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**SACRAMENTO REGIONAL 8-HOUR OZONE  
2011 REASONABLE FURTHER PROGRESS PLAN  
DRAFT REPORT**

**February 2008**

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# **SACRAMENTO REGIONAL 8-HOUR OZONE**

## **2011 REASONABLE FURTHER PROGRESS PLAN**

### **DRAFT REPORT**

**This Plan demonstrates how existing control strategies will provide the necessary future emission reductions to meet the federal Clean Air Act requirements for reasonable further progress towards attaining the 8-hour ozone NAAQS for the Sacramento region through 2011. In addition, this Plan includes an updated emission inventory and maintains existing motor vehicle emission budgets for transportation conformity purposes.**

**February 2008**

## **ACKNOWLEDGEMENTS**

This report was prepared by Sacramento Metropolitan Air Quality Management District staff from the Program Coordination Division and Land Use and Mobile Source Division as a joint project with the El Dorado County Air Quality Management District, Feather River Air Quality Management District, Placer County Air Pollution Control District, and Yolo-Solano Air Quality Management District.

We would like to thank staff from the California Air Resources Board and Sacramento Area Council of Governments for their major contributions in the development of the updated motor vehicle emissions inventory. In addition, we would like to acknowledge the helpful review, comments, and participation by various staff or committee members from the following agencies:

El Dorado County Air Quality Management District  
Feather River Air Quality Management District  
Placer County Air Pollution Control District  
Sacramento Metropolitan Air Quality Management District  
Yolo-Solano Air Quality Management District  
Sacramento Area Council of Governments  
California Air Resources Board  
U.S. Environmental Protection Agency

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>94SIP -</b>	1994 Sacramento Area Regional Ozone Attainment Plan
<b>ABAG -</b>	Association of Bay Area Governments
<b>APCD -</b>	Air Pollution Control District
<b>AQMD -</b>	Air Quality Management District
<b>ARB -</b>	California Air Resources Board
<b>BAR -</b>	Bureau of Automotive Repair
<b>CAA -</b>	Clean Air Act
<b>CAMVCP -</b>	California Motor Vehicle Control Program
<b>CARB -</b>	California Air Resources Board
<b>CCOS -</b>	Central California Ozone Study
<b>CEFS -</b>	California Emissions Forecasting System
<b>CEQA -</b>	California Environmental Quality Act
<b>CFR -</b>	Code of Federal Regulations
<b>CMAQ -</b>	Congestion Mitigation and Air Quality Improvement Program
<b>DOT -</b>	U.S. Department of Transportation
<b>DTIM -</b>	Direct Travel Impact Model
<b>EDCAQMD -</b>	El Dorado County Air Quality Management District
<b>EIC -</b>	emission inventory category code
<b>EMFAC -</b>	California's on-road motor vehicle emission factor model
<b>EPA -</b>	U. S. Environmental Protection Agency
<b>ERCs -</b>	emission reduction credits
<b>FHWA -</b>	Federal Highway Administration of DOT
<b>FMVCP -</b>	federal motor vehicle control program
<b>FR -</b>	Federal Register
<b>FRAQMD -</b>	Feather River Air Quality Management District
<b>FTA -</b>	Federal Transit Administration of DOT
<b>GVWR -</b>	gross vehicle weight rating
<b>HDGT -</b>	heavy-duty gas trucks

<b>HDV -</b>	heavy-duty vehicles
<b>HHDDT -</b>	heavy heavy-duty diesel trucks
<b>IC -</b>	internal combustion
<b>I/M -</b>	motor vehicle inspection and maintenance
<b>LDV -</b>	light-duty vehicles
<b>LHDT -</b>	light heavy-duty trucks
<b>MC -</b>	Mountain Counties
<b>MHR -</b>	Mather Airport
<b>MSCD -</b>	Mobile Source Control Division
<b>MTC -</b>	Metropolitan Transportation Commission (Bay Area)
<b>MTIP -</b>	Metropolitan Transportation Improvement Program
<b>MTP -</b>	Metropolitan Transportation Plan
<b>MVEB -</b>	motor vehicle emissions budget
<b>NAA -</b>	nonattainment area
<b>NAAQS -</b>	national ambient air quality standard
<b>NG -</b>	natural gas
<b>NSR -</b>	new source review
<b>NOx -</b>	nitrogen oxides
<b>OAQPS -</b>	EPA Office of Air Quality Planning and Standards
<b>PCAPCD -</b>	Placer County Air Pollution Control District
<b>ppb -</b>	parts per billion
<b>ppm -</b>	parts per million
<b>RACM -</b>	reasonably available control measure
<b>RACT -</b>	reasonably available control technology
<b>RFP -</b>	reasonable further progress
<b>ROG -</b>	reactive organic gases
<b>ROP -</b>	rate-of-progress
<b>RVP -</b>	Reid vapor pressure
<b>SACOG -</b>	Sacramento Area Council of Governments
<b>SECAT -</b>	Sacramento Emergency Clean Air and Transportation

<b>SIP -</b>	State Implementation Plan
<b>SMAQMD -</b>	Sacramento Metropolitan Air Quality Management District
<b>SMF -</b>	Sacramento International Airport
<b>SNA -</b>	Sacramento Nonattainment Area
<b>SV -</b>	Sacramento Valley
<b>TCM -</b>	transportation control measure
<b>tpd -</b>	tons per day
<b>VMT -</b>	vehicle miles traveled
<b>VOC -</b>	volatile organic compounds
<b>YSAQMD -</b>	Yolo-Solano Air Quality Management District

## **1. EXECUTIVE SUMMARY**

### **1.1 Background Information on Ozone**

Ground-level ozone, a colorless gas, can have harmful health effects. For instance, at certain concentration levels, ozone can aggravate respiratory diseases such as asthma or bronchitis and can cause chest pains and wheezing. Ozone can also cause damage to crops and natural vegetation, by acting as a chemical oxidizing agent.

Ozone is formed as a result of photochemical reactions involving two types of precursor pollutants: volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>). VOC and NO<sub>x</sub> air pollutants are emitted by many types of sources, including on-road and off-road combustion engine vehicles, power plants, industrial facilities, gasoline stations, organic solvents, and consumer products. VOC pollutants are also known as reactive organic gases (ROG).

### **1.2 Overview of Federal 8-Hour Ozone Standard**

The federal 8-hour ozone standard lowered the health-based limit for ambient ozone concentration from 0.12 parts per million of ozone averaged over one hour<sup>1</sup> to 0.08 parts per million of ozone averaged over eight hours<sup>2</sup>. An area's nonattainment designation is based on whether the 8-hour ozone design value<sup>3</sup> concentration for any of the monitoring sites in the area exceeds the national ambient air quality standard (NAAQS). The Sacramento region is designated a nonattainment area, and includes all of Sacramento and Yolo counties and portions of Placer, El Dorado, Solano, and Sutter counties.

Nonattainment areas are classified as marginal, moderate, serious, severe, or extreme areas depending on the magnitude of the highest 8-hour ozone design value for the monitoring sites in the nonattainment area. The Sacramento region was classified as a "serious" nonattainment area with an attainment deadline of June 15, 2013. This classification was based on the 8-hour ozone design value of 107 ppb at Cool, calculated from ozone concentrations monitored during 2001 to 2003.

This document includes the information and analyses to fulfill the federal Clean Air Act requirements for demonstrating reasonable further progress (RFP) towards attaining the 8-hour ozone NAAQS for the Sacramento region through 2011. In addition, this plan establishes an updated emissions inventory and maintains existing motor vehicle emission budgets for transportation conformity purposes.

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<sup>1</sup> The 1-hour ozone standard violation criterion is no more than 3 daily exceedances (>124 ppb) over 3 years at a monitoring site.

<sup>2</sup> The 8-hour ozone standard violation concentration limit is set at 84 ppb.

<sup>3</sup> The 8-hour ozone design value is the standard-related indicator calculated as the annual 4<sup>th</sup>-highest daily maximum 8-hour ozone concentration averaged over 3 years.

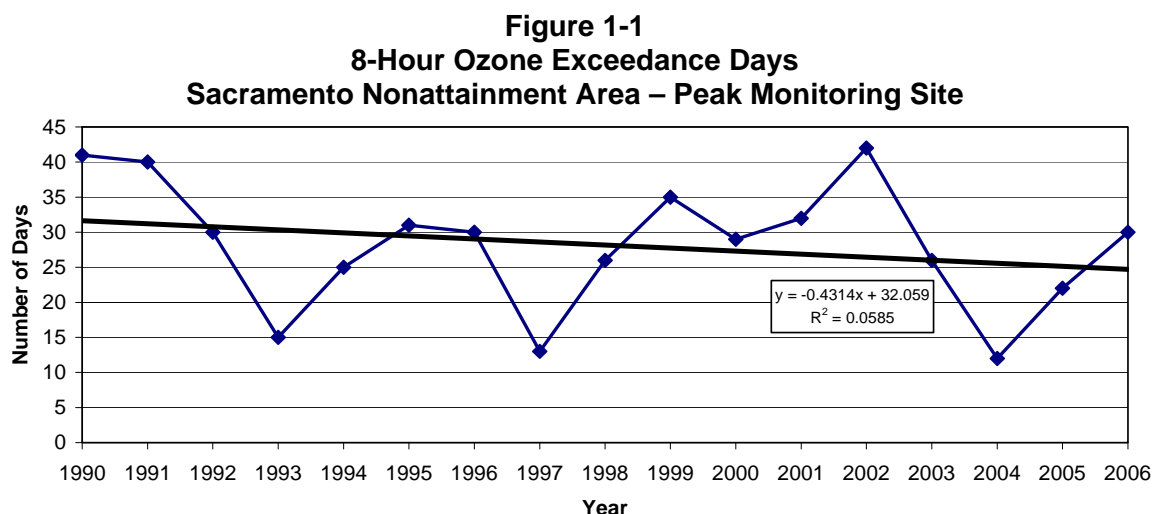
Despite meeting the 2011 progress target, however, the Sacramento region cannot meet the 2013 attainment date for serious nonattainment areas. This conclusion is based on an evaluation of: 1) emission inventory forecasts, 2) the implementation schedule of feasible control strategies, and 3) preliminary photochemical modeling results.

Section 181(b)(3) of the Clean Air Act (CAA) permits a state to request that EPA reclassify or “bump-up” a nonattainment area to a higher classification and extend the time allowed for attainment. This bump-up process is appropriate for areas that must rely on longer term strategies to achieve the emission reductions needed for attainment. Therefore, the air districts in the Sacramento region submitted a letter to the California Air Resources Board in February 2008 to request a voluntary reclassification (bump-up) of the Sacramento Federal Nonattainment Area from a “serious” to a “severe” 8-hour ozone nonattainment area with an extended attainment deadline of June 15, 2019.

### 1.3 8-Hour Ozone Trends in the Sacramento Region

The progress toward attainment is measured by analyzing ambient air quality data collected at various monitoring sites over a period of many years (1990-2006). There are currently 16 ozone monitoring stations located throughout the Sacramento region operated by local air districts and the California Air Resources Board.

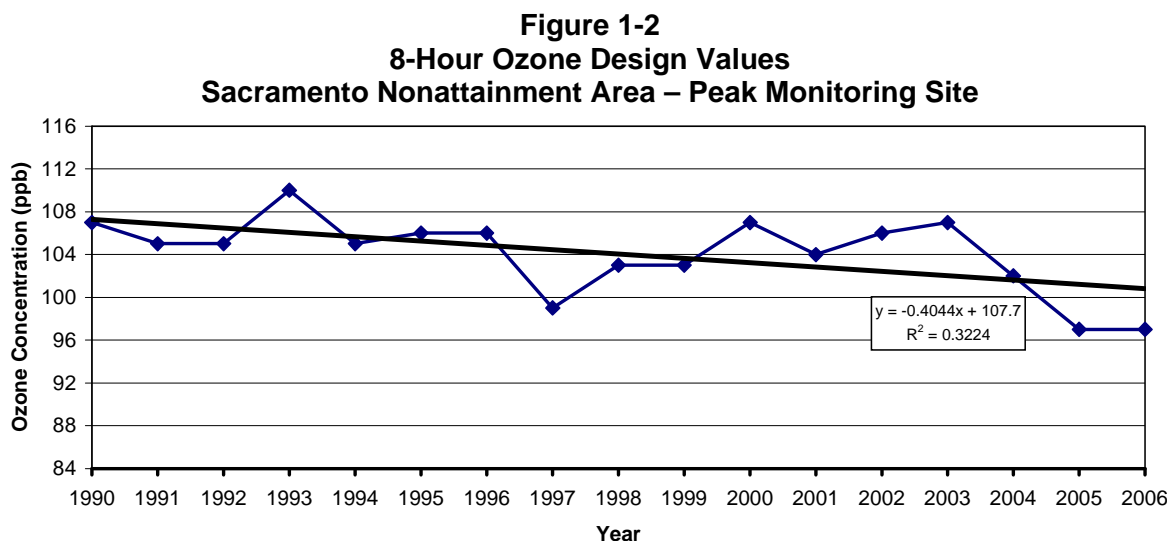
The annual number of 8-hour ozone exceedance days recorded at the peak monitoring sites fluctuates from year to year due to meteorological variability and changes in precursor emission patterns. The most frequent exceedances of the federal 8-hour ozone standard occur at the region’s eastern monitoring sites (Cool, Folsom, Placerville, and Auburn). The 17-year trend line indicates a slight decline in the overall average peak number of annual exceedance days, from about 32 down to 25 (see Figure 1-1).



Federal 8-hr ozone standard = 84 ppb

This trend analysis uses the highest number of 8-hour ozone exceedance days recorded each year at the various monitoring sites, including the addition of the Cool station in 1996.

The peak 8-hour ozone design value concentration also varies from year to year and occurs at the eastern monitoring sites in the Sacramento region. The overall 17-year trend line shows a slight decline, from 108 ppb down to about 101 ppb (see Figure 1-2). The design value has improved from being 24 ppb (or 28%) over the standard<sup>4</sup> down to about 17 ppb (or 20%).



Federal 8-hr ozone standard = 84 ppb

This trend analysis uses the highest 8-hour ozone design values based on ozone concentrations recorded each year at the various monitoring sites, including the addition of the Cool station in 1996.

## 1.4 VOC and NOx Emissions Inventory

Ozone is not directly emitted into the atmosphere, but is a secondary pollutant produced by photochemical reactions in the air involving volatile organic compounds (VOC) and nitrogen oxides (NOx). Therefore, planning efforts to evaluate and reduce ozone air pollution include identifying and quantifying the various processes and sources of VOC emissions (such as solvents, surface coatings, and motor vehicles) and NOx emissions (such as motor vehicles and other fuel combustion equipment).

EPA emission inventory guidance requires the planning emissions inventory to be based on estimates of actual emissions for an average summer weekday, typical of the ozone season. Only anthropogenic emissions are compiled for this RFP plan analysis. The anthropogenic emissions inventory is first divided into four broad source categories: stationary sources, area-wide sources, on-road motor vehicles, and other mobile sources. Each of these major categories is further defined into more descriptive equipment types and specific emission processes.

The 2002 base year anthropogenic planning inventory is estimated at about 160 tons per day of VOC emissions and 195 tons per day of NOx emissions for the Sacramento

<sup>4</sup> Federal 8-hour ozone standard = 84 ppb.



nonattainment area. The base year emissions are used to forecast future year inventories by using socio-economic growth indicators and the post-2002 emission reduction effects of existing control strategies. Also, potentially available pre-2002 emission reduction credits (ERCs) are included as additional growth in future years to ensure that their use will not be inconsistent with the reasonable further progress targets.

The 2002 base year emissions and 2011 emission forecasts for the Sacramento nonattainment area are summarized by the four major emission categories (and ERCs) in Tables 1-1 and 1-2. The VOC and NO<sub>x</sub> emission forecasts for 2011 show significant declines in mobile source emissions, despite increasing population, vehicle activity, and economic development in the Sacramento region.

**Table 1-1**  
**Emissions Inventory of Volatile Organic Compounds (VOC)**  
**Sacramento Nonattainment Area**

<b>Emission Category</b>	<b>2002</b>	<b>2011</b>
Stationary Sources	18	18
Area-Wide Sources	35	33
On-Road Motor Vehicles	64	38
Other Mobile Sources	43	38
ERCs	---	4
<b>Total</b>	<b>160</b>	<b>131</b>

**Table 1-2**  
**Emissions Inventory of Nitrogen Oxides (NO<sub>x</sub>)**  
**Sacramento Nonattainment Area**

<b>Emission Category</b>	<b>2002</b>	<b>2011</b>
Stationary Sources	16	15
Area-Wide Sources	3	3
On-Road Motor Vehicles	115	79
Other Mobile Sources	61	48
ERCs	---	3
<b>Total</b>	<b>195</b>	<b>149</b>

## **1.5 Reasonable Further Progress Demonstration**

The federal 8-hour ozone regulations<sup>5</sup> require that areas classified “serious or above” submit a reasonable further progress (RFP) demonstration plan that shows a minimum of 18% VOC (and/or NO<sub>x</sub>) emission reductions over the first 6 years following the 2002 baseline year and then an average of 3% reductions per year for each subsequent 3-

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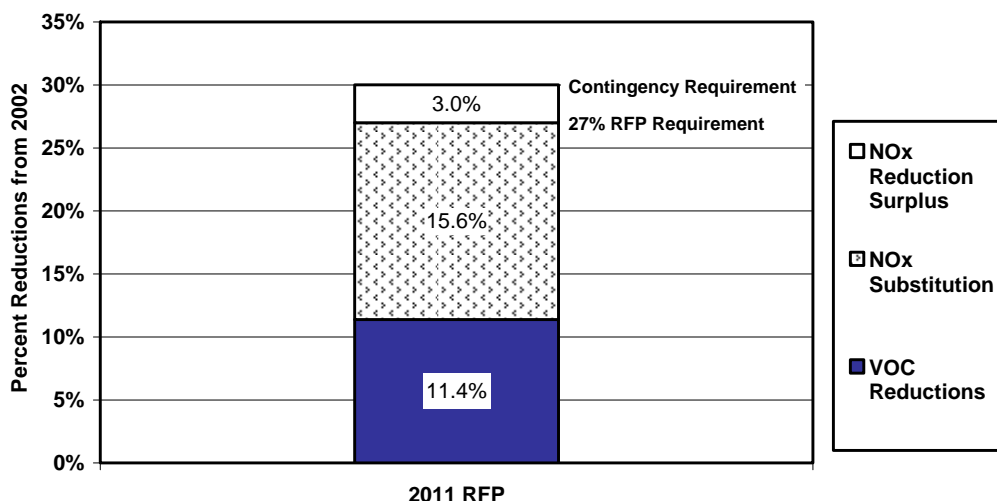
<sup>5</sup> Federal Register, November 29, 2005, p. 71634.

year period out to the attainment year. The RFP demonstration must fully account for emissions growth when calculating the net emission reductions.

In February 2006, the Sacramento region submitted an early 8-hour ozone RFP plan to EPA demonstrating an 18% reduction from 2002-2008 for the Sacramento nonattainment area with existing control strategies. In addition, the early RFP plan included an updated emission inventory and set new motor vehicle emission budgets for 2008, which EPA found to be adequate for transportation conformity purposes.<sup>6</sup>

This subsequent RFP demonstration for the 2011 milestone year is based on the 2011 emission inventory forecasts, which assume expected growth rates and existing control measures. The RFP requirement for 2011 is for a 27% reduction from 2002 base year emissions. Figure 1-3 shows the percentages of VOC and NOx reductions used to meet the 2011 RFP reduction goals. Projected future VOC and NOx emission reductions will provide the required 27% RFP reduction, as well as a 3% contingency margin.

**Figure 1-3**  
**Summary of Reasonable Further Progress Demonstration for 2011**  
**Sacramento Nonattainment Area**



## 1.6 Transportation Conformity and Motor Vehicle Emissions Budgets

Under the federal Clean Air Act, federal agencies may not approve or fund transportation plans and projects unless they are consistent with state air quality implementation plans (SIPs). Conformity with the SIP requires that transportation activities not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS). Conformity regulations state that emissions from transportation plans and projects must be less

<sup>6</sup> Federal Register, March 14, 2006, p. 13124 (effective date March 29, 2006).

than or equal to the motor vehicle emissions budgets established by reasonable further progress, attainment or maintenance plans (SIPs). (40 CFR 93.118)

While the 2011 RFP demonstration relies on revised motor vehicle emissions using EMFAC2007 and updated transportation activity data, the motor vehicle emissions budgets for 2011 are being maintained at the existing 2008 budget levels (previously established based on EMFAC2002). The motor vehicle emissions budgets for 2011 will be adjusted when the air districts in the Sacramento nonattainment area complete their subsequent attainment demonstration plan. This RFP plan is being expedited to satisfy the RFP demonstration requirement that was due June 15, 2007. A full evaluation of potential on-road emissions reductions from state and local measures and the environmental effects of updated transportation budgets will be conducted in the attainment demonstration plan.

The 2011 motor vehicle emissions budgets are shown in Table 1-3.

<b>Table 1-3</b>		
<b>2011 Motor Vehicle Emissions Budgets</b>		
<b>Sacramento Nonattainment Area</b>	<b>VOC</b>	<b>NOx</b>
2011 Motor Vehicle Emissions Budgets* (tons/day)	41	75

\*2008 motor vehicle emissions budgets (based on EMFAC2002) are carried forward to 2011.

In addition, to ensure that the transportation conformity budget levels do not interfere with the 2011 progress demonstration, the RFP demonstration was also performed using the 2011 budget levels in place of the 2011 on-road motor vehicle emissions inventory. The additional RFP analysis shows that the 2011 RFP reduction requirements can still be achieved using the 2011 motor vehicle emissions budgets.

