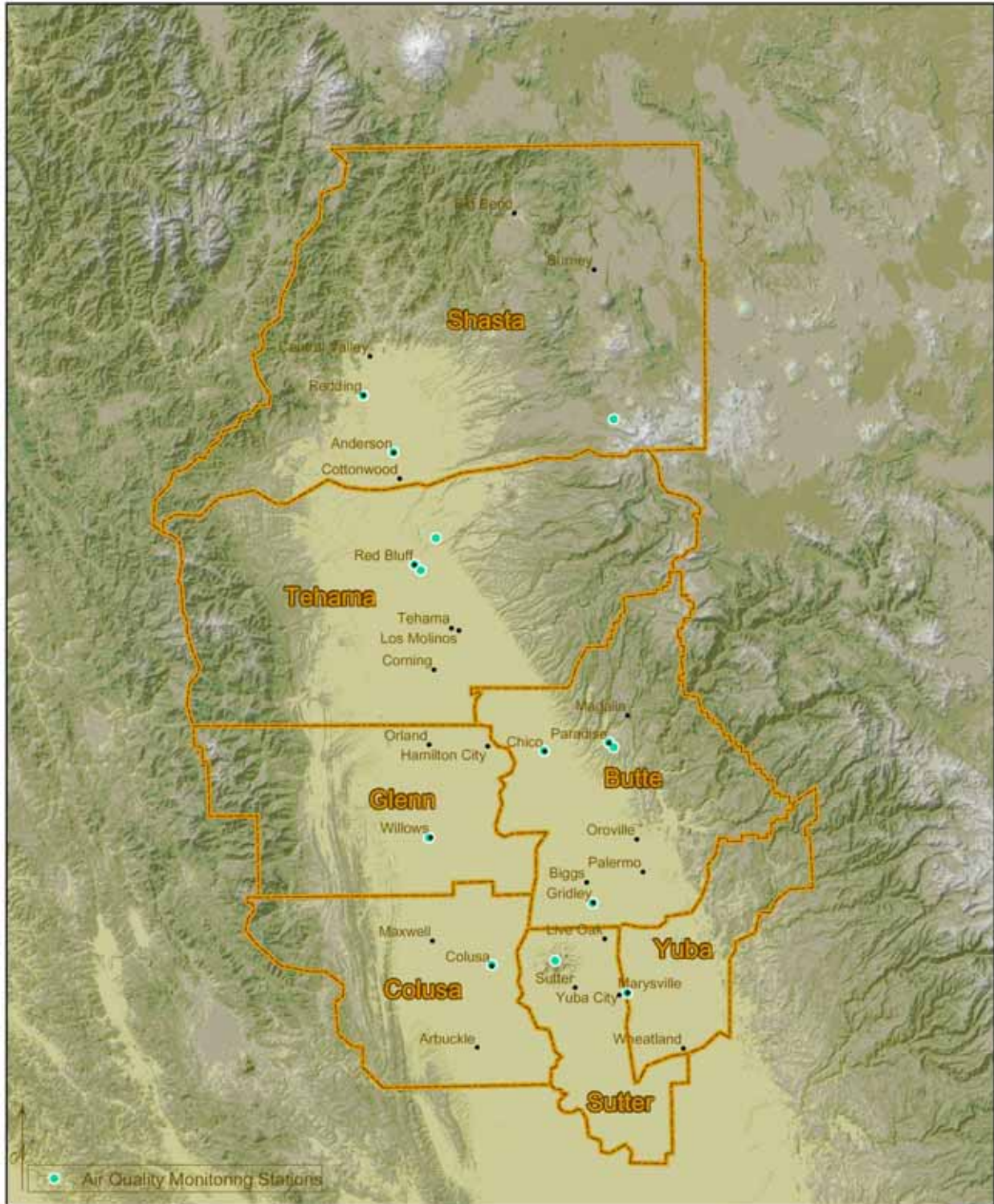


# Northern Sacramento Valley Planning Area 2006 Air Quality Attainment Plan



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## **2006 AIR QUALITY ATTAINMENT PLAN CHAPTER I – PLAN OVERVIEW**

### **I.1 INTRODUCTION**

The Air Pollution Control Districts and Air Quality Management Districts (Districts) for the counties located in the northern portion of the Sacramento Valley (depicted on the cover page) together comprise the Northern Sacramento Valley Planning Area (NSVPA). The NSVPA Districts have committed to jointly prepare and adopt a uniform air quality attainment plan for the purpose of achieving and maintaining healthful air quality throughout the air basin. This triennial update of the NSVPA Air Quality Attainment Plan (Plan) addresses the progress made in implementing the 2003 Plan and proposes modifications to the strategies necessary to attain the California ambient air quality standard for the 1-hour ozone standard at the earliest practicable date. The 2006 Plan identifies those portions of the NSVPA designated as “non-attainment” for the State ambient air quality standards and discusses the health effects related to the various air pollutants. The Plan identifies the air pollution problems which are to be cooperatively addressed on as many fronts as possible in order to make the region a healthier place to live now and in the future. Like the 1994, 1997, 2000, and 2003 Plans, the 2006 Plan focuses on the adoption and implementation of control measures for stationary sources, area wide sources, and indirect sources, and addresses public education and information programs. The 2006 Plan also addresses the effect that pollutant transport has on the ability of the NSVPA to meet and attain the State standards.

The California Air Resources Board (CARB) outlined in their 1994 State Implementation Plan (SIP) for ozone, control strategies that were to be developed and implemented over the next decade in California. This 2006 Plan contains the suggested control measures included in the 2003 Plan along with the Tier 1 Control Measures (Identification of Achievable Performance Standards and Emerging Technologies for Stationary Sources – March 1998; Identification of Performance Standards for Existing Stationary Sources – Updated May 16, 2002). These control measures will reduce air pollution throughout California and will ensure continued progress towards meeting or maintaining federal standards, and will aid in the progression towards California’s more stringent health protective State standards.

With the SIP as the State’s established control strategy for the future, the CARB found that the NSVPA Districts would have to meet basic requirements as laid out in Health & Safety (H&S) Code sections 40924 and 40925, which include the following:

1. Assessing progress towards achieving control measure commitments in the 2003 Triennial Plan;
2. Summarizing the last three years of ozone data to demonstrate improvement of air quality, utilizing air quality indicators to be provided by CARB staff;
3. Comparing the expected versus actual emission reductions for each measure committed to in the 2003 Triennial Plan; and
4. Updating control measure commitments and the growth rates of population, industry, and vehicle related emissions.

The most important element, as always, is the review of all feasible measures and updating Plan control measure commitments to reflect that review.

## **I. 2 LEGISLATIVE REQUIREMENTS**

As specified in the California Clean Air Act of 1988 (CCAA), Chapters 1568-1588, it is the responsibility of each District within the State to attain and maintain California's ambient air quality standards. The CCAA requires that an Attainment Plan be developed by all non-attainment Districts for ozone (O<sub>3</sub>), carbon monoxide (CO), sulfur oxides (SO<sub>x</sub>), and nitrogen oxides (NO<sub>x</sub>) that are either receptors or contributors of transported air pollutants. The purpose of this Plan is to comply with the requirements of the CCAA as implemented through the California Health and Safety Code (H&S Code). Districts in the NSVPA are required to update the Plan every three years. This revision of the Plan satisfies the requirement for the December 31, 2006 update. The Plan is formatted to reflect the 1990 baseline emissions year with a planning horizon of 2010. The H&S Code, Sections 40910 and 40913, require the Districts to achieve State standards by the earliest practicable date to protect the public health, particularly that of children, the elderly, and people with respiratory illness.

The H&S Code, Section 41503(b), requires that control measures for the same emission sources are uniform throughout the planning area to the extent that is feasible. To meet this requirement, the NSVPA has coordinated the development of this Attainment Plan and has set up a specific rule adoption protocol. The protocol was established by the Technical Advisory Committee (TAC) of the Sacramento Valley Basinwide Air Pollution Control Council and the Sacramento Valley Air Quality Engineering and Enforcement Professionals, which allow the Districts in the basin to act and work as a united group with the CARB as well as with industry in the rule adoption process.

Section 40912 of the H&S Code states that each District responsible for, or effected by, air pollutant transport shall provide for attainment and maintenance of the State and federal standards in both upwind and downwind Districts. This section also states that each downwind District's Plan shall contain sufficient measures to reduce emissions originating in each District to below levels which violate State ambient air quality standards, assuming the absence of transport contribution.

## **I. 3 AREA DESCRIPTION**

The area that this Plan specifically addresses is referred to as the NSVPA, and includes the following counties located in the northern portion of the Sacramento Valley: Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba (see cover page). The NSVPA is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges reach heights in excess of 6,000 feet above mean sea level (MSL), with individual peaks rising much higher. This provides a substantial physical barrier to both locally created pollution and the pollution that has been transported northward on prevailing winds from the Sacramento Metropolitan area.

Although a significant area of the NSVPA is at elevations higher than 1,000 feet above MSL, the vast majority of its populace lives and works below that elevation. The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems.

## **I. 4 AREA DESIGNATIONS**

Figure 1 shows the geographic locations of each District within the NSVPA. All of the Districts have been designated as non-attainment areas for the State standards for PM10. Moreover, all of the Districts, with the exception of Colusa and Glenn counties, have been designated as non-attainment areas for the State standard for ozone. Colusa and Glenn counties have been designated as non-attainment transitional areas for ozone (CARB - Area Designations and Maps – September 2006).

In the NSVPA, ozone violations are caused in part by combustion sources and are occasionally influenced by smoke impacts from wildfires. The primary emission source is the internal combustion engine. The ozone problem is further aggravated by transport from the Broader Sacramento Area (BSA), which is comprised of Sacramento County and portions of El Dorado, Placer, Sutter, and Yolo Counties. Ozone is formed by a photochemical reaction between nitrogen oxides and reactive organic gases. These ozone precursors are emitted as part of the exhaust of internal combustion engines in the NSVPA and BSA and are transported northward via the prevailing winds. Due to the regional nature of the ozone problem and the fact that the NSVPA counties share the same air basin with BSA, the Attainment Plan is prepared in conjunction with the Sacramento Valley Air Quality Engineering and Enforcement Professionals and the Sacramento Valley Basinwide Air Pollution Control Council's TAC.

## **I. 5 OVERVIEW OF AIR POLLUTANT HEALTH EFFECTS**

Air pollution affects the health of everyone to some degree.

### **Ozone**

In the NSVPA, ozone is a seasonal problem, typically occurring during the months of May through October. Sources for the pollutants which react to form ozone include motor vehicles, power plants, factories, chemical solvents, combustion products from various fuels, and consumer products.

Ozone acts as a strong irritant that attacks the body's respiratory system. Symptoms include shortness of breath, chest pain when inhaling deeply, wheezing and coughing. When ozone levels are high, people with lung disease (e.g., chronic bronchitis, emphysema, and asthma) are particularly susceptible to adverse health impacts.

### **Nitrogen Oxide**

Nitrogen dioxide (NO<sub>2</sub>), a toxic reddish-brown gas, and nitric oxide (NO), a colorless gas, comprise NO<sub>x</sub> (oxides of nitrogen). Because NO<sub>x</sub> is an ingredient in the formation of ozone, it is referred to as an ozone precursor. NO<sub>2</sub> is associated with adverse health effects and is formed in the atmosphere when NO is oxidized to NO<sub>2</sub>. Both NO<sub>2</sub> and NO are produced as a result of fuel combustion.

### **PM10**

Particulate matter is a mixture of solid particles and liquid droplets found in the air. Particulate matter may be produced by natural causes (e.g., pollen, ocean salt spray, soil erosion) and by human activity (e.g., road dust, agricultural operations, fuel combustion products, wood burning, rock crushing, cement production, and motor vehicles). The California Environmental Protection Agency (EPA) and the federal EPA regulate "respirable" particulate at the 10-micron level (PM10) and "fine" particles at the 2.5-micron level (PM2.5). Both coarse and fine particles

are of health concern because they can penetrate into the sensitive regions of the respiratory tract. Fine particles are linked to the most serious effects. They can cause persistent coughs, phlegm, wheezing, and other physical discomfort.

Exposure to particle pollution is linked to the increased frequency and severity of asthma attacks and bronchitis, and even premature death in people with existing cardiac or respiratory disease. When particle levels in the air increase, so do reports of adverse health outcomes. Those most sensitive to particle pollution include people with existing respiratory and cardiac problems, children, and the elderly. Prolonged and repeated exposure can also have adverse impacts. Life expectancy is somewhat lower in areas with high particle levels. All inhalable particles are harmful – both “coarse” particles in the 2.5 to 10 micron diameter size and “fine” particles, those smaller than 2.5 microns.

