Triennial Assessment and Plan Update

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Triennial Assessment and Plan Update

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Executive Summary

The California Clean Air Act (CCAA) of 1988 required submission of a plan for attaining and maintaining state ambient air quality standards for ozone with subsequent updates every three years. This Triennial Assessment and Plan Update (Plan) discusses the progress the Yolo-Solano Air Quality Management District (District) has made towards improving the air quality in its jurisdiction since its last Triennial Plan Update, which addressed the time periods 2003 – 2005 and 2006 – 2008. This Plan will examine the years 2009-2011.

This is the sixth update to the District's original 1992 Air Quality Attainment Plan (AQAP) and includes:

- Information about emission reductions achieved during the 2009-2011 periods,
- District emission inventory and emission forecasts,
- Air quality data and analysis of air quality trends through 2011, and
- Proposed commitments for the 2012 - 2014 period.

The State has set two health-based standards for ozone. The 1-hour standard is exceeded when monitored ground-level ozone exceeds 0.09 parts per million (ppm) during a one hour period. The 8-hour standard is exceeded when levels exceed 0.070 parts per million over any 8-hour period. From 2009 to 2011, the State 1-hour standard was exceeded on five days at monitoring stations located within the District. The 8-hour standard was exceeded on 13 days over the same 3-year time period.

The ozone trend analysis indicates that even with the adoption of new control measures scheduled for adoption by the District through 2015, the District will still need to rely heavily on mobile source control measures implemented by the State to make significant further progress towards achieving the state ozone standard.

The CCAA requires air districts to adopt all feasible control measures. The District has conducted an "all feasible measure" analysis for ozone control measures as part of the federal planning process. The District believes that this analysis represents the most up-to-date information currently available and is adequate for the all feasible measures requirement for this Plan update. As a result of this analysis, the District Board committed to adopting several measures. For the 2012 - 2016 period, amendments to the District's rules 2.14 – Architectural Coatings, 2.27 – Boilers, Steam Generators and Process Heaters, and 2.29 – Graphic Arts are scheduled to be adopted. These rule amendments will achieve additional reductions in the emissions of ozone precursors.

The District is not required to prepare an attainment plan for particulate matter measuring 10 microns and less in diameter (PM_{10}) or 2.5 microns and less in diameter ($PM_{2.5}$). However, the District continues to work to reduce particulate emissions through rules affecting stationary sources, the construction industry, and the District's agricultural burning program. The District also works with the California Air Resources Board (ARB) to

identify measures that can, where possible, reduce both ozone and particulate emissions. The District has been proactive in its attempt to implement the most readily available, feasible, and cost-effective measures that can be employed to reduce emissions of particulate matter (PM).

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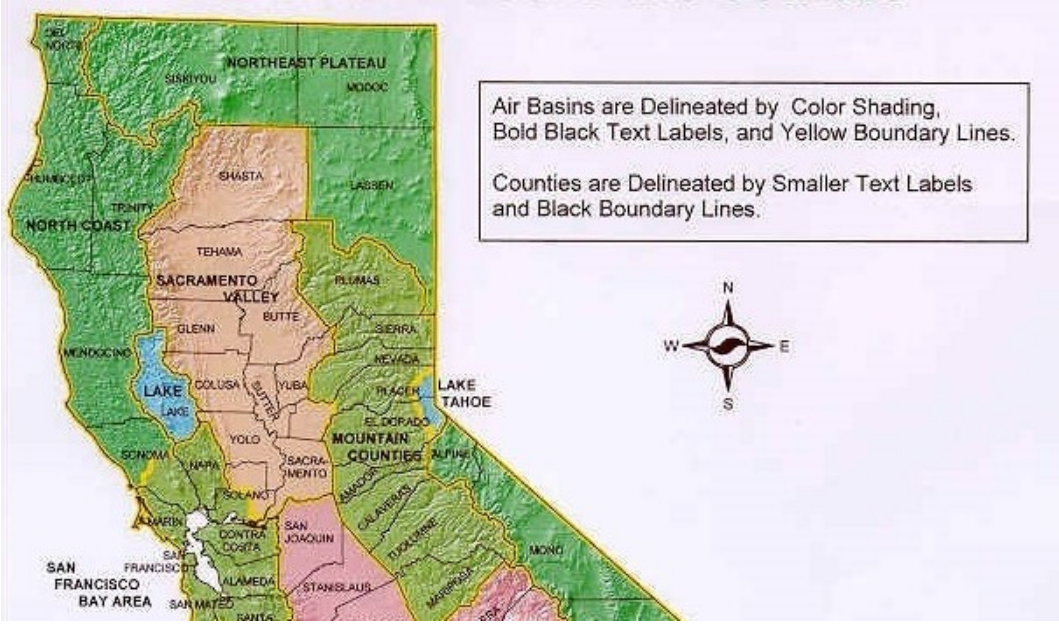
1. INTRODUCTION

The Yolo-Solano Air Quality Management District (District) is one of 35 air districts in California that were established to protect air quality. The District includes Yolo County and the northeastern portion of Solano County. Figures 1 and 2 illustrate the District's jurisdiction in relation to the Sacramento Valley Air Basin.

Figure 1: Sacramento Valley Air Basin[1]



The District is responsible for achieving and maintaining healthful air quality for its residents. This is accomplished by establishing and enforcing air pollution control rules and regulations in order to attain all state and federal ambient air quality standards and limit public exposure to airborne toxins and nuisance odors. Although the District does not have direct jurisdiction over mobile source emissions, the District does provide some financial incentives and employs public education campaigns to encourage mobile source reductions.

The California Clean Air Act (CCAA) includes provisions requiring areas to attain State ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate matter (PM_{10} and $PM_{2.5}$). The District has attained each of these standards, with the exceptions of ozone and the particulates. The CCAA includes provisions requiring areas that have not attained State ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, to prepare plans to attain these standards by the earliest practicable date.[2] A plan for particulates is not required.

[1] Source: http:/www.arb.ca.gov/maps/basinmap.jpg
[2] California Health and Safety Code (H&SC) §40911(a)

Accordingly, the District's original Air Quality Attainment Plan (AQAP) was developed pursuant to the CCAA requirements and identified feasible emission control measures to provide expeditious progress towards attaining the State ozone standard. The District's Board of Directors adopted the AQAP on February 19, 1992 and the Air Resources Board (ARB) approved it on May 28, 1992. The District is responsible for the overall development and implementation of the AQAP. Control measures included in the AQAP focus on emission sources under the District's authority, specifically stationary emission sources[3] and some area-wide sources[4]. Under the CCAA, the District updated the AQAP by the end of 1994 and is required to provide reports once every three years thereafter describing the progress the District has made towards attaining the state standard.

Figure 2: YSAQMD Jurisdiction[5]

1.1 Ozone

At certain levels, ozone can impact lung function by irritating and damaging the respiratory system. Ozone can also be harmful to crops and vegetation and can damage rubber, plastic, and other materials. Ozone is not a directly emitted pollutant, but is formed in the atmosphere by certain "precursor" pollutants. Consequently, the pollutants addressed by the AQAP are the ozone precursors, reactive organic gases (ROG) and oxides of nitrogen (NOx).

In 1988, the ARB adopted a 1-hour ozone standard of 0.09 parts per million (or 180 µg/m^3). In 1997, the ARB assigned designations to individual counties for this standard, and the District was determined to be in nonattainment. On July 26, 2007, the State

[3] Examples of stationary sources include power plants, manufacturing and industrial facilities, stationary internal combustion engines, gas stations, landfills, and solvent cleaning and surface coating operations.
[4] Area-wide emission sources are individually small and are spread over a wide area. They are mostly residential sources, including water heaters, furnaces, architectural coatings, and consumer products.
[5] Source: ARB CHAPIS website

adopted a more stringent 8-hour ozone standard of 0.070 ppm (or 137 µg/m3) in addition to the 1-hour standard. This new 8-hour standard was developed in part to achieve greater protection for sensitive groups. The District was found to be in nonattainment of the standard by the ARB.

1.2 Particulate Matter (PM)

Particulate matter (PM) larger than 2.5 microns and less than 10 microns, often referred to as coarse PM, is mostly produced in the District by automobile tire wear, industrial processes such as cutting and grinding, and suspension of particles from the ground or road surfaces by wind and human activities such as vehicle operation, construction or agriculture. PM emissions from these activities can lead to adverse health effects, such as the aggravation of respiratory conditions. PM can also contribute to reduced visibility.

In contrast, PM less than or equal to 2.5 microns in diameter (fine PM or $PM_{2.5}$) is mostly derived from fuel combustion sources, such as automobiles, trucks, and other vehicle exhaust, as well as from stationary combustion sources. The particles can be either directly emitted or formed secondarily in the atmosphere when gases such as NOx and sulfur oxides (SOx) combine with ammonia.

When the California Legislature passed the CCAA in 1988, it recognized the difficulty in managing PM. Therefore, State law does not require attainment plans for State PM standards. Even so, PM emissions are being reduced through enforcement of District rules, technological advancements in industry, and implementation of agricultural burning programs. In addition, pursuant to Senate Bill 656 (SB656) requirements, ARB and the local air districts have developed a list of the most readily available, feasible, and cost-effective control measures that could be employed to reduce PM emissions. The list of measures to be implemented in the District was adopted by the District's Board of Directors in July 2005. The District has adopted a majority of the measures originally included on the list.

1.3 California Clean Air Act (CCAA)

The CCAA requires an air quality strategy that will achieve a five percent average annual ozone precursor emission reduction or, if that is not achievable, an expeditious schedule for adopting every feasible emission control measure under air district purview (H&SC §40914).[6]

State law also requires annual and triennial progress reports regarding implementation of control measures, and triennial plan revisions, as necessary, to reflect and respond to changing circumstances.[7] A district may revise an emission reduction strategy if the

[6] The term "feasible" is not specifically defined in the CCAA. However, the statutory criteria for assessing a potential control measure include cost effectiveness, technological feasibility, total emission reduction potential, the rate of emission reduction, public acceptability, and enforceability [H&SC 40922(a)].
[7] H&SC §40924 and §40925

district demonstrates to ARB, and the ARB finds, that the modified strategy is at least as effective in improving air quality as the strategy being replaced.[8]

This Plan Update addresses the progress the District has made towards achieving the 1-hour and 8-hour CAAQS. The Plan complies with all of the following applicable progress report and plan revision requirements of the CCAA:

- Assess the extent of ozone air quality improvement achieved during the preceding three years,[9]
- Compare estimated rates of total emission reductions over the preceding three years to the rates anticipated in the AQAP for that same period, and incorporate updated projections of population, industry, and vehicle-related emissions growth,[10]
- Identify the proposed and actual dates for adopting and implementing District control measures,[11] and compare the expected emission reductions for each control measure to a newly revised estimate,[12]
- Include an updated schedule for expeditiously adopting every feasible control measure for emission sources under District purview,[13]
- Include an assessment of the cost-effectiveness of available and proposed control measures and contain a list which ranks the control measures from the least cost-effective to the most cost-effective,[14] and
- Determine whether a State-mandated, no-net-increase permitting program (i.e., State emission offset requirements) is necessary to achieve and maintain the State ozone standard by the earliest practicable date.[15]

Additionally, pursuant to recent ARB guidance, this Plan includes sections that:

- Summarize the existing financial incentive programs for reducing emissions,
- Discuss the District's schedule to have the same "no net increase" program as our downwind Districts in order to mitigate transport emissions,
- Document trends in air quality using air quality indicators, and
- Provide a long-term view of emissions projections for future years by four primary source sectors (stationary, area-wide, on- and off-road mobile sources).

