

**SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL DISTRICT**

**PM10
ATTAINMENT DEMONSTRATION PLAN
PROGRESS REPORT
1997-1999**

**Governing Board Hearing
Thursday, June 15, 2000**

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LIST OF ACRONYMS AND ABBREVIATIONS

AAQTF	Agricultural Air Quality Task Force
ADP	Attainment Demonstration Plan
ARB	California Air Resources Board
BACM	Best Available Control Measure
BARCT	Best Available Retrofit Control Technology
CDF	California State Department of Forestry and Fire Protection
CDFA	California Department of Food and Agriculture
CDPR	California State Department of Parks and Recreation
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CRPAQS	California Regional Particulate Air Quality Study
DMV	Department of Motor Vehicles
EPA	United States Environmental Protection Agency
HOST	Heavy Oil Storage Tank
IMS95	1995 Integrated Monitoring Study
LMA	Land Management Agency
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NH ₃	Ammonia
NOV	Notice of Violation
NOx	Oxides of Nitrogen
NRCS	National Resource Conservation Service
PM	Particulate Matter
PM10	Particles with an aerodynamic diameter less than or equal to 10 micrometers. PM10 include the fine PM2.5 particles as well as coarse particles (2.5-10µm)
PM2.5	Particles with an aerodynamic diameter less than 2.5 micrometers
RACM	Reasonably Available Control Measure
REMOVE	<i>REduce MOBILE Vehicle Emissions</i>
ROP	Rate of Progress
RWB	Residential Wood Burning
SIMP	Smoke Impact Monitoring Partnership
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
USDA	United States Department of Agriculture
VOC	Volatile Organic Compound

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EXECUTIVE SUMMARY

On May 15, 1997, the San Joaquin Valley Unified Air Pollution Control District (District) adopted a *PM10 Attainment Demonstration Plan* (PM10 ADP or Plan) that was prepared to implement requirements of the Federal Clean Air Act Amendments of 1990. The California Air Resources Board (ARB), by Resolution 97-28, approved the PM10 ADP for submittal as a revision to the State Implementation Plan (SIP) on June 26, 1997. In Resolution 97-28, the ARB requested:

...the governing Board of the San Joaquin Valley Unified Air Pollution Control District to review, by July 1, 2000, its overall progress towards implementing the 1997 Plan, including in its review a reassessment of the attainment projections and rate of progress milestones, and the adoption of plan revisions, if needed to ensure attainment by 2006, and directs the Executive Officer to work with the District to this end;

In response to the aforementioned provision of Resolution 97-28, the District prepared this document, the *PM10 ADP Progress Report* (ADP Progress Report). The ADP Progress Report presents the District's overall progress towards implementing proposed actions (or commitments) established in the PM10 ADP as well as a reassessment of the attainment projections for the annual and 24-hour standards. In summary, the reassessment of the District's attainment projections indicates that San Joaquin Valley Air Basin (SJVAB) attainment of the federal annual National Ambient Air Quality Standard (standard) for PM10 by 2001 remains probable as predicted in the ADP. Attainment of the federal 24-hour standard for PM10 by 2001 cannot be predicted for the SJVAB primarily due to exceedances at Corcoran and Bakersfield. While Bakersfield is still expected to satisfy the 24-hour standard by 2006 with forthcoming controls identified in the PM10 ADP, Corcoran still appears to require additional emission controls beyond the measures identified in the PM10 ADP to demonstrate attainment by the 2006 attainment date. The California Regional Particulate Air Quality Study (CRPAQS) is designed to provide information necessary for developing these emission controls.

The proposed action areas in the PM10 ADP include stationary and area sources, mobile sources, public education, research, agricultural sources, and special projects. While all action areas are discussed, the rulemaking program for stationary and area sources, and the various research programs, including those for agricultural-related studies, are emphasized in this progress report.

The PM10 ADP also set forth a framework for research work. Research studies regarding agricultural activities have been providing valuable information. Control strategies in the PM10 ADP for agricultural sources focus on field

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research to identify agricultural activities that significantly contribute to the PM10 problem. The ADP Progress Report provides an update on agriculturally-related research including, crop harvest (cotton, almond, walnut, fig, cotton, wheat, barley), land preparation and harvest equipment, soil research, and other research categories.

Research projects are implemented under the CRPAQS program and are currently underway. The projects have provided the District with an opportunity to work closely with the ARB to improve the PM10 emission inventory and emission inventory forecasts, better understand the causes of PM10 episodes in the SJVAB, and improve PM10 modeling techniques.

Research findings under CRPAQS, the 1995 Integrated Monitoring Study (IMS95), on-going research work under the District's special studies program and various other technical support studies offer the District important findings. The IMS95 is of particular importance. It was designed to advance the District's technical knowledge and provide a basis for developing an intensive field program to be conducted in 1999-2001. As a result, the IMS95 was successful in significantly advancing the District's understanding of SJVAB PM10 episodes.

The IMS95 also provides the basis for the 1999-2001 fall and winter intensive field studies. The fall intensive field program will provide analysis of the sources contributing to high PM10 events in Corcoran. The winter intensive field studies will provide PM10 and PM2.5 data for analysis of the SJVAB. Following the 1999-2001 field study, additional analysis and modeling will be conducted to obtain maximum value from the collected data. The field program will provide enhanced analysis of annual PM concentrations as well as the 24-hour fall and winter PM concentrations. This information, coupled with other research results, will add to the District's knowledge and understanding of PM10 and PM2.5 episodes and sources; hence providing the tools to more effectively establish regulatory and/or voluntary programs to reduce PM levels and meet attainment standards.

The reclassification of the SJVAB from moderate to serious PM10 nonattainment required the District to upgrade stationary and area source regulatory programs, including fugitive dust and smoke management regulations, to incorporate best available control measures (BACM). The ADP Progress Report describes the status of the upgrade and the District's regulatory schedule for sources that emit PM10 precursor emissions.

The amendment of Regulation VIII, (Fugitive PM10 Prohibitions), is the BACM upgrade initiated in response to the commitments made in the PM10 ADP and to EPA's proposed limited approval/disapproval of the regulation. The District's draft Regulation VIII rules (including two new rules) are proceeding through the

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rulemaking process, with the first workshops in April 2000 and adoption during the first quarter of 2001. The two new rules in Regulation VIII are Rule 8051, (Open Areas), and Rule 8081, (Agricultural Operations).

The District also committed to a BACM upgrade of Rule 4103 (Open Burning) in the PM10 ADP. In March 2000, the Air Resources Board adopted the revised *Smoke Management Guidelines for Agricultural and Prescribed Burning*. The guidelines establish statewide requirements for open burning. The District is proceeding with the amendment of Rule 4103 and a new rule, Rule 4106 (Prescribed Burning), to meet both BACM and the new statewide open burning requirements.

The San Joaquin Valley Unified Air Pollution Control District is the only major California air quality district to address urban sources of residential wood combustion by regulation. The District's Rule 4901, (Residential Wood Burning) (RWB), is similar to the ARB's *Proposed Suggested Control Measure for the Control of Emissions From Residential Wood Combustion: Technical Support Document*. As committed to in the PM10 ADP, the District is focusing its efforts on further reducing emissions from RWB activities in urban residential areas. Consistent with these commitments, the District will be evaluating the feasibility of limiting the installation of uncontrolled wood-burning fireplaces in new residences, as recommended in the EPA's *Residential Wood Combustion Emission Control Measures* document.

Since the PM10 ADP was adopted, the District conducted two extensive surveys to better assess emissions from residential wood burning, to measure residents' perceptions of wood smoke and the District's existing residential wood burning program, and to gauge public support for additional controls. The information gathered from the two surveys is being used by the District to reassess the emission inventory from RWB sources as well as to re-evaluate the RWB public education program as the means to fulfill the District's regulatory responsibility to address this source of PM10.

The District will continue to evaluate the role of RWB as part of an enhanced program to speciate air sampling filters for elemental carbon and signature organics of wood combustion. In addition, the residential wood burning source category will be reviewed more closely for PM2.5 exceedances, particularly for its contribution to the annual standard.

Other rule development work includes rule amendments and development of new rules that will address emissions from PM10 precursors. Ten such rules are scheduled for rulemaking with anticipated adoption dates over the next two years.

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The District has implemented the light/medium duty, on road emissions incentives programs set forth in the PM10 ADP. The PM10 ADP also described a heavy-duty vehicle engine program that the District was considering as part of its future control measures. The proposal in the PM10 ADP included calculations on the emission reductions that could be achieved by each \$1 million expenditure, but the PM10 ADP did not include an actual commitment to implement the program and did not include any of the reductions in its modeling for the PM10 ADP. Subsequently, a heavy-duty, low-emission engine incentive program was established by the District and the District's financial commitment to fund the heavy-duty engine program has far exceeded the example given in the PM10 ADP. Since December 1997, approximately \$7.6 million in Department of Motor Vehicles (DMV) surcharge fees have been awarded and approximately \$4.4 million has been awarded from the Carl Moyer Memorial Funds Program. The results indicate that 800 lower emitting engines have been approved, with over 6000 tons of oxides of nitrogen reduced over the life of the projects funded. These emission reductions are above and beyond all other emission reductions claimed in the PM10 ADP.

The reductions in ambient PM10 concentrations that the SJVAB has experienced follow a national trend of declining PM10 levels. Unlike the late 1980s and early 1990s, the last six years (1993-1998) provided favorable meteorology for air quality. However, the relative proportions of improvement of PM10 levels in ambient air quality due to weather patterns, regulatory actions and voluntary emission reductions cannot be determined.

The District believes that a revision of the PM10 ADP is currently not required because of the steady progress in both research and regulatory programs. The results from on-going research projects will assist in a better understanding of PM10 episodes, a more complete inventory, and better tools for forecasting projections, while the current regulatory scheme will bring the District closer to its attainment goals. Once the results from CRPAQS are available, the District should be able to revise its PM10 ADP to show attainment of the federal 24-hour standard at the Corcoran site by 2006.

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INTRODUCTION

The purpose of the *PM10 Attainment Demonstration Plan Progress Report* (ADP Progress Report) is to provide an overall progression of projects and programs that were proposed as commitments in the *PM10 Attainment Demonstration Plan* (PM10 ADP or Plan). The ADP Progress Report provides an assessment of Plan commitments from January 1997 to December 1999 and a reassessment of the attainment demonstration projections. The ADP Progress Report does not contain any new commitments.

The ADP Progress Report is divided into seven chapters. Chapter 1 provides a brief historical background to the Plan and the reason to develop the ADP Progress Report. Major areas of Plan commitments are provided in Table 1-1, *Major Proposed Action Areas in the PM10 Attainment Demonstration Plan*. Chapter 1 also provides a brief discussion of the PM10 emission inventory. Chapters 2 through 5 evaluate progress in stationary and area sources, mobile sources, agricultural sources and public education, respectively. In Chapters 2 and 4, the 1997 Plan commitments of projects and programs are compared to the status of those same projects and programs at the end of December 1999. Chapter 6 provides ambient air quality data and attainment projections. Finally, Chapter 7 covers research and special projects.

BACKGROUND

The San Joaquin Valley Air Basin (SJVAB) is designated by the United States Environmental Protection Agency (EPA) as a “serious” nonattainment area for particulate matter with an aerodynamic diameter of 10 microns or less (PM10). The standards for PM10 are health-based and were established in 1987 as part of the federal National Ambient Air Quality Standards (standard). The SJVAB does not meet the 24-hour and annual PM10 standard and is required to reach attainment for both standards by December 31, 2001. If attainment by that date can not be demonstrated, a one-time, five-year extension may be granted by the EPA. The extension would make the attainment date no later than December 31, 2006.

On May 15, 1997, the San Joaquin Valley Unified Air Pollution Control District (District) adopted a *PM10 Attainment Demonstration Plan* (PM10 ADP or Plan) that was prepared in response to the Federal Clean Air Act Amendments of 1990. On June 26, 1997, the California Air Resources Board (ARB) approved the PM10 ADP for submittal as a revision to the State Implementation Plan (SIP).

The PM10 ADP, which incorporates and supercedes the District’s *1994 Serious Area PM10 Plan* (Serious Plan), set forth the strategies that the District would

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pursue to reach attainment for the 24-hour and annual PM10 standards. District efforts include rule development, incentive programs, and extensive research to improve the PM10 emission inventory and support the development of future control strategies.

The ARB staff report on the PM10 ADP noted several improvements and some deficiencies in the Plan. The improvements include: (a) the projection of attainment of the annual PM10 standard throughout the SJVAB by December 31, 2001; (b) the projected attainment of the 24-hour PM10 standard by December 31, 2001 for five of the seven cities where the standard has been exceeded; (c) the inclusion of an incentive program for diesel-powered on-road and off-road mobile sources; and (d) commitments to improve the PM10 emission inventory for fugitive emissions from agricultural operations, construction operations, paved roads, and unpaved roads. The deficiencies in the District's PM10 ADP cited by the ARB were attributed to the limited understanding of the causes of PM10 episodes in the SJVAB. Correspondence by the ARB to the EPA on July 17, 1997, also noted that the District's PM10 ADP did not identify the specific controls required to reach attainment of the 24-hour PM10 standard at all monitoring sites by December 31, 2001 or 2006 (the five-year extension to the attainment date).

In Resolution 97-28, the ARB approved the PM10 ADP subject to a requirement that the District's Governing Board review the District's overall progress towards implementing the PM10 ADP by July 1, 2000. The review was to encompass the District's progress towards fulfilling the research and proposed actions (or commitments) for the development of control measures in the PM10 ADP, and a reassessment of the attainment projections. In addition, the ARB was directed by its Board to work with the District to improve the technical and analytical bases of the PM10 ADP, including improvements to the emission inventory and emission inventory forecasts, the understanding of the causes of PM10 episodes in the SJVAB, and the improvement of PM10 modeling techniques. The *PM10 ADP Progress Report* (ADP Progress Report) is the District's response to the ARB requirement. A copy of Resolution 97-28 is included as Appendix A.

EMISSION INVENTORY AND EMISSION REDUCTIONS

Based on the 1993 base year, the Primary PM10 emission inventory (from direct sources), ~~based on the 1993 Base Year,~~ has not changed since May 1997. ~~No directly-emitted PM10 controls have been adopted since 1997; hence, the directly-emitted emission reduction projections remain the same as those presented in the PM10 ADP (see Chapter 5, pages 5-7 through 5-13 of the PM10 ADP).~~

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Summary tables, which show emission reductions of NOx and VOCs (PM10 precursors), are presented in Appendix B of this report. This information is described in greater detail in the 1999 Ozone Rate of Progress (ROP).

The SJVUAPCDDistrict, in cooperation with the ARB, is in the process of developing a new base year emission inventory for PM10 from both direct and indirect sources that would include emissions reductions from regulatory programs and reflect updated methodologies.

**TABLE 1-1
MAJOR PROPOSED ACTION AREAS IN PLAN**

Area	Summary of Proposed Actions in Plan	Reference Page No. in Plan	Reference Page No. in ADP Progress Report
Stationary and Area Sources	<u>Regulation VIII</u> : The District will upgrade Regulation VIII rules from RACM to BACM, and increase its surveillance efforts to ensure compliance. The District will also consider the development of a new trackout rule to supersede the trackout provisions in Rules 8020, 8030, 8040, 8060, and 8070. The District will consider the consolidation of one or more Regulation VIII Rules as part of the BACM rule upgrades. The amendments to Regulation VIII will be fully implemented by 2001.	7-4 to 7-10	2-1 to 2-3
	<u>Prescribed Burning and Open Burning</u> : The District will develop a BACM-level rule for forest/land management prescribed burning to separate prescribed burning from the District's current RACM level rule, Rule 4103 (Open Burning). The District will propose Rule 4106 to implement BACM level controls for management-ignited and naturally-ignited prescribed fire. The District will develop an MOU with appropriate BACM-level strategies and control measures to reduce PM10 emissions from prescribed burning.	7-12 to 7-14	2-4 to 2-6
	<u>Residential Wood Burning</u> : The District will evaluate the effectiveness of Rule 4901 (Residential Wood Burning), and upgrade of the rule to BACM. The District will consider focusing efforts within urban residential areas, evaluate public awareness efforts, enhance speciation of air sampling filters, and evaluate the need to incorporate mandatory no burn requirements into Rule 4901. The District will consider the residential wood burning control measures recommended in the EPA BACM guidance. The District will consider a public education message to encourage residents to reduce and eliminate wood burning during adverse meteorological conditions.	7-10 to 7-11	2-6 to 2-9
Mobile Sources	The District will review the strategies evaluated by its contract with Acurex Environmental Corporation with	7-16 to 7-22	3-1 to 3-5

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Area	Summary of Proposed Actions in Plan	Reference Page No. in Plan	Reference Page No. in ADP Progress Report
	respect to the heavy-duty low-emission engine program, including the early introduction of new, low-emissions heavy-duty vehicles, low-emissions retrofitting or repowering of non-road equipment, and conversion or retrofit of heavy-duty vehicles to lower-emissions configurations.		
Public Education	The District will further develop current programs to increase awareness and enhance participation. This includes the Residential Wood Burning and Agricultural outreach programs.	7-23	5-1 to 5-2
Research and Agricultural Sources	<p>Through research, the District is to identify agricultural activities that significantly contribute to the PM10 problem and to later develop feasible methods of controlling emission from these sources. An agricultural timeline was developed by District Staff and corroborated by representatives of the agricultural community, and UC Davis. The timeline is intended to identify and direct the development of necessary research and development of appropriate controls. Agricultural research is being coordinated with the California Regional PM10/PM2.5 Air Quality Study (CRPAQS).</p> <p>Air quality planning and control activities will utilize research study findings as they are published and/or reviewed by the CRPAQS Policy and Technical Committees throughout the course of the study, and will not be deferred until after scheduled completion of the research program.</p> <p>Better activity and emissions rate data are needed for source categories including: prescribed burning and wildfires, residential wood combustion devices and usage rates, unpaved road mileage and VMT, paved road median and shoulder type/widths, various agricultural activities and crop types, and construction acreage, duration, and quantification of grading. On-going and planned research projects will allow the District and the ARB to account for these emissions in the emissions inventory.</p>	7-23 to 7-42	4-1 to 4-13 and 7-4 to 7-22
Special Projects	<p>Special studies will be conducted to improve the understanding of 24-hour PM10 episodes. Special study of Bakersfield, Corcoran, or any other special studies will be carefully designed to collect appropriate information and determine contributing sources.</p> <p>The PM10 ADP listed "actions to be taken" under the special projects section of the chapter on proposed actions. These "actions to be taken" include: comprehensive inspection/field surveys; intensive monitoring; development of source/activity specific control measures; expanded forecasting; and the evaluation of monitoring site locations.</p>	7-43	7-7 to 7-10

INTRODUCTION

This chapter describes the District's planning and regulatory efforts in the following stationary and area source categories that were included in the PM10 ADP: fugitive dust, smoke management, residential wood burning, and stationary NOx sources (PM10 precursor). In addition, measures included in the ozone attainment demonstration plan directed at controlling PM10 precursors from stationary and area sources were considered in the emissions forecasts of the PM10 ADP strategy, many control measures proposed for the control of ozone precursors will also control PM10 precursors. Summary charts of the status of these control measures are also included in this chapter.

The Federal Clean Air Act Amendments of 1990 require that air basins reclassified from moderate to serious, such as the District, upgrade their control strategies for fugitive dust sources from Reasonably Available Control Measures (RACM) to Best Available Control Measures (BACM). Much of the District's regulatory efforts for PM10 during the past three years involved upgrades of rules from RACM to BACM and related issues concerning EPA-approvability of the rules into the State Implementation Plan (SIP). This chapter describes the overall progress of these regulatory efforts.

FUGITIVE DUST

PM10 ADP Proposed Actions

The District committed to upgrade Regulation VIII to BACM levels to make it fully SIP approvable and also identified a number of specific measures to accomplish this task. In addition to upgrading Regulation VIII rules, the District also committed to increasing its surveillance efforts to ensure a higher level of compliance to the rule.

Regulation VIII (Fugitive PM10 Prohibitions)

In response to the PM10 ADP commitments, the District began the rule amendment process for Regulation VIII with scoping meetings with stakeholders in April 1999. Based on staff research and input from stakeholders, a draft version of the amended regulation was nearly completed, when in September 1999, the EPA proposed limited approval/disapproval for Regulation VIII rules for incorporation into the SIP. The proposed limited disapproval is based upon a list of issues that EPA cites as possible conflicts with BACM approval criteria. In

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most cases, these issues are similar to the RACM approvability problems that the District had under its Moderate PM10 Plan.