## **1.7 General Conformity**

General conformity is the federal regulatory process for preventing major federal actions or projects from interfering with air quality planning goals. Conformity provisions ensure that federal funding and approval are given only to those activities and projects that are consistent with state air quality implementation plans (SIPs). Conformity with the SIP means that major federal actions will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS). Examples of general federal actions that may require a conformity determination include, but are not limited to, the following: leasing of federal land; private construction on federal land; reuse of military bases; airport construction and expansions, and construction of federal office buildings.

A federal agency may demonstrate conformity by showing that the total of direct and indirect emissions from the action is accounted for in the applicable SIP's attainment or

maintenance demonstration. Current federal rules do not allow the emissions inventory in a reasonable further progress plan to be used to support a general conformity determination, since the inventory must be from an applicable SIP's attainment or maintenance demonstration. However, EPA is in the process of revising the General Conformity Rule. To the extent this revision of the rule allows for general conformity emissions levels to be updated through the RFP process, the District will work diligently with State, local, and other agencies to update the general conformity emission levels with those identified in this RFP plan.

## **1.8 Conclusions**

1. The Sacramento region is designated a nonattainment area for the federal ambient 8-hour ozone standard.
2. The Sacramento region's 8-hour ozone nonattainment classification is "serious" with an attainment deadline of June 15, 2013.
3. The air districts in the Sacramento nonattainment area submitted a letter to the California Air Resources Board in February 2008 to request a voluntary reclassification (bump-up) to a "severe" 8-hour ozone nonattainment area with an extended attainment deadline of June 15, 2019.
4. Since 1990, there has been a declining trend in 8-hour ozone exceedances and ozone design value concentration, with most frequent violations occurring at eastern monitoring sites (Cool, Folsom, Placerville, and Auburn).
5. In comparison to 2002 base year VOC and NO<sub>x</sub> emissions inventory, the emission forecasts for 2011 show significant declines in mobile source emissions, despite increasing population, vehicle activity, and economic development in the Sacramento region.
6. The reasonable further progress (RFP) demonstration for the 2011 milestone year is achieved by a combination of VOC and NO<sub>x</sub> emission reductions. The VOC and NO<sub>x</sub> emission forecasts with existing control strategies will provide for the required 27% reduction from 2002 base year emissions, as well as a 3% contingency margin.
7. Transportation conformity emission budgets for 2011 are being maintained at the existing 2008 budgets levels previously established based on EMFAC2002. These motor vehicle emissions budgets do not interfere with the 2011 RFP demonstration.
8. Future ozone planning efforts will include the preparation of the comprehensive 8-hour ozone attainment and reasonable further progress plan, followed by periodic progress (milestone) reports to assess reasonable further progress.

## **2. Reasonable Further Progress (RFP) Process**

### **2.1 Purpose of a Federal Ozone Plan**

In 2004, the Sacramento region was rated one of the four worst ozone air quality areas in the nation, based on the U.S. Environmental Protection Agency (EPA) designations and classifications for the 8-hour ozone national ambient air quality standards (NAAQS)<sup>7</sup>. While air quality has improved in recent years, exceedances of the health-based ozone air quality standard continue to occur. Emissions of air pollutants that contribute to the formation of ozone must be reduced significantly in order to attain the NAAQS.

The federal 8-hour ozone implementation rules<sup>8</sup> set new deadlines for attaining the ozone standard. The rules also set specific planning requirements to ensure that the reasonable further progress (RFP) and attainment goals are met. Foremost among these requirements is adoption and implementation of a federal ozone plan, which must identify a comprehensive strategy to reduce emissions needed to show reasonable further progress and demonstrate attainment of the ozone standard by the mandated deadline.

This Sacramento Regional 8-Hour Ozone 2011 Reasonable Further Progress Plan was prepared to meet the 2011 RFP demonstration goals and requirements for submittal as part of California's State Implementation Plan (SIP) update. The California SIP includes plans for each of the state's nonattainment areas, along with rules, regulations, and other control measures adopted by air districts and the California Air Resources Board (CARB) to comply with the NAAQS.

### **2.2 Development of the Sacramento Regional 8-Hour Ozone 2011 Reasonable Further Progress Plan**

This ozone reasonable further progress plan was developed for the Sacramento region by the five air districts in the nonattainment area. The five local air districts include the Sacramento Metropolitan Air Quality Management District (SMAQMD), the Yolo-Solano Air Quality Management District (YSAQMD), the Placer County Air Pollution Control District (PCAPCD), the El Dorado County Air Quality Management District (EDCAQMD), and the Feather River Air Quality Management District (FRAQMD). In addition, staff from the California Air Resources Board (CARB) and Sacramento Area Council of Governments (SACOG) were key contributors in the development of the updated motor

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<sup>7</sup> "Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards" (Federal Register, April 30, 2004, p. 23858-23951) and EPA Website for "Classifications of 8-Hour Ozone Nonattainment Areas" (<http://www.epa.gov/oar/oaqps/greenbk/gnc.html>), as of March 2, 2006.

<sup>8</sup> "Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard – Phase 1" (Federal Register, April 30, 2004, p. 23951-24000) and "Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard – Phase 2" (Federal Register, November 29, 2005, p. 71612-71705).

vehicle emissions inventory. SACOG is the metropolitan planning organization (MPO) for transportation planning in the Sacramento region.

## **2.3 Public Input and Review Process**

Some existing public working groups were used to disseminate information and seek input from a wide variety of key community stakeholders during the development process of the draft plan. These committees included the Sacramento Cleaner Air Partnership, SACOG's Climate Change and Air Quality Subcommittee and Regional Planning Partnership, and the Chamber of Commerce's Air Quality and Transportation Subcommittee, who represent major business interests, environmental groups, transportation agencies, local governments, and other community organizations. In addition, a public review period is required to receive comments on the draft Sacramento Regional 8-Hour Ozone 2011 Reasonable Further Progress Plan. Finally, the Board of Directors for each of the air districts in the Sacramento nonattainment area are required to hold a public hearing and approve the RFP plan.

## **2.4 Contents of Reasonable Further Progress Plan**

This document includes the information and analyses to fulfill the federal 8-hour ozone reasonable further progress planning requirements for the Sacramento regional nonattainment area through 2011.

Chapter 1 is an executive summary of the 8-hour ozone RFP plan. Chapter 2 explains the purpose of the RFP plan and its development process. Chapter 3 contains a brief overview of background information on ozone health effects, ozone formation, the federal ozone standard, and planning requirements. Chapter 4 analyzes and illustrates 8-hour ozone air quality trends in the Sacramento region. Chapter 5 presents the 2002 base year emissions inventory and the emission forecasts that are based on existing control strategies and growth assumptions.

Chapter 6 demonstrates how the reasonable further progress emission reduction requirements will be achieved through 2011. Chapter 7 discusses transportation conformity and motor vehicle emissions budgets. Chapter 8 explains general conformity requirements and provides estimates for forecasted airport emissions. Finally, Chapter 9 summarizes the key points and major conclusions of this report, and mentions expected future air quality planning efforts by the air districts.

Additional documentation for the more technical sections of the 8-hour ozone reasonable further progress plan is contained in the following Appendices:

- A – Emissions Inventory
- B – Emission Reduction Credits
- C – California Motor Vehicle Control Program Adjustments

### **3. BACKGROUND INFORMATION**

#### **3.1 Ozone Health Effects**

Ground-level ozone, a colorless gas, is one of the air pollutants regulated by the federal and state government. Reducing ozone to levels below state and federal standards is one of the primary goals of the air districts.

Ozone is a strong irritant that adversely affects human health. As documented by the EPA in their 2006 Criteria Document<sup>9</sup> for ozone, both short-term and long-term exposure to ozone can irritate and damage the human respiratory system, resulting in:

- decreased lung function;
- development and aggravation of asthma;
- increased risk of cardiovascular problems such as heart attacks and strokes;
- increased hospitalizations and emergency room visits; and
- premature deaths<sup>10</sup>.

The adverse effects of ozone are not just limited to humans. Ozone can cause damage to crops and natural vegetation, by acting as a chemical oxidizing agent.

#### **3.2 Ozone Formation and Precursor Pollutants**

Ozone is not directly emitted into the atmosphere. It is a secondary pollutant formed in the atmosphere through complex chemical reactions involving volatile organic compounds (VOC) and nitrogen oxides (NOx) in the presence of sunlight. Because of this, VOC and NOx are known as ozone “precursors.”

VOC and NOx air pollutants are emitted by many types of sources, including on-road and off-road combustion engine vehicles, power plants, industrial facilities, gasoline stations, organic solvents, and consumer products. VOC pollutants are also known as reactive organic gases (ROG).

#### **3.3 Clean Air Act and Prior Federal 1-Hour Ozone Standard**

The first comprehensive national air pollution legislation was the federal Clean Air Act (CAA) of 1970. The CAA was amended in 1977 to require local plans for meeting national ambient air quality standards (NAAQS). To protect the public from unhealthy ozone levels, the U.S. Environmental Protection Agency (EPA) revised the national

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<sup>9</sup> “Air Quality Criteria for Ozone and Related Photochemical Oxidants” (EPA, February 2006) – <http://www.epa.gov/ncea>.

<sup>10</sup> Staff Report Revisions to the “Review of the California Ambient Air Quality Standard for Ozone” (California Air Resources Board, October 27, 2005, p. 1-1 and 1-2).

ambient ozone standard in 1979 to a concentration of 0.12 parts per million averaged over one hour<sup>11</sup>.

The federal Clean Air Act Amendments of 1990 included new attainment deadlines and planning requirements. In 1991, the Sacramento region was initially designated by EPA as a “serious” nonattainment area for the 1-hour ozone standard with an attainment deadline of 1999. Attainment demonstration plans for the 1-hour ozone standard were due to EPA by November 15, 1994.

### **3.4 1994 Sacramento Area Regional Ozone Attainment Plan**

Sophisticated air quality computer modeling was used to simulate future ozone formation and evaluate the effectiveness of emission control scenarios. Computer modeling did not project attainment by the 1999 deadline. As a result, the 1994 Sacramento Area Regional Ozone Attainment Plan was prepared to demonstrate that a combined strategy controlling emissions of volatile organic compounds and nitrogen oxides could achieve attainment of the federal 1-hour ozone standard by 2005. Commitments were made to develop and implement new regional, state, and federal control measures to reduce emission levels below the amounts shown by the modeled attainment demonstration.

In response to the 1994 SIP relying on a 2005 attainment date, EPA approved the attainment plan and voluntary request for nonattainment reclassification from a “serious” area to a “severe” area, effective June 1, 1995.<sup>12</sup>

### **3.5 Federal 8-Hour Ozone Standard**

In July 1997, EPA promulgated an 8-hour standard for ozone<sup>13</sup>. This change lowered the health-based standard for ambient ozone from 0.12 parts per million of ozone averaged over one hour to 0.08 parts per million of ozone averaged over eight hours. In general, the 8-hour standard is more protective of public health and more stringent than the federal 1-hour standard.

The American Trucking Association legally challenged this standard. In May 1999, the U.S. Court of Appeals ruled that EPA’s delegation of authority and implementation approach were improper, and remanded the standard. EPA appealed this decision, and in February 2001, the U.S. Supreme Court upheld the 8-hour ozone standard, but maintained that EPA’s implementation approach was unreasonable. In June 2003, EPA proposed a revised implementation strategy for the 8-hour ozone standard to address

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<sup>11</sup> One-hour ozone standard violation criterion defined as no more than 3 daily exceedances (>124 ppb) over 3 years at a monitoring site.

<sup>12</sup> “California, Sacramento Ozone Nonattainment Area, Reclassification to Severe” (Federal Register, April 25, 1995).

<sup>13</sup> “National Ambient Air Quality Standards for Ozone” (Federal Register, July 18, 1997, p. 38855-38896).



the Supreme Court findings, and finalized phases 1 and 2 of the rulemaking in the April 30, 2004 Federal Register and November 29, 2005 Federal Register, respectively.

The Phase 1 rule addressed such topics as: 1) classification and attainment deadlines, 2) revocation of the 1-hour ozone standard, 3) transitioning to the 8-hour ozone rule, and 4) control measure anti-backsliding provisions<sup>14</sup>. The Phase 2 rule addressed remaining elements of implementing the 8-hour ozone standard, such as: 1) reasonably available control technology and measures, 2) reasonable further progress, 3) modeling and attainment demonstrations, and 4) new source review.

Several parties representing various interest groups legally challenged different aspects of the Phase 1 rule. On December 22, 2006, the United States Court of Appeals for the District of Columbia Circuit decided in favor of some petitioners and upheld some EPA actions. The Court determined that EPA could revoke the 1-hour ozone standard and did not dispute EPA's classification scheme for the new 8-hour ozone standard using the approach promulgated under the 1990 CAA Amendments.<sup>15</sup> Nevertheless, the Court appeared to vacate the Phase 1 rule in its entirety, because EPA did not comply with the Clean Air Act anti-backsliding provisions in section 172(e), which requires 8-hour ozone nonattainment areas remain subject to control measure commitments that applied under the 1-hour ozone standard. The anti-backsliding provisions at issue include:

1. The Phase 1 rule provided that NSR levels be based on new 8-hour ozone classifications, rather than maintaining the more restrictive 1-hour ozone NSR levels.
2. The Phase 1 rule deferred Clean Air Act, section 185 penalty fees that would have been enforced for areas that did not attain the federal 1-hour ozone standards beginning in 2005.
3. The Phase 1 rule allowed states to remove 1-hour ozone plan contingency measures that have not been triggered, or to modify the trigger for measures to reflect the 8-hour standard.
4. The Phase 1 rule no longer required conformity determinations for the 1-hour ozone standard.

EPA requested a rehearing by the D.C. Circuit Court of Appeals. On June 8, 2007, the Court rejected the rehearing of classification and anti-backsliding issues. However, the Court clarified its reference to 1-hour ozone conformity determinations and limited the scope of its previous decision vacating the Phase 1 rule by stating that only those portions of the rule specifically challenged by the petitioners were affected by the ruling. Additionally, the Court urged EPA to promptly promulgate a revised rule.

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<sup>14</sup> Section 172(e) of the Clean Air Act provides that in the event EPA relaxes a primary standard, controls cannot be less stringent than the controls applicable to nonattainment areas before the relaxation.

<sup>15</sup> Court allowed 8-hour ozone classifications using Clean Air Act, Title 1, part D, subpart 2, but not using subpart 1.

Finally, on January 14, 2008, the Supreme Court denied two Industry petitions to review the D.C. Circuit Court of Appeals' decision on EPA's Phase 1 rule. These two petitions challenged the Circuit Court's interpretation of the Clean Air Act's anti-backsliding provisions, arguing in part that these provisions should not apply when EPA strengthens a NAAQS.

This RFP plan assumes that upon new action by EPA in response to the Court's remand, that EPA will not modify the 8-hour ozone classification scheme and attainment deadlines. The anti-backsliding issues are independent of and not relevant to this 8-hour ozone RFP plan.

### **3.6 Sacramento Nonattainment Area Designation**

EPA made determinations of which areas violate the standard under the federal 8-hour ozone regulations<sup>16</sup>, effective June 15, 2004. An area's nonattainment designation is based on whether the 8-hour ozone design value concentration for any of the monitoring sites in the area exceeds the national ambient air quality standard<sup>17</sup>. A monitoring site's 8-hour ozone design value is the standard-related indicator calculated by averaging the annual fourth-highest daily maximum 8-hour ozone concentrations over the most recent three years.

The Sacramento region is designated a nonattainment area, and includes all of Sacramento and Yolo counties and portions of Placer, El Dorado, Solano, and Sutter counties. See Figure 3-1 for a map of the 8-hour ozone Sacramento nonattainment area (same boundaries as federal 1-hour ozone nonattainment area).

### **3.7 Nonattainment Classification and Attainment Deadline**

Nonattainment areas are classified<sup>18</sup> as marginal, moderate, serious, severe, or extreme areas depending on the magnitude of the highest 8-hour ozone design value for the monitoring sites in the nonattainment area. The Sacramento region was classified as a "serious" nonattainment area<sup>19</sup> for the 8-hour ozone standard, with an attainment deadline of June 15, 2013 (i.e., 9 years after designation). This classification was based on the 8-hour ozone design value of 107 ppb at Cool, calculated from ozone concentrations monitored during 2001 to 2003.

Recent information and analyses from the ozone attainment planning process shows that Sacramento region cannot meet the 2013 attainment date for serious

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<sup>16</sup> "Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards" (Federal Register, April 30, 2004, p. 23857-23951).

<sup>17</sup> Federal 8-hour ozone standard = 84 ppb.

<sup>18</sup> Sacramento's classification was given by the more specific requirements of the subpart 2 provisions in the Clean Air Act.

<sup>19</sup> "Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards" (Federal Register, April 30, 2004, p. 23887).

nonattainment areas. This conclusion is based on an evaluation of: 1) emission inventory forecasts, 2) the implementation schedule of feasible control strategies, and 3) preliminary photochemical modeling results.

Section 181(b)(3) of the Clean Air Act permits a state to request that EPA reclassify or “bump-up” a nonattainment area to a higher classification and extend the time allowed for attainment. This “bump-up” process is appropriate for areas that must rely on longer term strategies to achieve the emission reductions needed for attainment. More stringent requirements are imposed with each higher classification level.

Therefore, the air districts in the Sacramento region submitted a letter to the California Air Resources Board in February 2008 to request a voluntary reclassification (bump-up) of the Sacramento Federal Nonattainment Area from a “serious” to a “severe” 8-hour ozone nonattainment area with an extended attainment deadline of June 15, 2019.

### **3.8 18 Percent 2002-2008 Reasonable Further Progress Plan**

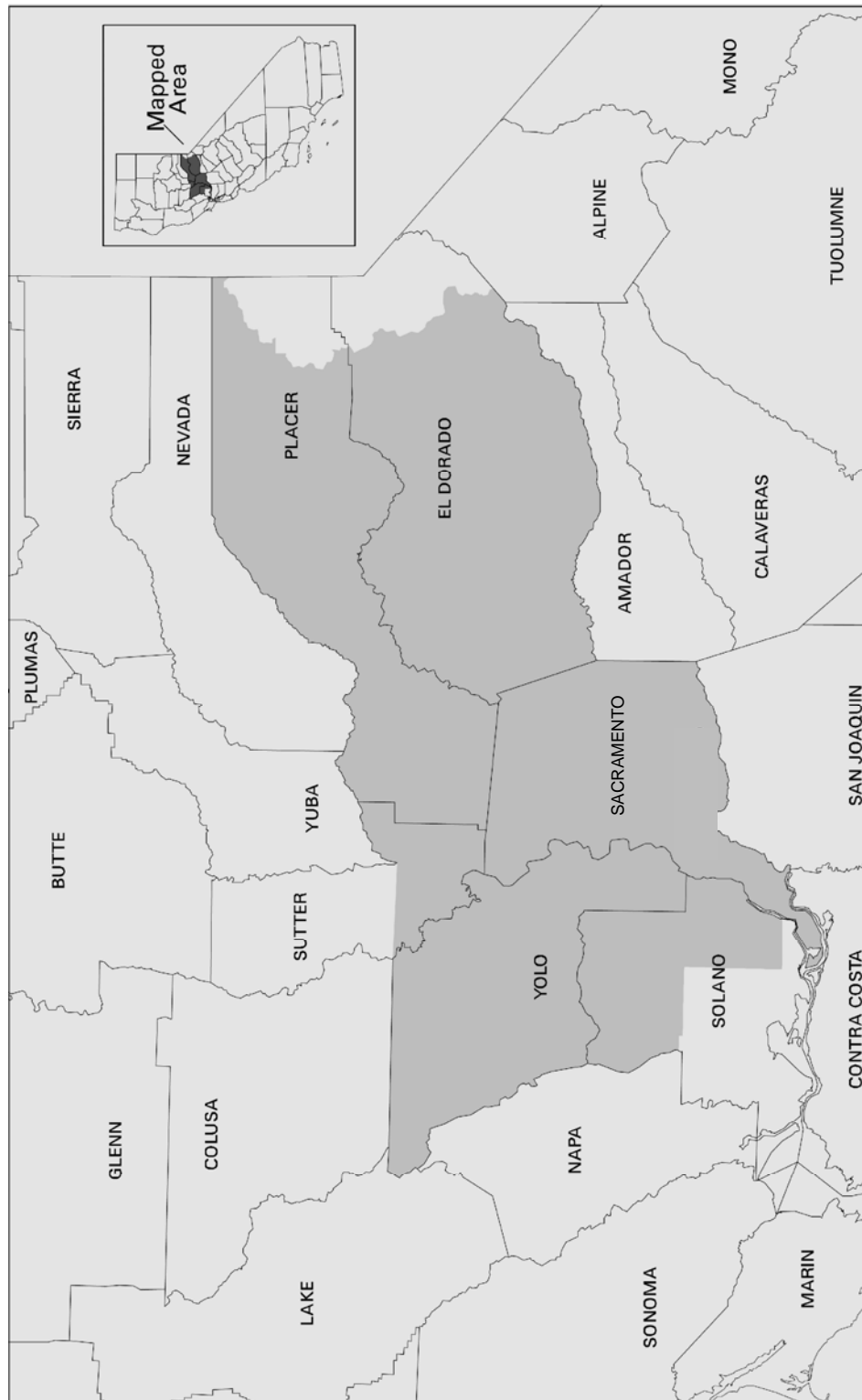
In February 2006, the Sacramento region submitted an early 8-hour ozone RFP plan<sup>20</sup> to EPA demonstrating an 18% reduction from 2002-2008 for the Sacramento nonattainment area with existing control strategies. In addition, the 2006 RFP plan included an updated emission inventory and set new motor vehicle emission budgets for 2008, which EPA found to be adequate for transportation conformity purposes.<sup>21</sup>

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<sup>20</sup> Sacramento Regional Nonattainment Area 8-Hour Ozone Rate-of-Progress Plan (February 2006).