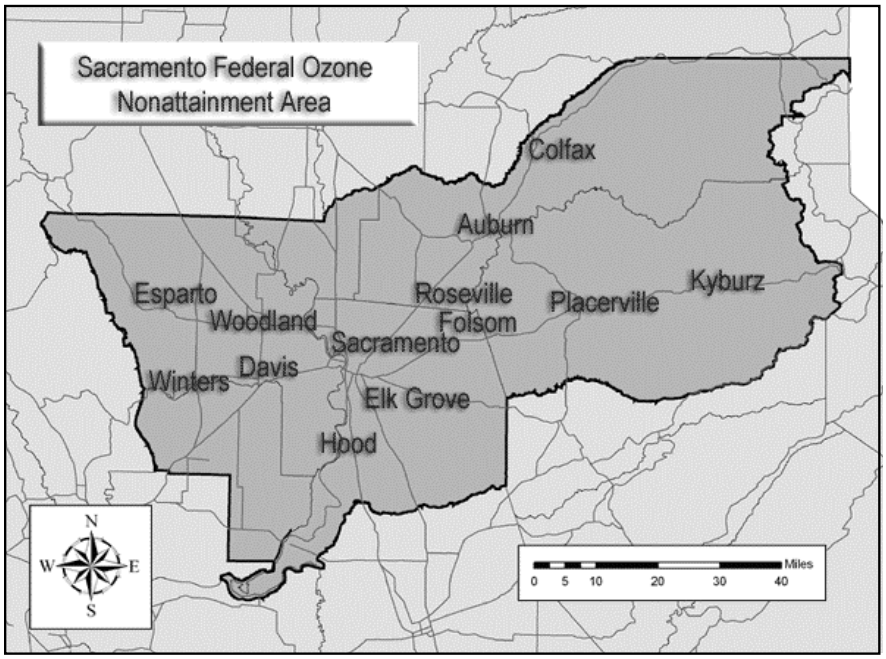
1.4 Federal Clean Air Act (FCAA)

Preceding development of the state's regulation of air quality, the Federal Clean Air Act (FCAA) established national ambient air quality standards (NAAQS) and requirements with respect to criteria air pollutants. One of the requirements of the FCAA applies to areas that

[8] H&SC §40925(b)
[9] H&SC §40924(b)(1)
[10] H&SC §40925(a)
[11] H&SC §40924(a)
[12] H&SC §40924(b)(2)
[13] H&SC §40914(b)(2)
[14] H&SC §40922(a)
[15] H&SC §40918.6

violate the NAAQS by requiring designated non-attainment areas to create attainment plans describing the efforts that will be employed to meet the air quality standards. The District is included in the Sacramento Federal Non-attainment Area (SFNA) for ozone. Figure 3 illustrates the boundaries of the SFNA which were designated by the EPA. These attainment plans, which are typically submitted by each non-attainment region, are included as part of an overall State Implementation Plan (SIP).

Figure 3: Sacramento Federal Ozone Non-attainment Area[16]



Due to violations of the national one-hour ozone standard, the SFNA was required to develop a SIP which was submitted to the EPA in 1994. The SIP was deemed by ARB to fulfill the requirements for the first Triennial Progress Report. The second, third, and fourth Triennial Progress Reports were completed in 1997, 2000, and 2003 respectively. The fifth Report combined years 2003-2008 and was completed in 2010. The 2010 report incorporated conclusions from the SFNA's 2008 federal ozone plan which was prepared to address a new 8-hour ozone NAAQS. All of the Triennial Progress Reports have concluded that the District has continued to show air quality improvements and continued to consider, review, and adopt additional control measures where appropriate. This report is the sixth update.

2. OZONE AIR QUALITY TRENDS

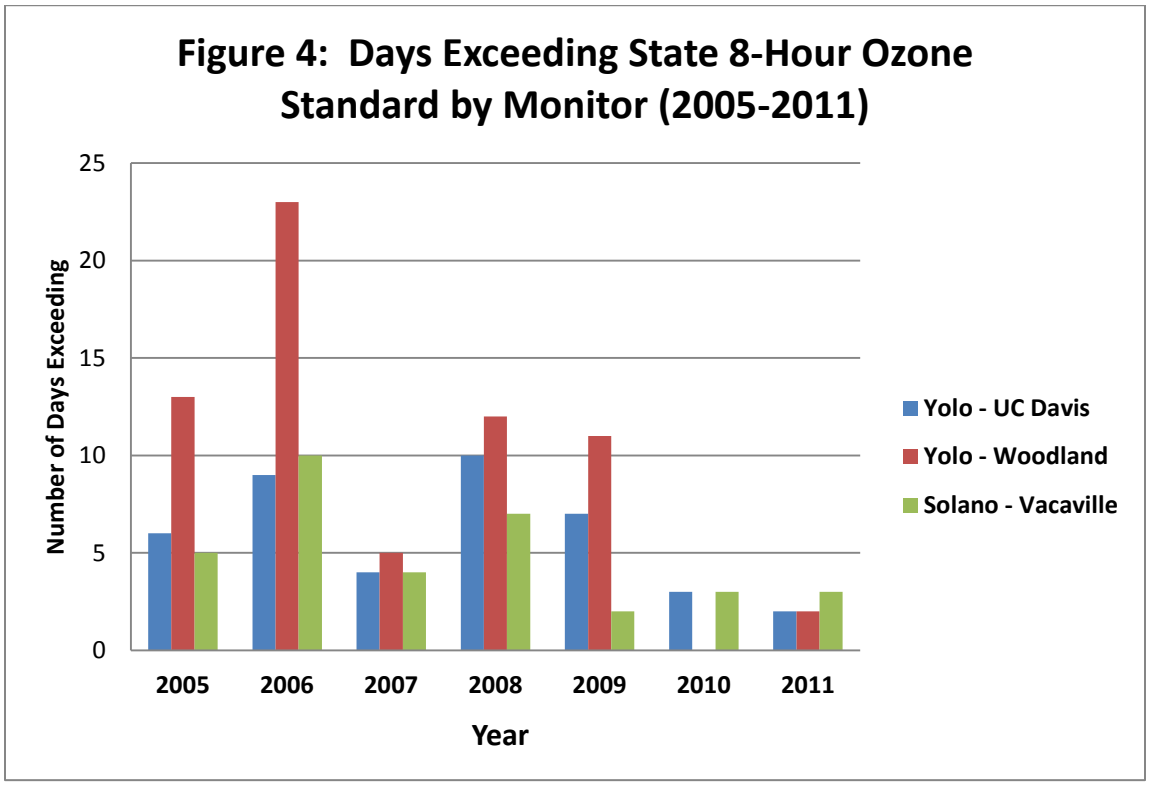
State law requires the triennial assessment of ozone air quality improvements achieved during the preceding three years to be based on ambient pollutant measurements and air quality indicators.[17] Accurate, real-time measurements of ambient air pollution, including

[16] Source: 2002 Milestone Report – SFNA represented by heavy shaded area
[17] H&SC Section 40924(b)(1)

ozone, are collected throughout the District at several sites to identify the status and trend of ambient air quality in Yolo and northeast Solano Counties. Appendix B shows the locations of monitoring stations operating in the District which satisfy the federal government's published standards for monitor siting and quality assurance. Three stations in the District monitor ozone and were used for the purposes of this report: Davis (UCD Campus), Woodland (Gibson Road), and Vacaville (Ulatis Road).

2.1 Ozone Exceedance Trends

The ozone trends for Yolo and northeast Solano Counties are presented in Figure 4, which identifies the number of days the State 8-hour ozone standard was exceeded between 2005 and 2011. An exceedance of the 8-hour ozone standard occurs when the monitored ambient concentration level is 0.070 ppm or greater over an 8-hour period.



- Data for 2008 excludes days for which an exceptional events request was approved by EPA due to 2008 wildfires.

The general pattern for ozone exceedances is not a steady trend downward, but the general pattern suggests that the worst years for air quality are becoming less severe, and the best air quality years are becoming cleaner.

2.2 Other Ozone Improvement Indicators

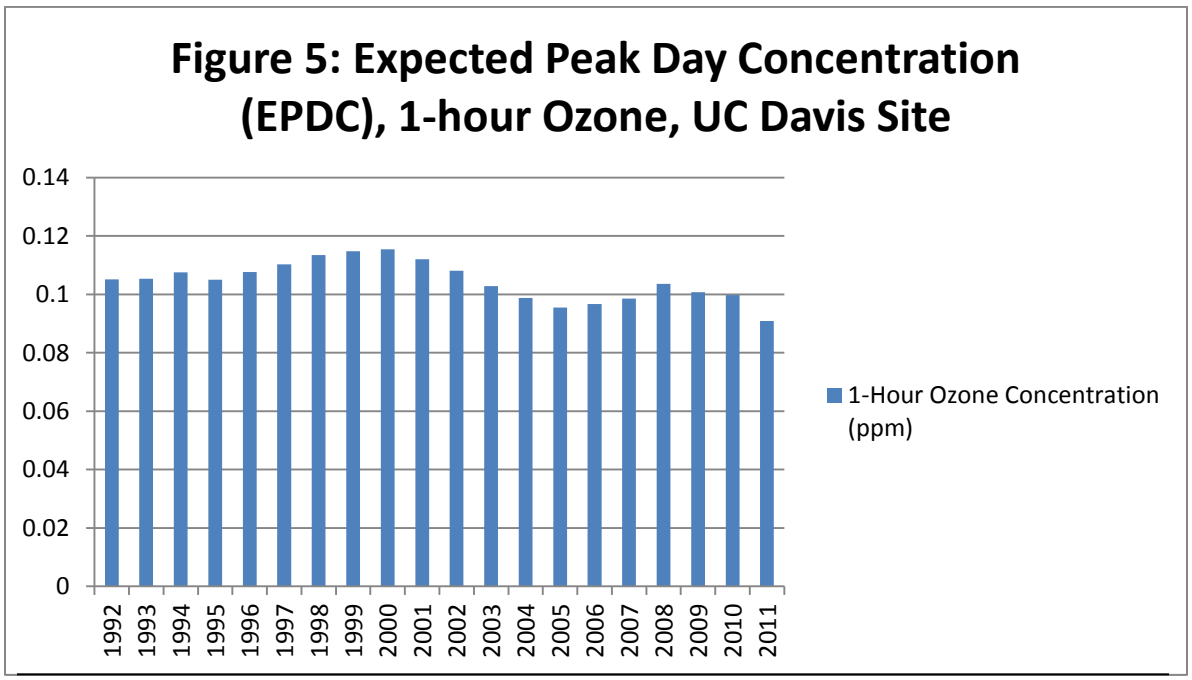
In addition to the actual number of ozone exceedances that have been observed over time, another useful statistical indicator that can be used to assess improvement in air quality is

the Expected Peak Day Concentration (EPDC). The EPDC tracks progress in reducing daily 1-hour and 8-hour ozone concentrations at each monitoring site. This indicator represents the potential worst-case for exposure to ozone and acute adverse health impacts. The EPDC represents a statistically derived value that reflects the concentration expected to be exceeded once per year, on average, based on the distribution of data for a particular monitoring location.