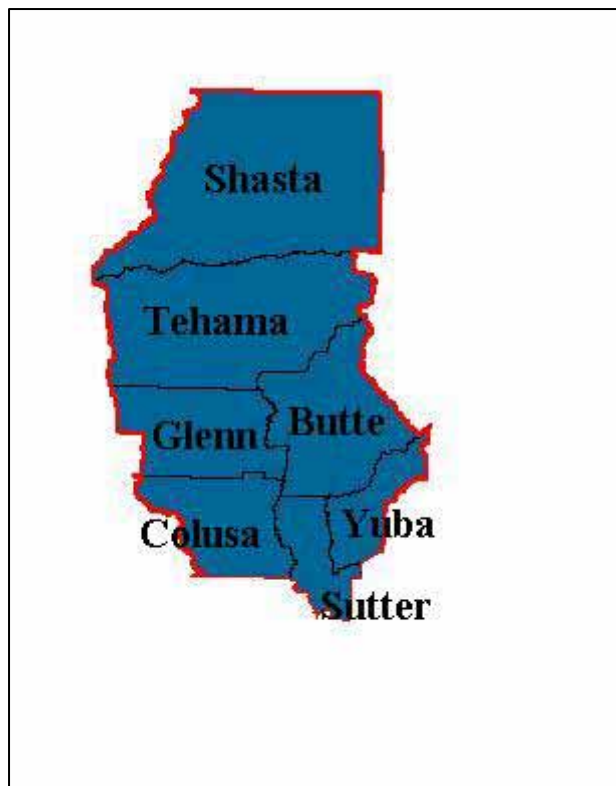
## **I. 6 PLAN LIMITATIONS**

The NSVPA staff have developed this Plan using data from each District’s stationary source emission inventory and the State’s ambient air quality monitoring database. The data collected and compiled is deemed as best available, and is intended to meet the minimum requirements of H&S Codes Section 90924(b). NSVPA staff believe that a more comprehensive network of ambient air quality monitors is needed in the NSVPA to more accurately reflect air quality and to assess the impact of pollutant transport on each District.

# Area Designations for State Ambient Air Quality Standards



**Ozone**



**PM 10**



**Non-Attainment Transitional**



**Non-Attainment**

**FIGURE 1**

## **2006 AIR QUALITY ATTAINMENT PLAN CHAPTER II - AIR MONITORING**

### **II.1 INTRODUCTION**

This chapter of the CCAA Attainment Plan Update will look at NSVPA air quality monitoring data and results from the past three years (2003-2005). This 2006 Plan Update is concerned with the pollutant ozone (O<sub>3</sub>) for which the NSVPA has been designated as non-attainment.

The air quality data contained in Appendix A was provided by the CARB website at [www.arb.ca.gov/adam/welcome.html](http://www.arb.ca.gov/adam/welcome.html). This section contains air quality statistics, reported in units of concentration, for the NSVPA.

The ambient air quality standards establish the concentration at which the pollutant is known to cause adverse health effects to sensitive groups within the population, such as children and the elderly. Both the California and federal governments have adopted health-based standards for the criteria pollutants, which include ozone, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and carbon monoxide. In general, the air quality standards are expressed as a measure of the amount of pollutant per unit volume of air. The ozone standard is expressed as parts per million (ppm).

### **II.2 OZONE MONITORING**

Ozone is a colorless gas with a pungent odor. It is the chief component of urban smog. Ozone is not directly emitted as a pollutant, but is formed in the atmosphere when precursor emissions, hydrocarbons and nitrogen oxides, react in the presence of sunlight. Generally, low wind speeds or stagnant air coupled with warm temperatures and cloudless skies provide for the optimum conditions. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often impacts a widespread area. In addition to adverse health effects, ozone causes damage to open vegetation, building surfaces, exposed rubber surfaces, and certain exposed plastics.

Meteorology (weather) and topography play major roles in ozone formation. When the weather is warm and the winds are light, a vertical downward motion of air and a natural cooling of the earth's surface act together to form an inversion that traps pollutants. Sunlight then causes a chemical reaction between the hydrocarbons and the nitrogen oxides, forming ozone.

The Sacramento Valley is shaped like an elongated bowl. Temperature inversion layers can clamp a lid on the bowl, allowing air pollution to rise to unhealthy levels. Weather conditions cause air pollution concentrations to fluctuate widely from day to day and season to season.

Topography alone gives the NSVPA great potential for trapping and accumulating air pollutants. The strong inversions typical of NSVPA summers are caused by subsidence, the slow sinking of air causing compressional warming. The surface inversions typical of winter are formed primarily at night as air is cooled when it comes in contact with the earth's cold surface. These are called radiation inversions.

Temperature inversions prevent pollutants from rising and being diluted vertically. Thus, pollutants remain trapped in the layer of air where people breathe. Summer subsidence inversions occur on over 90% of summer days; they persist throughout the day and tend to intensify during the afternoon. Winter radiation inversions occur on over 70% of winter nights, but are usually destroyed by daytime heating, bringing a rapid improvement in air quality by afternoon. Both types of inversion mechanisms may operate at any time of the year, and in the fall both may occur together to produce the heaviest pollution potential.

Recognizing the adverse health impacts of daylong exposure, the federal EPA promulgated an 8-hour ozone standard in 1997 as a successor to the 1-hour standard, which was established in 1979. The State EPA promulgated an 8-hour ozone standard that became effective May 17, 2006.

<b>AMBIENT AIR QUALITY STANDARDS FOR OZONE</b>	
<b><i>State Ozone Standard:</i></b> 0.07 ppm for 8 hour -- not to be exceeded - effective May 17, 2006.	<b><i>National Ozone Standards:</i></b> 0.08 ppm for 8 hours -- not to be exceeded based on the fourth highest concentration averaged over 3 years.

**Ozone Summary**

Figure 2 shows the placement of the air monitoring stations operating from 2003 through 2005 in the NSVPA. Currently there are ten ozone monitors evenly distributed throughout the NSVPA. Shasta County has two ozone monitors (one located in Redding, and one in Anderson); Butte County has two monitors (one located in Chico, and one located in Paradise); Sutter County has two monitors (one located in Yuba City, and one on the Sutter Buttes); Tehama County has two monitors (one in downtown Red Bluff, and one on the Tuscan Buttes); Glenn County has one monitor (located in Willows); and Colusa County has one monitor (located in the town of Colusa).

The State standard allows only one exceedance per year on average at any site within each District in the preceding three-year period. This is meant to take into account year-to-year weather fluctuations and any exceptional exceedances. The CARB has established three categories of exceptional exceedances: (1) “exceptional events” (e.g., forest fires); (2) “extreme concentration events”; and (3) “unusual concentration events”.

Appendix A, Ozone Tables and Graphs, are separated by county and graphically illustrate three-year ozone trends including: maximum 1-hour and 8-hour concentrations; number of days above State standard; and number of days above national 1-hour and 8-hour standards. Ozone trends are variable and unique for each District within the NSVPA. During the past three-year period, Anderson-Shasta County, Sutter Buttes-Sutter County and Paradise-Butte County monitors experienced the highest number of ozone violations in the basin. Ozone concentrations in the NSVPA have remained relatively constant over the past three years, while population and vehicle miles traveled (VMT) increased during the same period. Ozone concentrations increased appreciably in Anderson-Shasta County, largely due to unfavorable meteorological conditions.

## II. 3 EMISSION INVENTORY

The Districts and the CARB develop the emission inventory and associated emissions projections jointly. The California Emission Forecasting System (CEFS) is the computer tool used to develop the projections. The emission estimates are based on the most currently available growth and control data. This Plan's projections are based on the emission inventories of 2005. For mobile sources, CEFS integrates the emission estimates from the "EMission FACTor" (EMFAC) model.

The following tables present forecast emission data for the Sacramento Valley Air Basin for Reactive Organic Gases (ROG) and Oxides of Nitrogen (NOx) for several source categories. The annual average emissions are reported in tons per day for the years 2005, 2010, 2015 and 2020. The projected emissions show a downtrend for both ROG and NOx, which are the precursor emissions for ozone.

### REACTIVE ORGANIC GASES PROJECTED EMISSION INVENTORY 2005 Base Year - Annual Average – Grown and Controlled NORTHERN SACRAMENTO VALLEY PLANNING AREA

<b>STATIONARY SOURCES</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB.				
<b>SUMMARY CATEGORY NAME</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>FUEL COMBUSTION</b>				
ELECTRIC UTILITIES	0.147	0.086	0.094	0.094
COGENERATION	0.189	0.044	0.044	0.045
OIL AND GAS PRODUCTION (COMBUSTION)	0.943	0.535	0.535	0.535
MANUFACTURING AND INDUSTRIAL	0.543	0.222	0.235	0.247
FOOD AND AGRICULTURAL PROCESSING	0.412	0.386	0.376	0.366
SERVICE AND COMMERCIAL	0.114	0.076	0.075	0.076
OTHER (FUEL COMBUSTION)	0.372	0.107	0.106	0.106
<b>* TOTAL FUEL COMBUSTION</b>	<b>2.721</b>	<b>1.455</b>	<b>1.465</b>	<b>1.469</b>
<b>WASTE DISPOSAL</b>				
SEWAGE TREATMENT	0.000	0.000	0.000	0.000
LANDFILLS	0.000	0.000	0.000	0.000
INCINERATORS	0.000	0.000	0.000	0.000
SOIL REMEDIATION	0.001	0.000	0.000	0.000
OTHER (WASTE DISPOSAL)	0.049	0.013	0.014	0.014
<b>* TOTAL WASTE DISPOSAL</b>	<b>0.050</b>	<b>0.013</b>	<b>0.015</b>	<b>0.015</b>

**REACTIVE ORGANIC GASES PROJECTED EMISSION INVENTORY**  
**2005 Base Year - Annual Average – Grown and Controlled**  
**NORTHERN SACRAMENTO VALLEY PLANNING AREA**  
**(cont.)**

<b>STATIONARY SOURCES (continued)</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB.				
<b>SUMMARY CATEGORY NAME</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>CLEANING AND SURFACE COATINGS</b>				
LAUNDERING	0.024	0.026	0.028	0.030
DEGREASING	1.345	1.310	1.346	1.379
COATINGS AND RELATED PROCESS SOLVENTS	1.663	1.335	1.433	1.516
PRINTING	0.044	0.036	0.037	0.038
ADHESIVES AND SEALANTS	0.269	0.238	0.214	0.194
OTHER (CLEANING AND SURFACE COATINGS)	0.149	0.141	0.154	0.166
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>3.494</b>	<b>3.085</b>	<b>3.212</b>	<b>3.323</b>

<b>PETROLEUM PRODUCTION AND MARKETING</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
OIL AND GAS PRODUCTION	2.918	3.210	3.565	3.927
PETROLEUM REFINING	0.025	0.015	0.015	0.015
PETROLEUM MARKETING	1.871	1.777	1.857	2.006
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.120	0.052	0.052	0.053
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	<b>4.934</b>	<b>5.054</b>	<b>5.488</b>	<b>6.000</b>

<b>INDUSTRIAL PROCESSES</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
CHEMICAL	0.371	0.313	0.329	0.346
FOOD AND AGRICULTURE	0.889	0.592	0.642	0.685
MINERAL PROCESSES	1.607	1.041	1.140	1.208
METAL PROCESSES	0.000	0.000	0.000	0.000
WOOD AND PAPER	0.197	0.186	0.203	0.218
ELECTRONICS	0.000	0.000	0.000	0.000
OTHER (INDUSTRIAL PROCESSES)	0.044	0.044	0.048	0.050
<b>* TOTAL INDUSTRIAL PROCESSES</b>	<b>3.108</b>	<b>2.176</b>	<b>2.363</b>	<b>2.506</b>

<b>** TOTAL STATIONARY SOURCES</b>	<b>14.306</b>	<b>11.783</b>	<b>12.543</b>	<b>13.312</b>
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**REACTIVE ORGANIC GASES PROJECTED EMISSION INVENTORY**  
**2005 Base Year - Annual Average – Grown and Controlled**  
**NORTHERN SACRAMENTO VALLEY PLANNING AREA**  
**(cont.)**