<sup>21</sup> Federal Register, March 14, 2006, p. 13124 (effective date March 29, 2006).

**Figure 3-1  
Federal 8-Hour Ozone  
Sacramento Nonattainment Area**



## **4. 8-HOUR OZONE AIR QUALITY TRENDS**

### **4.1 Introduction to Air Quality Trends**

The progress toward attainment is measured by analyzing ambient air quality data collected at various monitoring sites over a period of many years. In this chapter, the focus of air quality trends is on two different 8-hour ozone parameters. These indicators are the number of days exceeding the 8-hour ozone standard and the magnitude of the 8-hour ozone design value concentrations.

### **4.2 Ozone Monitoring Sites**

There are currently 16 ozone monitoring stations located throughout the Sacramento nonattainment area operated by local air districts and the California Air Resources Board. Most ozone sites also have meteorological instruments, and some sites sample for ambient concentrations of ozone precursor pollutants, VOC and NOx.

See Figure 4-1 for a map showing the location of each of the ozone monitoring stations operating in the Sacramento region during 2006.

### **4.3 Annual Number of Exceedance Days**

Table 4-1 contains the annual number of days that exceeded the 8-hour ozone standard for each of the ozone monitoring sites in the Sacramento nonattainment area since 1990. The most frequent exceedances of the federal 8-hour ozone standard occur at the region's eastern monitoring sites (Cool, Folsom, Placerville, and Auburn). Also, the number of exceedance days at the peak monitoring site varies year to year, from 12 to 42. Year to year ozone differences are caused by meteorological variability and changes in precursor emission patterns. The 8-hour ozone standard allows for up to 3 exceedance days per year since the fourth-highest daily maximum 8-hour ozone concentration is used to calculate the ozone design value.

### **4.4 Trend in Exceedance Days**

The line graph in Figure 4-2 shows the number of exceedance days for the peak monitoring site in each year and a trend line from 1990 to 2006. The 17-year trend line indicates a slight decline in the overall average peak number of annual exceedance days, from about 32 down to 25, which equals a decline rate of about 0.4 exceedance day per year.

The trend line  $R^2$  statistic (coefficient of determination = 0.0585) is very low, which indicates a weak correlation due to the wide variability in the annual peak exceedance days. Also, the addition of the Cool monitoring station in 1996 may have skewed the 17-year trend analysis toward a smaller decline rate. Since Cool has been the peak exceedance site 7 times in the more recent years, the introduction of these higher

values in the later years of the trend analysis overshadows the decline rate of the earlier peak exceedance sites at Auburn and Folsom.

#### 4.5 Ozone Design Values

Table 4-2 lists the 8-hour ozone design value concentrations for each of the ozone monitoring sites in the Sacramento nonattainment area since 1990. The ozone design value is the indicator for determining attainment of the 8-hour ozone standard (84 ppb). A monitoring site's 8-hour ozone design value is calculated by averaging the annual fourth-highest daily maximum 8-hour average ozone concentrations over the most recent three years.<sup>22</sup> The location of the highest 8-hour ozone design value concentrations occurs most frequently at the region's eastern monitoring sites (Cool, Folsom, Placerville, and Auburn). Also, the region's peak ozone design value concentration varies from year to year, from a low of 97 ppb to a high of 110 ppb.

#### 4.6 Trend in Ozone Design Value

The line graph in Figure 4-3 shows the ozone design value for the peak monitoring site in each year and a trend line from 1990 to 2006. The overall 17-year trend line indicates a slight decline, from 108 ppb down to about 101 ppb. The design value has improved from being 24 ppb (or 28%) over the standard<sup>23</sup> down to about 17 ppb (or 20%), which equals a decline rate of about 0.4 ppb per year.

The trend line  $R^2$  statistic (coefficient of determination = 0.3224) is low, which indicates a weak correlation due to the lack of any significant trend pattern. Also, the addition of the Cool monitoring station in 1996 may have skewed the 17-year trend analysis toward a smaller decline rate. Since Cool has been the peak design value site from 1998 to 2005, the introduction of these high values in the later years of the trend analysis overshadows the decline rate of the earlier peak design value sites at Auburn and Folsom.

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<sup>22</sup> For example, the 2003 ozone design value concentration for a specific monitoring site would be calculated by taking the average of:

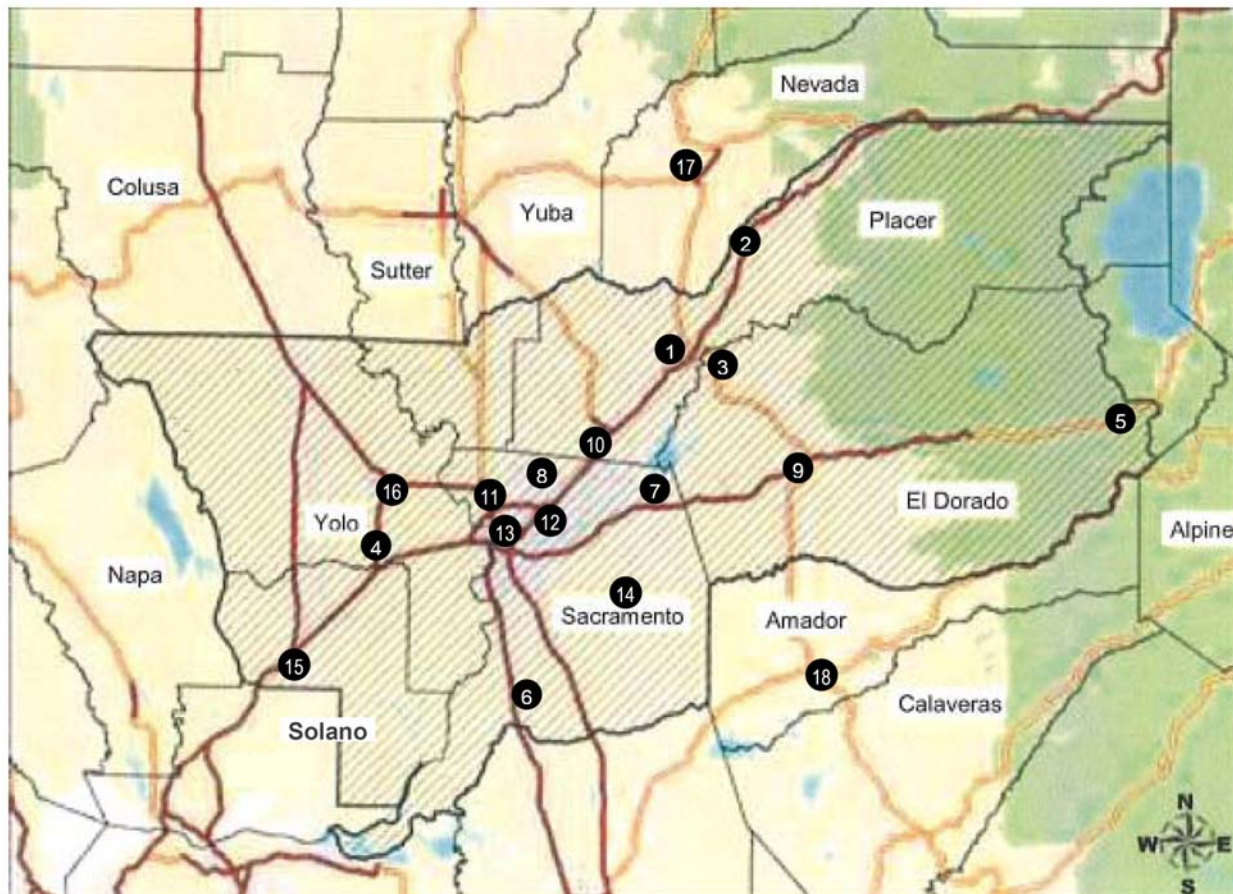
2001 4<sup>th</sup> highest daily maximum 8-hour average ozone concentration

2002 4<sup>th</sup> highest daily maximum 8-hour average ozone concentration

2003 4<sup>th</sup> highest daily maximum 8-hour average ozone concentration

<sup>23</sup> Federal 8-hour ozone standard = 84 ppb.

**Figure 4-1**  
**Sacramento Nonattainment Area**  
**Ozone Monitoring Stations**



2006 Ozone Monitoring Sites (County)

- |   |  |
|---|--|
| 1. Auburn (Placer Co.)                  | 12. Sacramento – Del Paso Manor (Sac. Co.) |
| 2. Colfax (Placer Co.)                  | 13. Sacramento – T Street (Sac. Co.)       |
| 3. Cool (El Dorado Co.)                 | 14. Sloughhouse (Sac. Co.)                 |
| 4. Davis (Yolo Co.)                     | 15. Vacaville (Solano Co.)                 |
| 5. Echo Summit (El Dorado Co.)          | 16. Woodland (Yolo Co.)                    |
| 6. Elk Grove (Sac. Co.)                 |  |
| 7. Folsom (Sac. Co.)                    |  |
| 8. North Highlands (Sac. Co.)           |  |
| 9. Placerville (El Dorado Co.)          |  |
| 10. Roseville (Placer Co.)              |  |
| 11. Sacramento – Airport Rd. (Sac. Co.) |  |

Adjacent Downwind Sites

- |                               |
|-------------------------------|
| 17. Grass Valley (Nevada Co.) |
| 18. Jackson (Amador Co.)      |

**Table 4-1**  
**8-Hour Ozone Exceedance Days**  
**Sacramento Nonattainment Area – Ozone Monitoring Sites**

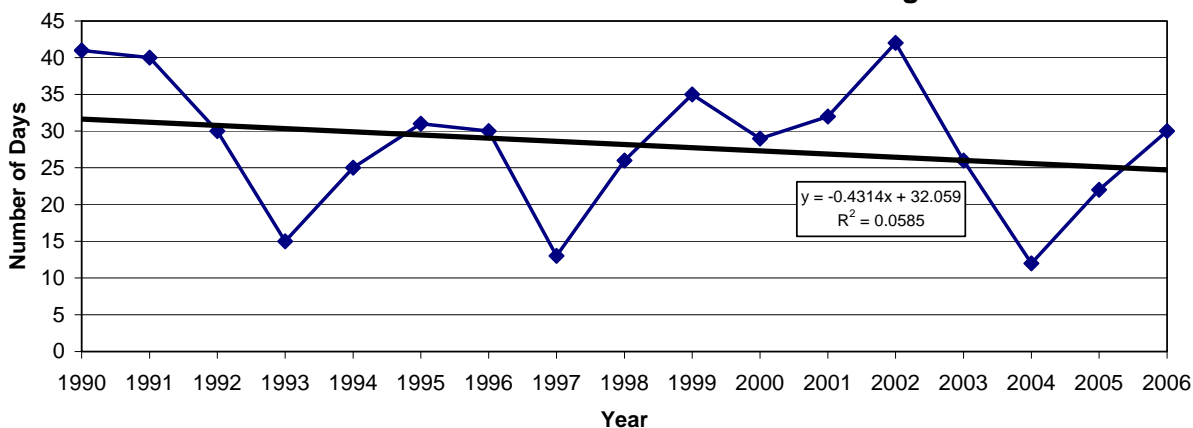
Monitoring Site	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Auburn	41	25	26	15	25	18	17	1	16	25	17	21	15	11	12	10	29
Colfax			12	4	12	11	5	2	8	9	na	na	18	12	9	13	14
Cool							30	10	25	35	29	32	42	22	8	22	30
Davis	3	0	4	1	0	2	4	1	4	5	2	2	2	0	0	0	1
Echo Summit											0	0	0	0	0	0	0
Elk Grove				0	3	4	9	3	4	7	1	3	0	5	1	2	7
Folsom	1	40	30	13	22	27	23	8	26	18	15	19	23	26	7	19	25
North Highlands	4	5	5	3	6	11	15	0	9	5	7	7	11	4	1	2	10
Placerville			29	12	22	31	27	13	17	23	15	15	20	19	7	16	20
Pleasant Grove*	0	0	4	2	0	7	5	0	4	3	3	3	2				
Rocklin*		12	24	9	19	17	20	4	12	11	12	8	15				
Roseville				7	8	8	12	2	12	9	8	9	11	5	1	9	9
Sac-Airport Rd.									6	1	1	2	0	1	0	1	1
Sac-Del Paso M.	17	14	14	6	5	23	13	1	10	6	9	6	23	13	3	10	10
Sac-T Street	2	2	2	1	0	3	3	1	4	4	0	3	3	1	0	1	3
Sloughhouse								3	24	19	18	15	16	19	8	10	17
Vacaville						3	2	0	7	8	0	0	0	0	1	0	2
Woodland									4	4	0	1	4	0	0	2	4
Peak Site	41	40	30	15	25	31	30	13	26	35	29	32	42	26	12	22	30

Data source: CARB air quality data base ([www.arb.ca.gov/adam/welcome.html](http://www.arb.ca.gov/adam/welcome.html)) – 2006 data preliminary.

\*Site closed

na = insufficient data available

**Figure 4-2**  
**8-Hour Ozone Exceedance Days**  
**Sacramento Nonattainment Area – Peak Monitoring Site**



Federal 8-hr ozone standard = 84 ppb

This trend analysis uses the highest number of 8-hour ozone exceedance days recorded each year at the various air monitoring stations, including the addition of the Cool station in 1996.



**Table 4-2**  
**8-Hour Ozone Design Values (ppb)**  
**Sacramento Nonattainment Area – Ozone Monitoring Sites**

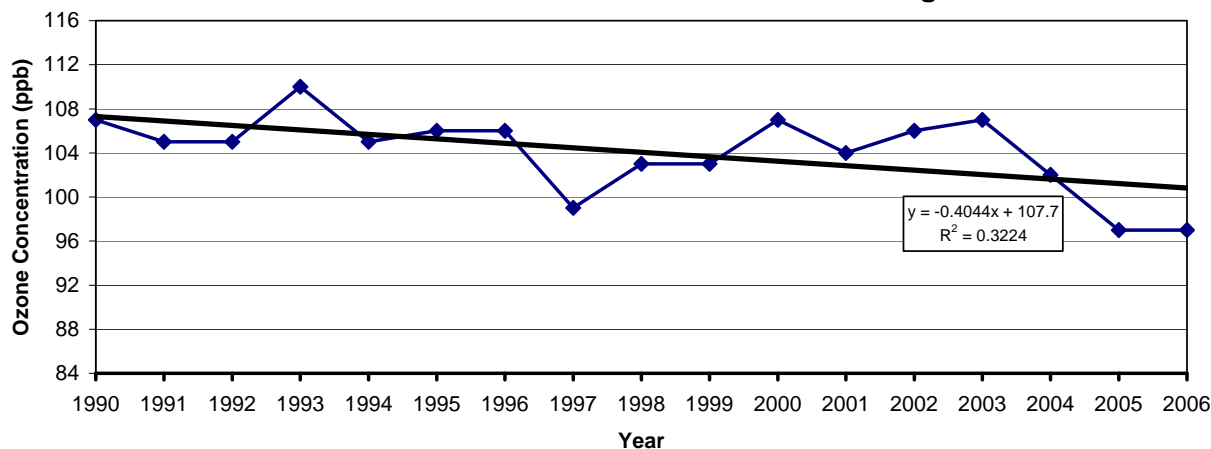
Monitoring Site	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Auburn	107	105	105	101	102	105	103	95	95	97	102	101	101	99	95	92	93
Colfax			92	92	92	92	91	86	86	86	na	na	na	88	92	91	97
Cool							103	97	103	103	107	104	106	107	102	97	95
Davis					79	78	82	79	80	81	85	81	77	76	74	73	74
Echo Summit													76	76	75	na	na
Elk Grove						81	87	87	87	88	85	84	75	80	77	82	82
Folsom	102	101	101	110	105	106	106	92	92	101	104	99	100	100	97	97	97
North Highlands	87	na	88	87	87	88	91	88	89	87	89	89	92	91	85	80	82
Placerville			98	95	97	99	103	99	98	98	99	96	94	95	94	94	94
Pleasant Grove*					81	82	83	82	81	81	84	83	82				
Rocklin*		93	102	101	103	100	100	95	94	92	93	91	92				
Roseville				103	96	97	96	93	93	89	93	90	92	90	87	86	89
Sac-Airport Rd.									88	85	82	79	78	77	74	73	73
Sac-Del Paso M.	96	95	100	99	92	96	100	97	95	91	95	92	95	97	95	92	90
Sac-T Street			79	79	78	78	80	77	79	80	82	80	79	79	75	73	76
Sloughhouse									97	100	105	98	95	95	94	94	96
Vacaville								76	82	85	85	77	72	72	71	71	73
Woodland									87	86	84	82	83	83	79	77	79
Peak Site	107	105	105	110	105	106	106	99	103	103	107	104	106	107	102	97	97

Data source: CARB air quality data base ([www.arb.ca.gov/adam/welcome.html](http://www.arb.ca.gov/adam/welcome.html)) – 2006 data preliminary.

\*Site closed after 2002.

na = insufficient data available

**Figure 4-3**  
**8-Hour Ozone Design Values**  
**Sacramento Nonattainment Area – Peak Monitoring Site**



Federal 8-hr ozone standard = 84 ppb

This trend analysis uses the highest 8-hour ozone design values based on ozone concentrations recorded each year at the various air monitoring stations, including the addition of the Cool station in 1996.

## **5. EMISSIONS INVENTORY**

### **5.1 Introduction to Emissions Inventory**

Ozone is not directly emitted into the atmosphere, but is a secondary pollutant produced by photochemical reactions in the air involving volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>). Therefore, planning efforts to evaluate and reduce ozone air pollution include identifying and quantifying the various processes and sources of VOC emissions (such as solvents, surface coatings, and motor vehicles) and NO<sub>x</sub> emissions (such as motor vehicles and other fuel combustion equipment). VOC pollutants are also known as reactive organic gases (ROG) and are considered to be synonymous for this report.

In this chapter, the emissions inventory system is characterized by different air pollutant source categories for the Sacramento nonattainment area. The summary of VOC and NO<sub>x</sub> emissions estimates are provided for a 2002 base year in tabular and graphical formats. In addition, the base year emissions are used to forecast future year inventories by using socio-economic growth indicators and the post-2002 emission reduction effects of existing control strategies. Emission reduction credits are also included into the emissions inventory forecasts. More detailed information and emissions inventory tables are provided in Appendix A – Emissions Inventory.

### **5.2 Emission Inventory Requirements**

The baseline year for the SIP planning emissions inventory is identified as 2002 by EPA guidance memorandum<sup>24</sup>. Additional EPA emission inventory guidance<sup>25</sup> and federal 8-hour ozone implementation rules<sup>26</sup> set specific planning requirements pertaining to future milestone years for reporting reasonable further progress (RFP). Key RFP analysis years include 2008 and every subsequent 3 years out to the attainment date. For this RFP plan, the emissions inventory forecasts are evaluated for the 2011 milestone year.

EPA emission inventory guidance<sup>27</sup> also requires the SIP planning emissions inventory to be based on estimates of actual emissions for an average summer weekday, typical of the ozone season. Only anthropogenic emissions are compiled for this RFP plan analysis.

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<sup>24</sup> “2002 Base Year Emission Inventory SIP Planning: 8-Hour Ozone, PM<sub>2.5</sub> and Regional Haze Programs” (EPA Memorandum from L. Wegman and P. Tsirigotis, November 18, 2002).

<sup>25</sup> “Emission Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations” (EPA-454/R-05-001, August 2005, updated November 2005).

<sup>26</sup> “Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard – Phase 2” (Federal Register, November 29, 2005, p. 71612-71705).

<sup>27</sup> “Emission Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations” (EPA-454/R-05-001, August 2005, updated November 2005, p. 17).

### **5.3 Emission Inventory Source Categories**

Due to the large number and wide variety of emission processes and sources, a hierarchical system of emission inventory categories was developed for more efficient use of the data. The anthropogenic emissions inventory is divided into four broad categories: stationary sources, area-wide sources, on-road motor vehicles, and other mobile sources. Each of these major categories is subdivided into more descriptive subcategory sources. Each of these subcategories is further defined into more specific emission processes.

#### **5.3.1 Stationary Sources**

The stationary source category of the emissions inventory includes non-mobile, fixed sources of air pollution. They are mainly comprised of individual industrial, manufacturing, and commercial facilities called “point sources.” The more descriptive subcategories include fuel combustion (e.g., electric utilities), waste disposal (e.g., landfills), cleaning and surface coatings (e.g., printing), petroleum production and marketing, and industrial processes (e.g., chemical). Industrial facility operators reported the process and emissions data used to calculate emissions from point sources.

#### **5.3.2 Area-Wide Sources**

The area-wide sources inventory category includes aggregated emissions data from processes that are individually small and widespread or not well-defined point sources. The area-wide subcategories include solvent evaporation (e.g., consumer products and architectural coatings) and miscellaneous processes (e.g., residential fuel combustion and farming operations). Emissions from these sources are calculated from product sales, population, employment data, and other parameters for a wide range of activities, which generate air pollution across the Sacramento nonattainment region. More detailed information on the area-wide source category emissions can be found on the CARB website: <http://www.arb.ca.gov/ei/areasrc/areameth.htm>

#### **5.3.3 On-Road Motor Vehicles**

The on-road motor vehicles inventory category consists of trucks, automobiles, buses, and motorcycles. On-road motor vehicle emissions are updated as part of the overall requirement for “plan revisions to include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutants” under sections 172(c)(3) and 182(a)(1) of the Clean Air Act. EMFAC, the California model for on-road motor vehicle emissions, has undergone significant revision since the EMFAC2002 model

(version 2.2), which was used in the early 8-hour ozone 2002-2008 RFP plan<sup>28</sup> submitted to EPA in February 2006.