In response to all issues and concerns raised by the EPA, the District determined that it would develop amendments to Regulation VIII that would not only meet its PM10 ADP commitments, but would also meet BACM and SIP approvability requirements. Since the District's adoption of its PM10 ADP, Maricopa County (Arizona), and the South Coast Air Quality Management District adopted fugitive dust regulations, which if approved by EPA, may establish precedents for BACM. The District's draft rule amendments are proceeding through the rulemaking process, with the first of several anticipated workshops held in April 2000 and adoption expected to occur in the first quarter of 2001. The rules that are proposed under the draft Regulation VIII are shown on Table 2-1.

Except for the inclusion of controls on certain on-field agricultural emissions, the District believes that EPA's recommendations in its limited approval/disapproval letter can be accommodated through amendments to Regulation VIII. The on-field agricultural activities, which include field harvesting operations, earth movement of cropland, and raising livestock and fowl, are currently part of an extensive research program. As stated in the PM10 ADP, the District will not implement control strategies for these sources prior to the completion of the research. Data pertinent to initiating the management of these sources (e.g., emission factors and activity levels) will need to be collected prior to District regulatory action. Until such time, the District strongly encourages the owners and/or operators of these source categories to apply voluntary best management practices as outlined by the District and the Natural Resource Conservation Service (NRCS) in the PM10 ADP.

Several workshops will be held on draft Regulation VIII; hence, the information presented here may be substantially amended in response to comments received during the public review period. However, the upgrade to BACM provisions and the inclusion of new source categories (excluding on-field agricultural operations that involve harvesting and cropland earthmoving activities) will remain the focus of the regulatory amendments and new rules in Regulation VIII.

Rule Compliance

In 1998, the District Compliance Division set a policy which eliminated the issuance of "notice to comply" citations to owners/operators violating Regulation VIII requirements. Instead, any source out of compliance with Regulation VIII is issued a "notice of violation" (NOV). The implementation of the new policy has stepped-up compliance efforts and, in 1999, resulted in a two-fold increase in the number of NOVs issued by the District over those issued in 1998.

**TABLE 2-1
DRAFT REGULATION VIII RULES**

Rule	Title	Applicability
8011	<i>Administrative Requirements</i>	This rule applies to specified outdoor fugitive dust sources. It contains definitions, exemptions, general requirements, administrative requirements, recordkeeping requirements, and test methods that are applicable to all the rules under Regulation VIII.
8021	<i>Construction, Demolition, Excavation, and Extraction and Landfill and Other Earthmoving Activities</i>	This rule applies to any construction, demolition, excavation, extraction, landfill and other earthmoving activities, except those associated with on-field agricultural activities. It also applies to the construction of new landfill sites or modification to existing landfill sites prior to commencement of such activities.
8031	<i>Bulk Materials</i>	This rule applies to the outdoor handling, storage, and transport activities of any bulk material.
8041	<i>Carryout & Trackout</i>	This rule applies to all sites where carry-out/track-out has occurred onto paved roads.
8051	<i>Open Areas</i>	This rule applies to open areas and vacant lots having 1/2 acre or more of disturbed surface area that remain undeveloped, unoccupied, unused, or vacant for more than 5 days.
8061	<i>Paved and Unpaved Roads</i>	The rule applies to any construction or modification project involving a public or private paved or unpaved road, street, highway, freeway, alley way, access drive, access easement, or driveway.
8071	<i>Unpaved Vehicle and Equipment Traffic Areas</i>	This rule applies to any unpaved vehicle/equipment traffic area of 5,000 square feet or larger on which at least one of the following occurs: vehicle and/or equipment

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Rule	Title	Applicability
		parking; vehicle fueling and service; or shipping, receiving and transfer.
8081	<i>Agricultural Operations</i>	This rule applies to off-field agricultural operations. An off-field agricultural operation is any operation that is not performed on cultivated land. The rule requires the control of fugitive dust emissions from storage, handling and transport of bulk materials; paved and unpaved roads; unpaved vehicle and/or equipment parking traffic areas; open areas and vacant lots; windblown fugitive dust; and carry-out/track-out in relation to off-field agricultural operations.

SMOKE MANAGEMENT

PM10 ADP Proposed Actions

The District committed to develop BACM-level Rule 4106 for forest/land management prescribed burning to separate prescribed burning from the District's current RACM level rule, 4103 (Open Burning) and to develop emissions budgets for prescribed burning activities. The District also committed to developing a Memorandum of Understanding (MOU) with forest and land management agencies that would include appropriate BACM-level strategies and control measures to reduce PM-10 emissions from burning.

Rules 4103 and 4106

The District's intent is to create two BACM rules that address opening burning. District Rule 4103 would continue to address open outdoor, agricultural, and field crop burning. However, for BACM levels of control for prescribed burning, the District proposes to develop a separate rule, Rule 4106, (Prescribed Burning). This rule would regulate range improvement, forest management, and wildland vegetation management and other prescribed fire uses by federal and state land management agencies.

The District began initial efforts to amend the rules in 1997. As part of the process, it was determined that a new allocation system, with "burn/no burn" decisions for specific projects made at the District level, would best meet the District's needs. In order to develop this system, it was necessary for the State to amend its *Agricultural Burning Guidelines*, under Subchapter 2 of Title 17 of

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the California Code of Regulations. The ARB Governing Board adopted the revised Title 17 guidelines in March 2000, which provided the added direction needed in the District's rulemaking process and the implementation of an allocation system.

In the 1994 Serious Plan, the District did not identify open burning as a non-significant PM10 source; therefore, Rule 4103 became subject to BACM requirements. In January 1999, the EPA notified the District that Rule 4103 failed to meet BACM and proposed limited approval and limited disapproval for incorporation into the SIP. In May 1999, the District requested a delay in final rulemaking from the EPA for Rule 4103 until ARB completes its proposed changes to Title 17 and any other applicable provisions of the California Health and Safety Code.

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Memorandum of Understanding with Land Managers

On August 20, 1998, the District entered into a Memorandum of Understanding (MOU) with several federal and state land management and fire protection agencies (collectively called the land management agencies or LMAs) consistent with the commitments contained in the PM10 ADP. The participants and signatories who developed the MOU include the US Forest Service (Sequoia, Sierra, and Los Padres National Forests), US National Park Service (Sequoia-Kings Canyon National Parks), Bureau of Land Management, US Fish and Wildlife Service, California State Department of Forestry and Fire Protection (CDF), and the California State Department of Parks and Recreation (CDPR).

The MOU was developed so that LMAs could immediately implement BACM level practices for prescribed burning activities. It provides flexibility for the LMAs to utilize management practices that meet BACM. Implementing BACM level controls for prescribed fire activities allows the LMAs to provide fire protection services, improve community fire safety, and meet ecosystem objectives while still meeting Federal Clean Air Act mandates and protecting air quality. The MOU is also consistent with the EPA's *Interim Air Quality Policy on Wildlands and Prescribed Fires*, which was implemented on April 23, 1998.

The MOU significantly improves coordination and communication between the LMAs and the District through the pre- and post-burn reporting requirements. In addition to reducing emissions by implementing BACM, the obligations agreed to in the MOU serve as a burn activity timing and coordination tool between the LMAs. The obligations agreed to are also intended to prevent excessive smoke from impacting urban and rural locations. See Appendix B for a copy of the MOU.

On-Going Efforts

In addition to the proposed actions stated in the PM10 ADP, the District and the Sierra Area Office of the California Department of Forestry and Fire Protection (CDF) finalized a Memorandum of Agreement (MOA) for a "mobile" air monitoring partnership, called the Smoke Impact Monitoring Partnership (SIMP), in August 1999. See Appendix C for a copy of the MOA.

The SIMP will provide equipment, training, and personnel to gather ambient air samples from smoke emissions caused by prescribed fires. Two "mobile" air-monitoring modules will collect ambient air samples during five prescribed fires, and, if possible, one wildfire, to measure emission concentrations from PM10, CO, and NO_x by locating the modules at or near anticipated smoke-impacted areas. The information gathered during this effort will help the District and CDF

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make more informed decisions on how to balance the need for clean and healthy air with the need to use prescribed fire as a tool to reduce the effects of wildfires.

This effort is consistent with commitments contained in the MOU with the land managers to develop emissions estimates, update the emissions inventory for prescribed fires, and improve prescribed and wild fire emission growth factors. The SIMP is also consistent with the “mobile” smoke monitoring goals contained in the PM10 ADP.

Also as part of the District’s on-going efforts, in April 1998, the Compliance Division began offering a training program to violators of Rule 4103 (Open Burning). Compliance School Training is offered quarterly to first-time violators of the open burn rule who have a level of responsibility sufficient to prevent future violations. The two-hour session offers an overview of general air pollution problems, a discussion of Rule 4103, and other related issues. Upon completion of the course, attendees receive up to \$150.00 in credit that is applied to their individual total penalty amount. While Compliance School is not a specific commitment in the PM10 ADP, its goal is to provide compliance information on open burning and to prevent future violations, thus indirectly reducing PM10 emissions from illegal open burns. From April 1998 to July 1999, compliance school attendees, representing 173 open burn violation cases, settled their cases through the program.

RESIDENTIAL WOOD BURNING

PM10 ADP Proposed Actions

The District committed to evaluate the effectiveness of Rule 4901 (Residential Wood Burning), and its upgrade to BACM. The District also indicated that it would:

- evaluate public awareness efforts;
- focus efforts within urban residential areas;
- enhance the evaluation of air sampling filters by speciation;
- evaluate the need to incorporate mandatory no-burn requirements into Rule 4901; and
- consider the residential wood burning control measures recommended in the EPA Residential Wood Combustion BACM guidance document.

The District further stated that a decision to incorporate additional mandatory elements into Rule 4901 would be based on the level of effectiveness of the current rule, and additional air quality analysis.

Rule Effectiveness

Rule 4901 is similar to ARB's *Proposed Suggested Control Measure for the Control of Emissions From Residential Wood Combustion: Technical Support Document*. The District is the only major California air pollution control agency to address urban sources of residential wood combustion by regulation. The District is currently investigating the feasibility of further reducing RWB emissions in urban residential areas by limiting the installation of uncontrolled wood-burning fireplaces in new residences, as recommended in the EPA Residential Wood Combustion BACM guidance document.

Information Gathering for Emissions Modeling and Public Awareness

During the past three years, the District conducted two extensive surveys to better assess the emissions from residential wood burning, to measure residents' perceptions of wood smoke and the District's existing residential wood burning (RWB) program, and to gauge public support for additional controls. The purpose and findings of the surveys are summarized in Table 2-2.

The first survey initiated by the District, in October 1997, collected data for use in modeling the emissions from fireplaces in the eight counties in the SJVAB. The collective term "fireplaces" included fireplaces, woodstove inserts, and pellet stove inserts. The survey provided findings in the following areas: presence and use of fireplaces or woodstoves; presence and types of fireplace inserts; years in which fireplace inserts were purchased; types of woodstoves respondents to the survey have; years in which woodstoves were purchased; times when fireplaces and woodstoves are used; extent to which fireplaces and woodstoves are used during specific times of the day; types and amounts of fuel burned in their fireplaces or woodstoves; ways in which respondents usually heated their homes; and reasons for using fireplaces or woodstoves for heat.

The second survey, which concluded in January 1999, measured valley residents' perceptions, awareness, and support of the District's public education program regarding RWB. Upon completion of the survey, findings were determined for the following areas: fireplace and woodstove usage; message awareness (based on District's RWB slogan "Please Don't Light Tonight"); source of the message awareness; effect of message on behavior; perceived effectiveness of RWB program; attitudes toward wood smoke; perceived physical effects of wood smoke; perceived intrusiveness of wood smoke; perceived contributor to pollution; and support for specific District measures, such as mandatory "no-burn" days, public funding of financial incentives, program for reporting excessive smoking chimneys, gas-only fireplaces, and conversion requirements.

**Table 2-2
RESIDENTIAL WOOD BURNING SURVEY RESULTS**

Title	Findings
<i>Residential Wood Combustion (Survey I)</i>	The research findings presented in Survey I were derived by telephone interviews conducted between October 8 and October 26, 1997. The primary purpose of this survey was to develop data for use in modeling the emissions from fireplaces and woodstoves in the eight counties served by the District. The market researchers made findings of facts designed primarily for emission modeling purposes.
<i>Residential Wood Combustion Program (Survey II)</i>	The research findings were derived by telephone interviews conducted from January 11 through 15, 1999, from all areas of the San Joaquin Valley Air Basin. The primary purpose of this survey was to measure residents' perceptions of the residential wood burning program in the Valley. Other objectives included measuring residents' awareness of the District's program message, and their support for specific District control measures. A presentation of the survey results was made by META Information Services at the District. Based on the survey results, META made 25 specific conclusions. See Appendix D for the conclusions.

The information gathered from the two surveys will be used by the District to reassess the emission inventory from RWB sources as well as to re-evaluate the RWB public education program as the means to fulfill the District's regulatory responsibility to address this source of PM10. See Chapter 5 for additional information on public education and awareness.

Review of Air Quality Analysis

The District reviewed an analysis conducted by James Schauer and Glen Cass regarding source contributions to airborne particles in the San Joaquin Valley Air

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Basin.¹ As part of the 1995 Integrated Monitoring Study (IMS95), the researchers analyzed atmospheric fine particulate matter samples collected in the SJVAB during two wintertime air pollution episodes. Source apportionment of observed fine particulate matter by chemical mass balance calculated the RWB contribution in Bakersfield and Fresno. In Bakersfield, the evaluated episodes had less than 50 $\mu\text{g}/\text{m}^3$ of fine particulate with 8 to 10 $\mu\text{g}/\text{m}^3$ contributed by RWB. In Fresno, one episode with 55 $\mu\text{g}/\text{m}^3$ of fine particulate was determined to have 14.7 $\mu\text{g}/\text{m}^3$ contributed by RWB. An episode with 97 $\mu\text{g}/\text{m}^3$ of fine particulate in Fresno was calculated to have a contribution of 48 $\mu\text{g}/\text{m}^3$ from RWB in the fine particulate range (2.5 μg level and under). However, the study did not identify the apportionment of the fine particulate to the total PM10 mass. Based on the Schauer and Cass analysis, the District believes that RWB is a significant contributor to the fine portion of particulate matter in the San Joaquin Valley during the winter and does contribute to exceedances of the 24-hour PM10 standard.

The District will continue to evaluate the role of RWB as part of an enhanced program to speciate air sampling filters for elemental carbon and signature organics of wood combustion. In addition, the source category, residential wood burning, will be reviewed more closely for PM2.5 exceedances, particularly for its contribution to the annual standard. An annual field program, and fall and winter intensive field programs have been scheduled for the years 2000 and 2001. See Chapter 7 for a detailed discussion of the field programs and IMS95.

COMPARATIVE REVIEW OF RULEMAKING COMMITMENTS AND RULEMAKING SCHEDULE OF PM10 PRECURSORS

This section provides two summary charts: a comparative review of rulemaking commitments for stationary rules, and a brief status report regarding rules that address PM10 precursors. Table 2-3 provides a comparative review of Plan commitments regarding stationary rules against the current status of those rules (as of December 1999). Table 2-4 shows the status of proposed rules and rule amendments that incorporate control strategies to reduce VOC emissions and NO_x levels (as of December 1999). These pollutants are known to be precursors of secondary PM10.

¹Schauer, J. and G. Cass, "Source Contributions to Airborne Particles in the San Joaquin Valley During the IMS95 Study," Draft Final Report, March 15, 1998.

TABLE 2-3
COMPARATIVE REVIEW OF RULEMAKING SCHEDULE COMMITMENTS

Plan Commitment (page no. in ADP)	Specific Regulatory ADP Commitment	Rule Amendment or Development Schedule in ADP	Rule Amendment or Development Schedule in Progress Report	Activities
Fugitive Dust (pp. 7.5-7.10)	Amend Regulation VIII, Rules 8010-8070	1 st Quarter 1999-4 th Q 2000	2 nd Quarter 1999-1 st Q 2001	<p>Action: Regulation number Proposed Alternatives has been Rule 80</p> <p>Goal: A implement Control pursuant Air Act District' Attainment Plan.</p> <p>Status: workshop 17, 18, Govern First Qu</p> <p>Other A 2000, E on Reg publish Register</p>
RWB (pp. 7.10-7.11)	Amend Rule 4901	1 st Quarter 1997-4 th Q 1998	The District is currently investigating the feasibility of further reducing RWB emissions in urban residential areas by limiting the installation of uncontrolled	<p>Action: 4901 up Rule 49 Proposed Measure Emission</p>

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Plan Commitment (page no. in ADP)	Specific Regulatory ADP Commitment	Rule Amendment or Development Schedule in ADP	Rule Amendment or Development Schedule in Progress Report	Activities
			wood-burning fireplaces in new residences, as recommended in the EPA Residential Wood Combustion BACM guidance document.	<i>Wood Combustion Support District California agency sources combust</i>
Smoke Management (pp. 7.12-7.14)	Amend Rule 4103	1 st Quarter 1997-4 th Q 1998	2 nd Quarter 2000-2 nd Q 2001 <u>Reason for Delay:</u> The District began its rule amendment process in 1997. Upon re-evaluating its overall smoke management plan, the District requested that the State's Title 17 program be revised to reflect issues confronting the District.. The rule amendment process was delayed in anticipation of the adoption of Title 17, the new <i>Smoke Management Guidelines</i> . The District began its internal work within one month of the adoption date of the <i>Smoke Management Guidelines</i> .	<u>Action:</u> 4103 and Goal: Amend Rule 4103, and would include BACM for and pre would necessa Title 17 Status: were held 12, 2001 Hearing 2001. <u>Other A</u> 1999, E limited a for Rule ARB ac Smoke Guidelin
Stationary NOx Sources (PM10 Precursor Rules) (pp. 7-15)	Amend Rules 4305, Rule 4701, and Rule 4703 for federal enforceability	2 nd Quarter 2002-4 th Q 2003	See Table 2-4.	<u>Action:</u> rule am by the F part of r revision

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Plan Commitment (page no. in ADP)	Specific Regulatory ADP Commitment	Rule Amendment or Development Schedule in ADP	Rule Amendment or Development Schedule in Progress Report	Activities
				Also see

Note: Emission reduction numbers for Regulation VIII rules are currently in development. There are no expected emission reduction gains from the smoke management rules (4103 and 4106). There were no new emission reduction numbers for stationary NOx sources from west-side NOx sources in the PM10 ADP.

**TABLE 2-4
RULEMAKING STATUS OF PM10 PRECURSORS**

Rule	Title	Background	C
441 1	Oil Production Well Cellars	<u>Goal:</u> New Rule 4411 would establish BARCT requirements to control VOC emissions from crude oil production well cellars.	<u>Status:</u> Scoping on May 9, 2000 Hearing: Seco
430 5	Boiler, Steam Generators, and Process Heaters	On September 14, 1998, the EPA, Region 9, published a Federal Register notice of proposed rulemaking that stipulates a limited approval and limited disapproval of Rules 4305, 4351, 4701 and 4703.	District will sub amendments to Quarter 2003, a ozone SIP revis
435 1	Boilers, Steam Generators, and Process Heaters-RACT	According to the EPA, the rules strengthen the SIP, but do not fully meet the FCAA provisions regarding requirements for nonattainment. The SIP exemption for certain west-side sources was cited as a SIP-deficiency.	
470 1	Stationary Internal Combustion Engines-RACT		
470 3	Stationary Gas Turbines		
460 1	Architectural Coatings	The ARB is working to adopt its BARCT determination guidance (Suggested Control Measure) for architectural coatings. The District anticipates the use of the document to upgrade Rule 4601 to BARCT status in its rulemaking efforts. <u>Goal:</u> Amendments would implement VOC BARCT requirements for architectural coatings.	<u>Status:</u> Scoping scheduled for M Board Hearing:
462 3	Storage of Organic Liquids	Rule amendments would implement BARCT by controlling storage tanks that store organic liquids with a true vapor pressure of greater than 0.5 psia. VOC emission reductions are anticipated.	The District has Heavy Oil Storage working group development of determining the

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Rule	Title	Background	C
		<u>Goal:</u> Amendments would implement VOC BARCT requirements for tanks that store volatile organic liquids	heavy oil. <u>Status:</u> First ro tentatively sche Governing Boa Quarter 2001.
466 2	Organic Solvent Degreasing	<u>Goal:</u> Amendments would establish VOC BARCT requirements for degreasing operations.	<u>Status:</u> Second was held on Apr 2000. Governi First Quarter 20
466 3	Organic Solvent Cleaning, Storage, and Disposal	<u>Goal:</u> New Rule 4663 would establish VOC BARCT requirements and implement all feasible control measures for cleaning operations performed outside degreasers, disposal and storage of solvents and solvent wastes.	<u>Status:</u> First ro held on April 11 Governing Boa Quarter 2001.
469 2	Commercial Charbroiling	<u>Goal:</u> New Rule 4692 would establish VOC BARCT requirements for charbroiling equipment pursuant to the District's Ozone Attainment Demonstration Plan	<u>Status:</u> Scopin tentatively sche and 23, 2000. Hearing: Seco

INTRODUCTION

The District does not have direct authority to set emissions standards for motor vehicles and non-road equipment. However, through voluntary participation, the District can reduce PM10 and precursor emissions from light/medium-duty and heavy-duty mobile sources through the use of financial incentives.

