other Mobile Sources encompass a wide variety of off-road equipment referred to as off-road emission sources. The major categories include emissions from aircraft, locomotives, commercial and recreational marine vessels, agricultural, construction, lawn and garden, and off-road recreation vehicles, and from hedge trimmers to cranes.

ARB estimates the majority of off-road emissions using the OFFROAD mobile source emissions model. OFFROAD is an integrated statewide model that estimates population, activity, and emissions for specific categories of equipment and fuel types at the county level. OFFROAD is used to generate base year emissions and to project changes in future inventories of mobile source emissions. However, some categories such as locomotives, ocean-going vessels, and harbor craft are estimated in individual modules external from the OFFROAD model.

Additional information on ARB's Off-Road Emissions Inventory Program and the OFFROAD model is available on ARB's website at: http://www.arb.ca.gov/msei/offroad/offroad.htm.

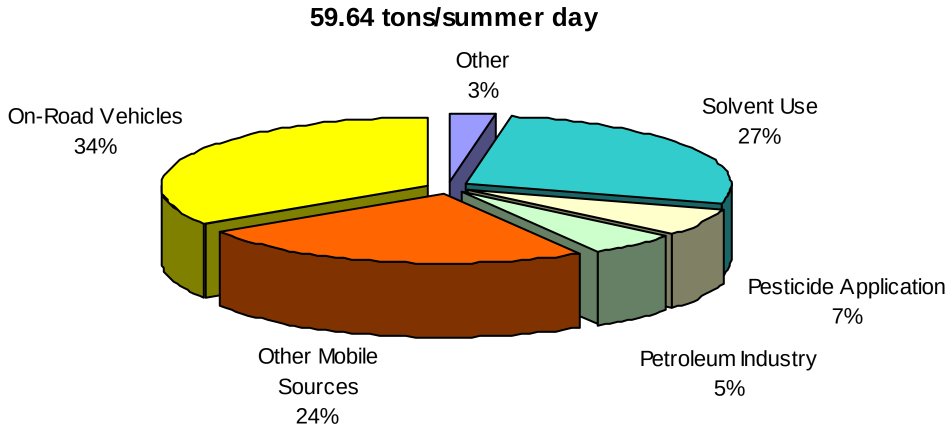
Table 2-2 presents the baseline emissions by major source category for the South Central Coast Air Basin (SCC) and Figure 2-2 and Figure 2-3 exhibit those emissions in percentages of ROG and NOx by major source category.

Table 2-2
2002 Baseline Planning Emissions by Major Source Category

Ventura County South Central Coast (SCC) Air Basin Major Source Category Name	(tons/summer day) ROG	 NOx
Stationary Sources		
Fuel Combustion	0.76	5.88
Waste Disposal	0.09	0.09
Cleaning and Surface Coatings	6.30	0.00
Petroleum Production and Marketing	3.10	0.04
Industrial Processes	0.37	0.08
Total Stationary Sources	**10.62**	**6.08**
Area-wide Sources		
Solvent Evaporation	13.53	0.00
Miscellaneous Processes	0.59	1.27
Total Area-wide Sources	**14.12**	**1.27**
Mobile Sources		
On-Road Motor Vehicles	20.31	30.00
Other Mobile Sources	14.59	24.49
Total SCC Mobile Sources	**34.90**	**54.49**
TOTAL SCC AIR BASIN	**59.64**	**61.83**

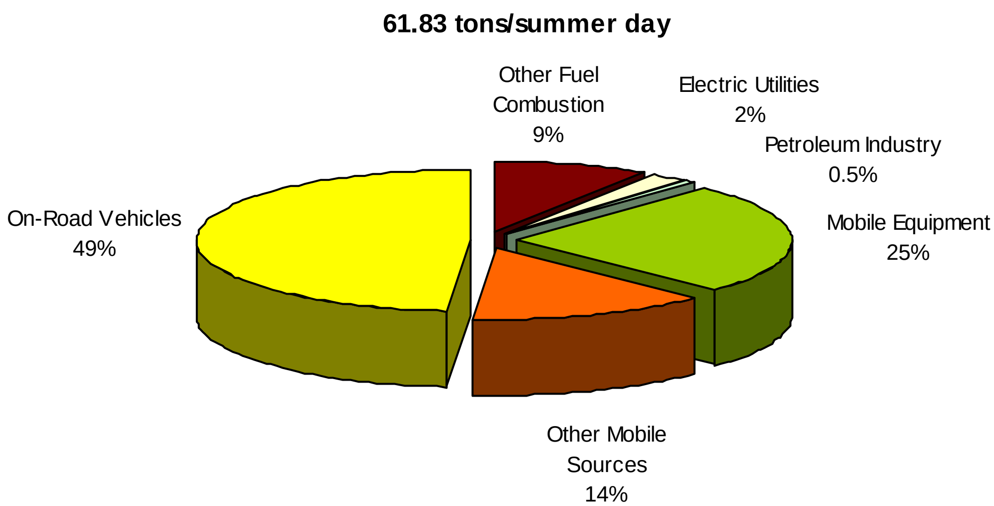
NOTES:
Source: CEFS v.1.06 (November 2006).
Includes ARB Adjustments (03/06/2008) and Revised On-Road Vehicles Emissions (03/12/2008).
Excludes OCS and Natural Sources.
Data rounding may affect totals.

Figure 2-2
Ventura County 2002 Planning Day
ROG Emissions Inventory



Reference:
ARB CEFS v1.06.
Includes ARB Adjustments (03/06/2008).
OCS excluded.

Figure 2-3
Ventura County 2002 Planning Day
NOx Emissions Inventory



Reference:
ARB CEFS v1.06.
Includes ARB Adjustments (03/06/2008).
OCS excluded.

2.3. Ventura County Marine Emissions Inventory

Marine emission sources include marine related activities in the State Tidelands boundary area, within three miles of the Ventura County coastline. ARB defines this area as being part of the South Central Coast (SCC) Air Basin, which is composed of Ventura, Santa Barbara, and San Luis Obispo counties. The Ventura County portion of the SCC Air Basin includes the onshore marine activities of Ventura County and the Port of Hueneme and its approach corridors. Any reference in this document to the SCC Air Basin is specifically referring to only the Ventura County portion of the larger air basin.

Offshore marine emission sources occur in the region beyond the three-mile State Tidelands boundary, in the Outer Continental Shelf (OCS) and include the offshore shipping lanes in the Santa Barbara Channel and San Nicolas Island. The OCS region includes those waters between 3 and 100 miles from shore. The OCS emissions are significant and are included in the photochemical modeling used to demonstrate attainment of the 8-hour ozone standard. However, only emissions in the Ventura County portion of the SCC Air Basin are relevant to Ventura County's ozone nonattainment area.

Emission sources related to marine activities are a significant part of the overall base year emissions inventory for Ventura County. ARB undertook an extensive process to develop a new statewide emission inventory for several important categories of marine emission sources used for the 8-hour Ozone SIP and ozone attainment modeling. ARB staff, in cooperation with local districts, developed a 2002 base year consistent statewide emissions estimation methodology for ocean-going vessels operating in California coastal waters, ports and inland waterways. The methodology reflects updated vessel population and operational data, engine characteristics and emission factors for ocean-going vessels statewide.

2.3.1. Ventura County Portion of the South Central Coast Air Basin

Coastal emission sources in the SCC Air Basin in Table 2-2 include Ships and Commercial Boats, Recreational Boats and Cargo Handling Equipment in the Off-Road Equipment category. Cumulatively these categories account for over 4 tons/day ROG and 3 tons/day NOx in 2002.

Ships and Commercial Boats are comprised of large commercial ocean-going vessels calling on Port Hueneme, smaller commercial boats and harbor craft, and military vessels affiliated with the U.S. Navy. Together these sources generate 1.4 tons/day NOx in 2002. Categories of ocean-going vessels include auto carriers, bulk cargo carriers, container vessels, passenger vessels, roll-on/roll off vehicle carriers, refrigerated cargo vessels, and tankers. Of the over 300 ocean-going vessels calling on Port Hueneme annually, the majority are auto carriers and refrigerated produce vessels.

NOx emissions from ocean-going vessels are 17% of the coastal total in 2002.

Commercial Boats and Harbor Craft include commercial fishing vessels, charter fishing vessels, excursion boats, tug and towboats, and crew and supply boats associated with the four offshore oil and gas production platforms. Over 75% of the commercial boats in Ventura County are commercial fishing boats. Commercial boats contribute over 21% of coastal NOx in 2002. Military vessel operations occur at the U.S. Navy facilities at the Port of Hueneme and include large naval ships, smaller support and operations vessels, tugboats, and other vessels, including some non-military vessels utilizing Navy facilities. Military vessels account for 6% of coastal NOx emissions in 2002.

Recreational Boats include vessels with outboard, inboard and stern-drive engines, sailboat auxiliary engines, and personal watercraft. Recreational vessels account over 90% or over 3.8 tons/day of the coastal ROG emissions in 2002 and 30% of NOx, about 0.9 tons/day.

Cargo Handling Equipment in the coastal waters include port operations/cargo handling equipment operating in association with large commercial vessels calling on Port Hueneme, such as yard tractors, forklifts, cranes, loaders, and other material handling equipment. Cargo Handling Equipment contributes about 0.8 tons/day or one quarter of coastal NOx in 2002.

2.3.2. Outer Continental Shelf Air Basin Marine Emissions

Marine activities are even more significant emission sources in the OCS Air Basin. As presented in Table 2-3, Figure 2-4, and Figure 2-5, emissions from Ships and Commercial Boats, including large commercial ocean-going vessels, smaller commercial boats, and military vessels, comprise the vast majority of emissions in the OCS Air Basin, almost 13 tons/day NOx, or over 96%, and over 77% of total ROG.

Commercial Ocean-going Vessels traversing the Santa Barbara Channel shipping lanes offshore of Ventura County include vessels calling on Port Hueneme or the ports of Los Angeles/Long Beach, and transiting vessels passing through southern California waters but without calling at either port. Over 10 tons/day of NOx in 2002 came from ocean-going vessels, about 77% of total NOx in the OCS, as well as over 39% of total ROG. Commercial boats include commercial and passenger charter fishing boats, excursion boats, tugboats and crew & supply boats affiliated with the offshore oil and gas production platforms. Commercial boats contribute over a third of offshore ROG and 2.3 tons/day of NOx emissions in 2002.

Military Vessels are large naval vessels, smaller support vessels, and tugboats operating offshore and in the approach corridors to Port Hueneme. Military Vessels account for about 5% of 2002 offshore ROG and less than 3% of NOx. In addition, aircraft emissions are associated with military aircraft operations at the U.S. Naval facility on San Nicolas Island, including transports, jet aircraft, and helicopters. The military aircraft activities are responsible for over 10% of offshore ROG emissions in 2002. Table 2-3 shows total emissions from these operations.

Stationary Sources are responsible for considerably smaller offshore emissions than Mobile Sources, about 13% of total offshore ROG and 3% of NOx. Oil & Gas Production ROG emissions include fugitive hydrocarbon losses from oil and gas production components and production and processing equipment on the off-shore oil and gas production platforms. Other offshore emission sources contributing less than 5% of total offshore ROG or NOx include electric generating types of equipment, natural gas flaring, and routine maintenance operations for the offshore oil and gas production platforms and the U.S. Naval facility on San Nicolas Island, all of which are permitted point sources.

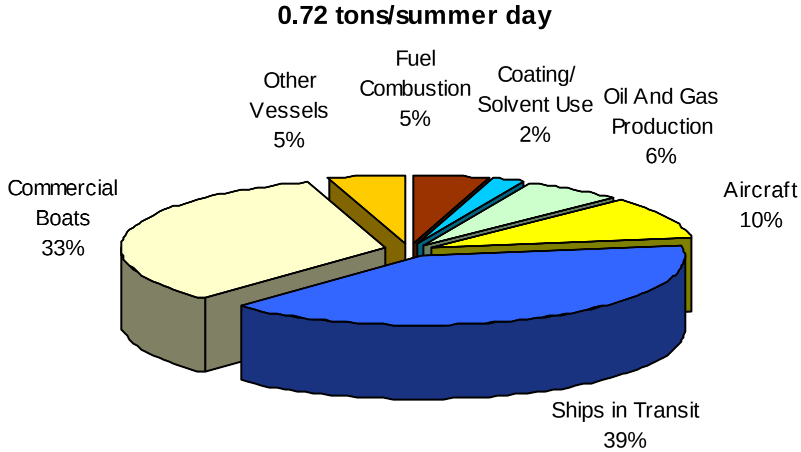
Table 2-3
2002 OCS Baseline Planning Emissions
by Emissions Inventory Category Name

Ventura County
Outer Continental Shelf (OCS) Air Basin — **(tons/summer day)**

Emissions Category Name	ROG	NOx
Stationary Sources		
Fuel Combustion		
Oil and Gas Production (Combustion)	0.01	0.15
Service and Commercial	0.02	0.24
Total Fuel Combustion	**0.03**	**0.39**
Cleaning and Surface Coatings		
Coatings and Related Process Solvents	0.01	0.00
Total Cleaning and Surface Coatings	**0.01**	**0.00**
Petroleum Production and Marketing		
Oil and Gas Production	0.04	0.01
Petroleum Marketing	0.00	0.00
Total Petroleum Production and Marketing	**0.04**	**0.01**
Total OCS Stationary Sources	**0.09**	**0.40**
Mobile Sources		
Other Mobile Sources		
Aircraft	0.07	0.04
Ships and Commercial Boats	0.56	12.92
Total Other Mobile Sources	**0.63**	**12.96**
Total OCS Mobile Sources	**0.63**	**12.96**
TOTAL OCS AIR BASIN	**0.72**	**13.36**

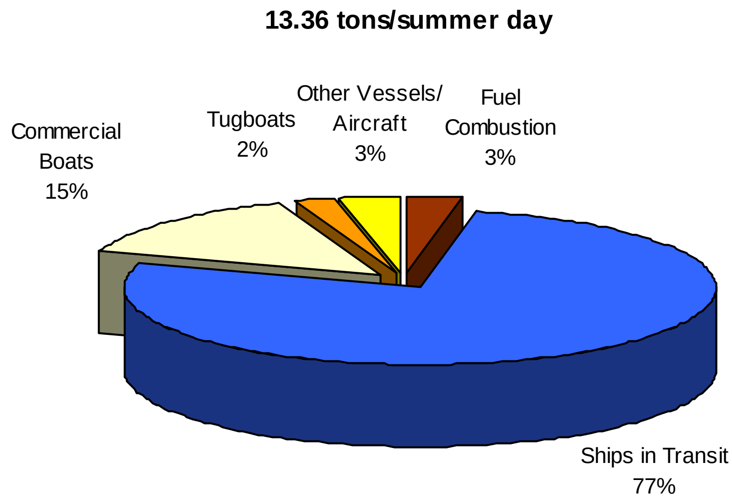
NOTES:
Source: CEFS v1.06 (November 2006).
No ARB adjustments needed for OCS.
Excludes Natural Sources.

Figure 2-4
Ventura County 2002 Planning Day
ROG Emissions Inventory (OCS Air Basin)



Reference:
ARB CEFS v1.06 (November 2006).
OCS is 3 – 100 miles offshore.

Figure 2-5
Ventura County 2002 Planning Day
NOx Emissions Inventory (OCS Air Basin)



Reference:
ARB CEFS v1.06 (November 2006).
OCS is 3 – 100 miles offshore.

3. CONTROL STRATEGY

This chapter presents the control strategy for the 2007 AQMP to achieve the federal 8-hour ozone standard. Since 1979, Ventura County's ozone strategy has been concurrent ROG and NOx emission reductions from stationary and mobile sources. Ventura County was the first area in the nation to institute a dual ROG/NOx strategy for meeting state and federal clean air standards for ozone.

The 2007 AQMP control strategy consists of a local component implemented by the District and a combined state and federal component implemented by the ARB and EPA. The District has primary responsibility for regulating stationary sources, including some area sources, within Ventura County. The ARB regulates on-road motor vehicles, some off-road mobile sources, and consumer products, and sets motor vehicle fuel specifications in California. The EPA regulates emissions from locomotives, aircraft, heavy-duty trucks used in interstate commerce, and some off-road engines exempt from state authority or best regulated at the national level. State and federal laws prohibit local air districts from regulating mobile sources.

The District's component of the 2007 AQMP control strategy consists of cost effective stationary source control measures, TCMs, and the District's voluntary mobile source incentive programs. Most of these local control program elements were in previous Ventura County clean air plans. California air agencies, including this air district, have aggressively pursued measures to meet state and federal clean air standards and have developed many of the most innovative and effective clean air strategies in the world.

Ventura County, along with other California air agencies, long ago implemented clean air measures that other parts of the country are just now considering. By 2002, the District fully implemented most of the local control measures in earlier Ventura County AQMPs, and most stationary sources in the county are now subject to stringent clean air regulations. Consequently, new local emission reductions are becoming ever smaller and often not economically or technologically feasible for sources in Ventura County. The percentage of total countywide ROG and NOx emissions (OCS Air Basin excluded) under District authority to regulate has been shrinking for many years and is now less that 50 percent.

ARB's component of the 2007 AQMP control strategy consists of its new State Strategy for California's 2007 SIP, a comprehensive clean air strategy designed to achieve federal air quality standards through a combination of technologically feasible, cost effective, and far-reaching measures. It describes the scope of California's ozone and fine particulate matter ($PM_{2.5}$) nonattainment problems and presents ARB staff's recommendations on how California can comply with federal clean air standards.

As elsewhere in California, Ventura County's ongoing progress towards clean air depends largely on current and proposed mobile source strategies under state and federal jurisdiction. District efforts will nonetheless remain crucial for Ventura County to attain and maintain state and federal clean air standards.

3.1. Stationary Source Control Measures

Stationary source control measures are equipment and techniques for reducing air pollutant emissions from stationary sources. Examples of stationary source control measures include vapor collection systems on gasoline and oil storage tanks, landfill gas recovery systems, and replacing internal combustion engines with electric motors. Control measures provide the framework for District clean air rules that reduce ROG and NOx emissions. ARB's Ventura County APCD List of Current Rules website lists all District rules referenced in this and other sections of the 2007 AQMP.

3.1.1. Control Measures with Emission Reductions Beyond the Base Year

This section presents ROG and NOx control measures already adopted as APCD rules but not fully implemented by the end of 2002, the base year for the 2007 AQMP. Table 3-1 presents these measures with expected emission reductions expressed in tons per day. The District will continue to implement these measures.

3.1.2. New Stationary Source Control Measures

This section presents new stationary source control measures recommended for inclusion in the 2007 AQMP as part of Ventura County's strategy to attain the federal and state ozone standards. In each case, the new measure is a proposed revision to an existing District rule. Table 3-2 summarizes these measures. The new measures also serve to meet the "every feasible measure" requirement of the California Clean Air Act (see Section 8.6). The emission forecasts do not reflect emission reductions from these measures.

Table 3-1
Stationary Source Control Measures - Local Control Measures Only

CM Number	Control Measure Name	District Rule	Year Adopted/ Amended	Year Impl'd.	Summer Planning Day Emissions (tpd) 2002	2008 (Emission Reductions)	2011 (Emission Reductions)	2012 (Emission Reductions)
ROG Control Measures								
R-303	Architectural Coating	74.2	1991	1992	0.02	0.00	0.00	0.00
R-306	Wood Product Coating	74.30	1994	2006	0.07	0.00	0.00	0.00
R-314	Adhesives	74.20	1993	1995	0.20	0.03	0.03	0.03
R-316	Graphic Arts Solvents	74.19	1992	1993	0.20	0.01	0.01	0.01
R-321	Pleasure Craft Coating	74.24.1	1998	1999	0.00	0.00	0.00	0.00
R-328	Surface Cleaning & Degreasing [a]	74.6 & 74.6.1	2003	2004	3.12	1.07	1.12	1.14
R-501	Fiberglass/Polyester Resin Use	74.14	2005	2005	0.02	0.00	0.00	0.00
R-504	Restaurant Cooking Operations	74.25	2004	2005	0.05	0.01	0.01	0.01
Total ROG Control Measure Emissions					**3.68**	**1.13**	**1.18**	**1.19**
NOx Control Measures								
N-102	Boilers, Steam Gen, Heaters <1MMBtu	74.11.1	1999	2000	0.10	0.04	0.05	0.05
N-110	Fan Type Central Furnaces	74.22	1993	1994	0.20	0.07	0.11	0.12
Total NOx Control Measure Emissions					**0.31**	**0.11**	**0.16**	**0.17**

NOTES:
[a] Every feasible measure.
Data rounding may affect displayed values and totals.

Table 3-2
New Stationary Source Control Measures

CM Number	District Rule	Control Measure Name	Proposed Rule Adoption	Proposed Rule Implementation
R-311	74.18	Motor Vehicle & Mobile Equipment Coating Operations	2008	2010
R-332	74.12	Surface Coating of Metal Parts and Products	2008	2009
R-329	74.2	Architectural Coatings	TBD [a]	TBD
R-606	74.29	Soil Decontamination Operations	2008	2009

NOTES:
Emission reductions from these new measures are not reflected in the emission forecasts.
This table does not list control measures fully implemented before 2002.
[a] To be determined.

R-311, Motor Vehicle & Mobile Equipment Coating Operations: This control measure would revise District Rule 74.18, *Motor Vehicle and Mobile Equipment Coating Operations*, to incorporate the requirements of ARB's suggested control measure (SCM) for automotive refinishing. The proposed rule revision would establish volatile organic compound (VOC) limits for specific automotive refinishing categories. It would also prohibit anyone from applying, manufacturing, blending, repackaging for sale, supplying, offering for sale, distributing, possessing, or selling any automotive coating that does not meet the VOC limits, except when the coating is sold for use with an approved emission control systems that is at least 85 percent efficient. The proposed standards also specify the manner in which the coatings may be applied. The SCM also prohibits the use of solvents that exceed a VOC content limit of 25 grams per liter, and specifies that any VOC-containing materials or products must be stored in closed, vapor-tight container when not in use and spray guns must be cleaned in a closed system or its approved equivalent.

ARB staff estimates that the cost effectiveness of the SCM to be $1.43 per pound of VOC reduced, which compares favorably with the cost effectiveness of similar measures such as the 2000 Architectural Coatings SCM ($3.20 per pound of VOC reduced). The average annual cost to automotive refinishing facilities is estimated to be $3,400.

The proposed District rule only addresses the VOC coating limits of the SCM. Adoption of the SCM provisions pertaining to VOC solvent content limits will occur later to give District staff time to study their feasibility for application in Ventura County.

District Rule: 74.18
Proposed Rule Adoption Date: 2008
Proposed Rule Implementation Date: 2010
Required Board Action: Adoption of a rule revision
Cost-effectiveness: $1.43 per ton of VOC reduced (overall)
Control Efficiency: 50%
Emission Reductions: 0.23 tons per day, ROG

<u>R-332, Surface Coating of Metal Parts and Products</u>: This control measure would reduce ROG emissions from general purpose, single component, air-dry metal coatings and from solvents used for substrate cleaning, spray gun cleaning, and general cleanup through two revisions to District Rule 74.12, S*urface Coating of Metal Parts and Products.*

The revised rule would limit the ROG content of general air-dry coatings to 2.3 lb/gallon. In addition, the rule would also limit the “Multi- Component Coatings” category with an ROG content limit of 2.8 lb/gallon. This category excludes other listed specialty multi-component coatings. The revised rule would also limit the solvents used for substrate cleaning, spray equipment cleaning, and general cleanup to no more than 25 grams per liter (0.21 lb/gallon). Spray gun washers would no longer be required but recommended.

These revisions are based on similar coating categories and standards in South Coast Air Quality Management District (AQMD) Rule 1107, *Coating of Metal Parts and Products*. The second revision reduces the ROG content limit for surface preparation and cleanup solvents to 25 grams of ROC per liter (0.21 lb/gal). This limit also appears in South Coast AQMD Rule 1171, *Solvent Cleaning Operations*.

The cost-effectiveness of replacing certain 2.8 lb/gal coatings with 2.3 lb/gal coatings is $15,441 per ton of ROC reduced. The cost-effectiveness of the proposed low-ROC solvent requirement ranges from $359 per ton of ROC reduced to $6,470 per ton.

The revisions to Rule 74.12 would reduce actual ROG emissions from the coating of metal parts and products about 19 percent, or 0.02 tons per day. About 36 percent of the emission reductions would result from the change in coating requirements. The remaining 64 percent would result from the proposed 25 g/l threshold for cleaning solvents.

District Rule: 74.12
Rule Adoption Date: 12/08
Rule Implementation Date: 6/09
Required Board Action: Adoption of a rule revision
Cost-effectiveness: Coating solvent limit - $15,441 per ton of ROC reduced
Cleaning solvent limit - $359 per ton of ROC reduced to $6,470 per ton of ROC reduced
Control Efficiency: 19% (overall)
Emission Reductions: 0.02 tons per day (overall), ROG

R-329, Architectural Coatings: This control would revise District Rule 74.2, *Architectural Coatings*, to incorporate the requirements of ARB's revisions to its SCM for architectural coatings. The purpose of the revisions is to enhance the effectiveness of the SCM to obtain ROG emission reductions. The changes include lowering VOC content limits for several coating categories, adding new coating categories, and deleting several coating categories because they are no longer needed as separate SCM categories. The revised SCM also contains revised coating category definitions either for clarification purposes or to improve rule enforcement. In addition, ARB staff found that some definitions required revision, based on their analyses of data submitted for the 2005 Architectural Coating Survey. The ARB adopted the SCM in October 2007.

District Rule: 74.2
Proposed Rule Adoption Date: To be determined
Proposed Rule Implementation Date: To be determined
Required Board Action: Adoption of a rule revision
Cost-effectiveness: Being determined
Control Efficiency: Being determined
Emission Reductions: Being determined, ROG

R-606, Soil Decontamination Operations: This measure would revise District Rule 74.29, *Soil Decontamination Operations*, to incorporate various enhancements. The purpose of the enhancements is to obtain further emission reductions from soil decontamination operations. The proposed revisions include controlling emissions during transport of contaminated soil; treating or removing contaminated soil within 30 days of excavation; lowering various exemption levels; prohibiting off-site soil aeration; keeping active soil storage piles wet or covered; covering inactive storage piles within one hour; and monitoring excavation sites.

District Rule: 74.29
Proposed Rule Adoption Date: 2008
Proposed Rule Implementation Date: 2009
Required Board Action: Adoption of a rule revision
Cost-effectiveness: Being determined
Control Efficiency: Being determined
Emission Reductions: Being determined, ROG

3.1.3. Further Study Control Measures

Further study measures are emission control methods that are not proposed for adoption as District rules at this time, due to inconclusive information about their technical feasibility, economic feasibility, or appropriateness for Ventura County. District staff will evaluate these measures and will adopt them as District rules if they prove feasible and appropriate for Ventura County.

California Health and Safety Code Section 40914(b)(2) requires that the District's clean air plan for the California ambient ozone standards include expeditious implementation of "every feasible measure" to reduce ozone precursor emissions, ROG and NOx. Measures that help Ventura County attain the state ozone standard also help the county attain the federal 8-hour ozone standard.

District staff reviewed the District's rules for its periodic rule evaluation for the California Clean Air Act. This review determined that the rules listed in Table 3-3, Further Study Control Measures, have potential for enhancement, thereby realizing additional emission reductions for both the federal and state ozone standards. Consequently, the District rules listed in Table 3-3 will serve a dual purpose. They will serve as potential measures for the District's federal 8-hour ozone plan and will meet the "every feasible measure" requirement for the state ozone standard. In addition, staff identified a potential new rule for oil well degassing operations. This measure, if shown to be economically and technologically feasible in Ventura County, would control ROG emissions when natural gas is vented prior to repair work on oil wells. The emission reduction potential is unknown at this time but is likely significant.

Section 8.6 presents further information regarding these rules. The District commits to rulemaking for these measures, during which District staff will evaluate the feasibility of each measure for Ventura County. For measures found feasible through the rulemaking process, District staff will provide emission reduction estimates prior to rule adoption.

Table 3-3
Further Study Control Measures

CM Number	District Rule	Control Measure Name	Rulemaking Schedule
R-316 [a]	74.19	Graphic Arts	2008
R-330	74.6	Surface Cleaning & Degreasing	TBD [b]
R-331	74.6.1	Batch Loaded Vapor Degreasers	TBD
R-431	70	Storage and Transfer of Gasoline	TBD
R-432	None	Oil Well Degassing	2009
Various [a]	Various	Coating Rules (74.12, 74.13, 74.21, 74.24, 74.30)	2008

NOTES:
[a] Further evaluation for RACT compliance (See Section 3.1.6.1).
[b] To be determined.

3.1.4. Reasonably Available Control Measures

CAAA Sections 172(c)(1) and (c)(2) require the District to demonstrate that it has adopted all control measures necessary to attain the 8-hour ozone standard as expeditiously as practicable and to meet RFP requirements. Reasonably available control measures (RACM) applies to both stationary source control measures and TCMs. The District has met this requirement for stationary sources through the Reasonably Available Control Technology (RACT) SIP presented in Section 3.1.5, the analyses of the revised control technique guidelines (CTG) presented in Section 3.1.6.1, and through a separate RACM analysis presented in Section 3.2.3.

3.1.5. Reasonably Available Control Technology

CAAA Sections 182(b)(2) and 182(f) (42 U.S.C. §7511a) require ozone nonattainment areas to implement RACT for sources that are subject to CTG and for “major sources” of ROG and NOx, which are ozone precursors. RACT is the lowest emissions limitation that a particular source is capable of meeting by application of control technology that is reasonably available considering technological and economic feasibility (44 FR 53762; September 17, 1979). RACT requirements are included in the CAAA to assure that significant source categories at major sources of ozone precursor emissions are controlled to a “reasonable” extent, but not necessarily to the more stringent best available control technology (BACT), or maximum achievable control technology (MACT) levels, expected for new or modified existing major stationary sources. CTGs are EPA documents that define RACT for existing sources of air pollution. Emission sources covered by CTGs are termed CTG sources.

3.1.6. RACT SIP

According to the EPA’s *Final Rule to Implement the 8-Hour Ozone NAAQS* (70 FR 71612; November 29, 2005), areas classified as moderate nonattainment or higher must submit a demonstration that their current rules fulfill 8-hour ozone RACT for all CTG categories and all major, non-CTG sources as a revision to their SIPs. RACT SIP submittals are in addition to the 8-hour ozone attainment plans. The RACT SIPs were due to EPA by September 15, 2006.

The District approved its RACT SIP on June 27, 2006 and sent it to ARB for submittal to EPA. ARB submitted the District's RACT SIP to EPA on January 31, 2007. The RACT SIP found that all District rules that apply to ozone precursor emissions fulfill RACT requirements for the 8-hour ozone NAAQS. The rules meet RACT or, more commonly, exceed RACT because they comply with more current and stringent control requirements of the California Clean Air Act. The RACT SIP also found that all CTG sources and major non-CTG sources within District boundaries meet or exceed RACT. These findings are not surprising since Ventura County has had a very aggressive clean air program for many years.

3.1.6.1. Updated CTGs

The CAAA requires the EPA to revise RACT, update existing CTG documents, or develop new documents, on a frequent basis to provide states and local clean air agencies with the most current technical information and assist them in determining RACT. In September 2006, the EPA updated the following CTGs:

- Offset Lithographic and Letterpress Printing
- Industrial Cleaning Solvents
- Flexible Packaging Printing
- Flat Wood Paneling Coatings

District staff compared applicable District rules to the updated CTGs and concluded that the spray gun cleaning requirements in several District coating rules (Rules 74.12, 74.13, 74.18, 74.21, 74.24, 74.30) may not meet the corresponding stringency requirements in the CTG for Industrial Cleaning Solvents. Likewise, the District may need to revise Rule 74.19, *Graphic Arts*, to meet the alcohol content limit for fountain solutions recommended in the CTG for Offset Lithographic and Letterpress Printing. However, Rule 74.19 does not specify an alcohol content limit for fountain solutions. Rather, it specifies an ROC content limit, which is not directly comparable to the CTG alcohol limit. Therefore, the District will evaluate and, if appropriate, revise its coating rules to address the Industrial Cleaning Solvents CTG regarding spray gun cleaning. The District will also evaluate District Rule 74.19 to address the Offset Lithography and Letterpress Printing CTG regarding the alcohol content of fountain solutions. Both of these rule evaluation commitments are reflected in Table 3-3, Further Study Control Measures.

The District does not need to revise Rule 74.19 with respect to flexible packaging printing because it already meets the stringency recommendations of the Flexible Packaging Printing CTG. Additionally, the District does not have any flat wood paneling coating sources.

3.1.7. New Source Review

NSR is a permitting program required by the CAAA to help ensure that new or modified equipment and facilities (e.g., boilers, turbines, crude oil storage tanks, power plants, and factories) do not significantly degrade air quality or slow progress towards clean air. NSR permits are legally binding documents that specify what can be constructed, what emission limits must be met, and how emission sources must be operated. The primary components of NSR are

BACT and emission offsets. The District's Engineering Division administers the District's NSR program. Further information regarding NSR is available on EPA's NSR website. Further information about the District's air permitting program is available on the District's Engineering Division website.

BACT is an emission limitation based on the maximum degree of reduction for each regulated air pollutant emitted from, or resulting from, any new or modified stationary source. It is generally determined on a case-by-case basis, taking into account energy, environmental and economic impacts, and other costs. Emission reduction credits (ERCs) are banked emission reductions available to offset emission growth from new, replacement, modified or relocated emissions units.

The District implements NSR through District Rule 26, *New Source Review*. Rule 26, which includes Rule 26 through 26.11, applies to new sources of air pollution and to modifications, replacements, and relocations of existing sources. The provisions of Rule 26 are applicable on a pollutant-by-pollutant and an emissions-unit-by-emissions-unit basis.

Rule 26 requires that source owners and operators apply BACT to minimize air emissions from these sources. BACT is determined on a case-by-case basis by District staff during the permit approval process. Rule 26 also requires that certain emission increases be offset with emission decreases. However, it allows banking of certain emission decreases as ERCs for later use as offsets.

3.1.8. Control Measures Not Retained in the 2007 AQMP

The 1994 AQMP contained stationary source control measures to help attain both the federal and state 1-hour ozone standards. This section presents stationary source control measures in the 1994 AQMP but not retained in the 2007 AQMP. Table 3-4 lists these measures. In each case, the District has not adopted the measure as a District rule because the measure became obsolete or infeasible for Ventura County based on technological or economic considerations. Additionally, for the reasons given with each measure, no emission reductions would be lost by not retaining these measures in the 2007 AQMP. The following discussion includes a brief description of each measure and the reason for not retaining it in the 2007 AQMP.

Table 3-4
Control Measures Not Retained in the 2007 AQMP

CM Number	Control Measure Name	Reason
R-322	Painter Certification Program	Proposed requirements included in District Rule 74.2 – *Architectural Coatings.*
R-327	Electronic Component Manufacturing	Proposed requirements included in Rule 74.6 – *Surface Cleaning & Degreasing.*
R-410	Marine Tanker Loading	Marine tanker loading facilities no longer operate in the county.
R-420	Pleasure Craft Fuel Transfer	Infeasible due to technological and safety issues.
R-421	Utility Engine Refueling	Proposed requirements included in ARB's Portable Fuel Container Spillage Control regulations.
N/R-705	Low Emission Fleets	Accomplished by District's *Carl Moyer Program* and ARB mobile source regulations and programs.

R-322, Painter Certification Program: This control measure would have reduced ROG emissions from architectural, industrial, and maintenance coating operations by instituting a painter certification program to emphasize pollution prevention methods, techniques, and practices that minimize the amount of coatings and solvents used, transferred, disposed of, and wasted.

This measure is now obsolete because District Rule 74.2, *Architectural Coatings*, is more cost-effective at reducing ROG emissions from architectural coating operations. Rule 74.2 was revised in 2001 to make the rule consistent with ARB's SCM for Architectural Coatings. The estimated emission reductions from the Rule 74.2 revision are 0.53 tons per day of ROC. This amount is about the same as from R-322. Hence, no emission reductions would be lost by not retaining R-322. Moreover, no other air district in California has proposed or implemented such a program.

R-327, Electronic Component Manufacturing: This control measure would have reduced ROG emissions from electronic component manufacturing through several control methods. These control methods included zero- or low-ROG solvents, improved operating procedures, and add-on emission control equipment.

This control measure is obsolete because its proposed requirements have been included in District Rule 74.6, *Surface Cleaning & Degreasing*. Hence, no potential emission reductions would be lost by not retaining R-327.

R-410, Marine Tanker Loading: District staff developed this control measure based on the ARB's BARCT determination for Marine Tanker Loading Operations. The measure would have reduced ROG emissions from marine tanker loading operations by requiring use of vapor collection systems during loading of petroleum products into marine tankers.

This measure is obsolete because Ventura County no longer has any marine tanker loading facilities. The marine tanker loading facilities that were in the county ceased operating in the 1990s, have been dismantled, and no longer have District air permits. Moreover, any new marine tanker facilities would be subject to the District's NSR rule and would have to install BACT to control ROG emissions during loading or unloading operations. No new marine tanker loading facilities in the county are anticipated at this time. Therefore, no emissions reductions would be lost by not retaining R-410.

<u>R-420, Pleasure Craft Fuel Transfer</u>: This control measure would have reduced ROG emissions from pleasure craft fueling operations through a new District rule to require Phase-II vapor recovery systems on facilities that refuel pleasure craft. The District is not retaining this measure in the 2007 AQMP because ARB has included the measure (FVR-2, Recover Fuel Vapors from Gasoline Dispensing at Marinas) in its 2003 Statewide Strategy and no emissions would be lost by not retaining R-420.

<u>R-421, Utility Engine Refueling Operations</u>: This control measure would have reduced ROG emissions from gasoline-powered utility equipment and motor vehicles refueling from portable fuel containers (gasoline cans). The measure called for all portable fuel containers sold or used in Ventura County to have spill control devices, such as leakless spouts, that prevent gasoline flow before the spouts are inserted into fuel tanks and after they are withdrawn from the tanks. In addition, fuel flow stops when the tanks become full, thus eliminating overfilling and spillage.

This measure is now obsolete because ARB is regulating portable fuel containers. The regulations include requirements such as spill-proof spouts, low permeation container walls, and labeling requirements. Therefore, no emissions would be lost by not retaining R-421.

<u>R-705/N-705, Low-Emission Vehicle Fleets</u>: This measure proposed to control ROG and NO_X emissions from public and private vehicle fleets. Fleet operators with vehicle fleets based in Ventura County would have been required to allocate a portion of their new fleet vehicle purchases to the purchase of low-emission vehicles. The measure would have applied to light-, medium-, and heavy-duty centrally-fueled fleets with more than a specified number of vehicles and would have gone beyond existing ARB programs.

This measure is not retained in the 2007 AQMP because the same amount of emission reductions are being achieved through the District's *Carl Moyer Memorial Air Quality Standards Attainment Program* and various ARB's motor vehicle emission standards and clean fuel fleet rules, such as the *Fleet Rule for Transit Agencies - Urban Bus Program, Solid Waste Collection Vehicle Rule*, and *Rule for On-Road Heavy-Duty Diesel-Fueled Public and Utility Fleets.* In addition, ARB is proposing new, more effective motor vehicle regulations that will further reduce ROG and NOx emissions in Ventura County. Therefore, a separate local low-emission fleet rule is not necessary and would not reduce motor vehicle emissions in Ventura County beyond what ARB's regulations and programs have achieved and will achieve. There are also legal issues regarding whether the District can regulate private motor vehicle fleets. Hence, no potential emission reductions would be lost by not retaining R-705/N-705.

3.2. Transportation Control Measures

TCMs are strategies that reduce motor vehicle emissions by reducing vehicle trips, vehicle use, vehicle miles traveled (VMT), vehicle idling, and traffic congestion. The CAAA requires TCMs, to meet progress milestones and demonstrate attainment of national air quality standards. The following strategies reduce emissions from on-road motor vehicles. These strategies were also in the 1994 AQMP.

Trip Elimination: This strategy reduces vehicle emissions by eliminating vehicle trips. The primary emissions eliminated are the cold-start emissions that occur when vehicle engines have been at rest for a period and then restarted. Cold-start emissions occur after engine startup but before the engines are warm enough for the emission control systems to work effectively. Cold-start emissions are a large percentage of total vehicle emissions and thus a major source of ozone precursors. Telecommuting, carpooling, combining trips, flexible work schedules, and certain land use measures that provide housing near jobs and shopping centers are strategies that eliminate vehicle trips.

Vehicle Substitution: This strategy reduces emissions associated with motor vehicle use by using nonmotorized transportation modes, which do not produce air emissions. Walking, biking, and telecommuting are all examples of vehicle substitution. Adopting trip reduction ordinances is a mechanism to encourage walking or biking facilities and discourage motor vehicle use in highly congested areas.

Vehicle Miles Traveled Reduction: This strategy reduces motor vehicle emissions because vehicles traveling fewer miles produce fewer emissions. This strategy does not reduce cold-start emissions. Park-and-ride lots, carpooling, and land use measures are all ways to reduce trip distances and, therefore, vehicle miles traveled and vehicle emissions.

Vehicle Occupancy: Increasing the number of passengers per vehicle can reduce all emissions associated with motor vehicle use. Transit, carpools, and vanpools are all mechanisms to implement this strategy. Other mechanisms include providing ridematch services for carpools and vanpools, restricting or limiting roads for high occupancy vehicles and passenger buses, establishing employer-based transportation management programs that encourage carpooling, vanpooling and transit use among employees.

Technological Improvements: This strategy reduces emissions through technological improvements to the internal operation of motor vehicles and the technologies used to improve the performance of transportation systems. Clean-fuel/electric vehicles, vehicle emission controls, Intelligent Transportation Systems, signal synchronization and freeway management systems that improve the performance of transportation systems are all mechanisms to implement this strategy. Programs to control extended idling of vehicles and remove older, high-polluting vehicles through vehicle scrapping incentives reduce emissions as well.

3.2.1. Transportation Control Measures Categories and Projects

This section presents the transportation control measures (TCMs) in the 2007 AQMP. The TCMs are grouped by categories and projects under control measure R-700/N-700, Transportation Control Measures, an umbrella control measure retained from the 1994 AQMP. To be included in the AQMP, potential projects must be TCMs in SCAG's Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP).

Candidate projects are first screened by District, Ventura County Transportation Commission (VCTC), and SCAG staff to determine if they are TCMs as defined by the project categories listed in Table 3-5. SCAG's Transportation Conformity Working Group, the local agency for the interagency consultation process required by the federal transportation conformity regulation, then formally confirms the projects as TCMs eligible for inclusion in the RTP and RTIP. The interagency consultation process is part of the federal transportation conformity regulation that requires procedures for federal, state, and local air districts and transportation agencies to consult with each other on transportation plans, programs, and projects. Transportation conformity is a regulatory process to help ensure that transportation plans, programs, and projects are consistent with air quality goals. District Rule 221, *Transportation Conformity*, contains a memorandum of understanding that outlines the interagency consultation process. Further information regarding transportation conformity is presented in Section 3.3 below.

The RTP is a long-range regional plan (minimum 20-years) that provides a blueprint for future transportation improvements and investments based on specific transportation goals, objectives, policies, and strategies. RTPs, based on federal transportation law, identify strategies to meet mobility, financial and air quality requirements. RTIPs are short-term transportation programs, with a six-year planning horizon, that identify specific transportation projects to implement the RTPs. SCAG is the Metropolitan Planning Organization responsible for updating the RTP and RTIP every four and two years, respectively, for the six-county SCAG region, including Ventura County. Both the RTP and RTIP for the SCAG region are on SCAG's RTP and RTIP websites.

The 2008 RTP is SCAG's multi-modal plan for a better regional transportation system, integrated with the best possible growth pattern for the region out to 2035. The plan provides the basic policy and program framework for long-term investment in the region's vast transportation system in a coordinated, cooperative, and continuous manner. Transportation investments in the SCAG region that receive state or federal transportation funds must be consistent with the RTP and must be included in the RTIP when ready for funding. SCAG's 2008 RTP provides the basis for the transportation control strategy of the 2007 AQMP and includes the total regional emission reductions from transportation projects in Ventura County.

Table 3-5
TCM Project Categories Included in R-700/N-700

Project Category
A. Ridesharing Measures Carpooling, Vanpooling, Park and Ride Lots, Ride Matching Services, Incentive Programs, Satellite Work Centers, Guaranteed Ride Home Programs, Station Cars, Onsite Services
B. Non-Motorized Measures Bicycle Paths/Facilities, Pedestrian Paths/Facilities, Telecommuting, Flexible Work Schedules, Bicycle and Pedestrian Programs
C. Traffic Flow Improvement Measures Signal Synchronization, Intersection Improvements, Incentive/Disincentive Programs, High Occupancy Vehicle Lanes, Intelligent Transportation Systems, Ramp Metering
D. Land Use Measures Transportation Demand Management (TDM) Ordinances, Smart Growth/Sustainable Community Projects, Mixed Use Development, Parking Management and Standards, Congestion Management Plan, TDM Strategies
E. Transit Measures Bus Fleet Expansion, Shuttles and Paratransit Vehicles Expansion, Transit Stations and Facilities, Express Busways, Passenger Rail Service, Rail Stations and Facilities, Real-Time Transit Information Systems, Transit Subsidies

The RTIP includes emission reductions from TCM projects. The emission reductions from TCMs are a subset of the total regional emission reductions from the RTP. The AQMP enforceable commitments for TCMs are to fund and implement the TCM projects contained in the first two years of the current six-year RTIP. Moreover, to be eligible for federal funding, the EPA's conformity rule requires that all TCMs in clean air plans undergo a timely implementation analysis in each RTIP update. The timely implementation requirement assures that TCMs receive priority funding and are implemented on schedule.

The RTIP update contains a timely implementation report, which tracks each committed TCM and demonstrates timely implementation. Appendix A presents the current list of committed TCMs in the 2006 RTIP.

3.2.2. TCM Rollover and Substitution

SCAG is responsible for updating the RTIP every two years. At each RTIP update, a new list of TCMs from the first two years of the RTIP, plus continuing TCMs from the previous RTIP, are rolled over into the AQMP upon approval by ARB and EPA. This "rollover" list becomes the committed TCMs for timely implementation and is monitored for compliance with the schedule established in the new RTIP. Once a TCM project is completed, it is reported in the RTIP update as completed and removed from future RTIPs. An RTIP update can occur more frequently than the biennial update. The rollover process applies when the RTIP requires a conformity analysis and finding.

A TCM substitution is required when a committed TCM project cannot be delivered or will be significantly delayed. The VCTC and/or the project sponsor must notify SCAG of the problem and propose a substitute TCM project or group of projects. The TCM substitution must follow the process set forth in Section 6011(d) of the federal SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) legislation and the federal transportation conformity rule. The substitute project(s) may not be from the committed TCM list.

3.2.3. Reasonably Available Control Measures - TCMs

The Clean Air Act requires a review of RACM for TCMs during AQMP development. For TCMs to be RACM, TCMs must be both technically and economically feasible and must advance the projected attainment date of the air quality standard by at least one year. EPA left the definitions for technically and economically feasibility vague so that areas could determine what measures would be feasible or infeasible according to local factors. Factors, such as the availability of control measures, ability to achieve emission reductions, and degree of cost effectiveness, are the primary considerations on an area-by-area basis. In addition, EPA did not provide a conclusive definition on "advancing attainment," but agencies have based their determination of RACM on whether a measure or group of measures would advance attainment by at least one year.

