

## **ON-GOING ACTIVITIES**

### **DISTRICT IMPROVEMENTS**

There are a variety of District on-going activities that will assist in bettering the understanding of the Valley's PM10 problem and in meeting the federal PM10 standards. These on-going activities comprise improvements to selected areas in the emission inventory, monitoring network, modeling, agricultural research, other special research projects and a variety of work with organizations participating in voluntary efforts to improve air quality.

#### **Emissions Inventory**

Improving the emissions inventory (EI) is an on-going process. During the development of this PM10 Plan and the Amended 2002 and 2005 Rate of Progress Plan for San Joaquin Valley Ozone, several areas of the emission inventory have been identified for improvement (see Appendix C for more details). Improvements to the EI involve the following source categories:

1. Portable Engines;
2. Wineries (fermentation);
3. Water Heaters and Boilers 75,000 BTU/hr to 2 Million BTU/hr;
4. Boilers, Steam Generators, and Process Heaters 2 to 5 Million BTU/hr;
5. Biosolids Management;
6. Imported Livestock Waste;
7. Soil Remediation;
8. Foam Product Manufacturing;
9. Civilian Aircraft;
10. Aircraft Refueling;
11. Oil and Gas Production Sumps.

In addition to the sources listed above, the District has identified other emissions inventory categories that require improvement. While these categories are important, the District will not commit to improving each item, but will update item(s) as time, resources, and priorities allow. The following is a list of emissions inventory categories that can be improved, refined, or further evaluated:

1. Size and chemical speciation profiles for ships, trains, planes, and other sources;
2. Measurement of VOC and ammonia emissions from livestock sources, with an emphasis on cattle and poultry;
3. Paved Road Dust:
  - Evaluate AP-42 emission estimation approaches against real-time based approaches developed by Desert Research Institute and the University of California, Riverside;
  - Develop spatially allocated emissions that include road volumes; and
  - Develop a more refined approach for growth of paved road dust emissions.

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4. Unpaved Roads:
  - Collect vehicle miles traveled (VMT) Data from Cities and Counties;
  - Collect VMT Data from State Agencies, such as, the Bureau of Land Management, the United States Forest Service, the Bureau of Indian Affairs, and the National Park Service;
  - Collect mileage and VMT data from private entities regarding irrigation and oil fields;
  - Refine VMT data from agricultural sources; and
  - Refine unpaved road spatial allocation methods.
6. Agricultural Operations:
  - Continue improvements on harvest emission factors, particularly almonds;
  - Associate land preparation emissions with environmental factors (humidity, soil moisture, soil type).
  - Refine methodologies for NOx and PM10 emissions from unspecified crop processing losses and unspecified product processing losses.
7. Woodstoves and Fireplaces
  - Collect better information about when, where, and how much wood is burned;
  - Collect information about the types of stoves and fireplaces used;
8. Livestock
  - Collect California PM data for dairies;
  - Evaluate PM from non-cattle livestock sources;
  - Collect speciated VOC data for dairies and other cattle;
  - Evaluate VOC from non-cattle livestock; and
  - Collect additional ammonia measurements for cattle and other livestock.
9. Construction
  - Estimates are currently based on housing units or economic indicators, need to collect actual permit data to better evaluate activity levels for construction dust emissions.
10. Ammonia
  - Provide graphic displays of ammonia emission estimates using CRPAQS data.
11. Internal Combustion (IC) Engines
  - Estimate emissions from area source IC Engines
12. Windblown Dust
  - Estimate windblown dust emissions from open areas.
  - Improve windblown dust emissions factors and emissions estimates. The current inventory for windblown dust is high considering the meteorology of the SJVAB.
13. Unpaved Traffic Areas
  - Improve activity and emission factor data.
  - Add data on industries currently not included.