PM10 ADP Proposed Actions

The District committed to an array of voluntary mobile source programs in the following categories:

- Light/medium-Duty Vehicle Emissions Reduction Incentive Program
- Retrofitting of Heavy-Duty on Road Vehicles to Low-Emissions configuration Incentive Program;
- Early Introduction of New, Low-Emissions On-Road Heavy-Duty Vehicles Incentive Program;
- Retrofitting or Repowering Non-Road Mobile Equipment with Low-Emissions technologies Incentive Program Development;
- REMOVE (*REduce MOtor Vehicle Emissions Program*);
- Expanded Enhanced Inspection and Maintenance (I&M) Program;
- Reductions in the Growth of Vehicle Activity.

A brief description of all programs developed and/or which are being implemented during the last three years and their current status is provided in the following sections. A discussion of the current status of the PM10 conformity motor vehicle emissions budget is also included in this chapter.

LIGHT/MEDIUM-DUTY ON-ROAD EMISSIONS INCENTIVE PROGRAMS

The District's on-road programs for light/medium-duty vehicles include: Vehicle Buy-Back, Smoking Vehicle, Indirect Sources, and *REduce MObile Vehicle Emissions (REMOVE)*. Table 3-1 summarizes the progress and status of these programs. Monies spent and emissions reduced are part of a dynamic interdependent process.

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**TABLE 3-1
LIGHT/MEDIUM-DUTY, ON-ROAD EMISSIONS INCENTIVE PROGRAMS**

Program	Description	Progress and Current Status
REMOVE	The District's REMOVE program administers funds generated by the DMV Surcharge Fees (AB 2766) for projects that reduce motor vehicle emissions.	As of August 19, 1999, the REMOVE program has awarded \$7,866,355 in grants resulting in approximately 464 tons of emission reductions reduced over the life of the projects. The REMOVE program will continue to fund projects that reduce motor vehicle emissions at an approximate current funding level of \$2 million per year.
Vehicle Buy-Back	The Vehicle Buy-Back program provides incentives to remove older, high-emitting vehicles from service.	Since May 1997, the District has committed \$1 million to the Vehicle Buy Back Program, resulting in the reduction of approximately 525 tons of emissions (ROG, NOx, PM10) over the remaining three-year life of the vehicles. The State of California is instituting a Vehicle Buy Back program in conjunction with the Enhanced Inspection and Maintenance Program. The District's Vehicle Buy Back Program will be subsumed by the State Program.
Expanded Enhanced I/M	<i>Expansion of the Enhanced I/M program to Communities with greater than 50,000 people. This includes Visalia, Merced, and Lodi.</i>	On March 16, 1999, the District requested that the State Bureau of Automotive Repair expand the State's Enhanced I/M program.
Indirect Sources ^a	A two 2% percent reduction in the growth in vehicle activity between the 1993 base year and the 2006 attainment date or equivalent emission reductions.	<i>The District continues to work with local jurisdictions on instituting changes to land-use development patterns that result in more pedestrian-friendly and transit-supporting communities. The District works with Metropolitan Planning Organizations regarding the use of Congestion Mitigation and Air Quality Funds.</i> Current estimates of the growth in vehicle activity during the 1990s indicate that growth in vehicle activity is much lower than was originally projected in the PM10 ADP and the two (2%) percent reduction has already been achieved.
Smoking Vehicle ^b	The Smoking Vehicle Program is a voluntary program where citizens can report smoking vehicles to the District. Letters are sent to vehicle owners requesting voluntary repairs. No previous emission reductions were quantified in the 1997 PM10 ADP.	Over 5,200 letters have been sent to owners of vehicles reported to the Smoking Vehicle Program since May 1997. The District will continue to operate a Smoking Vehicle Program.

^aThe Indirect Source program applies to light-duty and heavy-duty vehicles, however, it is mainly focused toward light-duty vehicles

^bThe Smoking Vehicle Program applies to both light-duty and heavy-duty vehicles.

HEAVY-DUTY LOW-EMISSION ENGINE INCENTIVE PROGRAM

The focus of the heavy-duty low-emission engine incentive program is to reduce emissions from heavy-duty engines by providing financial incentives for the purchase of reduced emission engine technologies. While a direct financial commitment was not made in the PM10 ADP, the SJVAPCD has subsequently acquired the means to implement the incentive programs for heavy-duty engine emission reductions. The heavy-duty program includes both on-road and off-road components. The on-road component applies to vehicles with gross vehicle weight rating greater than 14,000 pounds, and the off-road component of the program applies to vehicles with engines over 50 horsepower. The current status of the on-road component is shown in Table 3-2.

**TABLE 3-2
ON-ROAD HEAVY-DUTY LOW-EMISSION ENGINE INCENTIVE PROGRAM**

Program	Description	Progress and Current Status
On-Road Emissions	<p><u>Retrofit Program:</u> Incentive-based program for the modification of engines and fuel systems of existing diesel engines.</p> <p><u>New Vehicle Program:</u> Incentive-based program to introduce new heavy-duty vehicles into local operation certified to emit below the prevailing emissions standard.</p>	<p>The District is currently operating a Heavy-Duty Engine Program using DMV Surcharge Fees¹ and Moyer Program² funds.</p> <p>The On-Road component of the Heavy-Duty Engine Program has awarded \$5.9 million resulting in approximately 3,900 tons of NOx reduced over the life of the projects.</p>

¹Funds allocated from collection of a DMV vehicle registration surcharge for air quality

²Funds allocated under the Carl Moyer Memorial Air Quality Standards Attainment Program

A brief description and summary of the status of the off-road program is located in Table 3-3.

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**TABLE 3-3
OFF-ROAD, HEAVY-DUTY LOW-EMISSION ENGINE INCENTIVE PROGRAM**

Program	Description	Progress and Current Status
Off-Road Emissions <i>New Program Components:</i> a. Locomotive b. Marine Vessel c. Airport Ground Support Equipment d. Electric Forklift e. Stationary Agricultural Pumps	<i>Incentive program to reduce emissions from uncontrolled non-road equipment to reduce emissions.</i> The new program components (a-e) were not included in the 1997 PM10 ADP.	The District is currently operating a Heavy-Duty Engine Program using DMV Surcharge Fees and Moyer Program funds. Approximately \$10 million dollars was available for all heavy-duty engine projects for Fiscal Year 1999-2000. The DMV Surcharge Fees are allocated by the District Governing Board to fund various programs on a yearly basis. Since May 1997 (to March 2000), the Off-Road component of the District Heavy-Duty Engine Program has awarded \$273,282 towards off-road vehicles resulting in approximately 281 tons of NOx reduced over the life of the projects. In the 1999-2000 program year, the District allocated \$3.5 million to 329 stationary agricultural pumps. The District anticipates that over 3,750 tons of NOx will be reduced over the life of the project, which is approximately 10 years.

TRANSPORTATION CONFORMITY

The PM10 ADP contains emission budgets for transportation conformity purposes. On May 5, 1999, in a letter to the ARB, the EPA indicated that they were making an inadequacy finding for the emission budgets contained in the PM10 ADP. The EPA had concerns that the budgets exclude emissions from construction activities, fail to protect for the 24-hour PM10 standard, and lack emission inventory information to determine whether the 2020 emission budgets are adequate.

In order to satisfy the concerns raised by the EPA, a significant amount of additional information will be needed. The District will need to develop a Plan that clearly demonstrates attainment of the 24-hour PM10 standard, quantify construction emissions associated with transportation facilities, and develop emissions inventories for future year emissions budgets. The PM10 ADP includes air quality modeling projections for the year 2006. Considerable uncertainty exists in the modeling projections due to limitations associated with model formulations, identification of principle components responsible for observed emission levels, and emissions inventory basis and projections for key categories. Current information would not support projection of air quality to the year 2020 with an estimate that would be considered reliable given the associated uncertainties. It is anticipated that much of this information will be developed as part of the research conducted by the California Regional Air

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Quality Study (CRPAQS). When sufficient information is available, the District will submit revised emission budgets.

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AGRICULTURAL SOURCES CONTROL STRATEGY

The control strategy for agricultural sources set forth in the PM10 ADP focuses on field research to identify agricultural activities that significantly contribute to the PM10 problem, and the implementation of voluntary control measures once the research has been finalized. Because the overall contribution of agricultural sources to PM10 levels in the SJVAB is not well understood, an extensive research schedule was established in the PM10 ADP to assess the contribution to PM10 levels from common agricultural practices and related sources.

The research timeline presented in the PM10 ADP includes the completion of field research, submission of interim and final reports, data analysis, final assessment of research results, and the consideration of the development and implementation of relevant controls, to include voluntary control measures.

BACKGROUND

During the development of the PM10 ADP, it was determined that closer cooperation and interaction with the agricultural community and researchers should occur at a local level. An Agricultural Technical Group was formed to provide a forum for the review of on-going and planned agricultural research. The group is comprised of staff of the District and the California Air Resources Board, the California Cotton Ginners and California Cotton Growers Associations, Nisei Farmers League, Almond Hullers and Processors Association, and the state air quality coordinator of the Natural Resources Conservation Services (NRCS) of the United States Department of Agriculture (USDA) in cooperation with local farm bureaus. The PM10 ADP also maximized such cooperation with the agricultural community when it formalized its cooperation with the NRCS and the CDFA through a Memorandum of Understanding, as found in Appendix F.

At the national level, in 1999, the USDA Agricultural Air Quality Task Force (AAQTF) prepared policy recommendations on two major issues, agricultural burning and a voluntary incentive-based compliance program for agricultural activities. The voluntary compliance program was signed by the AAQTF in 1999, and has been forwarded to the USDA and EPA. The AAQTF recommends that USDA and EPA develop a voluntary air quality compliance program in accordance with certain guiding principles that are consistent with the philosophy of locally-led resources conservation. The AAQTF includes representation from EPA, local and state air regulatory agencies, production agriculture, and the NRCS. Several members of the AAQTF are also participants of the San Joaquin Valley Agricultural Technical Group. See Appendices G and H for the Voluntary (Incentive Based) Air Quality Compliance Program and the Memorandum of Understanding between the USDA and EPA, respectively.

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AGRICULTURE RESEARCH PROGRAMS

Research programs are primarily conducted through the California Regional Air Quality Study (CRPAQS) and/or the United States Department of Agriculture (USDA). The main research coordinator assisting the District in fulfilling its research commitments, as stated in the PM10 ADP, is the Crocker Nuclear Laboratory at the University of California, Davis (UCD). Other researchers, whose agricultural research projects indirectly support the PM10 ADP research commitments, include the following: the California State University of Fresno in conjunction with Ames Research Center-NASA and the University of Riverside College of Engineering-Center for Environmental Research and Technology, and private contractors, including, Research for Hire for the development of a general nitrogen fertilizer application calendar for major crops in the San Joaquin Valley, and Sonoma Technology Inc. for agricultural survey work.

In addition, there are other PM-related air quality research projects, funded under CRPAQS or the research division of the ARB, which may yield results that interface with the research commitments in the PM10 ADP. These include the following research titles:

- a. "Using GIS to Estimate Statewide Vehicle Activity and Roadway Mileage for Unpaved Roads in California"
- b. "Creating a Statewide Spatially and Temporally Allocated Agricultural Burning Emissions Inventory Using Consistent Emission Factors"
- c. "Evaluation of Geologic Dust Entrainment, Removal, and Transport Mechanisms"

Research results based on Plan commitments, to include emission factors, equipment comparisons, and alternative practices, will be used by the District and the NRCS in the development of voluntary control measures. Agriculture research studies are also being developed for the agricultural community, and technical papers describing the planning and preliminary results are being presented in various professional journals and at international conferences. Table 4-1 summarizes the current status of the agricultural research projects under various project categories, as described in the PM10 ADP research timeline. Crop harvest research fieldwork is focused on primary PM10 fugitive dust emissions during fall and winter agricultural operations for several significant crop types (by acreage), when PM10 exceedances have typically occurred. Other research includes unpaved roads, dairies, feedlots, poultry ranches, prioritization of other crops, soil research, raisin tray burning, equipment studies, and laboratory techniques and measuring tools. Table 4-2, provides additional on-going, agricultural-related research that will support commitments made in the Plan.

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**TABLE 4-1
PLAN COMMITMEN-SPECIFIC AGRICULTURAL RESEARCH IN SAN JOAQUIN VALLEY AIR BASIN**

Project Category (Researchers)	Commitments Listed in PM10 ADP¹	Products to Date	Comments
Crop Calendar Development and Emission Inventory Crop Activity Update	Data Analysis and Survey: 1995-1996	<u>Analysis and Survey</u> : July 1996 <u>Crop Calendar Development and Emission Inventory Crop Activity Update</u> , July 1996, compiled by the ARB in coordination with San Joaquin Valley agricultural experts	Information was used to update temporal profiles. Harvesting information from almonds, figs, cotton, walnuts, along with some land preparation and tilling information for all other crops were used to update the ARB's emission estimation methodology.
Unpaved Roads: 1. Additional Research 2. Control Strategy	1. Data Analysis/Final Report: 1998-1999 2. Development & Implementation: 1997-2004	1. <u>Final Report(s)</u> : April 1994, Crocker Nuclear Laboratory, UCD (Report Title: <i>Evaluation of the Emissions of PM10 Particulates from Unpaved Roads in the San Joaquin Valley</i>), December 1996, DRI (Report Title: <i>Effectiveness Demonstration of Fugitive Dust Control Methods for Public Paved Roads and Unpaved Shoulders on Paved Roads</i>), and February 1999, Institute of Transportation Studies, UCD (Report Titles: <i>Volume I--An Exploratory Study: A New Methodology for Estimating Unpaved Road Miles and Vehicle Activity on Unpaved Roads, Volume II--Using GIS to Estimate Unpaved Road Miles and Vehicle Activity on Unpaved Roads</i>). 2. <u>Development & Implementation</u> : NRCS EQIP Projects and Regulation VIII rule amendments of off-field agricultural roads	Information from these studies was used by the ARB in combination to update the state emission inventory. ARB is to further refine its emission factor in 1999-2000. NRCS EQIP projects provide grants to qualified growers to control PM10 emissions from unpaved agricultural roads. STI survey work on unpaved agriculture roads (see Table 4-2).

¹ Commitment Dates extend from the 1st quarter of the beginning task year to the 4th quarter of the ending task year. Also see Chapter 7, pages 7-30 through 7-32 of the ADP.

INTRODUCTION

The PM10 ADP describes the District's public education and outreach program as an important supplementary strategy for reducing PM10 emissions. The Plan indicates that the District will continue to develop and implement existing programs and will develop new and innovative ways of informing and educating the public about PM10. It specifically indicates that a new PM10 public awareness campaign similar to the District's ozone *Spare the Air* outreach program will be instituted. A brief summary of the District's outreach activities between 1997 and 1999 is described in the following section.

OUTREACH

Public Awareness Campaign through Physician Offices

In December 1998, letters and kid's art calendars were sent to 750 physicians specializing in respiratory ailments throughout the San Joaquin Valley Air Basin (SJVAB). The letter informed the physicians that the District would be conducting a public education campaign about particulate matter. It also included a notification that a number of physicians would be requested to assist the District in determining the most successful of patient education strategies.

A representative telephone survey of 30 doctors was conducted in January 1999. In addition to assessing outreach strategies, the purpose of the calls was to gain key physician support for the campaign. Peer endorsements were used in each community to garner widespread support. The information obtained will be used to develop outreach literature on particulate matter to be placed in physician waiting and treatment areas. These materials were developed during fall 1999 and are scheduled for distribution in winter 2000.

Earth Day Activities

The District uses annual "Earth Day" events as an opportunity to disseminate information regarding air quality, including the use of other agency brochures and pamphlets regarding PM10.

Coordination with Schools

In 1999, the District developed a new curriculum for schools that includes age-appropriate information on PM10. The curriculum and the accompanying activity book were distributed to offices of education and school districts in fall and winter 1999.

<p>WOOD BURNING CURTAILMENT PROGRAM</p>
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“Please Don’t Light Tonight” Program

The new “Please Don’t Light Tonight” program was introduced in the late fall and winter of 1998. The program was created in response to one of the proposed actions in the PM10 ADP regarding the development of a public awareness and education program for residential wood burning.

Through this program, the District asks residents in the SJVAB to voluntarily postpone the use of fireplaces during evenings when PM10 levels are forecast to be high. The program also has an educational component that explains how to properly burn to produce less PM10. In addition to contacting weather information providers, the District also invests in radio, television, electronic billboard and theater advertising with similar messages. To capitalize on the success of the “Spare the Air” program, the wood burning spots feature Dr. David Frank, the spokesperson for the summer ozone program. The media and public response to the program has been positive.

Survey II and Public Perception of Program

Public perception of the District’s *Please Don’t Light Tonight* program was measured in a survey conducted in January 1999. In addition, the survey measured public understanding of health issues and air quality impacts of wood burning. The information obtained in the survey was used to plan the 1999 residential wood burning public education campaign and will be used as a baseline to measure any future changes in public perception and to guide inform the future development of changes to the RWB program. Conclusions are provided in Appendix D.

INTRODUCTION

This chapter presents an update to air quality and attainment projections for the annual and the 24-hour PM10 standards as discussed in the PM10 ADP. The tables presented in this chapter include the design values as they were determined for the PM10 ADP, an update to the design values that consider air quality data through 1998, and a comparison of these values to the PM10 ADP 2001 projection that was established by modeling.

Calculation of expected exceedances is included for the updated ambient air quality data. As required by the Code of Federal Regulations (CFR), the District needs to consider the expected exceedance rates for the determination of attainment. This calculation was not included in the 1997 PM10 ADP because the San Joaquin Valley Air Basin (SJVAB) values were not near attainment levels at that time. The criteria for predicting potential future violations will be needed as the SJVAB approaches attainment for the annual and the 24-hour PM10 standards.

The national trend of declining PM10 values and the unusual nature of recent meteorological influences of El Niño and La Niña are considered in the discussion of trends. The SJVAB also experiences periods of long-term drought that would be expected to increase the geologic component of PM10 by decreasing soil moisture and increasing the emission factors for sources that generate fugitive PM10 emissions.

AMBIENT AIR QUALITY DATA

The ARB and the District continue to measure ambient levels of PM10 as required by the EPA. The ARB and the District currently operate fifteen sites throughout the SJVAB. In addition, the agencies operate numerous co-located monitors to measure the precision and accuracy of data collected from the monitoring sites. Tables 6-1 and 6-2 summarize the PM10 levels and include their associated design values.

Table 6-1 shows the annual average for each site that has a valid data set. Although six years of data are presented on Table 6-1, only three years of data are necessary to determine if a site complies with the federal annual PM10 standard. Table 6-2 shows the peak value at each site between 1993 and 1998. Peak data statistics are not directly used to determine attainment status of the federal 24-hour PM10 standard. Peak values are used to determine design values, which are important in determining the reductions needed to reach attainment. The ADP and current design values, as well as the ADP 2001 projections, are also provided in both tables.