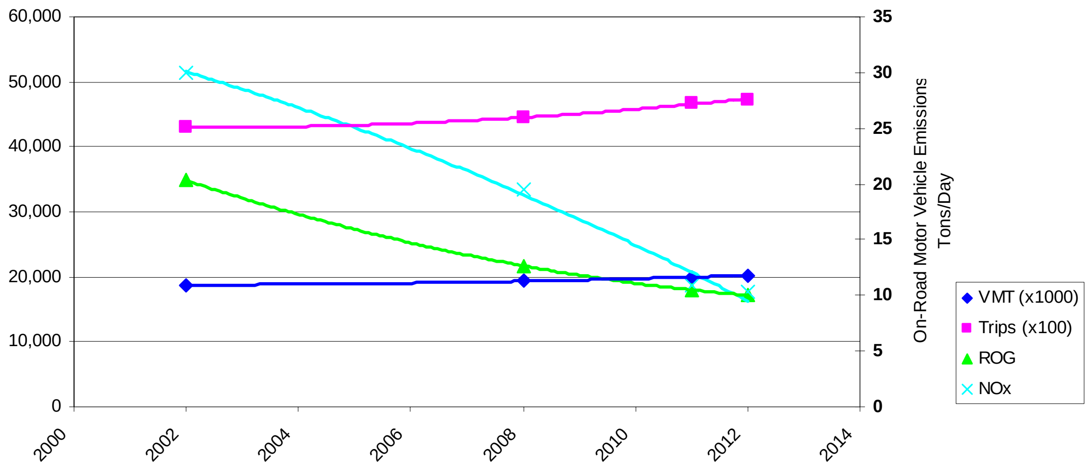
A list of candidate RACMs was prepared by SCAG and the District using TCMs from CAAA Section 108(f)(1)(A) and other Metropolitan Planning Organizations and air districts. The TCMs are organized according to the sixteen TCM categories listed in CAAA Section 108(f). Each candidate TCM has a control measure number, title, and a brief description. The District, along with SCAG and VCTC staff conducted the RACM analysis. If a TCM was found feasible for Ventura County, it was recommended as a potential measure for the 2007 AQMP with the appropriate implementing agency listed. If a TCM was determined infeasible for Ventura County, it was not recommended as a measure for the 2007 AQMP and the reasoned justification was provided. Appendix B is the RACM analysis conducted for the 2007 AQMP.

The RACM analysis was listed on the District's website and reviewed by the Transportation Conformity Working Group, Technical Transportation Advisory Committee, and Transit Operators Committee. Based on this comprehensive analysis, the majority of TCMs determined to be feasible are either being implemented, or have been implemented, in Ventura County. The TCMs determined to be infeasible did not meet the criteria for RACM because of the individual reasons provided in the analysis. Moreover, implementing all feasible TCMs in the RACM analysis would not advance the county's 8-hour ozone attainment date by at least one year. This criterion also applies to RACM implementation.

3.2.4. Motor Vehicle Trips and VMT vs. On-Road Motor Vehicle Emissions

Section 182(d)(1)(A) of the CAAA required that by November 15, 1992 the District submit specific enforceable TCMs and strategies to offset any growth in emissions from growth in VMT or number of vehicle trips, sufficient to allow total district-wide emissions to comply with the reasonable further progress and attainment requirements. The District met that requirement and showed that countywide motor vehicle emissions were decreasing despite increasing VMT. The 2007 AQMP updates that demonstration as shown by the trend projections in Figure 3-1. The dramatic downward trend in motor vehicle emissions is due largely to California's comprehensive motor vehicle emissions regulations.

Figure 3-1
Trips and VMT vs. On-Road Motor Vehicle Emissions Trends



NOTES:
EMFAC2007v2.3, Nov. 1, 2006**WIS Enabled.
Run Date: 03/12/2008 10:47:42.
Season: Summer.
See Table 4-2 for underlying data.

3.3. Conformity

Conformity is a federal regulatory process required in nonattainment areas by CAAA Section 176(c) to ensure that federal funding and approvals will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Section 176(c) prohibits federal agencies, departments, or instrumentalities from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any action which does not conform to an approved state or federal clean air plan. It is called conformity because federal agencies, such as the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Federal Aviation Administration (FAA), must show that their actions "conform with" (i.e., do not undermine or hinder) approved SIPs.

A conformity determination is a formal demonstration that the subject federal action is consistent with the respective SIP. Federal agencies make such demonstrations by performing conformity reviews of proposed federal actions. The conformity review evaluates and documents project-related air pollutant emissions, local air quality impacts, and the potential need for emission mitigation.

In 1993, EPA promulgated two sets of conformity regulations to implement Section 176(c): 1) transportation conformity; and, 2) general conformity. Transportation conformity is applicable to highway and mass transit projects and to transportation plans, programs, and projects funded under the Federal Highway and Transit Act. General conformity is applicable to other federal actions and approvals such as for new airports and water treatment facilities. The District currently has two conformity rules, Rule 221, *Transportation Conformity*; and, Rule 220, *General Conformity*.

3.3.1. Transportation Conformity

Transportation conformity is a CAAA and SAFETEA-LU regulatory process that coordinates air quality planning and transportation planning to help ensure that highway and transit projects will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Conformity applies to transportation improvement programs, transportation plans, and highway and transit projects funded or approved by the FHWA and the FTA. Both the RTP and RTIP must demonstrate conformity with the clean air plans within the SCAG region.

Metropolitan planning organizations, such as SCAG, make initial conformity determinations in metropolitan areas, while state departments of transportation usually do so in areas outside metropolitan areas. FHWA and FTA must also make conformity determinations. EPA and the Federal Highway Administration websites contain further information regarding transportation conformity.

Central to transportation conformity are motor vehicle emissions budgets (also referred to as conformity budgets), which set the maximum amount of on-road mobile source emissions that nonattainment areas can produce and continue to demonstrate progress towards attainment. Conformity budgets therefore act as “ceilings” for future on-road mobile source emissions. Exceedances of a conformity budget in a nonattainment area indicate an inconsistency with the applicable SIP and thus could jeopardize federal funding for transportation projects in that area. The conformity budget for an area is based on projections of motor vehicle emissions, and reflects the emission benefits of transportation control measures included in the SIP. Motor vehicle emissions are based upon the number of vehicles in the region, vehicle mileage, the rate of fleet turnover, seasonal temperatures in the region, vehicle miles traveled, population growth, and other factors.

Normally, conformity budgets are set with RFP Plans. However, EPA is revising its RFP regulations for areas whose air quality is dominated by air pollution transported from upwind regions. Ventura County is one of those areas. Until those revisions are complete, EPA will not approve conformity budgets for such areas (see Chapter 5). Therefore, to not disrupt Ventura County’s transportation planning process, nor jeopardize the county’s federal transportation funding, ARB has prepared an Early Progress Plan (EPP) for the county for the sole purpose of establishing a transportation conformity budget (13 tpd ROG & 19 tpd NOx) for 2009, Ventura County’s attainment year as a moderate 8-hour ozone nonattainment area. Ventura County’s EPP and 2009 conformity budget can be found at ARB's California State Implementation Plan website.

On April 16, 2008, EPA found that the motor vehicle emissions budgets contained in Ventura County's EPP adequate for transportation conformity decisions. Consistent with the 2004 final amendments to the Transportation Conformity Rule (69 FR 4004), the EPP 8-hour ozone conformity budgets replace the existing 1-hour ozone conformity budgets in the 2004 AQMP. As a result, SCAG and the U.S. Department of Transportation must use these budgets in future conformity analyses in Ventura County.

Notwithstanding the 2009 transportation conformity budget established by the EPP, the 2007 AQMP includes the following conformity budget for Ventura County as a serious 8-hour ozone nonattainment area. Table 3-6 presents a summary of the motor vehicle emissions budget for transportation conformity purposes under a serious federal 8-hour ozone classification. Once EPA approves the budget, it will supersede the EPP's conformity budget and serve as the conformity emissions budget for future transportation conformity determinations in Ventura County.

Table 3-6
Motor Vehicle Emissions Budget
(tons per day)

	2008	2011	2012
ROG	13	11	9
NOx	20	16	13

NOTES:
Based on EMFAC2007 and reductions from adopted rules not in EMFAC2007.
Budgets obtained by rounding up to the nearest ton.

3.3.2. General Conformity

General conformity is a CAAA regulatory process that applies to most federal actions other than transportation actions. Federal actions subject to general conformity include issuance of Army Corps of Engineers permits, water and wastewater projects funded by EPA, and other federal projects, such as harbors, airports, and reservoirs. Certain federal projects are exempt from general conformity. Those include projects whose air pollutant emissions would be below specified *de minimis* emission levels (based on area nonattainment classifications), and certain projects presumed to conform, such general and routine maintenance activities, activities at Superfund sites, and activities conducted in response to national emergencies. In addition, activities in attainment areas are not generally subject to general conformity, unless the area was a nonattainment area and is now under a federal clean air maintenance plan. The federal agency that approves the project or activity is responsible for the making the conformity determination for the project. EPA's General Conformity website contains further information regarding general conformity.

3.4. Incentive Programs

The District participates in four clean air incentive programs to help Ventura County meet state and federal clean air standards: the *Clean Air Fund*, the *Carl Moyer Memorial Air Quality Standards Attainment Program*, the *Lower Emissions School Bus Program*, and the *Lawn Mower Trade-In Program*. Below are summaries of these programs. Further information regarding the District's clean air incentive programs is available on the District's Grants/Incentive Programs website.

3.4.1. Clean Air Fund

The 3M Company created the *Clean Air Fund* in Ventura County in 1991 with a $1.5 million donation. Three hundred thousand dollars of that amount was set aside as a permanent endowment, which is now more than $823,000. The nonprofit Ventura County Community Foundation holds the funds in a trust. The Ventura County Air Pollution Control Board oversees the *Clean Air Fund* and authorizes project funding. The Clean Air Fund Advisory Committee (Committee) reviews all grant proposals and makes recommendations for funding to the Air Pollution Control Board. The Committee is comprised of representatives from transportation, environmental, business, and citizen interest groups.

Since its inception, the *Clean Air Fund* has allocated over $1.7 million for 48 clean air projects of various types. Examples of funded projects include clean air educational programs, solar pool heaters for local schools, cleaner boat engines, a lawn mower exchange program, and compressed natural gas transit buses and trash trucks.

3.4.2. Moyer Memorial Air Quality Standards Attainment Program

The California State Legislature created the *Carl Moyer Program* in 1998, named after the late Dr. Carl Moyer to recognize his work in the air quality field and his efforts to develop this important program. The *Carl Moyer Program* provides grants to owners of heavy-duty diesel vehicles, vessels, locomotives, and/or stationary agricultural pumps to replace, repower, or retrofit heavy-duty diesel engines to reduce NOx, ROG, and particulate matter. The *Carl Moyer Program* complements California's regulatory clean air program by obtaining early or extra emission reductions to help meet state and federal clean air standards. *Carl Moyer Program* grants are available to both private companies and public agencies.

The *Carl Moyer Program* is a cooperative effort of the ARB and local air pollution agencies. Each year, the ARB awards grants to local air agencies that apply for funds for local *Carl Moyer Programs*. In turn, air districts, following guidelines adopted by ARB, provide grants to public and private entities for cleaner-than-required engines and equipment. ARB's *Carl Moyer Program* requires, in part, that funded projects in Ventura County operate for at least three years and 75 percent of their use be within the county. In addition, to qualify for funding, projects must meet cost effectiveness requirements.

The District has operated its *Carl Moyer Program* since 1998. To date, nearly $10 million in *Carl Moyer Program* funds have been obligated locally. To help this effort, the District has provided $3.5 million in matching funds. The District's *Carl Moyer Program* has mostly funded new alternative fuel heavy-duty trucks, cleaner marine vessel engines, construction equipment engines, and agricultural irrigation pump engines.

In 2007, the District's board approved *Carl Moyer Program* funding to help repower 58 agricultural pump engines, 15 boat propulsion engines, 8 boat auxiliary engines, and 9 pieces of mobile farm equipment, all with new lower-emission diesel engines. The total amount of the grants was over $2.35 million. The anticipated emission reductions from these projects are 61.8 tons per year of NOx, 9.1 tons per year of ROG, and 1.7 tons per year of PM.

Through February 2008, the District's board approved *Carl Moyer Program* funding to repower an additional 18 agricultural pump engines with new lower-emission diesel engines. The total amount of the grants was over $238,000. The anticipated emission reductions from these projects are 15.6 tons per year of NOx, 2.6 tons per year of ROG, and 0.8 tons per year of PM.

ARB projects that Carl Moyer projects will reduce future ROG and NOx emissions in Ventura County by 0.01 and 0.19 tons per day, respectively in 2012. Table 4-3 presents projected Carl Moyer ROG and NOx emission reductions for each milestone year.

3.4.3. Lower-Emission School Bus Program

The ARB adopted the *Lower-Emission School Bus Program* in December 2000. This incentive program reduces schoolchildren's exposure to both toxic particulate emissions and smog-forming NOx emissions through two program components: the *Lower-Emission School Bus Replacement Program,* and the *School Bus Retrofit Program*. The *Lower-Emission School Bus Replacement Program* replaces older, in-use, high-polluting diesel school buses with new lower-emission buses. The *School Bus Retrofit Program* reduces particulate matter emissions from diesel school buses by retrofitting the bus engines with particulate traps. The District participates in both programs. These programs offer the District a unique opportunity to work with the school districts in the county in joint efforts to reduce children's exposure to diesel exhaust, which is a toxic air contaminant and a human carcinogen.

The *Lower-Emission School Bus Replacement Program* enables local school districts to replace pre-1987 model year buses with either new cleaner compressed natural gas (CNG) buses or new lower-emission diesel buses. Eligible school districts must contribute $25,000 to replace an in-use, 1977 through 1986 model year school bus, and no cost to replace an in-use, pre-1977 model year school bus. The program pays the remainder. School districts that purchase CNG buses can obtain an additional 10 percent of their grant for CNG refueling facilities.

The program's main goal is replacement of pre-1977 model year school buses. Therefore, the District's program focuses on replacing pre-1977 buses over other school bus replacement projects. Another goal of the program is to award two-thirds of the grants for CNG-fueled buses and one-third for lower emission diesel buses. The District's program thus gives priority to school districts applying for CNG-fueled buses. The District's program also requires that replaced buses be destroyed so that they can no longer operate in the county or elsewhere. To date, 20 CNG school buses and 9 lower-emission diesel school buses have replaced 29 pre-1987 school buses.

The *School Bus Retrofit Program* provides funding to school districts to retrofit existing diesel school buses with particulate filters that reduce diesel particulate emissions by at least 85 percent, thereby lessening peoples' exposure to harmful diesel exhaust. Participating local air districts administer the program with oversight by ARB. School district participation is voluntary and the grant monies fully fund the cost and installation of the new filters. No matching funds are required of either the District or the school districts.

In 2001, ARB granted the District $290,000 to retrofit 80 diesel school buses with diesel oxidation catalysts and Spiracle crankcase vent filter units. The combination of the diesel oxidation catalyst and Spiracle crankcase vent filter reduces particulate emissions by over fifty percent. Ten county school districts participated in the retrofit program. In 2005, ARB granted the District $273,000 to retrofit 33 diesel-powered school buses with diesel particulate filters (traps).

Proposition 1B, the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, will provide $200 million for the *School Bus Replacement and Retrofit Programs* statewide. Ventura County's share of this funding will be approximately $5 million.

3.4.4. Electric Lawn Mower Trade-In Rebate Program

The Ventura County APCD *Lawn Mower Trade-In Rebate Program* reduces combustion and gasoline spillage emissions from gasoline-powered lawn mowers by replacing gasoline-powered lawn mowers with electric lawn mowers. One hour of lawn mowing using a pre-2005 gasoline mower emits as much ROG and NOx as a super ultra low emission vehicle driving 792 miles or 13 conventional automobiles driving 60 mph for one hour.

In 1999 and 2000, the District conducted two electric mower buy down/exchange program events (Project Clean Cut in 1999 and 2000) at the Ventura Home and Garden Show. Although successful, both of these weekend events were very staff intensive, and required considerable resources to advertise, coordinate, and handle the event logistics.

At the 1999 event, 219 gasoline-powered lawn mowers were exchanged, and at the 2000 event, 198 gasoline-powered lawn mowers were exchanged. To make these three-day events successful, large advertising campaigns were required at significant cost. To minimize advertising and administrative costs, District staff developed the 2006 *Lawn Mower Trade-In Rebate Program,* which is a year-round promotion rather than a single weekend event.

The District commenced its 2006 *Lawn Mower Trade-In Rebate Program* in June 2006 with a $65,000 grant from the Clean Air Fund. The program exchanged 121 gasoline-powered mowers with new electric lawn mowers and 199 commercial leaf blowers with new low-emission leaf blowers.

The District's board approved the 2008 *Lawn Mower Trade-In Rebate Program* in February 2008. The 2008 program is a partnership with Lowe's Home Improvement stores in Ventura and Simi Valley, and with Country Home Products, maker of the Neuton cordless lawn mower. Total program funding is $82,000. Of that amount, $50,000 was an ARB grant and $32,000 was left over from 2006 program funds.

The 2008 program is open to all county residents and provides participants with either $200 vouchers to purchase cordless electric lawn mowers or $129 vouchers to purchase corded, plug-in electric lawn mowers. The $200 rebate is based on a similar rebate offered by the South Coast AQMD. The 2008 program will end when all designated funds are disbursed.

3.5. Ventura County Smart Growth Policies and Programs

Ventura County has been a leader in controlling urban growth and sprawl for decades. As a result, Ventura County cities are distinct from each other geographically, with greenbelt buffers and agricultural land separating the urbanized areas of the county. Moreover, 90 percent of the county's population lives within the county's ten cities. Ventura County has successfully accommodated growth while remaining a leading agricultural area in California. Some of the notable urban growth guidelines, policies, and programs in Ventura County are summarized below for informational purposes.

Guidelines for Orderly Development

The *Guidelines for Orderly Development* help facilitate orderly development of Ventura County by directing urban development to the cities rather than to the county's unincorporated areas. The *Guidelines for Orderly Development's* primary policy states: "Urban development should occur, whenever and wherever practical, within incorporated cities which exist to provide a full range of municipal services and are responsible for urban land use planning." Ventura County's Local Agency Formation Commission (LAFCO) administers the *Guidelines for Orderly Development*. The County of Ventura, all ten cities in the county, and the LAFCO have adopted the Guidelines for Orderly Development as policy. The County of Ventura first adopted the *Guidelines for Orderly Development* in 1969 and revised them in 1996. The *Guidelines for Orderly Development*:

- Provide a framework for cooperative intergovernmental relations.
- Allow for urbanization in a manner that will accommodate the development goals of the individual communities while conserving the resources of the County.

- Promote efficient and effective delivery of community services for existing and future residents.
- Identify in a manner understandable to the public the planning and service responsibilities of local governments providing urban services.

Greenbelt Agreements

Greenbelt Agreements (Agreements) are policy statements adopted by resolution or ordinance between the County of Ventura and one or more of the county's ten cities. Greenbelts in Ventura County are areas where cities have agreed not to annex areas and the County of Ventura has pledged to permit only open space or agricultural uses. The Agreements protect open space and agricultural lands from urbanization by preventing premature conversion to agriculturally incompatible uses. The Agreements also help ensure that the cities do not sprawl into each other. Although not a party to the Agreements, the Ventura County LAFCO will not approve a development that conflicts with any greenbelt agreement unless exceptional circumstances exist. City and County elected officials in Ventura County were pioneers in designing and adopting greenbelts. There are seven greenbelt agreements in Ventura County:

- Ventura-Santa Paula Greenbelt
- Santa Paula-Fillmore Greenbelt
- Camarillo-Oxnard Greenbelt
- Santa Rosa Valley Greenbelt
- Tierra Rejada Greenbelt
- Ventura-Oxnard Greenbelt
- Fillmore-Piru Greenbelt

SOAR and CURB

The Save Open Space and Agricultural Resources (SOAR) and City Urban Restriction Boundary (CURBs) resulted from several voter-approved ballot initiatives in the unincorporated areas of Ventura County and eight of the county's ten cities. The SOAR initiatives require voter approval in the affected jurisdictions before specified General Plan land use designations, such as agriculture and open space, can be up-zoned to urban designations. The CURB initiatives define a boundary around the affected jurisdictions and require voter approval before urban development can occur outside the CURB lines. The SOAR and CURB measures work together to direct urban growth to within existing city boundaries, thereby restricting urban sprawl, encouraging infill and higher density development, and protecting agricultural, open space, and natural lands in Ventura County.

The city SOARs established CURBs around each city. With limited exceptions, development beyond a city's CURB cannot occur unless the city voters approve an extension of the CURB. The city CURBs complement the County SOAR by preventing annexations of adjacent unincorporated areas into the cities for development unless the voters approve such annexations. The following are the Ventura County jurisdictions covered by SOAR initiatives:

- County of Ventura
- City of Ventura
- City of Camarillo
- City of Thousand Oaks
- City of Simi Valley
- City of Oxnard
- City of Moorpark
- City of Santa Paula
- City of Fillmore

Ventura County Air Quality Assessment Guidelines

The *Ventura County Air Quality Assessment Guidelines* (Guidelines) is a District document that provides District staff, lead agencies, consultants, and project applicants with uniform procedures for preparing the air quality sections of environmental documents pursuant to the California Environmental Quality Act (CEQA). CEQA applies to all discretionary activities, both public and private, approved by California public agencies, unless an exemption applies, and requires that any significant environmental effects of such projects be mitigated to the extent feasible. CEQA thereby provides a mechanism to reduce air emissions associated with urban growth.

The Guidelines recommend specific criteria and threshold levels for determining whether a proposed project may have a significant adverse impact on air quality. The Guidelines also provide mitigation measures to lessen or eliminate project air quality impacts found to be significant. The District does not require that lead agencies use the Guidelines; however, most lead agencies in the county, including the ten cities and the County of Ventura, do. Additionally, District staff routinely reviews and comments on the air quality sections of environmental documents prepared by county lead agencies.

Resolutions of Commitment to Implement Reasonably Available Transportation Control Measures

The commitments the ten cities and the County of Ventura made to integrate transportation, land use, and air quality considerations into land use decisions are documented in Appendix C-91, *Resolutions of Commitment to Implement Reasonably Available Transportation Control Measures*, of the 1991 AQMP. Additionally, several of the cities and the County of Ventura have incorporated air quality goals and policies into their General Plans.

Smart Growth in Ventura County

Smart growth is a set of urban planning and transportation concepts that concentrate growth to enhance a community's vitality and livability, avoid urban sprawl, preserve open space and agricultural land, and protect the environment. Smart growth advocates compact, transit-oriented, walkable, and bicycle-friendly land use, including mixed-use development, with a range of housing choices for all income levels.

Several jurisdictions in Ventura County are pursuing smart growth development on large and small scales. Notable examples include the Cities of Ventura and Fillmore and the County of Ventura. The City of Ventura has embraced smart growth as a central element of its 2005 General Plan. Detailed information regarding the City of Ventura's smart growth efforts and its 2005 General Plan can be found on the city's Community Development Department and General Plan websites. The City of Fillmore, through its Downtown Specific Plan, is redeveloping its central downtown area into an exemplary model of urban mixed-use development. The County of Ventura's *Build It Smart* website, which promotes energy- and resource-efficient building practices and land use decisions in Ventura County, profiles the City of Fillmore's Downtown Specific Plan. The County of Ventura is pursuing smart growth development solutions for the small rural community of Piru. The Piru development initiative is outlined in the County of Ventura's Piru SCAG Smart Growth Study.

3.6. State Strategy

On September 27, 2007, the ARB adopted its State Strategy for California's 2007 State Implementation Plan to achieve the additional emission reductions needed for all areas of the state, including Ventura County, to attain both the federal 8-hour ozone and $PM_{2.5}$ standards. Ventura County is nonattainment only for the federal 8-hour ozone standard. Those areas with the most challenging air quality problems – the South Coast AQMD, and San Joaquin Valley Unified APCD – are driving ARB's State Strategy. ARB and EPA will implement the State Strategy measures. The District will not implement any of the State Strategy measures because they are not under District regulatory authority. However, the 2007 AQMP incorporates the measures by reference and reflects the emission reductions the measures will achieve in Ventura County.

The control measures in ARB's State Strategy target passenger vehicles, trucks, construction equipment, agricultural equipment, goods movement, fuels, recreational vehicles and boats, and pesticides. Table 3-7 presents the State Strategy control measures, along with expected 2012 emission reductions in Ventura County.

Appendix H of ARB's State Strategy addresses ROG emission reductions from pesticide usage in Ventura County. The State Strategy will reduce ozone and $PM_{2.5}$ levels statewide, thereby ensuring progress towards both the state ozone and $PM_{2.5}$ standards throughout California. The State Strategy, including the proposed statewide emission control measures, revisions, and appendices, is available on ARB's State Implementation Plan website.

Table 3-7
Expected 2012 Emission Reductions from Proposed New SIP Measures

Proposed New California SIP Measures Ventura County Specific	Reductions (tpd) ROG	 NOx
Passenger Vehicles		
Smog Check Improvements (BAR)	0.7	0.8
Expanded Vehicle Retirement	---	---
Modified Reformulated Gasoline Program	0.3	---
Total Reductions	**1.0**	**0.8**
Heavy-Duty Trucks		
Cleaner In-Use Heavy-Duty Trucks	0.2	1.7
Total Reductions	**0.2**	**1.7**
Goods Movement Sources		
Auxiliary Ship Engine Cold Ironing & Clean Technology	---	0.3
Cleaner Main Ship Engines and Fuel	---	3.1
Port Truck Modernization	---	---
Accelerated Introduction of Cleaner Line-Haul Locomotives	---	---
Clean Up Existing Harbor Craft	---	0.5
Total Reductions	**---**	**3.9**
Off-Road Equipment		
Cleaner In-use Off-Road Equipment (over 25hp)	0.0	0.0
Cleaner In-use Agricultural Equipment	NYQ	NYQ
Total Reductions	**0.0**	**0.0**
Other Off-Road Sources		
New Emission Standards for Recreational Boats	0.0	0.0
Expanded Off-Road Recreational Vehicle Emission Standards	0.3	---
Additional Evaporative Emission Standards	NYQ	---
Vapor Recovery for Above Ground Storage Tanks	NYQ	---
Total Reductions	**0.3**	**0**
Areawide Sources		
Consumer Products Program	**0.4**	---
Total Reductions	**0.4**	**---**
Total Control Measure Reductions	**1.9**	**6.4**

NOTES:
NYQ = Not Yet Quantified.
BAR = Bureau of Automotive Repair.
Emission reductions reflect the combination impact of regulations and supportive incentive programs.
Data rounding may affect displayed values and totals.

4. EMISSIONS INVENTORY FORECAST

This chapter summarizes the ROG and NOx emissions inventory for future years. The forecast contains other air pollutants, however only ROG and NOx are pertinent to ozone formation and emission forecast reporting requirements. The 2007 AQMP incorporates all anthropogenic emission categories using the latest emission estimates and control implementation schedule. Revised emission forecasts are calculated using the actual 2002 base year emission inventory presented in Chapter 2, *2002 Baseline Emissions Inventory*, and revised control measure data in Chapter 3, *Control Strategy*.

4.1. Forecast Methodology

The 8-hour Ozone SIP base year emissions inventory and future year emissions forecast is a joint effort by the District and the ARB. The ARB California Emission Forecasting System (CEFS) is a computer model that uses pollutant-specific algorithms to calculate future year emissions for all areas throughout the state. The District relies on this model to produce future-year and historical-year emissions in accordance with EPA's 8-Hour Ozone SIP and the CCAA of 1988 emissions inventory reporting requirements.

Forecasted emissions are a product of two major components: growth factors and control factors. The forecast methodology involves applying growth and control factors to the 2002 base year emissions. District staff calculates the growth and control factors by analyzing the 2002 actual emissions, future socioeconomic assumptions and the future impact of state and federal control strategies. The forecast model computes the summer day ROG and NOx emissions specific to Ventura County for 2008, 2011, and 2012.

The formula used in ARB's CEFS emission forecasting model is:

$FY_t = BY*GF_t*CF_t$

Where:

FY_t = controlled planning day emissions for the forecast year (t)

BY = base year (2002) planning day emissions per process

GF_t = growth factor for forecast year (t)

CF_t = control factor for forecast year (t)

Growth factors (GF) account for changes in future year socioeconomic conditions relative to the 2002 base year using a variety of activity indicators. Activity indicators such as population, housing, and employment data are collected to track the economic status or social trends of the surrounding area. District and ARB staff assign activity indicators to emissions categories that best characterize the source activity and characteristic trend. The District updates the socioeconomic data used in the CEFS model every SIP planning cycle and as an ongoing process for rule development analyses. The growth factors reflect the change in future year ROG and NOx emissions relative to the base year. ARB maintains the statewide CEFS model and can calculate growth factors from the District-submitted data. The forecast indicators, growth factors, and data sources used primarily in the CEFS v1.06 are presented in Table 4-1.

Control factors (CF) represent the overall expected effectiveness of each control measure to reduce emissions. All emission categories in a base year are reviewed for potential assignment to control measures and updated for the required reporting years. District staff calculates control measure effectiveness estimates based on the best data available, knowledge of local sources already under control, and future control technologies. Control factors may change in the future as better information becomes available during the rule development process.

A control factor is a composite of the following four multipliers:

(1) technological control efficiency (CE) of the control technology, equipment or strategy requirements of the control measure;
(2) compliance efficiency, or rule effectiveness (RE) of the control measure, reflecting the actual "real world" ability of a control measure to achieve expected emission reductions;
(3) rule penetration (RP), or impact factor, representing the relative amount of emissions in a source category subject to a control measure, accounting for exemptions and other control measures; and,
(4) implementation factor (IP), or relative amount of total control occurring in a given year, for control measures having phased implementation or control requirements occurring in tiers.

Control factors are used to generate the remaining uncontrolled emissions in a source category after control is applied, represented by the following equation:

$$CF = 1-(CE*RE*RP*IP)$$

Each customized control factor is specific to an emission source and reflects a future year's anticipated emission control, and is relative to the level of control in the 2002 base year. Chapter 3, *Control Strategy* includes a summary table showing the overall control measure emission reductions and control measure descriptions.

For mobile sources, CEFS integrates the emission estimates from the EMFAC model for on-road vehicles and the OFFROAD model for other mobile sources. Growth assumptions for these mobile source categories are a product of collaboration among transportation agencies, local planning agencies, ARB, and SCAG. This plan uses the most current version of those emission estimates modeled by the SCAG regional transportation model and the ARB EMFAC and OFFROAD mobile source models. Table 4-2 shows important motor vehicle growth indicators from the ARB EMFACv2.3 on-road mobile model and the SCAG 2008 RTP as of March 12, 2008.

Table 4-1
Future Year Growth Factor Summary

Ventura County 2002 Base Year Forecast Indicator	2008 GF	2011 GF	2012 GF	Data Source
No Growth (Unity)	1.00	1.00	1.00	District
Population	1.08	1.12	1.13	SCAG/SCAQMD Regional Transportation Plan
Dwelling Units	1.08	1.12	1.13	SCAG/SCAQMD Regional Transportation Plan
Total Employment	1.05	1.10	1.11	SCAG/SCAQMD Regional Transportation Plan
Oil Production	0.98	0.95	0.94	CA Dept of Conservation Division of Oil, Gas & Geothermal Resources
Natural Gas Production	0.97	0.94	0.93	CA Dept of Conservation Division of Oil, Gas & Geothermal Resources
Petroleum Wells	0.97	0.95	0.95	CA Dept of Conservation Division of Oil, Gas & Geothermal Resources
Motor Vehicle Fuel Use	1.06	1.10	1.11	ARB - EMFAC2005
Refinery Throughput	0.88	0.82	0.81	CA Dept of Conservation Division of Oil, Gas & Geothermal Resources
Landfill Waste in Place	1.24	1.38	1.42	CA Integrated Waste Mgmt Board & Ventura Co. Solid Waste Mgmt District
Thermal Enhanced Oil Recovery	1.20	1.14	1.12	CA Dept of Conservation Division of Oil, Gas & Geothermal Resources
Civilian Aircraft Operations	0.92	0.93	0.93	Ventura County Department of Airports
Electric Generating-Natural Gas Usage	1.31	1.36	1.36	Ventura County Power Plants
Military Aircraft	1.40	1.49	1.50	US Navy/CBC/Contractor
Military Vessels	1.81	1.84	1.85	US Navy/CBC/Contractor
Residential Wood Fireplaces	1.07	1.10	1.11	ARB/Pechan and Associates
Consumer Product Use	1.00	1.00	1.00	California Department of Finance Population
Non-Methyl Bromide Structural Pesticide	1.08	1.12	1.13	ARB/Department of Pesticide Regulation
Train Locomotives - Road Hauling	1.10	1.15	1.17	ARB
Livestock Waste	1.00	1.00	1.00	Statewide Ag Census/Ventura County Ag Commissioner
Irrigated/Non-irrigated Grazing Acres	1.06	1.10	1.11	CA Dept of Conversation Farmland Mapping & Monitoring Program
Irrigated Acres	0.99	0.99	0.99	CA Dept of Conversation Farmland Mapping & Monitoring Program
Agricultural Aircraft	0.85	0.77	0.75	ARB/California Ag Aircraft Association
Livestock Waste - Range Cattle	1.00	1.00	1.00	USDA Ag Census/Ventura County Ag Commissioner
Wine Grape Acreage	1.00	1.00	1.00	USDA Wine Grape Acreage Report

Table 4-2
Motor Vehicle Growth Trends

Ventura County Totals	Indicator	2002	2008	2011	2012
Population	Residents	787,416	841,991	868,554	876,505
All vehicle categories	Vehicles	615,632	659,789	694,105	703,207
Vehicle miles traveled (x 1000)	VMT/ 1000	18,767	19,323	20,001	20,180
All vehicle trips	Trips	4,298,330	4,446,720	4,669,700	4,730,400
Fuel Consumption (1000 gallons)	Gasoline	956.4	967.0	999.3	1001.5
	Diesel	85.1	93.8	100.7	103.0

NOTES:
EMFAC2007v2.3; Nov 1, 2006 **WIS Enabled**.
Run Date: 03/12/2008 10:47:42, Enhanced Interim I/M (2001).
Season: Summer.

The ARB Planning and Technical Support Division has the primary responsibility for developing on-road and off-road mobile source emissions in California. The ARB mobile source mathematical models, EMFAC and OFFROAD, produce future year inventories by geographic area for all pollutants. Appendix C includes a summary of the EMFAC2007v2.3, (Run date: March 12, 2008) on-road motor vehicle summer day emissions inventory for the base year and forecast years specific to Ventura County.

4.1.1. External Adjustments to CEFS v1.06

The external adjustments listed below describe the recent ARB emissions inventory adjustments accounted for external to the ARB CEFS v1.06. The adjustments incorporate the most recent data changes to the emissions inventory identified by ARB specific to Ventura County and documented on ARB's State Implementation Plan website in Appendix A. The external adjustments are included in the RFP calculations in Chapter 5 and detailed in Table 4-3.

Table 4-3
ARB Adjustments to Emissions Inventory Baseline
(tons per day)

Ventura County	2002	2008	2011	2012
ROG				
HHDD Trucks	0.00	0.00	0.00	0.00
Pesticides/Fertilizers Adj.	-3.02	-0.14	0.53	0.54
HDD Reflash	0.00	0.00	0.00	0.00
Public/Utility Fleet	0.00	0.00	0.00	0.00
Truck Idling	0.00	0.00	0.00	0.00
Assembly Bill (AB) 1493	0.00	0.00	-0.01	-0.03
Carl Moyer Program	0.00	-0.01	-0.01	-0.01
Consumer Products	0.00	-0.22	-0.23	-0.23
Ship Auxiliary Engine	0.00	0.00	0.00	0.00
Off-road Engines	0.00	0.00	-0.02	-0.03
Total	**-3.02**	**-0.36**	**0.26**	**0.24**
NOx				
HHDD Trucks	0.00	0.00	0.00	0.00
HDD Reflash	-0.02	-0.25	-0.18	-0.16
Public/Utility Fleet	0.00	0.00	0.00	0.00
Truck Idling	0.00	-0.21	-0.23	-0.24
AB 1493	0.00	0.00	0.00	0.00
Carl Moyer Program	-0.15	-0.11	-0.19	-0.19
Ship Auxiliary Engines	0.00	-0.08	-0.10	-0.10
Off-road Engines	0.00	-0.12	-0.38	-0.39
Total	**-0.17**	**-0.78**	**-1.08**	**-1.09**

NOTES:
ROG and NOx adjustments as of 03/06/2008.
These adjustments include rules adopted through Dec. 31, 2006 and recently identified uninventoried emission categories. These adjustments are not included in CEFS v1.06.
Data rounding may affect displayed values and totals.

- HHDD Trucks: ARB's on-road motor vehicle emissions model (EMFAC2007) estimate for 2005 for this category was adjusted to match transportation agency VMT estimates.
- Pesticide/Fertilizer Adjustment: Update of the historical pesticide usage report (PUR) data 1990 - 2004 from the Department of Pesticide Regulation (DPR) and the corresponding adjustment for the 5-year average base year inventory.
- HDD Reflash: Diesel engine software upgrade rule to reduce heavy-duty truck NOx emissions (adopted March 2004).
- Public/Utility Fleet Rule: Rule to reduce diesel truck emissions in government and private utility fleets (adopted December 2005).

- Truck Idling: Rule to limit general truck idling to 5 minutes (adopted July 2004) and rule to limit sleeper cab truck to 5 minutes idling or use of an auxiliary power unit (adopted October 2005).
- AB 1493: Criteria air pollutant benefits from the greenhouse gas (GHG) limits for motor vehicles adopted in September 2004.
- *Carl Moyer Program*: Emission reductions from the *Carl Moyer Program* from 2007 through 2015 ($81 million in funding statewide).
- Consumer Products: Lower consumer product emission limits (adopted November 2006).
- Ship Auxiliary Engines: Rule to require ships to use cleaner marine gas oil or diesel to power auxiliary engines within 24 nautical miles of the California coast (adopted December 2005).
- Off-Road Engines:
  1) Rule to reduce emissions from new truck refrigeration trailers (adopted February 2004).
  2) Rule to reduce emissions from new portable construction, mining, and industrial equipment (adopted February 2004).
  3) Rule to reduce emissions from forklifts, generators, and pumps (adopted May 2006).

4.1.2. Emission Reduction Credits

EPA policy and the federal CAAA mandate pre-baseline ERCs be treated as potential growth in forecast years. ERCs are previous emission reductions that offset emissions growth from a new or modified permitted facility. Unless pre-baseline ERCs are included in future year growth factors, future year forecasted inventories must be adjusted to account for pre-baseline inventory ERCs.

Total available ERCs balances as of January 2002 were 1.67 tons/day ROG and 0.51 tons/day NOx. These total ERC values are included as a separate line item adjustment to the forecasted emission inventory to ensure credited emission reductions are accounted for as potential future growth and not as permanent emission reductions. This is based on the conservative assumption that all pre-baseline ERCs will be used to offset emission increases from permitted facilities, therefore the entire balance is included in forecast inventories as potential growth.

4.2. Emissions Forecast Summary

ROG and NOx summer planning emissions in the SCC Air Basin (onshore Ventura County and within three miles of the coastline) for the 2002 base year and forecast years 2008, 2011, and 2012 are presented in the figures and tables below. Forecast emissions represent the effects of future socioeconomic changes and implementation of local, state, and federal control measures. Figure 4-1 and Figure 4-2 present emission trends from the base year through the interval of forecast years by major emission category. Table 4-4 and Table 4-5 summarize base year emissions by major source category in descending order.

Significant reductions in ROG summer planning emissions are shown in Figure 4-1 and Table 4-4. ROG summer planning emissions should decrease by 11 tons/day, 18% by 2012. Quantities and percentages of ROG emission reductions are described below.

- Mobile Sources: 12.4 tons/day (36%).
  - On-Road Vehicles: 10.3 tons/day (51%).
    Although On-Road Vehicles represent the largest emission category in the base year, responsible for 34% of ROG emissions in 2002, by 2012 this category comprises 21% of the total. Nearly three quarters of the emission reductions are in place by 2008.
  - Other Mobile Sources: 2.1 tons/day (14%).
    This category contributes about 24% of ROG in 2002, the third leading emission category in the base year. By 2012, approximately 27% of total ROG emissions are from Other Mobile Sources, becoming the second largest emission source category.
- Stationary Sources: 0.3 tons/day (1%).
  - Solvent Use: 1.1 tons/day (7%).
    Solvent Use includes evaporative emissions from consumer products, architectural coatings, surface coatings, and cleaning solvent use. Solvent use accounts for almost 27% of ROG emissions in 2002, but is 31% of 2012 emissions, becoming the largest ROG emission category.
  - Pesticide Application: increases 0.8 tons/day (+21%).
    Pesticide Application is almost entirely attributable to agricultural pesticides (methyl bromide use), and contributes nearly 7% of total ROG in 2002. By 2012, ROG emissions from Pesticide Application becomes 10% of the total ROG emissions.
  - Petroleum Industry and Other Sources.
    Stationary and residential fuel combustion, agricultural burning, industrial processes related to manufacturing, and waste disposal are relatively small emission categories, and are not expected to change significantly from the base year.

As shown in Figure 4-2 and Table 4-5, total NOx summer emissions decrease substantially by 2012, declining nearly 22 tons/day or nearly 36%. The vast majority of emission reductions are attributable to Mobile Sources. Amounts and percentages of emission reductions are shown below.

- Mobile Sources: 22.4 tons/day (41%).
  - On-Road Vehicles: 15.3 tons/day (51%).
    On-Road Vehicles are responsible for over 48% of NOx emissions in 2002, and 37% by 2012. Over two thirds of the total NOx emission reductions occur by 2008.
  - Mobile Equipment: 5.3 tons/day (34%).
    Mobile Equipment categories represent 25% of NOx emissions in 2002 and 26% by 2012.

  - Other Mobile Sources: 1.8 tons/day (20%).
    Other Mobile Sources include aircraft, train locomotives, ships and commercial boats, recreational boats, off-road recreational vehicles and farm equipment. Other Mobile Sources account for approximately 14% of NOx in 2002, but by 2012, represent 18% of total NOx emissions.
- Stationary Sources: 0.2 tons/day (2%).
  - Other Fuel Combustion: 0.5 tons/day (8%).
    Other Fuel Combustion includes stationary industrial and commercial sources, agricultural irrigation engines, residential uses, and agricultural burning, with the exception of electric utilities and oil and gas production. Other Fuel Combustion sources contribute approximately 9% of NOx in 2002 and 13% in 2012.
  - Electric Utilities and the Petroleum Industry.
    These sources contribute less than 3% of NOx emissions and about 5% by 2012.

The summary ROG and NOx emissions forecast by Major Source Category by air basin follow in Table 4-6 and Table 4-7 for 2002, 2008, 2011 and 2012. In addition, the relative contributions by major emission category appear in Figure 4-3 and Figure 4-4 for ROG and NOx planning emissions for 2012.

Figure 4-1
ROG Major Source Category Trends

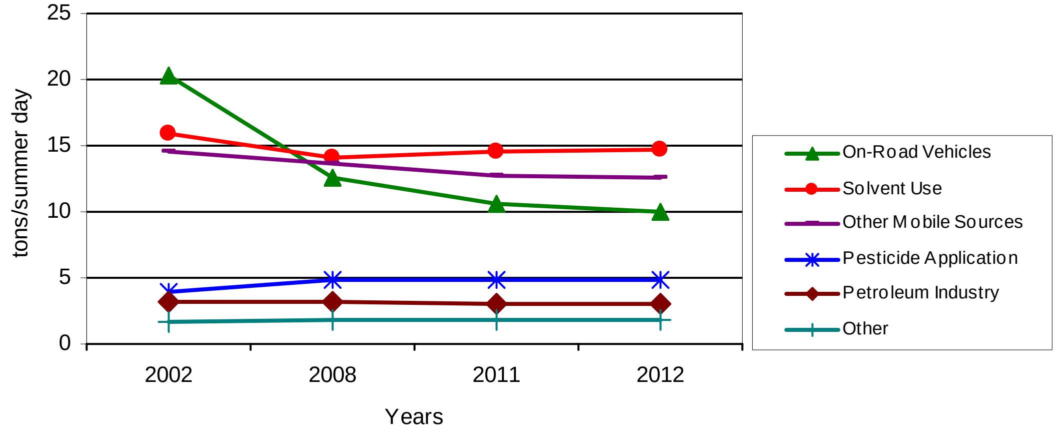


Table 4-4
Summer Planning Day ROG Emissions

Major Emission Category	ROG (tons/summer day) 2002	2008	2011	2012
On-Road Vehicles	20.31	12.64	10.54	9.98
Solvent Use	15.84	14.08	14.58	14.75
Other Mobile Sources	14.59	13.61	12.74	12.52
Pesticide Application	3.99	4.82	4.82	4.82
Petroleum Industry	3.23	3.13	3.10	3.10
Other	1.67	1.76	1.81	1.82
ERC Balance	0.00	1.67	1.67	1.67
ROG Total Emissions	**59.64**	**51.69**	**49.26**	**48.65**

NOTES:
Based on ARB CEFS v1.06 and ARB Adjustments 03/06/2008.
Data rounding may affect displayed values and totals.
Includes revised On-road Vehicle Emissions 03/12/2008.
OCS not included.

Figure 4-2
NOx Major Source Category Trends

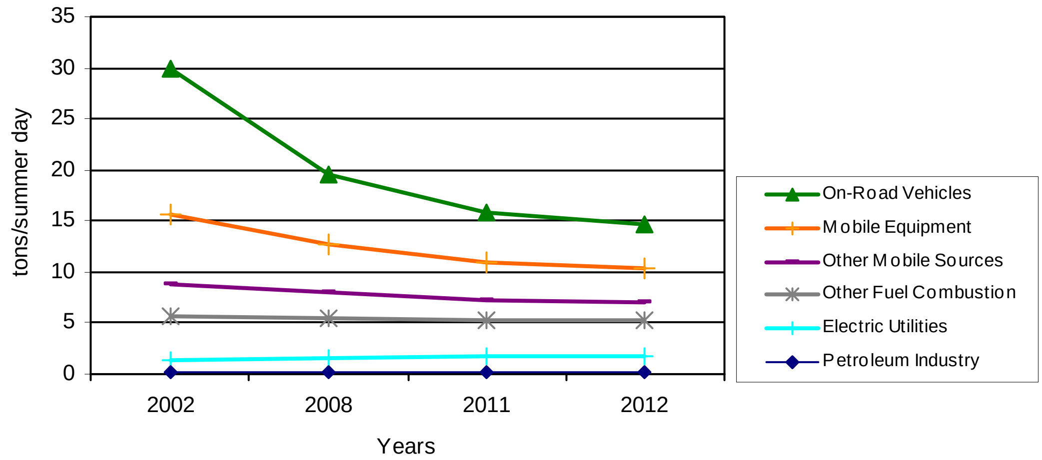


Table 4-5
Summer Planning Day NOx Emissions

Major Emission Category	NOx (tons/summer day) 2002	2008	2011	2012
On-Road Vehicles	30.00	19.52	15.80	14.67
Mobile Equipment	15.61	12.73	10.88	10.30
Other Mobile Sources	8.88	8.00	7.24	7.11
Other Fuel Combustion	5.71	5.41	5.28	5.23
Electric Utilities	1.36	1.62	1.68	1.69
Petroleum Industry r	0.27	0.25	0.24	0.24
ERC Balance	0.00	0.51	0.51	0.51
NOx Total Emissions	**61.83**	**48.05**	**41.65**	**39.75**

NOTES:
Based on ARB CEFS v1.06 and ARB Adjustments 03/06/2008.
Includes revised On-road Vehicle Emissions 03/12/2008.
Data rounding may affect displayed values and totals.
OCS not included.