<b>AREA-WIDE SOURCES</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB.				
<b>SUMMARY CATEGORY NAME</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>SOLVENT EVAPORATION</b>				
CONSUMER PRODUCTS	4.321	4.516	4.869	5.235
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	2.225	2.343	2.490	2.654
PESTICIDES/FERTILIZERS	5.392	5.027	4.889	4.760
ASPHALT PAVING / ROOFING	7.367	7.453	7.511	7.544
<b>* TOTAL SOLVENT EVAPORATION</b>	<b>19.305</b>	<b>19.339</b>	<b>19.759</b>	<b>20.193</b>
<b>MISCELLANEOUS PROCESSES</b>				
RESIDENTIAL FUEL COMBUSTION	1.666	1.663	1.675	1.708
FARMING OPERATIONS	5.432	5.432	5.432	5.432
CONSTRUCTION AND DEMOLITION	0.000	0.000	0.000	0.000
PAVED ROAD DUST	0.000	0.000	0.000	0.000
UNPAVED ROAD DUST	0.000	0.000	0.000	0.000
FUGITIVE WINDBLOWN DUST	0.000	0.000	0.000	0.000
FIRES	0.020	0.021	0.022	0.023
MANAGED BURNING AND DISPOSAL	6.467	6.479	6.494	6.517
COOKING	0.101	0.108	0.116	0.123
OTHER (MISCELLANEOUS PROCESSES)	0.000	0.000	0.000	0.000
<b>* TOTAL MISCELLANEOUS PROCESSES</b>	<b>13.686</b>	<b>13.703</b>	<b>13.739</b>	<b>13.803</b>
<b>** TOTAL AREA-WIDE SOURCES</b>	<b>32.991</b>	<b>33.042</b>	<b>33.498</b>	<b>33.996</b>

**REACTIVE ORGANIC GASES PROJECTED EMISSION INVENTORY**  
**2005 Base Year - Annual Average – Grown and Controlled**  
**NORTHERN SACRAMENTO VALLEY PLANNING AREA**  
**(cont.)**

<b>MOBILE SOURCES</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB.				
<b>ON-ROAD MOTOR VEHICLES</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
LIGHT DUTY PASSENGER (LDA)	7.674	5.483	3.517	2.460
LIGHT DUTY TRUCKS - 1 (LDT1)	5.306	4.296	3.272	2.380
LIGHT DUTY TRUCKS - 2 (LDT2)	3.928	3.197	2.406	1.950
MEDIUM DUTY TRUCKS (MDV)	1.650	1.397	1.148	0.962
LIGHT HVY DUTY GAS TRUCKS – 1 (LHDV1)	0.880	0.511	0.426	0.416
LIGHT HVY DUTY GAS TRUCKS – 2 (LHDV2)	0.377	0.272	0.188	0.142
MEDIUM HVY DUTY GAS TRUCKS (MHDV)	0.879	0.627	0.361	0.172
HEAVY HVY DUTY GAS TRUCKS (HHDV)	0.333	0.202	0.104	0.059
LIGHT HVY DUTY DIESEL TRUCKS – 1 (LHDV1)	0.064	0.048	0.042	0.036
LIGHT HVY DUTY DIESEL TRUCKS – 2 (LHDV2)	0.040	0.039	0.033	0.027
MED. HVY DUTY DIESEL TRUCKS (MHDV)	0.064	0.066	0.058	0.053
HVY HVY DUTY DIESEL TRUCKS (HHDV)	2.540	2.537	1.928	1.484
MOTORCYCLES (MCY)	1.412	1.249	1.230	1.344
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.008	0.008	0.008	0.008
HEAVY DUTY GAS URBAN BUSES (UB)	0.007	0.006	0.006	0.006
SCHOOL BUSES (SB)	0.042	0.031	0.028	0.026
OTHER BUSES (OB)	0.049	0.040	0.030	0.022
MOTOR HOMES (MH)	0.131	0.097	0.062	0.034
<b>* TOTAL ON-ROAD MOTOR VEHICLES</b>	<b>25.381</b>	<b>20.105</b>	<b>14.847</b>	<b>11.580</b>

<b>OTHER MOBILE SOURCES</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
AIRCRAFT	1.449	1.521	1.583	1.631
TRAINS	0.668	0.636	0.649	0.667
RECREATIONAL BOATS	13.163	11.353	10.260	9.727
OFF-ROAD RECREATIONAL VEHICLES	1.775	1.851	2.064	2.427
OFF-ROAD EQUIPMENT	5.186	4.005	3.222	2.834
FARM EQUIPMENT	3.568	2.794	1.890	1.225
FUEL STORAGE AND HANDLING	0.927	0.558	0.421	0.352
<b>* TOTAL OTHER MOBILE SOURCES</b>	<b>26.737</b>	<b>22.717</b>	<b>20.089</b>	<b>18.863</b>

<b>** TOTAL MOBILE SOURCES</b>	<b>52.118</b>	<b>42.822</b>	<b>34.936</b>	<b>30.443</b>
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<b>GRAND TOTAL FOR NSVPA</b>	<b>99.415</b>	<b>87.647</b>	<b>80.977</b>	<b>77.751</b>
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\* Emissions from natural sources are excluded.

**OXIDES OF NITROGEN PROJECTED EMISSION INVENTORY**  
**2005 Base Year - Annual Average – Grown and Controlled**  
**NORTHERN SACRAMENTO VALLEY PLANNING AREA**

<b>STATIONARY SOURCES</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB				
<b>SUMMARY CATEGORY NAME</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>FUEL COMBUSTION</b>				
ELECTRIC UTILITIES	3.938	2.116	2.429	2.453
COGENERATION	4.452	2.789	2.790	2.791
OIL AND GAS PRODUCTION (COMBUSTION)	5.862	4.551	4.551	4.551
MANUFACTURING AND INDUSTRIAL	7.015	4.963	5.304	5.662
FOOD AND AGRICULTURAL PROCESSING	4.449	3.757	3.144	2.449
SERVICE AND COMMERCIAL	4.180	2.808	2.779	2.728
OTHER (FUEL COMBUSTION)	3.162	1.534	1.495	1.473
<b>* TOTAL FUEL COMBUSTION</b>	<b>33.057</b>	<b>22.516</b>	<b>22.491</b>	<b>22.107</b>
<b>WASTE DISPOSAL</b>				
SEWAGE TREATMENT	0.000	0.000	0.000	0.000
LANDFILLS	0.008	0.000	0.000	0.000
INCINERATORS	0.005	0.002	0.003	0.003
SOIL REMEDIATION	0.068	0.039	0.045	0.045
OTHER (WASTE DISPOSAL)	0.000	0.000	0.000	0.000
<b>* TOTAL WASTE DISPOSAL</b>	<b>0.082</b>	<b>0.042</b>	<b>0.048</b>	<b>0.048</b>
<b>CLEANING AND SURFACE COATINGS</b>				
LAUNDERING	0.000	0.000	0.000	0.000
DEGREASING	0.000	0.000	0.000	0.000
COATINGS AND RELATED PROCESS SOLVENTS	0.001	0.001	0.001	0.001
PRINTING	0.000	0.000	0.000	0.000
ADHESIVES AND SEALANTS	0.000	0.000	0.000	0.000
OTHER (CLEANING AND SURFACE COATINGS)	0.001	0.001	0.001	0.001
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>0.002</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>

**OXIDES OF NITROGEN PROJECTED EMISSION INVENTORY**  
**2005 Base Year - Annual Average – Grown and Controlled**  
**NORTHERN SACRAMENTO VALLEY PLANNING AREA**  
**(cont.)**

<b>STATIONARY SOURCES (cont.)</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB				
<b>SUMMARY CATEGORY NAME</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>PETROLEUM PRODUCTION AND MARKETING</b>				
OIL AND GAS PRODUCTION	2.300	2.240	2.240	2.240
PETROLEUM REFINING	0.000	0.000	0.000	0.000
PETROLEUM MARKETING	0.223	0.066	0.066	0.066
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.000	0.000	0.000	0.000
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	<b>2.523</b>	<b>2.306</b>	<b>2.306</b>	<b>2.306</b>
<b>INDUSTRIAL PROCESSES</b>				
CHEMICAL	0.000	0.000	0.000	0.000
FOOD AND AGRICULTURE	0.027	0.016	0.017	0.018
MINERAL PROCESSES	3.987	2.336	2.551	2.742
METAL PROCESSES	0.000	0.000	0.000	0.000
WOOD AND PAPER	0.084	0.090	0.098	0.105
ELECTRONICS	0.000	0.000	0.000	0.000
OTHER (INDUSTRIAL PROCESSES)	0.349	0.276	0.322	0.322
<b>* TOTAL INDUSTRIAL PROCESSES</b>	<b>4.447</b>	<b>2.718</b>	<b>2.988</b>	<b>3.187</b>
<b>** TOTAL STATIONARY SOURCES</b>	<b>40.111</b>	<b>27.584</b>	<b>27.835</b>	<b>27.649</b>

**OXIDES OF NITROGEN PROJECTED EMISSION INVENTORY**  
**2005 Base Year - Annual Average – Grown and Controlled**  
**NORTHERN SACRAMENTO VALLEY PLANNING AREA**  
**(cont.)**

<b>AREA-WIDE SOURCES</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB				
<b>SOLVENT EVAPORATION</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
CONSUMER PRODUCTS	0	0	0	0
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	0	0	0	0
PESTICIDES/FERTILIZERS	0	0	0	0
ASPHALT PAVING / ROOFING	0	0	0	0
<b>* TOTAL SOLVENT EVAPORATION</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>MISCELLANEOUS PROCESSES</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
RESIDENTIAL FUEL COMBUSTION	0.995	1.003	1.013	1.026
FARMING OPERATIONS	0.000	0.000	0.000	0.000
CONSTRUCTION AND DEMOLITION	0.000	0.000	0.000	0.000
PAVED ROAD DUST	0.000	0.000	0.000	0.000
UNPAVED ROAD DUST	0.000	0.000	0.000	0.000
FUGITIVE WINDBLOWN DUST	0.000	0.000	0.000	0.000
FIRES	0.007	0.007	0.007	0.007
MANAGED BURNING AND DISPOSAL	1.877	1.867	1.861	1.858
COOKING	0.000	0.000	0.000	0.000
OTHER (MISCELLANEOUS PROCESSES)	0.000	0.000	0.000	0.000
<b>* TOTAL MISCELLANEOUS PROCESSES</b>	<b>2.879</b>	<b>2.877</b>	<b>2.881</b>	<b>2.891</b>

<b>** TOTAL AREA-WIDE SOURCES</b>	<b>2.879</b>	<b>2.877</b>	<b>2.881</b>	<b>2.891</b>
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**OXIDES OF NITROGEN PROJECTED EMISSION INVENTORY**  
**2005 Base Year - Annual Average – Grown and Controlled**  
**NORTHERN SACRAMENTO VALLEY PLANNING AREA**  
**(cont.)**

<b>MOBILE SOURCES</b>				
All emissions are represented in Tons per Day and reflect the most current data provided to ARB				
<b>ON-ROAD MOTOR VEHICLES</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
LIGHT DUTY PASSENGER (LDA)	4.902	3.563	2.243	1.440
LIGHT DUTY TRUCKS - 1 (LDT1)	4.325	3.378	2.405	1.574
LIGHT DUTY TRUCKS - 2 (LDT2)	4.315	3.244	2.204	1.538
MEDIUM DUTY TRUCKS (MDV)	2.264	1.801	1.318	0.944
LT HVY DUTY GAS TRUCKS – 1 (LHDV1)	0.675	0.701	0.718	0.769
LT HVY DUTY GAS TRUCKS – 2 (LHDV2)	0.258	0.243	0.226	0.225
MED HVY DUTY GAS TRUCKS (MHDV)	0.438	0.370	0.278	0.206
HVY HVY DUTY GAS TRUCKS (HHDV)	0.458	0.333	0.246	0.211
LT HVY DUTY DIESEL TRUCKS – 1 (LHDV1)	1.833	1.082	0.774	0.578
LT HVY DUTY DIESEL TRUCKS – 2 (LHDV2)	0.928	0.766	0.554	0.391
MED HVY DUTY DIESEL TRUCKS (MHDV)	3.039	2.649	1.870	1.269
HVY HVY DUTY DIESEL TRUCKS (HHDV)	37.414	36.569	25.086	17.432
MOTORCYCLES (MCY)	0.262	0.296	0.313	0.349
HVY DUTY DIESEL URBAN BUSES (UB)	0.178	0.175	0.171	0.170
HEAVY DUTY GAS URBAN BUSES (UB)	0.023	0.020	0.022	0.023
SCHOOL BUSES (SB)	0.407	0.414	0.395	0.381
OTHER BUSES (OB)	0.139	0.139	0.110	0.082
MOTOR HOMES (MH)	0.355	0.335	0.283	0.220
<b>* TOTAL ON-ROAD MOTOR VEHICLES</b>	<b>62.212</b>	<b>56.078</b>	<b>39.217</b>	<b>27.800</b>

<b>OTHER MOBILE SOURCES</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
AIRCRAFT	0.713	0.750	0.782	0.807
TRAINS	10.683	9.051	9.448	9.933
RECREATIONAL BOATS	2.451	2.751	2.792	2.895
OFF-ROAD RECREATIONAL VEHICLES	0.106	0.122	0.129	0.147
OFF-ROAD EQUIPMENT	12.861	10.315	7.789	5.704
FARM EQUIPMENT	17.093	13.882	10.016	6.620
FUEL STORAGE AND HANDLING	0.000	0.000	0.000	0.000
<b>* TOTAL OTHER MOBILE SOURCES</b>	<b>43.906</b>	<b>36.871</b>	<b>30.956</b>	<b>26.106</b>

<b>** TOTAL MOBILE SOURCES</b>	<b>106.118</b>	<b>92.948</b>	<b>70.173</b>	<b>53.906</b>
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<b>GRAND TOTAL FOR NSVPA</b>	<b>149.108</b>	<b>123.409</b>	<b>100.888</b>	<b>84.447</b>
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\* Emissions from natural sources are excluded.