The September 1993 ARB staff report entitled: "Guidance for Using Air Quality-Related Indicators in Reporting Progress in Attaining the State Ambient Air Quality Standards," identifies the EPDC as the best indicator for tracking progress at locations in a non-attainment area.

A goal of the planning process is for all EPDCs in the District's network to be below the standard because that is when the District will likely become an attainment area for the State standard.

Figures 5 and 6 display the 1-hour and 8-hour ozone EPDC values and the corresponding yearly trend for the Davis monitoring site, which is the longest operating site in the District. Overall there have been variations in the EPDC values with both increasing and decreasing values. The data indicates that there has been a steady trend in decreasing ozone exposure since 2000. Although the indicator increased somewhat between 1996 and 1999 due to an unusually high number of exceedances that occurred in 1996 and 2000, this was most likely the result of unusual ozone-producing weather rather than due to a short-term increase in emissions.



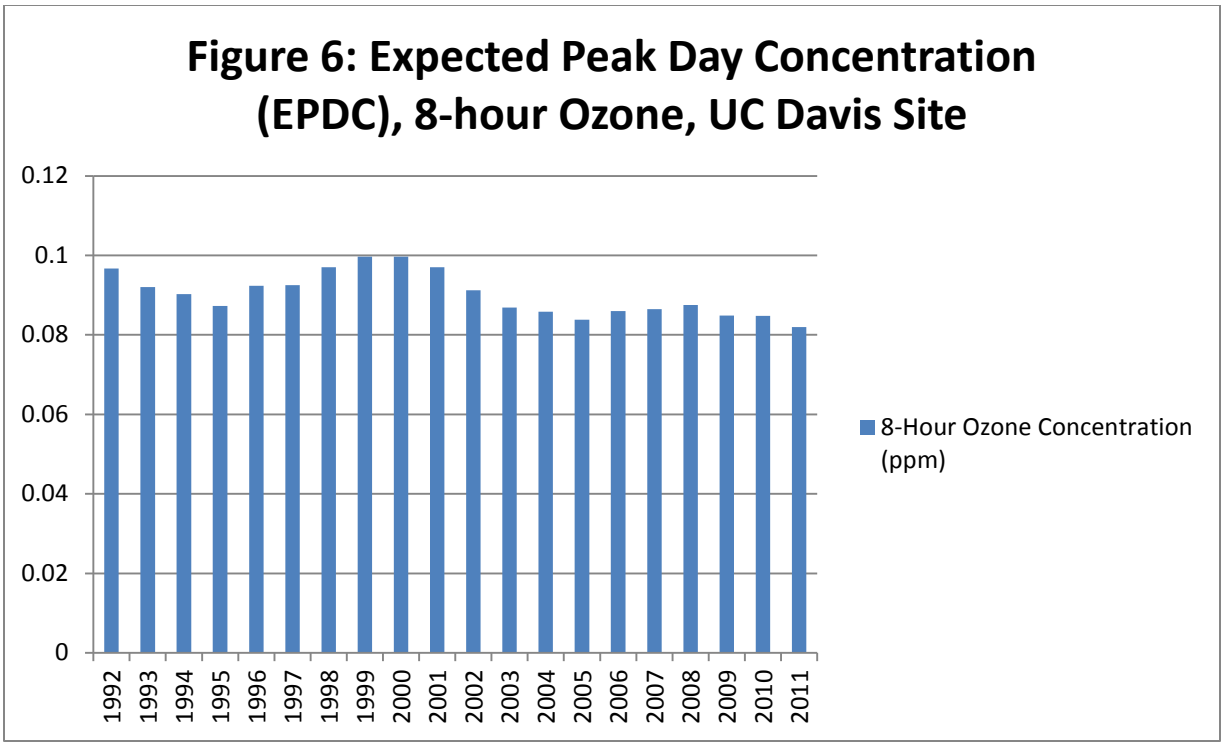


Figure 6: Expected Peak Day Concentration (EPDC), 8-hour Ozone, UC Davis Site
0.12
0.1
0.08
0.06
0.04
0.02
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
8-Hour Ozone Concentration (ppm)

3. EMISSION TRENDS

In order to forecast trends in emissions, the District and the ARB develop an emission inventory. The emission inventory is an estimate of ozone precursor pollutants (ROG and NOx) emitted by various sources. The emission inventory and the trends it shows can be used to assess progress the region is making toward attaining the California ambient ozone standard. This is because reducing ozone precursor emissions is necessary to lower ambient ozone levels. Reductions are the result of state, local, and federal regulations.

The emission inventory is divided into five major categories. These include stationary, area-wide, on-road mobile, other mobile, and natural source groupings. Stationary sources include facilities at fixed locations such as cogeneration plants or landfills, while "area" sources are composed of individually smaller sources which when aggregated have significant emissions. Gasoline stations and consumer products are examples of area sources. On-road mobile sources consist of the numerous cars and trucks that travel the streets and highways. Other mobile sources include agricultural and construction equipment, trains, planes, and recreational vehicles. Natural sources include biological and geological sources, wildfires, windblown dust, and biogenic emissions from plants and trees. Within each of these major categories are a number of subcategories. Appendix A shows the inventory at a more detailed level.

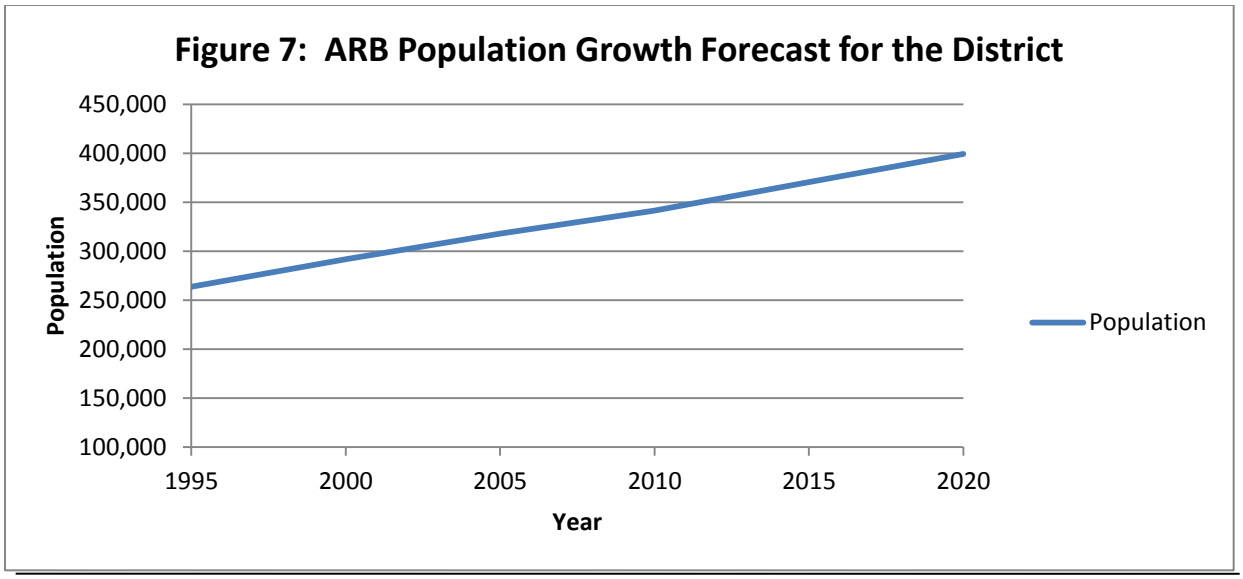
The emission inventory represents estimates of actual emissions that are calculated using reported or estimated process rates and emission factors. For example, motor vehicle emission estimates rely on calculations that include consideration of the fleet mix, vehicles miles traveled, trip starts, speeds, and vehicle emission factors. To derive future-year emission inventories, a current base-year inventory is projected forward in time, based on expected growth rates of population, travel, employment, industrial and commercial activity, and energy use. Reduction benefits from control measures are also accounted for.

As shown in Appendix A, mobile sources are responsible for the majority of ozone precursors emitted in the District. Mobile source emissions are directly related to the overall population and the amount of vehicle miles traveled (VMT).

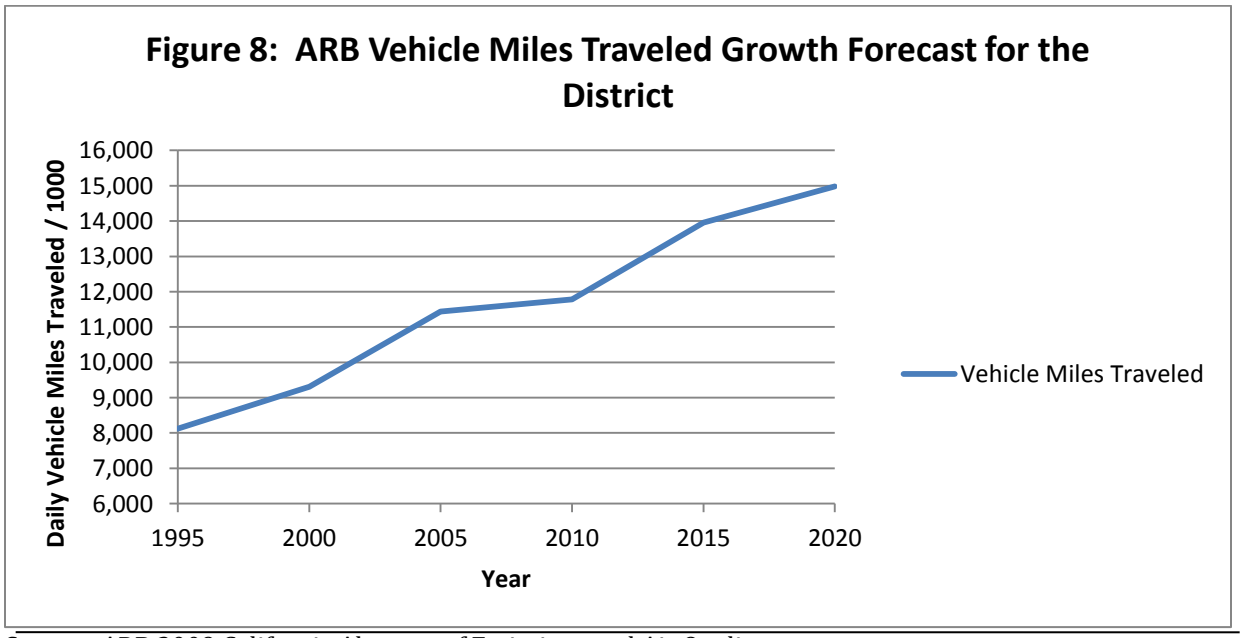
From 2009 to 2011, the District experienced a population growth of 3% from 336,856 people to an estimated 347,266 people, in conjunction with an approximate growth of 6.6% in vehicle miles traveled, from 11.4 million miles traveled per day in 2009 to 12.2 million miles traveled in 2011. [18]

Figures 7 and 8 show the forecasted growth in population and VMT in the District in future years. As shown, both population and VMT will continue to increase through 2020.