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**TABLE 6-1
SAN JOAQUIN VALLEY AIR BASIN 1993-1998 MONITORING DATA ANNUAL
AVERAGE PM10 CONCENTRATIONS AND DESIGN VALUES
COMPARISON OF CURRENT DESIGN VALUES
TO THE 2001 PROJECTIONS SUBMITTED IN THE ADP**

Station Name	1993	1994	1995	ADP Design Value	1996	1997	1998	Current Design Value	ADP 2001 Projection										
Bakersfield-California		45.1a	48.2	50 b	44.4	42.4	39.9	42	43										
Bakersfield-Chester	51.5	61.4 a	c																
Bakersfield-Golden State		55.0 a	58.1		d	54.1	46.1 a	d		d									
Clovis-Villa	43.2	38.2	40.3	40	35.7	39	33.5	36											
Corcoran-Patterson					d	47.1	36.2	41 b	46										
Corcoran-Van Dorsten	55.7	49	50.4	52	40.4	44.2 a	c												
Fresno-Drummond	52.8	49.6	48.9	51	39.8	46.7	39.3	42	45										
Fresno-First	46.4	39.5 a	44.6	43	37.8	42.5	34.2	38											
Fresno-Five Points	47.2	c		d															
Hanford-Campus Drive	36.3 a	c		51 b															
Hanford-Irwin	85.9 a	50.1	52.8		40.9	46.2	39.2	42	45										
Kern Wildlife Refuge	33.8 a	c		d															
Kettleman City	44.9	45.4	50	47	40.1	c		d											
Los Banos	35.1	c		d															
Madera-Library	46.5	40.4	41.9	43	c														
Merced-15th Street	41.7	39.4	38.7	40	c														
Modesto-14th Street					d	c	d	d											
Modesto-I Street	41.7	39.2	37.7	40	29.9 a	32.7	d	d											
Oildale-Manor	43.9	41.7	46.3	44	35.6	39.3 a	36.9	37											
Stockton-Hazelton	38.5 a	36.8	31.4	36	27.6	30	29	29											
Stockton - Wagner-Holt					d	26.1 a	25.5	d											
Taft-College	38.1 a	35.0 a	38.4	37	35.9	32.2	28.8	32											
Turlock-Minaret	51.7 a	41.1	41.6	45	32	37.1	31	33											
Visalia-Church	52.8	48.2	53.6	51	44.4	42.2	40.8	42	45										
<table border="1"> <tr> <td>50+</td> <td>Shaded value greater than 50 exceeds standard</td> </tr> <tr> <td>'a'</td> <td>Annual mean developed from an incomplete data set</td> </tr> <tr> <td>'b'</td> <td>Site moved; design value developed from combined data set</td> </tr> <tr> <td>'c'</td> <td>Site closed</td> </tr> <tr> <td>'d'</td> <td>No valid design value from incomplete data set</td> </tr> </table>										50+	Shaded value greater than 50 exceeds standard	'a'	Annual mean developed from an incomplete data set	'b'	Site moved; design value developed from combined data set	'c'	Site closed	'd'	No valid design value from incomplete data set
50+	Shaded value greater than 50 exceeds standard																		
'a'	Annual mean developed from an incomplete data set																		
'b'	Site moved; design value developed from combined data set																		
'c'	Site closed																		
'd'	No valid design value from incomplete data set																		

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**TABLE 6-2
SAN JOAQUIN VALLEY AIR BASIN 1993-1998 MONITORING DATA
24-HOUR MAXIMA PM10 CONCENTRATIONS AND DESIGN VALUES
COMPARISON OF CURRENT DESIGN VALUES
TO THE 2001 PROJECTIONS SUBMITTED IN THE ADP**

Station Name	1993	1994	1995	ADP Design Value	1996	1997	1998	Current Design Value	ADP 2001 Projection
Bakersfield-California		97	130	130	153	137	148	153	
Bakersfield-Chester	130	192	c	192					152
Bakersfield-Golden State		102	132	132	153	124	159	159	
Clovis-Villa	107	97	120	120	108	103	113	113	
Corcoran-Patterson					141	199	128	199	
Corcoran-Van Dorsten	239	125	279	279	143	154	78 c	154	242
Fresno-Drummond	152	127	126	152	121	121	132	132	131
Fresno-First	129	125	122	129	144	124	141	144	
Fresno-Five Points	190	c		190					
Hanford-Campus Drive	67	c		67					
Hanford-Irwin	192	116	185	192	120	143	146	146	162
Kern Wildlife Refuge	107	c		107					
Kettleman City	166	122	127	166	131	c		131	
Los Banos	101	c		101					
Madera-Library	128	100	111	128	89 c			111	
Merced-15th Street	121	131	100	131	61 c			131	
Modesto-14th Street					74	c	125	125	
Modesto-I Street	154	160	115	160	133	119	61	133	131
Oildale-Manor	96	133	195	195	138	125	103	138	162
Stockton-Hazelton	104	109	109	109	127	98	106	127	
Stockton - Wagner-Holt					117	130	99	130	
Taft-College	118	64	93	118	103	78	84	103	
Turlock-Minaret	150	135	120	150	122	111	108	122	
Visalia-Church	108	105	125	125	115	96	160	160	

NOTE: Values are not rounded for purpose of model comparison.

150+ Shaded value greater than 150 exceeds standard

'c' Site closed

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Additional Criteria for Attainment

As the SJVAB approaches attainment of the federal 24-hour PM10 standard, additional analysis of the expected number of exceedances per year is required. This calculation is intended to compensate for the possibility of missing the measurement of one or more exceedances of the standard when sampling is not performed on a daily basis. The current approved schedule for monitoring is one sample per six days.

According to the Code of Federal Regulations (CFR), Appendix K to Part 50, attainment of the federal 24-hour PM10 standard is reached when the “expected number of exceedances per year at each site is less than or equal to one” when averaged over three or more years. At least three years of valid data are required to provide an expected exceedance estimate that is considered reliable, and the incorporation of additional years of valid data is recommended to reduce the effect of short term variations. Table 6-3 provides expected exceedance statistics for all monitoring sites for the years 1993 through 1998. For those sites listed with letters F or P, expected exceedances cannot be calculated.

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**TABLE 6-3
EXPECTED EXCEEDANCES OF THE 24-HOUR PM10 STANDARD 1993-1998**

Station Name	1993	1994	1995	1996	1997	1998	Expected Exceedances per year (1993-1998)				
Bakersfield-California	N	P	0.00	0.00	0.00	0.00	0.0				
Bakersfield-Chester	0.00	F	C	C	C	C					
Bakersfield-Golden State	N	P	0.00	0.00	0.00	F	F				
Clovis-Villa	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Corcoran-Patterson	N	N	N	P	5.75	0.00	F				
Corcoran-Van Dorsten	21.65	0.00	10.22	P	0.00	P	F				
Corcoran (Joined data set)	21.65	0.00	10.22	0.00	5.75	0.00	6.3				
Fresno-Drummond	0.00	0.00	0.00	0.00	0.00	0.00	0.0				
Fresno-First	0.00	0.00	0.00	0.00	0.00	0.00	0.0				
Fresno-Five Points	6.13	C	C	C	C	C					
Hanford-Campus Drive	P	C	C	C	C	C					
Hanford-Irwin	F	0.00	6.13	0.00	0.00	0.00	1.2				
Kern Wildlife Refuge	0.00	C	C	C	C	C					
Kettleman City	6.57	0.00	0.00	0.00	C	C					
Los Banos	0.00	C	C	C	C	C					
Madera-Library	0.00	0.00	0.00	0.00	C	C					
Merced-15th Street	0.00	0.00	0.00	P	C	C					
Modesto-14th Street	N	N	N	P	C	P					
Modesto-I Street	0.00	5.11	0.00	0.00	0.00	P	P				
Oildale-Manor	0.00	0.00	5.11	0.00	0.00	0.00	0.9				
Stockton-Hazelton	0.00	0.00	0.00	0.00	0.00	0.00	0.0				
Stockton - Wagner-Holt	N	N	N	P	0.00	0.00	P				
Taft-College	0.00	0.00	0.00	0.00	0.00	0.00	0.0				
Turlock-Minaret	N	0.00	0.00	0.00	0.00	0.00	0.0				
Visalia-Church	0.00	0.00	0.00	0.00	0.00	5.41	0.9				
<table border="1"> <tr> <td>N = nonexistent or planned site</td> </tr> <tr> <td>C = closed</td> </tr> <tr> <td>F = site failed attainment test, insufficient data to calculate a value</td> </tr> <tr> <td>P = site passed attainment test, insufficient data to calculate a value</td> </tr> </table>								N = nonexistent or planned site	C = closed	F = site failed attainment test, insufficient data to calculate a value	P = site passed attainment test, insufficient data to calculate a value
N = nonexistent or planned site											
C = closed											
F = site failed attainment test, insufficient data to calculate a value											
P = site passed attainment test, insufficient data to calculate a value											

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Data Analysis

The annual average PM10 concentrations at all monitoring sites in all cities shown in Table 6-1 comply with the federal PM10 annual standard. The current design values are lower than the projected 2001 value for all of the annual ADP projections.

The current 24-hour design values in Table 6-2 for the cities of Bakersfield, Corcoran, and Visalia exceed the federal 24-hour PM10 standard. The calculation of expected exceedances in Table 6-3 also project noncompliance with the 24-hour standard at Bakersfield and Corcoran. The design value in Table 6-2 for Hanford complies with the 24-hour standard. In contrast to Table 6-2, Table 6-3 indicates compliance at Visalia and noncompliance at Hanford. The contradictory indications for Hanford and Visalia are due to evaluation of three-year trends in Table 6-2 and six-year trends in Table 6-3. To clarify the significance of this inconsistency, additional discussion is provided for the air quality trends of both cities.

The five previous years of compliance with the federal 24-hour PM10 standard and four year trend of declining annual PM10 average for Visalia suggest that the observation of one high concentration in 1998 may represent an anomalous measurement. The expected number of 24-hour exceedances for the last six years of data collected at Visalia is 0.90, complying with the 1.00 limit. Prior data and air quality trends for Visalia do not indicate an increasing PM10 trend; however, the detection of one 24-hour exceedance supports continuing monitoring at this location for the next few years to verify compliance with the federal 24-hour PM10 standard.

Hanford data for the years 1996 through 1998 show annual PM10 averages and 24-hour PM10 observations that comply with the standards. The expected number of exceedances is 1.2 based upon the last five years of data, but is zero for the last three years. Due to the prior history of high concentrations in this area, monitoring should continue at this location for the next few years to verify compliance with the federal 24-hour PM10 standard.

Trend Analysis

The San Joaquin Valley Air Basin has followed the national trend of declining PM10 levels. Unlike the late 1980s and early 1990s, the last six years (1993-1998) experienced favorable meteorology for air quality. Five of the years are considered to be seasonably 'wet' years, with precipitation records coming

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close to being broken. The meteorological phenomena make it challenging, if not impossible, to differentiate between improvements made in ambient air quality due to regulatory actions and voluntary emission reduction projects, and those improvements due to unusual meteorological effects.

ATTAINMENT PROJECTIONS

Annual PM10 Standard Projections Analysis

The District evaluated all PM10 monitoring data when preparing the PM10 ADP and determined that five cities had annual PM10 levels that should be modeled for attainment of the annual PM10 standard. Design values at or above the 50 $\mu\text{g}/\text{m}^3$ federal annual standard are highlighted in gray in Table 6-1. Corcoran (1993-1995 annual PM10 design value 52 $\mu\text{g}/\text{m}^3$), Fresno, Hanford, and Visalia (all with a design value of 51 $\mu\text{g}/\text{m}^3$) required PM10 ADP analysis. Bakersfield (design value 50 $\mu\text{g}/\text{m}^3$) was modeled as a precaution to ensure that the District was not overlooking a potential future violation of the annual standard, particularly since the annual PM10 design value had to be determined from combining data at two monitoring sites. Another factor that indicated annual modeling of Bakersfield would be a reasonable precaution is that Bakersfield also experiences the highest winter 24-hour PM10 concentrations. Analysis by modeling projected that all five cities would have annual PM10 design values below 50 $\mu\text{g}/\text{m}^3$ by the year 2001.

The current annual PM10 design values in Table 6-1, developed from analysis of monitoring data from all sites through 1998, reveal that no additional cities have annual PM10 design values that require analysis. The cities that were modeled for the PM10 ADP have shown improvement. The current annual PM10 design value is 42 $\mu\text{g}/\text{m}^3$ for **Fresno, Hanford, Visalia and Bakersfield (at the California site)**. This value is considerably below the 50 $\mu\text{g}/\text{m}^3$ standard and is below the value projected in the ADP for each of the cities.

The movement of the **Corcoran** monitoring site from Van Dorsten Avenue to Patterson Avenue prevents calculation of a new three-year annual PM10 design value for either site at this time. However, since all annual averages for both locations are below 50 $\mu\text{g}/\text{m}^3$, it is clear that a new design value for this city would be below the 50 $\mu\text{g}/\text{m}^3$ annual standard. An annual PM10 design value developed by combining the data from both sites is 41 $\mu\text{g}/\text{m}^3$, which is below the standard and below the value projected in the PM10 ADP.

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At the time that annual PM10 design values were determined for the PM10 ADP, the **Bakersfield - Golden State** site had not been in operation long enough to provide sufficient data to determine a valid annual PM10 design value. Unfortunately, the last three years of data collection include several quarters in 1998 with an insufficient number of valid samples for statistical confidence when computing an annual PM10 design value. The annual average in 1995 and 1996 was above 50 $\mu\text{g}/\text{m}^3$, the annual average during 1997 was below 50 $\mu\text{g}/\text{m}^3$, and an annual average cannot be calculated for 1998. There is insufficient data to determine a reliable trend for the Bakersfield - Golden State site that would allow the District to project its future annual PM10 design value. The annual component of the California Regional Air Quality Study (CRPAQS) should provide additional information to gain a better understanding of the contributions to particulate concentrations in the Bakersfield area. When the District evaluates compliance with 2001 attainment of the annual standard, the Bakersfield - Golden State site and the trend of concentrations in the area will be reexamined. The evaluation will include as much data analysis and modeling as is completed from the CRPAQS program at that time. New criteria for area averaging may be applicable to the Bakersfield sites when this evaluation is performed, a factor that would also affect the annual PM10 design value for the Bakersfield urban area. The appropriateness or significance of area averaging cannot be determined at this time.

Annual PM10 Standard Uncertainty Factors

The current annual PM10 design values are consistent with the PM10 ADP projections for improvement at all sites; however, the District views the improvement in design values for all cities with caution because several factors influence the trend and may exaggerate the apparent rate of improvement. It is not possible to quantify or separate the effect on monitoring data caused by unusual meteorological conditions experienced during the last several years to quantify the amount of improvement that can be related directly to emissions reductions. There is a national trend of declining annual PM10 concentrations, which is consistent with District observations. However, this trend has not been definitively linked exclusively to source reductions and has not been established as a reliable long-term condition. Historical long-term climatic patterns for the SJVAB include multi-year droughts that could temporarily increase annual concentration levels. These factors contribute to the uncertainty associated with a projection of attainment for the annual PM10 standard.

Annual PM10 Standard Findings

There are no indications at this time that contradict the PM10 ADP projected compliance with the 50 $\mu\text{g}/\text{m}^3$ annual PM10 standard by the year 2001 for all monitored urban areas. It is reasonable to conclude from the current annual

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PM10 design values that annual attainment will be achieved by 2001 at all sites without revision of the PM10 ADP. There is sufficient evidence to predict annual PM10 compliance for Corcoran from the combined data set of three years with annual averages below the standard at Corcoran sites, despite the statistical restriction that prevents calculation of a new site-specific three year annual PM10 design value at either Corcoran site. The District will review compliance with the annual standard at the Bakersfield – Golden State site, and the trend of concentrations in the Bakersfield urban area, when sufficient data collection, CRPAQS results and modeling are available to support a reliable analysis. The projection of attainment for the annual PM10 standard at all sites is dependent upon continued implementation of Best Available Control Measures (BACM) for fugitive sources for all sites to assure compliance with the 50 $\mu\text{g}/\text{m}^3$ annual standard during unfavorable meteorological conditions.

24-Hour PM10 Standard Projections Analysis

The District evaluated all PM10 monitoring data when preparing the PM10 ADP and determined that six cities had 24-hour PM10 design values that should be modeled for attainment. Corcoran (1993-1995 24-hour PM10 design value 279 $\mu\text{g}/\text{m}^3$), Oildale (195 $\mu\text{g}/\text{m}^3$), Bakersfield (192 $\mu\text{g}/\text{m}^3$), Hanford (192 $\mu\text{g}/\text{m}^3$), Modesto (160 $\mu\text{g}/\text{m}^3$) and Fresno (152 $\mu\text{g}/\text{m}^3$) required PM10 ADP analysis. Design values above the 150 $\mu\text{g}/\text{m}^3$ federal 24-hour standard are highlighted in gray in Table 6-2.

Table 6-2 shows current 24-hour PM10 design values developed from analysis of monitoring data from all sites through 1998. One observation above the 150 $\mu\text{g}/\text{m}^3$ standard was observed in Visalia (160 $\mu\text{g}/\text{m}^3$), a city that did not require modeling when the PM10 ADP was developed. Four of the six cities modeled for the PM10 ADP, Hanford (146 $\mu\text{g}/\text{m}^3$) Fresno (144 $\mu\text{g}/\text{m}^3$), Oildale (138 $\mu\text{g}/\text{m}^3$) and Modesto (133 $\mu\text{g}/\text{m}^3$), now have 24-hour PM10 design values below the 150 $\mu\text{g}/\text{m}^3$ standard. The Corcoran 24-hour PM10 design value improved from 279 $\mu\text{g}/\text{m}^3$ to 199 $\mu\text{g}/\text{m}^3$ and Bakersfield improved from 192 $\mu\text{g}/\text{m}^3$ to 159 $\mu\text{g}/\text{m}^3$.

24-Hour PM10 Standard Uncertainty Factors

The current 24-hour PM10 design values have improved at some sites more than was projected by the PM10 ADP. In addition to the improvement anticipated from the fugitive and precursor control programs, these sites have been affected by the national PM10 improvement trend and by recent meteorology. Unexpectedly strong improvements occurred at the Corcoran and Hanford sites that are predominately impacted by geologic emissions.

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For the same reasons discussed concerning the annual standard, the District must view the improvement in the 24-hour PM10 design values for all cities with caution because several factors influence the trend and may exaggerate the apparent rate of improvement. It is not possible to quantify or separate the effect on monitoring data caused by unusual meteorological conditions experienced during the last several years to quantify the amount of improvement that can be related directly to emissions reductions.

There is a national trend of declining annual PM10 concentrations that is consistent with District observations. However, this trend has not been definitively linked exclusively to source reductions and has not been established as a reliable long-term condition. Historical, long-term climatic patterns for the SJVAB include multi-year droughts that have shown a strong correlation with elevated 24-hour episodes predominated by geologic emissions. During winter episodes predominated by nitrates and other fine primary and secondary particulate matter, the geologic component during drought years is a larger percentage of the particulate mass than is observed during non-drought years. Where the winter 24-hour concentration is near the 150 $\mu\text{g}/\text{m}^3$ federal standard, additional geologic emissions could contribute to unexpected variations in the trend influencing the evaluation of attainment status. These factors contribute to the uncertainty associated with projection of future 24-hour PM10 peak concentrations.

24-Hour PM10 Standard Findings-Compliance Expected by 2001 with Adopted Rules and Commitments (With Review of Expected Exceedances): Modesto, Fresno, Oildale, Visalia

The ADP projected that **Modesto** would achieve compliance with the federal 24-hour PM10 standard with adopted rules and commitments by the year 2001. The current 24-hour PM10 design value for Modesto as shown in Table 6-2 is 133 $\mu\text{g}/\text{m}^3$, which continues to support this conclusion. The number of expected exceedances per year at Modesto for the years 1993 through 1998 cannot be calculated for Table 6-3 due to data limitations; however, from the available data the site passes the attainment test by not having recorded an exceedance in over three years. The current 24-hour PM10 design value and recent data support a finding that Modesto is likely to remain in compliance with the federal 24-hour standard unless it is adversely affected by changes related to the uncertainty factors previously described.

The ADP projected that **Fresno** would achieve compliance with the federal 24-hour PM10 standard with adopted rules and commitments by the year 2001. At the time the ADP modeling was performed, the Drummond site was observing higher 24-hour concentration than the First Street site. Modeling in the ADP

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projected a 24-hour PM10 design value of 131 $\mu\text{g}/\text{m}^3$ for the Drummond site that now has a design value of 132 $\mu\text{g}/\text{m}^3$. The current 24-hour PM10 design value for Fresno as shown in Table 6-2 is 144 $\mu\text{g}/\text{m}^3$ from the Fresno First Street site. While the First Street site has observed higher values than the Drummond site, no exceedances of the 150 $\mu\text{g}/\text{m}^3$ standard have been observed. From the expected exceedance calculations in Table 6-3, the number of expected exceedances per year at Fresno is zero for the years 1993 through 1998 for the Fresno Drummond and Fresno First Street sites. The current 24-hour PM10 design values and the expected exceedance calculations support a finding that Fresno is likely to remain in compliance with the federal 24-hour PM10 standard unless it is adversely affected by changes related to the uncertainty factors previously described.

The PM10 ADP projected that **Oildale** would not achieve compliance with the federal 24-hour PM10 standard by 2001 with adopted rules and commitments, and would need extension to 2006 and development of additional commitments not identified in the PM10 ADP as soon as they could be established from the research conducted in the CRPAQS program. The current 24-hour PM10 design value for Oildale is 138 $\mu\text{g}/\text{m}^3$, considerably below the 150 $\mu\text{g}/\text{m}^3$ standard. Long term review of Oildale 24-hour and annual PM10 values provides a strong indication that the single observed high exceedance does not represent an area of continuing violation. While favorable meteorology may be influencing this finding, it now appears that Oildale does not need an extension to 2006 to achieve compliance with the federal 24-hour PM10 standard. The current 24-hour PM10 design values and the expected exceedance calculation (0.9) support a finding that Oildale is likely to remain in compliance with the federal 24-hour PM10 standard unless it is adversely affected by changes related to the uncertainty factors previously described.