### **Improved Motor Vehicle Emissions Model, EMFAC2007**

The California Air Resources Board has continued to update and improve its EMFAC on-road motor vehicle emissions model with extensive new data. ARB's EMFAC2007 model (version 2.3)<sup>29</sup> was released November 2006. The most significant improvements in EMFAC2007 include:

- Revised vehicle fleet information based on California Department of Motor Vehicles registration records specific to each county, which reflect the growth in vehicle populations and the increasing average age of the fleet;
- Current base year and forecast year VMTs and speed distributions from regional transportation and metropolitan planning organizations;
- Redistribution of heavy-duty diesel truck populations based on VMT;
- Enhanced emission rate data for heavy-duty diesel trucks that include the results of testing larger sample sizes and recent model years; and
- New summer temperature and relative humidity profiles better representing the meteorological conditions corresponding to the federal 8-hour ozone standard.

Updated on-road motor vehicle emission estimates were developed using the latest available SACOG transportation data and California's new EMFAC2007<sup>30</sup> model. In general, the revised EMFAC2007 on-road motor vehicle emission forecasts are higher than the previous EMFAC2002 model. For example, in the Sacramento region, updated EMFAC2007 VOC emission forecasts are estimated about 10% higher than EMFAC2002, and updated EMFAC2007 NOx emission forecasts are estimated about 25% more than EMFAC2002.

The current and forecasted vehicle miles traveled (VMT) are from SACOG-supplied activity data (submitted to ARB December 2007)<sup>31</sup> based on transportation modeling for the Sacramento region's most recent Metropolitan Transportation Plan (MTP2035). The vehicle activity levels for the eastern part of Solano County in the Sacramento nonattainment area are based on MTP data (submitted to ARB August 2006) from the Bay Area Metropolitan Transportation Commission (MTC).

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<sup>28</sup> Sacramento Regional Nonattainment Area 8-Hour Ozone Rate-of-Progress Plan (February 2006).

<sup>29</sup> EMFAC software and detailed information on the vehicle emissions model can be found on the CARB website: <http://www.arb.ca.gov/msei/onroad/on-road.htm>

<sup>30</sup> ARB conducted off model runs to incorporate SACOG's MTP2035 travel forecasts that were not included in the released EMFAC2007 model (version 2.3). (Jon Taylor e-mail providing on-road emissions with SACOG activity, sent to SMAQMD on January 29, 2008).

<sup>31</sup> SACOG travel data transmittal letter to ARB and December 3, 2007 e-mail to SMAQMD.

## **SACOG's Blueprint MTP**

Over the past several years, the Sacramento region has embarked on a visionary process of defining and implementing a new, higher density, land use pattern which reduces congestion, encroachment on open space, average vehicle miles traveled per household and air pollutants. The program, called Blueprint, was initiated by SACOG with the goal of reducing traffic congestion in the future metropolitan transportation plans.

In December 2004, Blueprint smart growth principles and a 2050 growth scenario were approved by SACOG<sup>32</sup> to achieve the following objectives:

1. Provide a variety of transportation choices
2. Offer housing choices
3. Take advantage of compact development
4. Use existing assets
5. Mixed land use
6. Natural resource conservation
7. Ensure distinctive, attractive communities with quality design

The region then began the more detailed planning efforts for the long range Metropolitan Transportation Plan for 2035 (MTP2035). SACOG works with local jurisdictions, CalTrans, and transportation and planning agencies to define interim land use allocations and specific transportation project needs. Federal MTP guidelines require that the land use allocations represent what is most likely to be built. Therefore, the specific Blueprint smart growth policies affect land use allocations only to the extent that the local jurisdictions and SACOG are able to demonstrate that they will actually occur.

## **SACOG's Transportation Model**

The transportation analysis for the MTP2035 relied on SACOG's new regional travel forecasting system, SACSIM.<sup>33</sup> SACSIM incorporates an "activity-based" travel model which simulates the population of households allocated to parcels and creates a one-day activity and trip travel schedule for each person in the population. The activity and travel schedule are sensitive to transportation network accessibility and a variety of land use variables. SACSIM also incorporates a mode choice model which determines how each travel destination is reached. The network traffic assignment models load the trips onto the network. The results of the travel model predicted that growth in vehicle trips and growth in vehicle miles traveled will be slightly lower than the population growth rate for the Sacramento region through 2035.

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<sup>32</sup> <http://www.sacog.org/regionalfunding/betterways.pdf>

<sup>33</sup> Bradley, M.A., J.L. Bowman and B. Griesenbeck. "Development and application of the SACSIM activity-based model system," submitted for presentation at the 11<sup>th</sup> World Conference on Transport Research, Berkeley, California. June 2007.

### 5.3.4 Other Mobile Sources

The emission inventory category for other mobile sources includes aircraft, trains, ships, and off-road vehicles and equipment used for construction, farming, commercial, industrial, and recreational activities. The OFFROAD2007 model was released November 2006 by CARB and used to calculate the air pollutant emissions from vehicles and engines used in agriculture, construction, lawn and garden care, and off-road recreation. In general, emissions are calculated based on estimated equipment population, engine size and load, usage activity, and emission factors.

Aircraft, ship, and train emissions are estimated outside the OFFROAD model. More detailed information on the OFFROAD2007 mobile emissions model can be found on the CARB website: <http://www.arb.ca.gov/msei/offroad/off-road.htm>

## 5.4 Base Year Emissions Inventory

The following tables (Tables 5-1 and 5-2) show the 2002 anthropogenic emissions inventory of VOC and NO<sub>x</sub> by source categories for the Sacramento nonattainment area. The Sacramento nonattainment area for the federal 8-hour ozone standard includes all of Sacramento and Yolo Counties, eastern portion of Solano County, Placer and El Dorado Counties excluding the Lake Tahoe Basin, and the southern portion of Sutter County<sup>34</sup>. The emissions inventory for ozone planning purposes represents emissions for a summer seasonal average day in units of tons per day<sup>35</sup>. The VOC emissions total is 160 tons per day in 2002. The NO<sub>x</sub> emissions total is 195 tons per day in 2002.

The following pie charts (Figures 5-1 to 5-2) show the 2002 VOC and NO<sub>x</sub> emission inventory categories as a percentage of the total inventory for the Sacramento nonattainment region. In 2002, the VOC inventory includes 40% on-road mobile sources, 27% other mobile sources, 22% area-wide sources, and 11% stationary sources.

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<sup>34</sup> Southern Sutter County emissions include:

- 1) all point sources located in the area,
- 2) 6% of the county total of area and aggregated point sources that are projected by population or construction/demolition activity, where, 6% is the percent of Sutter County population in the Sutter portion of the Sacramento nonattainment area based on the same percentage split used in the 1994 SIP Plan,
- 3) 34% of the county total for emissions from agriculture and off-road equipment, where, 34% is the percent of Sutter County land area in the Sutter portion of the Sacramento nonattainment area,
- 4) 0% of the county total for emissions from oil and gas operations, landfills, and cogeneration categories.

<sup>35</sup> Annual emissions are multiplied by a summer seasonal factor,  $TF = [\text{sum of fractional monthly throughputs for the emission process during May through October}] / 184 \text{ days in the summer ozone season}$ .

The NO<sub>x</sub> inventory is mainly due to mobile source combustion emissions. In 2002, the NO<sub>x</sub> inventory includes 59% on-road mobile sources, 31% other mobile sources, 8% stationary sources, and 2% area-wide sources.

## **5.5 Emissions Inventory Forecasts**

Emission inventory forecasts are needed for various future milestone and attainment analysis years. The 2002 base year emissions are used to forecast future year inventories by using socio-economic growth parameters and the post-2002 emission reduction effects of already adopted control measures.<sup>36</sup> The various growth parameters include forecasts for population, housing, employment, energy demand, motor vehicle travel, and other industrial and commercial outputs. Existing control strategies continue to reduce future VOC and NO<sub>x</sub> emissions from stationary and area sources, on-road motor vehicles, and some other mobile source categories (such as off-road equipment).

Tables 5-1 and 5-2 include the anthropogenic emissions inventory forecasts of VOC and NO<sub>x</sub> by source categories for the Sacramento nonattainment area. Emission forecasts are given for the 2011 RFP milestone year.

The following bar charts (Figures 5-3 and 5-4) show the VOC and NO<sub>x</sub> emission inventory forecasts for stationary sources, area-wide sources, on-road motor vehicles, and other mobile sources for the Sacramento nonattainment region. Bar charts are given for the 2002 base year and compared to the 2011 RFP milestone year. The VOC and NO<sub>x</sub> emission forecasts show significant declines in mobile source emissions, despite increasing population, vehicle activity, and economic development in the Sacramento region.

## **5.6 Emission Reduction Credits Added to Emission Inventory Forecasts**

Certain pollutant emission reductions due to equipment shutdown or voluntary control may be converted to emission reduction credits (ERCs) and registered with the air districts. These ERCs may then be used as “offsets” to compensate for an increase in emissions from a new or modified major emission source regulated by the air districts. In the SMAQMD, ERCs may also be used as an alternative to strict compliance with specified rules. Thus, if a permitted source cannot meet the applicable emission standard requirements, usually because it is technically infeasible or not cost effective, the source may lease or purchase ERCs to achieve the required reductions.

Since ERCs represent potential emissions, they need to be taken into account in the forecasted emission inventories. One method is to assume that the use of ERCs will

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<sup>36</sup> Some recently adopted CARB and district control measures through December 31, 2006 were manually adjusted into emission projections for the Sacramento nonattainment area from the California Emission Forecast System (CEFS), Version 1.06 dated November 16, 2006. These recently adopted emission controls are listed separately in Appendix A.

already be included within the projected rate of stationary source growth in the emissions inventory. However, if the use of available ERCs exceeds anticipated emissions growth, future emissions could be underestimated. Therefore, to ensure that the use of ERCs will not be inconsistent with the future reasonable further progress and attainment goals, the amount of ERCs issued for reductions that occurred prior to the 2002 base year are added to the emission inventory forecasts.

### **Emission Reduction Credits**

For this RFP plan, the amount of unused ERCs available in the 2002 baseline year for the Sacramento nonattainment area are 3.2 tons per day of VOC and 1.8 tons per day of NOx. The quantity of these ERCs is documented by air district in Appendix B. The ERCs consist of emissions reduced from stationary sources, military aircraft, and agricultural burning sources.

All of the stationary source and military aircraft emissions represented by these ERCs were included in the previous 1990 SIP-approved base year emissions inventory or in the 1994 attainment demonstration. Including these ERCs here simply maintains the validity of those ERCs during the transition from the 1990 to the 2002 base year inventory.

NOx emissions from agricultural burning, including rice straw burning, were not included in the 1990 SIP base year inventory and as such were not included in the 1-hour ozone 1994 attainment demonstration, because NOx emission factors were not in an approved form at that time.<sup>37</sup> Currently, emission credits from reduction in burning may not be used to comply with offset requirements at a new major stationary source or a major modification, because they were not included in an approved attainment demonstration plan.<sup>38</sup> Therefore, the impact of accounting for ERCs from reduction in rice straw burning and other agricultural burning credits are being included in this RFP plan.

### **Future Bankable Rice Burning Emission Reduction Credits**

California legislation<sup>39</sup> in 1991 (known as the Connelly bill) required rice farmers to phase down rice field burning on an annual basis, beginning in 1992. A burn cap of 125,000 acres in the Sacramento Valley Air Basin was established, and growers with 400 acres or less were granted the option to burn their entire acreage once every four years. Since the rice burning reductions were mandated by state law, they would ordinarily not be “surplus” and eligible for banking. However, the Connelly bill included a special provision declaring that the reductions qualified for banking if they met the State and local banking rules.

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<sup>37</sup> The VOC emissions from these burning activities had been included in the 1994 Sacramento Area Regional Ozone Attainment Plan.

<sup>38</sup> Pursuant to EPA correspondence letter dated October 30, 2003

<sup>39</sup> Connelly-Areias-Chandler Rice Straw Burning Reduction Act of 1991.



Potential future rice burning ERCs could be issued for previous reductions that are eligible for banking. The amounts of future bankable rice burning ERCs for the Sacramento nonattainment area are estimated at 0.5 tons per day of VOC and 0.6 tons per day of NOx. The potential future bankable rice burning ERCs are listed by air district in Appendix B.

### **Summary of Emission Reduction Credits**

ERCs, including agricultural burning, issued for reductions that occurred prior to the 2002 base year and potential future bankable rice burning ERCs are summarized for the Sacramento nonattainment area and added to the VOC and NOx emission inventory forecasts in Tables 5-3 and 5-4. The ERCs are not included in the 2002 base year inventory.

## **5.7 Emissions Inventory Documentation**

More detailed documentation of the VOC and NOx emissions inventory is provided in Appendix A. This appendix contains the estimated 2002 and 2011 emission inventories for the Sacramento nonattainment area by more specific emission categories. A listing of the VOC and NOx emission reduction credits by individual air district is included in Appendix B.

Emission inventories are constantly being updated to incorporate new and better information and methodologies. Many improvements, especially in the mobile source categories, and the addition of previously un-inventoried emission sources, have been made to the inventory since the last approved SIP inventory. Detailed information on emission methodologies, changes and forecasts can be found on CARB websites: <http://www.arb.ca.gov/ei/ei.htm> and <http://www.arb.ca.gov/msei/msei.htm>

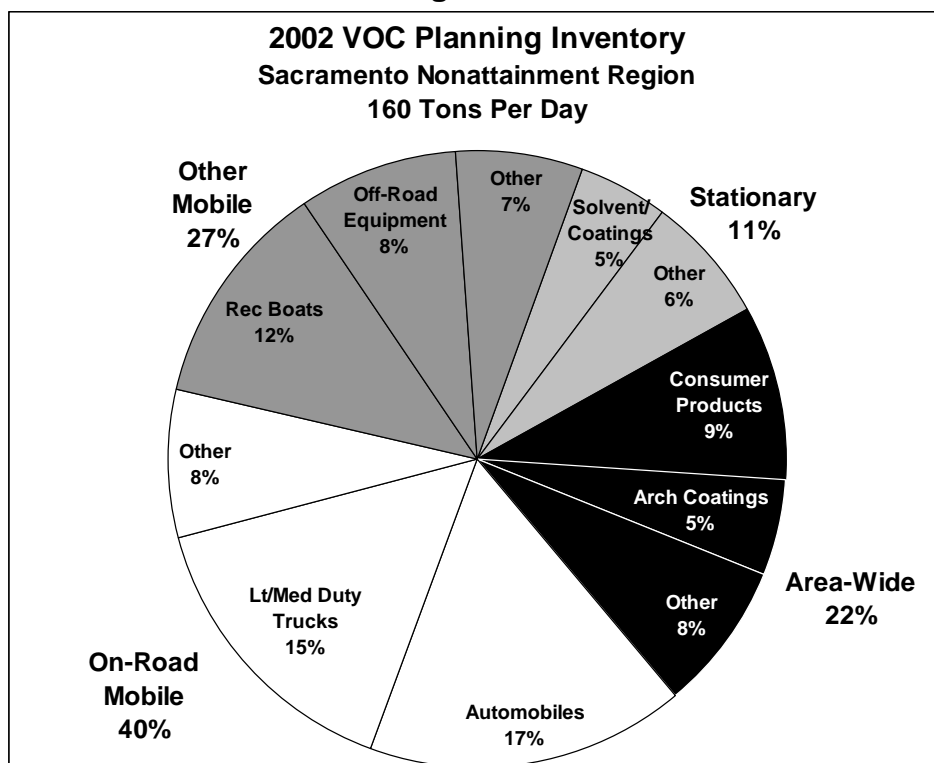
<b>Table 5-1</b> <b>Emissions of VOC<sup>a</sup> (tons per day)</b> <b>Sacramento Nonattainment Area</b>		
	<b>2002</b>	<b>2011</b>
<b>TOTAL EMISSIONS</b>	160	127
STATIONARY	18	18
AREA-WIDE	35	33
ON-ROAD MOTOR VEHICLES	64	38
OTHER MOBILE SOURCES	43	38
<b>STATIONARY</b>		
Solvent/Coatings	7.7	7.1
Petroleum Production/Marketing	4.9	5.3
Industrial Process	3.6	3.9
Other	2.0	2.1
<b>AREA-WIDE</b>		
Consumer Products	14.8	13.8
Architectural Coatings	8.0	7.3
Pesticides	1.8	1.3
Livestock Waste	2.8	2.9
Ag Burn/Other Managed Burn	1.3	1.3
Waste Composting	4.1	4.1
Other	2.1	2.3
<b>ON-ROAD</b>		
Automobiles	26.8	12.3
Lt/Med Duty Trucks	24.2	15.2
Heavy Duty Gas Trucks	6.2	3.6
Heavy Duty Diesel Trucks	3.2	3.2
Motorcycles	2.7	3.5
Buses/Motor Homes	0.5	0.3
<b>OTHER MOBILE</b>		
Recreational Boats	19.1	17.2
Equipment (Const/Ind/Farm)	6.7	4.2
Lawn & Garden Equipment	6.4	5.9
Gas Can	3.1	1.8
Trains	0.6	0.6
Aircraft	0.5	0.6
Other	6.5	7.2

<sup>a</sup> Source: CARB CEFS Version 1.06 Sacramento NAA (Rf#980), February 28, 2007, for average summer day, updated to reflect recently adopted control measures, new emissions, and Dec 2007 SACOG transportation data.

<b>Table 5-2</b> <b>Emissions of NO<sub>x</sub><sup>a</sup> (tons per day)</b> <b>Sacramento Nonattainment Area</b>		
	<b>2002</b>	<b>2011</b>
<b>TOTAL EMISSIONS</b>	195	146
STATIONARY	16	15
AREA-WIDE	3	3
ON-ROAD MOTOR VEHICLES	115	79
OTHER MOBILE SOURCES	61	48
<b>STATIONARY</b>		
Fuel Combustion	7.5	8.1
Ag Irrigation Pumps	7.9	5.9
Industrial Process	0.8	0.9
<b>AREA-WIDE</b>		
Residential Fuel Combustion	2.8	3.0
Ag Burn/Other Managed Burn	0.4	0.4
<b>ON-ROAD</b>		
Heavy Duty Diesel Trucks	53.8	47.2
Lt/Med Duty Trucks	30.3	15.1
Automobiles	19.7	8.0
Heavy Duty Gas Trucks	7.3	5.2
Buses/Motor Homes	3.1	2.7
Motorcycles	0.5	0.9
<b>OTHER MOBILE</b>		
Construction & Mining Equip	18.2	12.9
Trains	12.2	8.8
Farm Equipment	13.0	9.0
Boats	6.2	7.3
Comm/Ind Equipment	4.9	3.2
Trans Refrig Units	1.6	2.0
Oil Drilling/Workover	2.7	1.7
Aircraft	1.6	2.2
Other	0.9	0.8

<sup>a</sup> Source: CARB CEFS Version 1.06 Sacramento NAA (Rf#980), February 28, 2007, for average summer day, updated to reflect recently adopted control measures, new emissions, and Dec 2007 SACOG transportation data.