Table 4-6
Adjusted ROG Planning Emission Forecast by Major Source Category

Ventura County Major Source Category Name	ROG (tons/summer day) 2002	 2008	 2011	 2012
SCC AIR BASIN				
Stationary Sources				
Fuel Combustion	0.76	0.78	0.78	0.78
Waste Disposal	0.09	0.12	0.13	0.13
Cleaning and Surface Coatings	6.30	5.53	5.78	5.85
Petroleum Production and Marketing	3.10	3.00	2.97	2.97
Industrial Processes	0.37	0.38	0.40	0.40
Total Stationary Sources	**10.62**	**9.81**	**10.06**	**10.14**
Area-wide Sources				
Solvent Evaporation	13.53	13.36	13.62	13.71
Miscellaneous Processes	0.59	0.61	0.63	0.63
Total Area-wide Sources	**14.12**	**13.97**	**14.25**	**14.34**
Mobile Sources				
On-road Motor Vehicles	20.31	12.64	10.54	9.98
Other Mobile Sources	14.59	13.61	12.74	12.52
Total Mobile Sources	**34.90**	**26.24**	**23.29**	**22.50**
TOTAL SCC AIR BASIN	**59.64**	**50.02**	**47.59**	**46.98**
ERC Balance	----	1.67	1.67	1.67
TOTAL SCC AIR BASIN (ADJUSTED)	**59.64**	**51.69**	**49.26**	**48.65**
OCS AIR BASIN				
Stationary Sources				
Fuel Combustion	0.03	0.04	0.04	0.04
Cleaning and Surface Coatings	0.01	0.00	0.00	0.00
Petroleum Production and Marketing	0.04	0.04	0.04	0.04
Total Stationary Sources	**0.09**	**0.08**	**0.08**	**0.08**
Mobile Sources				
Other Mobile Sources	0.63	0.74	0.78	0.79
Total Mobile Sources	**0.63**	**0.74**	**0.78**	**0.79**
TOTAL OCS AIR BASIN	**0.72**	**0.82**	**0.86**	**0.87**
TOTAL VENTURA COUNTY(ADJUSTED)	**60.36**	**52.51**	**50.12**	**49.52**

NOTES:
Source: ARB CEFS v1.06 (November 2006).
Revised On-Road Vehicle emissions (03/12/2008) and ARB Adjustments (03/06/2008).
Data rounding may affect totals.

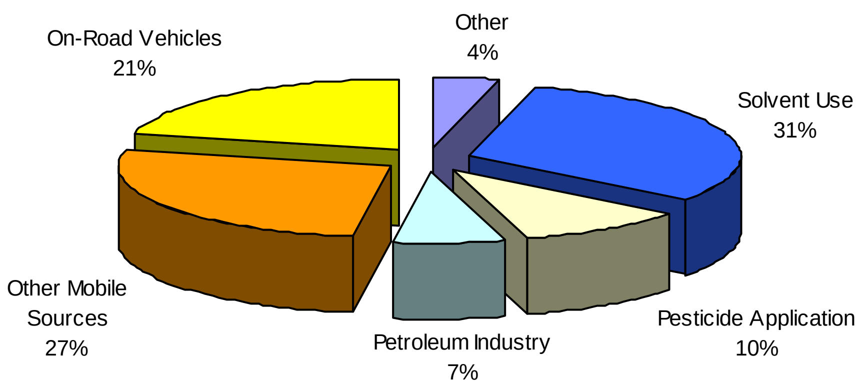
Table 4-7
Adjusted NOx Planning Emission Forecast by Major Source Category

Ventura County Major Source Category Name	NOx (tons/summer day) 2002	2008	2011	2012
SCC AIR BASIN				
Stationary Sources				
Fuel Combustion	5.88	5.75	5.64	5.59
Waste Disposal	0.09	0.11	0.12	0.12
Cleaning and Surface Coatings	0.00	0.00	0.00	0.00
Petroleum Production and Marketing	0.04	0.03	0.03	0.03
Industrial Processes	0.08	0.08	0.08	0.08
Total Stationary Sources	**6.08**	**5.97**	**5.87**	**5.82**
Area-Wide Sources				
Solvent Evaporation	0.00	0.00	0.00	0.00
Miscellaneous Processes	1.27	1.32	1.34	1.35
Total Area-Wide Sources	**1.27**	**1.32**	**1.34**	**1.35**
Mobile Sources				
On-Road Motor Vehicles	30.00	19.52	15.80	14.67
Other Mobile Sources	24.49	20.73	18.13	17.41
Total Mobile Sources	**54.49**	**40.25**	**33.93**	**32.08**
TOTAL SCC AIR BASIN	**61.83**	**47.54**	**41.13**	**39.24**
ERC Balance	----	0.51	0.51	0.51
TOTAL SCC AIR BASIN (ADJUSTED)	**61.83**	**48.05**	**41.64**	**39.75**
OCS AIR BASIN				
Stationary Sources				
Fuel Combustion	0.39	0.40	0.41	0.41
Cleaning and Surface Coatings	0.00	0.00	0.00	0.00
Petroleum Production and Marketing	0.01	0.01	0.01	0.01
Total Stationary Sources	**0.40**	**0.41**	**0.41**	**0.42**
Mobile Sources				
Other Mobile Sources	12.96	15.80	17.43	18.04
Total Mobile Sources	**12.96**	**15.80**	**17.43**	**18.04**
TOTAL OCS AIR BASIN	**13.36**	**16.20**	**17.84**	**18.45**
TOTAL VENTURA COUNTY (ADJUSTED)	**75.19**	**64.25**	**59.48**	**58.20**

NOTES:
Source: ARB CEFS v1.06 (November 2006).
Revised On-Road Vehicle emissions (03/12/2008) and ARB Adjustments (03/06/2008).
Data rounding may affect totals.

Figure 4-3
Ventura County 2012 Planning Day
ROG Emissions Inventory

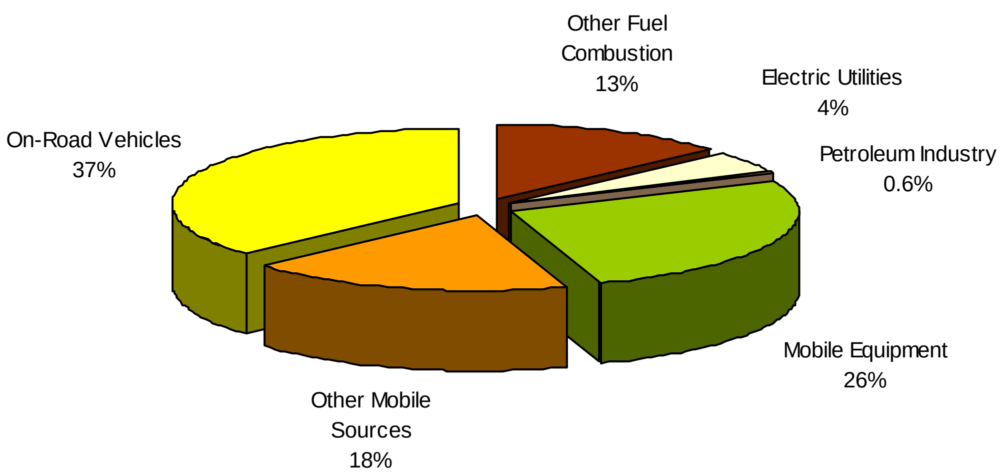
48.65 tons/summer day



Reference:
ARB CEFS v1.06 (Nov. 2006).
Total emissions include ERCs.
Excludes OCS and Natural Sources.

Figure 4-4
Ventura County 2012 Planning Day
NOx Emissions Inventory

39.75 tons/summer day



Reference:
ARB CEFS v1.06 (Nov. 2006).
Total emissions include ERCs.
Excludes OCS and Natural Sources.

4.3. Ventura County Marine-Related Emissions Forecast

As discussed in Section 2.3, coastal and offshore marine emission sources are important segments of Ventura County's overall emission inventory. A substantial effort has been made to improve and refine emission estimates for these emission sources, described in detail in Section 2.3.

4.3.1. SCC Air Basin Marine-Related Emissions

Coastal marine emission sources are located in the State Tidelands within three miles of the Ventura County coastline in the SCC Air Basin, which also incorporates the onshore portion of Ventura County, including the Port of Hueneme and its approach corridors.

As shown in Table 4-8, coastal marine emission sources include Ships and Commercial Boats, Recreational Boats, and Cargo Handling Equipment. Cumulatively these categories account for over 4 tons/day ROG and nearly 3 tons/day NOx in 2002 and well over 3 tons/day of both ROG and NOx in 2012. The most important ROG and NOx emission sources and their relative contributions to total coastal emissions in 2012 are described below.

- Ships and Commercial Boats: 1.6 tons/day NOx (50%).
  Ships and Commercial Boats are responsible for over 45% of coastal water NOx emissions in 2002, increasing by 18% to account for over half by 2012.
  - Ocean-going Vessels: 0.8 tons/day NOx (24%).
    NOx emissions from Ocean-going Vessels calling on Port Hueneme (auto carriers, bulk cargo carriers, container vessels, passenger vessels, roll-on/roll off vehicle carriers, refrigerated cargo vessels and tankers) comprise 17% of the coastal total in 2002 and are expected to increase by nearly 45% by 2012.
  - Commercial Boats and Harbor Craft: 0.5 tons/day NOx (15%).
    Commercial Boats and Harbor Craft such as commercial fishing vessels, charter fishing vessels, excursion boats, tug and towboats, and crew and supply boats associated with the four offshore oil and gas production platforms contribute over 21% of coastal NOx in 2002. Emissions are expected to decrease by nearly 24% by 2012.
  - Military Vessels: 0.4 tons/day NOx (11%).
    Military Vessels operations occurring at the U.S. Navy facilities at the Port of Hueneme include large naval ships, smaller support and operations vessels, tugboats and other vessels, and some non-military vessels utilizing Navy facilities. Military vessels account for 6% of coastal NOx emissions in 2002, and should increase by 0.2 tons/day by 2012.
- Recreational Boats: 3.4 tons/day ROG (92%) and 1.2 tons/day NOx (39%).
  Recreational Boats operate at the three ports, marinas and lakes in Ventura County, and include vessels with outboard, inboard and stern-drive engines, sailboat auxiliary engines, and personal watercraft. Recreational vessels account for 92% of the ROG emissions in

2002 and 2012, despite decreasing by about 13% (0.5 tons/day) by 2012. NOx from recreational boats increases by nearly 39% from 30% of total 2002 emissions.

- Cargo Handling Equipment: 0.3 tons/day NOx (11%).
  Cargo Handling Equipment includes port operations/cargo handling equipment operating in association with large commercial vessels calling on Port Hueneme, such as yard tractors, forklifts, cranes, loaders, and other material handling equipment. Cargo Handling Equipment generates 25% of NOx in 2002, decreasing over 53% (0.4 tons/day) by 2012.

Table 4-8
SCC Air Basin Marine Emission Categories 2002 – 2012

Ventura County	ROG Planning Day Emissions (tons/summer day)			
Emission Category	**2002**	**2008**	**2011**	**2012**
Ships & Commercial Boats	0.23	0.26	0.27	0.27
Recreational Boats	3.85	3.65	3.42	3.37
Cargo Handling Equipment	0.09	0.04	0.03	0.03
Total SCC Air Basin Marine ROG	**4.17**	**3.95**	**3.72**	**3.67**

	NOx Planning Day Emissions (tons/summer day)			
Emission Category	**2002**	**2008**	**2011**	**2012**
Ships & Commercial Boats	1.35	1.54	1.57	1.59
Recreational Boats	0.89	1.26	1.24	1.24
Cargo Handling Equipment	0.75	0.48	0.40	0.35
Total SCC Air Basin Marine NOx	**2.99**	**3.28**	**3.21**	**3.18**

NOTES:
CEFS v1.06 (November 2006).
Including ARB Adjustments (03/06/2008).

4.3.2. OCS Air Basin Marine-Related Emissions

Offshore emission marine sources shown in Table 4-9, Figure 4-5 and Figure 4-6 occur in the region beyond three miles of the coastline in the OCS Air Basin and include the offshore shipping lanes in the Santa Barbara Channel and San Nicolas Island. The most important ROG and NOx emission sources and their relative contributions to total offshore emissions in 2012 are described below.

- Ships & Commercial Boats: 18.0 tons/day NOx (97%) and 0.7 tons/day ROG (78%).
  This category accounts for the vast majority of emissions in the OCS Air Basin, nearly 78% of ROG and nearly 97% of NOx in 2002. By 2012, NOx is expected to increase by 39% (5.1 tons/day), while ROG should increase by 21%.
  - Ocean-going Vessels: 15.8 tons/day NOx (86%) and 0.5 tons/day ROG (52%)
    Ocean-going Vessels traversing the Santa Barbara Channel shipping lanes offshore of Ventura County include vessels calling on Port Hueneme or the ports of Los Angeles/Long Beach, and transiting vessels passing through southern California

waters but without calling at either port. Commercial Ocean-going Vessels account for 77% of NOx and 39% of ROG in 2002. Expansion in "goods movement" activity by ships visiting the ports in California are expected to increase NOx and ROG emissions by more than 50% (5.5 tons/day NOx).

  - Commercial Boats: 1.6 tons/day NOx (8%) and 0.2 tons/day ROG (19%).
    Commercial Boats include commercial and passenger charter fishing boats, excursion boats, tugboats and crew & supply boats affiliated with the offshore oil and gas production platforms. Commercial boats contribute over a third of offshore ROG and about 17% of NOx in 2002. Emissions of both pollutants should decrease by about 32% by 2012.

  - Military Vessels: 0.6 tons/day NOx (3%) and 0.1 tons/day ROG (7%).
    Military Vessels are large naval vessels, smaller support vessels, and tugboats operating offshore and in the approach corridors to Port Hueneme. Military vessels account for about 5% of 2002 offshore ROG and less than 3% of NOx emissions. By 2012 military vessels will contribute about 7% of ROG and 3% of NOx.

- Aircraft: 0.1 tons/day ROG (13%).
  Aircraft emissions are associated with military aircraft operations at the U.S. Naval facility on San Nicolas Island, including transports, jet aircraft and helicopters. Aircraft activities are responsible for 10% of offshore ROG emissions in 2002 and about 13% in 2012.

- Stationary Sources: 0.4 tons/day NOx (2%) and 0.1 tons/day ROG (9%).
  Oil & Gas Production ROG emissions include fugitive hydrocarbon losses from oil and gas production components and production and processing equipment on the offshore oil and gas production platforms; natural gas flaring is responsible for ROG and NOx emissions. Oil & Gas Production activities produce 6% of offshore ROG emissions in 2002. Other offshore emission sources contributing less than 7% of total offshore ROG and 3% of NOx include electric generating types of equipment and routine maintenance operations for the offshore oil and gas production platforms and the U.S. Naval facility on San Nicolas Island. There should be negligible changes in emissions by 2012.

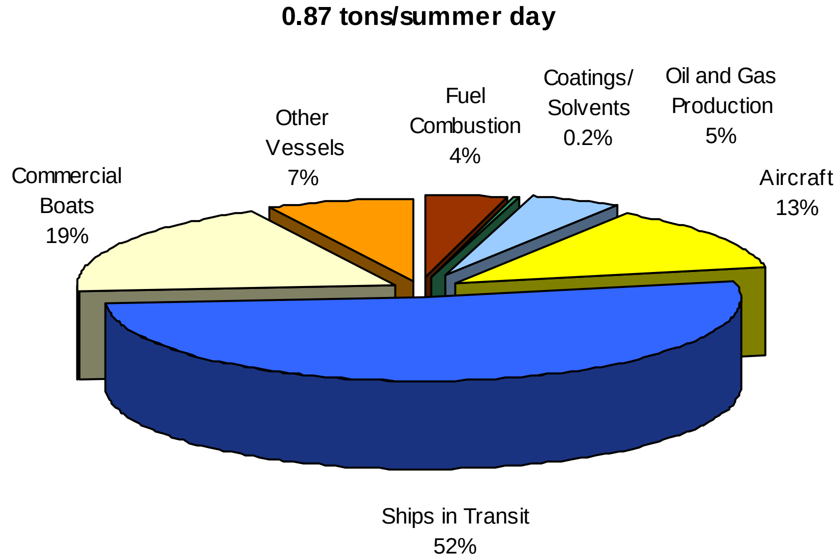
Table 4-9
OCS Air Basin Marine Emission Categories 2002 – 2012

Ventura County Emission Category	ROG Planning Day Emissions (tons/summer day) 2002	2008	2011	2012
Ships & Commercial Boats	0.56	0.64	0.67	0.68
Aircraft	0.07	0.10	0.11	0.11
Oil & Gas Production	0.04	0.04	0.04	0.04
Other	0.05	0.04	0.04	0.04
Total OCS Air Basin ROG	**0.72**	**0.82**	**0.86**	**0.87**

Emission Category	NOx Planning Day Emissions (tons/summer day) 2002	2008	2011	2012
Ships & Commercial Boats	12.92	15.74	17.36	17.97
Aircraft	0.04	0.06	0.06	0.07
Other	0.40	0.41	0.41	0.42
Total OCS Air Basin NOx	**13.36**	**16.21**	**17.83**	**18.46**

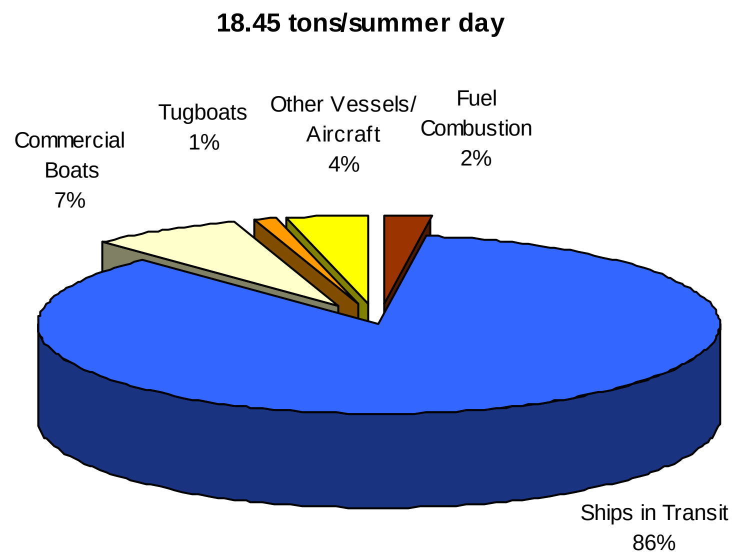
NOTES:
CEFS v1.06 (November 2006).
Including ARB Adjustments (03/06/2008).

Figure 4-5
Ventura County 2012 Planning Day
ROG Emissions Inventory (OCS Air Basin)



Reference:
ARB CEFS v1.06 (Nov. 2006).
OCS is 3 – 100 miles offshore.

Figure 4-6
Ventura County 2012 Planning Day
NOx Emissions Inventory (OCS Air Basin)



Reference:
ARB CEFS v1.06 (Nov. 2006).
OCS is 3 – 100 miles offshore.

4.4. Naval Base Ventura County Emission Forecasts

The 2007 AQMP includes emissions associated with potential growth or change in activity at the Naval Base Ventura County (NBVC). The purpose of these projections is to include information in the 2007 AQMP regarding potential growth at NBVC. These emissions are included in the AQMP's base year inventory and emissions forecasts. The baseline and projected emissions are from aircraft, missile, and ship operations. Increases in motor vehicle activity at NBVC are part of SCAG's regional transportation model and are not included in these projections. These data represent the best available information for NBVC as of June 5, 2007.

Table 4-10 summarizes the baseline emissions, estimated emissions from potential projects, and an additional 7% growth forecast for NBVC through year 2012 in the SCC Air Basin. The 7% growth forecast is based on an additional 1% growth factor for each year, beginning in 2006, to account for uncertainties in potential projects resulting from future actions. This additional growth would result in a base-wide emissions budget of 186.6 tons per year of ROG and 243.7 tons per year of NOx by 2012.

Table 4-10
Naval Base Ventura County Emissions Budget
(tons per year)

	2002[a]	2008	2009	2010	2011	2012
ROG	137.5	179.0	181.1	182.5	185.2	186.6
NOx	149.6	230.7	233.8	235.3	242.2	243.7

NOTES:
[a] Emissions do not include emissions from missile operations.
Source: Naval Base Ventura County Mobile Source Emissions Growth Projection and 8-Hour Ozone SIP Planning (6/5/2007).

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5. FEDERAL 8-HOUR OZONE REASONABLE FURTHER PROGRESS

5.1. Introduction

The CAAA requires that the 2007 AQMP show steady progress towards attaining the federal 8-hour ozone standard out to 2013, the county's serious classification attainment date. EPA defines reasonable further progress (RFP) as "annual incremental reductions in air pollutant emissions as reflected in a State Implementation Plan that EPA deems sufficient to provide for the attainment of the applicable national ambient air quality standards by the statutory deadline." A clean air plan must demonstrate both RFP and attainment of the applicable clean air standard to be approvable by EPA. It must also include contingency emission reductions if a nonattainment area fails to meet certain mandated milestones.

Reasonable further progress requirements for the 8-hour ozone standard are described in EPA's *Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard*, and build upon the requirements specified in CAAA Sections 172(c)(2), 182(b)(1)(A) and 182(c)(2)(b). CAAA Section 172(c)(2) is the general requirement for RFP. More specific requirements are given in Sections 182(b)(1)(A) and 182(c)(2)(b). Section 182(b)(1)(A) requires that moderate and above nonattainment areas reduce ROG at least 15 percent from baseline emissions within six years from the baseline year (i.e., by 2008 from 2002). Section 182(c)(2)(b) requires serious and above areas provide an average of three percent per year ROG and/or NOx reductions for the first six-year period from the baseline year, and each three-year period thereafter until their attainment dates.

However, the EPA's final RFP rule does not require serious and above 8-hour ozone nonattainment areas with approved 15 percent rate-of-progress ROG plans for the federal 1-hour ozone standard to do another 15 percent ROG-only reduction for the federal 8-hour ozone standard. Rather, those areas must reduce ROG and/or NOx emissions by an average of three percent per year for the first six-year period following the baseline year plus all remaining three-year periods out to their attainment dates. The federal Clean Air Act also specifies that areas classified moderate or higher must provide emission reductions equivalent to three percent of the adjusted base year inventory for contingency measures, the equivalent of one year of RFP.

The EPA approved Ventura County's 15 percent rate-of-progress plan on January 8, 1997. Therefore, the 2007 AQMP must provide an average of three percent per year of ROG and/or NOx reductions from 2002 through 2012, since Ventura County's serious classification attainment date is June 15, 2013. It must also show attainment of the 8-hour ozone standard by the end of the prior ozone season (i.e., by 2012). The baseline year for this AQMP is 2002. Therefore, RFP milestone reporting years are 2008, 2011, and 2012. The required milestone ROG/NOx reductions are 18 percent for 2008, 27 percent for 2011, and 30 percent for 2012.

EPA guidance for calculating RFP allows for accounting for ROG emissions 100 km and NOx emissions 200 km from Ventura County boundaries. For Ventura County's RFP, the same 100 km limit for both ROG and NOx was used. As such, on-shore emissions from the Los Angeles County portion of the South Coast Air Basin have been included in the baseline ROG and NOx inventories as “upwind emissions” for the RFP demonstration.

5.2. RFP Demonstration

Pursuant to the EPA’s Phase 2 rule for the federal 8-hour ozone standard, RFP calculations start with the 2002 base year emissions and reflect emission reductions from adopted state and local control strategies only. ARB adjusted both the base year emissions and milestone year emissions for measures already adopted through December 31, 2006. These adjustments are presented in Section 4.1.1 and detailed in Table 4-3. The adjustments are uninventoried emission categories and not included in CEFS v1.06. In addition, according to EPA policy, emission reduction benefits attributable to the federal motor vehicle control program (FMVCP) and fuel Reid Vapor Pressure (RVP) requirements must be discounted from the pre-1990 California motor vehicle program (CA MVCP).

Table 5-1 presents the RFP demonstrations showing Ventura County meeting RFP, and the three percent RFP contingency requirements for the serious area milestone years, 2008, 2011, and 2012. The adjusted baseline inventory in the table reflects the emission inventory adjustments presented in Table 4-3.

For all three milestone years, 2008, 2011, and 2012, the county will achieve RFP using only ROG emission reductions by 6.2, 2.4, and 0.6 percent per day, respectively. Therefore, RFP for each of those years does not require a combination of ROG and NOx reductions (NOx substitution). Three percent of 2002 NOx emission reductions have been set aside for 3% contingency requirements in each RFP milestone year.

Table 5-1
RFP Demonstration

	(tons/summer day)			
	2002	**2008**	**2011**	**2012**
Baseline ROG	598.8	424.9	387.6	378.4
CA MVCP/RVP Adjustment	0.00	38.20	49.90	53.79
RACT Corrections	0	0	0	0
Adjusted 2002 Baseline ROG in milestone year	598.8	560.6	548.9	545.0
RFP commitment for ROG reductions from new measures		0	0	0
Required % change since previous milestone year (ROG or NOx) compared to 2002		18%	9%	3%
Required % change since 2002 (ROG or NOx)		18%	27%	30%
Target ROG levels		459.7	400.7	381.5
Apparent shortfall in ROG		-34.8	-13.1	-3.1
Apparent shortfall in ROG, %		-6.2%	-2.4%	-0.6%
ROG shortfall previously provided by NOx substitution, %		0.0%	0.0%	0.0%
Actual ROG shortfall, %		-6.2%	-2.4%	-0.6%
Baseline NOx	718.0	565.7	493.0	476.6
CA MVCP Adjustment	0.00	41.85	52.15	55.58
Adjusted Baseline NOx	718.0	676.1	665.9	662.4
RFP commitment for NOx reductions from new measures	0	0	0	0
Change in NOx since 2002		110.5	172.9	185.8
Change in NOx since 2002, %		16.3%	26.0%	28.0%
NOx reductions since 2002 already used for RFP substitution through last milestone year, %		0.0%	3.0%	3.0%
NOx reductions since 2002 available for RFP substitution and contingency in this milestone year, %		16.3%	23.0%	25.0%
Change in NOx since 2002 used for ROG substitution in this milestone year, %		0.0%	0.0%	0.0%
Change in NOx since 2002 available for contingency in this milestone year, %		3.0%	3.0%	3.0%
Change in NOx since 2002 surplus after meeting substitution and contingency needs in this milestone year, %		13.3%	23.0%	25.0%
RFP shortfall, if any		**0.0%**	**0.0%**	**0.0%**
RFP Met?		**YES**	**YES**	**YES**
Contingency Met?		**YES**	**YES**	**YES**

NOTES:
Includes transport contributions from the Los Angeles-South Coast Air Basin.
From Updated Ventura RFP w-burning (3).xls, March 5, 2008, 4:57:37 PM.

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6. FEDERAL 8-HOUR OZONE MODELING AND ATTAINMENT DEMONSTRATION

6.1. Introduction

This chapter presents the photochemical modeling and supplemental Weight of Evidence (WOE) analyses conducted for the 2007 AQMP. The purpose of these analyses is to determine whether the proposed control strategy for the 2007 AQMP provides sufficient emission reductions to meet the federal 8-hour ozone standard by the attainment year.

6.2. Photochemical Modeling and Weight of Evidence Analyses

Section 182(c)(2)(A) of the federal CAAA requires that moderate and above ozone nonattainment areas attain the federal 8-hour ozone standard by specific dates based on their ozone nonattainment designations. Moreover, serious and above ozone nonattainment areas, including Ventura County, must use a photochemical grid model to show attainment.

Photochemical grid models are computer programs that mathematically simulate each of the physical and chemical processes that govern air pollutant in the lower atmosphere. Such processes include air pollutant release into the air, air pollutant transport and diffusion by the wind, air pollutant creation and destruction in the air through chemical reactions, and deposition of pollutants onto the ground. The region analyzed by a photochemical air pollution model is termed the modeling region or modeling domain and is a geographical area divided into a three-dimensional array of grid cells. The model calculates air pollutant concentrations in each grid cell for each hour of the modeling period and often displays the results graphically.

EPA modeling guidance recommends that nonattainment areas supplement their photochemical modeling results with a “weight of evidence” assessment if their model predicts future-year ozone levels of 0.082 ppm to 0.087 ppm. The federal 8-hour ozone attainment level is 0.084 ppm. A WOE assessment is a set of analyses intended to verify modeled predictions of future air quality, especially at levels near the federal standards. These analyses can include air quality trends, emission trends, meteorological data, evaluation of other air quality indicators, and additional air quality modeling. Because all analysis methods have strengths and weaknesses, examining an air quality problem using various analysis methods helps offset the limitations and uncertainty inherent in all air quality modeling methods. The scope of the WOE analysis is different for each nonattainment area. The level of detail appropriate for an area depends upon the complexity of the air quality problem in the area, how far into the future the attainment deadline is, and the amount of data and modeling available.

6.3. Attainment Demonstration

Photochemical modeling results indicate a design value of 0.087 ppm for Ventura County by 2013, the attainment date for serious ozone nonattainment areas. Based on photochemical modeling, as well as supporting analyses completed as part of the WOE evaluation, Ventura

County can expect to reduce its design value to 0.084 ppm and attain the federal 8-hour ozone standard by 2013, the attainment date for serious nonattainment areas. Appendix D contains the photochemical modeling protocol and WOE for the 2007 AQMP.

7. CONTINGENCY MEASURES

7.1. Introduction

Clean air plans for nonattainment areas must contain contingency reductions that take effect without further air agency action should the areas fail to achieve RFP goals or attainment by their attainment deadlines. CAAA Section 172(c)(9) requires that areas implement contingency measures if they fail to make RFP or fail to attain the air quality standards by the required attainment date. Section 182(c)(9) of the CAAA requires serious and above nonattainment areas to implement contingency measures if they fail to meet any applicable CAAA milestone for the federal 8-hour ozone standard.

Contingency measures must be specific federal, state, or local measures that will provide emission reductions surplus to those needed for attainment. The April 16, 1992 General Preamble to the CAAA of 1990 provided the following guidance regarding contingency measures: "States must show that their contingency measures can be implemented with minimal further action on their part and with no additional rulemaking actions such as public hearings or legislative review. In general, EPA will expect all actions needed to affect full implementation of the measures to occur within 60 days after EPA notifies the State of its failure (57 FR 13512). This could include Federal measures and local measures already scheduled for implementation."

The EPA has approved numerous SIPs that rely on one or more contingency measures that are in place and provide reductions surplus to RFP or attainment requirements. The key is that the statute requires extra reductions not relied on for RFP or attainment to provide a cushion while revising the plan to meet the missed milestone. However, nothing in the statute precludes an area from implementing such measures before needed by a milestone failure.

The CAAA does not specify the number of contingency measures nor does it specify an exact magnitude of emission reductions that the contingency measures are to achieve. However, EPA's General Preamble for Title I of the CAAA states that EPA will interpret Sections 172(c)(9) and 182(c)(9) as requiring additional emission reductions of up to three percent of the emissions in the adjusted base year inventory. Moreover, the reductions must occur in the year following the year in which the failure occurred.

EPA allows substitution of NOx contingency measures for ROG contingency measures if two conditions are met. First, the area must need NOx reductions to reduce ambient ozone concentrations. Second, a minimum of ten percent of the required contingency measures must be from ROG measures.

7.2. Reasonable Further Progress and Attainment Contingency Measures

7.2.1. RFP Contingency Measures

The CAAA specifies that each ozone non-attainment area must demonstrate ongoing emission reductions relative to the emission inventory base year (2002). Federal law requires a three percent per year reduction in VOC emissions and does not allow credit to be taken for pre-1990 federal motor vehicle control programs. Where both VOC and NOx emissions have been shown to contribute to high ozone levels, the Clean Air Act allows NOx emission reductions to be used to augment VOC emission reductions in order to demonstrate reasonable further progress. In nonattainment areas that are impacted by transport from other regions, emissions and emission reductions from those regions are taken into account when assessing reasonable further progress. Air quality modeling, described in Section 5, demonstrates that emissions from the South Coast Air Basin contribute to violations of the federal ozone standard in Ventura County.

Table 5.1 demonstrates that the RFP projected for Ventura County meets CAA requirements and is met using ROG emissions only. The RFP assessment takes into account projected emissions for upwind areas within 100 kilometers (the Los Angeles County portion of the South Coast Air Basin) as allowed by EPA guidance.

The emissions inventory indicates that the adopted measures from ARB's mobile source program will provide emissions reductions beyond those needed for Ventura County's RFP demonstration. As part of the RFP demonstration, Ventura County will rely on a portion of surplus NOx reductions to provide for 3% contingency reductions in the 2008 and 2011 RFP milestone years.

7.2.2. Attainment Contingency Measures

ARB, in its 2007 SIP, has committed to include the emissions benefits of one additional year of its motor vehicle program, including vehicle fleet turnover, and light-duty vehicle inspection and maintenance programs, in the year following each area's attainment year for attainment contingency measures. This commitment will meet Ventura County's attainment contingency obligation.

8. CALIFORNIA OZONE TRIENNIAL ASSESSMENT AND PLAN UPDATE

The CCAA requires that the District assess the progress the county has made towards meeting the state ambient 1-hour ozone standard during the previous three years (2003 through 2005). The CCAA also requires periodic plan updates for attaining the state 1-hour ozone standard. The 2007 AQMP satisfies both of these CCAA requirements.

The 2007 AQMP reports on the progress the county has made over the reporting period for the state 1-hour ozone standard. The state and local control programs presented in the 2007 AQMP for the federal 8-hour ozone standard will ensure that Ventura County continues to make progress towards the more stringent state 1-hour ozone standard. The deadline for the triennial assessments was December 31, 2006. However, ARB revised the deadline to correspond with federal SIP submittals.

By being a comprehensive clean air plan for the federal 8-hour ozone standard, the 2007 AQMP incorporates considerable new data and projections. In addition, most of the federal planning mandates for the 8-hour ozone standard addressed by the 2007 AQMP also address most of the planning requirements for the 1-hour state ozone standard. District staff has not identified any deficiencies with respect to meeting progress goals towards the state 1-hour ozone standard.

8.1. Triennial Assessment and Plan Update Requirements

California Health and Safety Code Sections 40924 and 40925 require that the Triennial Assessment Plan Update include the following:

- Improvement in air quality based upon air quality indicators identified by the ARB (Section 40924);
- Population-related, industry-related, and vehicle-related emissions growth (Section 40925);
- Control measures adopted by the District (Sections 40924 and 40925); and,
- Review of “every feasible measure” (Section 40925).

Table 8-1 provides a more complete list of triennial plan requirements and where those requirements are met in the 2007 AQMP.

Table 8-1
CCAA Triennial Assessment Requirements

Requirement	Submittal
Air Quality Analysis	Chapters 1 (Section 1.5.) & Chapter 8 (Section 8.2.)
Contingency Measures	Chapter 7
Control Measures	Chapter 3 & Chapter 8 (Section 8.5.)
Control Strategy Cost-Effectiveness	Chapter 8 (Section 8.5.1.)
Emission Inventory	Chapter 2 & Chapter 4
Every Feasible Measure	Chapter 8 (Section 8.6.)
Expeditious Adoption	Chapter 8 (Section 8.6.)
Population Exposure	Chapter 8 (Section 8.2.)
Public Information	Chapter 8 (Section 8.9.)
Ozone Transport	Chapter 8 (Section 8.7.)
Population Trends	Chapter 4 (Section 4.1.)
Transportation Control Measures	Chapter 3 (Section 3.2.)
Vehicle Trips & VMT Trends	Chapter 4 (Sections 4.1. & 4.1.2.)

8.2. Air Quality Indicators

The ARB recommends local districts use three air quality indicators to assess progress in meeting the state ambient 1-hour ozone standard: population-weighted exposure, area-weighted exposure, and expected peak day concentration. As discussed below, these indicators show that Ventura County has made excellent progress towards meeting the state 1-hour ozone standard. Further information regarding current and historical air quality data for Ventura County is available on the District's Air Quality Monitoring Division website.

8.2.1. Population-Weighted Exposure & Area-Weighted Exposure

Population-weighted Exposure: This indicator characterizes the potential average outdoor exposure per person to concentrations above the state ozone standard. It represents a composite of exposure around each air quality monitoring site weighted to emphasize equally the exposure for each person in Ventura County. The exposure value hence represents the number of hours multiplied by the ozone concentration over the California standard that the average person experiences, expressed in parts per hundred million (pphm) per person. However, population-weighted exposure represents the average potential exposure in the District, and not health impacts on individuals. The term "potential" denotes a person's possible daily exposure and not actual daily exposure. For example, being indoors during peak ozone concentrations will decrease a person's actual exposure to outdoor ozone concentrations.

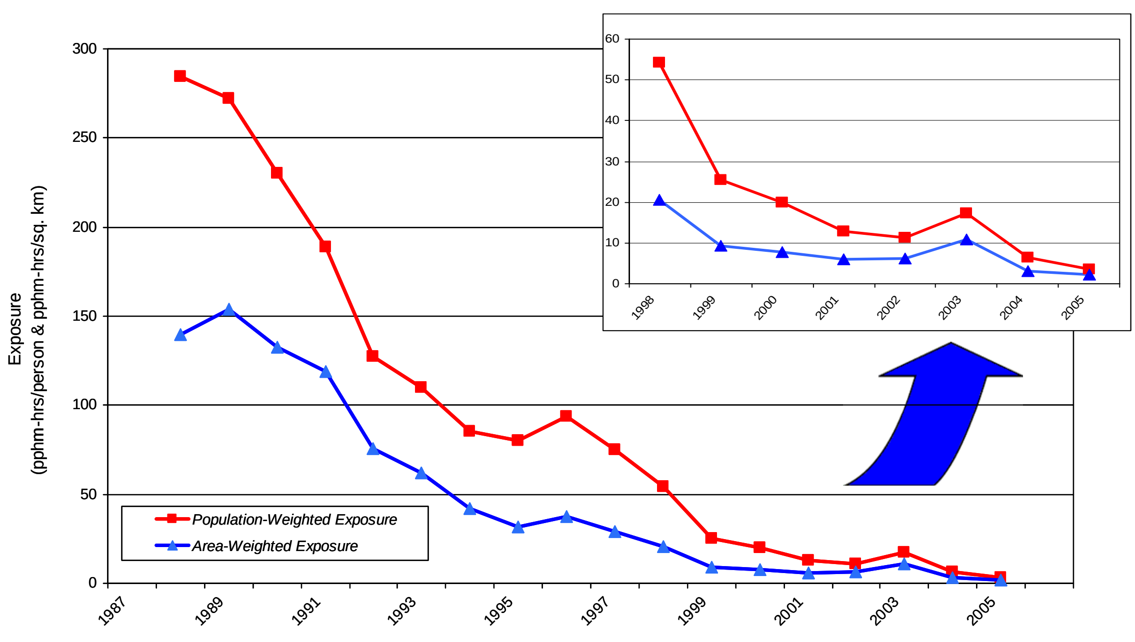
Health and Safety Code Section 40920 requires the District to reduce exposure to ozone levels in excess of the state standard from average 1986 - 1988 levels by at least 25 percent in 1994, by 40 percent in 1997, and 50 percent in 2000. Figure 8-1 presents the trend in three-year average population-weighted exposure to levels above the state ozone standard, as recommended by the

ARB. It shows population-weighted exposure in Ventura County has been reduced significantly since 1986 - 1988, and at a faster rate than required by Section 40920. By 2000, population-weighted exposure declined by 93 percent, compared to the 2000 target of 50 percent. By 2002, population-weighted exposure declined by 96 percent and nearly 99 percent by 2005.

Area-weighted Exposure: This indicator characterizes the potential average annual outdoor exposure per unit area. It represents a composite of exposure around each air quality monitoring site weighted to equalize the exposure throughout Ventura County. Area-weighted exposure is calculated similarly to population-weighted exposure, except the census tract ozone concentrations are multiplied by the square kilometers in the census tract. Exposure values are then summed and divided by the total square kilometers in the county.

As indicated, the District is required to reduce exposure to ozone levels in excess of the state standard from average 1986 - 1988 levels by 25 percent in 1994, by 40 percent in 1997, and by 50 percent in 2000. Figure 8-1 presents the county's downward trend in three-year average area-weighted exposures to ozone levels above the state ozone standard. As can be seen, area-weighted exposure has declined significantly since 1986 - 1988. By 2000, area-weighted exposure in Ventura County declined by 94 percent, compared to the 2000 target of 50 percent. By 2002, area-weighted exposure declined by 95 percent, and 98 percent by 2005.

Figure 8-1
Population & Area-Weighted Exposure



8.2.2. Expected Peak Day Concentration

Expected peak day concentration (EPDC) represents the maximum ozone concentration anticipated to occur once per year, on average. It is based on a statistical calculation of daily maximum 1-hour ozone data collected at each air quality monitoring site in the county over a three-year period. The EPDC is useful for tracking air quality progress at individual air quality monitoring locations. Because it uses a robust statistical calculation, it is relatively stable, thereby providing a trend indicator that is not highly influenced by year-to-year variations in meteorology.

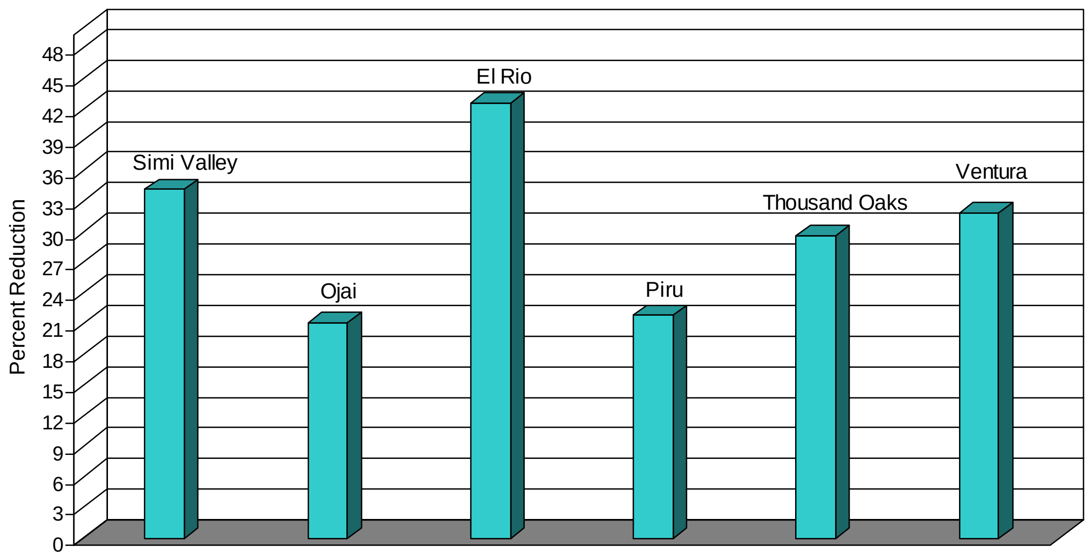
Table 8-2 presents a summary of the EDPC values calculated by ARB for the Ventura County air quality monitoring sites for 1986 and 2005. Figure 8-2 graphically presents the corresponding percent reduction in expected peak day concentration values for each of the air quality monitoring stations. Peak day ozone concentrations have significantly declined over the period. The percent reductions range from 21.1 percent in Ojai to 42.6 percent in El Rio. The average reduction was over 30.1 percent.

Table 8-2
Expected Peak Day Ozone Concentrations

Monitoring Site	1986-1988	1989-1991	1992-1994	1995-1997	1998-2000	2000-2002	2003-2005	Total Percent Reduction from 1986-1988
Simi Valley	17.6	16.4	14.7	15.3	13.2	12.5	11.6	34.1
Ojai	14.2	14.1	13.0	12.2	11.3	12.1	11.2	21.1
El Rio	14.1	12.6	12.0	10.9	9.1	8.3	8.1	42.6
Piru	14.2	13.4	11.8	11.7	10.3	11.7	11.1	21.8
Thousand Oaks	15.2	14.0	13.2	13.1	11.2	10.2	10.7	29.6
Ventura	12.9	12.5	10.6	11.0	8.5	8.3	8.8	31.8

NOTES:
Expected peak day concentration for ozone, in parts per hundred million (pphm).
Source: Air Resources Board (September 2006).

Figure 8-2
Percent Reduction in Expected Peak Day Ozone Concentrations: 1986 – 2005



8.3. Emissions Trends

Chapter 4, *Emissions Inventory Forecast*, presents updated emission control and forecast information, including population and motor vehicle growth trends, for 2002 through 2012 for stationary, area, and mobile source ROG and NOx emission categories. The updated forecasts were not compared to the corresponding forecasts in the 1994 AQMP because the emission inventory base years for each forecast set were different (1990 vs. 2002), as were the forecasting methodologies. Overall, ROG and NOx emissions are declining as they have for many years, continuing Ventura County's progress towards meeting the state and federal ozone standards. This improvement in air quality is occurring despite growing population and motor vehicle usage. From a 2002 baseline, ROG emissions are expected to decline by 18.4 percent and NOx by 35.7 percent by 2012. The greatest ROG and NOx declines will come from mobile sources, mostly a result of ARB's mobile source control strategies. Except for the Electric Utilities category, which is expected to increase 24.3 percent by 2012, all other categories are expected to decline as well.

8.4. Overall Progress

The air quality indictors presented in Section 8.2, together with the ozone concentration declines presented in Section 1.5.1, and the emission trends in Section 8.3, indicate that Ventura County has made exceptional progress towards attaining the state 1-hour ozone standard. Such improvement will continue as new control strategies and programs presented in this plan for the federal 8-hour ozone standard are implemented.

8.5. AQMP Control Measure and Rulemaking Update

This section summarizes the District's rulemaking activity for AQMP control measures during the 2003 - 2005 triennial assessment period. This section does not include other rulemaking activities unrelated to AQMP control measures, such as rules for other air pollutants, administrative rule changes, rule language cleanups and fix-ups, and air permitting rules. Information regarding the District's current rulemaking activities is available on the District's Rule Development website.

8.5.1. Control Strategy Cost Effectiveness

The CCAA requires that an emissions control strategy for the state 1-hour ozone standard be cost effective, when viewed in its entirety. Furthermore, the cost effectiveness of individual control measures must be determined and presented in rank order. The 1991 AQMP, prepared for the state 1-hour ozone standard, included cost effectiveness estimates for each proposed control measure. Only those control measures judged cost effective and technologically feasible for Ventura County were included in that plan. Such has been the case for every Ventura County AQMP before or since, including the 2007 AQMP. The proposed rule revisions included in this plan were based on multi-factor evaluations that included estimates of cost effectiveness. Likewise, District staff will not recommend any further study measure for adoption as a District rule unless shown to be cost effective and appropriate for Ventura County.

8.5.2. Control Measures Amended or Implemented 2003 – 2005 & Control Measures Still Reducing Emissions Beyond the 2002 Emission Inventory Base Year

Table 8-3 presents those control measures adopted/amended during the triennial period and their respective emissions reductions beyond previous AQMP projections. Of all the control measures in Table 8-3, only R-328, Surface Cleaning & Degreasing, achieved significant emissions reductions in 2005. The other control measures in Table 8-3 produced only minimal reductions in 2005. This reflects the maturity of the District's clean air program.

Table 8-3
Control Measures Adopted or Amended 2003 – 2005

CM Number	Control Measure Name	Rule Number	Year Adopted/ Amended	Year Implemented	Reduction (tons/summer day) 2005
ROG Control Measures					
R-306	Wood Products Coating	74.30	2003	2004	0.00[a]
R-328	Surface Cleaning & Degreasing	74.6/74.6.1[b]	2003	2004	1.03
R-314	Adhesives	74.20	2005	2005	0.02
R-316	Graphic Arts Solvents	74.19	2003	2004	0.01
R-501	Fiberglass & Polyester Resin	74.14	2005	2005	0.00
R-504	Restaurant Cooking Operations	74.25	2004	2005	0.00
Total ROG Control Measures					**1.06**

NOTES:
[a] Data rounding may affect displayed values and totals.
[b] Includes related revisions to District rules 74.12, 74.13, 94.19, 74.24, and 74.30.
Data source: ARB Rule Reduction File (2/13/2007).