## **II. 4 BACKGROUND INFORMATION: OZONE AIR QUALITY INDICATORS**

### **Air Quality Indicators**

There are a number of ways to look at how ozone levels have changed over time and assess the progress in attaining the State ozone standard. The Board has identified three air quality indicators for Districts to use in the triennial updates to ozone attainment plans. These are the Expected Peak Day Concentration (EPDC) and two exposure indicators: population-weighted (PWE) and area-weighted (AWE).

The EPDC represents the maximum ozone concentration expected to occur once per year on average, and is based on a statistical calculation of ambient ozone data collected at each monitoring site in the District. The EPDC is useful for tracking air quality progress at individual monitoring locations. Because it is based on a robust statistical calculation, it is relatively stable, thereby providing a trend indicator that is not highly influenced by year-to-year changes in meteorology.

The EPDC is calculated using ozone data for a three-year period (the summary year and two years immediately before the summary year). The data included in the calculation are daily maximum 1-hour ozone observations. However, when three years of data are not available, an EPDC can be calculated using only one or two years of data. The EPDC is computed using a statistical procedure that fits an exponential-tail model to the upper tail of the distribution of concentrations. The fitted distribution then is used to determine analytically the concentration that is expected to recur at a one-in-one year rate.

An EPDC with a valid label (Y) indicates that the data meets the designation criterion for complete and representative data. An EPDC that is not valid (N) means that it doesn't meet this criterion and indicates incomplete and potentially unrepresentative data. An invalid EPDC cannot be used for the purpose of determining attainment status, but can provide useful information for evaluating long-term air quality trends at individual sites.

### **Exposure Indicators**

The exposure indicators provided are the PWE and AWE indicators. These are intended to provide an indication of the potential for chronic adverse health impacts. Unlike the EPDC which tracks progress at individual locations, the PWE and AWE indicators consolidate hourly ozone monitoring data from all sites within the district into a single exposure value. The result is a value representing the average potential exposure in an area, which in this case, is a District. The term "potential" is used because daily activity affects an individual's exposure. For example, being indoors during peak ozone concentrations will decrease a person's exposure to outdoor ozone concentrations.

The purpose of the PWE indicator is to characterize the potential average outdoor exposure per person to concentrations above the level of the state ozone standard. The PWE indicator represents a composite of exposures at individual locations that have been weighted to emphasize equally the potential exposure for each individual in an area. In contrast, the purpose of the AWE indicator is to characterize the potential average annual outdoor exposure per unit area. The AWE indicator represents a composite of exposures at individual locations that have been weighted to emphasize equally the potential exposure in all portions of the district.

The exposure analysis is based solely on ambient (outdoor) ozone data. The calculation methodology assumes that an "exposure" occurs when a person experiences a 1-hour ozone

concentration outdoors that is higher than 0.09 ppm, the level of the State standard. The PWE and AWE consider both the level and duration of ozone concentrations above the State standard. The annual exposure is the sum of all the hourly exposures during the year and presents the results as an average per exposed person or average per exposed unit land area.

## **II. 5 OVERVIEW OF CALCULATION METHODOLOGY FOR THE POPULATION-WEIGHTED AND AREA-WEIGHTED EXPOSURE INDICATORS**

**The Time Period:** The population-weighted and area-weighted exposure indicators are computed as an annual value for each year.

**Air Quality Data:** The air quality data used for computing the exposure indicators are hourly ozone data. All available data for sites in the district are used, regardless of whether the data meet designation criterion for complete and representative data. Because the individual exposure values are interpolated from several monitoring sites, it is not critical that the data for all the sites be complete for all hours.

**Census Data:** The exposure computations are based on census data collected by the federal government. For the years from 1985 to 1999, the population statistics are based on the 1990 census. For the years 2000 through 2005, population data from the 2000 census was used.

The federal government has divided the nation into census tracts for the purpose of counting population and obtaining demographic information. Each of these census tracts has associated with it a centroid of the census tract, the population residing within the census tract, and the land area of the census tract. The population within each census tract is used in computing the annual population-weighted exposure, whereas the land area of the census tract is used in computing the annual area-weighted exposure. The centroid of the census tract is used in computing both exposure indicators.

**Calculation Procedure for Population-Weighted Exposure:** Hourly ozone concentrations are interpolated to each census tract centroid. Hourly ozone exposures are computed for each centroid by subtracting the value of the State ozone standard (0.09 ppm) from each interpolated hourly concentration. If negative, the result is set equal to zero. The hourly exposures for each census tract are multiplied by the number of people residing in the census tract. These hourly exposures are then added together and divided by the total population of all of the census tracts for which interpolated exposure values are available.

The result represents an hourly population-weighted exposure for the district. The hourly exposures are aggregated into a daily population-weighted exposure. The daily exposures are then aggregated into an annual population-weighted exposure. This is done for each year from 1985 through 2005, for which data are available.

**Calculation Procedure for Area-Weighted Exposure:** The procedure for computing the area-weighted exposure is similar. In this case, the hourly exposures for each census tract are multiplied by the square kilometer land area of the census tract. These hourly exposures are then added together and divided by the total land area of all of the census tracts for which interpolated exposure values are available. The result represents an hourly area-weighted exposure for the district. The hourly exposures are aggregated into a daily area-weighted exposure. The daily exposures are then aggregated into an annual area-weighted exposure. This is done for each year from 1985 through 2005, for which data are available.

# Figure 2. Air Quality and Meteorological Stations in the Northern Sacramento Valley Planning Area (NSVPA) (2003-2005)



## **2006 AIR QUALITY ATTAINMENT PLAN CHAPTER III – PUBLIC EDUCATION PROGRAMS**

### **III.1 INTRODUCTION**

The NSVPA continues to develop and implement public education programs in order to fulfill the requirements of the CCAA. Section 40918(f) of the California H&S Code states that, “Each District shall include provisions for public education programs to promote actions to reduce emissions from transportation and area wide sources”. Public education and information programs are important components of local and regional efforts to reduce air pollution.

### **III.2 EDUCATION PROGRAMS**

Many of the public education programs and projects have been funded using Vehicle Registration Surcharge Fees (Vehicle Fees). These include the following:

- Passenger fare transit subsidies
- Transit operations
- Purchase of transit buses
- Bicycle lanes and trails
- Electric “ZAP” bicycles
- Other bicycle facilities (racks, lockers, etc.)
- Carpool and transit subsidies
- Electric vehicle conversions
- Hybrid electric vehicle research and development
- Public Service Announcements
- Air Quality Education Exhibits
- PM10 Reduction Strategies
- Residential green waste recycling project
- On-Road cleaner vehicle repowering

The methodology used to provide education and information takes many forms: pamphlets, brochures, public reports and public service announcements; presentations and workshops; multimedia commercials, and; promotions. Public education programs are targeted to a wide audience, including the general public, academia, students from elementary to college level, the medical community, the agricultural community, and the business community.

Information concerning sources of air pollution, health effects, property damage, the fiscal and environmental impacts of air pollution, and what can be done to reduce air pollution continue to be the primary focus of public education efforts.

### **III.3 DISTRICT PROGRAMS**

Each District conducts its own public education program. Some elements are common and others are unique.

The Butte County District office’s public education program has been highly effective in educating permitted sources, students and interested parties about the effects of air pollution. The District’s clean air message continues to be well received by the public. Brochures describing the

many services and programs offered by the District are effectively distributed through various channels. Brochures serve as a valuable tool in providing information to the public.

The District Display is used at special events including school fairs, county fairs and special health expositions to describe air pollution and how to reduce it.

The *Stratus Status* newsletter is published quarterly and distributed to more than 1,000 permitted sources, industrial facilities, and other interested individuals throughout Butte County. An annual *Clean Air Kids* calendar contest has been conducted the past several years. Kindergarten through middle school-aged students in the County are invited to contribute their artistic ideas about how they can reduce air pollution. The District offers prizes to those submittals that are determined to best satisfy the requirements, and the artwork is used to produce the popular and widely distributed calendar. Press releases, presentations and special events are also used in public education, and the District maintains a website for the public's benefit at [www.bcaqmd.org](http://www.bcaqmd.org).

Colusa County's District office sponsors a Public Education program which includes the following public outreach activities:

- Distribution of pamphlets and brochures
- Public service announcements/reports
- Presentations on air pollution and health effects to elementary through high school classes
- Presentation to agricultural and business groups
- Working with Law Enforcement Agencies (LEAs) to provide electric bicycles

The Shasta County District office community education efforts include a broad spectrum of activities intended to increase public awareness of air quality issues and encourage people to reduce motor vehicle emissions. These activities include but are not limited to the following:

- Participation in community events such as District Fair and Salmon Festival
- Presentations in school classrooms
- The printing and distribution of air quality pamphlets and bike trails brochures
- Press releases
- Response to public inquiries
- Operation of a smoking vehicle reporting program
- Public service announcements via radio and television
- Funding bus stop improvements
- Funding murals at public schools
- The display of hybrid vehicles at community events

The Feather River's District office inspectors provide educational handouts regarding open burning regulations. The District has published brochures covering the following subject matter:

- Air Quality Permits
- Air Toxics Program
- Enforcement Procedures
- Agricultural Burning
- Residential Burning

These brochures are available to the public at the front counter of the District offices along with CARB educational “comic books”.

The Feather River District periodically speaks at organizational functions regarding air quality programs. The District maintains a web site at <http://home.jps.net/fraqmd/>, which provides resources and educational materials for public access. Electronic feedback forms are used to encourage air quality questions. The District responds to public and media questions and concerns received by telephone, e-mail, postal mail and in person.

The Tehama County District office also maintains a website: <http://www.tehcoapcd.net>. The District’s public education activities include:

- Distribution of CARB brochures and instructional leaflets
- Presentations to business groups and agricultural groups
- Public service announcements
- Response to public inquiries
- The issuance of press releases
- Sponsorship of and staffing of the *Air Quality* booth at Tehama County Fair
- Presentations in school classrooms

The Glenn County District office sponsors a public education program which includes the following outreach activities:

- Distribution of pamphlets/brochures in English and Spanish
- Public Service Announcements/Reports
- Presentations on air pollution and health effects to elementary through high school classes
- Presentations to Agricultural and Business Groups
- Working with LEAs to provide electric bicycles
- Public workshops
- Response to public inquiries
- Internet web site
- Science Fair
- State Fair

## **2006 AIR QUALITY ATTAINMENT PLAN CHAPTER IV – TRANSPORT OF POLLUTANTS**

### **IV. 1 INTRODUCTION**

This portion of the Attainment Plan addresses air pollution transport, identifies transport couples, and discusses transport mitigation regulations related to the Upper Sacramento Valley (USV). A review of amendments to the transport mitigation regulations and the relevance of the Central California Ozone Study are also discussed.

#### **Synopsis**

The CARB has identified that air pollution is transported from the Broader Sacramento Area (BSA) to the Upper Sacramento Valley (USV), thus establishing the BSA/USV Transport Couple. The impacts of transported BSA air pollution to Districts in the USV are variable. Transport pollution impacts are classified using the terms “Inconsequential”, “Significant”, and “Overwhelming”, as defined in Section IV.2 below. The most recent CARB assessment, published in March 2001, indicates that all three of these classifications occur in the BSA/USV transport couple region, with the latest classification of “inconsequential” added to describe the transport couple assessment for Shasta County.

### **IV. 2 DEFINITIONS AND TERMINOLOGY**

**Air Basin** – an area sharing similar meteorological and geographic conditions; also defined by political boundaries; an area in which the air mass is homogeneous; an area usually bounded by topographical features.