**Figure 5-1**



**Figure 5-2**

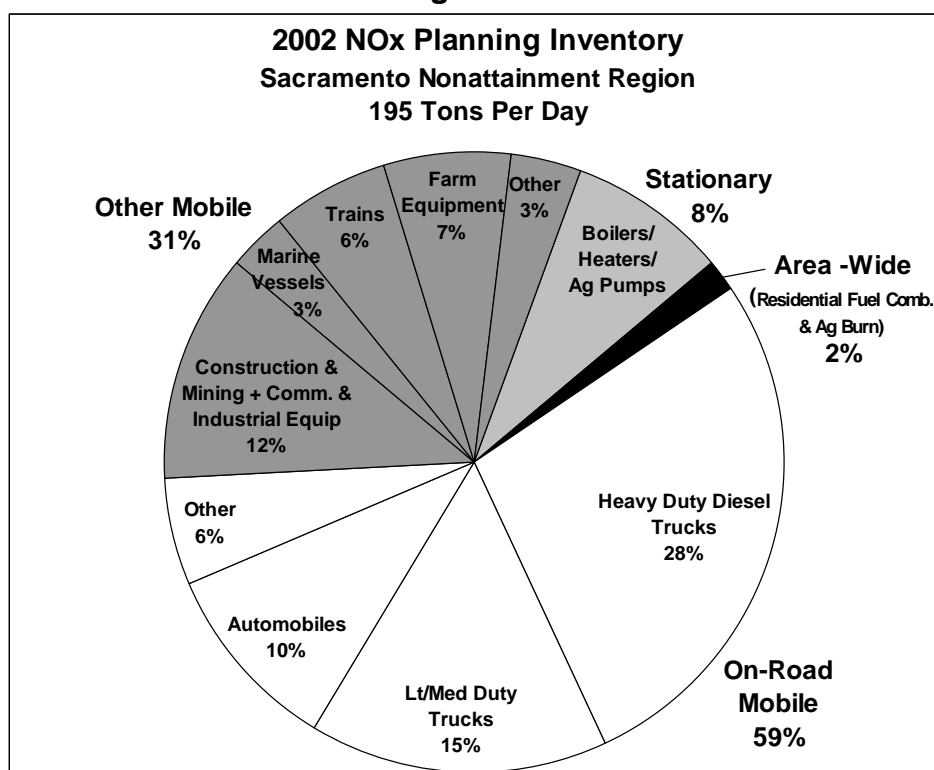


Figure 5-3

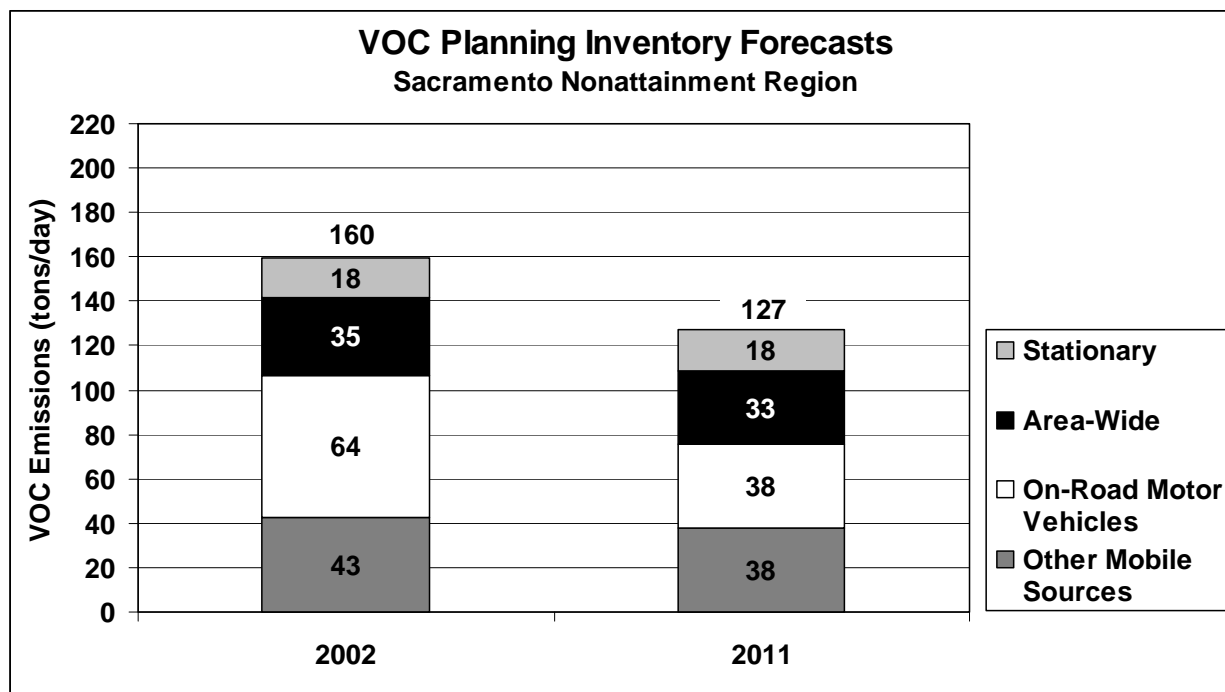
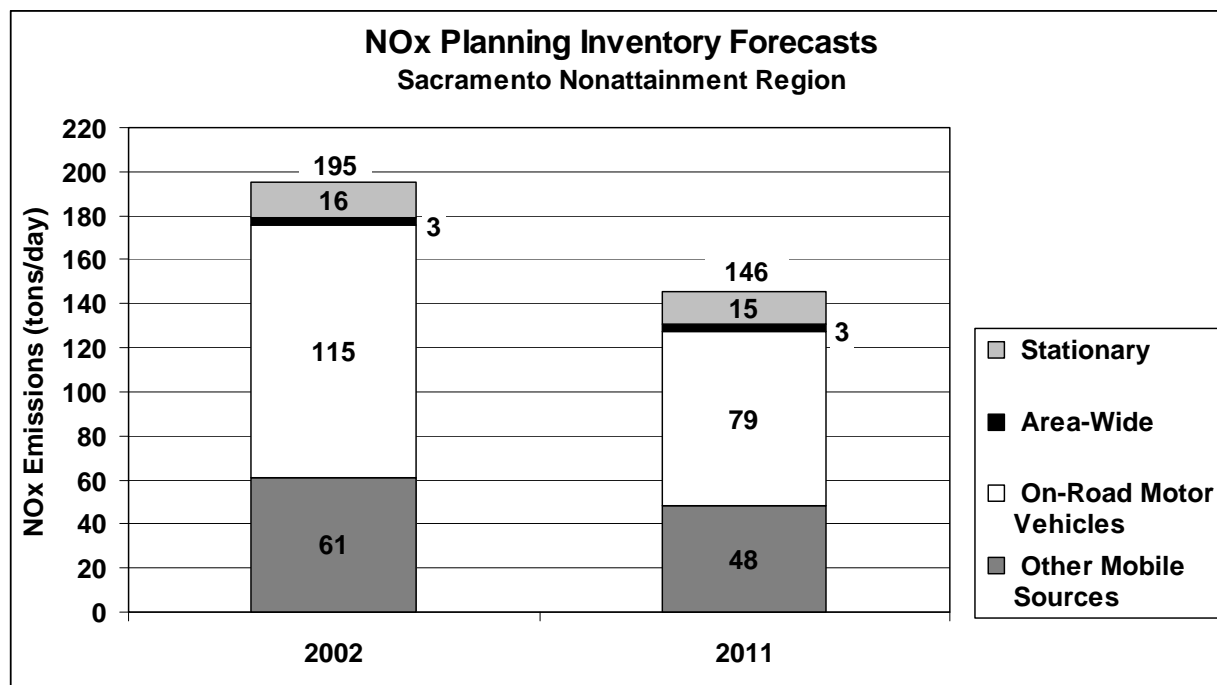


Figure 5-4



**Table 5-3**  
**VOC Emission Reduction Credits Added to the Emission Inventory Forecasts**  
**Sacramento Nonattainment Area**

<b>Emissions in tons/day</b>	<b>2002</b>	<b>2011</b>
Emission Reduction Credits	---	3.2
Future Bankable Rice Burning Emission Reduction Credits	---	0.5
<b>Total ERCs (rounded up)</b>	<b>---</b>	<b>4</b>
<b>Emission Inventory Forecasts</b>	<b>160</b>	<b>127</b>
<b>Total</b>	<b>160</b>	<b>131</b>

**Table 5-4**  
**NOx Emission Reduction Credits Added to the Emission Inventory Forecasts**  
**Sacramento Nonattainment Area**

<b>Emissions in tons/day</b>	<b>2002</b>	<b>2011</b>
Emission Reduction Credits	---	1.8
Future Bankable Rice Burning Emission Reduction Credits	---	0.6
<b>Total ERCs (rounded up)</b>	<b>---</b>	<b>3</b>
<b>Emission Inventory Forecasts</b>	<b>195</b>	<b>146</b>
<b>Total</b>	<b>195</b>	<b>149</b>

## **6. REASONABLE FURTHER PROGRESS DEMONSTRATION**

### **6.1 Introduction to Reasonable Further Progress**

The Clean Air Act specifies reasonable further progress (RFP) requirements for ozone nonattainment areas. RFP refers to the general need to obtain a certain amount of annual incremental reductions in emissions of the relevant air pollutant for the purpose of ensuring attainment of the standard by the applicable attainment deadline.

In February 2006, the Sacramento region submitted an early 8-hour ozone RFP plan<sup>40</sup> to EPA demonstrating an 18% reduction from 2002-2008 for the Sacramento nonattainment area with existing control strategies. In addition, the early RFP plan included an updated emission inventory and set new motor vehicle emission budgets for 2008, which EPA found to be adequate for transportation conformity purposes<sup>41</sup>. This subsequent RFP demonstration for the 2011 milestone year is based on the 2011 emission inventory forecasts, which assume expected growth rates and existing control measure strategies.

This chapter begins with a discussion of RFP requirements for the 8-hour ozone NAAQS. It also describes the methodology for deriving the base year emissions inventory, calculating RFP emission targets, assessing creditable reductions, and using NOx substitution for VOC reduction shortfalls. Finally, this chapter includes the emission reduction summary that demonstrates the RFP targets are met for the 2011 milestone year.

### **6.2 Reasonable Further Progress Requirements**

Sections 172(c)(2), 182(b)(1) and 182(c)(2)(B) of the Clean Air Act include RFP provisions for reducing emissions in ozone nonattainment areas (i.e., 15% during first 6 years and 3% per year thereafter). The federal 8-hour ozone regulations<sup>42</sup> (40 CFR 51.910) require that areas classified under subpart 2 as “moderate and above” that had not met the 15% VOC emission reduction requirement for the 1-hour standard (in the first 6 years from the 1990 baseline year) need to submit a reasonable further progress plan within 3 years after designation that provides for 15% VOC emission reductions in the first 6 years from the 2002 baseline year. In addition, those 8-hour ozone nonattainment areas classified as “serious and above” need to show a VOC (and/or NOx) emission reduction of at least 3% per year averaged over each consecutive 3-year period beginning 6 years after the baseline year (i.e., 2009-2011, 2012-2014, etc.) out to their attainment year.

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<sup>40</sup> The Sacramento Regional Nonattainment Area 8-Hour Ozone Rate-of-Progress Plan (February 2006) included RFP reductions of VOC and NOx emissions for the first 6 years from the 2002 baseline year.

<sup>41</sup> Federal Register, March 14, 2006, p. 13124 (effective date March 29, 2006).

<sup>42</sup> The final 8-hour ozone implementation rule (Phase 2) which includes the reasonable further progress requirements was signed and published in the November 29, 2005 Federal Register.

Areas classified under subpart 2 as “serious and above” that had met the 15% VOC emission reduction requirement for the 1-hour standard need to submit a reasonable further progress plan within 3 years after designation that provides for at least 3% average annual reductions of VOC (and/or NOx) emissions for the first 6 years from the 2002 baseline year and every subsequent 3-year period out to their attainment year.

Another requirement is that the reasonable further progress demonstration must fully account for emissions growth when calculating the net emission reductions.

### **6.3 Contingency Measures Requirement Demonstration**

In general, contingency measures are control measures that go into effect if planned emission controls fail to reach desired goals and targets. Contingency provisions are required under sections 172(c)(9) and 182(c)(9) of the Clean Air Act in the event the nonattainment area fails to meet a reasonable further progress milestone or attainment deadline. Contingency measures are specific additional controls to be implemented automatically without further significant rulemaking activities, such as public hearings or legislative review, or without further action by the State or the Administrator (EPA).

Federal guidance<sup>43</sup> requires that sufficient contingency measures in the plan be adopted to provide a 3% emission reduction beyond what is needed for the reasonable further progress requirement. The existing control measure strategy in this plan is expected to surpass the amount of emission reductions needed for reasonable further progress targets by a margin that meets the contingency measures requirements.

### **6.4 Methodology for Reasonable Further Progress Demonstrations**

The methodology for demonstrating reasonable further progress includes deriving the base year emissions inventory, calculating RFP emission reduction targets, assessing creditable reductions, and using NOx substitution for VOC reduction shortfalls.

#### **6.4.1 Base Year Emissions Inventory**

In order to perform the reasonable further progress evaluation, certain data requirements need to be met. The first is compiling the 2002 base year VOC and NOx inventories of anthropogenic emissions that are used as the basis for calculating the required percent reduction targets. Section 182(b)(1)(B) of the Clean Air Act defines the baseline emissions from which to derive the RFP reduction target as being the total amount of actual VOC or NOx emissions from all anthropogenic sources in the nonattainment area, excluding emissions eliminated by federal motor vehicle control program (FMVCP) regulations promulgated prior to 1990 and federal Reid vapor

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<sup>43</sup> “General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990” (57 FR 13498, April 16, 1992).



pressure (RVP) fuel regulations promulgated prior to the enactment of the Clean Air Act Amendments of 1990.

#### **6.4.2 RFP Emission Reduction Targets**

The required RFP percent emission reductions (e.g., average of 3% per year for first 6 years and every subsequent 3-year period until attainment) are applied to the adjusted base year VOC emissions inventory to derive the RFP target levels for the 2011 milestone year. Therefore, the reasonable further progress requirement for 2011 is for an additional 9% (2009-2011 period) on top of the previous 18% (2002-2008 period) for a total of 27% reduction from 2002 base year emissions.

#### **6.4.3 Creditable Control Measure Reductions**

The VOC and NO<sub>x</sub> emission inventory forecasts are needed for each future milestone year to quantify the emission reductions that are expected to be achieved with existing control measures including growth assumptions. When assessing RFP emission reductions creditable toward the percent reductions required, there are specific restrictions as listed in section 182(b)(1)(D) of the Clean Air Act. There are certain post-1990 control benefits not creditable as reductions if they were already required prior to the enactment of the 1990 Clean Air Act Amendments. These measures include the federal motor vehicle control program, federal Reid vapor pressure fuel regulations, corrections to reasonably available control technology (RACT) rules, and corrections to motor vehicle inspection and maintenance (I/M) programs.

The creditable VOC reductions from existing control regulations are applied to the required RFP target levels. If there are any RFP reduction shortfalls for VOC, the NO<sub>x</sub> reductions are considered in the RFP demonstration assessment.

#### **6.4.4 NO<sub>x</sub> Substitution for VOC Reduction Shortfalls**

Any remaining VOC reduction shortfalls are met by using NO<sub>x</sub> emission reductions. Section 182(c)(2)(C) of the Clean Air Act (for areas classified “serious or above” that had met the 15% VOC emission reduction requirement for the 1-hour standard) allows for the substitution of NO<sub>x</sub> emission reductions in place of VOC reductions to meet the reasonable further progress requirements. According to EPA’s NO<sub>x</sub> Substitution Guidance<sup>44</sup>, the substitution of NO<sub>x</sub> reductions for VOC reductions must be done on a percentage basis, rather than a straight ton-for-ton exchange.

Thus, if there is a certain percent VOC reduction shortfall, an equal percentage reduction in NO<sub>x</sub> emissions can be substituted to provide the equivalent reductions necessary for meeting the ozone reduction progress goals. For example, if there is a 12% reduction in VOC emissions forecasted from 2002 to 2011 and 27% is needed,

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<sup>44</sup> Environmental Protection Agency (OAQPS), “NO<sub>x</sub> Substitution Guidance”, December 1993.

then an additional 15% reduction in NO<sub>x</sub> emissions could be used to make up the shortfall to achieve the minimum required reduction.

#### **6.4.5 NO<sub>x</sub> Substitution Attainment Consistency Requirement**

The overall VOC and NO<sub>x</sub> reduction totals applied to the RFP demonstration must be consistent with the SIP attainment control strategy. Therefore, the cumulative amount of NO<sub>x</sub> substitution reductions used toward the RFP requirement cannot be greater than the total NO<sub>x</sub> reductions dictated by the modeled attainment demonstration. This attainment consistency requirement is meant to prevent the substitution of NO<sub>x</sub> reductions that would not lead to progress toward attaining the ozone standard.

The current air quality modeling analysis from the Central California Ozone Study (CCOS) shows that attainment can be reached with different combinations of VOC and NO<sub>x</sub> control. Photochemical modeling results<sup>45</sup> indicate that both VOC and NO<sub>x</sub> reductions provide ozone benefits in the Sacramento region, but on a ton for ton basis NO<sub>x</sub> reductions provide greater ozone benefits than VOC reductions. Therefore, a substantial use of NO<sub>x</sub> substitution would be consistent with current analyses of ozone attainment strategies in the Sacramento nonattainment area.

### **6.5 Calculations of Reasonable Further Progress Demonstration**

The Sacramento region is required to provide for at least 3% average annual reductions of VOC (and/or NO<sub>x</sub>) emissions for the first 6 years following the 2002 baseline year and every subsequent 3-year period out to its attainment year. Table 6-1 contains a summary of the calculations for determining whether reasonable further progress is achieved for the required 2011 milestone targets. Projected future VOC and NO<sub>x</sub> emission reductions will provide the required 27% RFP reductions, as well as a 3% contingency margin.

The reasonable further progress demonstration is achieved by forecasted emission reductions from existing control regulations and already adopted control measures. Also, both VOC and NO<sub>x</sub> emission reductions are needed to meet the RFP reduction targets as shown in Figure 6-1. The NO<sub>x</sub> substitution is used on a percentage basis to cover any VOC percentage shortfall.

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<sup>45</sup> Preliminary attainment modeling analysis indicates the future NO<sub>x</sub> reduction needed from 2002 base year emissions is about 50%.

**Table 6-1**  
**Calculation of Reasonable Further Progress Demonstration**  
**Sacramento Nonattainment Area**

<b>VOC Emission Calculations – Tons/Day</b>	<b>2011</b>
1. 2002 Baseline VOC Emission Inventory <sup>A</sup>	159.6
2. Non-Creditable Reductions Due to Pre-1990 FMVCP/RVP Adjustments <sup>B</sup>	11.8
3. Adjusted 2002 Baseline VOC Emissions (Line 1 – Line 2)	147.8
4. 2011 VOC Emissions Forecast with Existing Controls <sup>A</sup>	130.9
5. Forecasted Creditable Reductions Since 2002 (Line 3 – Line 4)	16.8
6. Forecasted % VOC Reductions Since 2002 (Line 5 ÷ Line 3)	11.4%
7. RFP % Reduction Required from Adjusted 2002 Baseline VOC Emissions <sup>C</sup>	27%
8. Forecasted % VOC Shortfall (Line 7 – Line 6)	15.6%
<b>NOx Emission Calculations – Tons/Day</b>	
9. 2002 Baseline NOx Emission Inventory <sup>D</sup>	195.5
10. Non-Creditable Reductions Due to Pre-1990 FMVCP Adjustments <sup>B</sup>	12.9
11. Adjusted 2002 Baseline VOC Emissions (Line 9 – Line 10)	182.6
12. 2011 NOx Emissions Forecast with Existing Controls <sup>D</sup>	148.5
13. Forecasted Creditable Reductions Since 2002 (Line 11 – Line 12)	34.0
14. Forecasted % NOx Reductions Since 2002 (Line 13 ÷ Line 11)	18.6%
15. % NOx Substitution Needed for VOC Shortfall (Same as Line 8)	15.6%
16. Forecasted % NOx Reduction Surplus (Line 14 – Line 15)	3.0%
<b>Is Reasonable Further Progress Met?</b>	<b>Yes</b>
<b>Is 3% Contingency Met for RFP?</b>	<b>Yes</b>

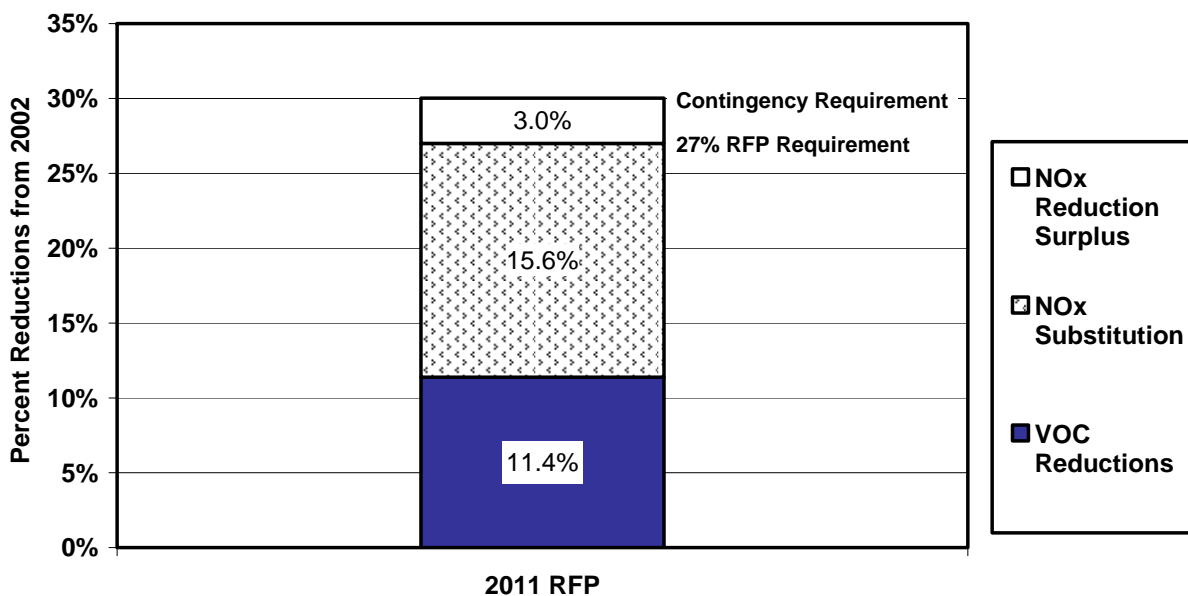
<sup>A</sup>VOC emissions from Chapter 5, Table 5-3.

<sup>B</sup>ARB provided the non-creditable FMVCP/RVP adjustments, using CA MVCP method in Appendix C.

<sup>C</sup>RFP reduction requirements contained in EPA's Final Rule to Implement the 8-Hour Ozone NAAQS (Phase 2) published in the November 29, 2005 Federal Register.

<sup>D</sup>NOx emissions from Chapter 5, Table 5-4.

**Figure 6-1**  
**Summary of Reasonable Further Progress Demonstration for 2011**  
**Sacramento Nonattainment Area**



Reasonable further progress (RFP) demonstration for 2011 is achieved by forecasted emission reductions from existing control regulations and already adopted control measures. Both VOC and NOx emission reductions are used to meet the 27% RFP reduction target as well as the 3% contingency requirement.

## **7. TRANSPORTATION CONFORMITY AND MOTOR VEHICLE EMISSIONS BUDGETS**

### **7.1 Introduction to Transportation Conformity**

Transportation conformity is the federal regulatory procedure for linking and coordinating the transportation and air quality planning processes. Under the federal Clean Air Act, federal agencies may not approve or fund transportation plans and projects unless they are consistent with state air quality implementation plans (SIPs). Conformity with the SIP requires that transportation activities not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS). The quantification and comparison of on-road motor vehicle emissions is the method for determining transportation conformity between air quality and transportation planning.

This chapter provides a historical perspective of transportation conformity budgets in the Sacramento region, summarizes principal transportation conformity requirements, and discusses motor vehicle emissions budgets (MVEB).

### **7.2 Historical Perspective**

The previous 1994 1-hour ozone attainment SIP established transportation conformity budgets for the Sacramento region through 2005. The 1994 SIP motor vehicle emission budgets for 2005 are listed in Table 7-1. These budgets were based on motor vehicle emission forecasts calculated using planning assumptions and emission factors (EMFAC7F) available at that time.