8.5.3. Status of Control Measures Scheduled for Revision 2003 – 2005

Table 8-4 presents the status of control measures scheduled for adoption or revision during the 2003 - 2005 triennial assessment period. The District implements each control measure in Table 8-4 through a District rule adopted by the Ventura County Air Pollution Control Board (Board or APCB). This means that Board actions to adopt, revise, or repeal control measures are actually actions to adopt, revise, or repeal the associated District rules.

Several of the proposed rule revisions were included to meet the “every feasible measure” requirement of the CCAA. Of those, the District’s board adopted revisions to two: R-306 (Rule 74.30), *Wood Product Coatings*; and, R-501 (Rule 74.14), *Polyester Resin Material Operations*. Revisions to R-306 reduced certain ROC content limits to coincide with those in South Coast AQMD Rule 1171, *Solvent Cleaning Operations*. Revisions to R-501 lowered monomer content limits to match those in South Coast AQMD Rule 1162, *Polyester Resin Operations*.

District staff’s “every feasible measure” analyses of control measures R-307 (Rule 74.12), *Surface Cleaning of Metal Parts & Products*, and R-328 (Rule 74.6), *Surface Cleaning & Degreasing*, indicated that each would achieve only negligible emission reductions. Therefore, the District did not adopt the proposed rule revisions.

District staff also conducted detailed analyses of control measure R-419, *Gasoline and ROG Liquid Storage Degassing Operations* (Rule 75.26 & 74.27) and concluded that the measure meets “every feasible measure.”

The APCB did not adopt “every feasible measure” rule revisions for control measure R-316 (Rule 74.19), *Graphic Arts*; and, R-324 (Rule 74.19.1), *Screen Printing Operations*, because District staff's analyses indicated that the proposed solvent limits would be technology forcing and infeasible at this time.

The District's board adopted further study control measure R-504, *Restaurant Cooking Operations*, as Rule 74.25. This new rule only applies to conveyorized restaurant charbroilers. Rule 74.25 will include other types of restaurant cooking equipment when control equipment becomes feasible and cost effective.

Table 8-4
Status of Control Measures Scheduled for Revision 2003 – 2005

CM Number	Control Measure Name	Rule	Affected Source Type	Status/Comments
R-306	Wood Products Coating	74.30	Wood product finishers	*Rule revisions adopted 6/06; <0.01 tpd ROC reduction.* ROC limits reduced for surface preparations and cleanup to comply with "every feasible measure" requirement.
R-307	Surface Cleaning of Metal Parts & Products	74.12	Manufacturers and refinishers of metal parts and products	*Rule revision scheduled for 2008.* Rule revision included to meet "every feasible measure" requirement. Rule not adopted due to only minor emission reductions expected and rulemaking workload considerations.
R-311	Motor Vehicle & Mobile Equipment Coating Operations	74.18	Auto body shops	*Rule revision schedule to be determined.* Rule revision included to meet "every feasible measure" requirement. Rule not adopted because ARB has adopted an SCM for automotive coatings and the District is evaluating the SCM for applicability in Ventura County. The SCM is included in the 2007 AQMP as Further Study Measure R-311.
R-316	Graphic Arts	74.19.	Graphic arts operations	*Detailed analysis indicated that the technology forcing limits are not feasible at this time.* Rule revision included to meet "every feasible measure" requirement.
R-324	Screen Printing Operations	74.19.1	Screen printing operations	*Scheduled for reconsideration in 2008.* Rule revision included to meet "every feasible measure" requirement. Detailed analysis indicated that the technology forcing limits are not feasible for Ventura County this time.
R-328	Surface Cleaning & Degreasing	74.6	Facilities that clean medical and electrical components	*Rule revisions to be determined.* Rule revision included to meet "every feasible measure" requirement. Rule not adopted due to only minor emission reductions expected and rulemaking workload considerations.

Table 8-4 (continued)

CM Number	Control Measure Name	Rule	Affected Source Type	Status/Comments
R-419	Crude Oil Storage Tank Degassing Operations	74.26	Crude oil storage tanks	*Detailed analysis indicated the rule meets "every feasible measure."* Rule revisions included to meet "every feasible measure" requirement.
R-419	Gasoline & ROG Liquid Storage Degassing Operations	74.27	Gasoline & reactive organic compound liquid storage tanks	*Detailed analysis indicated the rule meets "every feasible measure."* Rule revisions included to meet "every feasible measure" requirement. Detailed analysis indicated the rule meets "every feasible measure."
R-501	Polyester Resin Material Operations	74.14	Polyester resin material operations	*Rule revisions adopted 4/05; <0.01 tpd ROC reduction.* Rule revisions to meet "every feasible measure" requirement. Monomer content limits reduced and miscellaneous provisions revised or deleted.
R-504	Restaurant Cooking Operations	74.25	Chain driven charbroilers	*Rule adopted 10/04; <0.02 tpd ROC* Implements Further Study Measure R-504; only applies to conveyorized restaurant charbroilers. Other types of restaurant cooking equipment will be added when control options becomes feasible and cost-effective.
R-606	Soil Decontamination Operations	74.29	Fuel-contaminated soils	*Rule scheduled for adoption in 2008.*

8.6. Every Feasible Measure

Health and Safety Code Section 40914 requires plans for attaining the California 1-hour ozone standard to reduce emissions of ROG and NOx by a minimum of five percent per year, averaged over each consecutive three-year period. The 1991 Ventura County AQMP did not meet that emission reduction target. However, it was able to satisfy the alternative requirement of including "every feasible measure (also known as "all feasible measures") . . . and an expeditious adoption schedule," as allowed by Section 40914(b)(2). On August 13, 1992, the ARB approved the 1991 AQMP based on this "every feasible measure" determination of progress.

District staff conducted "every feasible measure" assessments for the District's 2001 and 2004 Triennial Assessments. For the 2001 Triennial Assessment, District staff evaluated 25 stationary source categories contained in ARB's document titled *Identification of Achievable Performance Standards and Emerging Technologies for Stationary Sources*. Based on that assessment, the District committed to further analysis of nine of the 25 measures. Of those measures, three were not implemented, four were recommended for adoption, one was not needed due to a lack of sources, and one required additional study.

For the 2004 Triennial Assessment, staff compared District rules to the "*Most Stringent All Feasible Measures List*" contained in the California Air Pollution Control Officers Association Rules Subcommittee's *Potential All Feasible Measures Report* (September 2003 Update). District staff examined 26 emission source categories and identified 13 categories where District rules had a potential for enhancement and further emission reductions. The District initiated rulemaking for each of the categories, during which the feasibility of each measure was determined for sources located in Ventura County.

For this Triennial Assessment, staff evaluated 44 District rules by comparing them to rules of other California air districts. District staff identified eight rules with potential for enhancement (see Table 8-5). In addition, staff identified a potential new control measure, R-432, for oil well degassing operations. This new rule, if further evaluation shows it to be economically and technologically feasible in Ventura County, would control ROG emissions from venting natural gas from oil wellheads prior to repair work on the wells. The emission reduction potential is unknown at this time but could be significant.

Of the measures listed in Table 8-5, the District's Board, at its September 2007 meeting, determined that further enhancement of R-334 (Rule 74.30), *Wood Products Coatings*, is not cost effective and, hence infeasible. The basis for this conclusion is that the current emission limit exemptions in Rule 74.30 are already more stringent than those in South Coast AQMD Rule 1136, *Wood Products Coatings*. Therefore, except for R-334, the District commits to rulemaking for the rules in Table 8-5, during which District staff will further evaluate the feasibility of each for Ventura County. Emission reductions will be estimated for those determined to be feasible prior to rule adoption. Staff believes that Ventura County APCD rules implement "every feasible measure" for all other emission source categories under its jurisdiction.

Table 8-5
Every Feasible/Further Study Control Measures – Detail

CM Number	District Rule	Control Measure Description	Rulemaking Schedule
R-316	74.19 - *Graphic Arts*	• Examine applicability of CTG recommended alcohol content limit for fountain solutions.	2008
R-329	74.2 - *Architectural Coatings*	Adopt the statewide SCM that ARB amended in October 2007.	TBD
R-330	74.6 - *Surface Cleaning and Degreasing*	• Lower ROG limits for solvents used on electronics and electrical components, medical devices, and application equipment. • Remove PTI exemption, achieve compliance through back end controls. • Reexamine Rocketdyne exemption. • Remove ARB exemption.	TBD
R-331	74.6.1 - *Batch Loaded Vapor Degreasers*	• Limit vapor degreasing solvents to 25 grams of VOC per gallon.	TBD

Table 8-5 (continued)

CM Number	District Rule	Control Measure Description	Rulemaking Schedule
R-332 [a]	74.12 - *Surface Coating of Metal Parts and Products*	• Implement a lower ROG limit for general air-dry one-component coatings. • Create a new multi-component coating category. • Eliminate the special category for lab furniture coatings. • Limit the ROG content of spray gun and cleanup solvents to no more that 25 grams per liter.	2008
R-311	74.18 - *Motor Vehicle & Mobile Equipment Coating Operations*	Implement VOC coating limits per the ARB's statewide SCM (10/20/05) and review the remainder of the SCM for feasibility in Ventura County.	TBD [b]
R-334 [c]	74.30 - *Wood Products Coating*	• Add ROG limits for refinishing operations.	TBD
R-431	70 - *Storage and Transfer of Gasoline*	Require: • Daily self-inspection. • Semi-annual source tests for stations with a throughput greater than 4.0 million gallons per year. • An O&M manual at each station. • 98% Phase I efficiency.	TBD
R-432	New - *Oil Well Degassing*	Adopt a new rule to control ROG emissions from oil wells prior to repair work.	TBD
R-606	74.29 - *Soil Decontamination*	• Require submission and implementation of an approved mitigation plan. • Control emissions during transport of contaminated soil. • Treat or remove contaminated soil within 30 days of excavation. • Change exemption threshold from 10 cu yd to 1 cu yd contaminated soil. • Change exemption threshold for accidental spills from 1 bbl to 5 gallons. • Prohibit off-site aeration; if over 90 days treatment system may not emit >10 lb/day. • Active storage piles must be kept wet or covered. • Inactive piles must be covered within 1 hour. • Reexamine agricultural exemption.	2008
Various	Various Coating Rules [d]	Examine applicability of CTG recommendations regarding spray gun cleaning.	2008

NOTES:

[a] Control measure R-332 was adopted as a revision to District Rule 74.12, *Surface Coating of Metal Parts and Product*.

[b] To be determined

[c] Control Measure-334 was rejected as enhancements to Rule 74.30, *Wood Products Coatings* based on cost effectiveness considerations.

[d] District Rules 74.12, 74.13, 74.18, 74.21, 74.24, & 74.30.

8.7. Control Measures Deleted from the 2007 AQMP

Several control measures that were in the 1994 AQMP are not in the 2007 AQMP for either the federal 8-hour ozone standard or the state 1-hour ozone standard. Section 3.1.8 presents these measures.

8.8. Ozone Transport

The CCAA directs ARB to assess the contribution of ozone and ozone precursors in upwind basins or regions on ozone concentrations that violate the State ozone standard in downwind basins or regions. The movement of ozone and ozone precursors between basins or regions is termed transport. The CCAA also directs ARB to establish mitigation requirements for upwind districts commensurate with their contributions to the air quality problems in downwind basins or regions.

Over the last decade, the ARB has published several transport reports that include technical assessments of transport relationships between air basins and regions in California. Along with these technical assessments, the reports have included mitigation requirements for ensuring that upwind areas do their part to limit the effects of transport on their downwind neighbors. These two important components are available on the following ARB websites: Transport Assessments and Transport Mitigation. ARB completed its most recent transport assessment, *Ozone Transport Mitigation in California*, in 2004.

ARB transport assessments indicate that Ventura County, as part of the South Central Coast Air Basin, impacts ozone levels in the South Coast Air Basin. This means that Ventura County must comply with ARB's transport mitigation requirements. The District complies with these requirements through its rules and permitting programs, including adoption of "every feasible measure," and application of BARCT to existing sources of ozone precursors. The county's greatly improved air quality over the last twenty or so years provides direct evidence that Ventura County has and is mitigating ozone transport into the South Coast Air Basin.

8.9. Public Information

The District conducts a public information program through its Public Information Division. It does this through a variety of both traditional and innovative public information techniques including: 1) District website, 2) publications and creative materials, 3) educational programs, 4) outreach events, 5) advertising programs, 6) media relations, and 7) special projects. Further information regarding the District's public information program is available on the District's Public Information Division website.

Publications and Creative Materials: In 2005, Public Information produced several new brochures, including: *Give Us 20 Minutes*; *Air Quality Complaints* (Spanish) and the booklet, *The Book of Air*. It also produced several new items for its educational program including an APCD hat for its *Air Town* elementary school program. In addition, it reprinted other previous publications including the *7 Days to Cleaner Air* series. It also produced 12 issues of the monthly report, *Skylines*.

Educational Programs: Public Information is actively involved in informing students about air pollution through outreach events and presentations. District staff has been educating middle school students with the *Clean Air Quest* classroom presentation since 2000. This interactive presentation includes a Jeopardy-style game that involves students with the links between air quality and transportation. Public Information also makes available *Air Town*, an activity program for children ages 5 – 9 in summer camps, day care centers, and after-school programs.

Public Information also conducts educational events, including the *Interactive Science Career Expo*, in conjunction with the Ventura County Science Fair. It also gives three Science Fair awards to air quality projects. Public Information has participated in the Ventura County clean air and transportation student calendar project for the last 12 years. Other air districts throughout the country have copied this concept.

Clean Air Month Supplement: Public Information published the third *Clean Air Today* supplement in the *Ventura County Star* on May 1, 2005 to coincide with Clean Air Month. The supplement was distributed to subscribers of the publication. In addition, copies were distributed to the public at outreach events, classroom presentations, the District's speakers bureau, and for Air Pollution Control Board use. The current edition of *Clean Air Today* is available on the District's website.

The supplement contains an update on Ventura County's air from the Ventura County Air Pollution Control Officer; a letter from the former Secretary of the California Environmental Protection Agency; an article on hydrogen technology; information on the health effects of air pollution with an emphasis on children's health; events calendar; book review; new EPA air pollution chart; article on early air quality pioneers; list of District publications and information on the speaker's bureau; 2005 Asthma Walk information; air quality cartoon from the 60s; kid's page; coupons from local merchants; and general contact information.

Summer Public Awareness Campaign: During the summer of 2005, the District partnered with the 24 Vons supermarkets in the county to distribute the "*Don't top off*" postcards to their customers. Most of the postcards were distributed in three days. The District also distributed postcards through its Transportation Programs (Rule 211) section.

Media Relations: Public Information handles media calls and news releases and provides local reporters with ideas for feature articles. Public Information coordinates all news conferences, radio and print interviews, and media sponsorships.

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9. EMERGING ISSUES

This chapter presents emerging air pollution issues that will provide the District with air pollution planning challenges well into the future. These issues are beyond the scope of the 2007 AQMP and are presented for informational purposes only.

9.1. New Federal 8-hour Ozone Standard

On March 12, 2008, EPA strengthened the national ambient air quality standards for ozone. The new federal primary 8-hour ozone standard, set to protect public health, is 0.075 ppm (rounded to the thousandth ppm). EPA also revised the federal secondary 8-hour ozone standard, set to protect public welfare, such as agricultural crops and ecosystems, to be identical to the primary standard. The former primary and secondary federal ozone standards, also identical at 0.08 ppm (effectively 0.084 ppm due to rounding), were last set in 1997. For comparison purposes, the California 8-hour ozone standard is 0.07 ppm.

The revisions reflect new scientific evidence from more than 1,700 scientific studies showing that adverse public health effects occur at ozone levels below the former federal primary standard. Furthermore, other evidence now shows that natural vegetation and agricultural crops can be seriously damaged by repeated, low-level ozone exposure.

EPA's timeline for implementing the new federal ozone standards calls for EPA to designate areas attainment or nonattainment for the new standards by March 12, 2010. However, EPA may take up to another year if there is insufficient data to make a designation by that date. Areas designated nonattainment would have until June 2013 to submit plans to EPA outlining how they would meet the new standards by specific dates (2013 - 2030), depending on the severity of their ozone problem. Until then, the 1997 federal 8-hour ozone standard and all associated regulatory requirements will remain in place. EPA's preliminary projections indicate that Ventura County will not attain the new ozone standards before 2020.

EPA's Ground-level Ozone website contains more information regarding ozone and the new 8-hour ozone standards.

9.2. Climate Change

The Earth's climate has undergone many changes during its history, ranging from ice ages to long periods of warmth. Historically, natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy from the Sun have affected global temperatures and the Earth's climate. However, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, *Climate Change 2007*, states, "Global atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years. The global increases in carbon dioxide concentration are primarily due to fossil fuel use and land use change, while those of methane and nitrous oxide are primarily due to agriculture." Moreover, according to the IPCC report, most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic concentrations of these three gases, collectively known as greenhouse gases (GHG). The IPCC report further states, "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."

Established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, the IPCC is a scientific organization charged with evaluating the causes and risks of global climate change. The IPCC does not monitor climate change, nor does it conduct climate change research. Its primary purpose is to provide decision makers and other interested parties, including governments, industry, academia, and the public, with objective information on global climate change. It accomplishes its mission through periodic assessment reports, the most recent being the Fourth Assessment Report. The IPCC assessments are based on peer reviewed and published scientific literature and are considered authoritative.

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer) and can arise from natural factors and processes, as well as human activities. Global warming is an average increase in the temperature of the Earth's lower atmosphere called the troposphere and can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, global warming often refers to the warming that can occur because of increased emissions of greenhouse gases from human activities.

Regarding the human influence on global climate change, the IPCC's Working Group I Report, *The Physical Science Basis*, the first of four primary components of the Fourth Assessment Report, states: "Human activities contribute to climate change by causing changes in Earth's atmosphere in the amounts of greenhouse gases, aerosols (small particles), and cloudiness. The largest known contribution comes from the burning of fossil fuels, which releases carbon dioxide gas to the atmosphere.

Greenhouse gases and aerosols affect climate by altering incoming solar radiation and outgoing infrared (thermal) radiation that are part of Earth's energy balance. Changing the atmospheric abundance or properties of these gases and particles can lead to a warming or cooling of the climate system. Since the start of the industrial era (about 1750), the overall effect of human activities on climate has been a warming influence. The human impact on climate during this era greatly exceeds that due to known changes in natural processes, such as solar changes and volcanic eruptions."

9.2.1. Climate Change Initiatives

Global warming is fast becoming the most important environmental issue of the 21st Century. As such, numerous local, state, national, and international efforts are gearing up and underway in the public and private sector to reduce GHG emissions.

9.2.2. United Nations Framework Convention on Climate Change

The foremost international climate change initiative is the United Nations Framework Convention on Climate Change (UNFCCC), commonly known as the Kyoto Protocol. Signed on March 21, 1994, the Kyoto Protocol calls for national governments to gather and share information on greenhouse gas emissions, national policies, and best practices; launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change. These efforts have been largely policy oriented.

The Kyoto Protocol now covers more than 170 countries globally and more than 60 percent of countries in terms of global greenhouse gas emissions. As of December 2007, the only signatory nations not to have ratified the Kyoto Protocol are the United States and Kazakhstan. The treaty expires in 2012, and international talks began in May 2007 on a successor treaty. Further information regarding the UNFCCC and the Kyoto Protocol can be found on the UNFCCC website.

9.2.3. United States Climate Change Policy and Initiatives

Although the United States has not ratified the Kyoto Protocol, in 2002 it established a comprehensive policy to address climate change. The policy has three basic components: slowing the growth of emissions, strengthening science, technology, and institutions, and enhancing international cooperation. The federal government is implementing this policy through voluntary and incentive-based programs and has established major programs to advance climate technologies and improve climate science. Further information regarding climate change and the federal government's climate change policy and initiatives can be found on EPA's Climate Change website.

9.2.4. California Climate Change Initiatives

Numerous California state and local agencies are developing policies, programs, and regulations to reduce California's GHG emissions. Most notable and far reaching of these regulatory efforts is AB 32, *The California Global Warming Solutions Act of 2006* (Health & Safety Code §38500 et seq.). AB 32 establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, and cost-effective reductions of GHG. More specifically, it makes ARB the primary state agency responsible for developing and maintaining a statewide inventory of GHG emissions and for formulating plans and action steps to reduce current GHG emissions statewide to 1990 GHG emission levels by the year 2020. AB 32 defines GHGs as carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride. Further information regarding State of California climate change initiatives can be found on ARB's Climate Change website and the State of California's Climate Change Portal website. Climate change activities and initiatives in Ventura County can be found on the County of Ventura's Climate Change and Energy Conservation website.

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GLOSSARY

Activity Indicator: A measure of socioeconomic conditions relative to a base year, such as population, housing, and employment data, used to project future year emissions by the relationship of the related activity. Example: Natural gas use per household.

Aerosols: Very small particles of solid or liquid matter suspended in the air.

Air Basin: An area of the state designated by the California Air Resources Board pursuant to Subdivision (a) of Section 39606 of the CH&SC that has similar meteorological and geographic conditions.

Air Contaminant: Any discharge, release, or other propagation into the atmosphere and includes but is not limited to, smoke, charred paper, dust, soot, grime, carbon, fumes, gases, odors, particulate matter, acids or any combination thereof.

Air Monitoring: The periodic or continuous sampling and analysis of air pollutants in ambient air or from individual air pollutant sources.

Air Quality Management District: A group or portions of counties, or an individual county specified in law with authority to regulate stationary, indirect, and area sources of air pollution with the region and governed by a regional air pollution control board comprised mostly of elected officials within the region.

Air Pollutants: Substances that are foreign to the atmosphere or are present in the natural atmosphere to the extent that they may result in adverse effects on humans, animals, vegetation, and/or materials.

Air Pollution Control Board (APCB): The governing body for an air pollution control district.

Air Pollution Control District (APCD): A county agency with authority to regulate sources of air pollution (other than emissions from mobile sources) such as refineries, manufacturing facilities, gasoline stations, dry cleaners, and power plants within a given county, and governed by a district Air Pollution Control Board composed of elected city and county officials.

Air Pollution Control Officer (APCO): A person appointed by the APCB and given the authority to appoint district personnel for the purpose of observing and enforcing the provisions of Part 4, Division 26 of the CH&SC.

Air Quality Management Plan (AQMP): A plan prepared by an APCD for a county or region designated nonattainment for one or more federal or state air pollutants, for the purpose of bringing the area into compliance with the requirements of the federal and/or California ambient air quality standards. AQMPs are incorporated into the State Implementation Plan (SIP).

Air Quality Standards: Those ambient air quality standards as promulgated by State or Federal pollution control agencies

Ambient Air: Air occurring at a particular time and place outside of structures. Often used interchangeably with outdoor air.

Anthropogenic: Of, relating to, or influenced by the impact of humans on nature; man-made.

ARB: The state agency responsible for air pollution control in California.

Area-wide Sources: Also known as "area" sources; are those sources which are not large enough to be tracked individually, but when added together can represent a large quantity of pollution. Examples of such sources include water heaters, gas furnaces, fireplaces, gas stations, dry cleaners and woodstoves. Area sources of pollution are identified by Category of Emission Source (CES) codes.

Attainment: Achieving and maintaining one or more of the National and/or California Ambient Air Quality Standards (NAAQS or CAAQS).

Atmosphere: The air that surrounds the earth but does not include the general volume of gases contained in any bona fide building.

Attainment Area: A geographic area that complies with one or more of the NAAQS or CAAQS.

Base Year: The year used in a predictive air pollution model that includes the known econmic conditions, population, and air emissions. The base year, current or past, is used to predict the forecast year in a predictive model.

Best Available Control Technology (BACT): The most up-to-date methods, systems, techniques, and production processes available to achieve the greatest feasible emission reductions for given regulated air pollutants and processes. BACT is a requirement of NSR (New Source Review) and PSD (Prevention of Significant Deterioration).

Best Available Control Measure (BACM): A term used to describe the "best" measures (according to EPA guidance) for controlling small or dispersed sources of particulate matter and other emissions from sources such as roadway dust, woodstoves, and open burning.

Best Available Retrofit Control Technology (BARCT): An emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each air pollutant source class or category (Section 40406 CH&SC).

Biogenic: Produced by living organisms. Biogenic air pollutant emissions are of great interest because of the predominance of agriculture and natural vegetation in Ventura County. However, the District has no authority to regulate biogenic emissions. Preliminary studies indicate that biogenic emissions may be at least two times the total hydrocarbon emissions already quantified in the emissions inventory for the AQMP.

Bureau of Automotive Repair (BAR): An agency of the California Department of Consumer Affairs and responsible for the implementation of the motor vehicle inspection and maintenance program (smog check).

California Air Resources Board (ARB): The State's lead air quality agency consisting of an eleven-member Governor-appointed board and supporting staff fully responsible for motor vehicle pollution control, and having oversight authority over California's air pollution management program.

California Clean Air Act (CCAA): A California law passed in 1988 that provides the basis for air quality planning and regulation independent of federal regulations, and which establishes new authority for attaining and maintaining California's air quality standards by the earliest practicable date. A major element of the Act is the requirement that local air districts in violation of the California clean air standards must prepare attainment plans that identify air quality problems, causes, trends, and actions to be taken for attainment.

California Department of Transportation (Caltrans): A California state agency that oversees the state's transportation infrastructure.

California Emissions Inventory Development and Reporting System (CEIDARS): The state's emissions inventory data base system.

California Emission Forecasting System (CEFS): ARB's model to forecast air pollutant emissions. A major feature of the model is its ability to track the effects of emission control rules and growth activity for stationary and other mobile sources by linking these factors directly to the emission categories.

California Environmental Quality Act (CEQA): A California law that sets forth a process for public agencies to make informed decisions on discretionary projects such land use entitlements. The process aids decision makers to determine whether any environmental impacts are associated with a proposed project. It requires elimination or reduction of environmental impacts associated with a proposed project and the implementation of mitigation measures to reduce or remove those impacts.

California Health and Safety Code (CH&SC): The California Health and Safety Code is the collection of state laws that govern, among other things, the handling of air pollution, hazardous waste, corrective action and permitted facilities.

Carbon Monoxide (CO): A colorless, odorless gas resulting from the incomplete combustion of fossil fuels. Over 80 percent of the CO emitted in urban areas is contributed by motor vehicles. CO is a criteria pollutant, and interferes with the blood's ability to carry oxygen to the body's tissues and results in numerous adverse health effects.

City Urban Restriction Boundary (CURB): A regional boundary set in an attempt to control urbanization by designating the area inside the boundary for higher density urban development and the area outside for lower density rural development.

Clean Air Act Amendments (CAAA): Amendments passed in 1977 and 1990 to the federal Clean Air Act of 1970 and which form the basis for the current national air pollution control effort. Basic elements of the amended act include national ambient air quality standards for major air pollutants, air toxics standards, acid rain control measures, and enforcement provisions.

Compressed Natural Gas (CNG): An alternative fuel that is cleaner burning and helps to meet ARB's mobile and stationary emission standards. CNG may be used in place of less clean fuels for powering motor vehicles.

Conformity: A formal demonstration of whether a federally-supported activity is consistent with the State Implementation Plan (SIP) – per section 176(c) of the federal CAA. Transportation conformity refers to plans, programs, and projects approved or funded by the Federal Highway Administration or the Federal Transit Administration. General conformity refers to projects approved or funded by other federal agencies.

Consumer Products: Products such as detergents, cleaning compounds, polishes, personal care products, and automotive specialty products that are part of our everyday lives and, through consumer use, may contribute to air pollution.

Contingency Measure: Required back-up air pollution control measures to be implemented in the event of specific conditions, such as failure to meet interim milestone emission reduction targets or failure to attain an applicable air quality standard by the statutory attainment date. Both the state and federal clean air acts require that District clean air plans include contingency measures.

Control Efficiency (CE): A variable that estimates the technological efficiency of an air pollutant control strategy. Control efficiency is one of the variables used to develop a control factor.

Control Factor (CF): Data derived from adopted State and Federal regulations and local district rules that impose emission reductions or a technological change on a particular emission process. Control factors are closely linked to the type of emission process and type of industry. They also account for three types of variables which include control efficiency, rule effectiveness, and rule penetration.

Control Measure: A single measure in an air quality plan to maintain or reduce the emissions of criteria pollutants. Control measures are enforceable commitments in the air quality plan.

Control Strategy: A combination of control measures designed to reduce air contaminant emissions to attain and maintain ambient air quality standards.

Control Techniques Guidelines (CTG): Guidance documents issued by EPA designed to assist state and local pollution authorities to achieve and maintain air quality standards for certain air pollutant sources (e.g. organic emissions from solvent metal cleaning known as degreasing) through reasonably available control technologies (RACT). CTGs contain information on the economic and technological feasibility of available emission control techniques.

Criteria Air Pollutant: An air pollutant for which acceptable levels of exposure can be determined and for which a federal or state ambient air quality standard has been set to protect public health and welfare. Examples include ozone, carbon monoxide, lead, nitrogen dioxide, sulfur dioxide, and fine particulates.

Department of Motor Vehicles (DMV): The California state agency responsible for registering motor vehicle drivers and motor vehicles and collecting state and local motor vehicle fees.

Department of Pesticide Regulation (DPR): The state agency responsible for regulating pesticide sales and use in California.

Design Value: The pollutant concentration used by air quality managers as the basis for determining attainment of an air quality standard, generally by using an air quality model. The design value may or may not be the same as the designation value.

District: A local air pollution control agency as defined by the CH&SC Section 40150. The Ventura County Air Pollution Control District is the local air pollution control agency for Ventura County, California.

EMFAC: The EMission FACtor computer model used by ARB to estimate on-road mobile vehicle emissions. This model is part of ARB's overall on-road mobile source Mobile Vehicle Emission Inventory (MVEI) model.

Early Progress Plan (EPP): An air quality planning document that shows progress towards attaining the federal ozone standards and establishes transportation conformity budgets.

Emissions Data: Measured or calculated concentrations or weights of air contaminants emitted into the ambient air. Data used to calculate emissions data are not emissions data.

Emission Factor: For stationary sources, the relationship between the amount of pollution produced and the amount of raw material processed or burned. For mobile sources, the relationship between the amount of pollution produced and the number of vehicle miles traveled. By using the emission factor of a pollutant and specific data regarding quantities of material used by a given source, it is possible to compute emissions for the source.

Emission Offsets: Actual enforceable emission reductions from existing sources sufficient to offset anticipated emission increases associated with new or modified stationary sources. A rule-making concept, whereby approval of a new stationary source of air pollution, or an increase of emissions from an existing source of air pollution, is conditional on the equal or greater reduction of emissions from other existing stationary sources of air pollution. This concept is utilized in addition to reduction in emissions by employing BACT.

Emission Reduction Credit (ERC): Credits given for actual emission reductions that are real, enforceable, permanent, quantifiable, and surplus (beyond any required reductions). An actual credit is certified via a District-issued document that specifies the date of issuance, expiration date of credit, type of pollutant, and legal owner of emission reduction credits. In some cases, ERCs can be transferred to another owner or saved for future use.

Emission Standard: The maximum amount or rate of a pollutant permitted from a polluting source such as an automobile or smoke stack.

Emissions Inventory: An emissions inventory is a large dataset that, as a whole, describes emission sources and quantifies pollutants released into the atmosphere. Considerations that go into the inventory include type and location of emission sources, the processes involved, and the level of activity (day, month) and year of activity.

Emissions Inventory Category: A group of similar air pollutant sources. Examples include oil and gas production, dry cleaning, and pesticide application.

Emissions Inventory Code (EIC): State computer coding scheme (14 digits) used to categorize emissions in the CEIDARS database.

Environmental Protection Agency (EPA): The United States federal agency charged with protecting human health and safeguarding the natural environment upon which life depends. EPA promulgates national ambient air quality standards and implements federal programs to improve air quality.

Equipment: Any operation, article, machine, equipment, or contrivance that may emit or reduce the emissions of any air contaminant or affected air pollutant.

Exceedance: Measured concentration of an air pollutant in ambient air is higher than the state and/or federal ambient air quality standard for that pollutant.

Expected Peak Day Concentration (EPDC): A calculated value that represents the concentration expected to occur at a particular air quality monitoring site once per year, on average. The calculation procedure uses measured data collected at the site during a three-year period.

Federal Aviation Administration (FAA): An agency of the United States Department of Transportation with authority to regulate and oversee all aspects of civil aviation in the U.S.

Federal Clean Air Act (CAA): A federal law passed in 1970 and significantly amended in 1977 and 1990 that forms the basis for the national air pollution control efforts. Basic elements of the Act include national ambient air quality standards for major air pollutants, air toxics standards, acid rain control measures, and enforcement provisions.

Federal Clean Air Act Amendments of 1990 (CAAA): The 1990 amended version of the federal CAA that mandates attainment of the NAAQS by specified attainment dates.

Federal Highway Administration (FHA): A division of the United States Department of Transportation that specializes in highway transportation. The agency's major activities are grouped into two programs, The Federal-aid Highway Program and the Federal Lands Highway Program.

Federal Implementation Plan (FIP): A plan prepared and enforced by the EPA that provides measures nonattainment areas must take to meet the requirements of the federal CAA. The EPA implements FIPs when states are unable or unwilling to adopt and implement adequate SIPs.

Federal Motor Vehicle Control Program (FMVCP): All federal actions aimed at controlling pollution from motor vehicles by such efforts as establishing and enforcing tailpipe and evaporative emission standards for new vehicles, testing methods development, and guidance to states operating inspection and maintenance programs.

Federal Transit Administration (FTA): An agency within the United States Department of Transportation that provides financial and technical assistance to local public transit systems.

Forecast Year: The future year of interest in a predictive air pollution or emissions model. The predictivie model results produce future year emissions based on expectations of future land use, transportation changes, econmic conditions, population growth, and emission controls.

GHG: Gaseous components of the atmosphere that contribute to the greenhouse effect. Greenhouse gases include, in order of relative abundance: water vapor, carbon dioxide, methane, nitrous oxide, ozone and chlorofluorocarbons.

Growth Factor (GF): Data derived from county-specific economic activity profiles, population forecasts, and other socio-demographic activity.

Heavy Duty Diesel Truck (HDD): Heavy duty diesel truck, gross vehicle weight 8,501-33,000 pounds.

Heavy-heavy Duty Diesel Truck (HHDD): Heavy-heavy duty diesel truck, gross vehicle weight greater than 33,001 pounds.

Hydrocarbon (HC): Any of a large number of compounds containing various combinations of hydrogen and carbon atoms. They may be emitted into the air as a result of fossil fuel combustion and fuel volatilization, and are a major contributor to smog.

Hydrofluorocarbons: A group of chemical compounds, consisting of alkanes, such as methane or ethane, with one or more halogens linked, such as chlorine or fluorine, making them a type of organic halide.

Implementation Factor (IF): A variable used to develop control factors, indicating the relative amount of total control from a control measure occurring in a given year to account for phased implementation or control requirements occurring in tiers.

Indirect Source: Any facility, building, structure, or installation, or combination thereof, which generates or attracts motor vehicle activity resulting in emissions of any pollutant (or precursor) for which there is a state or federal ambient air quality standard. Examples of indirect sources include employment sites, shopping centers, sports facilities, housing developments, airports, educational institutions, commercial and industrial developments, and parking lots and garages.

Indirect Source Review (ISR): A rule or policy that attempts to reduce air emissions generated by buildings and facilities through the motor vehicle activity they generate or attract. Examples of such buildings and facilities include shopping centers, sports facilities, housing developments, airports, educational institutions, commercial and industrial developments, and parking lots and garages. ISR is also called Indirect Source Control Program.

Inspection and Maintenance Program (I & M): A motor vehicle inspection program implemented by the California Bureau of Automotive Repair. It is designed to ensure the effectiveness of their emission control systems on a biennial basis. The program was enacted in 1979 and strengthened in 1990. The standard program is called Basic I & M. Enhanced I & M has more stringent testing requirements and is implemented in urbanized areas that are classified as “serious” and above nonattainment for ozone or “high moderate” and above for carbon monoxide and which had a population of 200,000 or more in 1980. Also known as the Smog Check program.

Intergovernmental Panel on Climate Change (IPCC): A scientific body tasked to evaluate the risk of climate change caused by human activity. The panel was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), two organizations of the United Nations.

Internal Combustion Engine (IC): A heat engine in which the combustion generates the heat inside the engine proper instead of in a furnace. An example of an IC engine is an automobile engine.

Inversion: A layer of warm air in the atmosphere that lies over a layer of cooler air, trapping pollutants beneath it.

Lead: A gray-white metal that is soft, malleable, ductile, and resistant to corrosion. Sources of lead resulting in concentrations in the air include industrial sources and crustal weathering of soils followed by fugitive dust emissions. Health effects from exposure to lead include brain and kidney damage and learning disabilities. Lead is the only substance currently listed as both a criteria air pollutant and a toxic air contaminant.

Local Agency Formation Commission (LAFCO): A decision making government entity in California with the responsibility to decide boundary issues pertaining to city and county (non-incorporated) lands, including spheres of influence, and issues about the annexation of county lands into a city or special district.

Local Sources: Air pollution sources for which local governments (cities, counties, air agencies) have primary regulatory authority.

Maintenance Plan: A plan that details the actions needed to maintain air quality at or below federal standards. The federal CAA requires maintenance plans for areas that have been re-designated attainment areas.

Major Source Category: A general, broad category of similar emission sources. Examples are Fuel Combustion, Waste Disposal, Solvent Evaporation are broad category classifications which are made up of many sub-categories.

"Major" Sources under CAAA: A source with a potential to emit more than a specific threshold of emissions annually, determined by the nonattainment designation of an air quality district.

Memorandum of Understanding (MOU): A formal agreement made among agencies for the purposes of jointly accomplishing a goal, program, etc. The governing boards of the involved agencies must ratify the agreement.

Maximum Achievable Control Technology (MACT): The emission standard for sources of air pollution requiring the maximum reduction of hazardous emissions, taking cost and feasibility into account. Under the CAAA, MACT must not be less than the average emission level achieved by controls on the best performing 12 percent of existing sources, by category of industrial and utility sources.

Metropolitan Planning Organization (MPO): The organization designated as being responsible, together with the State, for conducting the continuing, cooperative, and comprehensive planning process under 23 U.S.C. 134 and 49 U.S.C. 1607. It is the forum for cooperative transportation decision-making.

Mobile Sources: Sources of air pollution such as automobiles, motorcycles, trucks, off-road vehicles, boats, and airplanes.

Motor Vehicle: A self-propelled vehicle as defined in the California Vehicle Code, Division I, Section 415.

National Ambient Air Quality Standards (NAAQS): Standards set by the EPA for the maximum levels of certain air pollutants in outdoor air without unacceptable effects on human health or public welfare. There are NAAQS for ozone, particulates, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide.

Naval Base Ventura County: A major U.S. military facility in Ventura County, California.

New Source Review (NSR): The mechanism to assure that new and modified stationary sources of air pollution will not interfere with the attainment or maintenance of any ambient air quality standard, or prevent reasonable further progress towards the attainment or maintenance of any ambient air quality standard. A program used in a non-attainment area to permit or site new industrial facilities or modifications to existing industrial facilities that emit nonattainment criteria air pollutants. The two major requirements of NSR are Best Available Control Technology and Emission Offsets.

Nitrogen Dioxide (NO_2): A reddish-brown gas with a characteristic sharp, biting odor. Nitrogen dioxide is one of the most prominent air pollutants and a poison by inhalation.

Nonattainment Area: An area identified by the EPA and/or ARB as not meeting either federal or state clean air standards for a given criteria air pollutant.

OFFROAD Emissions Model: California Air Resources Board model that estimates population, activity, and emissions for specific categories of off-road (non-highway) equipment by fuel types at the county level.

Other Mobile Sources: A broad emissions category for mobile off-road equipment, including aircraft, locomotives, marine vessels, agricultural and construction equipment and more.

Organic Solvents: Liquids containing organic compounds which are used as dissolvers, viscosity reducers, or cleaning agents. These liquids are principally derived from petroleum and include petroleum distillates, chlorinated hydrocarbons, chlorofluorocarbons, ketones, and alcohols. Solutions, emulsions, and dispersions of water and soap, or water and detergent are not organic solvents. Soaps and detergents are water-based surfactants.

Outer Continental Shelf (OCS): All submerged lands lying seaward of state coastal waters (beyond 3 miles offshore) which are under U.S. jurisdiction as defined by the Outer Continental Shelf Lands Act of 1953.

Oxides of Nitrogen (NOx): A general term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen. Nitrogen oxides are created during combustion processes and are major contributors to smog formation and acid deposition. NO_2 is a criteria pollutant and may result in numerous adverse human health effects.

Ozone (O_3): A reactive gas consisting of three oxygen atoms. Found in two layers of the atmosphere, the stratosphere and the troposphere. In the stratosphere (the atmospheric layer 7 to 10 miles or more above the earth's surface), ozone is a natural form of oxygen that provides a protective layer shielding the earth from ultraviolet radiation. In the troposphere (the layer extending up 7 to 10 miles from the earth's surface), ozone is a chemical oxidant and major component of photochemical smog. It can seriously impair the respiratory system and is one of the most widespread of all the criteria pollutants for which the federal Clean Air Act required EPA to set standards. Ozone in the troposphere is produced through complex photochemical reactions of nitrogen oxides, which are among the primary pollutants emitted by combustion sources; hydrocarbons, released into the atmosphere through the combustion, handling and processing of petroleum products; and sunlight.

Ozone Precursors: Chemicals such as volatile organic compounds and nitrogen oxides, occurring either naturally or as a result of human activities, which contribute to the formation of ozone, a major component of smog.

Ozone Summer Season: May – October months, when ozone formation potential is the greatest.

Particulate Matter (PM): Any material, except pure water, that exists in the solid or liquid state in the atmosphere. The size of particulate matter can vary from coarse, wind-blown dust particles, to fine particle combustion products.

Particulate Matter - Fine ($PM_{2.5}$): A mixture of very small atmospheric particles with an aerodynamic diameter equal to or less than 2.5 microns. $PM_{2.5}$ consists of particles directly emitted into the air and particles formed in the air from the chemical transformation of gaseous pollutants. $PM_{2.5}$ particles result from activities such as industrial and residential combustion, and from vehicle exhaust. Particles 2.5 microns or smaller infiltrate deepest portions of the lungs, increasing the risks of long-term disease, including chronic respiratory disease, cancer, and increased and premature death.

Particulate Matter (PM_{10}): A major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and mists. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter the air sacs deep in the lungs where they may be deposited to result in adverse health effects. PM_{10} also causes visibility reduction and is a criteria air pollutant.

parts per hundred million (pphm): Standard measurement of concentration by which ozone or other atmospheric gases are measured.

parts per million (ppm): Standard measurement of concentration by which ozone or other atmospheric gases are measured.

Perfluorocarbons: Compounds derived from hydrocarbons by replacement of hydrogen atoms by fluorine atoms and made up of carbon and fluorine atoms only, such as octafluoropropane, perfluorohexane and perfluorodecalin.

Photochemical Reaction: A term referring to chemical reactions brought about by the light energy of the sun. Photochemical reactions in the atmosphere create harmful air pollutants such as ozone.

Point Source: Stationary emission sources having a district permit to operate identified on an individual basis due to the quantity or nature of their emissions. Examples of point sources include electrical power generating plants or large surface coating operations.

Pesticide Use Reports (PUR): Pesticide Use Reports contain agricultural pesticide use information. Under the program, all agricultural pesticide use must be reported monthly to the county agricultural commissioner, who in turn, reports the data to DPR.

Rate of Progress (ROP): Section 182(c)(2) of the federal CAA Amendments requires ozone nonattainment areas designated serious or above to demonstrate post-1996 volatile organic compound emission reductions of three percent per year, averaged over a 3-year period. The U.S. Environmental Protection Agency refers to these reductions as the rate-of-progress requirement.

Reactive Fraction: The relative amount of Total Organic Gas (TOG) compounds which is photochemically reactive and participates in ozone formation, excluding methane and other compounds with inconsequential effects on ozone photochemical reactivity.

Reactive Organic Gas (ROG): A reactive chemical gas composed of hydrocarbon compounds that may contribute to the formation of smog by their involvement in atmospheric chemical reactions. Also, sometimes referred to as non-methane organic compounds (NMOCs). VOC emissions are a subset of ROG emissions.

Reasonably Available Control Measures (RACM): A broadly defined term referring to technologies and measures to control air pollution.

Reasonably Available Control Technology (RACT): Devices, systems, process modifications, or other apparatus, or techniques that are reasonably available, taking into account the necessity of imposing such controls to attain and maintain a national ambient air quality standard; the social, environmental, and economic impact of such controls; and alternative means of providing for attainment and maintenance of such standard.

Reasonable Further Progress (RFP): A requirement for a State Implementation Plan showing increments of progress (emission reductions) from the date of designation of nonattainment for federal ozone standards to the attainment dates - applicable for both Subpart 1 and Subpart 2 ozone nonattainment areas.

Regional Transportation Improvement Plan (RTIP): A staged, multiyear, intermodal program of transportation projects covering a metropolitan planning area, consistent with the metropolitan transportation plan, and developed pursuant to 23 CFR Part 450.

Regional Transportation Plan (RTP): The official intermodal metropolitan transportation plan developed through the metropolitan planning process for the metropolitan planning area, and developed pursuant to 23 CFR Part 450.

Reid Vapor Pressure (RVP): The absolute vapor pressure of volatile crude oil and volatile non-viscous petroleum liquids except liquefied petroleum gases as determined by American Society for Testing and Materials publication, "Test Method for Vapor Pressure of Petroleum Products."

Rule Effectiveness: An estimate of how well an air pollution rule or control strategy works in "real-world" application. Rule effectiveness is one of the variables used to develop a control factor.

Rule Penetration: An estimate of the degree an air pollution control strategy will penetrate a certain regulated sector taking into account such things as equipment exemptions.

SAFETEA-LU: The Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users was signed into law guaranteeing funding for federal transportation and transit programs through Fiscal Year 2009. SAFETEA-LU provides the funds and programmatic framework for maintaining and improving the nation's transportation infrastructure.

Save Open-Space and Agricultural Resources (SOAR): A local nonprofit citizen organization in Ventura County dedicated to making Ventura County a better place to live by limiting urban sprawl, protecting open space and agricultural lands, and promoting livable and sustainable communities in Ventura County.

South Central Coast Air Basin (SCCAB): An air basin established by ARB that has similar meteorological and geographical conditions that consists of San Luis Obispo, Santa Barbara, and Ventura Counties.

South Coast Air Quality Management District (SCAQMD): South Coast Air Quality Management District. A regional air quality control district encompassing four counties in Southern California (Los Angeles, Orange, Riverside and San Bernardino).

Southern California Association of Governments (SCAG): The organization, known in federal law as the Council of Governments and Metropolitan Planning Organization, representing Los Angeles, Ventura, San Bernardino, Riverside, Orange, and Imperial Counties, and the cities within those six counties. As the designated Metropolitan Planning Organization for the designated areas, the Association of Governments is mandated by the federal government to research and formulate plans for transportation, growth management, hazardous waste management, and air quality. Additional mandates exist at the state level.