[18] District 2009-2011 estimates for population and vehicle miles traveled are from ARB 2009 California Almanac of Emissions and Air Quality



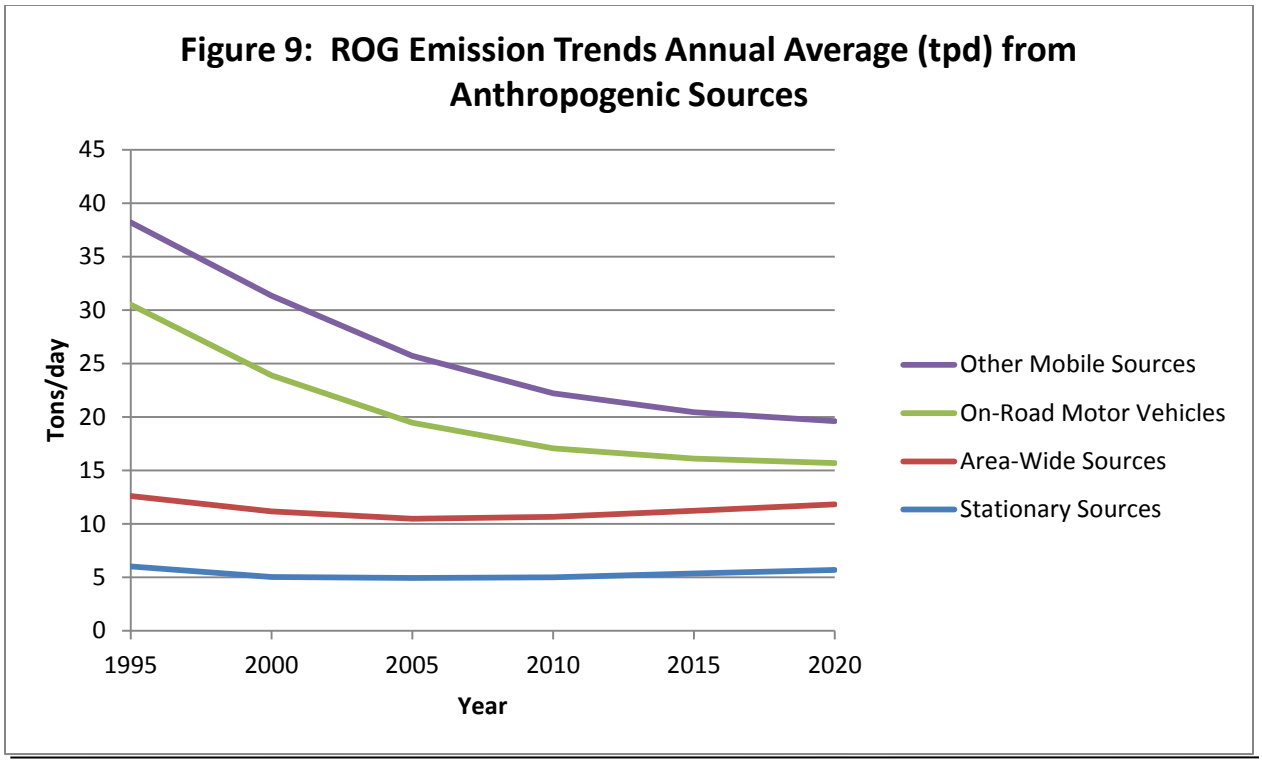
Source: ARB 2009 California Almanac of Emissions and Air Quality



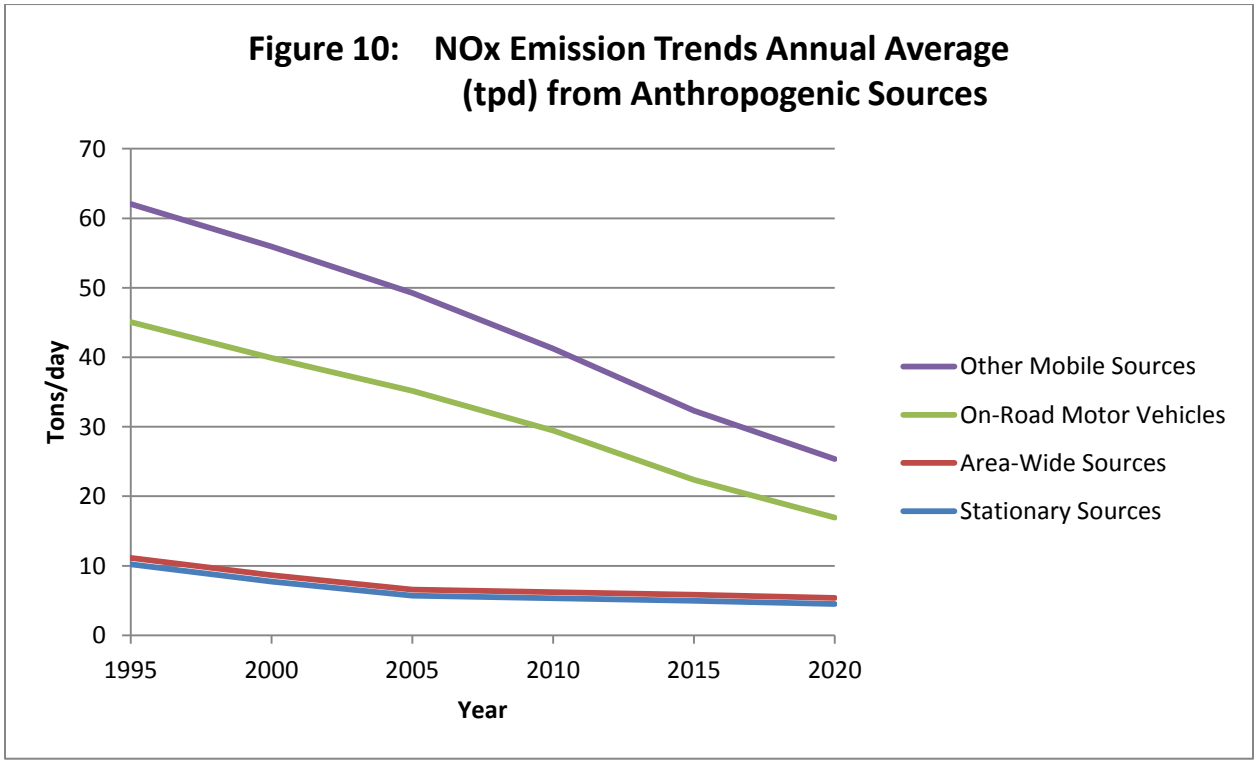
Source: ARB 2009 California Almanac of Emissions and Air Quality

Despite the increasing population and vehicle miles traveled as shown in Figures 7 and 8, the forecasted emission trends show decreases in the overall emission inventory. Figures 9 and 10 show the District's ROG and NOx emission trends, respectively, from anthropogenic (man-made) sources between 1995 and 2020.[19] These emission projections are based on currently adopted control measures and estimated growth forecasts.

[19] Source: ARB's emission inventory website (11/17/2008).



Source: ARB's emission inventory website (page last updated 4/13/2009)



Source: ARB's emission inventory website (page last updated 4/13/2009)

Using a 1995 baseline, ROG emissions are expected to decrease by roughly 48% and NOx emissions are expected to decrease by roughly 60% through 2020. These emissions decreases would occur even though the District's population and vehicle miles traveled are expected to increase roughly 51% and 84%, respectively, over the same time period. More stringent mobile source emission standards and cleaner burning fuels have largely contributed to the steady decline in NOx emissions. ROG emissions have been decreasing due to more stringent motor vehicle standards as well, but ROG emissions from cleaning and surface coatings and solvent evaporations from consumer products will slightly offset the decreased ROG emissions for motor vehicles.

ROG emissions from stationary sources are mainly due to operations at facilities that involve cleaning and surface coatings, the storage, dispensing, and transfer of petroleum, and industrial processes. The ROG emissions from the area-wide source category are primarily from consumer products and architectural coating solvents. NOx emissions are generated mostly through fuel combustion. The on-road emission estimates referred to here were developed by ARB using the EMFAC2007 emissions model. EMFAC estimates emissions from a wide variety of on-road motor vehicle types ranging from light duty passenger autos to heavy-duty urban buses. ARB has recently updated the EMFAC model, and emission estimates using this newer version will be available for the District's next Plan Update. ARB developed the other mobile emission estimates using the OFFROAD emission model. The OFFROAD model estimates average seasonal daily emissions from many categories of off-road equipment. This equipment is generally diesel powered. ARB then develops forecasts based on anticipated growth and controls within each equipment category. For the Natural Sources category, ARB estimates emissions of biogenic volatile organic compounds (BVOCs) from vegetation for natural areas, crops, and urban vegetation. BVOC emissions are functions of a species leaf mass, emission factors, temperature, and light conditions.

4. EMISSION REDUCTION EFFORTS

The District has been working to reduce the emission inventory and improve air quality collectively with the other SFNA air districts, ARB, EPA, and local jurisdictions. These efforts have contributed to the SFNA's successful air quality improvements over the past decade. The District will continue to partner with these stakeholders to bring about permanent improvements towards cleaner air.

4.1 Reductions from Area-wide and Stationary Sources

The ARB prepares emission inventories for select years in their CEIDARS emissions inventory database. Table 1 is a comparison of the emissions inventories for area-wide and stationary sources in 2005, 2008 and 2010 for ROG and NOx as reported in CEIDARS. Although it is important to reduce both ROG and NOx, NOx has historically been the more important precursor in the SFNA in that one ton of NOx reductions can lower ozone concentrations to a greater extent than one ton of ROG reductions.

Table 1: Emission Inventory Comparison
Area & Stationary Sources Only

	2005 (tons per day)	2008 (tons per day)	2010 (tons per day)
ROG	10.3	10.5	10.7
NOx	5.3	5.3	5.1
Total	**15.6**	**15.8**	**15.8**

The District's emissions inventory for its area and stationary sources indicates that as of 2010, ROG and NOx emissions from area-wide and stationary sources have not changed significantly since 2005.

4.1.2 Adopted Rules Since the Last Triennial Assessment

Over the 2009 – 2011 time period covered by this triennial assessment, the District has amended Rule 2.37 – Water Heaters and Small Boilers. This rule was amended in April, 2009 and is expected to achieve 1.95 tons per day of NOx reductions at full implementation. The District is proposing to amend one rule during the 2012 – 2014 period. Rule 2.14 – Architectural Coatings is scheduled to be amended in 2014.

4.1.5 Agricultural Sources

To reduce air contaminant emissions from agricultural sources, California enacted Senate Bill (SB) 700 in 2003. SB 700 eliminated the agricultural operation permit exemption in the California Health and Safety Code. However, while the bill established guidance and required elements for permitting agricultural sources, individual air districts were to

determine how to actually implement the provisions of the bill. The District adopted the following rules, shown in Table 2, and is in full compliance with SB 700.

Table 2: Senate Bill 700 (SB 700) Rule Adoptions

Rule No.	Control Category	Description	Adoption Date
11.1	Agricultural Operating Permit Program	Requires a District permit for any agricultural source with a potential to emit greater than one half of any applicable emission threshold for a major source	March 9, 2005
11.2	Confined Animal Facilities Permit Program	Requires a District permit for any large Confined Animal Facility (CAF)	June 16, 2006
11.3	Agricultural Engine Registrations	Requires a District registration for every agricultural use engine rated greater than 50 horsepower	July 9, 2008 (revised December 8, 2010)

4.2 Reductions from Mobile Source Control Measures

The District employs incentive programs to promote the accelerated introduction of lower emission technologies into the SFNA. These programs have included Clean Air Funds (CAF) and Lower Emission School Bus Funds. In addition, many incentive programs are operated regionally such as Carl Moyer Funds, Sacramento Emergency Clean Air and Transportation Funds, and Congestion Mitigation and Air Quality Funds. Specific information about these programs, as well as other mobile source reduction strategies implemented in the SFNA's air districts, is provided in Section 4.4, Incentive Programs.