<b>Table 7-1 1994 SIP Motor Vehicle Emissions Budgets Sacramento Nonattainment Area</b>		
	<b>VOC</b>	<b>NOx</b>
<b>2005 Emissions Budgets (EMFAC7F) – Tons per Day</b>	<b>31.3</b>	<b>61.3</b>

During 2004, using the latest planning assumptions and ARB's updated motor vehicle emission factors (EMFAC2002), a conformity determination could not be made, and a conformity lapse occurred October 4, 2004.

New transportation conformity budgets for 2008 were proposed for the Sacramento region in the early 8-hour ozone RFP plan<sup>46</sup> for 2002-2008. These transportation emission budgets were calculated using ARB's EMFAC2002 (version 2.2) motor vehicle

<sup>46</sup> Sacramento Regional Nonattainment Area 8-Hour Ozone Rate-of-Progress Plan (Final Report, February 2006).

emission forecasts<sup>47</sup> that were used to meet the 2008 RFP milestone demonstration. These transportation budgets assumed vehicle activity levels (like total miles traveled) based on the road and transit projects contained in the region's 2002 Metropolitan Transportation Plan.

In the March 14, 2006 Federal Register, EPA found that the new motor vehicle emissions budgets for 2008 were adequate for conformity purposes. This allowed SACOG to make the conformity determination for the 2006 Metropolitan Transportation Plan and the 2006/08 Metropolitan Transportation Improvement Program for the Sacramento region, lifting the conformity lapse on April 20, 2006 when approved by the Federal Highway Administration.

The existing motor vehicle emission budgets for the Sacramento nonattainment area for 2008 are shown in Table 7-2.

<b>Table 7-2</b> <b>Existing 2008 Motor Vehicle Emissions Budgets</b> <b>Sacramento Nonattainment Area</b>		
	<b>VOC</b>	<b>NOx</b>
<b>2008 Emissions Budgets (EMFAC2002) – Tons per Day</b>	<b>41</b>	<b>75</b>

### 7.3 Transportation Conformity Requirements

The Clean Air Act (CAA) requires that no federal department shall engage in, support in any way or provide financial assistance for or license or approve any activity that does not conform to the State Implementation Plan (SIP). (42 USC 7506.)

The U.S. Environmental Protection Agency (EPA) established the Transportation Conformity Rule (40 CFR 93) pursuant to section 176(c) of the Clean Air Act. This Rule:

- Establishes criteria and procedures for determining whether long range metropolitan transportation plans (MTPs), short range metropolitan transportation improvement programs (MTIPs), and projects conform to the SIP.
- Ensures that transportation plans and projects are consistent with the applicable SIP, such that associated transportation emissions are less than or equal to motor vehicle emissions budgets established for demonstrating reasonable further progress, attainment or maintenance of health-based air quality standards.

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<sup>47</sup> Note that some additional ARB and local control analysis adjustments were applied external to EMFAC2002 and are documented in Appendix D of the Sacramento Regional Nonattainment Area 8-Hour Ozone Rate-of-Progress Plan.

- Ensures that transportation plans, programs, and other individual projects do not cause new air quality violations, exacerbate existing ones, or delay attainment of air quality standards.

#### **7.4 Purpose of the Motor Vehicle Emissions Budget**

The motor vehicle emissions budget is that portion of the total allowable emissions allocated to on-road motor vehicle use in the submitted or approved SIP revision or maintenance plan for the purpose of meeting reasonable further progress milestones or demonstrating attainment or maintenance of the NAAQS, for any criteria pollutant or its precursors. (40 CFR 93.101)

Transportation conformity determinations are accomplished by comparing the motor vehicle emissions associated with MTPs and MTIPs with the motor vehicle emissions budgets established in the SIP for each attainment, milestone, or transportation planning year. If the emissions associated with implementation of the MTP and/or MTIP are within the budgets established in the SIP, a conformity determination can be made.

An emission budget is established for both VOC and NOx for two reasons:

1. Both VOC and NOx are ozone precursors, and reductions of both pollutants are needed to feasibly demonstrate attainment of the ozone standards, and
2. The reasonable further progress demonstration relies on NOx substitution to meet the required goals.

#### **7.5 Transportation Control Measures (TCMs)**

Transportation control measures (TCMs) are strategies for reducing vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions. SACOG, local governments, and the air districts have worked together over the years to develop and implement TCMs. They have included public transit, carpooling and vanpooling, bicycling and pedestrian enhancement, and land use programs. The Spare The Air program is also a TCM.

TCMs are also included in the “smart growth” assumptions for the Blueprint program used in the SACOG transportation model to forecast future vehicle activity. When compared to the base case growth scenario, the preferred Blueprint growth scenario results in reducing vehicle trips, vehicle miles traveled, and traffic congestion, while increasing transit use and other alternative travel modes. Thus, the implementation of the Blueprint strategies is predicted to reduce air pollutant emissions from motor vehicles.

In addition, the Transportation Conformity Rule (40 CFR 93.103) states, “When assisting or approving any action with air quality-related consequences, FHWA and FTA shall give priority to the implementation of those transportation portions of an applicable implementation plan prepared to attain and maintain the NAAQS.”

## 7.6 Maintaining Motor Vehicle Emissions Budgets

While the 2011 RFP demonstration relies on revised motor vehicle emissions using EMFAC2007 and updated transportation activity data, the motor vehicle emissions budgets for 2011 are being maintained at the existing 2008 budget levels (previously established based on EMFAC2002). The motor vehicle emissions budgets for 2011 will be adjusted when the air districts in the Sacramento nonattainment area complete their subsequent attainment demonstration plan. This RFP plan is being expedited to satisfy the RFP demonstration requirement that was due June 15, 2007. A full evaluation of potential on-road emissions reductions from state and local measures and the environmental effects of updated transportation budgets will be conducted in the attainment demonstration plan.

The 2011 motor vehicle emissions budgets are shown in Table 7-3.

<b>Table 7-3 2011 Motor Vehicle Emissions Budgets</b>		
<b>Sacramento Nonattainment Area</b>	<b>VOC</b>	<b>NOx</b>
2011 Motor Vehicle Emissions Budgets* (tons/day)	41	75

\*2008 motor vehicle emissions budgets (based on EMFAC2002) are carried forward to 2011.

In addition, to ensure that the transportation conformity budget levels do not interfere with the 2011 progress demonstration, the RFP demonstration was also performed using the 2011 budget levels in place of the 2011 on-road motor vehicle emissions inventory. The additional RFP analysis in Table 7-4 shows that the 2011 RFP reduction requirements can still be achieved using the 2011 motor vehicle emissions budgets.

## 7.7 Motor Vehicle Emissions Budget Approval Process

EPA can make an adequacy finding on new 8-hour motor vehicle emissions budgets prior to their approval of a SIP revision plan. This adequacy review process is subject to public participation and review requirements pursuant to 40 CFR 93.118(f). This adequacy process is intended to expedite the use of conformity budgets to protect air quality. If determined to be adequate for transportation conformity purposes by EPA, future transportation plans will need to conform to new motor vehicle emissions budgets. New, adequate 8-hour MVEBs will remain in effect until other budgets are found adequate or approved by EPA.



**Table 7-4**  
**2011 Reasonable Further Progress Demonstration**  
**With Motor Vehicle Emissions Budgets**

<b>Emission Calculations – Tons/Day</b>	<b>VOC</b>	<b>NOx</b>
1. 2002 Baseline Emission Inventory <sup>A</sup>	159.6	195.5
2. Non-Creditable Pre-1990 FMVCP/RVP Adjustments <sup>B</sup>	11.8	12.9
3. Adjusted 2002 Baseline Emissions [Line 1 – Line 2]	147.8	182.6
4. 2011 Emissions Forecast with Existing Controls <sup>C</sup>	133.9	144.5
5. Forecasted Creditable Reductions Since 2002 [Line 3 – Line 4]	13.9	38.1
6. Forecasted % Reductions Since 2002 [Line 5 ÷ Line 3]	9.4%	20.9%
7. Combined VOC and NOx % Reductions Since 2002 [Line 6]	30.3%	
8. RFP % Reduction Required from Adjusted 2002 Baseline Emissions <sup>D</sup>	27%	
9. Forecasted % Reduction Surplus [Line 7 – Line 8]	3.3%	
<b>Is Reasonable Further Progress Met?</b>	<b>Yes</b>	
<b>Is 3% Contingency Met for RFP?</b>	<b>Yes</b>	

<sup>A</sup>Emissions from Chapter 5, Tables 5-3 and 5-4.

<sup>B</sup>ARB provided the non-creditable FMVCP/RVP adjustments, using CA MVCP method in Appendix C.

<sup>C</sup>Emission forecasts from Chapter 5, Tables 5-3 and 5-4, except substituting 2008 motor vehicle emission budgets of 41 tpd VOC and 75 tpd NOx for the 2011 on-road motor vehicle emissions.

<sup>D</sup>RFP reduction requirements contained in EPA's Final Rule to Implement the 8-Hour Ozone NAAQS (Phase 2) published in the November 29, 2005 Federal Register.

## **8. GENERAL CONFORMITY**

### **8.1 Introduction to General Conformity**

General conformity is the federal regulatory process for preventing major federal actions<sup>48</sup> or projects from interfering with air quality planning goals. Conformity provisions ensure that federal funding and approval are given only to those activities and projects that are consistent with state air quality implementation plans (SIPs). Conformity with the SIP means that major federal actions will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS).

Current federal rules require the emissions inventory used to support a general conformity determination must be from an applicable SIP's attainment or maintenance demonstration. The 1994 SIP is the last attainment plan for the Sacramento region for which to assess general conformity.

This chapter summarizes basic general conformity requirements and emissions criteria for demonstrating general conformity. In addition, a specific inventory for airport emissions is provided in this chapter for the potential general conformity analysis of future airport expansions, if allowable under a revised General Conformity Rule.

### **8.2 General Conformity Requirements**

The Clean Air Act (CAA) requires that no federal department shall engage in, support in any way or provide financial assistance for or license or approve any activity that does not conform to the SIP. (42 USC 7506.)

The EPA promulgated the conformity regulations for general federal actions (40 CFR 51 subpart W and 40 CFR 93 subpart B) pursuant to section 176(c) of the Clean Air Act. The General Conformity Rule ensures that federal actions conform to the appropriate SIPs and sets forth the requirements a federal agency must comply with to make a conformity determination. General conformity requires that federal agencies and departments not support or approve an action that does any of the following:

- Causes or contributes to new violations of any NAAQS in an area;
- Increases the frequency or severity of an existing violation of any NAAQS; or
- Delays timely attainment of any NAAQS, required interim emission reduction, or other milestones.

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<sup>48</sup> Federal actions are defined as any activity engaged in by a department, agency, or instrumentality of the Federal government, or any activity that they support, fund, license, permit, or approve, other than activities related to transportation plans, programs, and projects that are applicable to transportation conformity requirements. (40 CFR 93.152)

### 8.3 Types of Federal Actions Applicable to General Conformity

Examples of general federal actions that may require a conformity determination include, but are not limited to, the following: leasing of federal land; private construction on federal land; reuse of military bases; airport construction and expansions, and construction of federal office buildings.

General conformity requirements apply if federal actions satisfy one of the following two conditions: (40 CFR 93.153)

- The action's direct and indirect emissions have the potential to exceed the de minimus threshold levels established for criteria pollutants in the rule. For a severe nonattainment area, the threshold level is 25 tons per year.
- The action's direct and indirect emissions of any criteria pollutant represent 10% or more of a nonattainment or maintenance area's total emissions inventory for that pollutant. For the nonattainment area, 10% of the total 2002 VOC emission inventory is 16 tons per day (or about 5,700 tons per year), and 10% of the total 2002 NOx emission inventory is 19 tons per day (or about 6,900 tons per year).

Direct emissions (of a criteria pollutant or its precursors<sup>49</sup>) are those that are caused or initiated by the federal action, and occur at the same time and place as the action. Indirect emissions are reasonably foreseeable emissions that are further removed from the federal action in time and/or distance, and can be practicably controlled by the federal agency due to a continuing program responsibility. (40 CFR 93.152) A federal agency can indirectly control emissions by placing conditions on federal approval or federal funding. An example would be controlling emissions by limiting the size of a parking facility or by making employee trip reduction requirements.<sup>50</sup>

### 8.4 Emissions Criteria for Demonstrating General Conformity

General federal actions whose total of direct and indirect emissions from future actions are above the federal major source thresholds for a nonattainment area's classification (50 tons per year of VOC or NOx for serious, and 25 tons per year for severe) must meet conformity emissions criteria (40 CFR 93.153(b) and 93.153(g)(2)).

For a required action to meet the conformity determination emissions criteria, the total of direct and indirect emissions from the action must be in compliance or consistent with all relevant requirements and milestones contained in the applicable SIP (40 CFR 93.158(c)), and in addition must meet other specified requirements, such as:

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<sup>49</sup> Precursors for ozone include NOx and VOC pollutants (40 CFR 93.152).

<sup>50</sup> "General Conformity Guidance: Questions and Answers" (OAQPS, EPA, dated July 13, 1994), p. 13.

- For any criteria pollutant, the total of direct and indirect emissions from the action is specifically identified and accounted for in the applicable SIP's attainment or maintenance demonstration (40 CFR 93.158(a)(1)); or
- For ozone or nitrogen dioxide, the total of direct and indirect emissions from the action is fully offset within the same nonattainment (or maintenance) area through a revision to the applicable SIP or a similarly enforceable emissions control measure (40 CFR 93.158(a)(2)); or
- For ozone or nitrogen dioxide, the total of direct and indirect emissions from the action is determined and documented by CARB to result in a level of emissions which, together with all other emissions in the nonattainment (or maintenance) area, would not exceed the emissions inventory specified in the applicable SIP (40 CFR 93.158(a)(5)(i)(A)); or
- For ozone or nitrogen dioxide, the total of direct and indirect emissions from the action is determined by CARB to result in a level of emissions which, together with all other emissions in the nonattainment (or maintenance) area, would exceed the emissions inventory specified in the applicable SIP and the State Governor or designee for SIP actions makes a written commitment to EPA for specific SIP revision measures reducing emissions to not exceed the emissions inventory (40 CFR 93.158(a)(5)(i)(B)).

## **8.5 Airports Emissions Inventory**

Airports in the nonattainment area are planning for future growth. Sacramento County has prepared a master plan for this growth, which results in increased emissions. Sacramento County airports include: Sacramento International Airport (SMF), Mather, Executive, McClellan, Franklin, Rancho Murietta, Sunset, Natomas, and Rio Linda. The aircraft emissions inventory forecast includes airports from all counties in the Sacramento nonattainment area.

To facilitate future conformity determinations, the projected direct and indirect emissions from airport growth are identified for the 2011 RFP milestone year in Table 8-1. The 1994 SIP aircraft emissions inventory for 2005 is shown for comparison purposes. Note that the current aircraft VOC emissions projection for 2011 is lower than the 1994 SIP projection for 2005, because the closure of the Mather and McClellan air force base operations was not included in the 1994 SIP.

Current federal rules do not allow for the emissions inventory in a reasonable further progress plan to be used to support a general conformity determination, since the inventory must be from an applicable SIP's attainment or maintenance demonstration.

However, EPA is in the process of revising the General Conformity Rule.<sup>51</sup> To the extent this revision of the rule allows for general conformity emissions levels to be updated through the RFP process, the District will work diligently with State, local, and other agencies to update the 2011 general conformity emission levels with those identified in this RFP plan.

<b>Table 8-1 Airport (Aircraft Operations + Ground Support Equipment) Emissions for the Sacramento Nonattainment Area</b>		
<b>Year of Operations</b>	<b>VOC (tons/day)</b>	<b>NOx (tons/day)</b>
94SIP* 2005 Emissions Inventory Aircraft Operations Only	1.4	2.0
2011 Projected Emissions Inventory Aircraft Operations	0.6	2.2
Ground Support Equipment	0.06	0.29

\*Ground support equipment was not included in the 94SIP.

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<sup>51</sup> "Revisions to the General Conformity Regulations; Proposed Rule" (Federal Register, January 8, 2008, p. 1402-1428).

## **9. SUMMARY AND CONCLUSIONS**

### **9.1 8-Hour Ozone Nonattainment Designation for Sacramento Region**

The federal 8-hour ozone standard lowered the health-based limit for ambient ozone concentration from 0.12 parts per million of ozone averaged over one hour to 0.08 parts per million of ozone averaged over eight hours. An area's nonattainment designation is based on whether the 8-hour ozone design value<sup>52</sup> concentration for any of the monitoring sites in the area exceeds the national ambient air quality standard (NAAQS). The Sacramento region is designated a nonattainment area, and includes all of Sacramento and Yolo counties and portions of Placer, El Dorado, Solano, and Sutter counties.

### **9.2 Bump-up Requested from "Serious" to "Severe" 8-Hour Ozone Classification with Extended 2019 Attainment Deadline**

Nonattainment areas are classified as marginal, moderate, serious, severe, or extreme areas depending on the magnitude of the highest 8-hour ozone design value for the monitoring sites in the nonattainment area. The Sacramento region was classified as a "serious" nonattainment area with an attainment deadline of June 15, 2013. This classification was based on the 8-hour ozone design value of 107 ppb at Cool, calculated from ozone concentrations monitored during 2001 to 2003.

Despite meeting the 2011 progress target, however, the Sacramento region cannot meet the 2013 attainment date for serious nonattainment areas. This conclusion is based on an evaluation of: 1) emission inventory forecasts, 2) the implementation schedule of feasible control strategies, and 3) preliminary photochemical modeling results. Therefore, the air districts in the Sacramento region submitted a letter to the California Air Resources Board in February 2008 to request a voluntary reclassification (bump-up) of the Sacramento Federal Nonattainment Area from a "serious" to a "severe" 8-hour ozone nonattainment area with an extended attainment deadline of June 15, 2019.

### **9.3 Trend in Ozone Air Quality Shows Improvement**

The progress toward attainment is measured by analyzing ambient air quality data collected at various monitoring sites over a period of many years (1990-2006). There are currently 16 ozone monitoring stations located throughout the Sacramento region operated by local air districts and the California Air Resources Board.

The annual number of 8-hour ozone exceedance days recorded at the peak monitoring sites fluctuates from year to year due to meteorological variability and changes in

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<sup>52</sup> The 8-hour ozone design value is the standard-related indicator calculated as the annual 4<sup>th</sup>-highest daily maximum 8-hour ozone concentration averaged over 3 years.

precursor emission patterns. The most frequent exceedances of the federal 8-hour ozone standard occur at the region's eastern monitoring sites (Cool, Folsom, Placerville, and Auburn). The 17-year trend line indicates a slight decline in the overall average peak number of annual exceedance days, from about 32 down to 25.

The peak 8-hour ozone design value concentration also varies from year to year and occurs at the eastern monitoring sites in the Sacramento region. The overall 17-year trend line shows a slight decline, from 108 ppb down to about 101 ppb. The design value has improved from being 24 ppb (or 28%) over the standard<sup>53</sup> down to about 17 ppb (or 20%).

#### **9.4 VOC and NOx Emissions Inventory Forecasted to Decline**

Ozone is not directly emitted into the atmosphere, but is a secondary pollutant produced by photochemical reactions in the air involving volatile organic compounds (VOC) and nitrogen oxides (NOx). Therefore, planning efforts to evaluate and reduce ozone air pollution include identifying and quantifying the various processes and sources of VOC emissions (such as solvents, surface coatings, and motor vehicles) and NOx emissions (such as motor vehicles and other fuel combustion equipment).

EPA emission inventory guidance requires the planning emissions inventory to be based on estimates of actual emissions for an average summer weekday, typical of the ozone season. Only anthropogenic emissions are compiled for this RFP plan analysis. The anthropogenic emissions inventory is first divided into four broad source categories: stationary sources, area-wide sources, on-road motor vehicles, and other mobile sources. Each of these major categories is further defined into more descriptive equipment types and specific emission processes.

The 2002 base year anthropogenic planning inventory is estimated at about 160 tons per day of VOC emissions and 195 tons per day of NOx emissions for the Sacramento nonattainment area. The base year emissions are used to forecast a future year inventory by using socio-economic growth indicators and the post-2002 emission reduction effects of existing control strategies. Also, potentially available pre-2002 emission reduction credits (ERCs) are included as additional growth in future years to ensure that their use will not be inconsistent with the reasonable further progress targets.

The 2002 base year emissions and 2011 emission forecasts for the Sacramento nonattainment area are summarized by the four major emission categories (and ERCs) in Tables 9-1 and 9-2. The VOC and NOx emission forecasts for 2011 show significant declines in mobile source emissions, despite increasing population, vehicle activity, and economic development in the Sacramento region.

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<sup>53</sup> Federal 8-hour ozone standard = 84 ppb.

**Table 9-1**  
**Emissions Inventory of Volatile Organic Compounds (VOC)**  
**Sacramento Nonattainment Area**

<b>Emission Category</b>	<b>2002</b>	<b>2011</b>
Stationary Sources	18	18
Area-Wide Sources	35	33
On-Road Motor Vehicles	64	38
Other Mobile Sources	43	38
ERCs	---	4
<b>Total</b>	<b>160</b>	<b>131</b>

**Table 9-2**  
**Emissions Inventory of Nitrogen Oxides (NOx)**  
**Sacramento Nonattainment Area**

<b>Emission Category</b>	<b>2002</b>	<b>2011</b>
Stationary Sources	16	15
Area-Wide Sources	3	3
On-Road Motor Vehicles	115	79
Other Mobile Sources	61	48
ERCs	---	3
<b>Total</b>	<b>195</b>	<b>149</b>

## **9.5 Reasonable Further Progress Demonstration Achieved for 2011**

The federal 8-hour ozone regulations<sup>54</sup> require that areas classified “serious or above” submit a reasonable further progress (RFP) demonstration plan that shows a minimum of 18% VOC (and/or NOx) emission reductions over the first 6 years following the 2002 baseline year and then an average of 3% reductions per year for each subsequent 3-year period out to the attainment year. The RFP demonstration must fully account for emissions growth when calculating the net emission reductions.