Based upon the 24-hour and annual PM10 design values from data available during the preparation of the ADP, **Visalia** was modeled for the annual standard but not the 24-hour standard. In 1998 Visalia experienced one episode of 160 $\mu\text{g}/\text{m}^3$, the only observed exceedance at this site in the last six years. Expected annual exceedances are calculated as 0.90 for the years 1993 through 1998. The trend of annual averages at this site shows steadily declining concentrations. After collection and quality assurance of 2001 monitoring data is completed, the Visalia 24-hour PM10 data should be reassessed to determine if the 1998 event was an isolated, atypical event or an indication of a previously undetected focus of high 24-hour PM10 concentration. The presence of a continuing downward trend in annual concentrations in Visalia implies that it is less likely that the observation is an indication of an area of increasing concentration and more likely that this was an atypical observation. The results of the annual and winter intensive components of the CRPAQS field study and subsequent analysis and

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modeling may provide a better understanding of conditions in this area, if the observation was not anomalous and similar conditions are observed.

24-Hour PM10 Standard Findings-Compliance Expected by 2001 with Additional Rules and Commitments as Identified in the ADP (With Review of Expected Exceedances): Hanford

The PM10 ADP projected that **Hanford** would not achieve compliance with the federal 24-hour PM10 standard by 2001 with adopted rules and commitments and would need extension to 2006 and development of additional commitments as soon as they could be established from the research conducted in the CRPAQS program. The current 24-hour PM10 design value for Hanford as shown in Table 6-2 is 146 $\mu\text{g}/\text{m}^3$, which complies with the 150 $\mu\text{g}/\text{m}^3$ federal 24-hour PM10 standard. From 1996 through 1998 the site did not observe an episode above the federal 24-hour PM10 standard and had annual averages in compliance with the federal PM10 annual standard. The recent improvement at this site raises doubt concerning the PM10 ADP finding that an extension beyond the year 2001 would be required for this site to achieve compliance with the federal 24-hour PM10 standard. Hanford will meet attainment requirements by 2001 if current trends continue.

The expected exceedance calculation as shown in Table 6-3 for Hanford is 1.2 for the years 1993 through 1998, which suggests that Hanford continues to have a statistical potential to experience concentrations in excess of the standard. An expected exceedance calculation of over 1.0 is considered to be sufficient to draw this conclusion. With a design value below 150 $\mu\text{g}/\text{m}^3$, an update of the modeling projection for the year 2001 at Hanford would indicate that existing adopted controls are sufficient to achieve compliance with the federal 24-hour PM10 standard. However, the expected exceedance estimate and the recent meteorology suggest that this finding should be viewed with caution.

The following findings for Hanford result from evaluation of the current 24-hour PM10 design value compliance with the standard, taking into consideration the 1.2 expected exceedance estimate.

- 2001 Adopted Rules and Commitments in the PM10 ADP: Compliance with the federal 24-hour PM10 standard would not be reliably assured at Hanford.
- 2001 With Additional Reductions Identified for Implementation in the PM10 ADP: Compliance with the federal 24-hour PM10 standard will be achieved by the year 2001 in Hanford if current trends continue.

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- 2006 Compliance Extension: Recent data does not indicate a need to extend the attainment date for Hanford to the year 2006, or to amend the list of control measures identified in the ADP to achieve compliance with the federal 24-hour PM10 standard at this site.

The projection of compliance with the federal 24-hour PM10 standard at Hanford by the year 2001, with additional controls as identified in the ADP, is dependent upon continued implementation of BACM for fugitive PM10 sources to assure compliance with the federal 24-hour standard during unfavorable meteorological conditions. This is particularly important at Hanford because the highest values observed at Hanford are predominated by geologic emissions.

24-Hour PM10 Standard Findings-Compliance Not Expected by 2001, Requiring Extension to 2006 to Achieve Attainment with Additional Identified Reductions: Bakersfield

The PM10 ADP projected that **Bakersfield** would not achieve compliance with the federal 24-hour PM10 standard by 2001 with adopted rules and commitments, but could achieve a value of 152 $\mu\text{g}/\text{m}^3$ by 2001 by implementation of additional identified reductions described in the PM10 ADP. Observed readings of 154 $\mu\text{g}/\text{m}^3$ are accepted as attainment observations due to equipment accuracy limitations; however, modeled values between 150 $\mu\text{g}/\text{m}^3$ and 154 $\mu\text{g}/\text{m}^3$ are generally considered as providing a less than certain assurance of attainment due to limitations in the accuracy of modeling predictions. Considering the value of an extension of the attainment year to 2006, the PM10 ADP projected the effect of additional identified reductions by modeling additional identified reductions through the year 2006, which resulted in a predicted concentration of 151 $\mu\text{g}/\text{m}^3$ for Bakersfield.

The tools available for the PM10 ADP modeling of the improvements due to controls utilized county level emissions estimates and geographic parameters to reflect the effect of controls. This limitation decreases the prediction of reductions by assuming county level emissions mixing. By the time the PM10 ADP was prepared, the 1995 Integrated Monitoring Study (IMS95) portion of the CRPAQS program had already revealed that the zone of influence of emissions sources was smaller in scale than the county level, a conclusion that has been specifically documented in the data analysis reports for IMS95. These factors provided an assurance that the amount of improvement shown by the model would underestimate the actual effect of reductions. The final conclusion of the PM10 ADP based upon these factors is that Bakersfield would achieve compliance with the federal 24-hour PM10 standard by 2001 with additional controls identified in the PM10 ADP and scheduled for implementation by the year 2001. If the requested extension of attainment to the year 2006 is

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approved, implementation of additional controls identified in the PM10 ADP and scheduled for implementation between the years 2001 and 2006 would provide a small amount of additional improvement to increase the reliability of the prediction of achieving attainment.

The current 24-hour design value shown for Bakersfield in Table 6-2 is 159 $\mu\text{g}/\text{m}^3$. The improvement of the design value from 192 $\mu\text{g}/\text{m}^3$ to 159 $\mu\text{g}/\text{m}^3$ is a significant and considerable reduction, but must be considered with caution. While consistent with modeling predictions, the current design value and the PM10 ADP 2001 projection are both so close to the standard that a definitive prediction of compliance with the federal 24-hour PM10 standard by the year 2001 is not possible at this time. Bakersfield, like Visalia, has observed only one value over 154 $\mu\text{g}/\text{m}^3$ that qualifies as an exceedance of the 24-hour standard and is experiencing a decline in annual average concentration for the one site where this value can be established. However, Bakersfield has also experienced two observations of 153 $\mu\text{g}/\text{m}^3$ and an annual average over 50 $\mu\text{g}/\text{m}^3$ in 1996 and observed two exceedances of the 150 $\mu\text{g}/\text{m}^3$ 24-hour standard in 1994. The occasional observations near the standard, the history of violations and the absence of a clearly defined declining trend in peak values do not provide a basis to support a prediction of compliance with the federal 24-hour PM10 standard by the year 2001.

As shown in Table 6-3, the expected exceedance calculation is zero for the Bakersfield - California Avenue site. The expected exceedance rate cannot be calculated for the Golden State site because the site did not capture valid data for a sufficient percentage of the required scheduled observations. An exceedance estimate calculated from an incomplete data set may overestimate or underestimate the prediction. While an exceedance estimate cannot be provided, the observation of an exceedance when less than the required number of valid samples is collected during a year is considered a failure to meet the attainment test for that year. This is displayed in Table 6-3 by inclusion of the letter F, defined in the table notes as indicating a failure of the attainment test.

The observed air quality data, expected exceedance calculations, and analysis of IMS95 results provide conflicting and ambiguous assistance to confirm the PM10 ADP projection of compliance with the federal 24-hour PM10 standard by 2001 with additional identified controls. The annual and winter intensive field programs of CRPAQS and subsequent modeling and analysis should provide a significant improvement in the ability to evaluate this area. This field program will capture data for the winter of 1999-2000 with the annual network supplementing existing monitoring sites. Further enhanced monitoring will take place during the winter intensive field program during the winter of 2000-2001. Analysis of filters and data collected during this field program will require more than a year. However,

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understanding the causes of high PM10 and PM2.5 concentrations in the Bakersfield area will improve as initial findings are released. Since the information needed to determine how to assure attainment will not be available until after the year 2001, it is clear that the District will be unable to reliably establish that compliance with the federal 24-hour PM10 standard has been achieved in the Bakersfield area without an extension.

The following findings for Bakersfield result from evaluation of the current 24-hour PM10 design value which exceeds the standard, a history of occasional values above the standard, an undefined expected exceedance calculation for the Golden State site, and a need for further results from field studies to refine the understanding of PM10 episodes in the Bakersfield area.

- 2001 Adopted Rules and Commitments in the PM10 ADP: Compliance with the federal 24-hour PM10 standard would not be reliably assured at Bakersfield.
- 2001 With Additional Reductions Identified for Implementation in the PM10 ADP: Compliance with the federal 24-hour PM10 standard by 2001 cannot be predicted at Bakersfield with existing information. The post 2001 results of the CRPAQS field programs and subsequent analysis will provide additional information to improve the ability to evaluate the effect of control programs in Bakersfield. This information will be used to determine if the additional reductions identified in the PM10 ADP for implementation by the year 2001 are sufficient to assure compliance with the federal 24-hour PM10 standard.
- 2006 Compliance Extension: The ADP prediction that compliance with the federal 24-hour PM10 standard will be achieved with controls identified in the PM10 ADP either in the year 2001, or by the year 2006 cannot be improved or verified with existing information. There is no clear indication that would recommend or require a revision of the list of control measures identified in the ADP to achieve compliance with the federal 24-hour PM10 standard at Bakersfield; therefore, an extension of the attainment date to the year 2006 is required to develop information to improve the analysis of PM10 episodes in the Bakersfield area.

Attainment projections for the 150 $\mu\text{g}/\text{m}^3$ 24-hour standard at Bakersfield include a dependence on continued implementation of BACM for fugitive sources to assure compliance with the standard during unfavorable meteorological conditions. Even though the most severe episodes in Bakersfield are predominated by fine particle primary and secondary particulate matter, geologic emissions represent a considerable fraction of the observed concentrations. The

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Bakersfield future year PM10 24-hour concentration projections are so close to the standard that compliance with the federal 24-hour PM10 standard will not be achieved if the geologic contribution increases during unfavorable meteorological conditions.

24-Hour PM10 Standard Findings-Compliance Not Expected by 2001, Requiring Extension to 2006 to Achieve Attainment with Additional Identified Reductions and Additional Commitments: Corcoran

The PM10 ADP projected that **Corcoran** would not achieve compliance with the federal 24-hour PM10 standard by 2001 with adopted rules and commitments, and would need extension to 2006 and development of additional commitments as soon as they could be established from the research conducted in the CRPAQS program.

Starting with the design value of 279 $\mu\text{g}/\text{m}^3$, the PM10 ADP predicted improvement to 262 $\mu\text{g}/\text{m}^3$ by 2001 with adopted controls and 242 $\mu\text{g}/\text{m}^3$ with additional identified controls. This indicated that an extension to the attainment date to the year 2006 would be needed to implement additional identified controls and to improve the understanding of contributions to the PM10 episodes in order to develop and implement additional controls that could not be identified from currently available information.

The current 24-hour PM10 design value for Corcoran shown in Table 6-2 is 199 $\mu\text{g}/\text{m}^3$, which demonstrates considerable improvement compared to the 279 $\mu\text{g}/\text{m}^3$ previous design value. The dramatic improvement creates uncertainty in providing an update to the PM10 ADP. The inability to distinguish between short term meteorologically influenced improvements, the effects of control programs, and the national trend of declining PM10 concentrations reduces the confidence of projections based on current observations. Additional uncertainty is introduced by the lack of precision of existing modeling tools. The tools available for the PM10 ADP modeling of the improvements, due to controls, utilized county level emissions estimates and geographic parameters to reflect the effect of controls, a limitation that decreases the prediction of reductions in the Corcoran area by assuming county level emissions mixing for all sources.

The expected exceedance calculation in Table 6-3 cannot be determined for either of the Corcoran sites because neither site was in operation for the full three-year period due to a change in location. The Van Dorsten Avenue site fails the attainment screening test because of exceedances recorded during 1993 and 1995, but no exceedances during its last two full years and its final partial year of operation were observed. No exceedances were observed at the Patterson Avenue site in its initial partial year of operation, but one exceedance was observed in 1997. The failure of the attainment screening test (noted in Table 6-

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3 by the letter F) indicates that the sites can be determined as not in attainment even though an exceedance estimate cannot be calculated. An exceedance estimate of 6.3 is established by combining the data from the two sites, confirming the non-attainment finding. The observations above the standard, the history of violations and the exceedance estimate clearly establish that Corcoran is not in attainment of the 24-hour PM10 standard.

Despite the significant reduction of 24-hour design value shown in Table 6-2, the ADP prediction that compliance with the federal 24-hour PM10 standard will not be achieved in Corcoran with controls identified in the PM10 ADP by the year 2001 is consistent with the Table 6-3 expected exceedance estimates. The ADP reductions from identified controls for Corcoran were projected at less than 20 $\mu\text{g}/\text{m}^3$ which will not be sufficient to achieve compliance with the federal 24-hour PM10 standard in Corcoran by the year 2006 without development of additional controls. Information to develop the controls will not be available until after 2001 from the CRPAQS results. The current design value suggests that the amount of additional controls needed may be small if current trends continue.

The IMS95 fall intensive study advanced the understanding of high concentration PM10 events in this area and provided new information on the limited zone of influence of sources. The IMS95 fall intensive study and subsequent analysis were not able to definitively identify the sources that have a strong relationship to exceedance events, but furthered the development of projects designed to provide that link. The CRPAQS program includes a saturation study to be conducted in the fall of 2000 in the Corcoran area and technical support study development and field testing of methods to determine source origin of geologic material collected in PM10 monitoring samples. The annual and fall intensive field programs of CRPAQS and subsequent modeling and analysis should provide a significant improvement in the ability to evaluate the Corcoran area. The results of these techniques will also improve our understanding of Hanford episodes predominated by geologic emissions and may be applicable in other locations experiencing geologic particulate episodes.

Analysis of filters and data collected during the CRPAQS field program will require more than a year. However, the ability to understand the causes of high PM10 and PM2.5 concentrations in the Corcoran area will improve as initial findings are released. Since the information needed to determine how to assure attainment will not be available until after the year 2001, it is clear that the District will be unable to reliably establish controls to achieve compliance with the federal 24-hour PM10 standard in the Corcoran area without an extension of time to collect and consider additional information.

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The District has demonstrated the intention to develop the requisite information as rapidly as possible. The District has financially supported the CRPAQS program, provided administrative services for the program, and has funded and conducted ancillary research. The CRPAQS research program and ancillary studies have proceeded as rapidly as practical considering the need to conduct initial technical studies and conduct other planning that is a prerequisite to a successful major field research study. The IMS95 field study was also performed as a mini-study to produce as much useful information as possible as early products. However, the IMS95 field study and subsequent analysis did not reveal the type and amount of control necessary to accomplish compliance with the federal 24-hour PM10 standard at Corcoran. The IMS95 field study and analysis was successful enough to improve our understanding of PM10 episodes in most areas of the San Joaquin Valley and assist in the design of the final major field studies to be conducted in 1999 through 2001.

The District has also taken action to increase the monitoring frequency to develop as much information as possible through District assets. In the fourth quarter of 1998, the District increased sampling frequency by provision of an additional monitor at Corcoran to one sample every three days. The additional sample collection will improve the understanding of high PM10 episodes. The field programs of the CRPAQS program also provide supplemental scheduled monitoring and daily monitoring during intensive field program elements that can be used to refine the understanding of the nature, frequency and duration of high concentration events.

The following findings for Corcoran result from evaluation of the current 24-hour PM10 design value which exceeds the standard, a history of exceedances, an expected exceedance calculation of 7.3 for the combined Corcoran site data, and a need for further results from field studies to refine the understanding of PM10 episodes in the Corcoran area.

- 2001 Adopted Rules and Commitments in the PM10 ADP: Compliance with the federal 24-hour PM10 standard will not be achieved at Corcoran by the year 2001.
- 2001 With Additional Reductions Identified for Implementation in the PM10 ADP: Compliance with the federal 24-hour PM10 standard will not be achieved by the year 2001 in Corcoran if current trends continue. Despite the magnitude of recent improvement, the additional reductions identified in the ADP for implementation by the year 2001 will not be sufficient to achieve compliance with the federal 24-hour PM10 standard at Corcoran by the year 2001. There is insufficient

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information to design a revision to the PM10 ADP that would accomplish attainment by 2001.

- **2006 Compliance Extension:** The attainment date extension request is needed to achieve compliance with the federal 24-hour PM10 standard at Corcoran by the year 2006. The proportional contribution of geologic sources to the observed 24-hour PM10 exceedances cannot be determined to identify an effective set of control measures from existing information. New information from the CRPAQS field program and analysis is needed to improve the analysis of PM10 episodes in the Corcoran area to develop an effective course of action. A revision to the list of control measures identified in the PM10 ADP will be required when the controls can be identified and quantified.

The projection of compliance with the federal 24-hour PM10 standard at Corcoran by the year 2006, with controls identified in the PM10 ADP and development of additional controls through products of CRPAQS, is also dependent upon continued implementation of BACM for fugitive sources to assure compliance with the 24-hour PM10 standard during unfavorable meteorological conditions. This is particularly important at Corcoran because the highest values observed at Corcoran are predominated by geologic emissions.

Summary of Findings

SJVAB attainment of the federal annual standard for PM10 by 2001 remains a strong probability as predicted in the ADP. Attainment of the federal 24-hour standard for PM10 by 2001 cannot be predicted for the SJVAB primarily due to exceedances at Corcoran and Bakersfield. While Bakersfield is still expected to satisfy the 24-hour standard by 2006 with forthcoming controls identified in the PM10 ADP, Corcoran still appears to require additional emission controls beyond the measures identified in the PM10 ADP to demonstrate attainment by the 2006 attainment date. The District intends to use the results of the CRPAQS and agriculture field studies research to identify appropriate controls that will ensure attainment of the 24-hour standard throughout the SJVAB by 2006.

Table 6-4 provides a summary of the annual and 24-hour attainment status and projections for each city.

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**Table 6-4
SUMMARY OF ATTAINMENT STATUS AND PROJECTIONS**

City	Annual PM10 Standard				24-Hour PM10 Standard						
	ADP Annual Status (1993-1995)	Annual Status (1996-1998)	ADP 2001 Projection	Current 2001 Projection	ADP 24-Hour Status (1993-1995)	24-Hour Status (1996-1998)	Expected Exceedances (1993-1998)	ADP 2001 Projection	Current 2001 Projection	ADP 2006 Projection	Current 2006 Projection
Fresno	N	A	A	A	N	A	A	A ³	A ³	A ³	A ³
Hanford	N	A	A	A	N	A	N	N	A ⁴	A ⁵	A ⁴
Corcoran	N	A	A	A	N	N	N	N	N	A ⁵	A ⁵
Visalia	N	A	A	A	A	N	A	²	A	²	A
Bakersfield	A ¹	A ¹	A	A ¹	N	N	N	N	N	A ⁵	A ⁴
Modesto	A	A	²	A	N	A	A	A ³	A ³	A ³	A ³
Oildale	A	A	²	A	N	A	A	N	A ³	A ⁵	A ³

NOTE: SJV Air Basin attainment requires attainment in all locations
A = local attainment status or prediction
N = local nonattainment status or prediction
¹ Based upon incomplete data
² Modeling not required due to local attainment status when the ADP was prepared
³ Adopted rules and commitments at the time the ADP was prepared will achieve attainment
⁴ Additional rules and commitments included in the ADP will achieve attainment
⁵ Development and identification of additional controls is required to achieve attainment

CALIFORNIA REGIONAL AIR QUALITY STUDY (CRPAQS)

The PM10 ADP focused its research commitments on the California Regional Air Quality Study (CRPAQS). CRPAQS is intended to provide products to support the development of effective PM10 and PM2.5 attainment plans for the San Joaquin Valley Air Basin (SJVAB) and the surrounding air basins. The information developed by the study will allow apportionment of high PM10 and PM2.5 concentrations to contributing sources, thereby avoiding burdens on the regulated community from unnecessary or ineffective control requirements. Effectively designed control programs will reduce the severity and frequency of 24-hour PM10 episodes, decrease the annual average concentration of PM10, improve visibility through reduction of fine particulate matter concentrations, and decrease the adverse health impacts from exposure to high levels of particulate matter.