**Ambient Air Quality Standards** – specified concentrations and durations of air pollutants which reflect the relationship between the intensity and composition of air pollution to adverse health effects. The standards are established by the CARB or, where applicable, by the federal government.

**Broader Sacramento Area (BSA)** - includes the Sacramento Metropolitan Air Quality Management District; Yolo-Solano Air Pollution Control District; the portions of the El Dorado County Air Pollution Control District included in 1990 U.S. Census Tracts 306.01, 307, 308.01, 308.02, 308.03, 308.04, 309.01, 309.02, 310, 311, 312, 315.01, and 315.02; and the portions of the Placer County Air Pollution Control District included in 1990 U.S. Census Tracts 203, 204, 205, 206.01, 206.02, 206.03, 207.01, 207.02, 207.03, 208, 209, 210.01, 210.02, 211.01, 211.02, 212, 213.01, 213.02, 214, 215.01, 215.02, 216, 218.01, and 218.02; and that area of the Feather River Air Quality Management District which is south of a line connecting the northern border of Yolo County to the southwestern tip of Yuba County, and continuing along the southern Yuba County border to Placer County.

**Couple** – a pair of geographic areas, one considered upwind and one considered downwind.

**Exceedance** – any ozone concentration greater than the ambient air quality standard for ozone.

**Extreme Concentration** – a concentration that is statistically expected to occur less frequently than once every year.

**Inconsequential** – an ozone transport impact classification describing a condition that exists when upwind emissions are not transported or do not appear to contribute significantly to a violation of the State ozone standard in the downwind area. A violation not impacted by transported emissions is considered local and results when the wind flow patterns and atmospheric conditions do not strongly suggest responsibility from an upwind area. The responsibility of “inconsequential” transport lies with the downwind area.

**Mitigation** – in air pollution control, mitigation refers to those measures that are taken to prevent or reduce emissions in the atmosphere. Mitigation may include: (1) the adoption and enforcement of local District rules and regulations to regulate emissions from stationary sources; (2) land-use and transportation control measures achieved through the California Environmental Quality Act (CEQA); and (3) the adoption of State and national regulations to reduce emissions through fuel reformulation and new engine technologies.

**Model** – a computer-based representation of atmospheric processes used to develop emission inventories, determine dispersion of pollutants, and predict downwind concentrations and impacted areas.

**Overwhelming** – an ozone transport impact classification describing a condition which exists when emissions from an upwind area independently cause a violation of the State ozone standard in a downwind area on any given day. This classification assumes that significant emission sources in the downwind area were not in the pathway of the air parcel being transported from the upwind area. The responsibility for a violation caused by “overwhelming” transport lies with the upwind area.

**Particulate Matter** – any material, except uncombined water, that exists in finely divided form as a liquid or solid at standard conditions.

**Precursor** – a directly emitted pollutant that, when released to the atmosphere, forms, or contributes to the formation of a secondary pollutant for which an ambient air quality standard has been adopted.

<b>Precursor</b>	<b>Secondary Air</b>
Reactive Organic Compound	Photochemical Oxidants (Ozone) The Organic Fraction of PM10
Nitrogen Oxides	Nitrogen Dioxide The Nitrate Fraction of PM10 Photochemical Oxidants (Ozone)
Sulfur Oxides	Sulfur Dioxide Sulfates The Sulfate Fraction of PM10

**Profiler** – equipment that provides continuous winds aloft measurements using the Doppler shift principle and radar waves.

**Reactive Organic Gases** – any compound of carbon, other than the following: methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonates, and halogenated hydrocarbons.

**Significant** – an ozone transport impact classification describing a condition in which the emissions from the upwind area contributed measurably to a violation of the State ozone standard in the downwind area on any given day, but did not “overwhelm” the area. A violation is considered to be caused by “significant” transport if the emissions from sources within the downwind area combine with the transported air parcel carrying ozone or ozone precursors from the upwind area. A violation classified as “significant” is considered shared, with responsibility lying with both the upwind and downwind areas.

**Transport** – horizontal movement of air pollution or air pollution precursors at the earth's surface or aloft. Vertical movement of air pollution is referred to as mixing.

**Upper Sacramento Valley (USV)** - includes the Colusa, Butte, Glenn, Tehama, and Shasta County Air Pollution Control Districts, and that area of the Feather River Air Quality Management District which is north of a line connecting the northern border of Yolo County to the southwestern tip of Yuba County and continuing along the southern Yuba County border to Placer County.

### **IV.3 BACKGROUND**

The CCAA requires each District in which a State ambient air quality standard for ozone, carbon dioxide, sulfur dioxide, or nitrogen dioxide is exceeded to develop a plan and an emission control program in order to attain the State standard(s). The CCAA recognizes that ozone and ozone precursors can be transported by winds over long distances and thereby contribute to air quality problems outside of the District or air basin of origination. To address this, the CCAA requires upwind Districts to mitigate the impacts to downwind areas by pollutants that are originally emitted in the upwind Districts (see section 39610 of the H&S Code) even though the downwind District may have a shared or sole responsibility for air quality impacts. The CCAA directs the CARB to assess the impacts of such transport and to establish mitigation requirements for upwind Districts.

In terms of identifying transport couples and assessing the downwind impacts, the CCAA directs the CARB to:

1. Identify downwind areas affected by transported air pollutants and the upwind air basins or regions that are the sources of the pollutants;
2. Assess the relative contribution of upwind emissions to downwind ozone concentrations as “overwhelming”, “significant”, “inconsequential”, or some combination thereof, to the extent permitted by available data [H&S Code, section 39610(a) and (b)]; and
3. Update this analysis at least once every three years [H&S Code, section 39610(d)].

In terms of transport mitigation the CCAA requires that:

Districts within the areas of origin of transported air pollutants shall include sufficient emission control measures in their Attainment Plans for ozone in order to mitigate the impacts of pollution sources within their jurisdictions on ozone concentrations in downwind areas. At a minimum, the Attainment Plans for Districts within the BSA shall conform to the following requirements:

1. Require the adoption and implementation of best available retrofit control technology (as defined in H&S Code, section 40406) on all existing stationary sources of ozone precursor emissions as expeditiously as practicable. At a minimum, the Plan shall

provide for the adoption of rules that represent best available retrofit control technology for source categories that collectively amount to 75 percent of the 1987 actual reactive hydrocarbon emissions inventory for permitted stationary sources, and 75 percent of the 1987 actual nitrogen oxides emissions inventory for permitted stationary sources, no later than January 1, 1994.

2. Include measures sufficient to attain the State ambient air quality standard for ozone by the earliest practicable date within the USV, except as provided in H&S Code section 41503(d), during air pollution episodes which the State board has determined meet the following conditions:
  - a. Are likely to produce a violation of the State ozone standard in the USV or within the portion of the Mountain Counties Air Basin which is north of the Calaveras-Tuolumne County border and south of the Sierra-Plumas County border;
  - b. Are dominated by overwhelming pollutant transport from the BSA; and
  - c. Are not measurably affected by emissions of ozone precursors from sources located within the USV or the portion of the Mountain Counties Air Basin which is north of the Calaveras-Tuolumne County border and south of the Sierra-Plumas County border.

Implementation of these requirements will be through the BSA Districts' Attainment Plans.

#### **IV. 4 The Central California Ozone Study (CCOS)**

As a result of the transport assessments performed over the last decade as required by State and federal transport regulations and more recently by the California Ozone Studies, air quality professionals have developed a basic understanding of the fundamental transport relationships between the various upwind and downwind regions of California.

The California Ozone Studies include the 1997 Southern California Ozone Study (SCOS) and the 2000 Central California Ozone Study (CCOS). The CCOS was conducted on the geographic region extending from Redding in the north to the Mojave Desert in the south, and from the Pacific Ocean in the west to the Sierra Nevada Mountains in the east. These studies will be invaluable in updating transport assessments and preparing future clean air Plans. The CARB and Districts plan to use the results of the CCOS to prepare the demonstration of attainment for the ozone standard for non-attainment areas in central California. The data gathering component of the CCOS was conducted during the summer of 2000. Emission inventory development, data analysis and modeling are on-going projects.

One goal of the CCOS project is to develop modeled attainment demonstrations which are required in federal ozone air quality plans. The modeling will also be useful to further refine the understanding of transport relationships in California during selected ozone episodes. CARB staff are working with stakeholders to identify approaches to better assess transport impacts using the study results. These analyses were included in the 2003-2004 SIP development process for Districts in the CCOS domain – including the San Francisco Bay Area, San Joaquin Valley, and Sacramento region. A number of CCOS projects are being fast-tracked in order to provide results that can be used in developing attainment demonstrations for these Districts. As a part of these analyses, the impact of upwind control strategies on downwind ozone formation will be evaluated.

## **2006 AIR QUALITY ATTAINMENT PLAN CHAPTER V – CONTROL MEASURES**

### **V.1 INTRODUCTION**

The Northern Sacramento Valley Planning Area (NSVPA) triennial air quality planning requirements of the California Clean Air Act (Act) state that air districts which could not demonstrate attainment of applicable state standards by December 31, 2002, are to submit a comprehensive plan update, unless the California Air Resources Board (CARB) determined that such update was unnecessary.

The CARB has outlined, in the approved State Implementation Plan (SIP) for ozone, new control strategies that will be developed and implemented over the next decade in California. These new strategies will reduce air pollution throughout California and ensure continued progress towards meeting federal standards, as well as progress towards California's more health protective standards. With the SIP as the state's established control strategy for the future, the CARB found that the NSVPA air districts would not be required to prepare a comprehensive plan update for the 2003 update. Instead, CARB directed the air districts to continue to focus on adoption and implementation of "feasible" control measures identified in the most recent Attainment Plan update. These control measures were chosen based on the following criteria: technical feasibility; cost effectiveness; emission reduction potential; rate of emission reductions; public acceptability; and enforceability. CARB provided guidance and assistance to air districts in development of the listed measures.

Table V-I summarizes the feasible control measure adoption status of each air district in the NSVPA. Each air district adopts the control measure as a "rule". This table also lists proposed adoption dates in those air districts where the rule has yet to be considered by the local governing board and emission reduction estimations for the pertinent pollutant based on adoption date and implementation during the planning cycle (calendar years 2001, 2002, and 2003).

The "new" control measures from Table V-II of the 2003 Attainment Plan were added to the existing Table V-I. These measures (categories) were taken from the CARB document "*Identification of Performance Standards for Existing Stationary Sources*"; April 1999; *Tier I Stationary Source Categories*. The measures listed are part of the first tier of three tiers that include over 80 stationary source categories that are potential candidates in the first tier applicable to the NSVPA and showing promise for emission reductions were listed as proposed new measures.

Due to the regional nature of the ozone non-attainment problem in the NSVPA, it is anticipated that adoption of the new measures will benefit air quality for all air districts within the NSVPA even though some of the sources affected by the control measures may not exist in each air district within the NSVPA.