Smog: A combination of smoke, ozone, hydrocarbons, nitrogen oxides, and other chemically reactive compounds, which, under various conditions of weather and sunlight, may result in a murky brown haze that causes adverse health effects and human welfare effects. A primary source of smog is motor vehicles.

Smog Check Program: A motor vehicle inspection program implemented by the California Bureau of Automotive Repair. It is designed to ensure the effectiveness of automobile emission control systems on a biennial basis. The program was enacted in 1979 and strengthened in 1990. Also known as the Inspection and Maintenance Program (I & M).

State Implementation Plan (SIP): A document prepared by each state describing existing air quality conditions and measures that it will take to attain and maintain national ambient air quality standards. The provisions and commitments in SIPs are federally enforceable.

State Tidelands: The off-shore region three miles from the shoreline.

Stationary Sources: Non-mobile sources such as power plants, refineries, and manufacturing facilities, and turbines that emit air pollutants.

Suggested Control Measure (SCM): "Model rules" adopted by the California Air Resources Board to help California's air districts develop their respective clean air rules and meet air quality standards. SCMs also promote uniformity among rules in each air district.

Sulfur Dioxide (SO_2): A colorless, extremely irritating gas or liquid of sulfur and oxygen and whose chemical formula is SO_2. Sulfur dioxide mainly enters the atmosphere as a pollutant through burning high sulfur-content fuel oils and coal, and from chemical processes occurring at chemical plants and refineries. SO_2 is a criteria air pollutant.

Summer Planning Day Emissions: Emissions occurring during a typical summer day during the months of May – October. This term is interchangeable term with "ozone season" day emissions.

tons per day (tpd): A unit of measurement often used in air pollutant emission inventories.

Total Organic Compounds (TOC): Organic compounds of carbon including methane emitted to the atmosphere. TOCs exclude carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate.

Transportation Control Measure (TCM): Any control measure or strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions. TCMs include encouraging the use of carpools and mass transit.

Transportation Planning Agency (TPA): See Regional Transportation Planning Agency.

United Nations Framework Convention on Climate Change (UNFCCC): An international environmental treaty produced at the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, held in Rio de Janeiro in 1992. The treaty is aimed at reducing emissions of greenhouse gases in order to combat global warming.

United States Environmental Protection Agency (EPA): The United States agency charged with setting policy and guidelines, and carrying out legal mandates for the protection of national interests in environmental resources.

Vehicle Miles Traveled (VMT): A measure of both the volume and extent of motor vehicle operation; the total number of vehicle miles traveled within a specified geographical area over a given period of time.

Ventura County Transportation Commission (VCTC): Agency responsible for planning and funding transportation and transit improvements in Ventura County. VCTC develops and implements transportation policies, projects, and funding priorities for a wide variety of transportation projects.

Visibility: The distance that atmospheric conditions allow a person to see at a given time and location. Visibility reduction from air pollution is often due to the presence of sulfur and nitrogen oxides, as well as particulate matter, including aerosols.

Volatile Organic Compounds (VOC): Hydrocarbon compounds that exist in the ambient air. VOCs contribute to the formation of smog and/or may themselves be toxic. VOCs often have an odor, and examples include gasoline, alcohol, and paint solvents.

Weight of Evidence (WOE): A supplementary set of analyses intended to verify modeled predictions of future air quality, especially at levels near the federal standards. These analyses can include air quality trends, emission trends, meteorological data, evaluation of other air quality indicators, and additional air quality modeling.

Appendix A

Ventura County
Transportation Control Measure Commitments

Lead Agency	Project ID	Description	2006 RTIP Completion Date
Camarillo	VEN050403	Calleguas Bike Path - Construct Class I Bike Path for 0.7 Miles from Adolfo Road to the Route 101 Freeway, with Connection to New Trail at Village at the Park (Phase II)	2009
Camarillo	VEN990305	Construct Ponderosa Extension from Earl Joseph to Ventura Blvd & Ventura Blvd Extension from Ponderosa to East of Central Ave including Bike Lanes	2012
Fillmore	VEN051401	Route 126 and Santa Paula Branch Railroad at Pole Creek – Class I Bike Path Undercrossing 0.2 Miles in Length	2009
Ojai	VEN010203	Ojai Valley Bike Trail Extension/Fulton St Extension	2007
Ojai	VEN54164	Bicycle & Pedestrian Trail Extension: Fox Cyn Barranca from Rt 150 to Ojai Valley Trail	2007
Oxnard	VEN990317	Oxnard Blvd 5th/Vineyard & on 5th St (Rt 34) Oxnard Blvd/Rose Ave Construct New Bicycle & Pedestrian Facilities	2008
San Buenaventura	VEN031229	Route 126 Bike Path – Phase II Bike Path (Class I) Crossing the Harmon Barranca	2007
San Buenaventura	VEN061007	Mills Road at Maple Adjacent to Pacific View Mall – Bus Turnouts with Bus Shelters, and Other Bus Stop Amenities	2008
San Buenaventura	VEN990319	California St Bridge over Rt 101 Pedestrian Enhancements	2007

Lead Agency	Project ID	Description	2006 RTIP Completion Date
Santa Paula	VEN54168	Facility Incl Bikeway/Walkway from Santa Paula Creek to Peck Rd Fencing, Landscaping, Bridge & Drainage, Public Access Points/Safety Items	2007
Simi Valley	VEN031202	Simi Valley Transit Expansion to Serve New Mall – Demonstration Project	2008
Simi Valley	VEN031203	One (1) CNG Paratransit Van for Expansion	2007
Simi Valley	VEN031205	Simi Valley Bike Path Class I 500-Foot Connection from Hidden Ranch Road to Stearns Street Includes 75-Foot Tunnel Under Metrolink Tracks	2009
Simi Valley	VEN051201	West Los Angeles Ave from West City Limit to Easy Street Class II Bike Lanes	2010
Simi Valley	VEN055401	Expand Transit Maintenance Facility to Accommodate System Expansion	2008
Simi Valley	VEN055408	Automatic Vehicle Location and Data Terminals	2008
Simi Valley	VEN055410	One Expansion Paratransit Van	2008
Simi Valley	VEN055413	One Expansion Paratransit Van	2009

Lead Agency	Project ID	Description	2006 RTIP Completion Date
Simi Valley	VEN54051	In Simi Valley Arroyo Simi Bike Trail from End of Existing Trail to Corriganville Park Construct Bike Path and Lanes	2007
South Coast Area Transit	VEN057403	Downtown Ventura/Ventura Harbor Demonstration Service (3-Year Demonstration)	2008
Thousand Oaks	VEN011209	Construct Bikeway Adjacent to Rt 101 (South Side) from Rancho Rd to Willow Ln (TEA21 #221)	2008
Thousand Oaks	VEN030613	Electronic Fare Boxes for Thousand Oaks Transit	2008
Thousand Oaks	VEN030614	Thousand Oaks Transportation Center Operations Building & Customer Waiting Room including Landscaping, Outdoor Seating, and Security Lighting	2008
Thousand Oaks	VEN031212	Expand Traffic Signal Coordination System	2007
Thousand Oaks	VEN054605	Conejo Creek Park Bike Path – Class I Bike Path for 0.5 Miles in Conejo Creek Park from Route 23 to Janss Road	2009
Thousand Oaks	VEN056407	Hillcrest Drive from Teller Road to Conejo Blvd – Class II Bike Lanes	2009
Ventura County	VEN070101	Phase 2 – Santa Paula Branch Row – Piru Creek to Rte 126, Construct Class I Bike Path and Pedestrian Path with Grading on Entire Row (Split from VEN990310)	2007

Lead Agency	Project ID	Description	2006 RTIP Completion Date
Ventura County	VEN990310	Piru/Rancho Camulos Construct Class I Bike Path and Adjacent Pedestrian Path, Fencing Re-Lay Track, Install Platform at Rancho Camulos	2008
Ventura County Transportation Commission	VEN070204	Smartcard Upgrade	2008
Ventura County Transportation Commission	VEN93017	Regional Rideshare Program	2010

Source: *Adopted 2006 Regional Transportation Improvement Program with Amendments 1-12*, Southern California Association of Governments, February 2008.
Draft 2008 Regional Transportation Plan, Southern California Association of Governments, December 2007.

Appendix B

Ventura County Reasonably Available Control Measures Analysis

Appendix B - Ventura County Reasonably Available Control Measures Analysis

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 1. Programs For Improved Public Transit					
1.1	Regional Express Bus Program	Purchase of buses to operate regional express bus services.	yes		Transit Operators, VCTC
1.2	Transit Access to Airports	Operation of transit to airport to serve air passengers.	no	The measure is economically infeasible because there are not enough air passengers in Ventura County.	
1.3	Study Benefits of a Particulate Trap Retrofit Program	Examine potential to accelerate application of particulate traps on diesel-powered buses to achieve earlier compliance with State regulations.	yes		Transit Operators, VCAPCD
1.4	Major Expansion of Mass Transit	Major change to the scope and service levels.	no	The measure is economically infeasible because there is not enough transit demand for order of magnitude increases in spending.	
1.5	Expansion of Public Transportation Systems	Expand and enhance existing public transit services.	yes		Transit Operators, VCTC
1.6	Transit Service Improvements in Combination with Park-and-Ride Lots and Parking Management	Local jurisdictions and transit agency improve the public transit system and add new Park-and-Ride facilities and spaces on an as needed basis.	yes		Cities, County, Transit Operators, VCTC
1.7	Free transit during special events	Offer free transit during selected special events to reduce event-related congestion and associated emission increases.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
1.8	Require that government employees use transit for home to work trips, expand transit, and encourage large businesses to promote transit use	Require all government employees use transit a specified number of times per week.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
1.9	Increase parking at transit centers or stops	Encourage transit convenience by providing additional parking at transit centers.	yes		Cities, County, VCTC, Transit Operators
1.10	Expand regional transit connection ticket distribution	Provides interchangeability of transit ticket.	yes		VCTC, Transit Operators

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 2. Restriction Of Certain Roads Or Lanes To, Or Construction Of Such Roads Or Lanes For Use By, Passenger Buses Or High Occupancy Vehicles					
2.1	Update High Occupancy Vehicle (HOV) Lane Master Plan	Analysis of increased enforcement, increasing occupancy requirements, conversion of existing HOV lanes to bus only lanes and/or designation of any new carpool lanes as bus-only lanes; utilization of freeway shoulders for peak-period express bus use; commercial vehicle buy-in to HOV lanes; and appropriateness of HOV lanes for corridors that have considered congestion pricing or value pricing.	no	The measure is technologically infeasible because there is no existing HOV Lane Plan.	
2.2	Fixed Lanes for Buses and Carpools on Arterials	Provide fixed lanes for buses and carpools on arterial streets where appropriate.	no	The measure is economically infeasible because Ventura County has no long, congested corridors.	
2.3	Expand number of freeway miles available, allow use by alternative fuel vehicles, changes to HOV lane requirements and hours	Various measures evaluated in many ozone nonattainment areas. Specifics vary according to freeway system, use patterns and local characteristics.	no	There are no existing HOV lanes in Ventura. The RTP process includes an evaluation for HOV throughout the region and includes or excludes HOV lanes based on transportation and performance criteria.	

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 3. Employer-Based Transportation Management Plans, including incentives					
3.1	Commute Solutions	The federal law that complements parking cash-out is called the Commuter Choice Program. It provides for benefits that employers can offer to employees to commute to work by methods other than driving alone.	yes		Employers, Transit Operators, VCTC
3.2	Parking Cash-Out	State law requires certain employers who provide subsidized parking for their employees to offer a cash allowance in lieu of a parking space.	yes		ARB, Employers
3.3	Employer Rideshare Program Incentives	Employer rideshare incentives and introduction of strategies designed to reduce single occupant vehicle trips. Examples include: public awareness campaigns, Transportation Management Associations among employers, alternative work hours, financial incentives for TCM participants as well as tax breaks for employers.	yes		Employers, VCAPCD, VCTC
3.4	Implement Parking Charge Incentive Program	Evaluate feasibility of an incentive program for cities and employers that convert free public parking spaces to paid spaces. Review existing parking polices as they relate to new development approvals.	no	This measure is technologically infeasible because there is plenty of parking, there would be little emissions reduction benefit, and it would unfairly penalize some businesses.	
3.5	Preferential Parking for Carpools and Vanpools	This measure encourages public and private employers to provide preferential parking spaces for carpools and vanpools to decrease the number of single occupant automobile work trips. The preferential treatment could include covered parking spaces or nearby spaces.	yes		Employers, VCAPCD
3.6	Employee Parking Fees	Encourage public and private employers to charge employees for parking.	no	The measure is technologically infeasible because the region is not urbanized enough to make it effective and could have negative effect to public parking areas (curb parking).	

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 3. Employer-Based Transportation Management Plans, including incentives (continued)					
3.7	Merchant Transportation Incentives	Implement "non-work" trip reduction ordinances requiring merchants to offer customers mode shift travel incentives such as free bus passes and requiring owners/managers/developers of large retail establishments to provide facilities for non-motorized modes.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
3.8	Purchase vans for vanpools	Purchase a specified number of vans for use in employee commute travel.	yes		Employers
3.9	Encourage merchants and employers to subsidize the cost of transit for employees	Provide outreach and possible financial incentives to encourage local employers to provide transit passes or subsidies to encourage less individual vehicle travel.	yes		VCAPCD, VCTC
3.10	Off-days for ozone alerts just like sick days	On ozone alert days, notify employees through email that there is an ozone alert. Employees are given a pre-specified number of days they can decide not to come in to work on ozone forecast days.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
3.11	Pay for in-house meals on ozone action days	Employer pays for meals in-house on ozone alert days so that employees do not travel to off-site locations.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
3.12	Voluntary business closures on ozone action days	A more expensive version of "off-days" for ozone alerts.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
3.13	Close government offices on Ozone action days to serve as an example	Similar to voluntary business closures.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
3.14	Mandatory compressed work weeks	Self-explanatory.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 3. Employer-Based Transportation Management Plans, including incentives (continued)					
3.15	Telecommuting	Goal of specified percentage of employees telecommuting at least once per week.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
Section 108(f) 4. Trip Reduction Ordinance					
In December 1995, Congress changed the Clean Air Act Amendments to make the Employee Commute Option program voluntary (no longer mandatory). California State Law prohibits mandatory employer based trip reduction ordinance programs (SB437). Therefore, no mandatory programs can be imposed.					

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 5. Traffic Flow Improvement Programs That Achieve Emission Reductions					
5.1	Develop Intelligent Transportation Systems	A variety of technological applications intended to produce more efficient use of existing transportation corridors.	Yes		Caltrans, Cities, County, SCAG, Transit Operators, VCTC
5.2	Coordinate Traffic Signal Systems	This measures implements and enhances synchronized traffic signal systems to promote steady traffic flow at moderate speeds.	Yes		Cities, County, VCTC
5.3	Reduce Traffic Congestion at Major Intersections	This measure implements a wide range of traffic control techniques designed to facilitate smooth, safe travel through intersections: signalization, turn lanes, median dividers, grade separations.	yes		Cities, County
5.4	Site-Specific Transportation Control Measures	This measure could include geometric or traffic control improvements at specific congested intersections or at other substandard locations. Another example might be programming left turn signals at certain intersections to lag, rather than lead, the green time for through traffic.	yes		Cities, County
5.5	Removal of On-Street Parking	Require all commercial/industrial development to design and implement off-street parking.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
5.6	Reversible Lanes	Implement reversible lanes on arterial streets to improve traffic flow where appropriate.	no	The measure is technologically infeasible because there is not sufficient congestion.	Caltrans, Cities, County, VCTC
5.7	One-Way Streets	Redesignate streets (or portions of in downtown areas) as one-way to improve traffic flow where appropriate.	no	The measure is technologically infeasible because there is not sufficient congestion.	Cities, County
5.8	On-Street Parking Restrictions	Restrict on-street parking where appropriate.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
5.9	Bus Pullouts in Curbs for Passenger Loading	Provide bus pullouts in curbs, or queue jumper lanes for passenger loading and unloading.	yes		Cities, County, Transit Operators, VCTC

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 5. Traffic Flow Improvement Programs That Achieve Emission Reductions (continued)					
5.10	Additional Freeway Service Patrol	Operation of additional lane miles of new roving tow truck patrols to clear incidents and reduce delay on freeways during peak periods.	no	Current and projected congestion levels too low to warrant measure.	
5.11	Consider coordinating scheduling of arterial and highway maintenance to exclude ozone action days if the maintenance activities require lane reductions on heavily utilized arterials and highways	Self-explanatory.	yes		Caltrans, Cities, County, VCAPCD
5.12	Re-routing of trucks on ozone days	Self-explanatory.	yes		VCAPCD
5.13	Fewer stop signs	Improve flow-through traffic by removing stop signs.	no	The measure is technologically infeasible because the safety issue outweighs the potential small air quality benefit.	
5.14	Ban left turns	Banning all left turns would stop the creation of bottlenecks although slightly increase travel distances.	no	No clear demonstration of air quality benefits.	
5.15	Changeable lane assignments	Increase number of one-way lanes going in congested flow direction during peak traffic hours.	no	Not enough congestion on applicable facilities to yield any appreciable air quality improvement.	
5.16	Adaptive traffic signals and signal timing	Self explanatory.	yes		Caltrans, Cities, County
5.17	Freeway bottleneck improvements (add lanes, construct shoulders, etc.)	Identify key freeway bottlenecks and take accelerated action to mitigate them.	yes		Caltrans, SCAG, VCTC
5.18	Minimize impact of construction on traveling public. Have contractors pay when lanes are closed as an incentive to keep lanes open	Self-explanatory.	yes		Caltrans, Cities, County
5.19	Internet provided road and route information	Reduce travel on highly congested roadways by providing accessible information on congestion and travel.	yes		Caltrans
5.20	Regional route marking systems to encourage underutilized capacity	Encourage travel on local roads and arterials by better route marking to show alternatives.	yes		Caltrans, Cities, County, VCTC

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 5. Traffic Flow Improvement Programs That Achieve Emission Reductions (continued)					
5.21	Congestion management field team to clear incidents	Self-explanatory.	no	Current and projected congestion levels too low to warrant measure.	
5.22	Use dynamic message signs to direct/smooth speeds during incidents	Self-explanatory.	yes		Caltrans
5.23	Get real-time traffic information to drivers	Self-explanatory.	yes		Caltrans, VCTC
5.24	55 mph speed limit during ozone season	Self-explanatory.	no	The measure is not feasible because it requires state legislative change.	
5.25	Require 40 mph speed limit on all facilities	Depends on area's emission factors.	no	The measure is not feasible because it requires state legislative change.	
5.26	Require lower speeds during peak periods	Self-explanatory.	no	The measure is not feasible because it requires state legislative change.	
Section 108(f) 6. Fringe And Transportation Corridor Parking Facilities Serving Multiple Occupancy Vehicle Programs Or Transit Service					
6.1	Park and ride lots	Develop, design and implement new Park and Ride facilities in locations where they are needed.	Yes		Caltrans, Cities, County, Transit Operators, VCTC
6.2	Park and ride lots serving perimeter counties	Specific to a locality.	Yes		Cities, County, SCAG, VCTC

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 7. Programs To Limit Or Restrict Vehicle Use In Downtown Areas Or Other Areas Of Emission Concentration Particularly During Periods Of Peak Use					
7.1	Off-Peak Goods Movement	Implement an ordinance to restrict truck deliveries by time or place in order to minimize traffic congestion during peak periods.	no	No authority to implement.	
7.2	Truck Restrictions During Peak Periods	Implement an ordinance to restrict truck travel during peak periods in order to minimize traffic congestion.	no	No authority to implement.	
7.3	Involve school districts to encourage walking to school	Decrease vehicle emissions due to school trips by reducing these trips through education and out-reach programs.	yes		School Districts, VCAPCD
7.4	Adjust school hours so they do not coincide with peak traffic periods and Ozone seasons	Measure to reduce travel during peak periods and ozone-contributing periods in the early morning.	no	No authority to implement.	
7.5	Area-wide tax for parking	Reduce driving by limiting parking through pricing measures.	no	No authority to implement.	
7.6	Increase parking fees	Same as above.	no	No authority to implement.	
7.7	Graduated pricing starting with highest in CBD	Charge the most for parking in the central business or other high volume areas in a city to discourage vehicle travel in these areas.	no	No authority to implement.	
7.8	Buy parking lots and convert to other land use	Limit parking by converting available parking to other land uses to discourage driving.	no	The measure is technologically infeasible because the area is too rural to be able to make this effective.	
7.9	Limit the number of parking spaces at commercial airlines to support mass transit	Reduce airport travel by limits on parking at airports.	no	The measure is technologically infeasible because it is at the discretion of regional and local airport authority to make land use decisions pertaining to airports.	
7.10	No CBD vehicles unless LEV or alt fuel or electric	Define high-use area and ticket any vehicles present unless they are low emitting, alternative fueled or electric.	no	No authority to implement.	
7.11	Auto restricted zones	No vehicles allowed in certain areas where high emissions, congestion or contribution to ozone problems.	no	No authority to implement.	
7.12	Incentives to increase density around transit centers	Lower travel by increasing residential and commercial density in areas near transit.	yes		Cities, County
7.13	Land use/air quality guidelines	Guidelines for development that contributes to air quality goals.	yes		VCAPCD

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 7. Programs To Limit Or Restrict Vehicle Use In Downtown Areas Or Other Areas Of Emission Concentration Particularly During Periods Of Peak Use (continued)					
7.14	Incentives for cities with good development practices	Provide financial or other incentive to cities that practice air quality-sensitive development.	yes		ARB, SCAG, State Legislature
7.15	Cash incentives to foster jobs/housing balance	Specific to locality – encouraged by California Clean Air Plan.	yes		ARB, Cities, County, SCAG, VCAPCD
7.16	Trip reduction oriented development	Specific to locality – encouraged by California Clean Air Plan.	yes		ARB, Cities, County, SCAG, VCAPCD
7.17	Transit oriented development	Specific to locality – encouraged by California Clean Air Plan.	yes		ARB, Cities, County, SCAG, VCAPCD
7.18	Sustainable development	Specific to locality – encouraged by California Clean Air Plan.	yes		ARB, Cities, County, SCAG, VCAPCD

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 8. Programs For The Provision Of All Forms Of High-Occupancy, Shared-Ride Services					
8.1	Financial Incentives, Including Zero Bus Fares	Provide financial incentives or other benefits, such as free or subsidized bus passes and cash payments for not driving, in lieu of parking spaces for employees who do not drive to the workplace.	yes		Employers
8.2	Internet ridematching services	Provide match-lists, route info, hours and contact information over the internet to assist individuals in joining or developing carpools.	yes		SCAG, VCTC
8.3	Preferential parking for carpoolers	Provide free, covered, near-building or similar incentives to carpoolers.	yes		Cities, County, Employers, VCTC
8.4	Credits and incentives for carpoolers	Self-explanatory.	yes		Cities, County, Employers, VCTC
8.5	Employers provide vehicles to carpoolers for running errands or emergencies	Having vehicles available for work-day errands makes it easier to go to work without one.	yes		Cities, County, Employers
8.6	Subscription Services	Free van services to provide transportation for the elderly, handicapped or other individuals who have no access to transportation.	yes		Transit Operators, VCTC
8.7	School carpools	Self-explanatory.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
8.8	Guaranteed ride home	Self-explanatory.	yes		Employers, VCTC

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 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					
9.1	Establish Auto Free Zones and Pedestrian Malls	Establish auto free zones and pedestrian malls where appropriate.	yes		Cities, County
9.2	Encouragement of Pedestrian Travel	This measure involves encouraging the use of pedestrian travel as an alternative to automobile travel. Pedestrian travel is quite feasible for short shopping, business, or school trips. Promotion of pedestrian travel could be included in air pollution public awareness efforts to remind people of this basic alternative.	yes		SCAG, VCTC, VCAPCD
9.3	Bicycle/Pedestrian Program	Fund high priority projects in countywide plans consistent with funding availability.	yes		Cities, County, VCTC
9.4	Close certain roads for use by non-motorized traffic	During special events, weekends, or certain times of the day, close some roads to all but non-motorized traffic.	yes		Cities, County
9.5	Encouragement of Bicycle Travel	Promotion of bicycle travel to reduce automobile use and improve air quality. Bikeway system planning, routes for inter-city bike trips to help bicyclists avoid other, less safe facilities. Another area for potential actions is the development and distribution of educational materials, regarding bicycle use and safety.	yes		Caltrans, Cities, County, VCAPCD, VCTC
9.6	Free Bikes	Provide free bikes in the manner of Boulder, CO. Simple utilitarian bikes that can be used throughout the metro area and dropped off at destination for use by anyone desiring use.	no	No authority to implement. Also, evidence suggests that bicycle theft is a problem in other programs and renders this measure technically and economically infeasible.	
9.7	Cash Rebates for Bikes	Provide financial incentives to purchase bicycles and thereby encourage use.	no	No clear demonstration of air quality benefits.	
9.8	Close streets for special events for use by bikes and pedestrians	Self-explanatory.	yes		Cities, County

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 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					
10.1	Bike racks at work sites	Self explanatory.	yes		Cities, County, Employers, VCTC
10.2	Bike Racks on Buses	Bike racks would be placed on a to-be-determined number of buses to increase bicycle travel.	yes		Transit Operators, VCTC
10.3	Regional Bike Parking Ordinance for all new construction	Bike Transit Centers for/at all employment centers 100+ employees: Bike lockers, clothing lockers, showers, cleaners drop-off and pick-up. Bike repair and rental.	no	The Legislature reduced authority to implement indirect source control measures through revisions to the Health & Safety Code (HSC 40717.6, HSC 40717.8, HSC 40717.9).	
Section 108(f) 11. Programs To Control Extended Idling Of Vehicles					
11.1	Limit Excessive Car Dealership Vehicle Starts	Require car dealers to limit the starting of vehicles for sale on their lot(s) to once every two weeks. Presently, a number of new and used car dealers start their vehicles daily to avoid batter failure and assure smooth start-ups for customer test drives.	no	The measure is technologically infeasible because contrary to colder climates where vehicles are started on a daily basis, vehicles in the South Central Coast are started much less frequently.	
11.2	Limitations on Vehicle Idling	Limitations to limit extended idling operations of trucks.	yes		ARB, VCAPCD
11.3	Turn off engines while stalled in traffic	Public outreach or police-enforced program.	no	The measure raises safety and congestion concerns and has no clear demonstration of air quality emissions benefits.	
11.4	Restrict idling	Require idle limits for trucks.	yes		ARB, VCAPCD
11.5	Reduced idling at drive-throughs. Shut windows down	Mandate no idling or do not allow drive-through windows during ozone season.	no	No clear demonstration of air quality emissions benefits. This measure is not economically feasible.	
11.6	Promote use of Pony engines	Use special battery engines to keep air conditioning and other truck systems working while truck not in use.	yes		ARB, VCAPCD
11.7	Idle restrictions at airport curbsides	Police enforced.	no	No commercial airport. This measure is implemented based on security restrictions.	

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 12. Program To Reduce Motor Vehicle Emissions, Consistent With Title II, Which Are Caused By Extreme Cold Start Conditions					
The definition of an "extreme cold start" specifies temperatures below 20 degrees Fahrenheit. Not applicable in the South Central Coast - no extreme cold start conditions.					
Section 108(f) 13. Employer-Sponsored Programs To Permit Flexible Work Schedules					
13.1	Alternative Work Schedules	Enables workers to choose their own working hours within certain constraints. Flextime provides the opportunity for employees to use public transit, ridesharing, and other nonmotorized transportation. A related strategy, staggered work hours, is designed to reduce peak congestion in the vicinity of the workplace.	yes		Employers, VCAPCD
13.2	Modifications of Work Schedules	Implement alternate work schedules that flex the scheduled shift time for employees. Encourage the use of flexible or staggered work hours to promote off-peak driving and accommodate the use of transit and carpooling.	yes		Employers, VCAPCD
13.3	Telecommunications-Telecommuting	Encourage the use of telecommuting in place of motor vehicle use where appropriate.	yes		SCAG, VCAPCD
13.4	Telecommunications-Teleconferencing	Encourage the use of teleconferencing in place of motor vehicle use where appropriate.	yes		SCAG, VCAPCD

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 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					
14.1	Areawide Public Awareness Programs	This measure focuses on conducting ongoing public awareness programs throughout the year to provide the public with information on air pollution and encourage changes in driving behavior and transportation mode use.	yes		VCAPCD, VCTC
14.2	Special Event Controls	This measure would require new and existing owners/operators of the special event centers to reduce mobile source emissions generated by their events. A list of optional strategies would be available that reduce mobile source emissions. The definition of "special event center" could be developed through the rule development process.	yes		VCAPCD
14.3	Land Use/Development Alternatives	This measure includes encouraging land use patterns which support public transit and other alternative modes of transportation. In general, this measure would also encourage land use patterns designed to reduce travel distances between related land uses (e.g., residential-commercial). Shorter trip lengths ultimately relieve traffic congestion and improve air quality.	yes		Cities, County, SCAG, VCTC
14.4	Voluntary No Drive Day Programs	Conduct voluntary no drive day programs during the ozone season through media and employer based public awareness activities.	yes		VCAPCD
14.5	Evaluation of the Air Quality Impacts of New development and Mitigation of Adverse Impacts	Evaluate the air quality impacts of new development and mitigate any adverse impacts.	yes		Cities, County, VCAPCD
14.6	Transportation for Livable Communities (TLC)/Housing Incentive Program	Program provides planning grants, technical assistance, and capital grants to help cities and nonprofit agencies define and implement transportation projects that support community plans including increased housing near transit.	no	Too little funding available to implement at beneficial levels.	
14.7	Incentives to increase density around transit centers	Lower travel by increasing residential and commercial density in areas near transit.	yes		Cities, County

Appendix B - Ventura County Reasonably Available Control Measures Analysis (continued)

Measure No.	Measure Title	Description	Feasible for Use in VC?	Reasoned Justification for Infeasible Measure	Potential Implementing Agency
Section 108(f) 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 (continued)					
14.8	Incentives for cities with good development practices	Provide financial or other incentive to local cities that practice air quality-sensitive development.	yes		SCAG, State Legislature, VCAPCD
14.9	Increase state gas tax	Self-explanatory.	no	No authority to implement and no clear demonstration of air quality benefits.	
Section 108 (f) 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. For Purposes Of This Clause, The Administrator Shall Also Consult With The Secretary Of The Interior					
15.1	Encouragement of Pedestrian Travel	Promote public awareness and use of walking as an alternative to the motor vehicle.	yes		ARB, SCAG, VCAPCD
15.2	Pedestrian and Bicycle Overpasses Where Safety Dictates	Ongoing implementation as development occurs.	yes		Cities, County
Section 108(f) 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					
16.1	Counties assess ten dollar license plate fee to fund repair/replacement program for high-emitters	Self-explanatory.	no	No authority to implement.	
16.2	Buy vehicles older than 1975	Self-explanatory.	yes		ARB, VCAPCD
16.3	Demolish impounded vehicles that are high emitters	Self-explanatory.	no	No authority to implement.	
16.4	Do whatever is necessary to allow cities to remove the engines of high emitting vehicles (pre-1980) that are abandoned and to be auctioned	Self-explanatory.	no	No authority to implement.	
16.5	Accelerated retirement program	Identify high emitting vehicle age groups and develop a program to remove them from use.	yes		ARB, VCAPCD

Appendix C

Ventura County Emissions Forecast by Emissions Inventory Category Name

Table C-1
ROG Planning Emission Forecast by Summary Category by Air Basin

Ventura County	ROG (tons/summer day)			
EIC Summary Category Name	2002	2008	2011	2012
SCC AIR BASIN				
STATIONARY SOURCES				
Fuel Combustion				
010-Electric Utilities	0.24	0.29	0.30	0.30
020-Cogeneration	0.01	0.01	0.01	0.01
030-Oil And Gas Production (Combustion)	0.14	0.13	0.13	0.13
040-Petroleum Refining (Combustion)	0.00	0.00	0.00	0.00
050-Manufacturing And Industrial	0.04	0.04	0.04	0.04
052-Food And Agricultural Processing	0.20	0.20	0.20	0.20
060-Service And Commercial	0.07	0.08	0.08	0.08
099-Other (Fuel Combustion)	0.07	0.04	0.03	0.03
Total Fuel Combustion	**0.76**	**0.78**	**0.78**	**0.78**
Waste Disposal				
110-Sewage Treatment	0.01	0.01	0.01	0.01
120-Landfills	0.09	0.11	0.12	0.13
130-Incinerators	0.00	0.00	0.00	0.00
140-Soil Remediation	0.00	0.00	0.00	0.00
199-Other (Waste Disposal)	0.00	0.00	0.00	0.00
Total Waste Disposal	**0.09**	**0.12**	**0.13**	**0.13**
Cleaning And Surface Coatings				
210-Laundering	0.01	0.01	0.01	0.01
220-Degreasing	3.17	2.27	2.38	2.41
230-Coatings And Related Process Solvents	2.08	2.19	2.28	2.31
240-Printing	0.27	0.28	0.29	0.29
250-Adhesives And Sealants	0.40	0.39	0.41	0.41
299-Other (Cleaning And Surface Coatings)	0.38	0.39	0.41	0.42
Total Cleaning And Surface Coatings	**6.30**	**5.53**	**5.78**	**5.85**
Petroleum Production And Marketing				
310-Oil And Gas Production	2.03	1.97	1.93	1.92
320-Petroleum Refining	0.00	0.00	0.00	0.00
330-Petroleum Marketing	1.07	1.03	1.04	1.05
399-Other (Petroleum Production And Marketing)	0.00	0.00	0.00	0.00
Total Petroleum Production And Marketing	**3.10**	**3.00**	**2.97**	**2.97**
Industrial Processes				
410-Chemical	0.10	0.11	0.11	0.11
420-Food And Agriculture	0.01	0.01	0.01	0.01
430-Mineral Processes	0.04	0.04	0.04	0.04
440-Metal Processes	0.00	0.00	0.00	0.00
450-Wood And Paper	0.11	0.11	0.12	0.12
470-Electronics	0.02	0.02	0.03	0.03
499-Other (Industrial Processes)	0.08	0.08	0.08	0.08
Total Industrial Processes	**0.37**	**0.38**	**0.40**	**0.40**
TOTAL STATIONARY SOURCES	**10.62**	**9.81**	**10.06**	**10.14**

Table C-1 (continued)

Ventura County	ROG (tons/summer day)			
EIC Summary Category Name	**2002**	**2008**	**2011**	**2012**
AREA-WIDE SOURCES				
Solvent Evaporation				
510-Consumer Products	5.78	5.06	5.21	5.26
520-Architectural Coatings And Related Process Solvents	3.21	2.87	2.97	3.01
530-Pesticides/Fertilizers	3.99	4.82	4.82	4.82
540-Asphalt Paving / Roofing	0.56	0.60	0.62	0.63
Total Solvent Evaporation	**13.53**	**13.36**	**13.62**	**13.71**
Miscellaneous Processes				
610-Residential Fuel Combustion	0.20	0.21	0.22	0.22
620-Farming Operations	0.12	0.12	0.12	0.12
630-Construction And Demolition	0.00	0.00	0.00	0.00
640-Paved Road Dust	0.00	0.00	0.00	0.00
645-Unpaved Road Dust	0.00	0.00	0.00	0.00
650-Fugitive Windblown Dust	0.00	0.00	0.00	0.00
660-Fires	0.02	0.02	0.02	0.02
670-Managed Burning And Disposal	0.19	0.21	0.21	0.21
690-Cooking	0.07	0.06	0.06	0.06
Total Miscellaneous Processes	**0.59**	**0.61**	**0.63**	**0.63**
TOTAL AREA-WIDE SOURCES	**14.12**	**13.97**	**14.25**	**14.34**
MOBILE SOURCES				
On-Road Motor Vehicles				
710-Light Duty Passenger (LDA)	9.19	5.11	3.88	3.53
722-Light Duty Trucks - 1 (LDT1)	1.84	1.14	0.89	0.84
723-Light Duty Trucks - 2 (LDT2)	3.64	2.55	2.35	2.28
724-Medium Duty Trucks (MDV)	1.87	1.32	1.25	1.23
732-Light Heavy Duty Gas Trucks - 1 (LHDV1)	1.39	0.57	0.47	0.45
733-Light Heavy Duty Gas Trucks - 2 (LHDV2)	0.21	0.10	0.09	0.09
734-Medium Heavy Duty Gas Trucks (MHDV)	0.51	0.25	0.20	0.18
736-Heavy Heavy Duty Gas Trucks (HHDV)	0.20	0.11	0.08	0.07
742-Light Heavy Duty Diesel Trucks - 1 (LHDV1)	0.00	0.02	0.02	0.02
743-Light Heavy Duty Diesel Trucks - 2 (LHDV2)	0.02	0.02	0.01	0.01
744-Medium Heavy Duty Diesel Trucks (MHDV)	0.04	0.03	0.03	0.03
746-Heavy Heavy Duty Diesel Trucks (HHDV)	0.37	0.32	0.27	0.25
750-Motorcycles (MCY)	0.86	1.00	0.92	0.91
760-Heavy Duty Diesel Urban Buses (UB)	0.00	0.00	0.00	0.00
762-Heavy Duty Gas Urban Buses (UB)	0.01	0.01	0.01	0.01
770-School Buses (SB)	0.02	0.01	0.02	0.02
776-Other Buses (OB)	0.03	0.02	0.02	0.02
780-Motor Homes (MH)	0.11	0.06	0.04	0.04
Total On-Road Motor Vehicles	**20.31**	**12.64**	**10.54**	**9.98**

Table C-1 (continued)

Ventura County EIC Summary Category Name	ROG (tons/summer day) 2002	 2008	 2011	 2012
Other Mobile Sources				
810-Aircraft	0.51	0.66	0.69	0.69
820-Trains	0.13	0.12	0.12	0.11
830-Ships And Commercial Boats	0.23	0.26	0.27	0.27
840-Recreational Boats	3.85	3.65	3.42	3.37
850-Off-Road Recreational Vehicles	2.00	2.65	2.89	2.98
860-Off-Road Equipment	5.90	4.90	4.24	4.05
870-Farm Equipment	0.77	0.59	0.51	0.46
890-Fuel Storage And Handling	1.21	0.79	0.62	0.58
Total Other Mobile Sources	**14.59**	**13.61**	**12.74**	**12.52**
TOTAL MOBILE SOURCES	**34.90**	**26.24**	**23.29**	**22.50**
ERC Balance		**1.67**	**1.67**	**1.67**
TOTAL SCC AIR BASIN	**59.64**	**51.69**	**49.26**	**48.65**
OCS AIR BASIN				
STATIONARY SOURCES				
Fuel Combustion				
030-Oil And Gas Production (Combustion)	0.01	0.01	0.01	0.01
060-Service And Commercial	0.02	0.02	0.02	0.02
Total Fuel Combustion	**0.03**	**0.04**	**0.04**	**0.04**
Cleaning And Surface Coatings				
230-Coatings And Related Process Solvents	0.01	0.00	0.00	0.00
Total Cleaning And Surface Coatings	**0.01**	**0.00**	**0.00**	**0.00**
Petroleum Production And Marketing				
310-Oil And Gas Production	0.04	0.04	0.04	0.04
330-Petroleum Marketing	0.00	0.00	0.00	0.00
Total Petroleum Production And Marketing	**0.04**	**0.04**	**0.04**	**0.04**
TOTAL STATIONARY SOURCES	**0.09**	**0.08**	**0.08**	**0.08**
MOBILE SOURCES				
Other Mobile Sources				
810-Aircraft	0.07	0.10	0.11	0.11
830-Ships And Commercial Boats	0.56	0.64	0.67	0.68
Total Other Mobile Sources	**0.63**	**0.74**	**0.78**	**0.79**
TOTAL MOBILE SOURCES	**0.63**	**0.74**	**0.78**	**0.79**
TOTAL OCS AIR BASIN	**0.72**	**0.82**	**0.86**	**0.87**
TOTAL VENTURA COUNTY	**60.36**	**52.51**	**50.12**	**49.52**

NOTES:
Source: CEFS v1.06 (November 2006).
External ARB adjustments to CEFS v1.06 are noted in Table 4-3.
Table 3-7 State proposed 2012 reductions are not included.
Data rounding may affect displayed values and totals.

Table C-2
NOx Planning Emission Forecast by Summary Category by Air Basin

Ventura County	NOx (tons/summer day)			
EIC Summary Category Name	2002	2008	2011	2012
SCC AIR BASIN				
STATIONARY SOURCES				
Fuel Combustion				
010-Electric Utilities	1.36	1.62	1.68	1.69
020-Cogeneration	0.01	0.01	0.02	0.02
030-Oil And Gas Production (Combustion)	0.23	0.21	0.21	0.20
040-Petroleum Refining (Combustion)	0.01	0.01	0.01	0.01
050-Manufacturing And Industrial	0.85	0.89	0.93	0.95
052-Food And Agricultural Processing	2.54	2.34	2.17	2.11
060-Service And Commercial	0.36	0.33	0.33	0.33
099-Other (Fuel Combustion)	0.52	0.34	0.30	0.29
Total Fuel Combustion	**5.88**	**5.75**	**5.64**	**5.59**
Waste Disposal				
110-Sewage Treatment	0.01	0.01	0.01	0.01
120-Landfills	0.08	0.10	0.11	0.11
130-Incinerators	0.00	0.00	0.00	0.00
140-Soil Remediation	0.00	0.00	0.00	0.00
199-Other (Waste Disposal)	0.00	0.00	0.00	0.00
Total Waste Disposal	**0.09**	**0.11**	**0.12**	**0.12**
Cleaning And Surface Coatings				
210-Laundering	0.00	0.00	0.00	0.00
220-Degreasing	0.00	0.00	0.00	0.00
230-Coatings And Related Process Solvents	0.00	0.00	0.00	0.00
240-Printing	0.00	0.00	0.00	0.00
250-Adhesives And Sealants	0.00	0.00	0.00	0.00
299-Other (Cleaning And Surface Coatings)	0.00	0.00	0.00	0.00
Total Cleaning And Surface Coatings	**0.00**	**0.00**	**0.00**	**0.00**
Petroleum Production And Marketing				
310-Oil And Gas Production	0.04	0.03	0.03	0.03
320-Petroleum Refining	0.00	0.00	0.00	0.00
330-Petroleum Marketing	0.00	0.00	0.00	0.00
399-Other (Petroleum Production And Marketing)	0.00	0.00	0.00	0.00
Total Petroleum Production And Marketing	**0.04**	**0.03**	**0.03**	**0.03**
Industrial Processes				
410-Chemical	0.00	0.00	0.00	0.00
420-Food And Agriculture	0.00	0.00	0.00	0.00
430-Mineral Processes	0.00	0.00	0.00	0.00
440-Metal Processes	0.02	0.02	0.02	0.02
450-Wood And Paper	0.00	0.00	0.00	0.00
470-Electronics	0.00	0.00	0.00	0.00
499-Other (Industrial Processes)	0.06	0.06	0.06	0.06
Total Industrial Processes	**0.08**	**0.08**	**0.08**	**0.08**
TOTAL STATIONARY SOURCES	**6.08**	**5.97**	**5.87**	**5.82**

Table C-2 (continued)

Ventura County EIC Summary Category Name	NOx (tons/summer day) 2002	 2008	 2011	 2012
AREA-WIDE SOURCES				
Solvent Evaporation				
510-Consumer Products	0.00	0.00	0.00	0.00
520-Architectural Coatings And Related Process Solvents	0.00	0.00	0.00	0.00
530-Pesticides/Fertilizers	0.00	0.00	0.00	0.00
540-Asphalt Paving / Roofing	0.00	0.00	0.00	0.00
Total Solvent Evaporation	**0.00**	**0.00**	**0.00**	**0.00**
Miscellaneous Processes				
610-Residential Fuel Combustion	1.12	1.16	1.17	1.18
620-Farming Operations	0.00	0.00	0.00	0.00
630-Construction And Demolition	0.00	0.00	0.00	0.00
640-Paved Road Dust	0.00	0.00	0.00	0.00
645-Unpaved Road Dust	0.00	0.00	0.00	0.00
650-Fugitive Windblown Dust	0.00	0.00	0.00	0.00
660-Fires	0.00	0.01	0.01	0.01
670-Managed Burning And Disposal	0.15	0.15	0.16	0.16
690-Cooking	0.00	0.00	0.00	0.00
Total Miscellaneous Processes	**1.27**	**1.32**	**1.34**	**1.35**
TOTAL AREA-WIDE SOURCES	**1.27**	**1.32**	**1.34**	**1.35**
MOBILE SOURCES				
On-Road Motor Vehicles				
710-Light Duty Passenger (LDA)	6.41	3.27	2.41	2.16
722-Light Duty Trucks - 1 (LDT1)	1.64	0.91	0.69	0.63
723-Light Duty Trucks - 2 (LDT2)	5.11	2.91	2.41	2.24
724-Medium Duty Trucks (MDV)	2.94	1.86	1.59	1.49
732-Light Heavy Duty Gas Trucks - 1 (LHDV1)	2.26	1.09	0.96	0.95
733-Light Heavy Duty Gas Trucks - 2 (LHDV2)	0.30	0.20	0.19	0.19
734-Medium Heavy Duty Gas Trucks (MHDV)	0.50	0.33	0.28	0.26
736-Heavy Heavy Duty Gas Trucks (HHDV)	0.53	0.31	0.23	0.21
742-Light Heavy Duty Diesel Trucks - 1 (LHDV1)	0.04	0.75	0.60	0.56
743-Light Heavy Duty Diesel Trucks - 2 (LHDV2)	0.75	0.58	0.48	0.45
744-Medium Heavy Duty Diesel Trucks (MHDV)	3.20	2.06	1.68	1.55
746-Heavy Heavy Duty Diesel Trucks (HHDV)	5.40	4.37	3.48	3.18
750-Motorcycles (MCY)	0.14	0.23	0.23	0.23
760-Heavy Duty Diesel Urban Buses (UB)	0.07	0.07	0.06	0.06
762-Heavy Duty Gas Urban Buses (UB)	0.02	0.02	0.03	0.03
770-School Buses (SB)	0.17	0.14	0.15	0.15
776-Other Buses (OB)	0.09	0.08	0.07	0.07
780-Motor Homes (MH)	0.43	0.33	0.27	0.26
Total On-Road Motor Vehicles	**30.00**	**19.52**	**15.80**	**14.67**

Table C-2 (continued)

Ventura County EIC Summary Category Name	NOx (tons/summer day) 2002	 2008	 2011	 2012
Other Mobile Sources				
810-Aircraft	0.33	0.45	0.48	0.48
820-Trains	2.46	1.72	1.30	1.32
830-Ships And Commercial Boats	1.35	1.54	1.57	1.59
840-Recreational Boats	0.89	1.26	1.24	1.24
850-Off-Road Recreational Vehicles	0.05	0.06	0.07	0.07
860-Off-Road Equipment	15.61	12.73	10.88	10.30
870-Farm Equipment	3.81	2.97	2.58	2.40
890-Fuel Storage And Handling	0.00	0.00	0.00	0.00
Total Other Mobile Sources	**24.49**	**20.73**	**18.13**	**17.41**
TOTAL MOBILE SOURCES	**54.49**	**40.25**	**33.93**	**32.07**
ERC Balance		**0.51**	**0.51**	**0.51**
TOTAL SCC AIR BASIN	**61.83**	**48.05**	**41.65**	**39.75**
OCS AIR BASIN				
STATIONARY SOURCES				
Fuel Combustion				
030-Oil And Gas Production (Combustion)	0.15	0.14	0.14	0.14
060-Service And Commercial	0.24	0.26	0.27	0.27
Total Fuel Combustion	**0.39**	**0.40**	**0.41**	**0.41**
Cleaning And Surface Coatings				
230-Coatings And Related Process Solvents	0.00	0.00	0.00	0.00
Total Cleaning And Surface Coatings	**0.00**	**0.00**	**0.00**	**0.00**
Petroleum Production And Marketing				
310-Oil And Gas Production	0.01	0.01	0.01	0.01
330-Petroleum Marketing	0.00	0.00	0.00	0.00
Total Petroleum Production And Marketing	**0.01**	**0.01**	**0.01**	**0.01**
TOTAL STATIONARY SOURCES	**0.40**	**0.41**	**0.41**	**0.42**
MOBILE SOURCES				
Other Mobile Sources				
810-Aircraft	0.04	0.06	0.06	0.07
830-Ships And Commercial Boats	12.92	15.74	17.36	17.97
Total Other Mobile Sources	**12.96**	**15.80**	**17.43**	**18.04**
TOTAL MOBILE SOURCES	**12.96**	**15.80**	**17.43**	**18.04**
TOTAL OCS AIR BASIN	**13.36**	**16.20**	**17.84**	**18.45**
TOTAL VENTURA COUNTY	**75.19**	**64.25**	**59.49**	**58.20**

NOTES:
Source: CEFS v1.06 (November 2006).
External ARB adjustments to CEFS v1.06 are noted in Table 4-3.
Table 3-7 State proposed 2012 reductions are not included.
Data rounding may affect displayed values and totals.