## **Monitoring Network**

In an effort to gather real-time hourly data, the ARB is currently operating continuous PM10 monitors at Fresno-First and Stockton-Hazelton. The ARB also collects daily PM2.5 data at Fresno-First and Bakersfield-California. Beta Attenuation Monitors

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(BAM) for PM2.5 are located at Bakersfield-California, Fresno-first, Modesto-14<sup>th</sup> Street, and Visalia-Church. The District has Tapered Element Oscillating Microbalance (TEOM) PM10 monitors at Clovis-Villa and Corcoran-Patterson.

Since April 2002 the Corcoran-Patterson site is gathering real-time PM10 and PM2.5 data from Beta Attenuation Monitors (BAM). The data gathered by these units are being used to document diurnal variations in particulate matter concentrations and document PM10 concentrations for Air Quality Index (AQI) reporting and forecasting. The BAM and TEOM data are not used to determine attainment of the particulate matter standards.

### **Modeling Improvements**

Modeling efforts will be improved by application of CRPAQS modeling and modeling tool development. CRPAQS results will continue to improve our understanding of the factors and relationships affecting particulate chemistry, formation and deposition. Particle size related deposition rates are poorly quantified at this time and are not considered in current modeling techniques. CRPAQS did not include deposition rate measurements to address this modeling limitation. Federally funded research in the SJVAB or elsewhere may provide technical data to address this issue in the future.

Chemical Mass Balance modeling will improve as additional speciation profiles are developed or updated for different sources; however, no national coordination or planning is evident to update and improve these signature libraries. The conduct of various state and regional studies provide occasional updates that are incorporated by ARB subsequent to technical review and consideration. Continued refinement and evaluation of the connection between emission inventories and observed particulate concentrations will be an ongoing challenge for the District and ARB. Continued review is required to ensure that the relationships suggested by CMB are tested for validity and comprehensiveness. The process of CMB modeling is limited by the proper identification, availability, selection and accuracy of appropriate contributing source profiles.

Continued analysis is required to improve the understanding of nitrate formation chemistry parameters and variation. Efforts for this Plan focused on early CRPAQS data (IMS95), which will be supplemented by evaluation and modeling of the 1999-2001 field program data.

Assessments of biogenic emissions, particulate formation mechanisms from biogenic aerosols and rates for surface deposition removal of particulates by vegetation are poorly quantified at this time. These factors are generally considered to be more important for Eastern states, but evaluation of local contributions and removal rates must be better quantified to improve model performance for CMB and regional modeling.

## **ON-GOING AGRICULTURAL RESEARCH**

The Agricultural Technical Advisory Committee, created in 1999, continues to provide a forum for the review of on-going and planned agricultural research at a local level. The committee is working on securing funds for the development of the Agricultural CMP program and its components. In addition, the committee plans to identify and prioritize research projects.

This committee is also known as the AgTech group. The group is comprised of representatives from the District, California Air Resources Board (ARB), California Cotton Ginners and California Cotton Growers Associations, Nisei Farmers League, Almond Hullers and Processors Association, Natural Resources Conservation Services (NRCS), Environmental Protection Agency (EPA), and local farm bureaus. Since its inception, the group has grown to include participants from the California Department of Food and Agriculture (CDFA), Western United Dairymen (WUD), JG Boswell, university researchers, and many more.

In 2002, the AgTech group created three subcommittees to better address specific issues of the agriculture industry. Members of the AgTech group as well as stakeholders comprised these subcommittees.

One subcommittee is the Growers Subcommittee, which is chaired by representatives of the agricultural industry. The primary function of this subcommittee is to assist in the identification of conservation management practices (CMP) for the nut trees, fruit trees, and row and field crops industries. The subcommittee has compiled a preliminary list of CMPs, which will be further reviewed and refined. The list was used by the District to develop the Agricultural CMP Program.

Another subcommittee is the Almond Technical Subcommittee chaired by the Air Quality Group (UC Davis and the Center of Irrigation Technology, CSU Fresno). The Air Quality Group is cooperatively conducting a research study to monitor PM emissions from almond harvesting. The objectives include the development and improvement of PM10 emission factors, and observation of PM10 emission changes due to changes in cultural practices. This group conducted initial on-field tests in an almond orchard in Manteca and is now proposing to conduct on-field measurements of PM10 emission factors from nut pick-up operations in commercial almond orchards during the 2003 season.