**TABLE V-I DISTRICT STATUS OF FEASIBLE CONTROL MEASURES**

<i>Control Measure</i>		<i>Butte</i>	<i>Colusa</i>	<i>Feather River</i>		<i>Glenn</i>	<i>Shasta</i>	<i>Tehama</i>
				Yuba	Sutter			
Air Quality Element General Plan	Adoption Date	03-97	not adopting	12-94	11-96	not adopted	04-94	In Progress
	Proposed Adoption Date	--	--			01-08 (01-02 in 2003 Plan)	--	11-07 (12-04 in 2003 Plan)
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	a	a	a	a	a	a	a
Architectural Coatings	Adoption Date	08-02	05-91 amend 07-02	Amended 11-02		not adopted	05-02 Amend 07-05	08-02
	Proposed Adoption Date	--	--	06-11 (amendment)		07-07	--	--
	Emission Reductions of NO <sub>x</sub> or ROG (tons)	ROG (36.5)	ROG (3.65)	ROG (25.5)		ROG (3.65)	ROG (29.2)	ROG (10.9)
Automobile Finish Coatings	Adoption Date	06-97	03-98	08-98		05-99	04-97	11-98
	Proposed Adoption Date	--	--	01-16 (amendment)		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	ROG (6.6)	ROG (0.0)	ROG (8.5)		ROG (0.0)	ROG (15.2)	ROG (2.4)
Cutback Asphalt	Adoption Date	01-95	12-93 amended 07-97	not adopted		09-94	06-95	02-94
	Proposed Adoption Date	--	--	08-08		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	c	c	b		c	c	c

**TABLE V-I DISTRICT STATUS OF FEASIBLE CONTROL MEASURES**

<i>Control Measure</i>		<i>Butte</i>	<i>Colusa</i>	<i>Feather River</i>		<i>Glenn</i>	<i>Shasta</i>	<i>Tehama</i>
				Yuba	Sutter			
Disposal of Organic Waste	Adoption Date	03-03	01-96	not adopted		07-98	06-95	3-95
	Proposed Adoption Date	--	--	08-08 (06-05 in 2003 plan)		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	a	c	b		ROG (0.5)	c	c
Gas Turbines	Adoption Date	not adopting	03-98	not adopted		not adopting	not adopting	04-98
	Proposed Adoption Date	06-04 in 2003 plan	--	06-09 (12-04 in 2003 plan)		--	Board denied	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	d	NO <sub>x</sub> (0.0)	b		b	b	a
Industrial Boilers	Adoption Date	03-04	01-96	06-06		07-98	06-95 Amend 12-95	03-95
	Proposed Adoption Date	--	--			--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	NO <sub>x</sub> (14)	c	a		NO <sub>x</sub> (7.5)	c	c
Internal Combustion Engines	Adoption Date	12-04	03-98	not adopted		Not adopted	04-97	06-97
	Proposed Adoption Date	--	--	06-10 (09-04 in 2003 plan)		01-08 (01-04 in 2003 plan)	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	NO <sub>x</sub> ()	a	b		b	a	a

**TABLE V-1 DISTRICT STATUS OF FEASIBLE CONTROL MEASURES**

<i>Control Measure</i>		<i>Butte</i>	<i>Colusa</i>	<i>Feather River</i>		<i>Glenn</i>	<i>Shasta</i>	<i>Tehama</i>
				Yuba	Sutter			
Polyester Resin Operations	Adoption Date	09-05	01-96	not adopted		07-98	06-95	03-95
	Proposed Adoption Date	--	--	10-08 (12-05 in 2003 plan)		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	a	c	b		ROG (0.5)	c	c
Residential Wood Combustion	Adoption Date	10-01	06-97	06-96		11-94	03-95	03-95
	Proposed Adoption Date	--	--	2009 SB 656		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	a	a	a		a	a	a
Smoking Vehicle Program	Adoption Date	10-01	not adopting	No MOU		not adopting	02-97	not adopting
	Proposed Adoption Date	--	ARB (Smoking Vehicle Program)	--		ARB (Smoking Vehicle Program)	ARB (Smoking Vehicle Program)	ARB (Smoking Vehicle Program)
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	a	a	a		a	f	f
Solvent Degreasing	Adoption Date	9-28-05	01-96	06-91		07-98	06-95	03-95
	Proposed Adoption Date	--	--	12-11 (amendment)		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	e	c	b		ROG (0.5)	c	c

**TABLE V-1 DISTRICT STATUS OF FEASIBLE CONTROL MEASURES**

<i>Control Measure</i>		<i>Butte</i>	<i>Colusa</i>	<i>Feather River</i>		<i>Glenn</i>	<i>Shasta</i>	<i>Tehama</i>
				Yuba	Sutter			
Transportation Control Measure	Adoption Date	03-97	not adopting	12-94		not adopting	01-93	not adopting
	Proposed Adoption Date	--	--	--		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	a	a	c		a	a	a
Vapor Recovery Systems for Gasoline Distributors	Adoption Date	06-05	03-98	06-91		11-88	12-88 Amend 06-97	04-98
	Proposed Adoption Date	--	--	01-09 (amendment)		--	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	a	ROG (8.40)	a		c	ROG (18.1)	a
Adhesives and Sealants	Adoption Date	not adopted	not adopted	not adopted		not adopted	02-03 Amend 07-05	04-03
	Proposed Adoption Date	03-08 (12-03 in 2003 plan)	09-08 (12-03 in 2003 plan)	10-09 (12-03 in 2003 plan)		09-08 (12-03 in 2003 plan)	--	--
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	b	b	b		b	a	a
Graphic Arts	Adoption Date	not adopted	not adopted	not adopted		not adopting	not adopted	not adopted
	Proposed Adoption Date	09-07 (06-04 in 2003 plan)	06-08 (06-04 in 2003 plan)	12-09 (06-06 in 2003 plan)		--	06-08 (06-04 in 2003 plan)	06-08 (06-04 in 2003 plan)
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	b	b	b		b	b	b

**TABLE V-I DISTRICT STATUS OF FEASIBLE CONTROL MEASURES**

<i>Control Measure</i>		<i>Butte</i>	<i>Colusa</i>	<i>Feather River</i>		<i>Glenn</i>	<i>Shasta</i>	<i>Tehama</i>
				Yuba	Sutter			
Metal Parts and Product Coatings	Adoption Date	not adopted	07-06	not adopted		not adopting	not adopted	not adopted
	Proposed Adoption Date	08-07 (09-04 in 2003 plan)	12-06 in 2003 plan	12-09 (09-04 in 2003 plan)		12-03 in 2003 plan	12-08 (06-04 in 2003 plan)	12-09 (06-04 in 2003 plan)
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	b	a	b		b	b	b
Wood Products Coating Operations	Adoption Date	Not adopted	07-06	12-05		not adopting	03-04 amend 07-05	not adopted
	Proposed Adoption Date	09-07 (12-03 in 2003 plan)	--	--		12-03 in 2003 plan	--	12-09 (12-03 in 2003 plan)
	Emission Reductions Of NO <sub>x</sub> or ROG (tons)	b	b	a		B	ROG (16.8)	b

Footnotes:

- a Emissions (and therefore emission reductions) are not calculated for this measure.
- b Emissions were not calculated because the measure was not adopted.
- c Emission reductions were not presented since the measure was adopted prior to 01-97.
- d No applicable sources.
- e Pending rule update.
- f ARB (Smoking Vehicle) program participation.
- g NA “Not Applicable” due to attainment status.

**Appendix A  
NSVPA Ozone Trends Tables and Graphs**

<b><i>Ozone Trends Summary: Chico-Manzanita Avenue - Butte County</i></b>								
	<b>Days &gt; Standard</b>			<b>1-Hour Observations</b>	<b>8-Hour Averages</b>			
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	0	0	0	0.083	0.085	0.077	0.072	0.088
2004	0	0	0	0.088	0.092	0.073	0.075	0.092
2003	0	0	0	0.092	0.094	0.076	0.078	0.096

<b><i>Ozone Trends Summary: Chico-Paradise Airport - Butte County</i></b>								
	<b>Days &gt; Standard</b>			<b>1-Hour Observations</b>	<b>8-Hour Averages</b>			
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	0	0	1	0.092	0.101	0.085	0.083	0.099
2004	2	0	3	0.103	0.103	0.094	0.088	0.103
2003	5	0	8	0.101	0.102	0.091	0.089	0.102

<b><i>Ozone Trends Summary: Colusa-Sunrise Blvd. - Colusa County</i></b>								
	<b>Days &gt; Standard</b>			<b>1-Hour Observations</b>	<b>8-Hour Averages</b>			
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	0	0	0	0.085	0.083	0.074	0.067	0.083
2004	0	0	0	0.084	0.089	0.073	0.069	0.088
2003	0	0	0	0.089	0.095	0.071	0.075	0.096

<b><i>Ozone Trends Summary: Willows-E Laurel Street - Glenn County</i></b>								
	<b>Days &gt; Standard</b>			<b>1-Hour Observations</b>	<b>8-Hour Averages</b>			
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	0	0	0	0.077	0.086	0.070	0.067	0.085
2004	0	0	0	0.084	0.087	0.070	0.070	0.088
2003	0	0	0	0.090	0.088	0.079	0.073	0.091

<b><i>Ozone Trends Summary: Redding-Health Dept - Shasta County</i></b>								
	<b>Days &gt; Standard</b>			<b>1-Hour Observations</b>	<b>8-Hour Averages</b>			
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	3	0	3	0.103	0.101	0.089	0.076	0.100
2004	2	1	2	0.131	0.098	0.096	0.075	0.102
2003	0	0	0	0.094	0.096	*	0.073	0.095

**Appendix A  
NSVPA Ozone Trends Tables and Graphs (cont.)**

<i>Ozone Trends Summary: Anderson-North Street - Shasta County</i>								
	Days > Standard			1-Hour Observations		8-Hour Averages		
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	2	0	0	0.106	0.107	0.084	0.084	0.109
2004	3	0	2	0.115	0.107	0.092	0.087	0.112
2003	9	0	6	0.114	0.107	0.096	0.075	0.118

<i>Ozone Trends Summary: Lassen Volcanic Nat'l Park – Shasta County</i>								
	Days > Standard			1-Hour Observations		8-Hour Averages		
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	0	0	0	0.092	0.082	0.078	0.068	0.081
2004	0	0	0	0.082	0.083	0.073	0.071	0.085
2003	0	0	0	0.091	0.084	0.073	0.072	0.088

<i>Ozone Trends Summary: Sutter Buttes - Sutter County</i>								
	Days > Standard			1-Hour Observations		8-Hour Averages		
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	1	0	0	0.096	0.100	*	*	0.107
2004	1	0	1	0.100	0.113	*	0.090	0.119
2003	10	0	6	0.117	0.113	0.099	0.088	0.121

<i>Ozone Trends Summary: Yuba City-Almond Street - Sutter County</i>								
	Days > Standard			1-Hour Observations		8-Hour Averages		
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	0	0	0	0.092	0.092	0.073	0.074	0.094
2004	2	0	0	0.098	0.097	0.081	0.076	0.097
2003	0	0	0	0.090	0.099	0.079	0.079	0.101

<i>Ozone Trends Summary: Tehama County – Red Bluff – Oak Street</i>								
	Days > Standard			1-Hour Observations		8-Hour Averages		
Year	1-Hour		8-Hour	Maximum	3-Year 4th High	Maximum	3-Year Average 4th High	EPDC
	State	Nat'l	Nat'l					
2005	0	0	0	0.090	0.099	*	*	0.095
2004	0	0	0	0.086	0.100	*	*	0.099
2003	4	0	1	0.103	0.100	*	*	0.100

**Appendix A**  
**NSVPA Ozone Trends Tables and Graphs (cont.)**

<i>Ozone Trends Summary: Tuscan Butte - Tehama County</i>								
	<b>Days &gt; Standard</b>			<b>1-Hour Observations</b>	<b>8-Hour Averages</b>			
Year	1-Hour		8-Hour		3-Year		3-Year	
	State	Nat'l	Nat'l	Maximum	4th High	Maximum	Average 4th High	EPDC
2005	2	0	2	0.098	0.097	*	*	0.096
2004	2	0	2	0.097	0.100	*	0.085	0.100
2003	2	0	2	0.100	0.100	*	*	0.099