Appendix D

Attainment Demonstration

PREFACE

This appendix includes two sections - both prepared by the California Air Resources Board for the Ventura County Air Pollution Control District: Protocol for Photochemical Modeling of Ozone in Ventura County and Ventura County Weight of Evidence Assessment. Page numbers are sequential in the appendix, and there is a table of contents for each of the sections at the beginning of the appendix.

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PROTOCOL FOR PHOTCHEMICAL MODELING OF OZONE IN VENTURA COUNTY

2/1/2008

Prepared for

Ventura County Air Pollution Control District
Ventura, California 93003

Prepared by

California Environmental Protection Agency
California Air Resources Board
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1. INTRODUCTION

This document was prepared by the California Air Resources Board (CARB) to assist the Ventura County Air Pollution Control District in the development of a year 2008 ozone attainment plan for Ventura County. This document is a protocol that describes the use of an ozone air quality model to estimate future-year 8-hour ozone design values. The need for and purpose of the protocol document have been described in a technical guidance document adopted by the CARB (1992).

The primary purpose of this protocol is to describe the procedures used to model ozone concentrations in Ventura County and the use of the results to project concentrations in future years. The objective is to promote the review of these procedures and encourage participation in the development of strategies to meet federal and state air quality standards for ozone.

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2. AIR QUALITY MODELING DOMAIN AND MODELING TOOLS

Air quality in Ventura County is often strongly influenced by air quality in the South Coast Air Basin (SCAB). Los Angeles County is adjacent to Ventura, and dwarfs Ventura County in terms of population and anthropogenic emissions. Therefore, any model-based analysis of ozone air quality in Ventura County must include Los Angeles County, if not the whole SCAB.

To avoid replicating work, much of the ozone modeling for Ventura County was taken from work done by the South Coast Air Quality Management District (SCAQMD) in preparation for their contribution to the 2007 California ozone State Implementation Plan (SIP). The SCAQMD prepared modeling analysis for six high-ozone episodes that occurred during 2004 and 2005 (SCAQMD, 2007). These analyses were based on the 1997 South Coast Ozone Study (SCOS) domain which includes Ventura County (Figure 2-1).

2.1. Modeling Domain Description And Modeling Tools

2.1.1. Modeling Domain

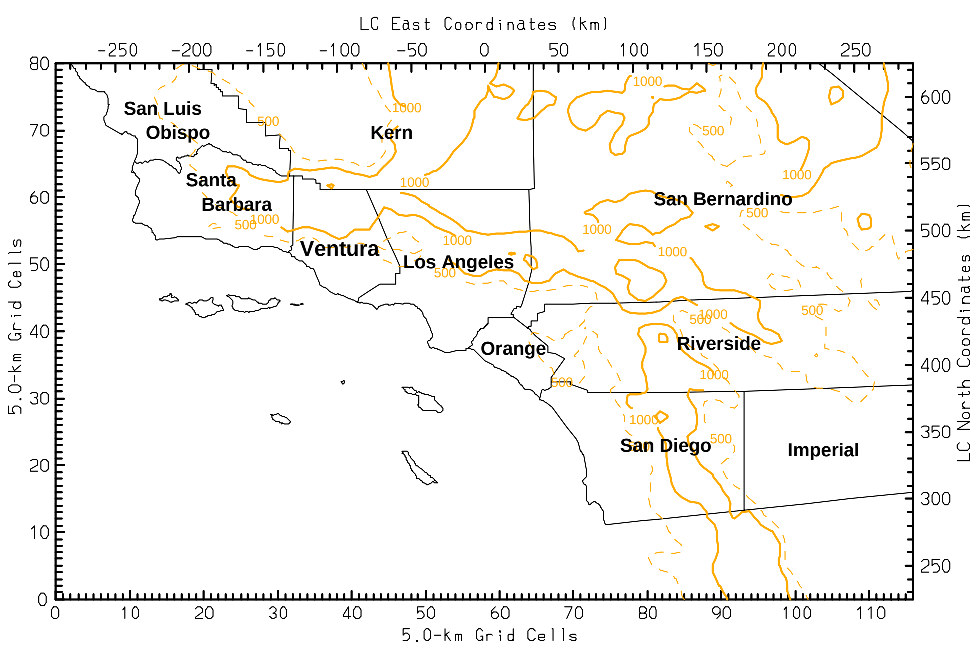
The 1997 SCOS air quality modeling domain was defined in a Lambert Conical Projection with 2 parallels (see Table 2-1). The Lambert Project was selected based on the needs of the prognostic meteorological modeling used to generate the meteorological inputs required by the air quality model. The horizontal grid consisted of 116x80 grid cells with a resolution of 5x5 km. The domain covers 232,000 km^2; over 89,000 square miles.

Figure 2-1 shows the boundaries of the ozone modeling domain. The northern boundary of the model extends into Santa Barbara and Kern counties, while the southern boundary extends into Mexico. The eastern boundary of the modeling domain is over 230 miles east of Ventura County in the desert portions of San Bernardino and Riverside counties, while the western boundary extends 155 km (96 miles) beyond the westernmost point of the County's shoreline.

Table 2-1 Coordinate definitions for the 1997 Southern California Ozone Study (SCOS) modeling domain.

<u>Lambert Conical Projection with 2 Parallels</u>	
Parallels:	30N and 60N
Central Meridian:	118.0 W
Origin (0x0 km):	N x 118W
<u>Air Quality Modeling Domain</u>	
Lower, Left Hand Corner:	-290 x 225 km
Number of Cells:	116 x 80

Figure 2-1 The Southern California Ozone Study (SCOS) air quality modeling domain showing terrain contours.



2.1.2. Air Quality Model

The U.S. EPA (2005) modeling guidelines did not recommend any single air quality model for the development of a SIP. Instead, the U.S. EPA recommended a number of criteria for selecting an air quality model. Among these criteria were:

- the model should be peer reviewed by the science community
- the model should be appropriate for the specific application
- the model should be used with a data base that is appropriate for the application
- the model should have a proven track record of successful use
- the model should be used in a manner consistent with a protocol describing its use

The U.S. EPA (2005) listed a number of air quality models that met the above criteria and among them was CAMx (ENVIRON, 2004). Because the CAMx model has an additional advantage over other models in that it is being used by the California Air Resources Board (CARB) in other parts of California (CARB, 2007), there is a base of local knowledge concerning its application and use.

For the Ventura County SIP, the CAMx v4.4-beta with SAPRC99 chemistry was selected. The v4.4-beta is an upgrade to the most recently available version of CAMx v4.3. In CAMx v4.3 there is no explicit representation for three chemical species that are important to understanding ozone chemistry in California; these are methyl butenol (MBUT), ethanol (ETOH), and methyl tert-butyl ether (MTBE). The MBUT is a component of biogenic emissions associated with conifers and is found in most of the mountainous areas of California. The species ETOH and MTBE are important components of automobile gasoline in California. ENVIRON incorporated explicit representations of these species into v4.4beta at the request of the SCAQMD (2006).

2.1.3. Meteorological Modeling

The U.S. EPA's 2005 modeling guidance encourages the use of a prognostic meteorological model to generate the meteorological fields needed in an air quality model. The MM5 prognostic meteorological model (Grell et. al., 1993) is well known and widely used in the United States for generating regional meteorological fields. The MM5 model is a non-hydrostatic model with a pressure-normalized (sigma) terrain-following coordinate system. The model uses global-scale simulation results to define initial and boundary concentrations, and multiple nesting layers to generate gridded meteorological fields at smaller scales that are more appropriate for air quality modeling.

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3. OZONE EPISODE SELECTION

Five of the six ozone episodes selected for analysis by the SCAQMD were selected primarily for the high ozone concentrations observed in the SCAB. The sixth episode (August 3-9, 2005) was selected for high ozone concentrations within Ventura County. Each of the episodes recorded 8-hour ozone concentrations of 85 ppb or greater within Ventura County. However, for most of the episodes, ozone concentrations of 60 ppb or greater did not occur at more than one site very often. With only a few monitoring sites to base analyses on, there were greater uncertainties in air quality model performance. The episodes modeled are listed in Table 3-1 with 8-hour ozone concentrations measured in Ventura County.

Figure 3-1 shows the air monitoring sites operating in Ventura County during years 2004 and 2005. They are: Ojai (3172), Emma Wood State Beach (2756), Rio Mesa (2991), Piru (2702), Simi Valley (2880), and Thousand Oaks (2984).

Figure 3-1: Locations of surface meteorology monitoring sites in the vicinity of Ventura County

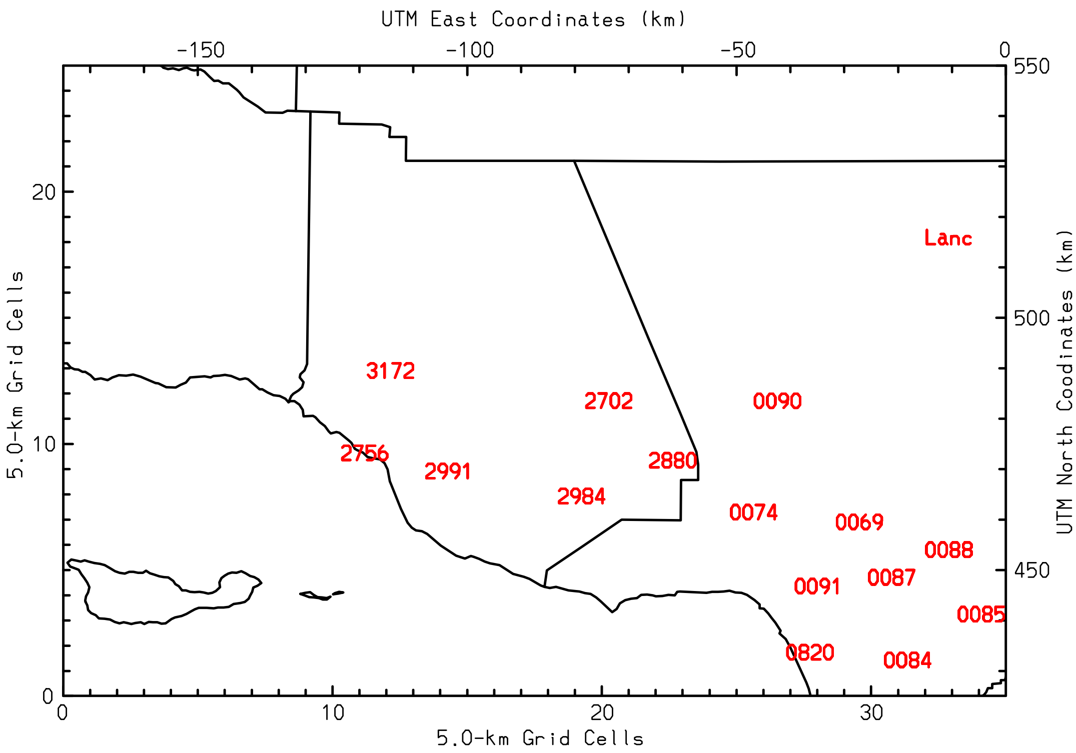


Table 3-1: Ozone episodes selected by the SCAQMD for analysis and high 8-hour ozone concentrations (ppb) in Ventura County.

Episode	Day	Simi Valley	Piru	Thousand Oaks	Ojai	Emma Woods
June, 2004	03	nd	nd	nd	nd	nd
	04	085	082	068	086	055
	05	095	080	069	078	052
	06	082	075	071	074	065
	07	061	060	058	059	055
August, 2004	04	060	063	049	066	051
	05	077	053	074	076	059
	06	083	080	073	086	041
	07	073	076	064	079	037
	08	074	079	051	075	035
May, 2005	17	056	053	052	053	044
	18	062	064	059	060	037
	19	072	073	061	067	028
	20	047	047	040	053	035
	21	082	070	068	064	047
	22	084	msg	077	072	050
	23	076	071	066	067	057
	24	076	069	068	066	061
July, 2005	14	063	049	044	070	033
	15	085	080	061	089	046
	16	082	069	060	083	046
	17	085	068	056	079	039
	18	073	068	046	076	035
	19	085	083	061	082	032
August, 2005	03	085	083	066	081	069
	04	081	081	065	083	049
	05	094	086	064	084	042
	06	093	082	066	085	039
	07	075	068	054	069	044
	08	080	070	057	064	047
	09	069	072	056	069	051
August, 2005	25	075	071	074	057	060
	26	053	064	059	047	048
	27	065	066	057	068	043
	28	086	080	068	071	042
	29	085	082	062	085	034

4. AIR QUALITY MODEL INPUT PREPARATION

4.1. Meteorology Inputs

The meteorology inputs required by the CAMx air quality model were generated using the MM5 prognostic meteorological model. The MM5 modeling domain was centered at 34.537N x 118 W and included nested domains of 45-, 15-, and 05 km. The 5-km domain consisted of 120x84 grid cells. The vertical MM5 domain consisted of 34 layers to a height of approximately 15,000 magl. There was a 500-km northing offset between the meteorological modeling domain and the air quality modeling domain.

For each of episode modeled, the MM5 model was initialized on the day prior to the beginning of each simulation period. For example, for the July, 2005 episode, the simulation was initialized at July 12, 1200 GMT – 0500 PDT. Analysis nudging was used for the 45- and 15-km grids at 6-hour intervals. Because of the limited amount of upper-air data available, no observational nudging was done for layers above the surface.

Within the 5-km grid, the MRF scheme was used to describe the planetary boundary layer. The multi–layer soil model was used to describe the surface energy budget (see Grell, et. al., 1993). Surface wind measurements were used for nudging (observational FDDA) for all of the episodes, except for the August 3-9, 2005 episode. Further details were described in SCAQMD (2007).

The MM5 output was post-processed for CAMx input using software provided by ENVIRON (2004). The 34 layers from the meteorological modeling domain were mapped into 16 layers to a height of approximately 5,000 magl for the air quality modeling domain. Table 4-1 shows the nominal height and thickness of each layer. Vertical diffusivities were estimated using O'Brien (1970). To limit potential numerical artifacts in the meteorological parameter fields on the nest boundaries, 2 grid cells were removed from the 5-km MM5 output, resulting in a grid of 116x80 grid cells and is the bases of the air quality modeling domain.

Table 4-1: Vertical layer assignments for the CAMx air quality model and the MM5 meteorological model.

CAMx No.	MM5 No.	Height magl	Thickness m
1	1	36.	36.
2	3	109.	73.
3	5	220.	111.
4	7	369.	149.
5	9	521.	152.
6	11	675.	154.
7	13	911.	236.
8	15	1235.	324.
9	17	1569.	334.
10	19	2095.	526.
11	20	2462.	367.
12	21	2942.	480.
13	22	3449.	507.
14	23	3984.	535.
15	24	4553.	569.
16	25	5160.	607.

4.1.1. Meteorological Fields Evaluation

The U.S. EPA (2005) recommends an evaluation of meteorological inputs for air quality modeling but does not specify acceptability criteria or standards. In this section, the wind, temperature, and mixing-height fields are compared with available measurements.

The SCOS modeling domain contains diverse terrain and surface types. Contrasts between the ocean surface and land, coastal plains and inland high-deserts, east-west running and north-south running mountains result in complex wind and air temperature patterns. Averaging wind or temperatures over the domain can hide discrepancies between measured and simulated features. Therefore, the meteorological model performance was evaluated by subregions of the modeling domain shown in Figure 4-1.

Air quality and meteorological features are generally not confined by political boundaries. However, the political boundary between Los Angeles and Ventura Counties is also a region of convergent air flow. Therefore, it was appropriate to represent Ventura County as a subregion separate from Los Angeles County.

Figure 4-1: The Southern California Ozone Study (SCOS) modeling domain and model-performance subregions.

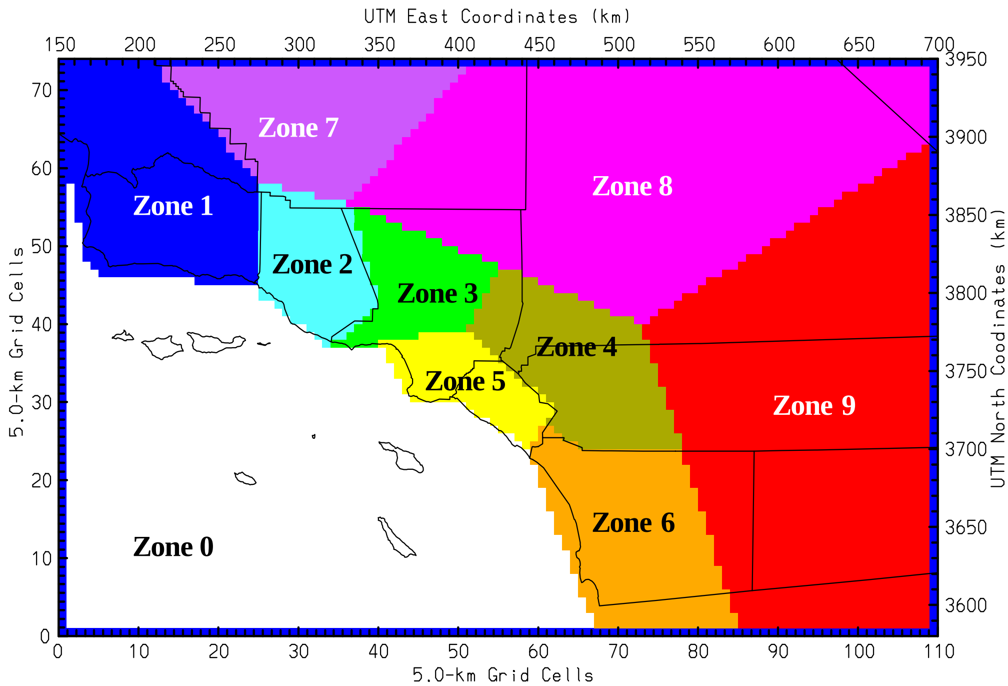
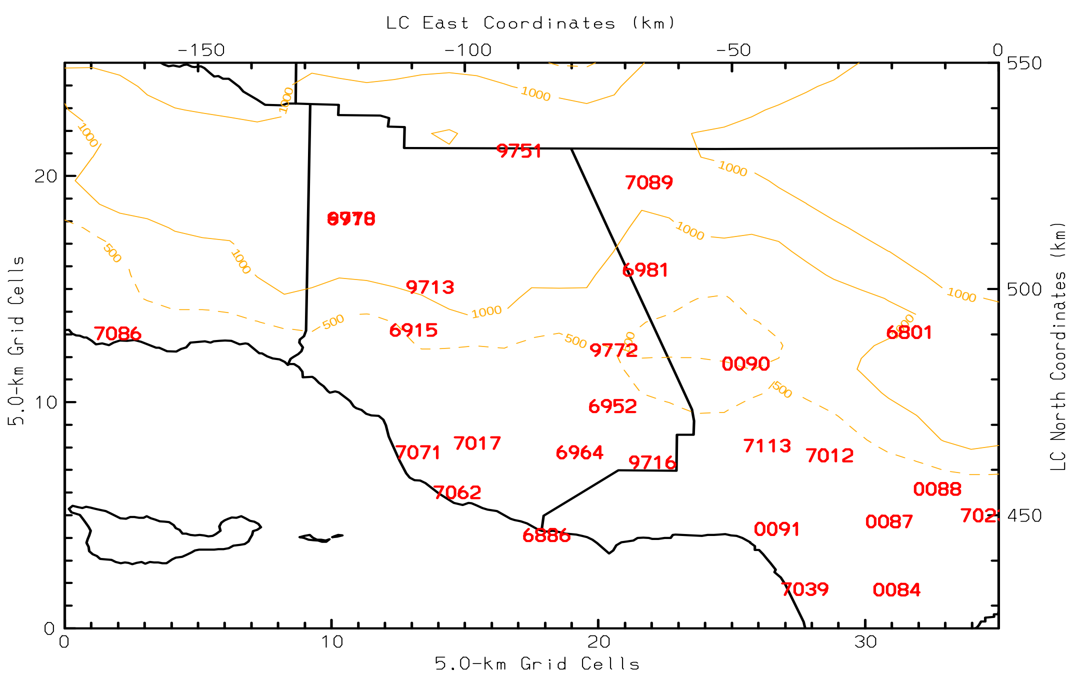
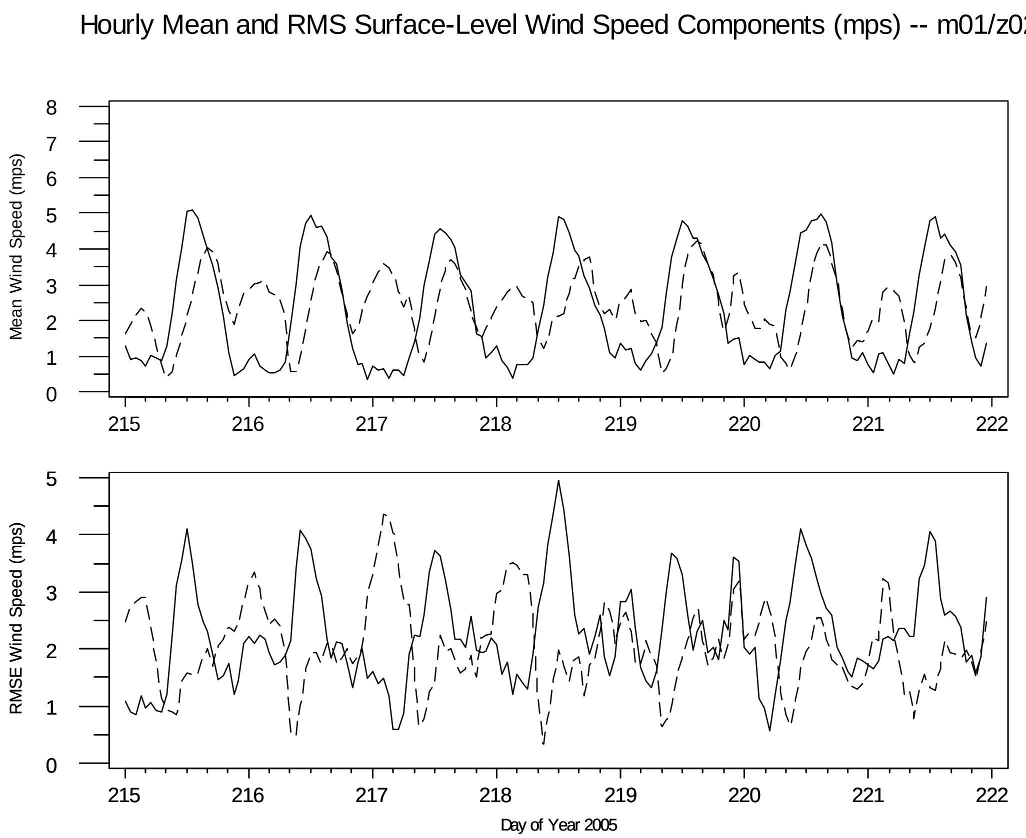


Figure 4-2 Locations of surface meteorology monitoring sites in the vicinity of Ventura County



Twelve meteorological monitoring sites were identified within Ventura County are shown in Figure 4-2. The hourly wind speeds averaged for all sites and hourly root mean square differences (RMSE) between measured and simulated wind speed components (i.e., east-west component and north-south component) were calculated and are summarized in Figure 4-3. In this section, results from the August 3-9, 2005 episode period are presented as typical of results from all six of the episodes. In Figure 4-3, the upper graph compares the average measured (solid line) and simulated (dashed line) wind speed. The lower graph compares the root mean square difference in 'u' component (solid line) and 'v' component (dashed line) wind speed.

Figure 4-3 Comparisons of measured and observed hourly winds for Ventura County during the August 3-9, 2005 (DOY 215-221) period. The upper graph compares the average measured (solid line) and simulated (dashed line) wind speed. The lower graph compares the root mean square difference in 'u' component (solid line) and 'v' component (dashed line) wind speed.



The simulated averaged afternoon wind speeds showed general agreement with measured wind speeds. However, simulated overnight wind speeds were greater than those observed. The discrepancy between daytime and nighttime performance can be partly explained by the complex topography of Ventura County: in general, the northern half of Ventura County is at higher elevations than the southern half. The MM5 model tended to over-emphasize the nighttime katabatic flow (see Figure 4-4). During afternoons, the stronger sea-breeze was reflected throughout most of the County in both the measurements and the simulated results (see Figure 4-5). These discrepancies are also reflected in the component winds (Figure 4-3). During the nighttime hours, there was a greater RMSE in the north-south component wind than in the east-west component. During the daytime hours, there was a smaller RMSE in the north-south component.

Easterly wind flow aloft was in important feature of the simulated wind fields of the August 3-9, 2005 episode. In this feature, the August 3-9, 2005 episode was unique. Such easterly winds are frequently measured by the radar wind profiler (RWP) at Simi Valley. Unfortunately, during the August 3-9, episode there were few data available from this RWP. Figure 4-6 illustrates the simulated wind field at 500 meters above ground level (magl) on August 4 at 0100 PDT. Easterly wind flow throughout Ventura County is evident. The lone measurement from the radar wind profiler (RWP) at Simi Valley supports the simulated flow pattern.

The hourly measured and simulated air temperatures were averaged and root mean square errors (RMSE) air temperatures were calculated and summarized in Figure 4-7. The MM5 model tended to overestimate temperatures throughout the episode. The RMSE air temperatures were as high as 7˚C. Because sensitivity analyses have shown that ozone chemistry was assumed to be relatively insensitive to air temperatures (see Chapter 5), these discrepancies were not expected to have a large impact on simulated ozone concentrations. However, the relatively large temperature RMSE may explain some of the discrepancies in simulated wind speed due to the relationships between air temperatures, air densities, the forcing for meso-scale winds.

There were no regular measurements in Ventura County from which mixing heights could be estimated. Figure 4-7 shows simulated mixing heights at Ojai, Simi Valley, and Emma Wood State Beach during the August 3-9, 2005 episode period. Maximum daily mixing heights were expected to be lower along the coast and then increase inland with distance from the coast. This pattern is observed in Figure 4-7. However, the simulated maximum mixing heights were much higher than expected for Ventura County by at least a factor of 2 (e.g., Hanna et. al, 1989). Of the 3 sites, the highest mixing heights, in excess of 2000 magl, were simulated at Simi Valley. A further analysis of the mixing heights is provided in Chapter 5.

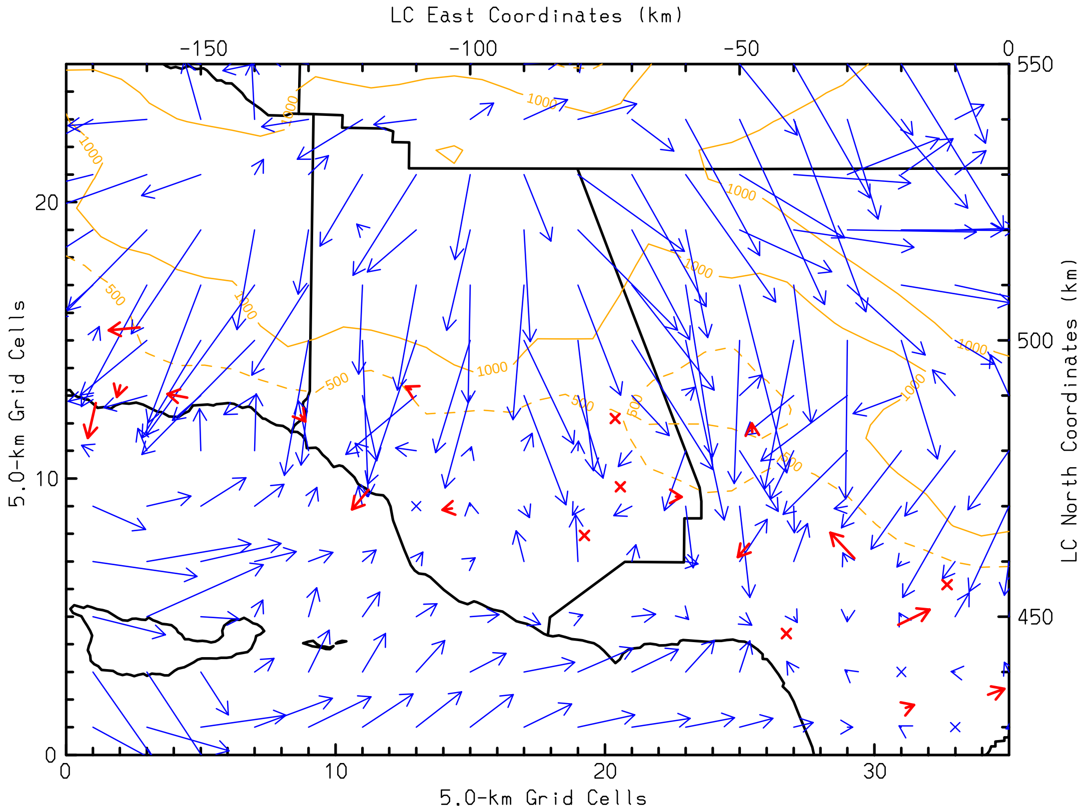


Figure 4-4 Measured (red) and simulated (blue) surface wind vectors for August 05, 2005 at 0300 PDT. The vector lengths represent 1-hour wind run.

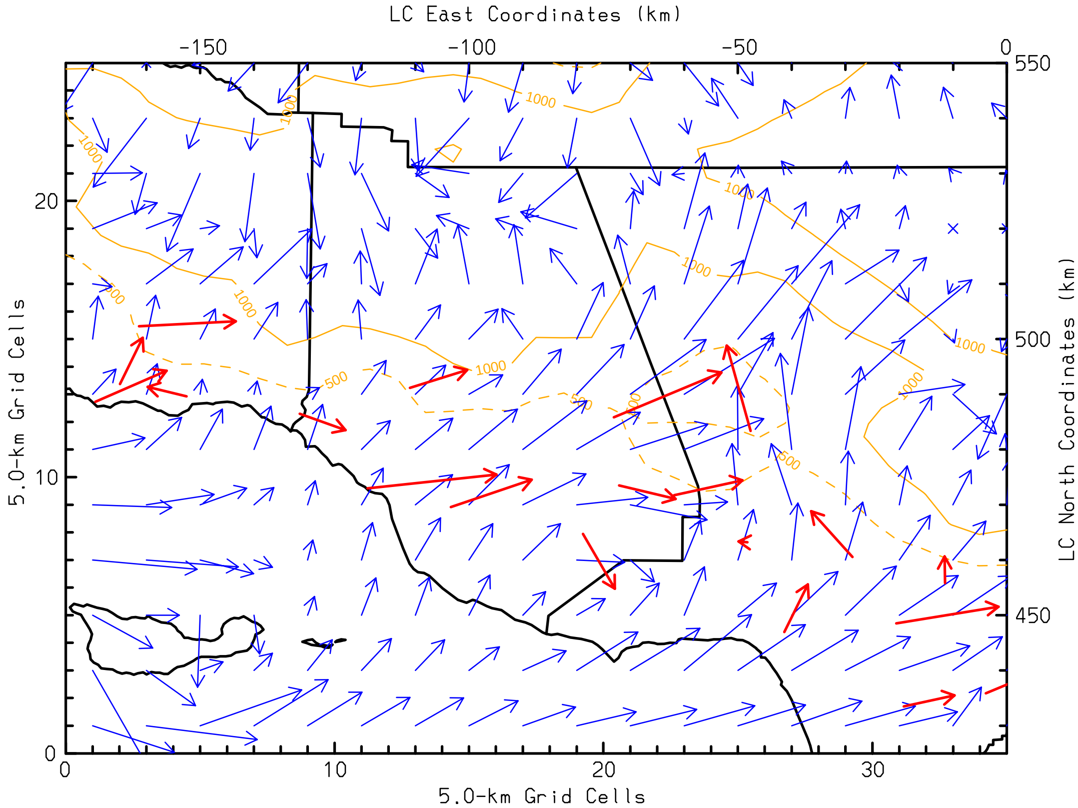


Figure 4-5: Measured (red) and simulated (blue) surface wind vectors for August 05, 2005 at 1500 PDT. The vector lengths represent 1-hour wind run.

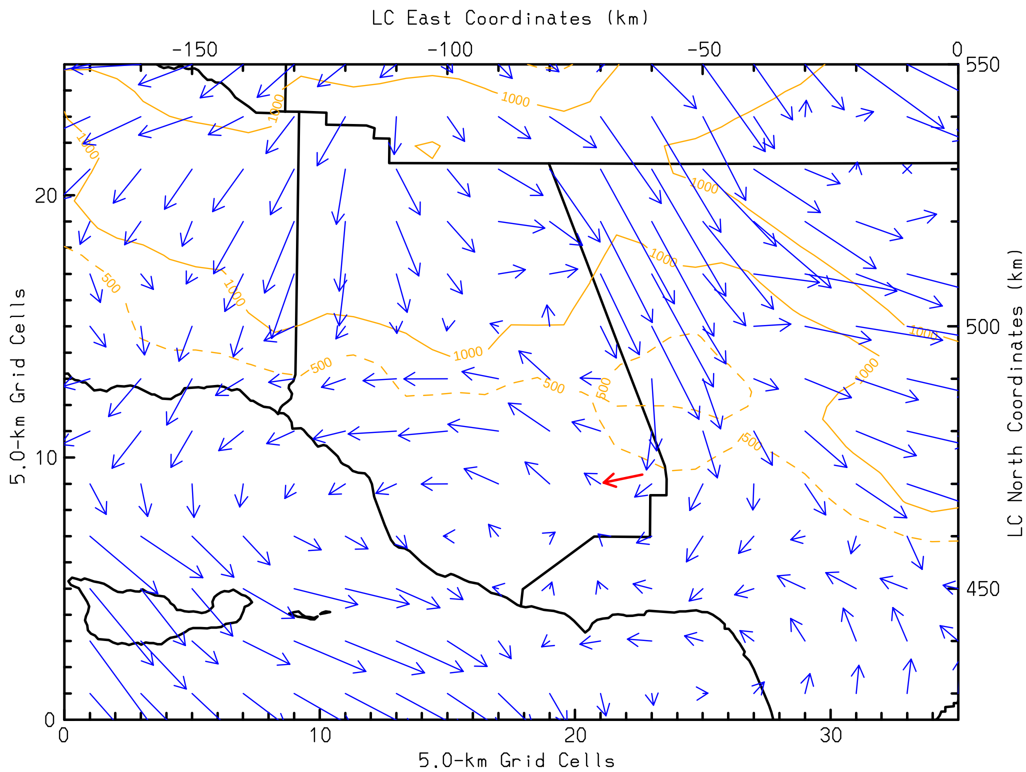


Figure 4-6: Simulated (blue) wind vectors at 500 magl for August 04, 2005 at 0100 PDT. The vector lengths represent 1-hour wind run. Note the single wind measurement (red) at Simi Valley.

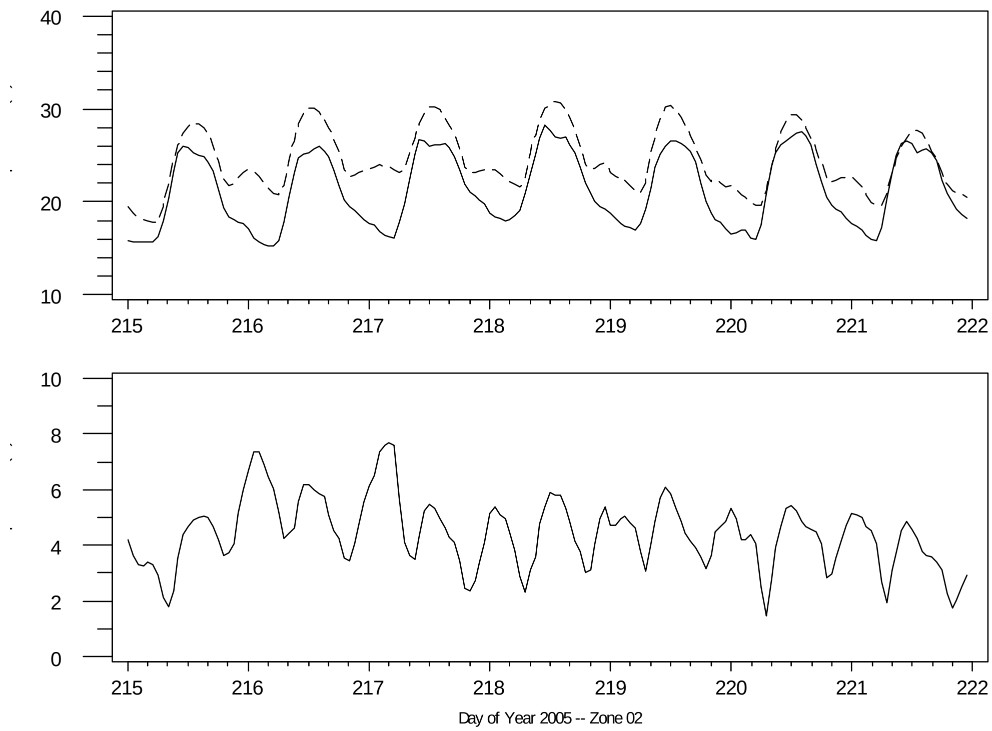


Figure 4-7: Comparison of hourly measured and simulated air temperatures in Ventura County during the August 3-9, 2005 (DOY 215-221) episode. The upper graph compares the average measured (solid line) and simulated (dashed line) air temperatures. The lower graph shows the root mean square difference in measured and simulated air temperatures.

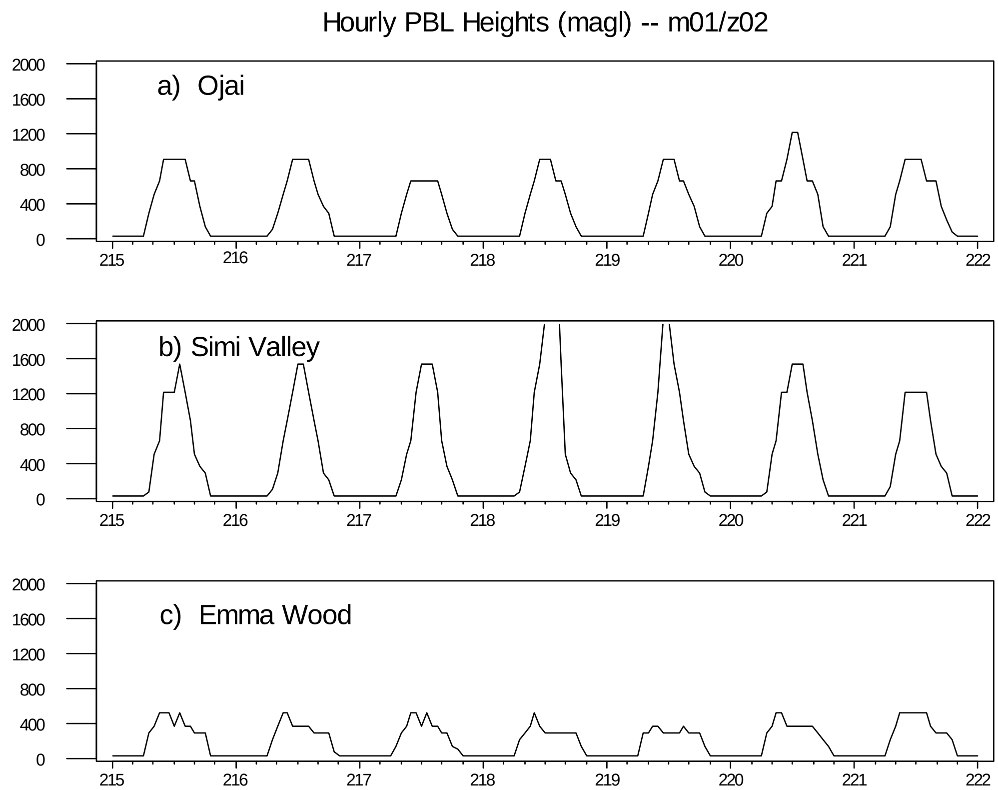


Figure 4-8: Simulated hourly mixing heights at Ojai ('a'), Simi Valley ('b'), and Emma Wood State Beach ('c') during the August 3-9, 2005 (DOY 215-221) episode period.

4.2. Initial and Boundary Concentrations for Air Quality Modeling

The SCOS modeling domain is bounded on the west by the Pacific Ocean which is characteristically the source of most of the air flowing into Ventura County and the SCAB (e.g., CARB, 1984 – see Figure 2-1). Since the Pacific Ocean is generally free of anthropogenic emissions, the assumption that it is "clean air" is reasonable. The U.S. EPA (1991) defined a clean air profile for photochemical modeling purposes. This profile (see Table 4-2) included 40 parts per billion (ppb) of ozone, 2 ppb of nitrogen oxides (NOx), and approximately 22 ppbC of reactive organic gasses (ROG).

At monitoring sites along the California coastline, ozone concentrations of between 30 and 40 ppb have often been measured (data not shown). However, there is uncertainty whether ozone concentrations of less than 40 ppb represent background because of the proximity of NOx emissions sources along the coastline. For lack of better information, a background ozone concentration of 40 ppb was assumed at the surface.

Newchurch et. al. (2003) reported that long-term measurements of ozone aloft in northern California were higher than 40 ppb. During the August, episode of the 1997 SCOS field study, ozone concentrations at 5000 magl averaged 60 ppb (see Figure 4-9). Therefore, for this analysis, the top ozone concentration at the top of the domain boundary (approximately 5,000 magl) was set to 60 ppb.

The U.S. EPA (1991) recommends a clean air NOx concentration of 2 ppb. As part of the episodic modeling done for the South Coast Air Basin (SCAB), sensitivity analyses using the air quality model showed that in the absence of anthropogenic emissions, simulated ozone concentrations were as high as 65 ppb – far higher than the assumed background concentration of 40 ppb. Since biogenic emissions are an unavoidable source of ROG, the NOx concentrations from the boundaries were the cause of the ozone.

Other sensitivity analysis have shown that the half-life for the conversion of NOx to nitrate (NO_3) over the Pacific Ocean was approximately 10% per hour. From these results it seemed reasonable, given the length of the trajectories over the Ocean, that little NOx should remain by the time the air flow reached the coast of California.

Allowing for the possibility of some offshore shipping (the international shipping lanes offshore from southern California are within the boundaries of the modeling domain), on the offshore boundaries the NOx concentration was assumed to be 2 ppb to a height of 200 magl. Above 200 m, boundary NOx concentrations were set to 0.1 ppb. Onshore, the vertical boundary NOx concentration was set to 2 ppb. Sensitivity analysis using this modified boundary concentration in the absence of anthropogenic emission results in peak simulated ozone concentrations of between 35 and 45 ppb (see Chapter 5).

Table 4-2: Clean air concentrations of Reactive Organic Gases (ROG) used for initial and boundary concentrations for modeling ozone in the Southern California Ozone Study (SCOS) domain. The ROG species were based on the U.S. EPA (1991) concentrations defined using the Carbon Bond IV mechanism and translated to the SAPRC99 chemical mechanism.

Carbon Bond IV

Species	Carbon Number	Conc. ppbC
OLE	2.	0.6
PAR	1.	14.9
TOL	7.	1.3
XYL	8.	0.8
FORM	1.	2.1
ALD2	2.	1.1
ETH	2.	1.0
ISOP	5.	0.1
MEOH	1.	0.1
ETOH	1.	0.1

Total (ppbC)		22.0

SAPRC99

Species	Carbon Number[1/]	Conc. ppbC
OLE1	3.9	0.7
OLE2	4.4	0.0
ALK1	2.2	5.5
ALK2	2.4	5.5
ALK3	4.4	4.1
ALK4	5.5	0.0
ALK5	8.3	0.0
HCHO	2.0	1.9
CCHO	3.1	1.7
RCHO	4.1	1.0
ARO1	6.8	1.4
ARO2	8.2	0.6
ETHE	2.0	0.7
ISOP	5.0	0.1
MEOH	1.0	0.1
ETOH	2.0	0.0

Total (ppbC)		24.3

1/ The Carbon Number was estimated by dividing the molecular weight by 14. g-mole/C.

Table 4-3: Reactive Organic Gases (ROG) samples (units are ppbC) collected using aircraft on August 4 and 5, during the 1997 Southern California Ozone Study. The approximate site locations are Santa Catalina Island (S.Cat), San Nicholas Island (S.Nic), Point Conception (Pt.Con), El Monte (E.Mon), Riverside (River), Banning (Bann), Van Nuys (V.Nuys), Fallbrook (Rmond).