The last subcommittee is the Dairy Subcommittee chaired by CDFA. This subcommittee focuses on air quality research needed by the dairy industry. It has developed a draft Dairy Action Plan entitled, "Air Emissions Action Plan for San Joaquin Valley Dairies" which serves as a research plan to study air emissions and their mitigation. This plan contains proposed research objectives with short-, mid- and long-term goals, which will be refined over time. All objectives will address ammonia, particulate matter, and reactive organic gas emissions from dairy farms

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and their processes. The funding needs for five years of research are estimated at \$2.4 million, with nearly \$675,000 already secured.

The subcommittee is in the process of modifying the Dairy Action Plan into a plan that would address all California dairies rather than just the dairies in San Joaquin Valley. The subcommittee will also assist the District in developing the CMPs for the CAFO component of the Agricultural CMP program.

Currently, there are two research projects funded to measure VOC from dairies in the San Joaquin Valley Air Basin (SJVAB). One is the USDA funded project to U.C. Davis titled "Agricultural sources of PM10 and ozone precursors", and the other is an amendment to an ARB funded project to CSU Fresno titled "Ammonia emissions from soils and vegetation". Both projects began in summer of 2002. The researchers on these projects are working together to design effective experimental methods and procedures. The ultimate goal of the two research projects is to improve the emissions estimates available to the District for VOC from dairies.

## **SPECIAL STUDY STRATEGY**

During California Regional PM10/PM2.5 Air Quality Study (CRPAQS) field studies, selected sites had additional collocated monitoring to establish a one-in-three day sampling schedule. CRPAQS also provides a period with additional PM2.5 monitoring. During intensive episodes forecasted during CRPAQS, additional continuous and filter based measurements were also collected. The study is intended to provide products to support the development of effective PM10 and PM2.5 attainment plans for Central California. It is uniquely positioned to produce needed data within the implementation schedule specified for the new PM standards. The information developed will improve apportionment of high PM10 and PM2.5 concentrations to contributing sources.

CRPAQS has already provided evaluation and refinements for the daily forecasting of pollution episodes. The accuracy of forecasting is essential for proper management of agricultural and prescribed fires to minimize the occurrence and severity of PM10 24-hour episodes.

Future results of CRPAQS data analysis and modeling will contribute to improved understanding of atmospheric processes. The relationship and chemistry of contributing sources will be evaluated through data analysis and modeling. Development of improved modeling assumptions, tools and methods is expected to provide improved analysis for SIP planning and control measure analysis. Table 8-1 lists the schedule for completing CRPAQS modeling.

**Table 8-1  
CRPAQS Modeling Schedule**

Spring 2003	Initiate in-house modeling efforts for CRPAQS episodes
Spring 2003	Release RFP for external modeling support
Summer 2003	Initiate UCD modeling for CRPAQS episodes
Fall 2003	Begin contracts for external modeling support
Winter 2004	Preliminary findings from in house modeling
Summer 2004	Preliminary findings from UCD modeling
Fall 2005	Modeling contracts complete

The District with assistance from ARB will analyze the CRPAQS modeling results for their impact on the attainment strategy as the researchers release the data. If the data indicates that the PM10 precursors ammonia and VOC should be part of an effective attainment strategy, the District commits to revising the PM10 Plan as needed to be consistent with the findings. With preliminary findings available in late 2004 and final reports expected in 2005, the potential plan revision will coincide with the Reasonable Further Progress (RFP) Report that will be under development at that time. That plan development process will provide an opportunity to adopt additional controls if needed for expeditious attainment.