CRPAQS COMPONENTS

There are several components to the CRPAQS program. They include planning, special studies, the main field program, and data analysis and modeling. The components are broken down to the following phases:

A. Planning Phase:

1. Literature evaluations
2. Historical data evaluation
3. Protocol development
4. Emissions inventory planning study
5. Preliminary modeling investigations
6. Technical support studies (TSS)
7. IMS95 field program, a small scale field study combined with technical support studies
 - a. Fall field program - Corcoran
 - b. Winter field program - Bakersfield
8. Methods evaluation, equipment comparisons and testing of foothill locations for mixing depth transitional measurements

B. Special Studies:

1. Control effectiveness on unpaved roads and unpaved shoulders of paved roads
2. US Department of Agriculture (USDA) directly funded agricultural research projects
3. Fugitive Dust Characterization Study

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C. **Main field program, 1999-2001**, (including emissions, upper air and surface measurements of air pollutants, precursors, and meteorological and environmental variables):

1. Annual field program
2. Fall intensive field program
3. Winter intensive field program

D. **Data Analysis and Modeling**, (subsequent to the 1999-2001 field program):

Analysis and modeling will be conducted to evaluate and design improvements to control programs. Evaluation of the annual field program will assist in the improvement of attainment and maintenance of the PM10 annual standard. An extensive database will also be provided to analyze the effect of the control program on compliance with the PM2.5 annual standard, if and when one becomes effective. The Fall intensive field program will provide analysis of the sources contributing to high PM10 events in Corcoran. The Winter intensive will provide PM10 and PM2.5 data for analysis of the SJVAB and surrounding air basins.

CRPAQS PLANNING PHASE

The planning phase of CRPAQS analyzed existing information and conducted technical and field studies on a limited scale to identify appropriate features and methods for PM10 and PM2.5 study. Technical studies, as shown on Table 7-1 included a wide variety of topics including dispersion in low wind conditions and ammonia evaluation.

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**TABLE 7-1
CRPAQS TECHNICAL SUPPORT STUDIES**

Number	Name	Status
1	Assessing the suitability of the summer 1990 database to support modeling and analysis	Conducted as part of historical data analysis
2	Assessing the merits of expanding the extent of the geographical region for the winter intensive	Conducted as part of historical data analysis
3	Assessing the merit of carrying out an autumn episodic field study	Conducted as part of historical data analysis
4	Determining diurnal variation and optimal averaging times for PM10 samples	Conducted as part of IMS95
5	Characterizing micrometeorological phenomena	Conducted as part of IMS95
6	Evaluating the predictive capabilities of equilibrium models	Conducted as part of IMS95
7	Establishing uncertainties in sampling and analysis	Conducted as part of IMS95
8	Determining representativeness of sampling	Conducted as part of IMS95
9	Comparing vertical soundings of a phased array doppler and a profiler	Conducted as part of IMS95
10	Determining the extent of measurements needed to support modeling	Conducted as part of historical modeling (94-1PM)
11	Determining the dynamics of fog formation and dissipation	Conducted as part of IMS95
12	Identifying rare earth isotopes and single particles in dust as an aid in discriminating between the contributions of fugitive dust and other primary particles	Still underway (98-1PM, 98-3PM, 98-4PM, 98-5PM, 98-7PM, 98-9PM)
13	Feasibility of using rare earth isotope tracers for tracking the fate of primary and secondary aerosols from combustion sources	Completed (95-3PM, 95-4PM)
14	Assessing the magnitude of NOx emissions from soils in the San Joaquin Valley Air Basin.	Conducted by ARB
15	Evaluation of methods for determining ammonia emissions from selected sources in the San Joaquin Valley Air Basin.	Completed (95-1PM)
16	Methods Intercomparison	Conducted as part of IMS95

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1995 INTEGRATED MONITORING STUDY

The 1995 Integrated Monitoring Study (IMS95) was a preliminary field program⁸ conducted during the fall and winter of 1995/1996. The objectives of the program were to:

1. collect information to more effectively plan the overall CRPAQS study;
2. provide an improved understanding of the nature and causes of elevated fall and winter PM10 and PM2.5 concentrations;
3. provide an initial database suitable for evaluating air quality models; and
4. provide enhanced interim products prior to execution of the 1999-2001 main field monitoring program.

The IMS95 had three primary components; a two week fall sampling program in November 1995, a four week winter sampling program in December 1995 and early January 1996, and a two week fog sampling program in January 1996. Analysis of the data collected during IMS95 was completed in 1998. The data analysis significantly advanced District knowledge and understanding of SJVAB PM10 episodes. Air quality modeling of the data will continue through 1999.

Analysis of data collected during IMS95 was conducted for the following series of scientific subjects:

- Meteorological Methods Evaluation
- Spatial Representativeness
- Adequacy of Meteorological Measurements
- Characterization of 3-D Fog Fields
- Background Concentrations
- Dispersion Under Low Wind Speeds
- Emissions Reconciliation
- Emissions Source Activity Detection
- Gaseous and Aerosol Organic Carbon Compositions
- Zone of Influence
- Gas-Aerosol Phase Distribution

⁸ Funding for the field monitoring portion of the study was \$2.6 million. Funding for data analysis was an additional \$600,000. The field portion of the 1995 Integrated Monitoring Study was conducted by the Desert Research Institute, Sonoma Technology Inc, Colorado State University, the California Institute of Technology, Systems Applications International, and Aerovironment. Data analysis and modeling was conducted by Sonoma Technology Inc, ENVAIR, ENSR Consulting and Engineering, the California Institute of Technology, Systems Applications International, Colorado State University, Technical and Business Systems, Inc., Carnegie Mellon University, Desert Research Institute, and the California Air Resources Board.

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Evaluation of NO_x, SO₂, and NH₃ Influence on Ammonium Nitrate
Assessment of the Regional versus Local Nature of Secondary Aerosols
Atmospheric Dynamics and Chemical Concentration Effects on Aerosol
Formation in Fog
Evaluation of Secondary Organic Formation in the Winter
Fog Effects on PM Concentration and Composition
Deposition and Fogs
Fog Acidification and Aerosol Formation
Characterization of the Validity of Light Scattering Measurements
Characterization of the Spatial and Temporal Patterns of Visibility
Contributions of Chemical Constituents to Visibility Reduction
Contributions of Chemical Constituents to Light Extinction Budget
Contributions of Emissions Sources to Light Extinction Budget

1995 Integrated Monitoring Study Fall Program

During the fall program, daily PM₁₀ monitoring was conducted at a core site located at the District's monitoring site at Corcoran. Corcoran is located in an agricultural region south of Fresno that traditionally experiences high PM₁₀ concentrations in the fall. To assess the representativeness and spatial variability of PM₁₀ concentrations in the region, 22 portable PM₁₀ monitoring sites were deployed throughout the area surrounding Corcoran.

Three episodes, each of three to four days duration, occurred during the fall monitoring program. While concentrations between sites often varied by up to a factor of two on any given day, all sites exhibited similar patterns of rising and falling concentrations. Low wind speeds and stable weather conditions played a major role in defining these concentration patterns. Concentrations exceeded the federal PM₁₀ standard of 150 µg/m³ at every site at least once during the monitoring period, with the maximum PM₁₀ concentration of 279 µg/m³ occurring on November 13, 1995. The following day, 21 out of the 22 monitoring sites in the region recorded PM₁₀ concentrations that exceeded 150 µg/m³.

Chemical analysis of the samples showed that the largest contributor at all sites was geological material constituting, on average, 60% of the total PM₁₀ mass. The next most significant constituent was secondary ammonium nitrate, averaging 18% of the PM₁₀ mass, followed by organic carbon at 15%. Little site to site variability in secondary ammonium nitrate concentrations was observed. In contrast, geological material concentrations often varied by a factor of two to three between sites for 24-hour samples collected at sites separated by only a few kilometers. This suggests that a relatively uniform regional level of secondary ammonium nitrate exists upon which more locally varying concentrations of geological material are added. Furthermore, the zone of influence of geologic sources involved with the highest observed concentrations

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were shown to be very limited. The sources of peak events could not be clearly determined from observational data. This indicated the need to proceed with research to characterize geologic sources and determined the design of the fall intensive monitoring program of the 1999-2001 field study.

1995 Integrated Monitoring Study Winter Program

The winter program represented the major effort of IMS95. The study focused on the months of December and January, which have historically recorded high PM10 and PM2.5 concentrations, with a significant contribution from secondary PM constituents such as ammonium nitrate. Four core air quality monitoring sites located at Fresno, Bakersfield, Kern Wildlife Refuge, and Southwest Chowchilla collected PM10 and PM2.5 data every three hours, along with measurements of fog and precursor gases. Fresno and Bakersfield represent two of the major urban areas in the southern SJVAB, while Kern Wildlife Refuge and Southwest Chowchilla are located in rural, agricultural regions. Portable PM10 monitoring sites were located at 42 locations surrounding the Fresno, Bakersfield, and Kern Wildlife Refuge core sites to assess the representativeness and spatial variability of concentrations. Additional monitoring sites collected daily PM10 and PM2.5 measurements to provide information on concentrations at the boundaries of the region. The air quality monitoring was accompanied by measurement of weather data at both the surface and aloft to characterize the flow of air in the southern portion of the SJVAB and to provide information on the types of weather conditions associated with PM10/PM2.5 episodes in the wintertime.

Four periods of elevated PM10/PM2.5 concentrations were measured during the winter monitoring program. These peak concentration periods were generally characterized by low wind speeds, colder temperatures, and patchy fog, and were separated by the passage of storm systems. PM10 concentrations were not as high as those measured during the fall program, with the daily maximum PM10 concentration of 125 $\mu\text{g}/\text{m}^3$ occurring at Fresno on December 26, 1995. However, PM2.5 was a significant fraction of PM10 throughout the study period, constituting 70% to 80% of the PM10 mass. Six occurrences of PM2.5 concentrations greater than the new federal PM2.5 standard⁹ of 65 $\mu\text{g}/\text{m}^3$ were recorded during the study period, with a maximum PM2.5 concentration of 104 $\mu\text{g}/\text{m}^3$ at Fresno on December 26, 1995.

PM10 and PM2.5 concentration differences of up to a factor of 10 were observed between three-hour samples collected within the same day at the two urban sites (Bakersfield and Fresno), with concentrations peaking in the late evening and

⁹ The PM2.5 standard has been remanded as a result of the outcome of the American Trucking Association, Inc. v. USEPA. The case has been appealed to the Supreme Court. The court is unlikely to rule on the appeal until late 2000 or early 2001. The future status of the PM2.5 standard cannot be determined at this time.

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early morning. Smaller differences between 3 hour sample concentrations were observed at the rural sites of Kern Wildlife Refuge and Southwest Chowchilla, with maximum concentrations generally occurring during the afternoon period.

Chemical analysis of the samples showed that secondary ammonium nitrate was the largest contributor to all samples comprising an average of 30% to 40% of the PM mass. Secondary ammonium nitrate concentrations were relatively uniform throughout the study area, with urban and rural sites recording similar concentrations. The core sites were found to be ammonia rich, with the formation of secondary ammonium nitrate limited by the amount of NO_x, rather than ammonia. These large secondary ammonium nitrate concentrations were the major contributor to visibility reduction during non-foggy periods. The presence of fog was found to increase secondary ammonium sulfate concentrations, but decrease secondary ammonium nitrate.

Elemental carbon and organic carbon were the second largest contributors, constituting 30% of the mass at the urban sites. Concentrations at the rural sites were much lower. The organic carbon concentrations were highly correlated with the late night/early morning concentration peaks observed at the urban sites. Major contributors to organic carbon at the urban sites were emissions from wood smoke, diesel exhaust, gasoline exhaust, and food cooking. The contribution from geological material was small at all sites, constituting on average less than 10% of the PM10 mass, and less than 1% of the PM2.5 mass.

Winter PM concentrations were found to largely derive from emissions within distances of 10 to 20 kilometers of a monitoring site. There was a relatively uniform distribution of secondary ammonium nitrate throughout the region. Local sources of organic carbon appeared to be a major cause of site to site variability.

CRPAQS SPECIAL STUDIES

Special studies are multi-year technical support studies that have been performed as separate projects coordinated with the main program to provide information for analysis, modeling, and control measure design. Three types of special studies have been conducted and are still in progress: road related emissions, agricultural activity emissions, and geologic emission signatures.

A study of control effectiveness on unpaved roads and unpaved shoulders of paved roads has already been conducted and completed. This study evaluated the effectiveness of suppressant materials after initial application and following a year of aging and wear (see chapter 4).

USDA has directly funded research in a series of agricultural studies designed to evaluate the sources and sinks of particulate matter air pollution related to agricultural activities. The agricultural research is a multi-year effort to evaluate

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and compare equipment and techniques for planting and harvesting of various crops (see chapter 4).

The Fugitive Dust Characterization Study is in progress to identify signatures for geologic sources that are currently difficult to differentiate. This project is expected to benefit the analysis of observed episodes and development of control programs by improving the ability to identify the origin of observed concentrations of geologic particulate matter.

Fugitive Dust Characterization Study¹⁰

Fugitive particulate emissions are a major PM10 component during the summer and fall in the San Joaquin Valley. Significant contributors to PM10 fugitive emissions are believed to be:

1. paved and unpaved roads (including unpaved shoulders) and unpaved parking lots and staging areas;
2. agricultural operations such as land preparation, cultivation, harvesting, and wind erosion of fallow land;
3. animal husbandry in feedlots and dairies; and
4. road and building construction.

Contributions from these sources to PM10 and PM2.5 measured at receptors need to be determined to assign priorities to emissions studies and to determine the degree to which emissions must be controlled.

Since fugitive emissions are intermittent and highly variable, source oriented meteorological source apportionment models must be supplemented with other source apportionment approaches. Receptor models have the potential to distinguish among a variety of sources by their emissions signatures.

However, source apportionment approaches require more information on the properties of contributing sources to establish distinctive signatures. Current chemical profiles from fugitive particulate emissions and other source types include measurements of elements, sulfate, nitrate, ammonium, chloride, phosphate, potassium, sodium, iron, magnesium, calcium, and organic and elemental carbon. Chemical profiles with elemental, ion, and carbon abundance are sufficient to distinguish geological PM10 contributions from those of non-

¹⁰ The funding for this project is \$420,000. Organizations participating in the study include the Desert Research Institute, U.C. Davis, Florida International University, R. J. Lee Group, and USDA.

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geological contributors such as motor vehicle exhaust, vegetative burning, coal-burning, residual oil combustion, several industrial emissions, and even among certain industrial dusts. However, much of the geological material in the San Joaquin Valley results from alluvial deposits that originated in the Sierra Nevada and Coastal mountains and have mixed and deposited over centuries to form a relatively homogeneous mixture of mineral compounds and elements. The currently measured species are insufficient to distinguish contributions from various geological sources across a wide range of values.

Fugitive Dust Characterization Study Objectives

The objectives of the Fugitive Dust Characterization Study are to:

1. develop one or more methods that are able to distinguish different geological emission sources from one another;
2. obtain complete descriptions of source profiles from different fugitive particulate emitters typical of the SJVAB; and
3. determine which of the chemical and physical properties, and sampling and analysis methods provide the greatest source discrimination for the least cost and effort.

Additional chemical and physical properties need to be examined to determine which ones can meet these criteria in practical source apportionment applications. The detailed source profiles in this project will be used to identify those components in source emissions that are likely to be detectable in ambient air and hold the potential to distinguish the contributions of different types of fugitive particulate emitters to ambient PM10 and PM2.5 concentrations.

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Fugitive Dust Characterization Study Methodology

A number of different properties have been identified that may distinguish one fugitive particulate emissions source from another. For example, in addition to minerals, agricultural soils contain crop residues such as pollens, spores, leaves, seeds, fibrous material, microbes, proteins, pesticides, herbicides, fertilizers and soil amendments that may show themselves by individual particle, compound, or organic analysis. Soils from feed lots and dairies may contain hair and skin, bacteria, hormones, antibodies, proteins, DNA, excrement and feed residues that are also identifiable by the same analytical methods. Paved and unpaved road particulate emissions may contain brake and tire residues, deposited exhaust, road surface debris such as asphalt and paint, motor oils, leaf and textile fragments, and dust suppression materials. Construction particulate emissions may contain heavy equipment exhaust, construction material fragments, cement, drywall, concrete, cloth fibers, sawdust, and plastics.

Based on these potential markers, six different analytical techniques will be applied to source samples collected in the SJVAB. Fifty samples have been collected representing agricultural fields, dairies/feedlots, paved roads, unpaved roads, staging areas, and construction sites. Replicate samples have been taken from a single source to determine reproducibility of the sampling and analysis methods, and from several examples of the same source type to estimate variability of profiles for that source category. Soil samples have been distributed to the analytical contractors. Results from the analysis are expected to be available by June 2000.

CRPAQS 1999-2001 FIELD PROGRAM

CRPAQS 1999-2001 Field Program Basis, Objectives and Design

The basis for the field program design included extensive analysis of historical data, technical support studies, and a preliminary field monitoring program (IMS95). Input to the design was solicited from regulatory agencies, data analysts and modelers, and qualified scientific consultants. The District has participated in the design of the study to ensure that the objectives of the special study strategy included in the PM10 ADP are met.

The objective of the field program is to obtain a documented data set, with appropriate data qualification statements that is suitable for characterizing the nature and causes of PM10 and PM2.5 particulate matter concentrations and visibility impairment in the SJVAB by supporting modeling and data analysis activities.

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The study monitoring programs are designed to collect data to evaluate the annual and episodic PM10 and PM2.5 concentrations. The design of the 1999-2001 field program includes measurements in all areas of concern to the SJVAB. The 1999-2001 field program will provide an in-depth analysis for the annual PM10 and PM2.5 concentrations and will extensively evaluate both the fall and winter PM10 and PM2.5 conditions. The monitoring program will include 14 months of data collection throughout the SJVAB and surrounding regions, including intensive, short term monitoring in the fall and winter during conditions associated with episodes of high 24-hour PM10 and PM2.5 concentrations. Intensive collection of observational data will be conducted when forecasting identifies conditions that have historically been associated with the highest 24-hour PM10 and PM2.5 concentrations.

The annual average study began on December 1, 1999. It is scheduled to end on January 31, 2001. This includes daily meteorological measurements and continuous aerosol sampling at some of the sites. The annual study period includes two complete wintertime periods, with the most extensive program of measurements during the final winter. This schedule permits further evaluation and testing of new measurement systems that will be deployed. The annual field program also includes a 100 meter tower at a non-urban site between Fresno and Bakersfield that will be instrumented with high time-resolution temperature, meteorological, and particle size instruments at several levels. Under a variety of meteorological situations likely to occur throughout the year, measurements will be made by instruments on the tower to detect vertical and horizontal dispersion and mixing characteristics and windblown dust suspension characteristics. The tower will also serve as an analysis platform for wintertime fog and aerosol chemistry studies. The Walnut Grove tower between Sacramento and Stockton will be instrumented in a similar manner during the winter intensive measurement period. Annual average measurements will continue throughout the fall and winter intensive studies.

The fall intensive study will occur for 60 consecutive days beginning around September 2000, to correspond to the intensive harvesting and land preparation activities in the Corcoran area in the central San Joaquin Valley. The highest concentrations of PM10 in the Corcoran area have generally coincided with this period of increased activity.

The winter intensive study will take place over a 60-day period between mid-November 2000, and the end of January 2001. The precise start and end dates will be selected based on meteorological forecast of conditions conducive to PM buildup. Episodes lasting three to eight days, for a total of 15 episode days, will be selected by forecast within this period for collection of additional

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measurements to enhance the quantitative and qualitative data for peak episode evaluation.

CRPAQS 1999-2001 Annual Field Program

Air quality sampling locations for the annual monitoring program (December 1, 1999, through January 31, 2001) will include:

1. existing extensive network of PM10 monitoring sites;
2. new PM2.5 monitoring networks being established by the Air Resources Board and local air pollution control districts; and
3. additional temporary sites established specifically for the study.

Approximately 70 PM10 sites and as many as 50 PM2.5 sites will be operated as part of this backbone network. Study enhancements to these networks will include full scale “anchor” monitoring sites measuring gaseous and aerosol species, through both filter-based and continuous species specific methods. In addition, “satellite” monitoring sites will measure aerosol species using portable PM monitors and nephelometers. Surface and aloft meteorological measurements will be collected utilizing a network of surface meteorological sites, radar profilers, and sodars. Final site locations may vary from sites identified in Table 7-2, and Figures 7-1 and 7-2, which show the planned list and locations of monitoring sites to be used during the annual field program study.