	U.S. EPA Clean	S.Cat	S.Cat	S.Nic	S.Nic	Pt.Con
Height (ft)		300	100	150	4500	4500
Time (PDT)		09	14	08	08	09
Category	-----	-----	-----	-----	-----	-----
OLE	0.6	1.3	0.7	0.6	0.5	0.7
PAR	14.9	146.2	29.3	12.7	7.7	14.4
TOL	1.3	32.0	7.9	3.3	2.4	4.0
XYL	0.8	9.8	1.8	2.3	1.4	1.8
FORM	2.1	8.8	nd	2.7	4.0	2.4
ALD2	1.1	1.2	nd	1.2	1.0	0.8
ETH	1.0	0.0	0.0	0.0	0.0	0.0
ISOP	0.1	0.0	0.0	0.0	0.0	0.0
	-----	-----	-----	-----	-----	-----
Totals	21.9	199.3	39.7	22.8	17.0	24.1

	E.Mon	River	Bann	Hesp	VNuys	Rmond
Height (ft)	nd	nd	nd	nd	nd	nd
Time (PDT)	15	08	07	06	05	05
Category	-----	-----	-----	-----	-----	-----
OLE	0.1	0.0	0.0	0.0	0.2	0.0
PAR	30.8	120.7	22.3	22.5	46.2	26.0
TOL	2.0	3.0	0.7	1.0	4.8	1.4
XYL	1.3	0.8	0.0	0.2	3.0	0.4
FORM	nd[1/]	nd	nd	nd	nd	nd
ALD2	nd	nd	nd	nd	nd	nd
ETH	0.0	0.0	0.0	0.0	0.0	0.0
ISOP	0.0	0.0	0.0	0.0	0.0	0.0
	-----	-----	-----	-----	-----	-----
Totals	34.9	124.5	23.3	24.1	55.9	28.1

1/ 'nd' – no data

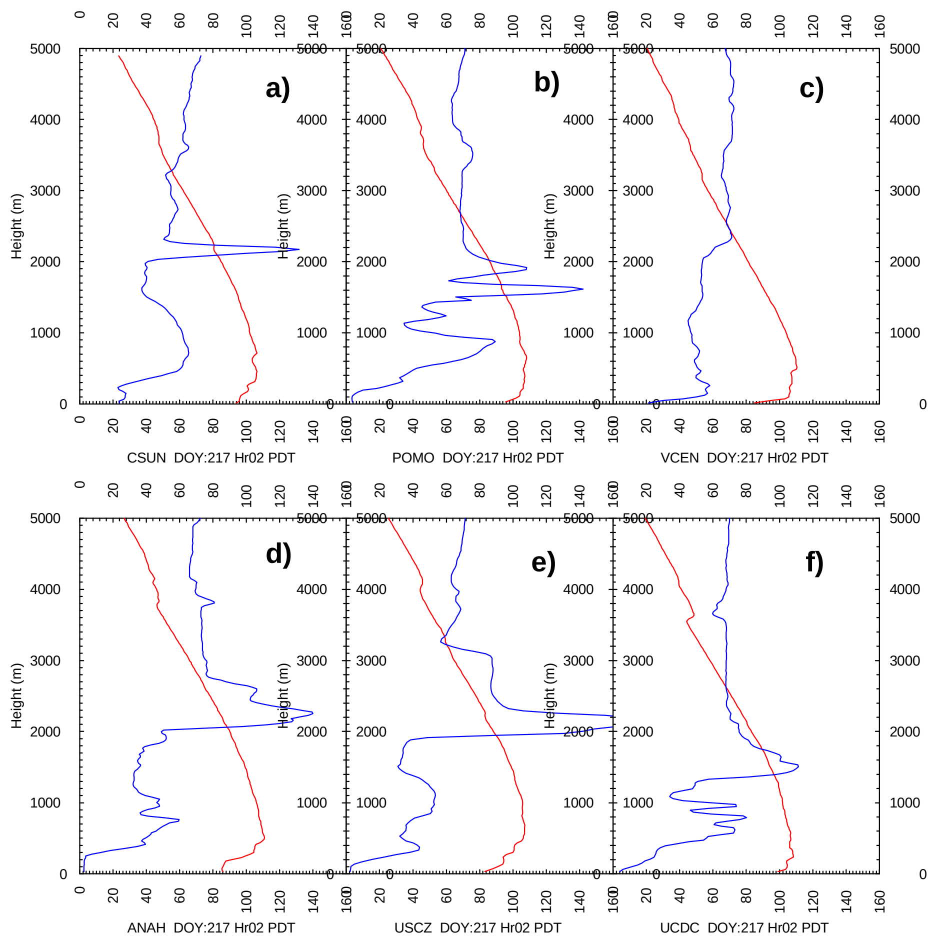


Figure 4-9: Vertical ozone concentration (ppb) profiles (blue lines) measured August 5, 1997 at 0200 PDT at CSU Northridge (a), Pomona (b), Valley Center (c), Anaheim (d), USC(e), and UC Riverside (f). The vertical temperature profiles (red lines) are also shown, but without scale.

During the 1997 SCOS field study ROG concentrations of between 15 and 235 ppbC were measured throughout the SCAB (Table 4-3). These concentrations are consistent with the clean air definition of U.S. EPA (1991). These modeling analyses, the concentrations were converted from the Carbon Bond IV profiles to the SAPRC99 profiles taking care to match the concentrations by category (see Table 4-2).

The initial ozone concentrations were identical to the boundary concentrations up to 1000 magl (vertical layers 1-9). Above 1000 magl, the ozone initial ozone concentration was set to 60 ppb to maintain initial consistency with the top boundary concentration.

4.3. Emissions Inventory Development

Emissions inventories for at least 3 years were required for each of the six episodes modeled: the base year (2004 or 2005), the year 2002, and the future year. Area- and point-source emissions totals by county were provided by the California Emissions Forecast System (CEFS) using a base year of 2002 and extrapolating to 2004, 2005, 2012 and 2017 (Inventory Reference No. 980). Monthly adjusted weekday and weekend day emissions totals were provided. The emissions were spatially disaggregated using gridded surrogates based on STI (2001).

The on-road, mobile source emissions totals were derived by county using EMFAC v2.24.6 (the latest version of the Emission FACtors model used to calculate emission rates from on-road motor vehicles). The spatial and temporal distribution of on-road, mobile-source emissions was calculated using DTIM4 (the latest version of the Direct Travel Impact Model used to produced gridded on-road motor vehicle emissions) and using estimates of Vehicle Miles Traveled (VMT) provided by the South California Association of Governments (SCAG, 2006).

For DTIM, hourly, gridded temperature fields were calculated from measurements. The temperature measurements were adjusted for height above ground level prior to interpolation. These gridded temperature fields were also used to calculate the county-specific, hourly average temperatures weighted by VMT, needed to run EMFAC. The gridded hourly emissions fields from DTIM were scaled by county to match the emissions estimates from EMFAC. Spatial and temporal adjustments to the gridded emissions were made for weekend days.

Day-specific biogenic emissions were calculated using the California Air Resources Board (CARB) model BEGIS (Scott and Benjamin, 2003). The hourly, gridded temperature fields used to run DTIM were also used to run BEGIS. The BEGIS model generates gridded hourly emissions for isoprene, monoterpenes, and methyl-tributenol. An additional 30% of the mass was assigned to 'other volatile organic components' (OVOC), to represent unmeasured chemical species.

Two sets of emissions inventories were prepared for modeling ozone concentrations for the year 2012. The 2012 baseline inventory was derived from the CARB's California

Emissions Forecasting System (CEFS), adjusted for reductions from adopted rules and other corrections not reflected in the CEFS version 1.06 inventory that was frozen for SCAQMD modeling purposes. The 2012 controlled emissions inventory scenario reflects reductions from the 2007 California State Strategy for the SIP approved by the CARB.

4.3.1. Emissions Quality Assurance

The spatial surrogates defined by STI (2001) and used to disaggregate area-source emissions were based on the CARB Statewide emissions domain. The Statewide domain is based on a Lambert Projection with a central meridian at 120.5 W and a horizontal resolution of 4-m. However, the SCOS modeling domain is based on a Lambert Projection with a central meridian at 118 W and a horizontal resolution of 5 km. The DTIM VMT grid was based on a Universal Transverse Mercator Projection (zone 11) with a 5-km resolution. Quality assurance procedures were needed to ensure that the emissions were properly mapped into the SCOS modeling domain with no loss of mass.

The quality assurance procedures were comprised of two parts. In the first part, emissions totals for the whole modeling domain were compared on a daily basis, by major component. In the second part, emissions inventory components were mapped in the SCOS modeling domain to ensure the proper spatial distribution.

In this section, results from the July, 2005 episode period were presented as typical of all six episodes. The emissions components were generally defined by the emissions models used to develop the gridded emissions inventory. These included on-road mobile source emissions, biogenic emissions, other non-temperature-dependent sources ('area' sources), elevated point sources, and surface-level point sources. The surface-level point sources were small point sources with plume rises considered too small to exit the surface-layer modeled (~25 meters).

It is difficult to compare exact totals for ROG emissions before and after they are processed for input into an air quality model. The various emissions models provide organic species as Total Organic Gases (TOG) which must be speciated into reactive organic gases (ROG) for the air quality model. Also, because of the complexity of organic species, they must be categorized and some information concerning molecular weight is lost. However, for carbon monoxide (CO) and nitrogen oxides (NOx) the chemical species are treated explicitly and there is no such confusion. Table 4-4 summarizes emissions totals by major component for a selected weekday and a weekend day from the July, 2005 episode. Differences between preprocessed domain-wide totals and model-ready totals for surface-level CO and NOx emissions were less than 1%. Differences between preprocessed elevated point sources and model ready elevated point source emissions were attributed to the fact that elevated point sources representing all of the counties within California were provided, and not all of them fell within the modeling domain. Emissions from those portions of the domain within Mexico were not included because their quality is poor (large uncertainties) and they were not considered important to ozone concentrations in the South Central Coast and South Coast Air Basins.

Table 4-5 summarizes daily emissions totals for Ventura County, for the August 3-9, 2005 episode for 2005 and 2012. The totals shown in Table 4-5 should only be considered approximate, but were typical for each of the six episodes. They are based on emissions gridded with a resolution of 4 km; which may not exactly represent political boundaries. Day-to-day differences can be attributed to differences between weekdays and weekend-days, and day-specific temperatures.

Figures 4-10 through 4-14 show the spatial distribution for area sources, surface-layer point-sources, on-road mobile-sources, elevated point-sources, and biogenic sources. The gridded emissions had a resolution of 5-km. Therefore, it was difficult to show exact agreement between emissions and political or coastal boundaries. Also, the process of remapping emissions from one coordinate system to another causes the gridded emissions to spatially 'spread' slightly.

Table 4-4: Emissions inventory domain-wide totals (ton/day) for a weekday and a weekend day 2005.

Friday, July 15

	Before Processing			SAPRC99 Model-Ready		
	CO	NOx	TOG	CO	NOx	TOG[1/]
area	1667	806	1716	1665	802	1628
surf. point	126	75	233	126	75	230
on-road	3816	868	432	3811	867	424
elev. point	65	84	43	55	72	36
biogenic	--	--	--	--	--	806

Sunday, July 17

	Before Processing			SAPRC99 Model-Ready		
	CO	NOx	TOG	CO	NOx	TOG[1/]
area	2422	685	1751	2407	682	1662
surf.point	113	62	94	114	62	93
on-road	3142	497	345	3138	497	340
elev. point	51	80	40	42	69	32
biogenic	--	--	--	--	--	825

1/ TOG was calculated as the sum of ROG and CH4.

Table 4-5 Daily emissions totals (ton/day) for Ventura County for selected days during the August 3-9, 2005 episode period for the year 2005 and the year 2012 baseline.

	Wed,Aug.03			Thu,Aug.04			Fri,Aug.05			Sat,Aug.06			Sun,Aug.07		
	CO	NOx	TOG[1/]	CO	NOx	TOG[1/]	CO	NOx	TOG[1/]	CO	NOx	TOG[1/]	CO	NOx	TOG[1/]
On-Shore 2005															
Statnry	23	12	70	23	12	70	23	12	70	20	9	63	18	8	60
Off-Road	70	25	15	70	25	15	70	25	15	110	19	21	110	19	21
On-Road	133	21	17	133	21	17	137	21	17	130	16	16	120	14	16
Biogen	0	0	76	0	0	74	0	0	53	0	0	52	0	0	60
Off-Shore 2005															
Statnry	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Off-Road	3	14	<1	3	14	<1	3	14	<1	3	14	<1	2	14	<1
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
totals	229	72	178	229	72	176	232	72	155	264	58	153	251	56	158
On-Shore 2012															
Statnry	24	12	69	24	12	69	24	12	69	32	8	62	29	8	58
Off-Road	70	18	12	70	18	12	70	18	12	100	15	19	100	15	19
On-Road	81	13	10	81	13	10	83	13	11	79	10	10	73	9	10
Biogen	0	0	76	0	0	74	0	0	53	0	0	52	0	0	60
Off-Shore 2012															
Statnry	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Off-Road	1	16	<1	1	16	<1	1	16	<1	1	16	<1	1	16	<1
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
totals	178	59	168	178	59	167	180	59	146	213	48	143	204	47	147

1/ TOG emissions totals were estimated from the SAPRC99 model-ready files by adding ROG and CH4

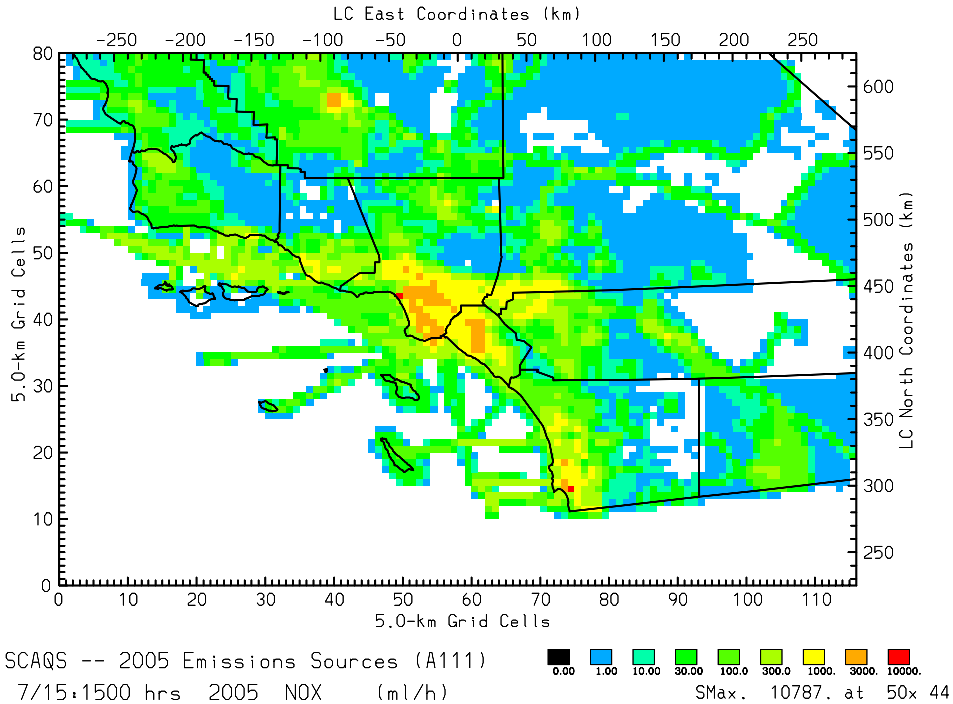


Figure 4-10 The spatial distribution of area-source NOx (g-mole/hour) emissions during a typical weekday at 1500 PDT, during the summer of 2005.

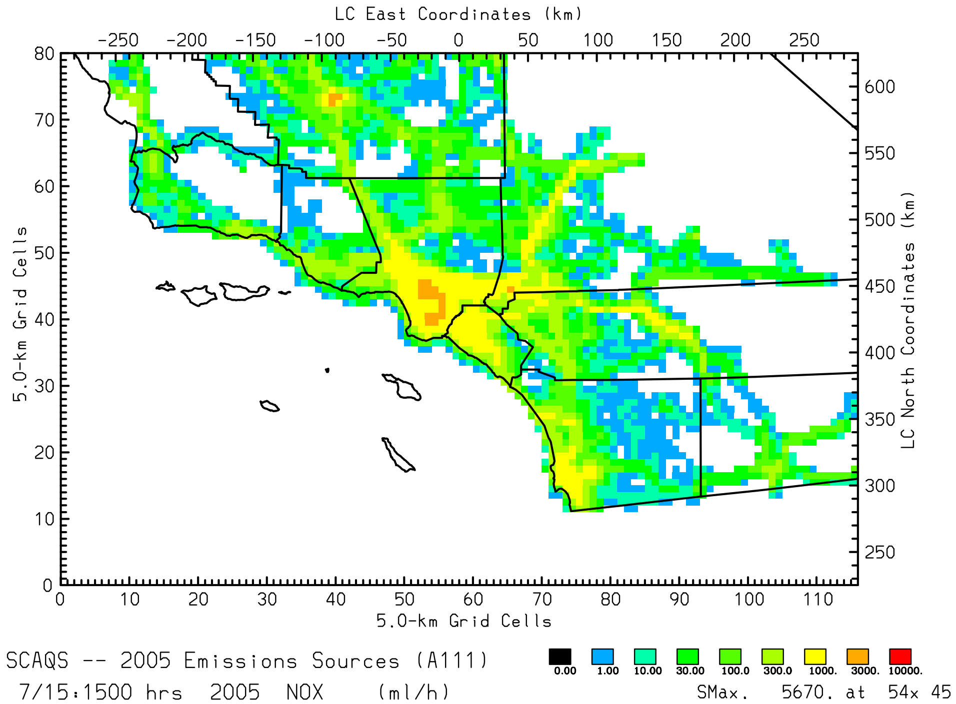


Figure 4-11 The spatial distribution of on-road, mobile-source NOx (g-mole/hour) emissions during a typical weekday at 1500 PDT, during the summer of 2005. The contour scale is logarithmic.

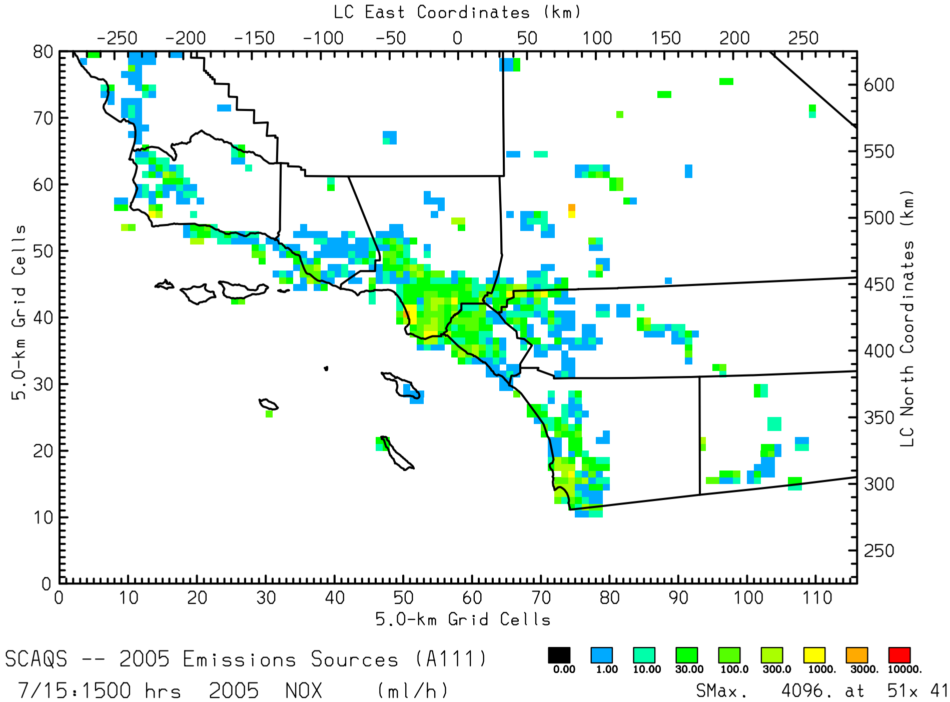


Figure 4-12 The spatial distribution of surface-level, point source NOx (g-mole/hour) emissions during a typical weekday at 1500 PDT, during the summer of 2005. The contour scale is logarithmic.

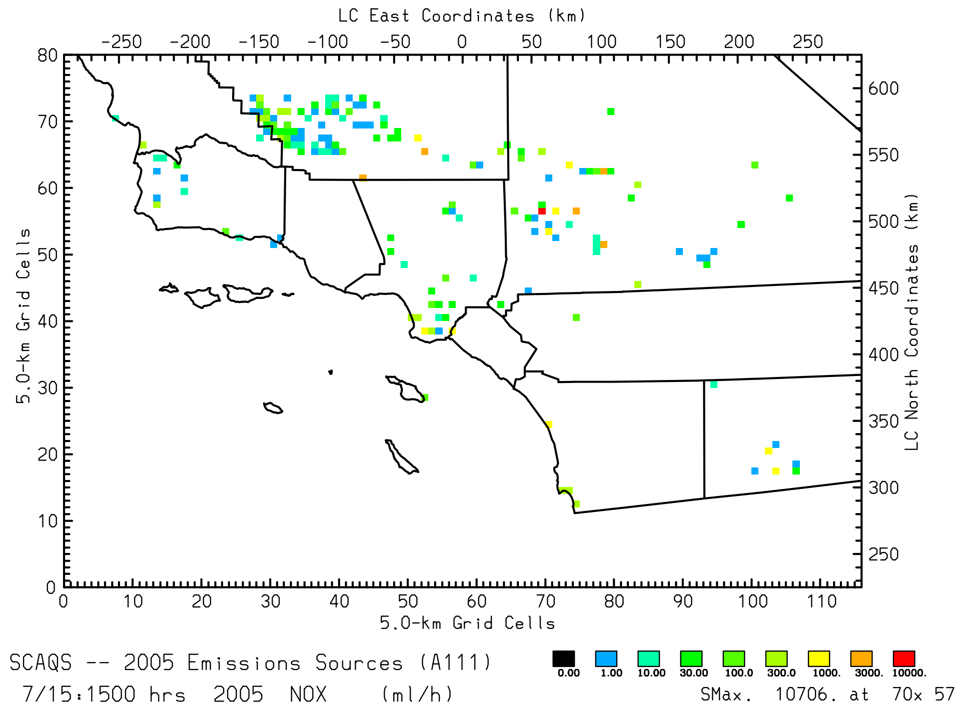


Figure 4-13 The spatial distribution of elevated, point-source NOx (g-mole/hour) emissions during a typical weekday at 1500 PDT, during the summer of 2005. The contour scale is logarithmic.

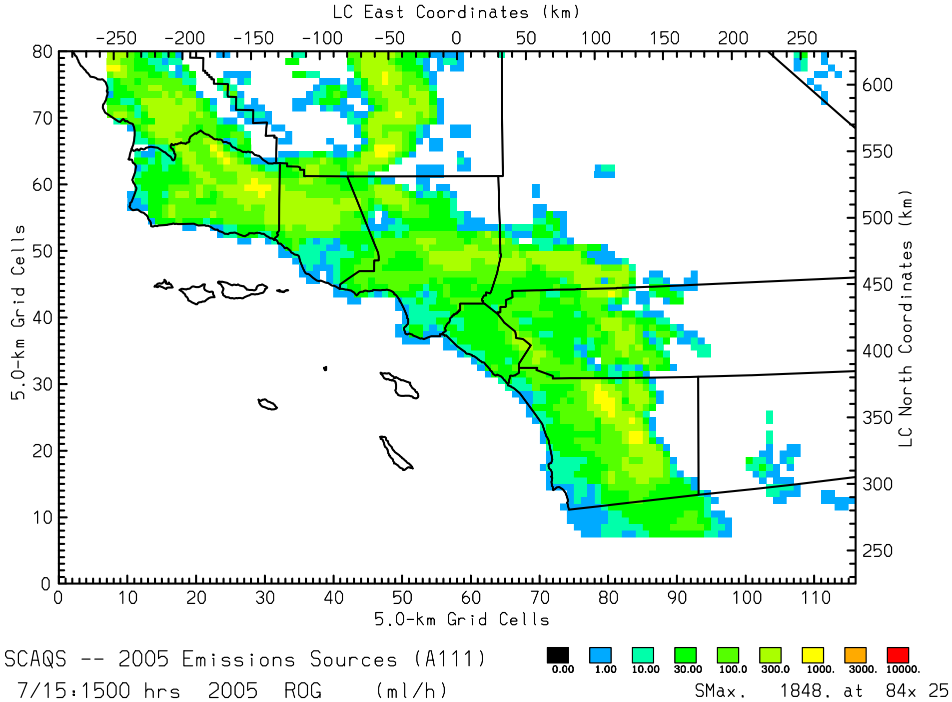


Figure 4-14 The spatial distribution of biogenic ROG (g-mole/hour) emissions during a typical weekday at 1500 PDT, during the summer of 2005. The contour scale is logarithmic.

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5. BASE YEAR SIMULATION RESULTS

Table 3-1 (see Chapter 3) showed the days simulated for each of the six episodes selected by the SCAQMD. The first day of each episode was considered a 'spinup' day. Subsequent days were evaluated for air quality model performance and the suitability of each of the observed and simulated concentrations for use in the development of the ozone SIP for Ventura County.

5.1. Base Year Results and Air Quality Model Performance Evaluation

The use of air quality models to develop an ozone SIP is based on the presumption that the results from these models suitably represent measured air quality. To assess this suitability, the U.S. EPA (2005) recommends that the results of the base-year simulation be evaluated against measured concentrations. This model performance evaluation should involve a number of evaluation procedures including statistical and graphical measures to compare measured and simulated pollutant concentrations and sensitivity analyses to evaluate the suitability of the model inputs. This chapter discusses results from the most pertinent of the evaluations completed and considered.

5.1.1. Statistical Base-Case Evaluation

The U.S. EPA (1991) recommends statistical measures for evaluating the performance of air quality models. These include unpaired peak concentration ratio (UPR), mean normalized bias (MNB), and mean gross error (MGE). For ozone, these statistical measures compared measured and simulated ozone concentrations for monitoring sites with ozone concentrations of 60 ppb or greater. Under the U.S. EPA (1991) guidelines, the thresholds for acceptable model performance were UPR in the range of 0.80-1.20, MNB of +/- 15% and, MGE of 35% or less.

The U.S. EPA (1991) recommends that statistical measures of model performance be calculated for the domain as a whole. However, for a modeling domain as large and complex as the SCOS domain, it was decided to divide the domain into subregions and evaluate model performance for each subregion independently (see Figure 4-1). Within the domain, Ventura County was represented by subregion 2 (SR002). During the years 2004 and 2005 period, six ozone monitoring sites were located in Ventura County (Figure 5-1).

For each of the six episodes daily UPR, NMB, and MGE were calculated for Ventura County. Table 5-1 summarizes the statistical measures for evaluating ozone model performance for each day of the five episodes. The simulation results met U.S. EPA (1991) model performance thresholds for UPR, MNB, and MGE on 10 of the days. Of these, 6 were from the August 3-9, 2005 episode. As an example, the pattern of simulated ozone for August 6, at 1500 PDT is summarized in Figure 5-2.

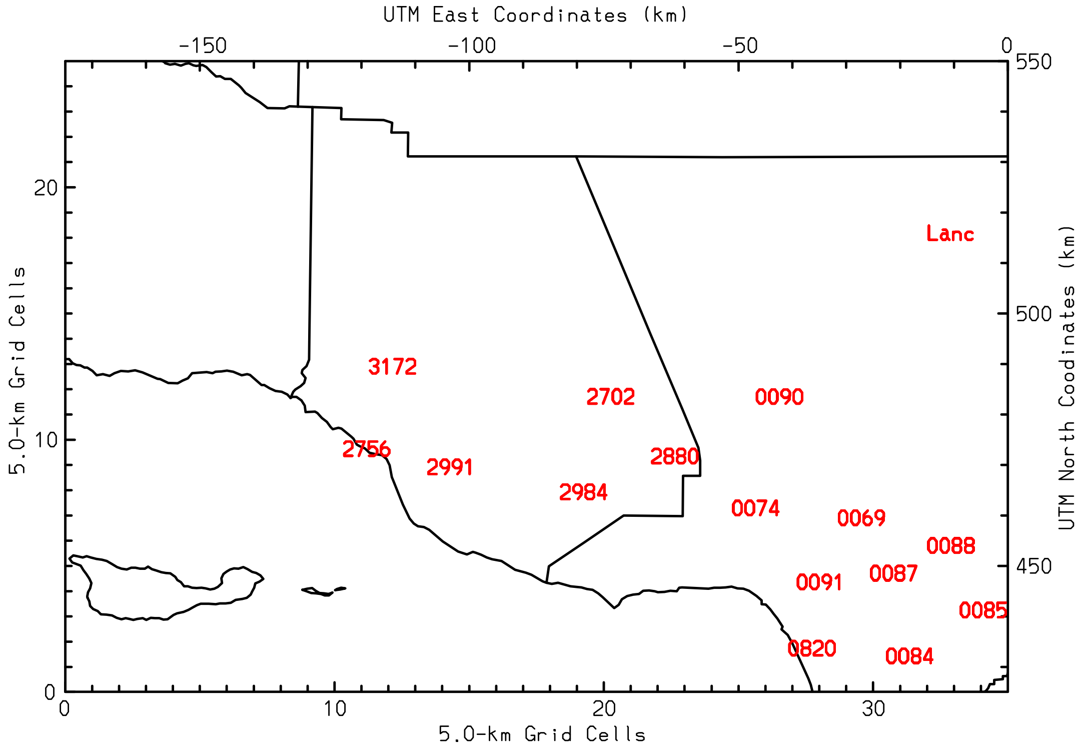

Figure 5-1 Ozone monitoring sites in Ventura County during years 2004 and 2005. The sites are Ojai (3172), Emma Wood State Beach (2756), Rio Mesa (2991), Piru (2702), Simi Valley (2880), and Thousand Oaks (2984).

Table 5-1 Ozone model performance statistical measures for five 2004 and 2005 episode, for Ventura County (SR0002). The statistical measures are Unpaired Peak Ratio (UPB), Mean Normalized Bias (MNB), and Mean Gross Error (MGE). The simulated daily 8-hour ozone concentration and the 8-hour observed concentrations are also shown. Statistical measures that met U.S. EPA (1991) performance thresholds are highlighted.

Episode	Day	UPR -nd-	MNB %	MGE %	Sim. 1-hr Pk.O3 ppb	Sim. 8-hr Pk.O3 ppb	Obs. 8-hr Pk.O3 ppb
June, 2004	04	0.69	-36	36	65	56	86
	05	0.69	-31	31	82	64	95
	06	1.05	-16	16	92	75	82
	07	**0.88**	**-14**	**14**	60	53	61
August, 2004	04	0.95	-16	16	67	56	66
	05	0.83	-30	30	76	61	77
	06	0.90	-30	30	87	67	86
	07	0.93	-20	20	93	66	79
	08	0.37	-22	22	73	63	75
May, 2005	18	0.82	-21	21	57	51	64
	19	0.69	-30	30	58	51	72
	20	--	--	--	<60	<60	53
	21	0.64	-31	31	59	52	82
	22	0.66	-34	34	62	56	84
	23	0.88	-18	18	78	61	76
	24	0.74	-27	27	68	58	76
July, 2005	15	1.02	-19	24	108	79	89
	16	**1.03**	**-14**	**19**	99	84	83
	17	**1.09**	**-15**	**17**	100	79	85
	18	0.81	-22	22	74	62	76
	19	0.94	-24	24	94	69	85
August, 2005	03	**1.00**	**-07**	**13**	91	81	85
	04	**1.01**	**-04**	**08**	97	84	83
	05	**0.94**	**-10**	**16**	105	91	94
	06	**0.96**	**00**	**14**	98	90	93
	07	**1.09**	**+10**	**12**	94	84	75
	08	**1.06**	**+05**	**14**	95	86	80
	09	1.21	+10	10	95	83	72

Table 5-1 (continued)

August, 2005	26	**0.93**	**-13**	**16**	73	59	64
	27	0.92	-16	17	69	61	68
	28	0.72	-28	28	68	59	86
	29	0.58	-41	41	57	51	85

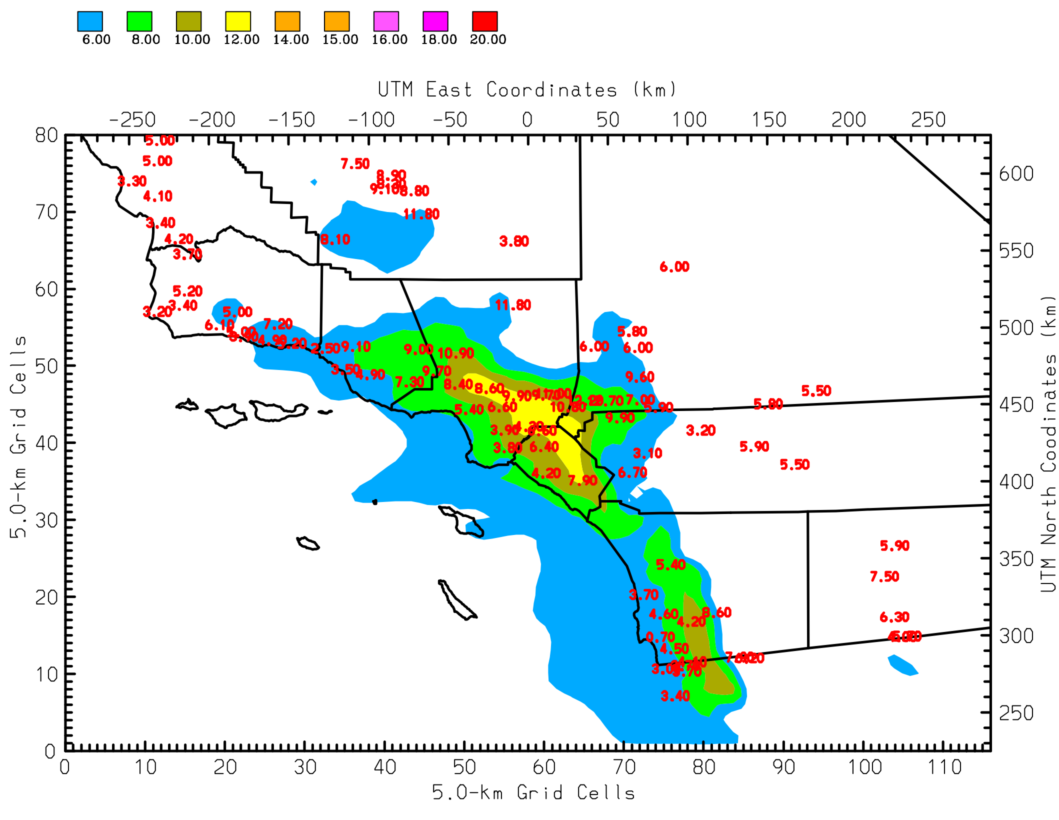

Figure 5-2 Measured (numbers) and simulated (contours) ozone concentrations on August 6, 2005 (DOY 218) at 1500 PDT. The minimum shaded contour is 60 ppb ozone and the contour intervals are 20 ppb ozone.

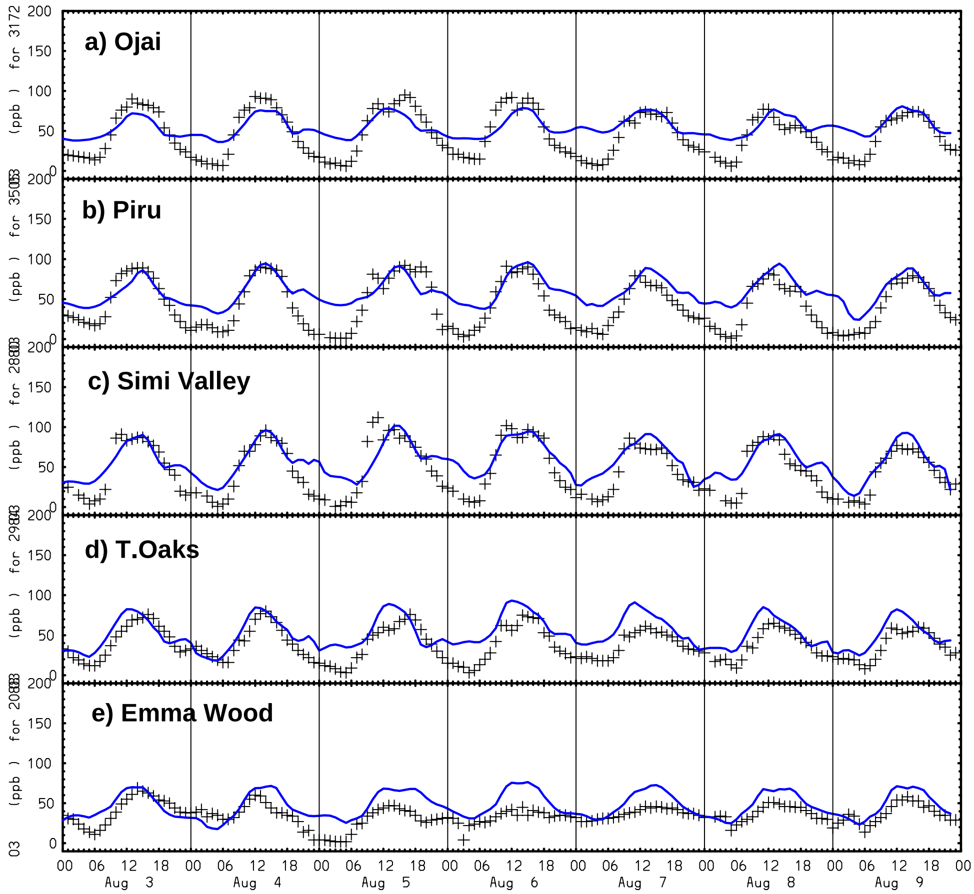

Figure 5-3 Comparison of measured (points) and simulated (lines) hourly ozone concentrations (ppb) from the August 3-9 episode base case simulation (mA01). The monitoring sites were Ojai (a), Piru (b), Simi Valley (c), Thousand Oaks (d), and Emma Wood State Beach (e).

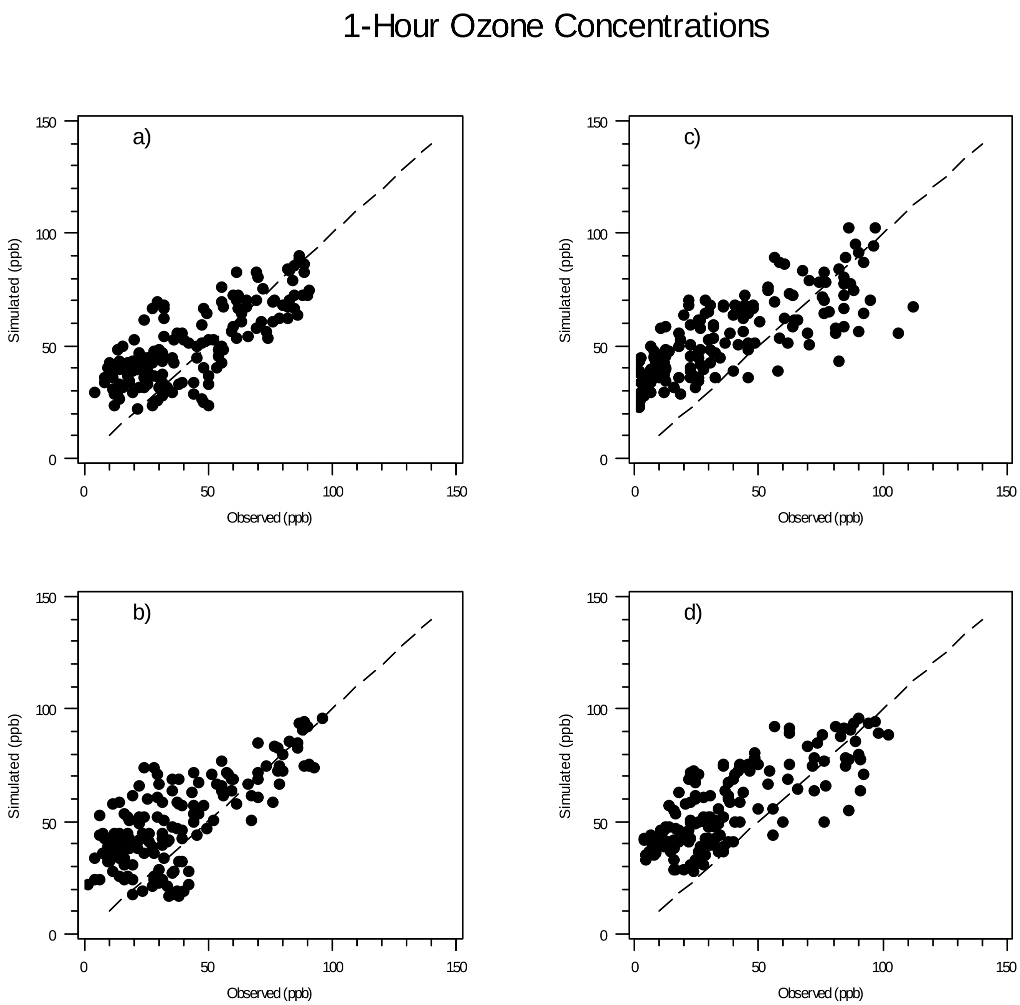

Figure 5-4 Simulated and observed daily 1-hour ozone concentrations for Ventura County from the August 3-7, 2005 episode. The graphs show the results for August 4 (a), August 5 (b), August 6 (c), and August (7). The lines in the plots represent a slope of 1.

Simulated afternoon wind patterns in Ventura County consistently showed the development of a sea-breeze that drew air from over the Santa Barbara Channel across Ventura County. Except for the contribution of offshore shipping, this air would be expected to be relatively clean and devoid of ROG. Therefore, for most of the episodes, little ozone was simulated in the western part of the County (e.g., Ojai). The August 3-9, 2005 episode showed the only exceptions to this pattern in the simulated wind fields. It was only during this episode that MM5 simulations showed easterly flow patterns in the Santa Barbara Channel and Santa Ynez Mountains that led to higher ozone concentrations in western Ventura County.

At the eastern end of Ventura County (e.g., Simi Valley), for most of the episodes, the afternoon westerly flow encountered easterly flow in Los Angeles County. The resulting convergence zone created the conditions conducive to the formation of ozone

Measured and simulated ozone concentrations at selected Ventura County sites are summarized in Figure 5-3 for the August 3-9, 2005 episode. Diurnal changes in measured ozone concentrations increased with distance from the coast and this pattern was replicated in the simulated concentrations. There was little diurnal change at Emma Wood State Beach, located on the coast. Inland, at such sites at Ojai and Simi Valley, simulated over-night ozone concentrations were somewhat higher than those observed; however, the day-time maximum ozone concentrations were well represented in the simulation results.

For the August 3-9, episode, simulated 1-hour ozone concentrations showed generally good agreement with observed concentrations throughout Ventura County; particularly at higher concentrations (e.g., Figure 5-4).

5.1.2. Sensitivity Analyses

Sensitivity analyses are air quality simulations for which base case inputs have been altered to assess the model response to those inputs. Sensitivity analyses are used to better understand the air quality model response to uncertainties in the inputs and to assess whether the air quality model is responding in an appropriate manner. This section reports on selected sensitivity analyses to assess model response to changes in boundary concentrations, meteorological variables, and emissions. These analyses were focused on the August 3-9, 2005 (DOY 214-221) and the July 15-19, 2005 (DOY 196-200) episodes, representing the period of the best air quality model performance.

5.1.2.1. Boundary Condition Sensitivity

The U.S. EPA (1991) recommends a 'clean-air' NOx concentration of 2 ppb. In the base case simulations, the NOx concentration was reduced to 0.1 ppb above 200 magl. The July, 2005 episode was run without anthropogenic emissions using the case base boundary concentrations and using boundary concentrations with 2 ppb for all lateral boundaries (the initial concentrations were not altered and NOx remained 0.1 ppb above 200 magl).

The simulation results without anthropogenic emissions and using the base case boundary concentrations resulted in maximum 8-hour ozone concentrations of 37 ppb within Ventura County (SR0002) and 42 ppb in the Inland Empire of the SCAB (SR0004 -- see Figure 4-1). With the increase in NOx concentrations to 2 ppb for all boundaries, the maximum ozone concentration in Ventura County was 44 ppb and 53 ppb in the SR0004. The response to higher NOx concentrations on the boundary was likely greater in SR0004 than in Ventura because of greater biogenic emissions in the warmer SCAB.

Considering all of the episodes, most of the episode days simulated underestimated ozone concentrations within Ventura County (see Table 5-1). The sensitivity analysis suggested that using the higher boundary concentration of NOx would increase simulated ozone concentrations and, could improve base case model performance. However, it would also result in higher future-year simulated concentrations, independent of the level of anthropogenic emissions. It is expected that the higher this lower limit, the more difficult it will be to demonstrate attainment using an air quality model.

5.1.2.2. Meteorological Field Sensitivity

Simulated nighttime wind speeds tended to be higher than wind speeds measured in Ventura County, and the simulated air temperatures tended to be higher than those observed (see Section 4.3.). In this section, the wind and temperature fields used in the base case simulations were altered to investigate the air quality model response to these inputs. Adjustments (to wind and temperatures) do not reflect actual hour-by-hour differences. In that light, the factors used to make the adjustments are arbitrary. The model performance statistical measures for these simulations were compared to that of the base case (mA01) in Table 5-2.

In first sensitivity simulation (mA02), the air temperatures within the modeling domain were decreased by 3˚ C to approximate the discrepancies between simulated and observed temperatures (see Figure 4-6). The reduced air temperatures resulted in a reduction in peak daily ozone concentrations of 5-6 ppb throughout Ventura County. This was equivalent to approximately 2 ppb ozone per degree.

In the second sensitivity (mA03), the wind speeds throughout the domain were reduced by 20%. The reductions in wind speed resulted in an increase in ozone concentrations; however, the impact was less in western Ventura County (e.g., 3-8 ppb at Ojai) than in the eastern part of the County (e.g., 8-10 ppb at Simi Valley – data not shown).

In the third sensitivity simulation (mA04) the vertical diffusivity fields were reduced to approximate reducing the afternoon mixing heights by half. The simulation results from reduced mixing heights were mixed. Maximum daily ozone concentrations (reflected in the URP) were reduced on August 4, but increased on August 6. However, the average simulated ozone concentrations (reflected in the MNB) were lower compared with those from the base case. On August 5, the base case MNB of -10% was reduced to -21%.

The likely cause of the lower ozone concentrations from the reduced mixing heights was the interaction between mixing heights and easterly wind flows aloft (e.g., see Figure 4-6). The reduced mixing heights limited transport to the surface of the ozone and ozone precursors advected from Los Angeles County. This may also reflect limitations in the vertical resolution within MM5. However, while the mixing heights used in the base-case simulation may be over-estimated, the resulting transport from Los Angeles County to western Ventura County was adequately represented because the easterly flow was expected to be confined to below the mixing height.

Table 5-2 Model performance statistical measures for 1-hour ozone concentrations, for selected sensitivity analyses based on alterations of the air temperature, wind, and mixing height fields during the August 3-9, 2005 episode.

	Aug 04		Aug 05		Aug 06	
	UPR[1/]	MNB[1/]	UPR	MNB	UPR	MNB
	-nd-	%	-nd-	%	-nd-	%
Base Case (mA01)	1.01	-04	0.94	-10	0.96	00
Scaled Temp (mA02)	0.95	-10	0.89	-16	0.90	-06
Scaled Wind (mA03)	1.13	+05	1.04	-04	1.06	+08
Scaled MHgt (mA04)	0.96	-13	0.94	-21	1.08	-06

1/ Unpaired Peak Ratio (UPR) and Mean Normalized Bias (MNB)

Table 5-3 Ozone model performance statistical measures for selected sensitivity analyses based on alterations of the August 3-9, 2005 base case emissions inventory.

	Aug 04		Aug 05		Aug 06	
	UPR[1/]	MNB[1/]	UPR	MNB	UPR	MNB
	-nd-	%	-nd-	%	-nd-	%
Base Case (aA05)	1.00	-04	0.91	-10	0.94	00
BC 0.75*NOx (aA06)	0.94	-08	0.88	-13	0.88	-04
BC 1.25*NOx (aA07)	1.02	-03	0.90	-10	0.98	02
BC 0.75*ROG (aA08)	0.95	-08	0.85	-14	0.90	-05
BC 1.25*ROG (aA09)	1.05	00	0.97	-07	0.98	05
No.Biogenic (aA10)	0.95	-10	0.87	-15	0.91	-03

1/ Unpaired Peak Ratio (UPR) and Mean Normalized Bias (MNB)
2/ The emissions inventory used for 'mA07' was an update of that used for 'mA04'.

5.1.2.3. Emissions Inventory Sensitivity

The model sensitivity to emissions uncertainty was investigated by varying the base case anthropogenic emissions inventory for the August 3-9, 2005 episode. The impact of biogenic emissions on ozone concentrations in Ventura County was also evaluated.

The August 3-9, 2005 base case emissions inventory was altered by scaling anthropogenic emissions NOx and ROG by factors of 0.75 and 1.25 respectively (i.e., +/- 25%). The simulations were running using these altered emissions inventories and the results compared with the base case model performance in Table 5-3.

Simulations done in the Los Angeles Coastal Plain have often shown NOx detriment, wherein reductions in NOx emissions resulted in increase ozone concentrations. However, no such detriment were apparent in the sensitivity analyses done using the base case emissions inventory. Reductions in ROG or NOx emissions resulted in lower simulated ozone concentrations, and increases in ROG or NOx emissions resulted in higher ozone concentrations throughout Ventura County (similar simulations done for the July, 2005 episode showed little change in simulated ozone in response to NOx emissions changes, suggesting that insensitivity to NOx emissions may occur during different meteorological conditions – data not shown).