4.3 Reductions Related to CEQA and Land Use

District staff works with appropriate land use jurisdictions to implement air quality mitigation measures for projects under the California Environmental Quality Act. Through this process, the District can realize ROG and NOx reductions by encouraging project design features that promote walking, biking, and transit and which can help to reduce total VMT.

4.3.1 Transportation Control Measures

The CCAA defines transportation control measures (TCM's) as "… any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions."[20] The District coordinates with the regional transportation agencies such as Yolo County Transportation District (YCTD), Solano Transportation Authority (STA), and Sacramento Area Council of Governments (SACOG) to

[20] H&SC §40717(g)

implement reasonable measures to reduce emissions from vehicles. This coordinated effort is producing emission reductions that will help to achieve the State health-based ambient air quality standards and the mandates of the CCAA.

YoloBus (Yolo County), Unitrans (Davis), City Coach (Vacaville), Delta Breeze (Rio Vista) and Fairfield-Suisun Transit operate all the fixed route bus services in the District. Readi-Ride provides curbside bus service in Dixon. Collectively, these bus services provide opportunities for alternative travel by servicing school trips, commuter trips, and providing links to paratransit services, Capitol Corridor passenger rail, Bay Area Rapid Transit, Baylink ferry, and the Sacramento International Airport. Ridership has generally increased for these transit services over time.

The Yolo Transportation Management Association and Solano Napa Commuter Information implement Transportation Demand Management by offering personalized assistance for traveling around Yolo and Solano Counties and cities in neighboring counties. They proactively support programs that are intended to encourage alternative modes of transportation.

Examples of TCM programs for which the District has provided financial support over the past several years include:

- YoloBus Summer Sizzler (discounted youth transit passes)
- Free transit on Spare the Air days
- Solano-Napa Commuter Information's Commuter Incentive Program
- Yolo Transportation Management Association's: Yolo Commute Alternative Resource (YCAR)
- Discounted YoloBus passes for youths living in Yolo housing facilities

Examples of bicycle, pedestrian and alternative transportation projects for which the District provided financial supported include:

- Davis-Woodland Bikeway Alternative Transportation Corridor
- Vacaville-Dixon Bike Routes
- DaVinci High School Bicycle Co-op
- Dixon Transportation Mobility Master Plan
- Bike racks at Yolobus stops
- Bike racks for Dixon buses

4.3.2 Congestion Mitigation and Air Quality Improvement (CMAQ)

The CMAQ program was created under the federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, continued under the Transportation Equity Act for the 21st Century (TEA-21), and reauthorized by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) through 2009. The current

federal surface transportation act is known as MAP-21, which also reauthorizes the CMAQ program.

The purpose of the CMAQ program is to fund transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards (NAAQS) for ozone, CO and PM. The CMAQ program supports two important goals: improving air quality and relieving congestion. CMAQ funds must be used for projects such as transit improvements, high-occupancy vehicle lanes, ridesharing services, public education and information, pedestrian and bicycle programs or technology-based programs that reduce emissions from on-road motor vehicle engines. CMAQ funds cannot be used for projects that increase the transportation system's capacity for single-occupant vehicles.

Federal CMAQ funds were allocated to states, and ultimately to local regions, based on population and air quality needs. As the federally designated Metropolitan Planning Organization, SACOG is responsible for determining which local projects receive CMAQ funding in Yolo County. For the District portion of Solano County, CMAQ funds are distributed through a process administered by the Solano Transportation Authority (STA). The District participates in selecting projects that receive CMAQ funding during the applicable public review processes.

Much of the CMAQ funds allocated within the District were used as matching funds for a variety of air quality projects and programs, including those funded under the District's CAF program, as well as projects funded under the SECAT component of the SMAQMD Heavy Duty Low Emission Vehicle Incentive Program.

4.4 Incentive Programs

4.4.1 Clean Air Funds Program

In June 1993, the District began its first year of funding outside agency projects using CAF Program criteria. Public or private agencies, groups, or individuals can apply for funding from the District under this program. Funding for the CAF program is generated through a vehicle registration surcharge of $4.00 per vehicle. In the Solano County portion of the District, AB 8 funds are also used to supplement the CAF program. AB 8 funds are property tax proceeds collected from the northeast portion of Solano County (Dixon, Rio Vista, and Vacaville).

The following list shows the CAF program categories under which projects can receive funding. Projects are funded based on their emission reduction potential, cost-effectiveness, community acceptance and potential for successful implementation.

- Clean Technologies/Low Emission Vehicles
- Alternative Transportation
- Transit Services
- Public Education/Information

4.4.2 SMAQMD Heavy Duty Low Emission Vehicle Incentive Program

This heavy duty vehicle incentive program is administered by the SMAQMD and implemented throughout the SFNA. The program has two major components, which are the Carl Moyer Memorial Air Quality Standards Attainment Program and the Sacramento Emergency Clean Air and Transportation (SECAT) Funds. Each of these program areas is addressed below.

4.4.1.1. Carl Moyer Program

The SMAQMD receives and distributes Carl Moyer funds directly from the ARB on behalf of the SFNA with the exception of southern Sutter County. The SMAQMD provides the incentive money to companies, fleet operators and individuals who are willing to reduce emissions from their heavy-duty vehicles and mobile off-road equipment. The primary purpose of the program is to reduce NOx and PM emissions from heavy-duty diesel engines. Typical Carl Moyer projects include repowering agricultural water pumps, off-road construction and agricultural equipment and replacing, repowering or retrofitting heavy-duty diesel engines in on-road trucks. Projects must achieve an overall project cost effectiveness of no more than $17,080 per weighted ton of NOx, ROG and PM reduction, calculated in accordance with the program cost effective methodology. Funds are allocated by ARB to air districts based on a combination of population and the district's SIP commitment to heavy-duty vehicle emission reductions.

4.4.1.2. Sacramento Emergency Clean Air Transportation (SECAT)

The SECAT Program is a partnership between the air districts of the SFNA and SACOG. The program's goal is to reduce harmful emissions from on-road heavy-duty vehicles operating in the SFNA. The program is administered by the SMAQMD.

Eligible types of projects include the following:

- Replacing older, higher polluting vehicles with newer, lower-emission vehicles (Fleet Modernization);
- Purchasing new, low or zero-emitting vehicles;
- Retrofitting existing heavy-duty vehicles with after-treatment systems to reduce NOx; and
- Implementing any other verifiable, enforceable, and cost-effective technology for reducing NOx emissions from heavy-duty on-road vehicles.

The SECAT Program is distinct from the Carl Moyer Program. The key difference is that the SECAT Program is not limited to financing the incremental capital costs of emission control measures, but can also pay for operating costs, facility modifications, out-of-cycle replacement, and financial incentives for participation. Also, the SECAT program may only fund on-road vehicle projects.

4.4.3 Clean School Bus Program

The purpose of the District's Clean School Bus Program is to reduce ROG, NOx and PM emissions from the operation of school buses in the District through a combined approach of replacing and retrofitting older high-polluting school buses. The program also seeks to limit exposure of school children to cancer-causing diesel particulate produced by school buses through this same process.

The District's Clean School Bus Program is funded through AB 923 and Proposition 1B monies, and is administered consistent with the ARB's Lower Emission School Bus Guidelines. To date, 58 buses have received retrofits and 23 buses have been replaced.

4.4.4 Lawn Mower Exchange Program

The District holds an annual mower exchange program that allows participants to obtain a discount or rebate on an electric mower in exchange for recycling a working gas-powered mower. The Yolo-Solano Mower Exchange is open to residents residing in all of Yolo and Solano Counties thanks to a partnership with the Bay Area AQMD, which has jurisdiction over southern and central Solano County. All gas-powered mowers collected during the program are scrapped.

From 2010 to 2012, a total of 504 lawn mowers were replaced. Over an expected 10-year lifespan, each mower is expected to achieve approximately 1.14 pounds of ROG reductions and 0.07 pounds of NOx reductions. There are associated PM10 reductions from conversion to electric mowers as well. The District intends to run the mower replacement program again in 2013.

4.5 Public Outreach Programs

As a required element under the District's AQAP, the District continues to support public outreach programs within Yolo and Solano counties. The emission reductions from some of the programs such as the mower exchange are easily quantifiable while other efforts are not. The SFNA air districts have been participating in a joint agency effort to standardize quantitative methods for estimating emission reductions from participation in these programs. A list of continued existing public outreach efforts is included below:

- A partnership with EPA to utilize Enviroflash, an air quality notification program for residents within our jurisdiction. Enviroflash allows residents to receive air quality forecasts and alerts via e-mail or text message. Currently, there are 1,900 Enviroflash subscribers in the District.
- The District provides real-time air quality data as well as air quality forecasts on its website at ysaqmd.org and on the regional SpareTheAir.com website.
- Continued news coverage and public inquiry response.
- Physical and digital education collateral including brochures, fact sheets, newsletters and use of social media.

- General air quality awareness promotion including radio and newspaper announcements for the Don't Light Tonight and Spare the Air programs. There are currently 1,900 District residents signed up to receive Don't Light Tonight notifications.
- Participation in County Fairs, Transit Days, and other public events.

The District contributes financially and assists in implementation of the Spare the Air driving curtailment program, which marked its 17th year of operation in 2011. Highlights of the effort include:

- Radio spots promoting general Spare The Air awareness and specific action alerts on Spare The Air days.
- Display of ozone and PM maps at www.sparetheair.com.
- Scooter the Spare the Air Dog, who attends community events including several in Yolo and Solano communities.
- Spare The Air alerts broadcast during Sacramento weather forecasts and printed on the weather page of the Sacramento Bee.
- Free rides on YoloBus and Unitrans (operating in Davis) on Spare The Air days.

The air districts of the region coordinate to run the "Spare the Air" program which provides notification to the public of the daily air quality forecast and advisories. Residents can subscribe to the "Air Alert" program to receive emails or text messages with regional air quality forecasts. At last count, there were 800 active Air Alert subscribers in the District.

A survey of residents in the Sacramento nonattainment area was conducted at the end of 2012 to evaluate how effective the Spare the Air campaign was at modifying driving behaviors. A random sample of individuals were contacted and interviewed. The following conclusions are based on the survey results:

- One third of responders indicated that they reduce their driving during ozone season in order to reduce air pollution.
- Approximately 1.67 tons of ozone precursors were reduced due to individuals actively reducing trips during the summer months.
- Approximately 46% of drivers in the nonattainment area had been exposed and were aware of Spare the Air advertisements.
- 23% of respondents were aware of specific requests not to drive on Spare the Air days.
- 21% of respondents stated that they drove less on Spare the Air days.

Outreach efforts associated with the Spare the Air program will continue in future years, as the implementation of the program is listed as a Transportation Control Measure in the SFNA's federal 8-hour ozone plan.

4.6 Reductions from Mobile Source, Transportation, and Land Use Control Measures

Emission reductions from completed projects in the 2009-2011 time periods are shown in Table 3. Mobile emission reductions listed in the tables include technology based measures from the District's Clean Air Funds Program, the District's Clean School Bus Program and reductions generated within the District under the regional Heavy Duty Low Emission Vehicle Incentive Program administered by the SMAQMD.