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Table 7-2 CRPAQS ANNUAL MEASUREMENT PLAN 1999-2001

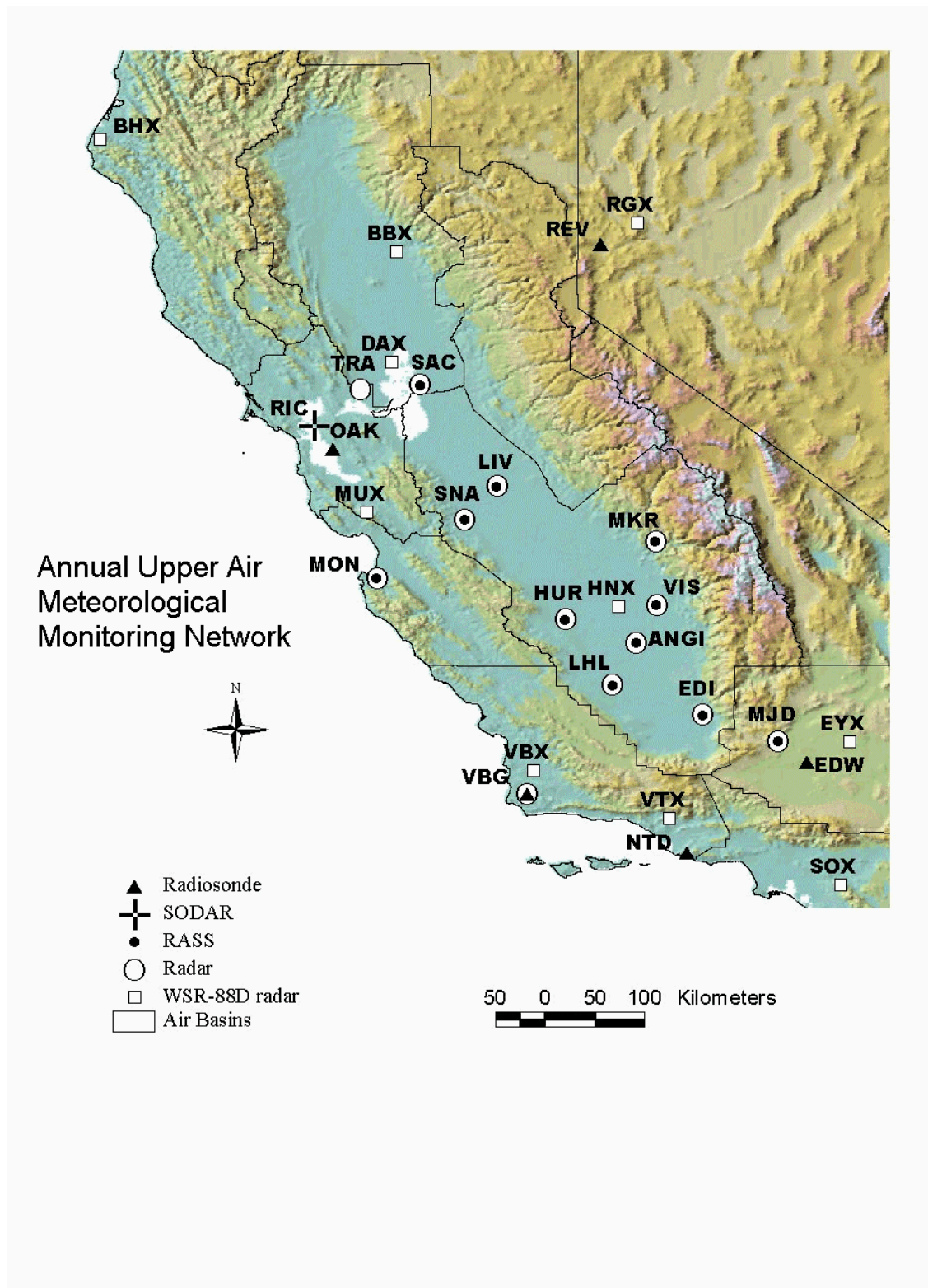
Site ID	Site Name	Site Type	Upper Air Meteorology	Surface Meteorology	Beta Attenuation Monitor	Particle Counter	Nephelometer	Aethelometer	NOy	Ozone	Carbon	Sequential Sampler	Minivol (PM2.5, PM10)	Federal Reference Method	VOC
ACP	Angel's Camp	Satellite				1						2			
AGBR	Ag Fields	Satellite										3			
ALT1	Altamont Pass	Satellite	1			1						1	1		
ANGI	Angiola	Anc/UA	1	2	2	4	1	1	1	1	1	2	1	1	
BAC	Bakersfield, CA Avenue	Anchor			2		1	1	1	1	1	2	1		
BARS	Barstow	Satellite				1									
BGS	Bakersfield, Golden State	Satellite				1									
BRES	Bakersfield Residential	Satellite				1							2		
BTI	Bethel Island	Satellite	1			1							3		
CARP	Carrizo Plain	Satellite				1							1		
CHL	China Lake	Satellite				1							2		
CLO	Clovis, North Villa	Satellite											2		
COA	Coalinga	Satellite				1									
COP	Corcoran, Patterson Avenue	Satellite											5		
CRD	Crows Landing	Satellite				1									
DUB1	Dublin	Satellite				1									
EDI	Edison	Sat/UA	1	1		1							1		
EDW	Edwards AFB	Satellite				1							3		
	Fresno (new site)	Satellite											2		
FEDL	Feedlot	Satellite				1							3		
FEL	Fellows	Satellite				1							3		
FELF	Fellows Foothills	Satellite				1							2		
FRER	South Fresno Gradient	Satellite				1							2		
FRES	Fresno Residential	Satellite				1							3		
FSD	Fresno, Drummond	Satellite				1							2		
FSF	Fresno, 1st Street	Anchor			2	2		1	1	1	1	2	2		
HAN	Hanford, Irwin Street	Satellite				1							2		
HELM	Helm (Fresno County)	Satellite				1							2		
HUR	Huron	Upper Air	1	1											
KCW	Kettleman City	Satellite				1							1		
KRV (MKR)	Sierra Foothills-Kings River	SAT/UA	1	1		1									
KWF	Kern or Pixley Wildlife	Satellite				1							3		
LHL	Lost Hills	Upper Air	1	1											
LIV	Livingston	Upper Air	1	1											
LVF	Livermore, 1st Street	Satellite											3		

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Table 7-2 (Continued) CRPAQS ANNUAL MEASUREMENT PLAN 1999-2001

Site ID	Site Name	Site Type	Upper Air Meteorology	Surface Meteorology	Beta Attenuation Monitor	Particle Counter	Nephelometer	Aethelometer	NOy	Ozone	Carbon	Sequential Sampler	Minivol (PM2.5, PM10)	Federal Reference Method	VOC
M14	Modesto, 14th Street	Satellite										5			
MJD	Mojave Desert (Tehachapi)	Upper Air	1	1											
MOP	Mojave, Poole	Satellite										2			
MRM	Merced, Midtown	Satellite										2			
OLD	Oildale, Manor	Satellite				1						4			
OLW	Olancha	Satellite				1						3		1	
PAC	Pacheco Pass	Satellite	1			1						1			
PARN	Point Arena	Satellite										2		1	
PLE	Pleasant Grove	Satellite				1						2			
RGI	Ridgecrest	Satellite										1			
RIC	Richmond	Upper Air	1	1								1			
S13	Sacramento, T Street	Satellite										3			
SAC	Sacramento, Elk Grove	Upper Air	1	1											
SDP	Sacramento, Del Paso	Anchor				1	1					1			
SFA	San Francisco, Arkansas	Satellite										2			
SJ4	San Jose, 4th Street	Anchor				1	1					1			
SNA	Santa Nella	Upper Air	1	1											
SNFH	Sierra Foothills	Satellite				1						3			
SOH	Stockton, Hazleton	Satellite										2			
SWC	Southwest Chowchilla	Satellite				1						2			
TEH2	Tehachapi Pass	Satellite				1						1			
TEJ	Tejon Pass	Satellite				1									
TRA	Travis AFB	Upper Air	1	1											
VBG	Vandenberg AFB	Upper Air	1	1											
VCS	Visalia, Church Street	Satellite										3			
VIS	Visalia	Upper Air	1	1											
WAG	Walnut Grove Tower	Satellite				1									
WLKP	Walker Pass	Satellite	1			1									
YOSE1	Yosemite, Turtleback Dome	Satellite										1			

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CRPAQS 1999-2001 Fall Intensive Field Program

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Planning for the fall field program schedule corresponds to the mid-September to mid-November period of historically high PM10 concentrations dominated by geologic material. Specific issues to be addressed in the fall monitoring program include identification of the sources of geological material, determination of the zone of influence of these sources, and the development of improved data on particulate suspension and deposition. The fall measurement program will include neighborhood scale saturation monitoring, measurement of organic traces species and particle morphology, time-of-flight mass spectrometry, and particle suspension and deposition measurements at an instrumented 100 meter tower configured to record meteorology and air pollutant information at several different elevations.

The fall intensive field program measurements complement and supplement those acquired as part of the long-term annual PM10 backbone network and the seven-site supplemental PM10 measurement sites in the annual study. The full data set from all elements of the field program constitutes a large coverage of background, interbasin transport, intrabasin gradient, source-oriented, and community exposure sites. The supplemental fall intensive sites provide focus for receptor zone of representation and source zone of influence analysis. Final site locations may vary from Figure 7-3, which shows the approximate locations of monitoring sites planned to be used during the study.

The fall campaign will include the following components:

- ***PM10 backbone network enhancements:*** Twenty-four hour duration PM10 samples will be acquired daily on Teflon filters amenable to elemental analysis at the Corcoran and Hanford sites. These will be used to determine how PM10 and its coarse fraction vary throughout this period of traditionally high PM10 levels.
- ***PM10 satellite network enhancements:*** Approximately 30 satellite sites with portable PM10 nephelometers will be operated in and around the Corcoran area to detect generation from nearby sources and movement of particulate emissions through the area. At five sites Minivol PM10 samplers with Teflon and quartz filters will be operated to evaluate chemical composition. Measurements from the continuous monitors will be evaluated every two weeks over the 60-day campaign to determine if any sites are “hot-spots.” Based upon this evaluation the Minivols may be moved to different locations within the network to chemically characterize the PM10 at hot spots.
- ***Surface meteorological network enhancements:*** Up to five surface meteorological stations will be located within and around the Corcoran

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satellite network to acquire five-minute average wind speed and wind direction. Measurements from these sites will be compared with the measurements from the District station at Corcoran to evaluate the extent to which transport directions and suspension properties are induced by meteorology. These measurements will also be used to determine the directional origin of pulses measured by continuous nephelometers and to relate these pulses to emission sources.

- **Upper air meteorological network enhancements:** A sodar will operate near the Corcoran airport to evaluate the evolution of the boundary layer and to quantify the potential transport distances of materials that are suspended above the surface layer.
- **In situ single particle quantification:** Time of flight mass spectrometers will be deployed for short periods at the Corcoran and Fresno sites to quantify the composition and size of individual particles to determine their formation mechanisms and sources. The timing, size, and chemical nature of individual particles with a large chemical component will be contrasted between these two sites to evaluate the extent to which urban and non-urban fugitive sources affect PM10 levels in a large metropolitan area (Fresno) and a nearby rural town (Corcoran).
- **Particulate marker measurements:** Specific markers of different particulate emission sources will be quantified on 24-hour PM10 samples in Fresno, Corcoran, and at the 100 meter tower to distinguish between specific sources such as paved and unpaved road travel, construction, and agricultural activities associated with different crops and farming operations. Sampling and analysis methods for this part of the fall campaign will be finalized using preliminary results of the Fugitive Dust Characterization Study. This will be the first ambient test of chemical and physical markers found in distinct sources that might quantify their contributions to receptors. Marker categories include microscopic size and composition, pesticides, lipids, microbes, and fatty acids.

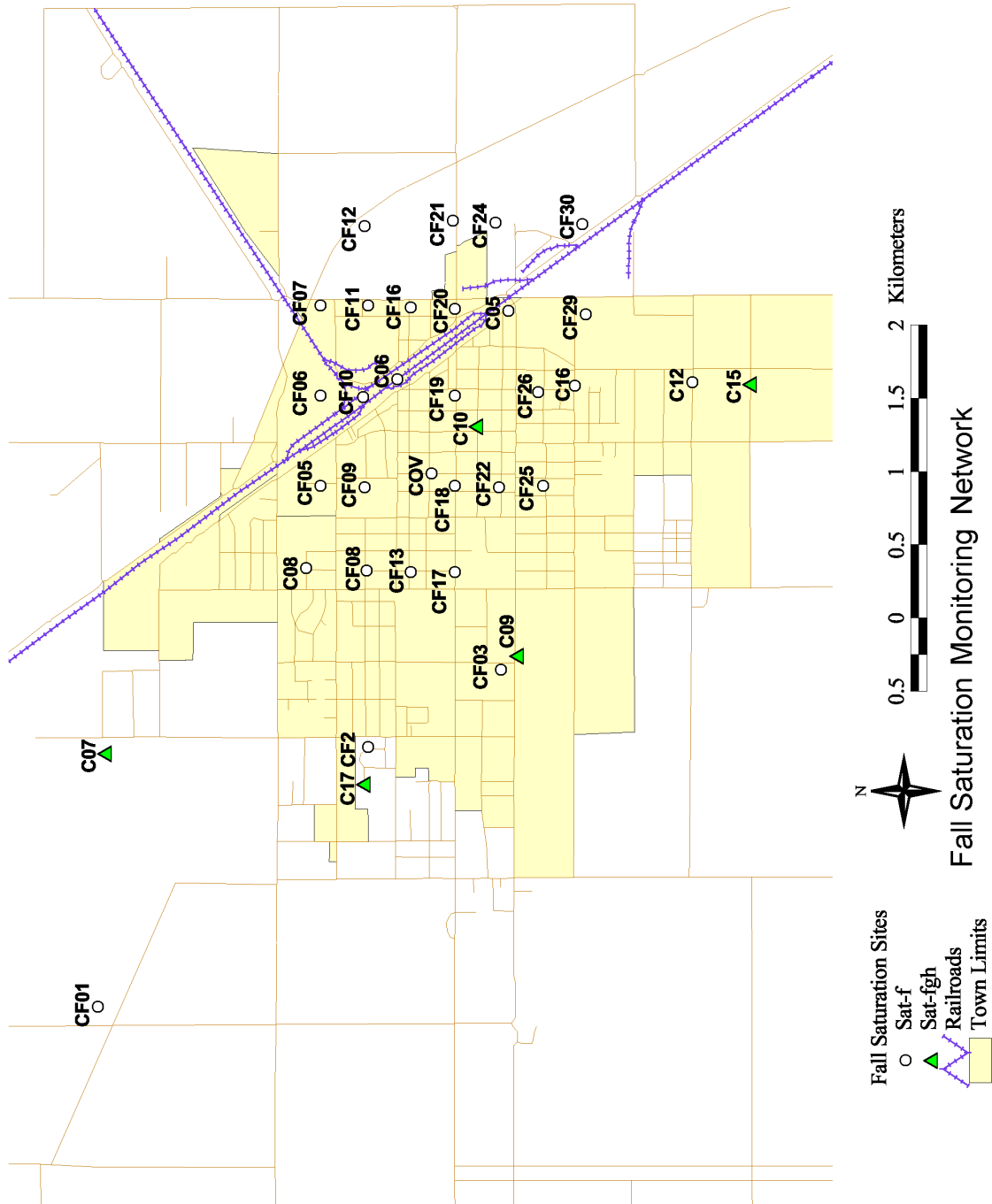
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CRPAQS 1999-2001 Fall Intensive Field Program Objectives

Measurements will be used to accomplish the following objectives:

1. **Quality Assurance:** Data base performance tests, quality audits, and measurement comparisons and assessment of measurement accuracy and precision will be used to evaluate the accuracy, precision, validity, and completeness of the CRPAQS database. Data will be used to evaluate the entire PM10 network, including the sites within the fall study domain.
2. **Temporal and Spatial Distributions:** Spatial and temporal analyses will be applied to the PM10 measurements from the portable nephelometers and supplemental sites. The hypothesis, that the PM10 zone of representation is much smaller than the PM2.5 zone of representation, will be tested by comparing chemical concentrations from the satellite sites. PM10 and PM2.5 concentrations will be compared to identify common and divergent patterns.
3. **Boundary Layer and Regional Circulation:** Micrometeorological and particle size measurements from the 100 meter tower will determine which particle sizes attain elevations sufficient to be transported long distances aloft. Horizontal winds aloft will be applied to concentrations measured at the top of the 100 meter tower to estimate the directions and distances that coarse particles might reach to assess the influence of rural emissions on populated urban areas.
4. **Source Zones of Influence and Characteristics:** Chemical and physical measurements will be used with the Chemical Modeling Balance model to estimate primary source contributions to ambient PM10 concentrations. The goal of source apportionment analysis is to distinguish among paved road, agricultural, construction, and wind generated emissions. The urban and rural concentrations of fugitive particulate markers will be compared and contrasted to determine how much urban and non-urban particulate emissions intermix. Ammonia distributions measured in the satellite network will be examined to determine the zone of influence for ammonia emitters in the Corcoran area.

Figure 7-3



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CRPAQS 1999-2001 Winter Intensive Field Program

The winter episodic field study will take place over a period of eight weeks on a forecast basis during December and January 2000/2001. The PM2.5 concentrations have been historically highest during the winter months, with secondary ammonium nitrate and carbonaceous material as the dominant constituents. Specific issues to be addressed in the winter monitoring program include:

1. identification of the sources of carbonaceous material;
2. determination of the limiting precursors for secondary PM species;
3. low wind speed surface and aloft transport and mixing mechanisms; and
4. the zone of influence for both primary and secondary sources of PM.

The winter measurement program will include an expanded set of anchor sites, an enhanced upper air monitoring network, organic species tracers, fog chemistry, time-of-flight mass spectrometry, and measurement of wet deposition. Special emphasis will be placed on collection of continuous and species specific particulate measurements to support both receptor and grid-based modeling approaches. Methods for collecting information on air quality aloft are also being explored, with the use of an instrumented 100 meter tower, an elevated site in the Sierra Nevada mountains, aircraft, and balloon-borne systems. Final site locations may vary from Figure 7-4, which shows the planned locations of additional monitoring sites to be used during the study.

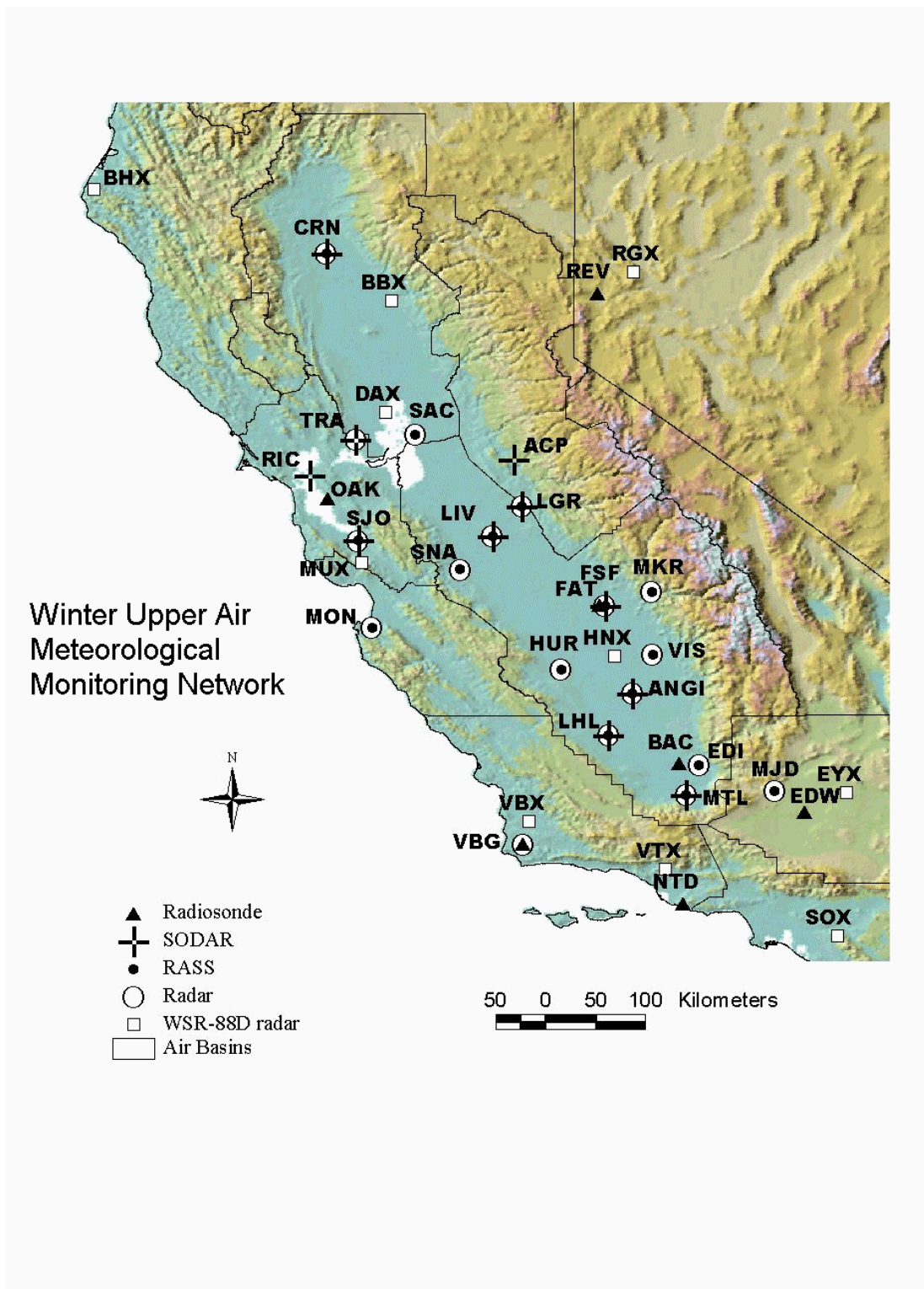
CRPAQS Data Analysis and Modeling

Following the 1999-2001 field study, additional analysis and modeling will be conducted to obtain a maximum value from the collected data. The field program is well designed to provide enhanced analysis of annual PM10 concentrations as well as the 24-hour fall and winter PM10 concentrations. The fall and winter intensive portions of the field program will provide an extensive evaluation of the areas previously observed to experience the highest PM10 concentrations (Corcoran and Bakersfield).