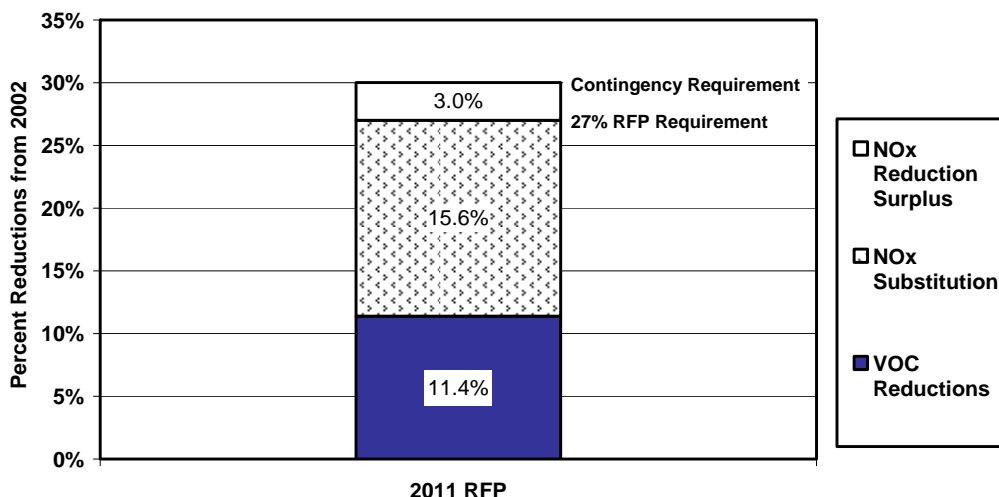
The RFP demonstration for the 2011 milestone year is based on the 2011 emission inventory forecasts, which assume expected growth rates and existing control measures. The RFP requirement for 2011 is for a 27% reduction from 2002 base year emissions. Figure 9-1 shows the percentages of VOC and NOx reductions used to meet the 2011 RFP reduction goals. Projected future VOC and NOx emission reductions will provide the required 27% RFP reduction, as well as a 3% contingency margin.

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<sup>54</sup> Federal Register, November 29, 2005, p. 71634.



**Figure 9-1**  
**Summary of Reasonable Further Progress Demonstration for 2011**  
**Sacramento Nonattainment Area**



## 9.6 Transportation Conformity and Motor Vehicle Emissions Budgets

Under the federal Clean Air Act, federal agencies may not approve or fund transportation plans and projects unless they are consistent with state air quality implementation plans (SIPs). Conformity with the SIP requires that transportation activities not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS). Conformity regulations state that emissions from transportation plans and projects must be less than or equal to the motor vehicle emissions budgets established by reasonable further progress, attainment or maintenance plans (SIPs). (40 CFR 93.118)

While the 2011 RFP demonstration relies on revised motor vehicle emissions using EMFAC2007 and updated transportation activity data, the motor vehicle emissions budgets for 2011 are being maintained at the existing 2008 budget levels (previously established based on EMFAC2002). The motor vehicle emissions budgets for 2011 will be adjusted when the air districts in the Sacramento nonattainment area complete their subsequent attainment demonstration plan. This RFP plan is being expedited to satisfy the RFP demonstration requirement that was due June 15, 2007. A full evaluation of potential on-road emissions reductions from state and local measures and the environmental effects of updated transportation budgets will be conducted in the attainment demonstration plan.

The 2011 motor vehicle emissions budgets are shown in Table 9-3.

<b>Table 9-3 2011 Motor Vehicle Emissions Budgets</b>		
<b>Sacramento Nonattainment Area</b>	<b>VOC</b>	<b>NOx</b>
2011 Motor Vehicle Emissions Budgets* (tons/day)	41	75

\*2008 motor vehicle emissions budgets (based on EMFAC2002) are carried forward to 2011.

In addition, to ensure that the transportation conformity budget levels do not interfere with the 2011 progress demonstration, the RFP demonstration was also performed using the 2011 budget levels in place of the 2011 on-road motor vehicle emissions inventory. The additional RFP analysis shows that the 2011 RFP reduction requirements can still be achieved using the 2011 motor vehicle emissions budgets.

## **9.7 Updated Emissions Inventory for General Conformity**

General conformity is the federal regulatory process for preventing major federal actions or projects from interfering with air quality planning goals. Conformity provisions ensure that federal funding and approval are given only to those activities and projects that are consistent with state air quality implementation plans (SIPs). Conformity with the SIP means that major federal actions will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards (NAAQS). Examples of general federal actions that may require a conformity determination include, but are not limited to, the following: leasing of federal land; private construction on federal land; reuse of military bases; airport construction and expansions, and construction of federal office buildings.

A federal agency may demonstrate conformity by showing that the total of direct and indirect emissions from the action is accounted for in the applicable SIP's attainment or maintenance demonstration. Current federal rules do not allow the emissions inventory in a reasonable further progress plan to be used to support a general conformity determination, since the inventory must be from an applicable SIP's attainment or maintenance demonstration. However, EPA is in the process of revising the General Conformity Rule. To the extent this revision of the rule allows for general conformity emissions levels to be updated through the RFP process, the District will work diligently with State, local, and other agencies to update the 2011 general conformity emission levels with those identified in this RFP plan.

## **9.8 Future Ozone Planning Efforts**

Future ozone planning efforts will include the preparation of the comprehensive 8-hour ozone attainment and reasonable further progress plan, followed by periodic progress (milestone) reports to assess reasonable further progress.

### **Attainment Plan**

The attainment plan will include the necessary information and analyses to fulfill the remaining federal 8-hour ozone attainment planning requirements for the Sacramento nonattainment area. The attainment demonstration evaluation will use the emission forecasts, photochemical modeling results, and proposed control strategy scenario. In addition, a weight-of-evidence determination will assess and corroborate the likelihood of the modeled attainment demonstration based on evaluation of potential modeling uncertainties and alternative non-modeling methods of data analysis.

### **Milestone Reports**

Section 182(g) of the Clean Air Act Amendments requires that progress (milestone) reports be prepared to evaluate whether actual emission reductions meet the minimum reasonable further progress targets. In addition, the milestone analysis assesses the control measures that have actually been adopted and implemented in comparison to the overall comprehensive attainment strategy contained in the ozone plan. The first 8-hour ozone milestone report will be prepared following the 2008 RFP milestone year, and then every three years out to the attainment year.

**SACRAMENTO REGIONAL 8-HOUR OZONE  
2011 REASONABLE FURTHER PROGRESS PLAN  
APPENDICES**

- A. EMISSIONS INVENTORY**
- B. BASELINE EMISSION REDUCTION CREDITS**
- C. CALIFORNIA MOTOR VEHICLE CONTROL PROGRAM ADJUSTMENTS**

## **Appendix A: Emissions Inventory**

Appendix A contains the estimated VOC and NO<sub>x</sub> 2002 baseline and 2011 forecast summaries by specific emission categories for the Sacramento Federal Nonattainment Area as listed in Tables A-1 and A-2. The emissions inventory reflects recent changes to the CARB CEFS Emission Inventory Version 1.06 for the Sacramento Nonattainment Area (dated February 28, 2007) for average summer day. These revisions listed in Tables A-3 and A-4 include: 1) CARB and district adjustments for recently adopted controls through December 31, 2006, 2) recently corrected emission categories, and 3) recently identified previously uninventoried categories. In addition, the on-road motor vehicle emissions using EMFAC2007 have been updated to incorporate the new SACOG transportation activity data from the recent Metropolitan Transportation Plan for 2035 (MTP2035), which includes the Blueprint Program.

**Table A-1**  
**VOC Emissions for 2002 Baseline and 2011 Forecast**  
**Sacramento Nonattainment Area**

<b>ROG - SACNAA - SUMMER PLANNING INVENTORY -- ADJUSTED FOR MEASURES AND CATEGORIES THROUGH 31 DEC 2006 REFLECTS NEW SACOG ACTIVITY DATA (BLUEPRINT MTP2035, DECEMBER 2007)</b>		
<b>SUBCATEGORY</b>	<b>2002</b>	<b>2011</b>
<b>Stationary</b>		
ELECTRIC UTILITIES	0.17	0.28
COGENERATION	0.00	0.00
OIL AND GAS PRODUCTION (COMBUSTION)	0.15	0.19
MANUFACTURING AND INDUSTRIAL	0.07	0.08
FOOD AND AGRICULTURAL PROCESSING	0.78	0.72
SERVICE AND COMMERCIAL	0.22	0.24
OTHER (FUEL COMBUSTION)	0.13	0.08
SEWAGE TREATMENT	0.03	0.04
LANDFILLS	0.36	0.37
INCINERATORS	0.01	0.01
SOIL REMEDIATION	0.08	0.10
OTHER (WASTE DISPOSAL)	0.01	0.02
LAUNDERING	0.05	0.06
DEGREASING	2.47	1.49
COATINGS AND RELATED PROCESS SOLVENTS	3.17	3.63
PRINTING	1.14	1.17
ADHESIVES AND SEALANTS	0.86	0.79
OTHER (CLEANING AND SURFACE COATINGS)	0.00	0.00
OIL AND GAS PRODUCTION	1.01	1.02
PETROLEUM MARKETING	3.87	4.27
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.00	0.00
CHEMICAL	2.09	2.12
FOOD AND AGRICULTURE	0.48	0.60
MINERAL PROCESSES	0.25	0.32
METAL PROCESSES	0.00	0.00
WOOD AND PAPER	0.75	0.83
ELECTRONICS	0.01	0.01
OTHER (INDUSTRIAL PROCESSES)	0.00	0.00
<b>Stationary Subtotal</b>	<b>18.17</b>	<b>18.44</b>
<b>Area-Wide</b>		
CONSUMER PRODUCTS	14.76	13.77
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	8.02	7.30
PESTICIDES/FERTILIZERS	1.80	1.30
ASPHALT PAVING / ROOFING	0.82	0.85
RESIDENTIAL FUEL COMBUSTION	1.18	1.25
FARMING OPERATIONS	2.82	2.90
CONSTRUCTION AND DEMOLITION	0.00	0.00

PAVED ROAD DUST	0.00	0.00
UNPAVED ROAD DUST	0.00	0.00
FUGITIVE WINDBLOWN DUST	0.00	0.00
FIRES	0.04	0.04
MANAGED BURNING AND DISPOSAL	1.30	1.26
COOKING	0.11	0.13
WASTE COMPOSTING	4.11	4.11
<b>Area-Wide Subtotal</b>	<b>34.95</b>	<b>32.91</b>
<b>On-Road Mobile</b>		
LIGHT DUTY PASSENGER (LDA)	26.77	12.30
LIGHT DUTY TRUCKS - 1 (LDT1)	8.32	4.53
LIGHT DUTY TRUCKS - 2 (LDT2)	10.70	7.12
MEDIUM DUTY TRUCKS (MDV)	5.22	3.51
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	2.52	1.56
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.64	0.46
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	1.87	0.96
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	1.16	0.57
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.07
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.04	0.07
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.20	0.20
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	2.99	2.87
MOTORCYCLES (MCY)	2.70	3.51
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.01	0.01
HEAVY DUTY GAS URBAN BUSES (UB)	0.01	0.01
SCHOOL BUSES (SB)	0.06	0.05
OTHER BUSES (OB)	0.15	0.10
MOTOR HOMES (MH)	0.24	0.12
<b>On-Road Subtotal</b>	<b>63.60</b>	<b>38.01</b>
<b>Other Mobile</b>		
AIRCRAFT	0.53	0.60
TRAINS	0.63	0.61
SHIPS AND COMMERCIAL BOATS	0.23	0.17
RECREATIONAL BOATS	19.05	17.22
OFF-ROAD RECREATIONAL VEHICLES	3.57	5.26
OFF-ROAD EQUIPMENT	13.11	10.10
FARM EQUIPMENT	2.67	1.81
FUEL STORAGE AND HANDLING	3.08	1.80
<b>Other Mobile Subtotal</b>	<b>42.87</b>	<b>37.58</b>
<b>Grand Total</b>		
	<b>159.59</b>	<b>126.93</b>

**Table A-2**  
**NOx Emissions for 2002 Baseline and 2011 Forecast**  
**Sacramento Nonattainment Area**

<b>NOX - SACNAA - SUMMER PLANNING INVENTORY -- ADJUSTED FOR MEASURES AND CATEGORIES THROUGH 31 DEC 2006 REFLECTS NEW SACOG ACTIVITY DATA (BLUEPRINT MTP2035, DECEMBER 2007)</b>		
<b>SUBCATEGORY</b>	<b>2002</b>	<b>2011</b>
<b>Stationary</b>		
ELECTRIC UTILITIES	1.12	1.61
COGENERATION	0.01	0.01
OIL AND GAS PRODUCTION (COMBUSTION)	0.25	0.31
MANUFACTURING AND INDUSTRIAL	2.61	2.90
FOOD AND AGRICULTURAL PROCESSING	8.09	6.08
SERVICE AND COMMERCIAL	2.29	2.35
OTHER (FUEL COMBUSTION)	1.05	0.76
SEWAGE TREATMENT	0.01	0.01
LANDFILLS	0.04	0.04
INCINERATORS	0.02	0.02
SOIL REMEDIATION	0.00	0.00
OTHER (WASTE DISPOSAL)	0.00	0.00
LAUNDERING	0.00	0.00
DEGREASING	0.00	0.00
COATINGS AND RELATED PROCESS SOLVENTS	0.01	0.01
PRINTING	0.01	0.02
ADHESIVES AND SEALANTS	0.00	0.00
OTHER (CLEANING AND SURFACE COATINGS)	0.00	0.00
OIL AND GAS PRODUCTION	0.01	0.01
PETROLEUM MARKETING	0.02	0.03
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.00	0.00
CHEMICAL	0.16	0.16
FOOD AND AGRICULTURE	0.02	0.02
MINERAL PROCESSES	0.43	0.52
METAL PROCESSES	0.00	0.00
WOOD AND PAPER	0.06	0.06
ELECTRONICS	0.00	0.00
OTHER (INDUSTRIAL PROCESSES)	0.00	0.00
<b>Stationary Subtotal</b>	<b>16.21</b>	<b>14.92</b>
<b>Area-Wide</b>		
CONSUMER PRODUCTS	0.00	0.00
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	0.00	0.00
PESTICIDES/FERTILIZERS	0.00	0.00
ASPHALT PAVING / ROOFING	0.00	0.00
RESIDENTIAL FUEL COMBUSTION	2.85	3.02
FARMING OPERATIONS	0.00	0.00
CONSTRUCTION AND DEMOLITION	0.00	0.00



PAVED ROAD DUST	0.00	0.00
UNPAVED ROAD DUST	0.00	0.00
FUGITIVE WINDBLOWN DUST	0.00	0.00
FIRES	0.01	0.01
MANAGED BURNING AND DISPOSAL	0.42	0.40
COOKING	0.00	0.00
<b>Area-Wide Subtotal</b>	<b>3.28</b>	<b>3.42</b>
<b>On-Road Mobile</b>		
LIGHT DUTY PASSENGER (LDA)	19.72	7.98
LIGHT DUTY TRUCKS - 1 (LDT1)	7.38	3.43
LIGHT DUTY TRUCKS - 2 (LDT2)	14.79	7.20
MEDIUM DUTY TRUCKS (MDV)	8.11	4.51
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	3.19	2.51
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.73	0.65
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	1.46	1.06
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	1.95	0.97
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.14	2.09
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	1.63	1.61
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	12.10	8.78
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	39.90	34.71
MOTORCYCLES (MCY)	0.47	0.87
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.84	0.72
HEAVY DUTY GAS URBAN BUSES (UB)	0.08	0.08
SCHOOL BUSES (SB)	0.76	0.80
OTHER BUSES (OB)	0.57	0.52
MOTOR HOMES (MH)	0.84	0.58
<b>On-Road Subtotal</b>	<b>114.65</b>	<b>79.07</b>
<b>Other Mobile</b>		
AIRCRAFT	1.64	2.21
TRAINS	12.18	8.83
SHIPS AND COMMERCIAL BOATS	2.01	1.50
RECREATIONAL BOATS	4.16	5.82
OFF-ROAD RECREATIONAL VEHICLES	0.09	0.11
OFF-ROAD EQUIPMENT	28.27	20.61
FARM EQUIPMENT	12.99	9.03
FUEL STORAGE AND HANDLING	0.00	0.00
<b>Other Mobile Subtotal</b>	<b>61.33</b>	<b>48.12</b>
<b>Grand Total</b>	<b>195.47</b>	<b>145.54</b>

## Recent Emission Inventory Adjustments

Emission inventory adjustments presented in this appendix include recent changes by the air districts and CARB. These emission changes are due to: 1) recently adopted control measures through December 31, 2006, 2) corrections to emission categories, and 3) recent or previously uninventoried sources. Tables A-3 and A-4 contain a summary of the district and CARB emission inventory adjustments, respectively.

**Table A-3**  
**District Emission Inventory Adjustments in Sacramento Nonattainment Area**

District Rule/Category/Source	Adoption Year	Implement Year	VOC Emission Changes* (TPD)	
			2002	2011
PCAPCD-216,240 Degreasing/Solvent Cleaning	2003	2003-2004		-0.445
PCAPCD-239 Graphic Arts	2004	2005		-0.122
SMAQMD-496 Livestock Waste (Option A)	2006	2008		-0.018
PCAPCD-243 Polyester Resin/Plastic Product Manufacturing	2003	2003		-0.194
FRAQMD-3.20 Wood Products Coating	2005	2006		0.000
Correction to SMAQMD Oil&Gas Production Fugitive Emissions			-0.304	-0.304
Added Heritage Dairy (Yolo-Solano)				0.105
Added Cosumnes Power Plant (Sacramento)				0.082
Added Jepson Composting (Yolo-Solano)			4.110	4.110
<b>Total District Adjustments</b>			<b>3.806</b>	<b>3.215</b>

District Rule/Category/Source	Adoption Year	Implement Year	NOx Emission Changes* (TPD)	
			2002	2011
SMAQMD-411 Boilers, Steam Generators, and Process Heaters	2005	2007-2009		-0.095
FRAQMD-3.21 Boilers, Steam Generators, and Process Heaters	2006	2007		0.000
PCAPCD-242 IC Engines	2003	2003		-0.033
Added Cosumnes Power Plant (Sacramento)				0.344
<b>Total District Adjustments</b>			<b>0.000</b>	<b>0.216</b>

**Table A-4**  
**CARB Emission Inventory Adjustments in Sacramento Nonattainment Area**

CARB Rule/Category	VOC Emission Changes* (TPD)	
	2002	2011
Pesticides/Fertilizers Corr.	-0.08	-0.66
Reflash	0.00	0.00
Public Fleet	0.00	-0.03
Idling	0.00	0.00
AB 1493 (Motor Vehicle Greenhouse Gases)	0.00	-0.03
Moyer**	0.00	-0.04
Consumer Products	0.00	-0.60
Off-road	0.00	-0.04
Ships	0.00	0.00
<b>Summary</b>	<b>-0.08</b>	<b>-1.39</b>

\*\*Moyer On-Road Portion

0.00                      -0.02

CARB Rule/Category	NOx Emission Changes* (TPD)	
	2002	2011
Reflash	-0.14	-1.72
Public Fleet	0.00	-0.04
Idling	0.00	-2.28
AB 1493 (Motor Vehicle Greenhouse Gases)	0.00	0.00
Moyer***	-0.20	-0.26
Off-road	0.00	-0.78
Ships	0.00	-0.01
<b>Summary</b>	<b>-0.34</b>	<b>-5.09</b>

\*\*\*Moyer On-Road Portion

-0.10                      -0.14

\*These changes, which include recently adopted control measures up to 12/31/06, are directly incorporated in Tables A-1, A-2 and the Emissions Inventory Chapter 5, including the on-road motor vehicle control reductions. Since the on-road inventory was revised to reflect SACOG December 2007 transportation activity data (MTP2035), these changes are incorporated into the new on-road inventory adjustments by applying a ratio of the revised emissions to its baseline.

## **Appendix B: Emission Reduction Credits (ERCs)**

Appendix B contains a summary description and inventory of VOC and NO<sub>x</sub> emission reduction credits (ERCs) listed by the individual air districts. Included are: 1) unused ERCs issued for reductions that occurred prior to the 2002 base year, and 2) future bankable rice burning ERCs. The VOC and NO<sub>x</sub> ERC totals were added to the emission inventory forecast years in Chapter 5, Table 5-3 and Table 5-4, respectively.

### **Unused ERCs Issued for Reductions That Occurred Prior to 2002 Base Year**

Certain pollutant emission reductions due to equipment shutdown or voluntary control may be converted to emission reduction credits (ERCs) and registered with the air districts. These ERCs may then be used as “offsets” to compensate for an increase in emissions from a new or modified major emission source regulated by the air districts. Unused ERCs are considered as potential future emissions supplemental to the forecasted emissions inventory.

The amounts of unused ERCs from stationary sources and agricultural burning reductions that occurred prior to the 2002 base year are summarized in Table B-1. The individual banked emission certificates by air district are listed in Tables B-3 through B-6.

All of the emissions represented by the stationary source ERCs were included in the previous 1990 SIP-approved base year emissions inventory or in the attainment demonstration. Including these ERCs here simply maintains the validity of those ERCs during the transition from the 1990 to the 2002 base year inventory. They are included here to ensure the potential future use of these credits does not interfere with reasonable further progress and attainment goals.