### **OPERATION CLEAN AIR**

A number of political and business leaders from around the SJVAB have come together to form "Operation Clean Air". The purpose of the group is "to create a 5-year action plan that will clean our air and promote prosperity in the San Joaquin Valley". The centerpiece of the effort is the development of a Clean Air Action Plan (CAAP) for the SJVAB. The CAAP will include voluntary emission reduction strategies that can be implemented by governmental agencies, private businesses, and individuals. The emission reduction measures included in the CAAP will be in addition to the traditional regulatory programs included in the District's air quality plans. The CAAP will also include a component outlining resources that will be needed to achieve the reductions outlined within it.

### **ENVIRONMENTAL QUALITY INCENTIVES PROGRAM**

The Environmental Quality Incentives Program (EQIP) was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. Incentives for measures that benefit air quality play an increased role in this year's program. To date, over 600 miles of unpaved roads have been controlled with the application of oil, providing over 500 tons per year of PM10 reductions. In addition, several thousand acres

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have chipped agricultural prunings instead of burning them. This has resulted in over 240 tons of PM10 reductions and over 382 tons of NOx and VOC reductions.

EQIP offers contracts with a minimum term that ends one year after the implementation of the last scheduled practices and a maximum term of ten years. These contracts provide incentive payments and cost-shares to implement conservation practices. Persons who are engaged in livestock or agricultural production on eligible land may participate in the EQIP program. EQIP activities are carried out according to an environmental quality incentives program plan of operations developed in conjunction with the producer that identifies the appropriate conservation practice or practices to address the resource concerns. The practices are subject to NRCS technical standards adapted for local conditions. The local conservation district approves the plan.

EQIP may cost-share up to 75 percent of the costs of certain conservation practices. Incentive payments may be provided for up to three years to encourage producers to carry out management practices they may not otherwise use without the incentive. However, limited resource producers and beginning farmers and ranchers may be eligible for cost-shares up to 90 percent. Farmers and ranchers may elect to use a certified third-party provider for technical assistance. An individual or entity may not receive, directly or indirectly, cost-share or incentive payments that, in the aggregate, exceed \$450,000 for all EQIP contracts entered during the term of the Farm Bill.<sup>1</sup>

## **SUSTAINABLE INCENTIVES**

In an effort to bring about early air quality improvements for all pollutants of concern in the Valley, the District is considering a variety of new concepts. One program concept that would promote the implementation of air pollution reducing practices is to enable sources, including exempt sources, to use *sustainable incentives*.

*Sustainable incentives* are financial measures, programs, and/or prohibitory rule alternative compliance plans which provide an economic mechanism to fund pollution reduction measures. *Sustainable incentives* may be in the form of private industry and/or foundation programs, federal and/or state government grants, tax credits, prohibitory rule incentives, and other programs.

*Sustainable incentives* are based in part upon the highly successful initiatives implemented by the United States Department of Agriculture, Natural Resource Service, through the federal farm bill's "Environmental Quality Incentives Program (EQIP), the State's highly successful Carl Moyer Program, and the District's "REMOVE Program" and other economic incentive and alternative compliance plan programs that offset the implementation cost for pollution reduction measures. This is accomplished within the framework of a private industry/public/agency partnership. Sustainable incentives revolves around a market based approach to

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<sup>1</sup> <http://www.nrcs.usda.gov/programs/eqip/>

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pollution reduction utilizing measures that are economically sound and backed up by scientific research.

*Sustainable incentives* are market based concepts that require (1) local Districts, the Air Resource Board and EPA to assist local municipalities and public agencies in acquiring federal funding for the implementation of emission reduction measures (as opposed to only mandating requirements); (2) the acceptance of proposals from private industry that generate equivalent emissions reductions identified in prohibitory rules, but are less costly, and (3) promote the acquisition of federal, State, and/or other funding to continue and expand incentive programs such as EQIP, Carl Moyer, and acquire additional funds for the local transportation agencies and local communities, to offset mitigation cost needs. *Sustainable incentives* could obtain or reductions either through contributing to programs such as the federal farm bill's Environmental Quality Incentives Program, on-site reductions or reductions generated within the geographic region of the local District.