Table 3: Mobile Source/Land Use Emission Reduction Strategy

Source Categories	2009-2011	
	ROG (tpd)	NOx (tpd)
Mobile Source	0.2	1.55
TCM/Land Use	0.004	0.005
Total Emission Reductions	**0.2**	**1.56**

5. TRANSPORT MITIGATION REGULATION

The following citation relating to ozone transport is from ARB's webpage:

> "The California Clean Air Act (CCAA or Act) requires the Air Resources Board (ARB or Board) to assess the contribution of ozone and ozone precursors from upwind regions on ozone concentrations that violate the State ozone standard in downwind areas. The Act also directs ARB to establish mitigation requirements for upwind districts designed to mitigate their impact on downwind districts.
>
> ARB originally established mitigation requirements in 1990 which are contained in Title 17, California Code of Regulations, Sections 70600 and 70601. These regulations were amended in 1993 and more recently in 2003. The Board adopted amendments on May 22, 2003, which were approved by the Office of Administrative Law on December 4, 2003, and became effective on January 3, 2004.
>
> These amendments added two new requirements for upwind districts. These amendments require upwind districts to (1) consult with the downwind neighbors and adopt "all feasible measures" for ozone precursors and (2) amend their "no net increase" thresholds for permitting so that they are equivalent to those of their downwind neighbors no later than December 31, 2004. The amendments clarify that upwind districts are required to comply with the mitigation requirements, even if they attain the State ozone standard in their own district, unless the mitigation measures are not needed in the downwind district."

For clarification, the California Health and Safety Code §39610 actually required the ARB no later than December 31, 1989, to identify each air basin in which transported air pollutants from upwind areas outside the air basin caused or contributed to a violation of the State ambient air quality standard for ozone and to identify the district of origin for the transported air pollutants. Under Title 17, Division 3, Chapter 1, Subchapter 1.5, Article 6, Section 70500, the State did not identify the origin of transport by air district, but by region. The ARB has identified the "Broader Sacramento Area" as transporting to the Upper Sacramento Valley, the San Joaquin Valley, the San Francisco Bay Area, and the Mountain Counties. Included in the definition of "Broader Sacramento Area" is the Yolo-Solano AQMD.

The first requirement of all feasible measures was addressed during the consultation and creation of the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan. In this plan, an extensive all feasible measures analysis for each district in the SFNA was completed and is discussed in further detail in the following section. The second requirement was implemented through District Rule 3.20, Ozone Transport

Mitigation, which was adopted by the Governing Board on December 8, 2004. This rule implemented a 10 ton per year "no net increase" program for VOC and NOx.

6. ALL FEASIBLE MEASURES

The CCAA requires an air quality strategy to achieve a 5% average annual ozone precursor emission reduction when implemented or, if that is not achievable, an expeditious schedule for adopting every feasible emission control measure under air district purview.[21] The District, as part of the SFNA, has estimated a 1.6% per year precursor emission reduction from 2005 through 2020. Since this is less than the required 5% annual emission reduction required by the CCAA, the District is obligated to adopt every feasible measure to reduce ozone precursors.

The District is committed to reviewing feasible measures adopted across the State to obtain future emissions reductions. The District, in conjunction with ARB and the other local districts that comprise the SFNA underwent a rigorous analysis of all feasible control measures during the development of the federal State Implementation Plan for Attainment of the 8-hour ozone standard. Any measure that was deemed to be feasible in our jurisdiction was identified, and further analysis of its cost-effectiveness and emissions reduction potential was conducted to determine if the measure could be slated for adoption/amendment into District Rules and Regulations. The District believes that the all feasible measure analysis conducted for the federal 8-hour plan provides an up-to-date and accurate evaluation of potential control measures.

6.1 Commitments

Table 4 shows the triennial update control measure commitments through 2020.

Table 4: List of Proposed Triennial Commitments for 2012 - 2016

Rule No.	Control Category	Description	Proposed Action and Schedule	Expected Emission Reductions by 2018 (tpd)	Cost Effectiveness ($/ton)
2.14	Architectural Coatings	Lowers VOC content in coatings	Adopt in 2014	ROG = 0.21	$10,400
2.27	Boilers, Steam Generators and Process Heaters	Lower NOx emission limits	Adopt in 2016	NOx = 0.29	$13,934 – $25,718
2.29	Graphic Arts	Lower rule exemption limit and lower solvent VOC content	Adopt in 2016	N/A	N/A

[21] H&SC §40914

7. INTERAGENCY CONSULTATION

The District held an interagency meeting on March 13, 2013 to discuss the proposed plan with neighboring, upwind, and downwind air districts, as well as other interested state agencies. A list of the air districts and local agencies that received the document follows. Any comments submitted by these agencies will be included in the next section, 8.0 Public Review and Workshop.

- Amador County APCD
- Bay Area AQMD
- Butte County AQMD
- Calaveras County APCD
- California Air Resources Board
- Colusa County APCD
- El Dorado APCD
- Feather River AQMD
- Glenn County APCD
- Mariposa County APCD
- Northern Sierra AQMD
- Placer County APCD
- Sacramento Area Council of Governments
- Sacramento Metropolitan AQMD
- San Joaquin Valley APCD
- Shasta County AQMD
- Tehama County APCD
- Tuolomne County APCD

8. PUBLIC REVIEW AND WORKSHOP

The District held a public workshop to discuss the proposed adoption of the Plan on March 14, 2013 at the District office. Notifications were sent to surrounding air districts, City Managers within the District, building, planning, and community development departments within the District, all Board members and all permit or registration holders. The workshop notice was also published in the local newspapers. A copy of the public workshop notice and draft Plan were posted on the District's webpage. The workshop was attended by several members of the public affiliated with sources permitted by the District.

Although participants at the public workshop did have several questions, no comments were received from the public at the workshop. One air district submitted comments on the proposed Plan that were administrative in nature. The indicated administrative changes were made to the draft document in response to these comments.

9. CONCLUSION

Air quality is gradually improving as the result of tons of ozone precursors being removed from the emission inventory. The overall exposure of District residents to ozone continues to decrease. The District has conducted an "all feasible measures" analysis and committed to adopting a new rule over within next three years to further reduce ozone precursor emissions. Other rule adoptions have been committed to through 2016 as part of the federal ozone planning process. However, the District must continue to reduce emissions to meet federal air quality deadlines, meet and maintain State healthful air quality levels, and reduce public exposure to toxic air contaminants. Incentive programs, such as the Carl Moyer Program and the District's Clean Air Fund incentive program, will further assist the District in achieving the necessary emission reductions to meet state and federal ambient air quality standards.

Appendix A:

District's Emission Inventory Detail

Appendix A: District's ROG Emission Inventory Detail

Source Type	ROG[a] (tons/day)					
Category	1995	2000	2005	2010	2015	2020
Stationary Sources						
Cleaning and Surface Coatings	2.1	1.4	1.4	1.5	1.6	1.7
Petroleum Production/Marketing	1.9	1.5	1.7	1.9	2.1	2.3
Industrial Processes	1.2	1.6	1.0	1.1	1.2	1.3
Waste Disposal	0.1	0.1	0.2	0.2	0.2	0.2
Fuel Combustion	0.4	0.3	0.4	0.4	0.3	0.3
Stationary Subtotal	**5.7**	**4.8**	**4.8**	**5.1**	**5.4**	**5.7**
Area-Wide Sources						
Consumer Products	2.3	2.2	2.0	2.2	2.4	2.6
Architectural Coatings/Solvents	0.9	1.0	0.9	1.0	1.0	1.1
Pesticides/Fertilizers	1.7	1.3	1.0	0.9	0.9	0.9
Asphalt Paving/Roofing	0.1	0.1	0.1	0.1	0.1	0.1
Farming Operations	0.6	0.6	0.6	0.6	0.6	0.6
Miscellaneous	1.5	1.5	1.5	1.5	1.5	1.4
Area-Wide Subtotal	**6.6**	**6.2**	**5.5**	**5.6**	**5.9**	**6.1**
On-road Mobile Sources						
Automobiles	7.2	4.9	2.8	1.7	1.0	0.7
Light/Medium Duty Trucks	6.3	4.5	2.8	2.0	1.6	1.3
Heavy Duty Gas Trucks	2.1	1.4	1.0	0.6	0.4	0.3
Heavy Duty Diesel Trucks	1.4	1.4	1.5	1.4	1.0	0.7
Motorcycles	0.6	0.4	0.8	0.7	0.8	0.8
Buses	0.1	0.0	0.0	0.0	0.0	0.0
Motor Homes	0.1	0.1	0.0	0.0	0.0	0.0
On-road Mobile Subtotal	**17.9**	**12.7**	**9.0**	**6.4**	**4.9**	**3.9**
Other Mobile Sources						
Aircraft	0.0	0.0	0.0	0.0	0.0	0.0
Trains	0.2	0.2	0.2	0.2	0.2	0.2
Ships & Commercial/Recreational Boats	0.2	0.2	0.2	0.2	0.1	0.1
Off-Road Recreational Vehicles	0.4	0.2	0.1	0.1	0.1	0.1
Off-Road Equipment	1.8	0.7	1.5	1.2	1.0	0.8
Farm Equipment	1.2	1.1	1.0	0.7	0.5	0.3
Fuel Storage & Handling (Gas Cans)	0.5	0.4	0.3	0.2	0.1	0.1
Other Mobile Subtotal	**7.7**	**7.5**	**6.3**	**5.1**	**4.4**	**3.9**
Total (Anthropogenic) Sources	**37.9**	**31.2**	**25.6**	**22.2**	**20.6**	**19.6**
Natural (Non-Anthropogenic Sources)	**19.2**	**19.2**	**19.5**	**19.5**	**19.5**	**19.5**
GRAND TOTAL[b]	**57.1**	**50.4**	**45.1**	**41.7**	**40.1**	**39.1**

[a] Data source: ARB CEFS Version 2.12, downloaded 1/3/2013, for annual average data.

[b] Columns may not sum to totals due to rounding.