The response of the model to removing the biogenic emissions was similar to removing anthropogenic ROG emissions (note: the biogenic emissions account for approximately 25% of the TOG for Ventura County – see Table 4-5). The change in simulated ozone with the removal of biogenic emissions was only a little less than the reduction in anthropogenic ROG of 25%. The impact of the removal of biogenic emissions from the inventory varied only a little from day-to-day, but generally reduced simulated ozone concentrations at Simi Valley and Ojai by 3-5 ppb (data not shown).

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6. PREDICTION OF FUTURE-YEAR DESIGN VALUES

6.1. Methodology

The U.S. EPA (2005) recommends that the results from air quality models be used to scale measured ozone design values to predict future-year 8-hour ozone concentrations. Using this approach, the ozone air quality model was run using emissions inventories for a “reference” year and then run a second time using emissions for a designated future-year. Measured ozone concentrations were used to calculate an 8-hour ozone design value at each monitoring site for the reference year. The ratio of the simulated concentrations at each site averaged for the future year and the average concentration for the reference year was calculated. This ratio, defined as the relative reduction factor (RRF), was multiplied by the reference-year design value to estimate the future year design value.

For each episode, emissions from three years were needed. The first set of emissions represented the base year. For the episodes used in this analysis, the base year was either 2004 or 2005. The purpose of the simulations using the base year emissions was to evaluate ozone model performance. Only days from each episode that met model performance and concentration - threshold criteria were used in the calculation of the RRF. The results from the reference year, recommended by the U.S. EPA (2005) to be the year 2002, and the future year were used to calculate the future-year design value. For Ventura County, the targeted future-year was 2012.

The U.S. EPA (2005) argues that the response of ozone air quality models to changes in emissions is approximately constant above a concentration of 85 ppb. Therefore, in an ideal study, only those days with simulated ozone concentrations of 85 ppb or greater would be used to calculate RRFs (in cases with limited data, 70 ppb may be used). To increase this likelihood, the U.S. EPA allowed the use of the maximum simulated ozone concentration within 15-km of each monitoring site to be used for this calculation. The U.S. EPA also recommended that at least 10 episode days be used for each site in the calculation of a RRF and set a minimum limit of 5 episode days. However, the number of episode days available, the number of days at each site with suitably high measured ozone concentrations, and air quality model performance impact the ability to meet this target in practice.

6.2. 8-Hour Ozone Design Values

The 8-hour ozone design value for each monitoring site was based on the 4-th highest ozone concentration measured within a year, averaged over three years. However, the U.S. EPA (2005) allows for flexibility in the calculation of the reference year design value. The methodology adopted for this analysis was to calculate the 8-hour ozone design value for the year 2002 as the average of the design values for the years 2002, 2003, and 2004 (effectively, a 5-year weighted average of the 4-th highest within each year). The results for Ventura County were summarized in Table 6-1.

6.3. Model Performance and Ozone Threshold Criteria

For use in projecting future-year design values, ozone simulation results should meet ozone model performance criteria and concentration thresholds. Section 5.1. summarizes statistical measures for evaluating base case model performance. To ensure that episodes are representative and that simulated concentrations are high enough to respond to emissions, the observed and simulated 8-hour ozone concentrations for each must site be 70 ppb or greater. In summary, therefore, for simulation results to be used in the calculation of a site-specific RRF, the following criteria were met:

- 1-hour model performance for the subregion in which each site is located must meet the U.S. EPA (1991) thresholds for UPR, MNB, and MGE.
- the base year measured 8-hour ozone concentration must be 70 ppb or greater.
- the reference year (e.g., 2002) simulated 8-hour ozone concentration within 15-km of each site must be 70 ppb or greater.

A review of model performance revealed that the August 3-9, 2005 episode was the only one of the six for which simulated ozone concentrations in western Ventura County (i.e., Ojai) were suitable for this analysis (data not shown – see also Figure 5-1). Therefore, results from only the August 3-9, 2005 episode were used in the calculation of relative reduction factors and the estimation of future-year ozone design values.

6.4. Calculation of Site Specific RRFs and Future-Year Design Values

The RRF for each site in Ventura County violating the 8-hour ozone NAAQS (see Table 3-1) was calculated based on the ratio of the average concentrations simulated for the year 2002, and the average concentration for the future year. The future-year 8-hour ozone design value was calculated as:

$$DV_{fy} = \left(\frac{SIM_{fy}}{SIM_{2002}} \right) * DV_{2002}$$

Table 6-1 Weighted-averaged, eight-hour ozone design values (ppb) for the year 2002 for those sites in violation of the 8-hour NAAQS for ozone.

Site	2002	2003	2004	Aver[1/]
Ojai	095	095	094	094
Simi Valley	097	095	092	094
Piru	085	090	088	087

1/ The average was truncated to the nearest 'ppb'.

Table 6-2 Observed and simulated daily 8-hour ozone concentrations at selected Ventura County monitoring sites (ppb).

	Aug.3 ppb	Aug.4 ppb	Aug.5 ppb	Aug.6 ppb	Aug.7 ppb	Aug.8 ppb	No. Days Used	Average ppb	RRF -nd- ppb	Base Case Design Value
Site: Ojai										
Obs. 2005	081	084	084	085	069[2/]	065[2/]	4			
Sim. 2002	071	076	076	081	079	078		076		094[1/]
Sim. 2012	068	072	071	076	074	071		072	0.95	089
Sim. 2012a	068	068	069	074	071	069		071	0.93	087
Site: Piru										
Obs. 2005	083	082	086	082	068[2/]	070	5			
Sim. 2002	082	085	094	094	086	088		089		087[1/]
Sim. 2012	075	078	084	082	076	077		079	0.89	078
Sim 2012a	073	075	082	078	074	073		076	0.85	075
Site: Simi Valley										
Obs. 2005	085	082	094	093	075	080	6			
Sim. 2002	083	088	095	100	097	099		094		094[1/]
Sim. 2012	077	082	090	090	085	087		085	0.90	085
Sim. 2012a	076	080	091	087	080	082		083	0.88	083

1/ The 8-hour design values for 2002 were from observations.
2/ This day was not used in the RRF calculation because the ozone concentration was less than 70 ppb

The average concentrations and year-specific relative reduction factors (RRF) shown in Table 6-2 for each site were calculated using days for which observed concentrations in 2005 were 70 ppb or greater. The simulated ozone concentrations are the maximum daily concentration within 15 km of each site location. The simulation results represent the year 2005 base case ('Sim. 2005 – run to evaluate model performance only), the year 2002 base case emissions ('Sim. 2002'), the simulated year 2012 base case emissions ('Sim. 2012'), and the year 2012 controlled emission scenario ('Sim. 2012a').

Where DV_{fy} is the future year design value, SIM_{fy} is the simulated average 8-hour concentration for the future year, SIM_{2002} is the simulated average 8-hour concentration for 2002, and DV_{2002} is the year 2002 8-hour ozone design value. The calculation of 8-hour ozone design values for 2012 is summarized in Table 6.2. Year 2012 design values were calculated using two emissions inventory scenarios: the 2012 uncontrolled base case, and a 2012 project controls case.

The results summarized in Table 6-2 suggest a maximum ozone 8-hour ozone design value at Ojai of 89 ppb in the year 2012 using the uncontrolled base case emissions and a design value of 87 ppb using the controlled base case emissions scenario. The U.S. EPA (2005) modeling guidelines allow a projected 8-hour ozone design value of 83 to 87 ppb to be equivalent to an attainment demonstration with supplemental "weight of evidence" (WOE) analyses.

6.5. Sensitivities of Relative Reduction Factors to Meteorological Inputs

The sensitivity analyses summarized in Section 5.1.2. suggest that uncertainties in the input meteorological fields influenced the simulation results of the air quality model. In this section, the question of whether these uncertainties could impact projected future-year ozone design values is addressed. The 2002 and 2012 base case emissions inventories for the August 3-9, 2005 episode were run with the perturbations in meteorological inputs introduced in Chapter 5. These included a decrease in air temperatures of 3° C, an approximate 50% reduction in the mixing height fields, and background NO concentrations of 2 ppb (see Section 4.2.).

The results from the analyses suggested that uncertainties in the meteorological input fields for the air quality model can have a marked impact on estimated future-year design values. The perturbed air temperature and mixing height fields, and background NO concentrations resulted in differences of up to 5 ppb in estimated year 2012 design values. Although the results from only two sites were summarized in Table 6-3, it was apparent that the impacts were not uniformly distributed. This analysis suggests that further refinements in the meteorology fields used to run the air quality model could improve the estimation of future-year design values in Ventura County.

Table 6-3 Estimated year 2012 ozone design values for Ojai and Simi Valley using controlled emissions as function of adjustments to the air temperature and mixing height inputs to the air quality model. The relative reduction factors (RRF) were base on the simulation results averaged for August 4-6, 2005. The results in this table only approximated the more formal calculations used to calculate Table 6-2 and; therefore, did not show exact agreement.

	Sim. 2002 ppb	Sim. 2012 ppb	RRF -nd-	Year 2012 DV ppb
Site: Ojai				
Base Case Met.	072	064	0.90	086
Scaled Temp.	067	060	0.90	084
Scaled M.Hgt	064	061	0.95	089
High NOx Bndy.	075	068	0.90	085
Site: Simi Valley				
Base Case Met.	088	075	0.85	080
Scaled Temp.	082	071	0.86	081
Scaled M.Hgt	082	075	0.91	085
High NOx Bndy.	092	080	0.87	081

6.6. Sensitivity of Projected Future-Year Design Values to Emissions

The future-year 8-hour ozone design values calculated in Section 6.4. were determined using baseline planning emissions inventories for the year 2012. Future analyses were done to assess the response of these design values to future reductions in emissions inventories. In these analyses, the baseline anthropogenic ROG and NOx emissions for 2012 were reduced in increments of 20% (e.g., 1.0, 0.8, 0.6, 0.4, and 0.2, respectively). The air quality model was run using each of the resulting 25 emissions inventories. From each simulation, the 8-hour ozone design values were calculated for Ojai and for Simi Valley using the procedures outlined in Section 6.4. The results were summarized as iso-surface plots of 8-hour design values (sometimes referred to and 'EKMA' plots). The results for 2012 are summarized in Figure 6-1. The concentration in the upper-right-hand corner is the baseline 8-hour ozone design value calculated in Section 6.4. for the uncontrolled base case emissions.

A) Year 2012 8-hour DV (ppb) for Simi Valley (Site ID 2880).

```
  1.0|     70.     74.     78.     82.     85.
     |
     |
  0.8|     69.     73.     77.     80.     83.
     |
N    |
O 0.6|     67.     71.     74.     77.     79.
X    |
     |
  0.4|     63.     66.     68.     70.     71.
     |
     |
  0.2|     54.     56.     57.     58.     58.
     |
     |
     -----------------------------------------
         0.2     0.4     0.6     0.8     1.0
                          ROG
```

B) Year 2012 8-hour DV (ppb) for Ojai (Site ID 3172)

```
  1.0|     77.     80.     83.     86.     89.
     |
     |
  0.8|     77.     80.     83.     85.     87.
     |
N    |
O 0.6|     76.     78.     79.     81.     82.
X    |
     |
  0.4|     71.     72.     73.     74.     75.
     |
     |
  0.2|     62.     62.     63.     63.     63.
     |
     |
     -----------------------------------------
         0.2     0.4     0.6     0.8     1.0
                          ROG
```

Figure 6-1 Year 2012 8-hour ozone design values (ppb) in response to anthropogenic ROG and NOx emissions reduction for Simi Valley (A) and for Ojai (B).

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VENTURA COUNTY WEIGHT OF EVIDENCE ASSESSMENT

2/1/2008
(mln/gms/klm)

Prepared for

Ventura County Air Pollution Control District
Ventura, California 93003

Prepared by

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1. INTRODUCTION

Ventura County is currently classified as a Moderate nonattainment area for the federal 8-hour ozone standard and has a nominal attainment date of June 15, 2010. The Ventura County Air Pollution Control District is requesting a reclassification to Serious, with an attainment date of June 15, 2013. Air quality analyses show that while progress in this area has been significant, it has slowed over the last several years, lending uncertainly to the current 2010 attainment date. Furthermore, the photochemical modeling analyses indicate that attainment will not occur by 2010. However, the photochemical modeling results do, in combination with the supporting Weight of Evidence analyses, support a 2013 attainment date. The following chapters describe the air quality, emissions, and modeling analyses that support the County's reclassification as Serious and to support the overall conclusion that Ventura County will attain the federal 8-hour ozone standard by 2013.

U.S. EPA has provided guidance on how to interpret the attainment deadline when attainment is measured by calendar year and the deadline is on June 15 – in the middle of the calendar year. U.S. EPA guidance calls for the analysis of attainment to be done for the year prior to the actual attainment year. The analyses summarized in this report evaluated emission and air quality projections for 2012, the year prior to the 2013 attainment deadline.

2. U.S. EPA ATTAINMENT DEMONSTRATION REQUIREMENTS

The attainment demonstration portion of a SIP consists of the analyses used to determine whether a proposed control strategy provides the reductions necessary to meet the NAAQS by the attainment year. The Ventura attainment demonstration includes photochemical modeling which predicts the statewide emissions control strategy will result in an 8-hour design value of 0.087 parts per million (ppm) in 2012. This is just above the federal attainment level of 0.084 ppm. Because of the uncertainties inherent in photochemical modeling, the U.S. EPA allows states to supplement the model results with a Weight of Evidence (WOE) demonstration when photochemical modeling predicts ozone levels of 0.082 ppm to 0.087 ppm.

The WOE assessment provides a set of complementary analyses that supplement the SIP-required modeling. These analyses can include consideration of measured air quality, emissions, and meteorological data, as well as evaluation of other air quality indicators and additional air quality modeling. All analysis methods have inherent strengths and weaknesses. However, examining an air quality problem in a variety of other ways helps offset the limitations and uncertainties that are inherent in all air quality modeling.

The scope of the WOE analysis is different for each nonattainment area. The level of detail appropriate for each area depends upon the complexity of the air quality problem, how far into the future the attainment deadline is, and the amount of data and modeling available. This document summarizes the analyses that comprise the WOE assessment for the Ventura County nonattainment area.

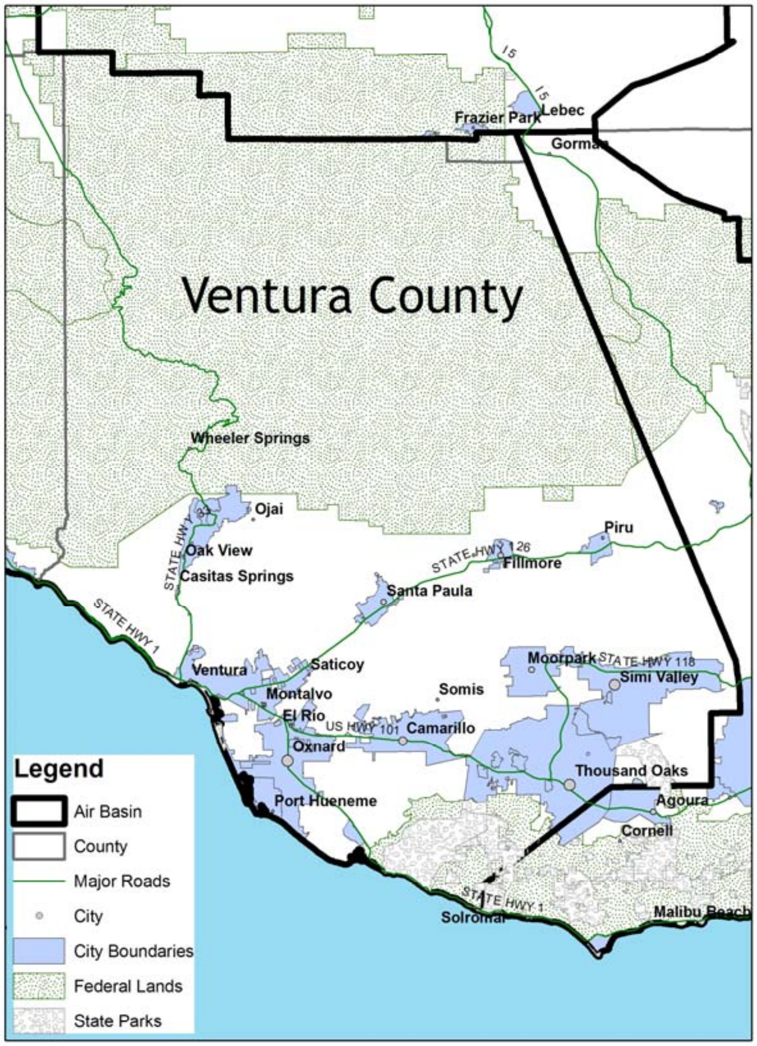
3. HISTORICAL CONTEXT

Ventura County is located west of Los Angeles County and is bordered by Kern County to the north, Santa Barbara County to the west, and the Pacific Ocean to the southwest. It includes the Channel Islands National Park and serves as a gateway to this five-island marine sanctuary. The federal 8-hour nonattainment area includes all of Ventura County, with the exception of the Channel Islands.

The County has a combination of undeveloped and agricultural lands, as well as developed urban areas. As shown in Figure 1, the Los Padres National Forest, located in the northern portion of Ventura County, accounts for almost half the County's land area. The County's diverse economic base also includes biotechnology, telecommunications, and manufacturing activities, as well as tourism and military testing and development.

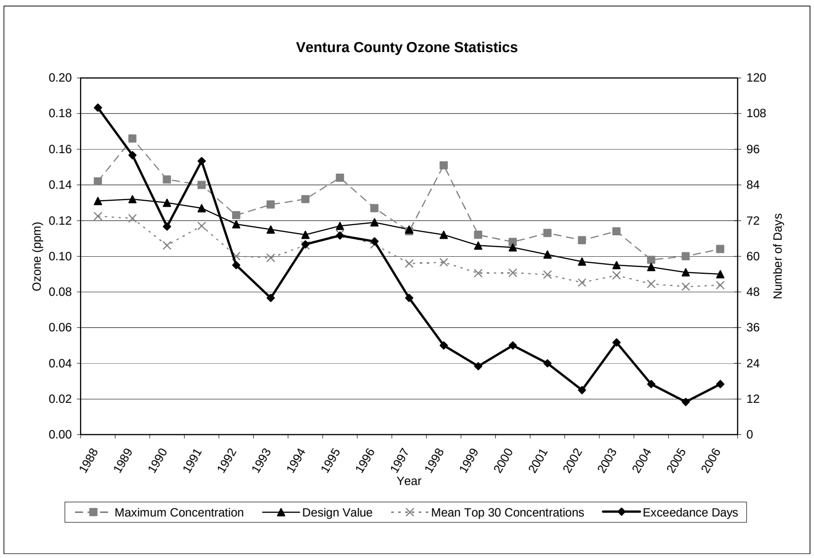
Ozone in the Ventura County nonattainment area results from locally generated emissions, as well as the transport of ozone and ozone precursors from outside the County. Previous analyses by ARB staff have shown that emissions and pollutants transported from the South Coast Air Basin contribute to the ozone problem in Ventura County under certain meteorological conditions. Furthermore, ozone precursor emissions in the Los Angeles County portion of the South Coast Air Basin, which lies directly east of Ventura County, are nearly ten times the level of those in Ventura County. As a result, transported emissions can have a significant impact on Ventura County's air quality. Additionally, Ventura County's ozone air quality is impacted by emissions from shipping and related operations -- both in-port and off-shore.

Figure 1 Ventura County Land Area



The Ventura County and South Coast districts have some of the most stringent emissions control programs in the State. Local, State and federal control programs together have resulted in dramatic improvements in ozone air quality over the last 18 years. The number of federal 8-hour exceedance days decreased 85 percent between 1988 and 2006. Ambient concentrations declined about 30 percent during this same period, as indicated by changes in the maximum concentration, the design value (an average of the fourth highest value in each of three consecutive years), and the mean of the Top 30 (the mean of the 30 highest 8-hour ozone concentrations recorded each year; see Figure 2).

Figure 2 Ventura County Ozone Statistics 1988 to 2006



4. ASSESSMENT OF RECENT AIR QUALITY TRENDS

4.1. General Basinwide Perspective

Similar to the long-term historical trends described in the previous chapter, trends for all air quality indicators have continued to show substantial declines over the last decade (1995 compared with 2006). Since 1995, there has been:

- A 75 percent decrease in the number of exceedance days (67 days in 1995 versus 17 days in 2006).
- A 30 percent decrease in the maximum ozone concentration.
- An approximately 25 percent decrease in both the design value and the mean Top 30.

Because of these improvements, Ventura County is now close to attaining the federal 8-hour standard. Ten years ago, the County's design value was nearly 40 percent above the standard, and design values for all monitoring sites exceeded the federal standard. In contrast, 2006 data show that five of the County's seven ozone monitoring sites now have design values that meet the standard, while the remaining two exceed the standard by less than 10 percent. The five sites that now meet the standard are El Rio (attained in 1997), Ventura-Emma Wood State Beach (attained in 1998), Thousand Oaks (attained in 2001), Ventura County-W Casitas Pass Road (attained in 1999; site closed in 2002), and Piru (attained in 2006). The Ojai and Simi Valley monitoring sites have had similar design values over the last five years, ranging from about 15 percent above the standard in 2002 to less than 10 percent above the standard in 2006, when both sites had a design value of 0.09 ppm.

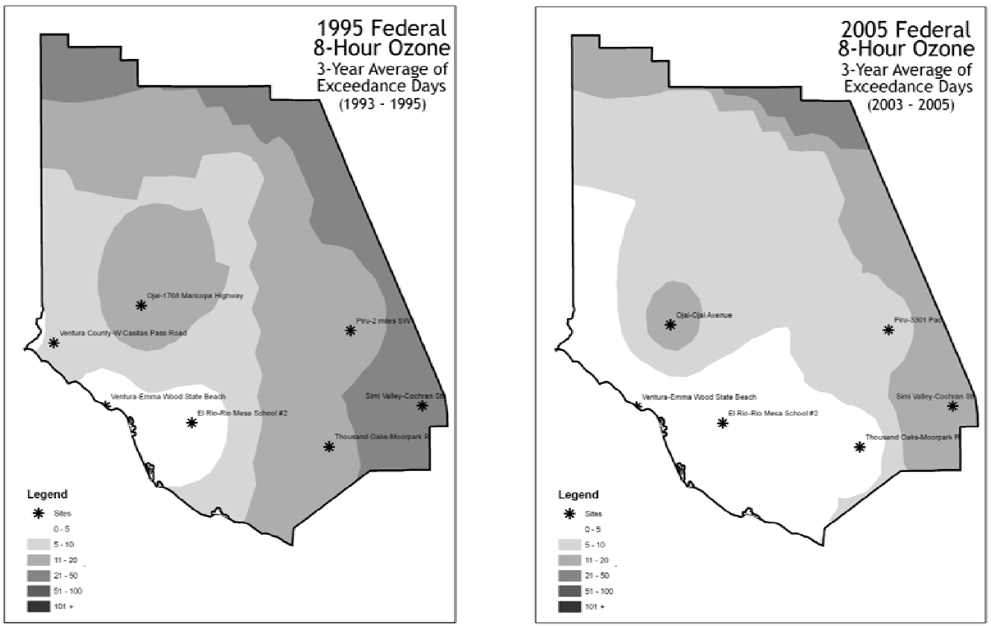
Based on preliminary 2007 data, it appears ozone is continuing to improve. Through December 31, 2007, there were only 6 exceedance days: 5 days exceeding only at Simi Valley and 1 day exceeding at both Simi Valley and Thousand Oaks. This compares with 17 exceedance days during 2006. In addition, design values continue to move closer to the standard, with a 2007 design value of 0.088 ppm for Simi Valley and 0.085 ppm for Ojai.

Another way to look at the improvement in air quality is to map the change in the number of exceedance days. The maps in Figure 3 are based on monitoring data and show the reduction in the number of days exceeding the federal 8-hour standard over the last decade (1995 to 2005). This approach provides an estimate of the change in the spatial extent of the ozone problem. Ten years ago (1993 to 1995 map), only a small portion of the County near the coast had 5 or fewer exceedance days. The number of days increased as one moved inland. The worst areas, located along the northern and eastern borders of Ventura County, had more than 20, and in limited areas, more than 50 federal exceedance days.

Today (2003 to 2005 map), the area with 5 or fewer exceedance days is much larger, encompassing the entire coastal area and extending inland. Most of the rest of the County lies within the range of 6 to 10 exceedance days. The areas with the worst ozone air quality are still located along the portions of the County that border the San Joaquin Valley and South Coast air basins, and these areas may be impacted by emissions and pollutants from outside the County. However, the ozone air quality in these transport-impacted border areas has improved since 1995 and is expected to continue improving with implementation of South Coast and statewide emissions control strategies.

Figure 3 Ventura County Change in Federal 8-Hour Exceedance Days 1995 to 2005

Ventura County
Federal 8-Hour Exceedance Days



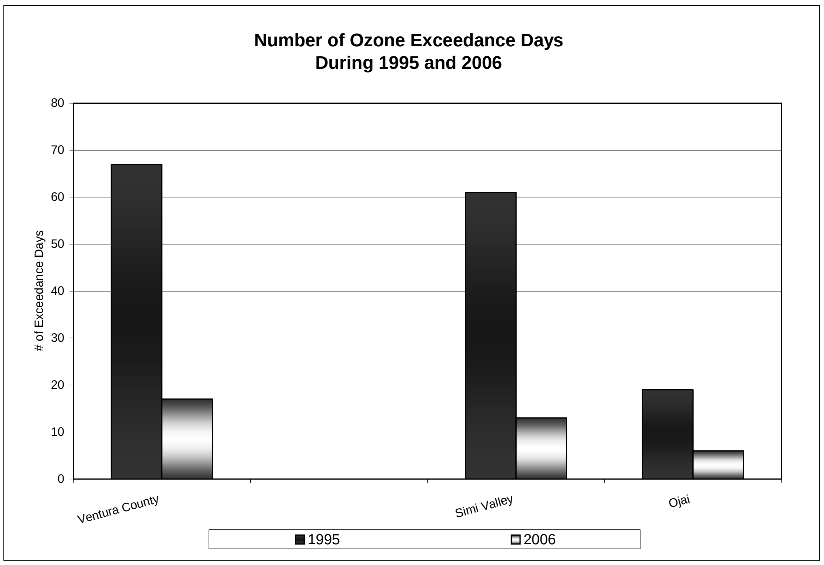
4.2. Regional Analysis

Historically, Simi Valley has been the high site in Ventura County, both in terms of ozone concentrations and number of exceedance days. In contrast, Ojai had much lower concentrations, as well as a lower number of exceedance days.

Although Ojai still has fewer exceedance days, the design value for Ojai has been either similar to or equal to that for Simi Valley during the last five years.

Figure 4 shows the number of exceedance days during 1995 and 2006 for all of Ventura County, as well as Simi Valley and Ojai, individually. The Simi Valley and Ojai sites are both located in inland valleys, in the eastern and western portions of the County, respectively. Although the populations of the two areas are very different (Simi Valley has more than ten times the population of Ojai), ozone concentrations have been very similar during the last several years. As shown in Figure 4, the number of countywide exceedance days decreased 75 percent between 1995 and 2006. The decrease at Simi Valley was slightly higher (80 percent), while the decrease at Ojai was slightly lower (70 percent). In addition to these substantial decreases in exceedance days, the maximum concentration at Simi Valley decreased 30 percent, and the design value decreased 25 percent between 1995 and 2006. In contrast, Ojai showed a much slower rate of improvement in these two indicators: less than 10 percent decrease in both from 1995 to 2006. The overall decrease at Ojai is smaller, in part, because concentrations at Ojai were at a lower level than at Simi Valley during 1995, but now the levels at these two sites are fairly comparable.

Figure 4 Ventura County Change in Number of Federal 8-Hour Exceedance Days by Region 1995 and 2006



5. ADDITIONAL SUPPORTING ANALYSES

Prior to completion of the photochemical air quality modeling, ARB staff completed a rollback analysis to estimate Ventura County's design value in 2010, the deadline for Moderate nonattainment areas. The rollback analysis evaluated the response of the design value to emissions reductions over the prior ten-year period. In addition to the rollback, staff completed several other air quality analyses aimed at evaluating potential attainment dates. These analyses are also described below.

5.1. Rollback Analysis

Staff completed a rollback analysis for Ventura County to determine what the future year design value would be. Before applying rollback, ARB staff calculated the ratio between emissions changes (ROG and NOx, combined) and 8-hour ozone design values. For Ventura County, this ratio was 1.1 to 1. In other words, a 1.1 percent change in combined emissions results in a 1 percent change in design value.

Existing control programs are expected to reduce the County's ROG and NOx emissions by about eight and ten percent, respectively, by the year 2010. Based on

Ventura County's 2005 design value of 0.091 ppm, and using a rollback analysis that accounts for a background concentration of 0.040 ppm in calculating the design value, this level of emissions reductions is expected to lower Ventura County's design value to 0.076 ppm in 2010. However, results of the rollback analysis should be viewed with caution because the analysis is based on the mix of pollutants occurring in the past. It therefore embodies a significant degree of uncertainty. In contrast, the design value predicted by photochemical modeling reflects anticipated changes in the NOx and ROG mixture.

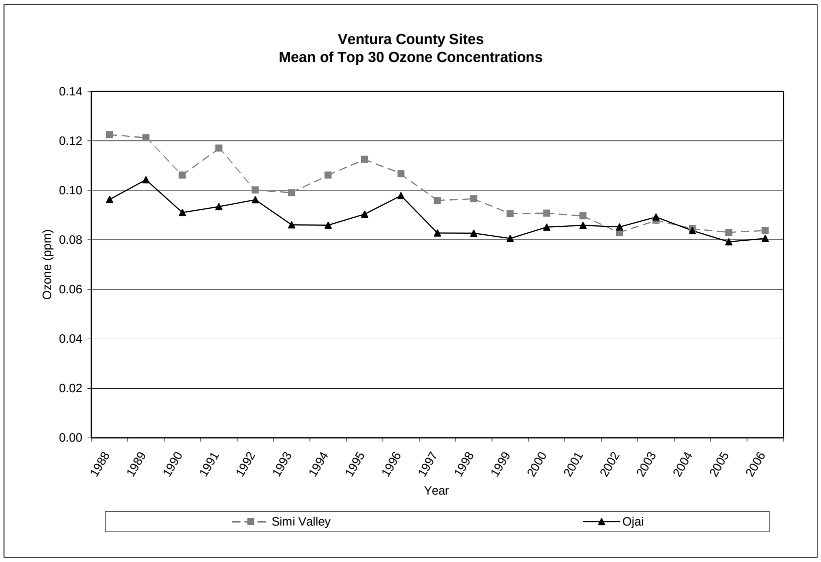
5.2. Additional Air Quality Analyses

Using the mean of the Top 30 concentrations each year and regression equations based on design values, ARB staff evaluated whether the rate of progress both historically and in recent years supports attainment in 2012 and beyond. The two indicators were evaluated for both high sites in Ventura County: Simi Valley and Ojai.

5.2.1. Mean of the Top 30 8-Hour Ozone Concentrations

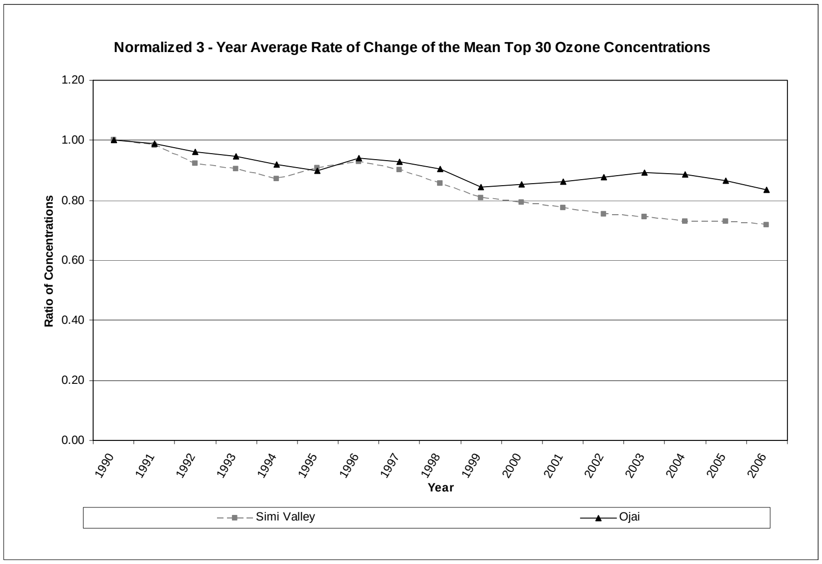
The mean of the Top 30 represents the mean of the 30 highest 8-hour ozone concentrations measured at a site during each year and reflects the change in the average ozone concentration on the 30 worst days. Although the mean of the Top 30 is not directly related to the federal standard, it does provide a stable indicator that is not highly influenced by year-to-year changes in meteorology. Figure 5 shows the mean of the Top 30 trends for both Simi Valley and Ojai. Since 1988, the mean of the Top 30 at Simi Valley has declined 30 percent, from a concentration of 0.123 ppm in 1988 to 0.084 ppm in 2006. While there was some variability in the trend during the early years, there has been a steady downward trend since 1995. The decrease at Ojai has been about half as much, or about 15 percent: from 0.096 ppm in 1988 to 0.081 ppm in 2006. Although the mean of the Top 30 for Ojai was lower than for Simi Valley during the earlier period, concentrations at Ojai increased during the early 2000s. During the last several years, values for both sites have been similar.

Figure 5 Mean of Top 30 8-Hour Ozone Concentrations at Simi Valley and Ojai



As a way of gaining further insight into how the mean of the Top 30 has changed over time, the rate of change, relative to the start year, was also evaluated. For this evaluation, 3-year averages of the yearly values were normalized to the first year by calculating the ratio of the 3-year average of the mean Top 30 concentration to the 1990 3-year average of the mean Top 30 concentration. Three-year averages of the normalized rate of progress values are plotted in Figure 6. Throughout most of the period, both sites have shown relatively steady progress towards lower mean Top 30 concentrations, although the rate of progress at Ojai has been somewhat slower. Nevertheless, based on the trend lines, it appears the downward trends will continue. With continued emissions reductions, additional improvements in ozone air quality are expected over the next several years, bringing Ventura County to its attainment goal.

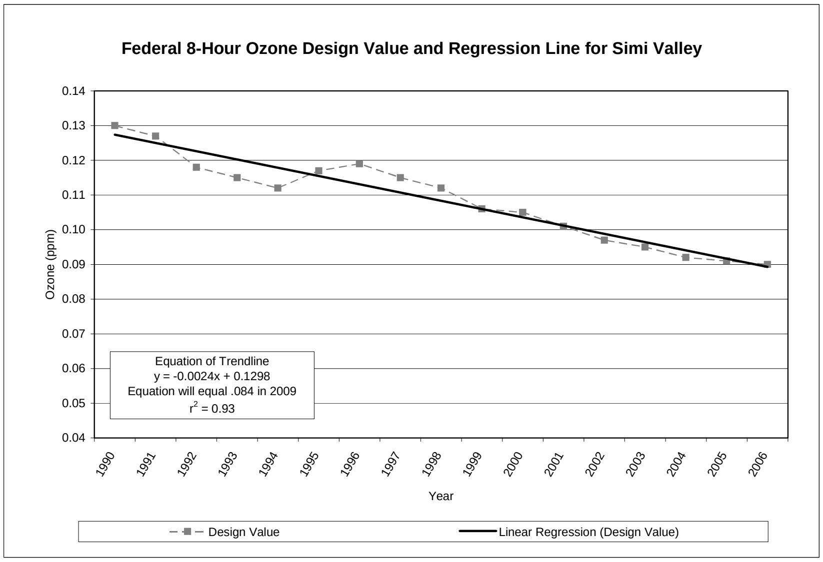
Figure 6 Mean of Top 30 8-Hour Ozone Concentrations at Simi Valley and Ojai Normalized to the 1988-1990 3-Year Average



5.2.2. <u>Design Value Regression Analyses</u>

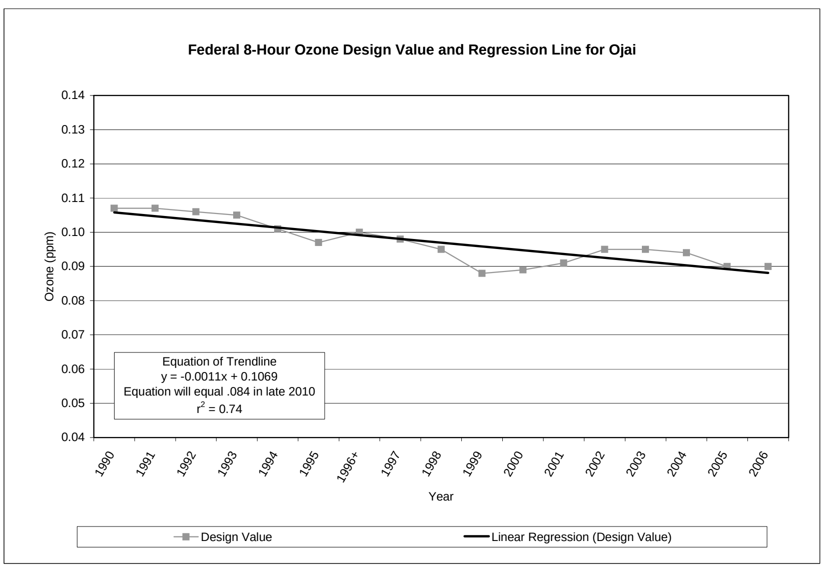
In addition to evaluating the trends in the mean Top 30 concentrations, ARB staff also completed a regression analysis of design values for both Simi Valley and Ojai. Figures 7 and 8 show the trend in federal 8-hour design values for Simi Valley and Ojai, respectively. The regression line for the design values is also plotted and can be used to assess an expected attainment year, given a continuation of the recent rate of progress. The r^2 values for the regressions were relatively high for both sites (0.93 for Simi Valley and 0.74 for Ojai). Based on the regression lines, an attainment year was calculated for each site. At Simi Valley, the design value is estimated to reach 0.084 ppm in 2009, while the design value at Ojai is estimated to reach attainment by late 2010. Although there are a number of uncertainties associated with this approach, it indicates that attainment will not occur prior to 2010.

Figure 7 Simi Valley Federal 8-Hour Ozone Design Value and Linear Regression Line



Note: "r^2" is the square of the *sample correlation coefficient*, which is a measure of the ability of the variable on the x-axis to explain the variable on the y-axis.

Figure 8 Ojai Federal 8-Hour Ozone Design Value and Linear Regression Line



Note: "r^2" is the square of the *sample correlation coefficient*, which is a measure of the ability of the variable on the x-axis to explain the variable on the y-axis.

6. EMISSIONS AND PRECURSOR TRENDS

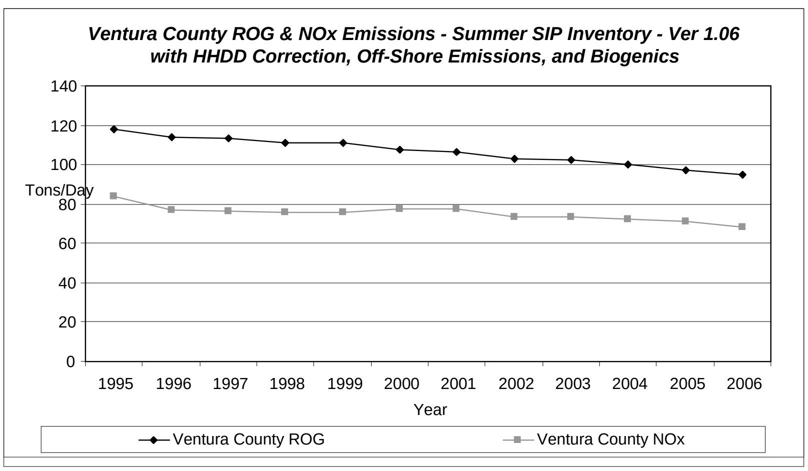
Reactive organic gases (ROG) and oxides of nitrogen (NOx) are precursors to ozone. Emissions controls have significantly reduced the amounts of these precursors in the ambient air. These reductions have resulted in greatly improved ozone air quality. The following sections describe the ROG and NOx emissions trends in Ventura County since 1994, as well as the amounts of these precursors measured in the ambient air.

6.1. Emissions Trends

Emissions controls have substantially reduced the amounts of both ROG and NOx emitted by various sources throughout Ventura County. Figure 9 shows the estimated countywide trend in the precursor emissions from 1995 to 2006. The totals reflect estimates for the summer season in tons per day and include emissions from natural biogenic sources. Also included are offshore emissions out to a distance of 24 miles.

Since 1995, there has been a fairly steady decrease in both ROG and NOx emissions, and the relative amounts of the two precursors have remained fairly constant over the twelve years. Overall, the emissions estimates show about a 20 percent decrease in both ROG and NOx emissions between 1995 and 2006.

Figure 9 Ventura County Estimated ROG and NOx Emissions 1995 to 2006

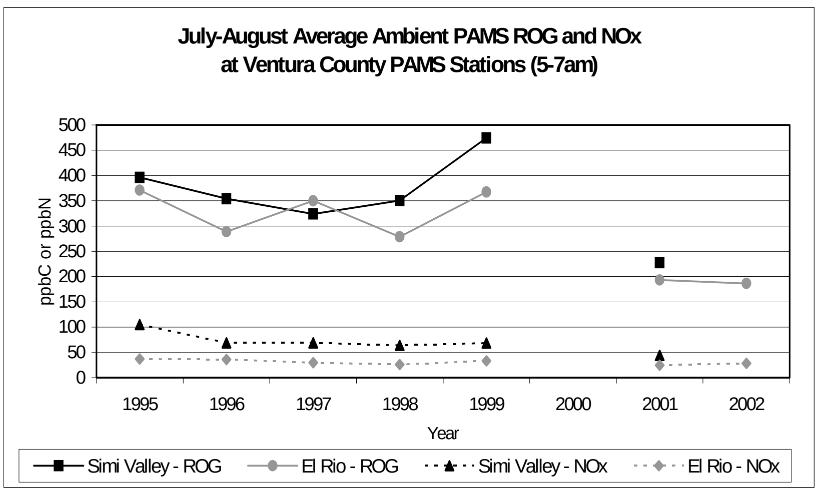


6.2. Precursor Trends

The decrease seen in the estimated emissions trend is supported by the ambient trends, as well. Figure 10 shows levels of ROG and NOx measured in the ambient air at Simi Valley and El Rio, the two sites in the County with long-term records for both precursors. The data plotted were collected from the Photochemical Assessment

Monitoring Stations or PAMS sites, and they reflect measurements collected from 5 a.m. to 7 a.m. during July and August. Although the ROG trends are quite variable, most likely reflecting year-to-year changes in meteorology, the trend lines generally show overall reductions in both precursors at both sites. Ambient ROG decreased at a slower rate than NOx at the Simi Valley site. In contrast, ambient ROG decreased at about twice the rate of NOx at the El Rio site. The spatial and temporal scales of the trends are very different, making it difficult to resolve the differences between the emissions estimates and the ambient PAMS measurements. The important point is that the emissions trends and the ambient trends both indicate that ROG and NOx precursors have decreased over time and these decreases have resulted in improved ozone air quality.

Figure 10 Simi Valley and El Rio Summer Morning Average ROG and NOx from PAMS Network Stations



7. PHOTOCHEMICAL MODELING RESULTS

The U.S. EPA (2005) provided criteria for calculating future-year ozone design values using air quality simulation results. Among these criteria were recommendations for air quality model performance, observed and simulated ozone concentration thresholds, and the number of simulated days used to estimate the relative reduction factors (RRFs), which are used to project design values from a specific reference year to a future year. All of these criteria were met for Ventura County, with the exception of the number of days used for some sites.

The U.S. EPA (2005) recommends that at least 5 days be used at each site for calculating RRFs. However, because of the limited number of days with high ozone concentrations and the limited success simulating high ozone in Ventura County, this number was difficult to meet. Six episodes totaling 34 days were modeled. Using the criteria outlined by the U.S. EPA (1991) to statistically compare observed and simulated ozone concentrations, suitable model performance for Ventura County was attained for 10 of the days. One additional criterion was also applied: the simulated and observed 8-hour ozone concentrations at each site had to be 0.070 ppm or greater. From this analysis, it was determined that simulation results from four days could be used in calculating the RRF for Ojai, five days for Piru, and six days for Simi Valley.

Using the year 2012 emissions inventory reflecting a controlled emissions scenario, the simulation results were used to calculate 8-hour ozone design values. These results projected year 2012 design values of 0.087 ppm at Ojai, 0.077 ppm at Piru, and 0.085 ppm at Simi Valley. Because of the uncertainties associated with air quality modeling, the U.S. EPA (2005) guidelines allow projected 8-hour ozone design values within the range of 0.082 ppm to 0.087 ppm as a demonstration of attainment when accompanied by supporting Weight of Evidence analyses.

8. SUMMARY

U.S. EPA guidance allows the use of a Weight of Evidence analysis when photochemical modeling does not demonstrate attainment, but indicates an attainment year design value of 0.087 ppm or below. Photochemical modeling results indicate a design value of 0.087 ppm for Ventura County by 2013, the attainment date for Serious nonattainment areas. Based on photochemical modeling, as well as supporting analyses completed as part of the WOE evaluation, attainment by 2013 can be projected because of the following factors:

- Between 1988 and 2006, the number of federal 8-hour exceedance days in Ventura County dropped 85 percent, and other indicators, including design value, maximum concentration, and mean of the Top 30 concentrations decreased about 30 percent. The decreases in these trend indicators have been fairly steady over time, and the downward trend is expected to continue with continued emissions reductions.

- During the mid-1990s, the ozone problem in Ventura County was widespread. Since then, the design values at a number of sites have been reduced to levels below the standard. Currently, only Simi Valley and Ojai have design values that exceed the standard, and concentrations at both sites are decreasing.

- The spatial extent of relatively clean areas has expanded over the last decade. The most populated areas of the County now have an average of 10 or fewer exceedance days per year.

- The mean of the Top 30 concentrations at Simi Valley and Ojai continue to decline, albeit at a slower rate at Ojai, as compared with Simi Valley. Based on historical progress, the declines are expected to continue.

- Emissions estimates and ambient precursor data show that both ROG and NOx have declined, demonstrating the effectiveness of past emissions reductions. In addition, emissions estimates indicate a continued decline in precursor emissions over the next decade.

- In addition to emissions reductions in Ventura County, precursor emissions are estimated to continue decreasing in the South Coast Air Basin, which will contribute to lower ozone concentrations in the transport-impacted areas of Ventura County.

- Results of the enhanced rollback analysis show a design value of 0.076 ppm for Simi Valley in 2010, assuming an average background concentration of 0.040 ppm and reductions in ROG and NOx emissions of 8 percent and 10 percent, respectively, between now and 2010.

- In contrast, regression analyses based on design values show that attainment in Ventura County is not expected before 2010, but can be expected to occur by 2012.

- Photochemical modeling shows a design value of 0.087 ppm for Ventura County in 2012, which is close to attainment and within the range of a WOE attainment demonstration.

In summary, given the uncertainty in photochemical modeling, taken together with the significant air quality progress that has already occurred, and the result of the rollback and regression analyses which suggest attainment by 2012, the overall WOE analysis indicates that Ventura County can expect to attain the federal 8-hour ozone standard by 2013, the required attainment date for Serious nonattainment areas.

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