*Footnotes:*

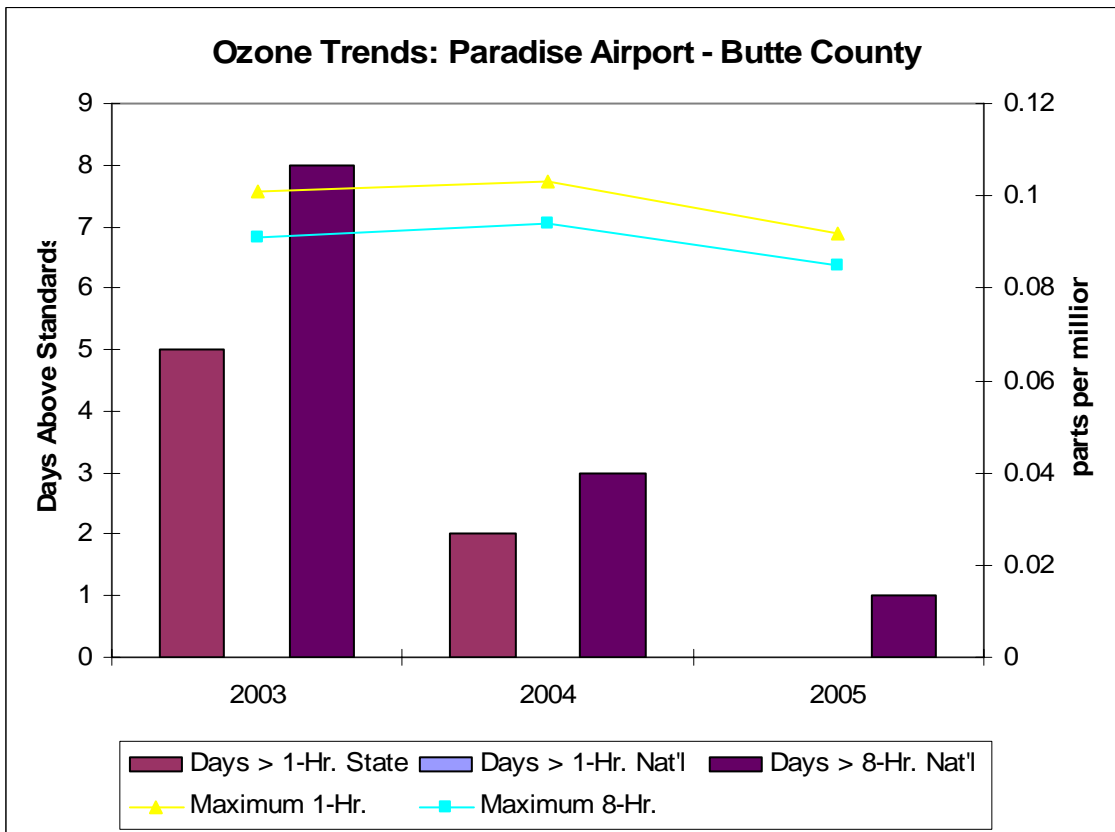
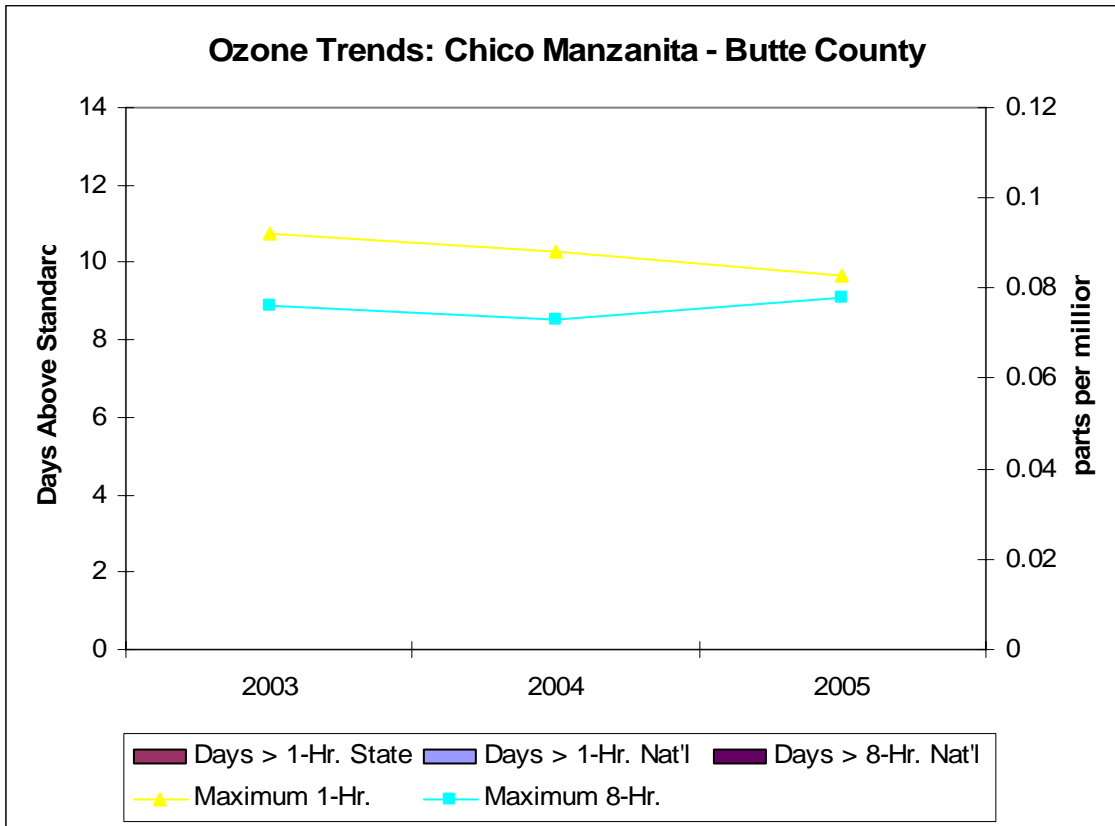
*All concentrations expressed in parts per million (ppm)*

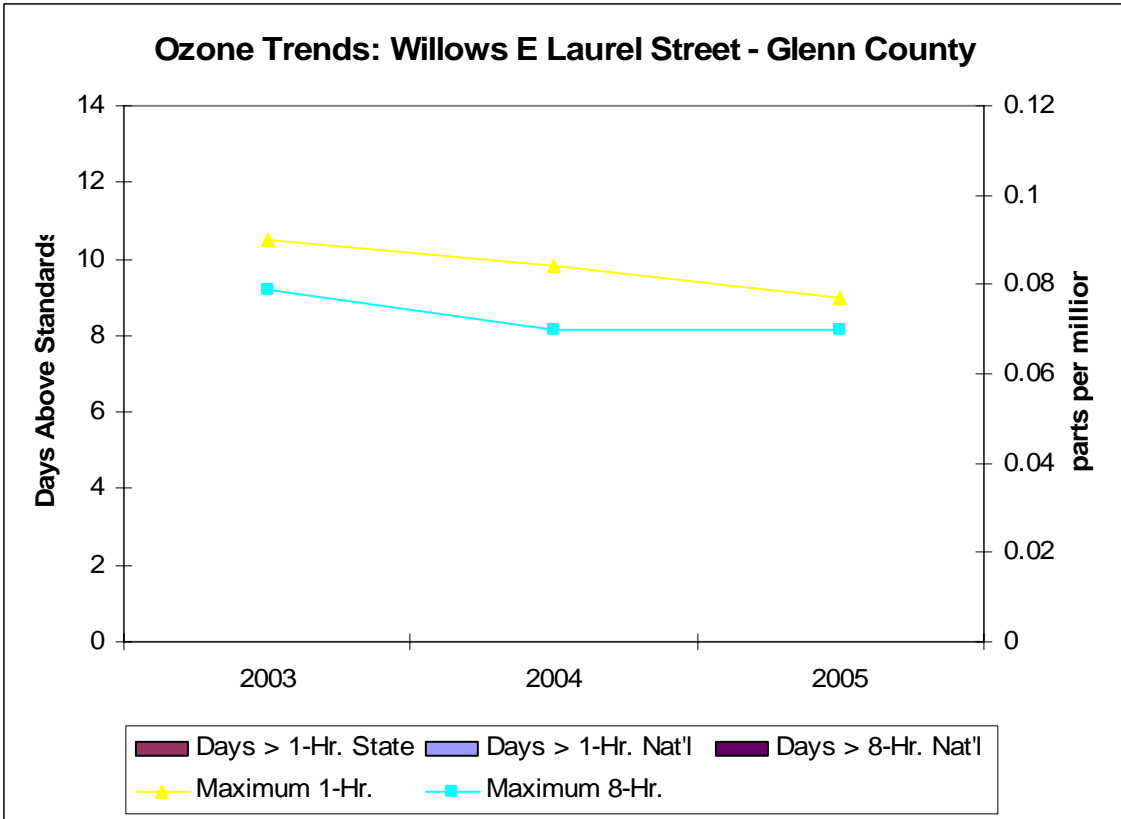
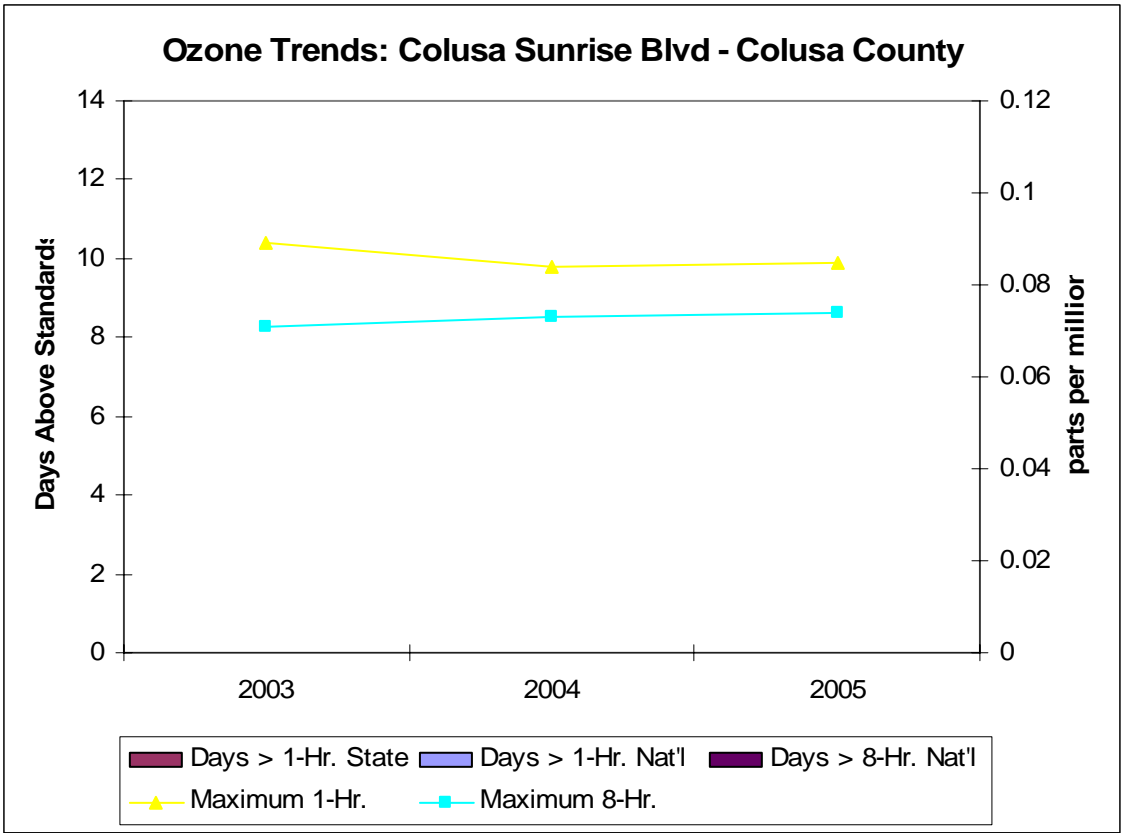
*EPDC - Expected Peak Day Concentration – represents the maximum ozone concentration expected to occur once per year*

*State Ozone ambient air quality standard 1-hour is 0.09 ppm*

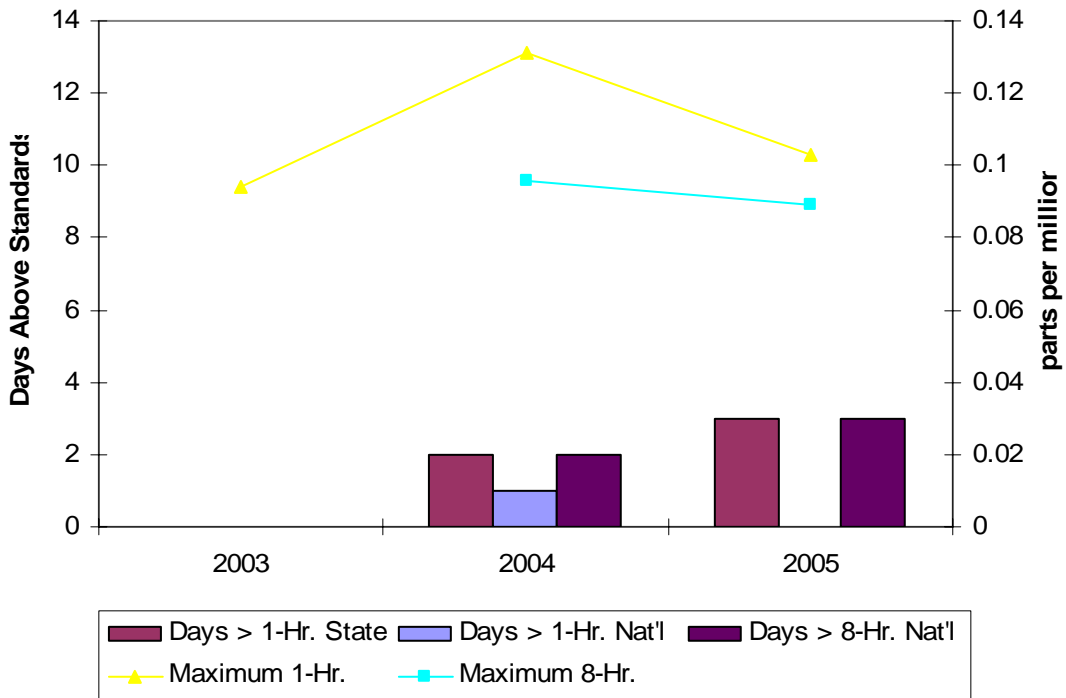
*National Ozone ambient air quality standard 1-hour is 0.12 ppm*