NO<sub>x</sub> emissions from agricultural burning, including rice straw burning, were not included in the 1990 SIP base year inventory and as such were not included in the 1-hour ozone 1994 attainment demonstration. Currently, emission credits from reduction in burning may not be used to comply with offset requirements at a new major stationary source or a major modification, because they were not included in an approved attainment demonstration plan. Therefore, the impact of accounting for ERCs from reduction in rice straw burning and other agricultural burning credits are being included in this draft 8-hour ozone attainment demonstration.

### **Future Bankable Rice Burning Emission Reduction Credits**

California legislation in 1991 (known as the Connelly bill) required rice farmers to phase down rice field burning on an annual basis, beginning in 1992. A burn cap of 125,000 acres in the Sacramento Valley Air Basin was established, and growers with 400 acres or less were granted the option to burn their entire acreage once every four years. Since the rice burning reductions were mandated by state law, they would ordinarily not

be “surplus” and eligible for banking. However, the Connelly bill included a special provision declaring that the reductions qualified for banking if they met the State and local banking rules.

Due to the special consideration in the Connelly bill, there are potential future rice burning ERCs that could be issued for previous reductions that are still eligible for banking. The amounts of future bankable rice burning ERCs for the Sacramento nonattainment area are estimated at 0.5 tons per day of VOC and 0.6 tons per day of NOx. The potential future bankable rice burning ERCs are listed by air district in Table B-2.

**Table B-1**

<b>Summary of Unused Banked Emission Reduction Credits In the Sacramento Nonattainment Area for 2002 Baseline</b>		
<b>Air District<sup>a</sup></b>	<b>Avg. Summer Day<sup>b</sup></b>	
	<b>VOC (tpd)</b>	<b>NOx (tpd)</b>
Sacramento Metropolitan AQMD	2.075	1.141
Yolo-Solano AQMD	0.423	0.368
Placer County APCD	0.401	0.052
Feather River AQMD (South Sutter)	0.273	0.236
<b>Total Unused Banked ERCs</b>	<b>3.2</b>	<b>1.8</b>

<sup>a</sup>There are no ERCs for El Dorado County AQMD.

<sup>b</sup>Avg. Summer Day calculated by (Qrt. 2 + Qrt. 3)/(183)

**Table B-2**

<b>Summary of Future Bankable Rice Burning Emission Reduction Credits In the Sacramento Nonattainment Area</b>		
<b>Air District<sup>a</sup></b>	<b>Avg. Summer Day</b>	
	<b>VOC (tpd)</b>	<b>NOx (tpd)</b>
Sacramento Metropolitan AQMD	0.11	0.12
Yolo-Solano AQMD	0.16	0.18
Placer County APCD	0.09	0.10
Feather River AQMD (South Sutter)	0.13	0.14
<b>Total Future Rice Burning ERCs</b>	<b>0.5</b>	<b>0.6</b>

<sup>a</sup>There are no future bankable rice burning ERCs for El Dorado County AQMD.

**Table B-3**

<b>SMAQMD BANKED UNUSED ERCs 2002 BASELINE</b>									
<b>ERC Holder</b>	<b>Cert #</b>	<b>ROG Emissions in lbs/quarter</b>				<b>NOx Emissions in lbs/quarter</b>			
		<b>1<sup>st</sup> Qtr</b>	<b>2<sup>nd</sup> Qtr</b>	<b>3<sup>rd</sup> Qtr</b>	<b>4<sup>th</sup> Qtr</b>	<b>1<sup>st</sup> Qtr</b>	<b>2<sup>nd</sup> Qtr</b>	<b>3<sup>rd</sup> Qtr</b>	<b>4<sup>th</sup> Qtr</b>
Army Depot	00353	1	1	1	1	155	155	155	155
Army Depot	00355	22	22	22	22	281	281	281	281
Army Depot	00356	22	22	22	22	281	281	281	281
Army Depot	00357	22	22	22	22	281	281	281	281
Army Depot	00359	58	58	58	58				
Army Depot	00360	132	132	132	132				
Army Depot	00361	133	133	133	133				
Army Depot	00362	75	75	75	75				
Army Depot	00363	17	17	17	17				
Army Depot	00364	84	84	84	84				
Army Depot	00365	64	64	64	64				
Army Depot	00366	561	561	561	561				
Army Depot	00367	215	215	215	215				
Army Depot	00368	486	486	486	486				
Army Depot	00369	319	319	319	319				
Army Depot	00370	84	84	84	84				
Army Depot	00371	142	142	142	142				
Army Depot	00372	310	310	310	310				
Army Depot	00373	87	87	87	87				
Army Depot	00374	109	109	109	109				
Army Depot	00375	71	71	71	71				
Army Depot	00376	5	5	5	5				
Army Depot	00446	130	130	130	130				
Army Depot	00447	112	112	112	112				
Chevron	00247	1,361	1,361	1,361	1,361	3,305	3,306	3,306	3,306
Chevron	00250	1,273	1,273	1,274	1,274	3,092	3,092	3,093	3,093

SMAQMD BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
Chevron	00248					1,497	1,497	1,498	1,498
Chevron	00249					153	153	153	153
Chevron	00251	31	32	33	33	2,207	2,207	2,207	2,207
Chinet	00424	1,478	1,478	1,478	1,478	1,311	1,311	1,311	1,311
Chinet	00425	26	26	26	26	358	358	358	358
Chinet	00423	1,103	1,103	1,103	1,103				
Chinet	00422	53	53	53	53				
Custom Made	00028	126	126	126	126				
Custom Made	00030	461	456	450	450				
Intel	00463					0	3	3	3
Kaiser	00055	6	6	6	6	66	66	66	66
Mather AFB	00073	9	9	9	9				
Mather AFB	00077	15	15	15	15	192	192	192	192
Mather AFB	00083	635	635	635	635				
Mather AFB	00088	28	28	28	28				
Mather AFB	00091	495	495	495	495				
Mather AFB	00092	495	495	495	495				
Mather AFB	00093	495	495	495	495				
Mather AFB	00094	495	495	495	495				
Mather AFB	00097	495	495	495	495				
Mather AFB	00098	495	495	495	495				
Mather AFB	00100	38	88	118	50				
Mather AFB	00084, 85, 109, 110, 113- 123, 147	4	4	4	4				
Mather AFB	00102	3	3	3	3				
Mather AFB	00125	2	2	2	2	26	26	26	26
Mather AFB	00128	5	5	5	5	57	57	57	57

SMAQMD BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
Mather AFB	00138	3	3	3	3	41	41	41	41
Mather AFB	00139	2	2	2	2	25	25	25	25
Mather AFB	00146	39	39	39	39				
Mather AFB	00148	2	2	2	2	24	24	24	24
Mather AFB	00151	62	62	62	62	778	778	778	778
Mather AFB	00152	62	62	62	62	778	778	778	778
Mather AFB	00157	62	62	62	62	778	778	778	778
Mather AFB	00158	62	62	62	62	778	778	778	778
Mather AFB	00162	62	62	62	62	778	778	778	778
Mather AFB	00213	1,084	1,084	1,084	1,084				
Mather AFB	00215	495	495	495	495				
Mather AFB	00216	495	495	495	495				
Mather AFB	00217	495	495	495	495				
Mather AFB	00218	495	495	495	495				
Mather AFB	00219	495	495	495	495				
Mather AFB	00220	495	495	495	495				
Mather AFB	00221	495	495	495	495				
Mather AFB	00235	155	155	155	155				
Mather AFB	00240	550	802	563	595				
Mather AFB	00342	7,978	7,978	7,978	7,978				
McClellan AFB	00279	2	2	2	2	2	2	2	2
McClellan AFB	00280	2	2	2	2	2	2	2	2
McClellan AFB	00281	1	1	1	1	1	1	1	1
McClellan AFB	00282	6	6	6	6	7	7	7	7
McClellan AFB	00283	5	5	5	5	6	6	6	6
McClellan AFB	00284					18	18	18	18
McClellan AFB	00285	34	34	34	34	232	232	232	232
P G & E	00020	61,665	6,702	20,697	39,507	149,758	16,277	50,263	95,947
P G & E	00287	28,863	45,174	59,132	28,545	30,097	69,709	103,607	29,323



SMAQMD BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
P G & E	00288					40,000	40,000	40,000	40,000
Procter & Gamble	00291	18,203	18,203	21,573	18,203				
Procter & Gamble	00333	347	347	345	345				
Sac'to Bee	00163	2,219	2,244	2,268	2,269				
Sac'to Bee	00164	2,219	2,244	2,268	2,269				
Sac'to Bee	00165	2,219	2,244	2,268	2,269				
Sac'to Bee	00166	2,219	2,244	2,268	2,269				
Silgan	00637	1,696	1,283	1,949	2,297				
Silgan	00638	1,829	836	1,457	2,705				
Silgan	00639	1,546	1,518	1,947	3,142				
Silgan	00640	782	258	1,196	1,551				
Silgan	00641	2,349	1,287	2,747	3,651				
Silgan	00642	1,913	1,397	3,846	4,384				
Silgan	00643	1,317	1,389	3,089	3,614				
Silgan	00644	458	354	1,603	59				
SMAQMD	00415	239,305	239,680	239,593	238,653	30,308	30,254	30,121	30,253
State Of Calif	00339	1	11	38	9				
State of Calif	00451	1	14	49	13				
State of Calif	00453	1	11	38	12				
Swanson's	00286	5,145	5,108	4,999	5,089				
Tri-Valley	00455	0	0	74	0	0	0	1,024	0
UCD Med	00690				1	5	3	4	5
UCD Med	00691				1	5	3	4	5
UCD Med	00692				1	5	3	4	5
UCD Med	00693				1	5	3	4	5
UCD Med	00694	64	46	38	61	839	613	505	798
Total unused in lbs/quarter		400,887	359,418	400,093	387,569	268,532	174,379	243,052	213,857
Total unused in tons/quarter		200.444	179.709	200.047	193.785	134.266	87.19	121.526	106.929

SMAQMD BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
Average Summer Day = (Qrt 2 + Qrt 3)/183 tons/day			2.075				1.141		

**Table B-4**

YSAQMD BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
Adams, Schumb & Adams	0042	35	34	34	47	237	232	233	321
ALZA Corporation	0217	1,466	1,322	935	1,259				
ALZA Corporation	0241	0	714	714	0				
BP West Coast Products	0233	21	0	9	18				
Calpine Corporation	0269	0	0	460	806	0	7,700	0	0
City of Roseville	0251					0	10,620	0	4,414
City of Roseville	0252					0	5,137	0	2,746
Hunt-Wesson	0028					0	0	1,789	0
Mariani Packing Company	0287	0	0	139	0				
Mariani Packing Company	0288	0	0	139	0				
Mariani Packing Company	0289	0	0	139	0				
Mariani Packing Company	0290	120	100	111	114				
Mariani Packing Company	0291	120	100	111	114				
MM Yolo Power LLC	0277					0	1751	0	796
MM Yolo Power LLC	0282					0	0	1,587	0
MM Yolo Power LLC	0283					0	0	1,388	0
MM Yolo Power LLC	0284					0	0	1,289	0
MM Yolo Power LLC	0296					0	1163	1306	1502
MM Yolo Power LLC	0300					796	0	0	0
MM Yolo Power LLC	0301					796	0	0	0
Pacific Coast Producers	0206					0	0	251	0

YSAQMD BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
Pacific Gas & Electric	0044	14	0	0	0	226	0	0	0
Pacific Gas & Electric	0045	14	0	0	0	226	0	0	0
Pacific Intl Rice Mills	0223	0	0	23	58	0	0	609	1,088
SMUD	0230	162	128	123	284				
SMUD	0231	598	395	342	414				
SMUD	0229	2,820	2,561	2,806	3,061				
SMUD	0228	2,278	2,067	2,140	2,710				
Shell Oil Products	0168	1,473	776	542	741				
Teichert Aggregates	0240	54	63	38	51	512	594	356	488
UC Davis (UCD)	0198	0	0	139	0	0	0	1,587	0
UCD	0199	0	0	139	0	0	0	1,388	0
UCD	0200	0	0	139	0	0	0	1,289	0
UCD	0201	0	1	188	21				
UCD	0203	0	0	200	25				
UCD	0260	8	674	215	280				
UCD	0261	3	221	70	92				
UCD	0262	17	1,381	441	574				
UCD	0263	141	5,694	3,274	4,054	0	6,000	0	0
UCD	0297					0	1,008	388	851
UCD	0298						664	737	751
UCD	0299						664	737	751
Adams Group	0189	8,087	7,509	2,311	10,975	5,225	4,852	1,493	7,092
Adams Group	0191	17,408	15,723	3,931	19,093	11,248	10,160	2,540	12,337
Dino Beltrami Trust	0108	4,551	0	2,044	0	2,842	0	1,277	0

YSAQMD BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
Jack Wallace	0110	13,307	7,081	4,227	8,599	8,480	4,576	2,678	5,556
Judith Coppel & Jeanne Ireland	0114	1,888	0	848	0	1,179	0	530	0
Reclamation District 108	0235	10,181	9,208	2,466	11,180	11,263	10,180	2,599	12,358
River Garden Farms	0031	53,485	49,509	15,483	61,137	34,542	31,660	8,934	38,646
Wallace Construction	0112	4,482	2,623	1,910	3,186	2,862	1,695	1,207	2,058
<b>Total unused in lbs/quarter</b>		<b>122,733</b>	<b>107,884</b>	<b>46,830</b>	<b>128,893</b>	<b>80,434</b>	<b>98,656</b>	<b>36,192</b>	<b>91,755</b>
<b>Total unused in tons/quarter</b>		<b>61.366</b>	<b>53.942</b>	<b>23.415</b>	<b>64.446</b>	<b>40.217</b>	<b>49.328</b>	<b>18.096</b>	<b>45.878</b>
<b>Average Summer Day = (Qrt 2 + Qrt 3)/183 tons/day</b>			<b>0.423</b>				<b>0.368</b>		

**Table B-5**

<b>PLACER APCD BANKED UNUSED ERCs 2002 BASELINE</b>									
<b>ERC Holder</b>	<b>Cert #</b>	<b>ROG Emissions in lbs/quarter</b>				<b>NOx Emissions in lbs/quarter</b>			
		<b>1<sup>st</sup> Qtr</b>	<b>2<sup>nd</sup> Qtr</b>	<b>3<sup>rd</sup> Qtr</b>	<b>4<sup>th</sup> Qtr</b>	<b>1<sup>st</sup> Qtr</b>	<b>2<sup>nd</sup> Qtr</b>	<b>3<sup>rd</sup> Qtr</b>	<b>4<sup>th</sup> Qtr</b>
Lausman Lumber	96-00008					1,609	1,829	1,829	1,568
Sierra Pine	2002-14	956	868	1243	516				
Ball Corp	2000-05	2,616	2,616	2,616	2,616				
Georgia-Pacific	2001-23					5,050	5,050	5,050	5,050
Builders Pre-Stain	2002-12	16,379	16,379	16,379	16,379				
Builders Pre-Stain	2002-13	3,300	3,300	3,300	3,300				
Formica	00-006	20,961	13,070	12,910	12,315				
Formica	00-00011					747	747	747	676
RC Collet	2002-02 2002-05	343	2,858	1,818	1,952	87	754	551	551
Georgia Pacific	2001-26	33,512	33,512	33,512	33,512				
Reason Farms	2003-07					1,803	1,578	902	3,231
Reason Farms	2003-09	1,630	1,426	815	2,920				
<b>Total unused in lbs/quarter</b>		<b>79,697</b>	<b>74,029</b>	<b>72,593</b>	<b>73,510</b>	<b>9,296</b>	<b>9,958</b>	<b>9,079</b>	<b>11,076</b>
<b>Total unused in tons/quarter</b>		<b>39.848</b>	<b>37.014</b>	<b>36.296</b>	<b>36.755</b>	<b>4.648</b>	<b>4.979</b>	<b>4.540</b>	<b>5.538</b>
<b>Average Summer Day = (Qrt 2 + Qrt 3)/183 tons/day</b>			<b>0.401</b>				<b>0.052</b>		

**Table B-6**

<b>SOUTH SUTTER BANKED UNUSED ERCs 2002 BASELINE</b>									
<b>ERC Holder</b>	<b>Cert #</b>	<b>ROG Emissions in lbs/quarter</b>				<b>NOx Emissions in lbs/quarter</b>			
		<b>1<sup>st</sup> Qtr</b>	<b>2<sup>nd</sup> Qtr</b>	<b>3<sup>rd</sup> Qtr</b>	<b>4<sup>th</sup> Qtr</b>	<b>1<sup>st</sup> Qtr</b>	<b>2<sup>nd</sup> Qtr</b>	<b>3<sup>rd</sup> Qtr</b>	<b>4<sup>th</sup> Qtr</b>
Akin	2001-03	1,248	808	220	1,395	1,048	678	185	1,172
Akin	2002-06	1,362	881	240	1,522	1,507	975	266	1,684
Atkinson	2001-02	689	446	434	770	762	493	229	851
Barosso	2001-01	435	281	77	486	365	236	64	408
Bethel	2001-30-T1	15,101	9,771	2,665	16,877	16,707	10,810	2,948	18,672
Bethel	2001-30-R2	15,101	9,771	2,665	16,877	16,707	10,810	2,948	18,672
Bulkley	2001-37-01R	0	0	0	0	441	2,855	78	493
Bulkley	2001-08-01R	0	0	0	0	0	551	1,174	0
Bulkley	2001-07-01R	0	0	0	0	307	198	54	343
Dougherty	2002-09	2,112	4,583	4,888	2,360	2,336	3,332	2,661	2,611
Green Valley	2002-07	4,665	3,018	823	5,213	5,161	3,339	911	5,768
Lauppe	2001-25	1,217	788	215	1,361	1,347	872	238	1,505
Lauppe	2001-24	0	1,244	1,309	0	0	704	740	0
Lauppe	20002	4,370	2,828	771	4,884	3,671	2,375	648	4,103
Lauppe	20002-PB	4,189	2,710	739	4,682	4,635	2,999	818	5,180
Lauppe	20009	0	4,586	4,773	0	0	2,283	2,376	0
Leal	2001-31	246	59	43	275	272	176	48	304
Matteoli	2001-35-R1	0	0	0	0	1,972	276	348	2,204
Matteoli	20006	1,633	1,057	288	1,826	1,372	888	242	1,533
Murphy	2001-27	3,052	2,779	1,375	3,411	3,377	2,640	1,069	3,774
Pacific Aggregates	2001-35-T1	1,782	1,153	314	1,992	0	0	0	0
Pacific Aggregates	2001-37-01T	398	258	70	445	0	0	0	0
Pacific Aggregates	2001-08-01T	0	1,106	3,336	0	0	0	0	0
Pacific Aggregates	2001-07-01T	365	236	64	408	0	0	0	0
Paulsen	2001-42	1,499	970	264	1,675	1,658	1,073	293	1,853
Payne	2001-26	0	1,367	2,604	0	0	773	1,164	0
SMUD	99002-T2	256	166	45	286	215	139	38	241
SMUD	99001-T2	20,350	13,167	3,591	22,744	17,094	11,061	3,016	19,105
Vestal	2001-29	1,141	738	201	1,275	1,262	817	223	1,411
Windswept	98031	715	1,724	1,438	800	792	1,225	883	885

SOUTH SUTTER BANKED UNUSED ERCs 2002 BASELINE									
ERC Holder	Cert #	ROG Emissions in lbs/quarter				NOx Emissions in lbs/quarter			
		1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr
Total unused in lbs/quarter		81,926	66,495	33,452	91,564	83,008	62,578	23,662	92,772
Total unused in tons/quarter		40.963	33.248	16.726	45.782	41.504	31.289	11.831	46.386
Average Summer Day = (Qrt 2 + Qrt 3)/183 tons/day			0.273				0.236		



## **Appendix C: Pre-1990 Motor Vehicle Control Program Adjustments**

Section 182(b)(1)(D) of the Clean Air Act stipulates that emission reductions stemming from the federal on-road motor vehicle control program as it existed in 1990 may not be used to help meet minimum emission reduction requirements for reasonable further progress (RFP) purposes. The Clean Air Act also prohibits states from taking credit for emission reductions resulting from using gasoline with a Reid vapor pressure limit specified by 1990. This precludes states from demonstrating satisfactory progress for ozone simply on the merit of the federal motor vehicle and fuels programs as they existed in 1990. States are required to adjust for the benefits of these federal programs in RFP calculations.

Over the years, various methods have been used to estimate the benefits of the pre-1990 federal motor vehicle program. In 2005, the U.S. Environmental Protection Agency (U.S. EPA) released guidance on this subject in Appendix A to the preamble to Phase 2 of the 8-hour ozone implementation rule. Appendix A was written for all 50 states and explains how to calculate the benefits of the 49-state pre-1990 program.

The one-size-fits-all approach found in Appendix A is problematic for California. California's pioneering efforts to set emission standards from motor vehicles resulted in nationwide emission standards adopted by U.S. EPA. In general, California's auto emission standards have been, and still are, more stringent than federal standards, particularly for passenger vehicles. California Air Resources Board (ARB) staff has held ongoing discussions with U.S. EPA staff about the most appropriate way to calculate the benefits of the motor vehicle and fuels control program as it existed in 1990. It was clear to ARB staff that U.S. EPA guidance in Appendix A did not recognize the maturity of California's program in 1990 or provide California a workable means to estimate the benefits of the pre-1990 motor vehicle program.

In September 2007, in response to issues raised by ARB staff, U.S. EPA staff proposed an alternative calculation methodology specifically for use in California. This alternative would allow calculating the benefits from the pre-1990 California program in lieu of those from the pre-1990 49-state federal program. By ARB staff's accounting, using the alternative U.S. EPA method would still result in an underestimation of the progress produced by California's program, although to a lesser extent than would Appendix A. This is due to an overestimation of the residual benefits of the pre-1990 California motor vehicle program. Nevertheless, ARB staff has estimated the benefits of California's pre-1990 motor vehicle program for the Sacramento Metro nonattainment area according to the U.S. EPA-approved alternative methodology.

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