Appendix A: District's NOx Emission Inventory Detail

Source Type	NOx[a] (tons/day)					
Category	1995	2000	2005	2010	2015	2020
Stationary Sources						
Cleaning and Surface Coatings	0.0	0.0	0.0	0.0	0.0	0.0
Petroleum Production/Marketing	0.0	0.0	0.0	0.0	0.0	0.0
Industrial Processes	0.5	0.1	0.2	0.2	0.2	0.2
Waste Disposal	0.0	0.0	0.0	0.0	0.0	0.0
Fuel Combustion	6.9	5.5	4.1	4.0	3.3	3.0
Stationary Subtotal	**7.4**	**5.6**	**4.3**	**4.2**	**3.5**	**3.2**
Area-Wide Sources						
Consumer Products	0.0	0.0	0.0	0.0	0.0	0.0
Architectural Coatings/Solvents	0.0	0.0	0.0	0.0	0.0	0.0
Pesticides/Fertilizers	0.0	0.0	0.0	0.0	0.0	0.0
Asphalt Paving/Roofing	0.0	0.0	0.0	0.0	0.0	0.0
Farming Operations	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.9	0.9	0.9	0.9	0.9	0.9
Area-Wide Subtotal	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**
On-road Mobile Sources						
Automobiles	7.3	5.4	2.9	1.9	1.2	0.8
Light/Medium Duty Trucks	9.5	7.8	4.9	3.4	2.4	1.7
Heavy Duty Gas Trucks	1.7	1.3	1.0	0.8	0.8	0.7
Heavy Duty Diesel Trucks	14.9	16.3	19.1	16.5	11.5	7.8
Motorcycles	0.1	0.1	0.2	0.2	0.2	0.2
Buses	0.1	0.2	0.2	0.2	0.2	0.2
Motor Homes	0.2	0.2	0.1	0.1	0.1	0.1
On-road Mobile Subtotal	**34.0**	**31.3**	**28.6**	**23.2**	**16.5**	**11.6**
Other Mobile Sources						
Aircraft	0.0	0.0	0.0	0.0	0.0	0.0
Trains	3.4	3.7	2.9	2.4	2.7	2.8
Ships & Commercial/Recreational Boats	2.3	2.3	2.5	2.2	1.7	1.5
Off-Road Recreational Vehicles	0.0	0.0	0.0	0.0	0.0	0.0
Off-Road Equipment	5.2	4.8	4.3	3.6	2.8	2.1
Farm Equipment	6.0	5.2	4.4	3.8	2.6	1.7
Fuel Storage & Handling (Gas Cans)	0.0	0.0	0.0	0.0	0.0	0.0
Other Mobile Subtotal	**16.9**	**16.0**	**14.1**	**11.8**	**9.7**	**8.1**
Total (Anthropogenic) Sources	**59.2**	**53.8**	**47.9**	**40.1**	**30.6**	**23.8**
Natural (Non-Anthropogenic Sources)	**0.0**	**0.0**	**1.0**	**1.0**	**1.0**	**1.0**
GRAND TOTAL[b]	**59.2**	**53.8**	**48.9**	**41.1**	**31.6**	**24.8**

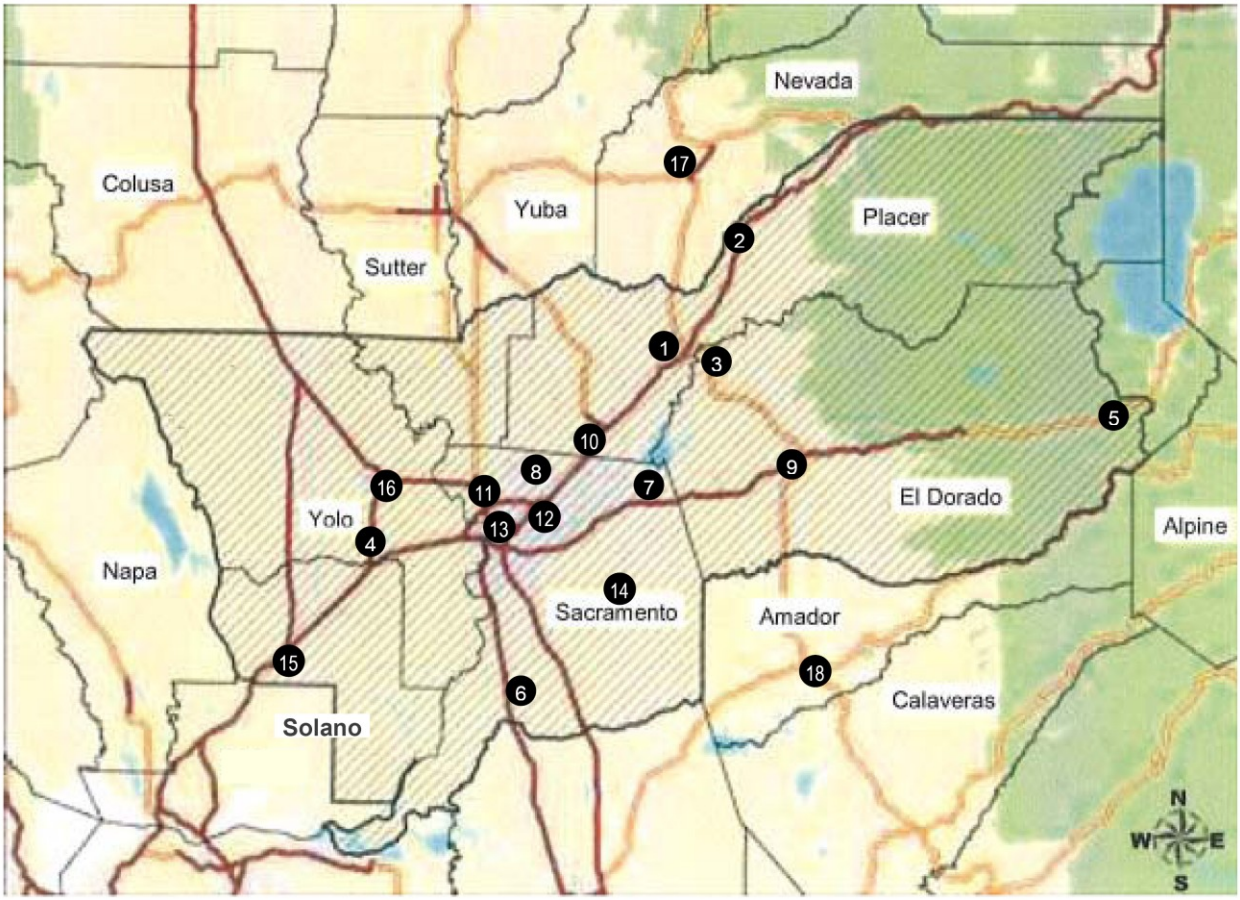
[a] Data source: ARB CEFS Version 2.12, downloaded 1/3/2013, for annual average data.

[b] Columns may not sum to totals due to rounding.

Appendix B:

Sacramento Valley Air Basin Monitoring Stations

Sacramento Region Monitoring Stations



Ozone Monitoring Sites (County)

Sacramento Nonattainment Area Sites

1. Auburn (Placer Co.)
2. Colfax (Placer Co.)
3. Cool (El Dorado Co.)
4. Davis (Yolo Co.)
5. Echo Summit (El Dorado 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.)
12. Sacramento – Del Paso Manor (Sac. Co.)
13. Sacramento – T Street (Sac. Co.)
14. Sloughhouse (Sac. Co.)
15. Vacaville (Solano Co.)
16. Woodland (Yolo Co.)

Other Sites – Outside SFNA

17. Grass Valley* (Nevada Co.)
18. Jackson** (Amador Co.)

Appendix C:

Proposed Control Measures

Control Measure Number: YSAQMD – Rule 2.14

Control Measure Title: Architectural Coatings

Control Measure Description

This control measure regulates the volatile organic compound (VOC) content in coatings applied to stationary structures and their appurtenances (e.g., general use flats, general use non-flats, and specialty coatings such as industrial maintenance coatings, lacquers, floor coatings, roof coatings, stains, etc.). The strategy also regulates the sale of coatings within the district by prohibiting manufacturers and suppliers of coatings from selling coatings that do not comply with the strategy.

The Yolo-Solano AQMD's architectural coating rule (Rule 2.14) was originally adopted in 1979 with the most recent amendment occurring in November 2001. The amendment in November 2001 adopted ARB's 2000 Suggested Control Measure (SCM) for this category. On October 25, 2007, ARB adopted a new SCM for Architectural Coatings that established lower VOC limits for some coating categories.

The table below shows a comparison between the VOC limits in the current Rule 2.14 and the new SCM; coating categories that do not have lower VOC limits are not included.

Category	YSAQMD Rule 2.14 (g/l)	ARB SCM (g/l)
Flat Coating	100	50
Nonflat Coating	150	100
Nonflat – High Gloss	250	150
Antenna Coating	530	250
Anti-fouling Coatings	400	250
Bituminous Roof Coatings	300	50
Clear Wood Coatings: Clear Brushing Lacquer Lacquers (including lacquer sanding sealers) Sanding Sealers (other than lacquer sanding sealers) Varnishes	 550 550 350 350	275
Concrete/Masonry Sealer (was Waterproofing)	400	100
Concrete/Masonry Sealer Reactive Penetrating Sealer	400	350
Dry Fog Coatings	400	150
Fire Retardant Coatings: Clear Opaque	 650 350	350
Floor Coatings	250	100
Flow Coatings	420	250
Mastic Texture Coatings	300	100
Primers, Sealers, and Undercoaters	200	100

Quick Dry Enamels	250	150
Quick Dry Primers, Sealers, Undercoaters	200	100
Roof Coatings	250	50
Rust Preventative Coatings	400	250
Specialty Primers, Sealers, and Undercoaters	350	100
Temperature-Indicator Safety Coating	550	420
Traffic Marking Coatings	150	100

Emission Inventory – 2018

EIC Code	EIC Description	ROG Planning Inventory (tpd)
520-520-9100-0000	Oil-Based (Organic Solvent Based) Coatings (Unspecified)	0.0201
520-520-9105-0000	Oil-Based Primers, Sealers, and Undercoaters	0.0382
520-520-9106-0000	Oil-Based Quick Dry Primers, Sealers, and Undercoaters	0.0226
520-520-9108-0000	Oil-Based Specialty Primer, Sealer, and Undercoaters	0.0012
520-520-9109-0000	Oil-Based Bituminous Roof Primer	0.0037
520-520-9113-0000	Oil-Based Waterproofing Sealers	0.0176
520-520-9118-0000	Oil-Based Waterproofing Concrete/Masonry Sealers	0.0123
520-520-9122-0000	Oil-Based Faux Finishing	0.0004
520-520-9124-0000	Oil-Based Mastic Texture	0.0054
520-520-9126-0000	Oil-Based Rust Preventative	0.0088
520-520-9131-0000	Oil-Based Stains – Clear/Semitransparent	0.0696
520-520-9136-0000	Oil-Based Stains – Opaque	0.0066
520-520-9141-0000	Oil-Based Varnish – Clear/Semitransparent	0.0463
520-520-9153-0000	Oil-Based Quick Dry Enamel Coatings	0.0159
520-520-9157-0000	Oil-Based Lacquers (Unspecified)	0.0172
520-520-9159-0000	Oil-Based Flat Coatings	0.0006
520-520-9160-0000	Oil-Based Nonflat – Low Gloss/Medium Gloss	0.0256
520-520-9161-0000	Oil-Based High Gloss Nonflat Coatings	0.0276
520-520-9164-0000	Oil-Based Bituminous Coatings	0.0521
520-520-9165-0000	Oil-Based Concrete Curing Compounds	0.0011
520-520-9166-0000	Oil-Based Dry Fog Coatings	0.0103
520-520-9169-0000	Oil-Based Floor Coatings	0.0029
520-520-9170-0000	Oil-Based Form Release Coatings	0.0073
520-520-9172-0000	Oil-Based Industrial Maintenance Coatings	0.1067
520-520-9173-0000	Oil-Based Metallic Pigmented Coatings	0.0333
520-520-9174-0000	Oil-Based Roof Coatings	0.0025
520-520-9176-0000	Oil-Based Traffic Coatings	0.0091
520-520-9177-0000	Oil-Based Wood Preservatives	0.0083
520-520-9200-0000	Water-Based Coatings (Unspecified)	0.0026
520-520-9205-0000	Water-Based Primers, Sealers, and Undercoaters	0.0403
520-520-9206-0000	Water-Based Quick Dry Primers, Sealers, and Undercoaters	0.0031
520-520-9208-0000	Water-Based Specialty Primer, Sealer, and Undercoaters	0.0025
520-520-9209-0000	Water-Based Bituminous Roof Primer	0.0006
520-520-9213-0000	Water-Based Waterproofing Sealers	0.0023
520-520-9218-0000	Water-Based Waterproofing Concrete/Masonry Sealers	0.0033
520-520-9222-0000	Water-Based Faux Finishing	0.0022
520-520-9223-0000	Water-Based Form Release Coatings	0
520-520-9224-0000	Water-Based Mastic Texture	0.0028