*National Ozone ambient air quality standard 8-hour is 0.08 ppm*

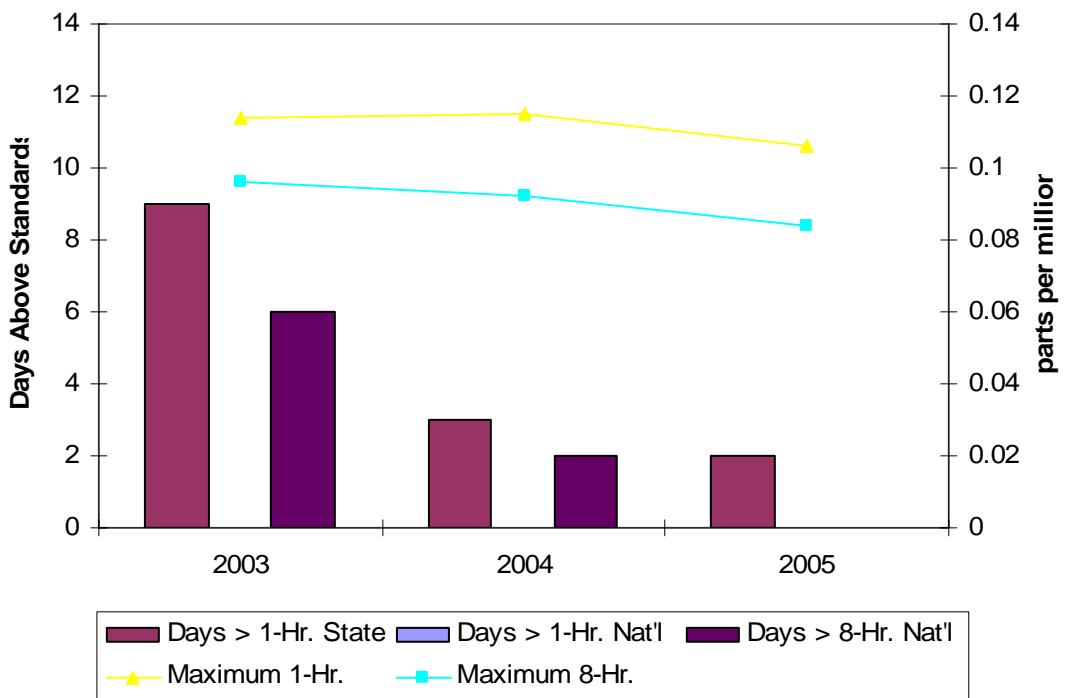




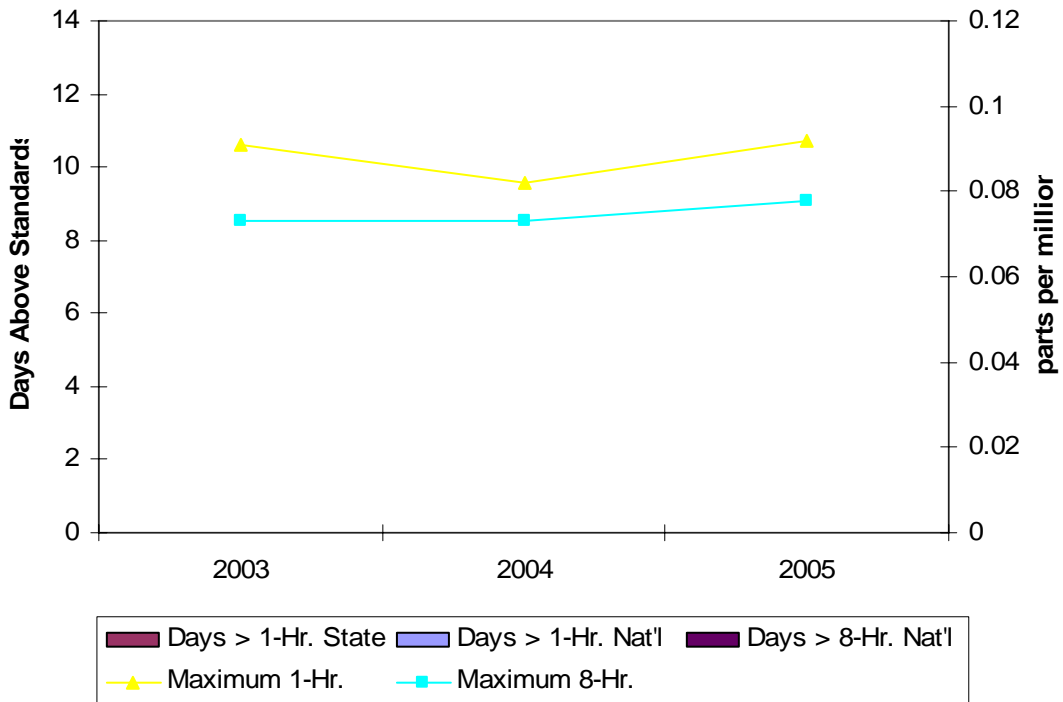
### Ozone Trends: Redding - Shasta County



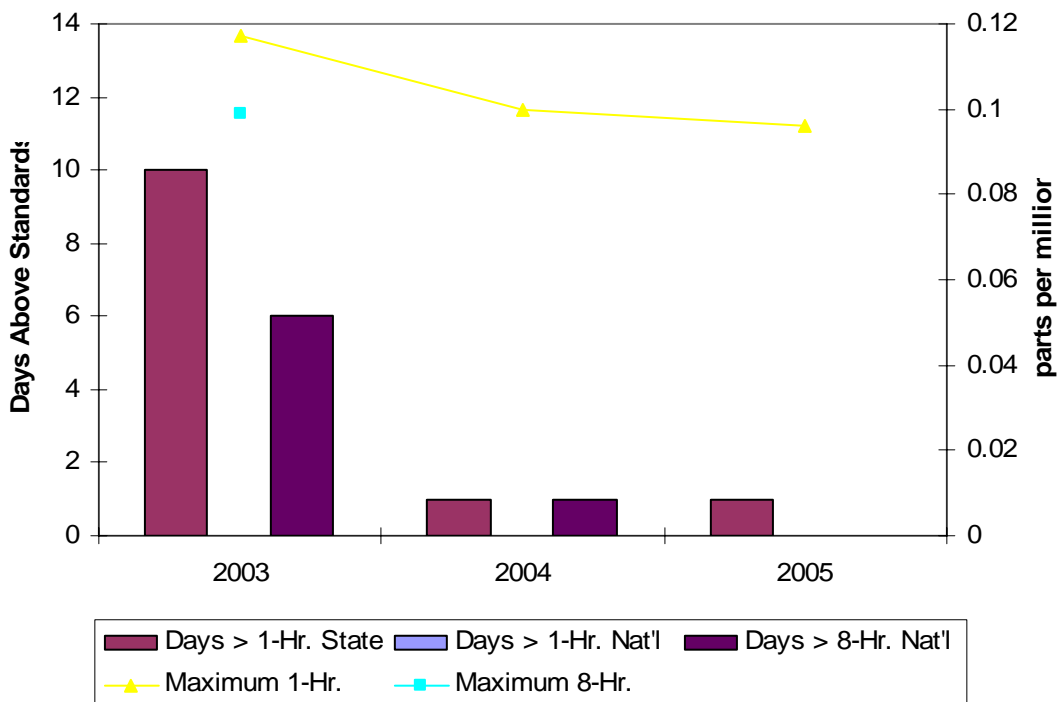
### Ozone Trends: Anderson - Shasta County



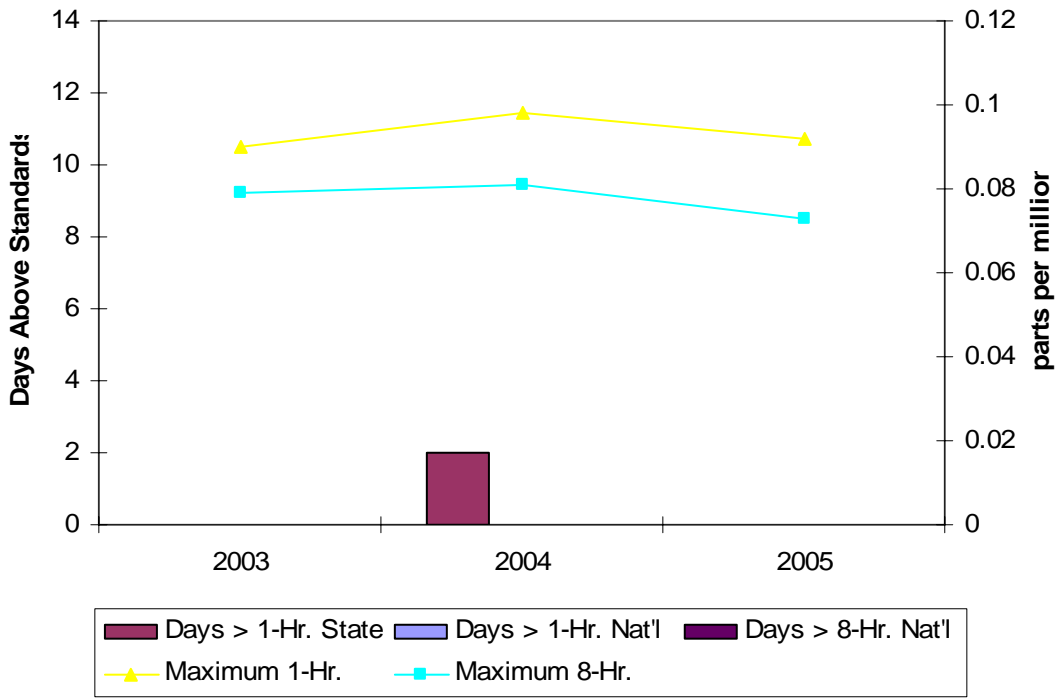
### Ozone Trends: Lassen Park - Shasta County



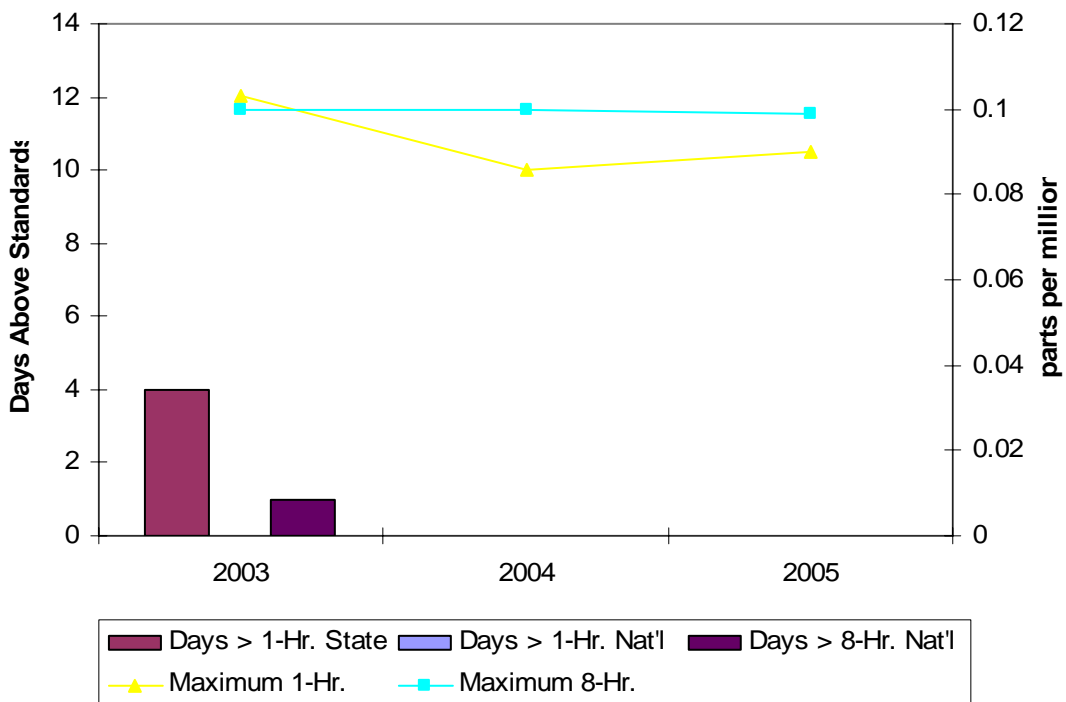
### Ozone Trends: Sutter Buttes - Sutter County



### Ozone Trends: Yuba City - Sutter County



### Ozone Trends: Red Bluff - Tehama County



### Ozone Trends: Tuscan Buttes - Tehama County