520-520-9226-0000	Water-Based Rust Preventative	0.0003
520-520-9231-0000	Water-Based Stains – Clear/Semitransparent	0.0039
520-520-9236-0000	Water-Based Stains – Opaque	0.0061
520-520-9241-0000	Water-Based Varnish – Clear/Semitransparent	0.0062
520-520-9257-0000	Water-Based Lacquers (Unspecified)	0.0012
520-520-9259-0000	Water-Based Flat Coatings	0.1538
520-520-9260-0000	Water-Based Nonflat – Low Gloss/Medium Gloss	0.1832
520-520-9261-0000	Water-Based High Gloss Nonflat Coatings	0.0166
520-520-9264-0000	Water-Based Bituminous Coatings	0.0003
520-520-9265-0000	Water-Based Concrete Curing Compounds	0.0035
520-520-9266-0000	Water-Based Dry Fog Coatings	0.0030
520-520-9269-0000	Water-Based Floor Coatings	0.0077
520-520-9272-0000	Water-Based Industrial Maintenance Coatings	0.0087
520-520-9273-0000	Water-Based Metallic Pigmented Coatings	0.0008
520-520-9274-0000	Water-Based Roof Coatings	0.0044
520-520-9276-0000	Water-Based Traffic Coatings	0.0276
520-520-9277-0000	Water-Based Wood Preservatives	0
Total		**1.0603**

Emission Reductions

EIC Description	Adoption Date	Implementation Date	ROG Emission Reduction tpd 2018
Architectural Coating Categories	2014	2016	0.2144

Cost Effectiveness

The cost effectiveness calculations were based upon economic analyses conducted by the South Coast Air Quality Management District for amendments to its Rule 1113. The specific economic analyses used are listed below:

- December 6, 2002 Amendments (based on vacated May 14, 1999 Amendments) (1998 economic data) – industrial maintenance coatings; rust preventative coatings; floor coatings; non-flats; primers, sealers, and undercoaters; quick-dry primers, sealers, and undercoaters; and quick-dry enamels.
- December 5, 2003 Amendments (2003 economic data) – clear wood finishes (including sanding sealers and varnish); roof coatings; stains; and waterproofing sealers (including concrete and masonry sealers). Range of cost effectiveness was $4,229 - $11,405/ton.
- June 9, 2006 Amendments (2006 economic data) – concrete-curing compounds; dry-fog coatings; and traffic coatings. Range of cost effectiveness was $4,882/ton.

It was assumed that the economic relationships between Yolo-Solano and South Coast suppliers and users of architectural coatings do not differ significantly. Therefore, the estimated South Coast cost-effectiveness values were assumed to be transferable to Yolo-Solano.

The cost effectiveness values calculated from the December 6, 2002 and December 5, 2003 amendments were adjusted to 2006 dollars (from 1998 and 2003 dollars, respectively) using the Bureau of Labor Statistics' Consumer Price Index for West Urban consumers. The estimated overall cost effectiveness for this proposed measure is $10,387/ton.

Authority

Authority to implement this control measure by the YSAQMD is in accordance with California Health and Safety Code, Sections 40000, 40001, and 41010.

References

1. Yolo-Solano Air Quality Management District, Rule 2.14, Architectural Coatings; November 14, 2001.
2. California Environmental Protection Agency – Air Resources Board, Suggested Control Measure for Architectural Coatings, June 22, 2000.
3. South Coast Air Quality Management District, Rule 1113, Architectural Coatings; June 9, 2006.
4. California Environmental Protection Agency – Air Resources Board, Forecasted Emissions by Summary Category Ozone SIP Planning Projections – V1.06 RF#980; Date of Last Update: November 16, 2006.
5. South Coast Air Quality Management District, Staff Report for Proposed Amendment Rule 1113 (Architectural Coatings). May 14, 1999.
6. South Coast Air Quality Management District, Staff Report for Proposed Amendment Rule 1113 (Architectural Coatings). December 6, 2002.
7. South Coast Air Quality Management District, Staff Report for Proposed Amendment Rule 1113 (Architectural Coatings). December 5, 2003.
8. South Coast Air Quality Management District, Staff Report for Proposed Amendment Rule 1113 (Architectural Coatings). June 9, 2006.
9. U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index 1996-2006.
10. Control Measure, YSAQMD – 2.14, February 2, 2007.
11. California Air Resources Board Suggested Control Measure for Architectural Coatings, October 25, 2007.
12. Control Measure 2.14 Calculation Spreadsheet, SMAQMD, May 20, 2008.

Control Measure Number: YSAQMD – 2.29

Control Measure Title: Graphic Arts

Control Measure Description

VOC emissions from graphic art operations result from the evaporation of organic solvents in the inks, fountain solutions, and solvents used in the various types of printing processes. These operations produce a wide variety of printed products that include books, magazines, newspapers, fliers, posters, and packaging materials. These various types of products require that facilities use very specific materials and printing methods. The different types of printing methods include lithography, flexography, gravure, and letterpress. Although the District's graphic arts rule (Rule 2.29) contains specific screen printing requirements, for the purposes of the SIP, the screen printing category will be grouped into the paper, fabric, and film coating category.

For certain lithographic and flexographic printing operations heatset inks are used. These viscous inks are cured using indirect hot air dryers that evaporate the ink solvents immediately after printing. In the Yolo-Solano AQMD, smaller heatset presses are equipped with electric hot air or UV light dryers. However, the larger heatset presses are equipped with natural gas fired dryers. Currently, only a single flexographic printing facility is permitted to use a Regenerative Thermal Oxidizer (RTO) to control the ROG emissions from its operation. Because no additional NOx controls are currently available for combustion devices being used as air pollution control equipment, NOx reductions associated with graphic arts operations will not be addressed in this control strategy.

The first proposed control measure in reducing the ROG emissions would be to lower the District's current rule exemption limit from 400 pounds per month to 60 pounds per month. The second proposed control measure is to revise the Districts' various cleaning solvent ROG limits to match the current Sacramento Metropolitan AQMD standards. The District's ROG emission exemption is contained in Rule 2.29, Graphic Arts Printing Operations, while the allowable solvent limits are contained in District Rule 2.31, Solvent Preparation and Cleanup.

Emission Inventory –2018

EIC Code	EIC Description	ROG Inventory for Control Measures (tpd)
		2018
24099580000000	Solvent	0.125

Emission Reductions

EIC Description	Adoption Date	Implementation Date	ROG Emission Reduction (tpd)
			2018
Solvent	2016	2018	Not available

Yolo Solano Air Quality Management District does not have enough data to quantify the emission reduction.

Cost Effectiveness

Because of the various types of solvents currently used in this wide source category and the unavailability of specific usage data, the District cannot perform a cost effectiveness calculation for this control measure. However, it is expected that because of the availability of the compliant products in the Sacramento Metropolitan Air Quality Management District, the added costs associated with purchasing and disposing of the ROG compliant materials will not greatly differ from the cost of the currently compliant ROG products.

Authority

The District is authorized to adopt and amend rules and regulations by Health and Safety Code Sections 40001, 40702, and 41010.

Implementation

This control measure will be implemented by the YSAQMD.

References

1. California Environmental Protection Agency – Air Resources Board, Forecasted Emissions by Summary Category Ozone SIP Planning Projections - V1.06 RF#980; Date of Last Update: November 16, 2006.
2. Sacramento Metropolitan Air Quality Management District, Rule 450, Graphic Arts Operations; March 24, 2000.
3. Yolo-Solano Air Quality Management District, Rule 2.29, Graphic Arts Printing Operations; August 13, 1997.
4. Rule 2.31, Solvent Preparation and Cleanup; August 13, 1997.

Control Measure Number: YSAQMD – 2.27

Control Measure Title: Boilers, Steam Generators, and Process Heaters/Space Heaters

Control Measure Description

Boilers and steam generators are used to provide hot water and steam for a variety of industrial and commercial applications. These applications include space heating, food processing, garment laundering, and equipment sterilization. Manufacturing operations use process heaters to heat materials or equipment during the manufacturing process. The equipment burners can be fired on solid, liquid or gaseous fuels. A unit's maximum input rating can be calculated from the fuel heat input value over an hour's time and is reported in British Thermal Units per hour (MMBTU/hr). Per regulatory convention, the emissions from these types of units are reported in parts per million (ppm) corrected to 3% oxygen (O_2).

The proposed control measure consists of the District amending Rule 2.27 (Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters) to incorporate a multi-tiered NOx emission limit.

Emission Inventory - 2018

EIC Code	EIC Description	NOx Planning Inventory (tpd)
		2018
5000501100000	Manufacturing and Industrial Boilers, Natural Gas Fuel	0.0302
5001001100000	Manufacturing and Industrial Boilers, Propane Fuel	0.0068
5099501100000	Manufacturing and Industrial Process Heaters, Natural Gas Fuel	0.8936
5200501100000	Manufacturing and Industrial Process Heaters, Distillate Oil Fuel	0.141
5201001100000	Manufacturing and Industrial Oven Heaters (Forced Drying Surface Coatings), Natural Gas Fuel	0.0217
6000501100000	Manufacturing and Industrial, Other, Natural Gas Fuel	0.1428
6001001100000	Manufacturing and Industrial, Other, LPG Fuel	0.0078
6099501100000	Food and Agricultural Process Boilers, Natural Gas Fuel	0.6945
31035601100000	Food and Agricultural Process Heaters, Natural Gas Fuel	0.0099
Total		**1.9483**

Emission Reductions

EIC Description	Adoption Date	Implementation Date	NOx Emission Reduction Tons/day
			2018
Boilers	2016	2018	0.2883

Cost Effectiveness

From an analysis performed by the Sacramento Metropolitan AQMD in 2003[2], the cost for boiler retrofits will vary on the size, the type, and the age of an individual unit. It is expected that some of the older units that have reached the end of their service lives may be replaced instead of being retrofitted with low-NOx equipment or post-combustion controls. Based on this analysis,

the cost of equipment modifications ranged from $12,664 - $23,359 per ton of NOx reduced. Adjusted for inflation, the expected cost in 2007 will be $13,934 - $25,718.

Total Cost: $17,924,227 - $33,061,593 over a 15 year equipment useful life (2007).

Authority

The District is authorized to adopt and amend rules and regulations by Health and Safety Code Sections 40001, 40702, and 41010.

Implementation

This control measure will be implemented by the YSAQMD through Rule 2.27.

References

1. California Environmental Protection Agency – Air Resources Board, Forecasted Emissions by Summary Category Ozone SIP Planning Projections - v1.06 RF#980; Date of Last Update: November 16, 2006.
2. Sacramento Metropolitan Air Quality Management District, Final Draft – Sacramento Off-Road Measures: Boilers, Steam Generators, and Process Heaters/Space Heaters, October 14, 2003.