PM2.5 will also be evaluated in both the annual and winter intensive portions of the field study. The monitoring program also includes extensive measurement of PM2.5 concentrations with chemical analysis and particle size measurements. Emissions models, especially for ammonia and fugitive emissions, will be compared with ambient measurements and emissions surveys during this study period.

Figure 7-4

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LIST OF APPENDICES

- Appendix A:** Air Resources Board Resolution 97-28
- Appendix B:** Excerpts from 1999 Ozone Rate of Progress
- Appendix C:** Memorandum of Understanding Between the San Joaquin Valley Unified Air Pollution Control District and the Land Managers and Fire Protection Agencies
- Appendix D:** Memorandum of Agreement Between the San Joaquin Valley Unified Air Pollution Control District and the California State Department of Forestry and Fire Protection
- Appendix E:** Conclusions to RWB Survey Conducted by META
- Appendix F:** Memorandum of Understanding Between the Natural Resource Conservation Service, California Department of Food and Agriculture, and San Joaquin Valley Unified Air Pollution Control District
- Appendix G:** Voluntary (Incentive-Based) Air Quality Compliance Program for Production Agriculture
- Appendix H:** Memorandum of Understanding Between the U.S. Department of Agriculture and the U.S. Environmental Protection Agency
- Appendix I:** Agriculture Research Publications
- Appendix J:** District Responses to Public Workshop Comments (Draft Progress Report, April 2000)

Please Note: Not all the appendices are not available electronically. Only Appendix J is located on this website. To receive a hard copy of any or all of the appendices listed above, please contact the Planning Department at the San Joaquin Valley Unified Air Pollution Control District at (559) 230-5800. Thank you.

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Appendix J

DISTRICT RESPONSE TO PUBLIC WORKSHOP COMMENTS (April 6, 2000):

General Note: Staff incorporated PM10-related activities in the Progress Report that took place during the period of January 1997 through December 1999, and that assisted the District in fulfilling commitments found in the PM10 Attainment Demonstration Plan (ADP). Any follow-up of a significant event or activity that has occurred after December 1999, after District consideration, is mentioned in the Governing Board Letter to the Progress Report.

CHAPTER 1 AND 2

No comments received.

CHAPTER 3

Comment: There should be a status report to the Moyer program and non-mobile agricultural sources, such as the stationary agriculture engines, that have been funded through the program and have shown emission reductions.

Response: Staff has updated the information on the Moyer program and non-mobile agricultural sources by adding additional text to Table 3-3 in Chapter 3 of the Progress Report.

CHAPTER 4

1. Comment: It is important to mention that the time for conducting the fieldwork and the priorities set for the research is tied closely to seasonality of the crops being studied, and when PM10 exceedances have typically occurred.

Response: The chapter has been revised to reflect this suggestion.

2. Comment: Local farm bureaus should be added to the list of Agriculture Tech Group participants. See second paragraph on page 4-1.

Response: The second paragraph on page 4-1 has been modified to reflect this comment.

3. Comment: The Table on page 4-3 should be updated to include preliminary results of dairies and feedlot research, the fertilizer application calendar work, and the NRCS agriculture unpaved road survey. There should also be an emphasis that no research was conducted in April 1998 and 1999 due to the weather, thus causing delays in the research schedule.

Response: The Table on page 4-3 has been revised to reflect research findings that have been made up to December 1999. Any additional preliminary or final research findings made December 1999 has been included in the Governing Board Letter to the Progress Report. Gaps and delays in the research calendar have been briefly explained in Table 4-1.

4. Comment: Add the EQIP grant for the Agricultural Air Quality-Farmer Information Meetings to Table 4-2.

Response: This particular EQIP grant application was submitted after December 1999, therefore, it was not included in the body of the Progress Report, but the District recognizes its importance and responds by

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highlighting the grant award herein. The goals of the EQIP educational grant that was awarded to the California Cotton Ginners and Growers Association, as its sponsoring nonprofit organization, is to provide educational outreach to growers with regard to air quality issues. Representatives from the USDA-Natural Resource Conservation Service, the SJVUAPCD, agricultural industry, SE Asian growers, UC Extension Farm Advisors, and researchers at the University of California in Davis will develop and/or present air quality displays and informational materials to be used at farm shows and conduct special grower outreach information meetings to take place in the upcoming year.

5. Comment: The Progress Report should mention the Governor's Economic Summit and the statewide CDFR/ARB advisory committee on air quality for agriculture.

Response: The District appreciates the agriculture community's initiative taken in November 1999 to establish a statewide agricultural air quality advisory council that would parallel the USDA's task force on air quality. It is our understanding that a plan to have the Air Resources Board work in cooperation with the Department of Food and Agriculture and bring agricultural air quality issues to the advisory council is conceptual in nature at this time.

6. Comment: The chapter should mention the results of the past two years of the EQIP.

Response: The chapter includes a mention of the Environmental Quality Incentive Program and progress made through December 1999, as it relates to District activities with respect to the PM10 ADP.

7. Comment: The agriculture chapter should emphasize that the Agriculture Air Quality Task Force has signed the Voluntary PM10/Ozone policy.

Response: The chapter includes mention of the policy and provides the latest information on the policy as of December 1999. Further developments regarding the policy that have occurred after that date will be provided in the Governing Board Letter to the Progress Report.

8. Comment: The Progress Report should discuss the Governor's biomass project and how this will reduce agricultural burning.

Response: The project is not discussed in the body of the Progress Report because of its timeframe in relation to the December 1999 information cut-off date; however, the District recognizes its importance and responds by highlighting it herein. It is the District's understanding that a biomass grant program was established through the Governor's budget and funds for diverting orchard prunings and removals into the feedstock for power generation will be available in July 2000. There were discussions between the Central Valley Fuels Management/Mendota Biomass Power and the SJVUAPCD regarding agricultural burning in the Winter of 2000. According to the District compliance staff, when farmers contact the District regarding "orchard removal burns" they are encouraged to use biomass as an

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alternative means of disposal and are referred to Central Valley Fuels Management/Mendota Biomass representatives to divert orchard prunings and removals before considering burning the materials in their field. There are presently seven participants engaged in the collection and processing of materials that typically would be open-field burned.

9. Comment: Table 4-1 should be modified to compare Plan commitments against actual status of data gathering, final reports, and control strategies (voluntary or otherwise).

Response: Staff has revised Table 4-1 to reflect this comment for progress made through December 1999. Since many of the research activities were not highlighted in the Plan, the Progress Report provides, as an appendix, a list of agricultural research reports to reflect both UCD (Crocker Nuclear Laboratory) and non-UCD agriculturally-related studies. Table 4-1 now only includes research activities that pertain to the activities listed in the ADP's Agriculture Research Timeline, as found on pages 7-30 to 7-32 of the Plan. A new chapter table was added to reflect non-UCD related agricultural research.

CHAPTER 5

No comments received.

CHAPTER 6

Comment: The Progress Report should provide a summary of emission inventory and a pie chart or graphics that show where the District thinks the emissions come from.

Response: The PM10 Attainment Demonstration Plan contains this information, which is the key document on which the Progress Report is based.

CHAPTER 7

1. Comment: To the list of items on page 7-8 regarding under the Fugitive Dust Characterization Study, a fifth item should be added to include geologic sources.

Response: Staff wishes to clarify that all the items listed (numbers 1-4) under the Fugitive Dust Characterization Study subtitled section are geological source categories. The list is a breakdown of sources contributing to observed geologic concentrations. The four listed items and the paragraph preceding this section have been revised to improve the text and provide this clarification.

2. Comment: Regarding page 7-8, I have a concern with the phrase, "during the summer" and concerns with the list of items on page 7-8. For item #1, are parking lots a problem? For item #2, "crops" discussed should only be the

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major crops that cause a problem. For item #3, this may not be a significant problem.

Response: As mentioned in our Response to Comment #1 for Chapter 7, Staff has revised and clarified the text for this section of Chapter 7 to address your comments. The list presented on page 7-8 represents contributing source types that have been identified by the US EPA. The amount and significance of each category has not been definitively determined at this time.

GENERAL COMMENTS

1. Comment: The Progress Report should include the MOU that was signed between the District, the CDFA, and the NRCS as an appendix.

Response: Staff has included the MOU as an appendix.

2. Comment: The Progress Report should amend its tables and compare progress made against timelines and plan commitments as presented in the PM10 ADP.

Response: The tables and charts in the Progress Report have been re-evaluated and revised to reflect appropriate changes that are essential to show District progress of plan commitments.

3. Comment: Either as part of the emission inventory or Chapter 2, there should be text that discusses the use of voluntary controls at cotton gins that have resulted in emission reductions.

Response: The Progress Report does not include information on projects that achieve emission reduction credits (ERCs). However, the District encourages stakeholders to voluntarily make emission reductions that may result in credits.

4. Comment: The Progress Report should mention the status of Title 17.

Response: Staff has revised several sections in the Progress Report to reflect the March 2000 ARB adoption of the revisions to Title 17 because of its ramification to the District's 4103 and 4106 rulemaking process.

DISTRICT RESPONSE TO WRITTEN PUBLIC COMMENTS (20 April 2000):

<p><u>General Note:</u> Staff incorporated PM10-related activities in the Progress Report that took place during the period of January 1997 through December 1999, and that assisted the District in</p>
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fulfilling commitments found in the PM10 Attainment Demonstration Plan (ADP). Any follow-up of a significant event or activity that has occurred after December 1999, after District consideration, is mentioned in the Governing Board Letter to the Progress Report.

FEDERAL, STATE, AND LOCAL GOVERNMENTAL AGENCIES

Environmental Protection Agency:

Comments provided to District Staff by personal communication. No written comments received.

Air Resources Board:

1. Comment: The ADP Progress Report should include a schedule for assessing CRPAQS and agricultural research results and for the technical analysis necessary for revising the attainment demonstration. The schedule should ensure that there will be time to implement the strategies, regulatory and voluntary, needed to attain the 24-hour standard at all locations by 2006.

Response: Research progress is reviewed as part of an on-going process. Both the ARB and District staff regularly attend CRPAQS technical committee meetings and AG Tech Group meetings as part of an overall assessment of research progress. The District maintains its commitment to ensure that research information is developed in a timely manner and that the information will be used to implement control strategies by the 4th Quarter 2004 for the agricultural field studies. Additionally, the District will continue its work with the ARB staff to develop a progress schedule for the CRPAQS studies for the development and implementation of control strategies at the end of 2004. This is an area that will receive continual District staff attention and, as research results are finalized, information will be reviewed as to its appropriateness in the development of control strategies. As stated in the PM10 ADP, voluntary control strategies for agricultural sources will be developed in cooperation with the Natural Resources Conservation Services.

2. Comment: We believe that inclusion of an updated precursor inventory (NOx and HC) would benefit the ADP Progress Report.

Response: VOC and NOx emission reductions (stated in the 1994 SIP currency), as they were reported in the 1999 Ozone Rate of Progress report are provided in Appendix B.

Local Governmental Agencies: No comments received.

GENERAL STAKEHOLDERS

Natural Resource Conservation Service:

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Comment: The NRCS has conducted several activities within the SJV Air District's jurisdictional boundaries that concern air quality. I would like to have our activities reflected within your current list of accomplishments.

These activities include the following: a grant of \$30,000 from our agency to your agency to collect data from farmers within the District regarding agricultural practices to reduce the generation of PM10; incentive programs for farmers to adopt air quality enhancement practices under EQIP; outreach to farmers at the 1999 Tulare Farm Show; and the recent EQIP grant awarded to the California Cotton Growers and Ginners Association that would provide funds to support outreach and informational activities to farmers on air quality issues.

Response: Staff has revised various chapters and sections of the Progress Report to reflect the suggested comment.

Central Valley Fuels Management/Mendota Biomass Power:

Comment: We would like the District to consider adding information about the District's cooperative work with local biomass power companies regarding the use of agricultural prunings and orchard removals into the feedstock for power generation.

Response: See earlier response to comment #8 under Chapter 4.

Western States Petroleum Association (Bakersfield Office):

1. Comment: Before any new rules are adopted, WSPA recommends that the District evaluate these efforts [field research, submission of interim and final reports, data analysis, final assessment or research results, etc.] before requiring new controls on industry. Furthermore, WSPA emphasizes the need of the District, in conjunction with the CRPAQS, to fully understand the complexity of all air quality issues that will come out of the study.

Response: The Progress Report provides status to commitments made in the PM10 ADP, which was adopted in May 1997. Several of these commitments are in response to the District redesignation to a "serious" PM10 nonattainment area. Research will assist the District to better understand PM10 issues in the San Joaquin Valley Air Basin. However, the District is required to address commitments presented in the ADP (for example, BACM rulemaking), and the District is required by law to address the deficiencies of our PM10 rules as listed by the EPA in their limited approval/disapproval decisionmaking.

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2. Comment: WSPA is concerned about EPA's desire to federalize emission controls instituted for ozone attainment on the West Side, as this is clearly not justified.

Response: Your concerns are noted; however, this issue does not fall within the scope of District activities. Federal rulemaking has not been finalized; therefore, the District encourages you to directly discuss this issue further with the EPA.

3. Comment: The ADP progress report contains neither a summary of the current inventory nor an estimated breakdown of how much is contributed by each source. The report also does not contain any information on how the emission inventories have changed from the 1997 PM10 SIP future projections as compared with more recent updated projections taking into account the economic incentive programs.

Response: The Progress Report is intended to describe progress made on the various commitments made in the PM10 Attainment Demonstration Plan (see Chapter 7 of ADP). The ADP is the main document in which information such as the current emission inventory for direct sources of PM10 and the breakdown of source contribution is located.

The emission inventory for direct PM10 sources, based on the 1993 baseline, has not changed since the ADP was adopted. However, staff has revised Chapter 1 to briefly discuss this issue.

4. Comment: The 1997 ADP committed the District to revise its regulations to include BACM. However, the control measures described in the recently proposed amendments to Regulation VIII Rules are significantly more stringent, with excessive record keeping, than anticipated by the affected industries.

Response: The PM10 ADP included commitments to develop BACM in response to the federal Clean Air Act and the District's redesignation to a "serious" PM10 nonattainment area. In addition, the District is required to respond to the rule deficiencies noted by the EPA in their limited approval/disapproval rulemaking regarding Regulation VIII. One of the main deficiencies noted by the EPA is the lack of recordkeeping. Regulation VIII is currently being amended, and is in the workshop phase of rulemaking. As stated earlier, the purpose of the Progress Report is to report progress made on fulfilling District Plan commitments from January 1997 to December 1999.

5. Comment: WSPA would like to point out that the annual average PM10 concentrations at all monitoring sites in all cities shown in Table 6-1 comply with the federal annual NAAQS for PM10. According to the monitoring data, since the area is in attainment with the annual NAAQS,

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there is no need for implementation of new controls aimed at attaining the federal annual standard.

Response: While the District designs controls primarily to reduce emissions to lower the 24-hour concentrations, these controls also have a mitigating effect on the annual concentrations.

6. Comment: Regarding the federal 24-hour NAAQS for PM10, Table 6-2 in the ADP Progress Report has some 2001 projections that are higher than the current design values, which indicates that the regulatory process is working more efficiently than initially planned. This also illustrates that without an explanation in the text of how the current ambient values were used to project the 2001 attainment date, it is not clear how good the projection methodology is. Similarly, there is no explanation of the requirements and mechanisms for estimating expected exceedances in order to determine attainment.

Response: The 2001 projections are from the ADP and not a recalculation from recent air monitoring data. In addition, the ADP, Table 6-2 is an evaluation of whether or not the District's trend corresponds to the ADP projections. In addition, Chapter 8 of the PM10 ADP provides, in detail, the methodology and procedure for determining attainment demonstration projections, and Appendix K of the ADP provides the spreadsheets of the modeling analysis.

California Cotton Ginners and Growers Associations (Association):

1. Comment: On page 2-1 references to fugitive dust are made. Many of the comments focus on EPA's limited approval/disapproval of the District's previous Regulation VIII. Many of EPA's concerns focus on issues with sources of windblown dust. Windblown dust does not play a significant role in exceedances of the PM10 standard in the San Joaquin Valley. We recommend that the District reaffirm this position by including a statement on this issue similar to that as presented on page 3-6 of the District's PM10 Attainment Demonstration Plan.

Response: The purpose of the PM10 ADP Progress Report is to provide an update to the plan commitments outlined in Chapter 7 of the ADP. Since research commitments play an integral part of the ADP, an update to research activities is also critical to the Progress Report. The Progress Report has purposefully avoided providing detailed information that pertains to the San Joaquin Valley airshed and the geographical and meteorological dynamics of the air basin since it is comprehensively provided in Chapter 3 of the ADP. However, for those unfamiliar with the ADP, Staff references this issue by presenting the following statements, as found on pages 3-6 and 3-7:

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“Wind speed and direction play an important role in dispersion and transport of air pollutants...during the winter months, the Valley experiences light, variable winds of less than 10 mph. Low wind speeds, combined with low lying inversion layers in the winter, create a climate conducive to the formation of high PM-10 concentrations.

...analysis of seasonal wind speeds is significant when applying erosive wind velocities criteria defined by the NRCS of the USDA...Over 75% of the winds with enough velocity to cause erosion occur in the spring and summer seasons in the Air Basin when PM-10 levels in the ambient air are among the lowest.

The above analysis of wind speeds invalidates the conventional assumption that wind erosion is the dominant factor relating to PM-10 geologic dust emissions in the Air Basin.”

2. Comment: According to District information several agricultural operations have retrofitted their irrigation pump engines and tractor engines, resulting in reductions in NOx and PM10 emissions. This should be acknowledged, and the emissions reductions associated with the program should be quantified.

Response: Staff has included additional text to Table 3-3 in Chapter 3 of the Progress Report to reflect this comment for NOx emission reductions. Under the off-road, heavy-duty low-emission engine incentive program the District does not quantify direct particulate emissions from irrigation pump engines and tractor engines; therefore, such information has not been presented in the Progress Report.

3. Comment: The District needs to comment on the growth factors for agricultural off-road mobile sources developed recently by the ARB. The ARB has developed new growth factors which reflect a 0.5% reduction in agricultural land through 2010. This is based on information provided by the USDA and the California Department of Conservation. We recommend that the District include comments that demonstrate these facts.

Response: Information on growth factors for agricultural off-road mobile sources is not presented in the body of Progress Report since it occurred after December 1999; however, the District considers it important to mention herein. The comment is valid. The ARB has developed new growth factors for the agricultural off-road mobile sources in January 2000 to reflect a 0.5% per year reduction in agricultural land. This information will be subsequently used to update the emission inventory for PM10.

4. Comment: Some descriptive information regarding the research in general should be provided. For example, a comment should be made on the fact that the research is focusing on operations that occur during the fall and winter, since that is the time of the year when the SJV experiences exceedances of the PM10 standard. There should be a reference to the current unpaved road study for agricultural sources being conducted by STI, and funded by USDA-NRCS. Information generated by this study will help to better understand the contribution of unpaved farm roads to the Valley's

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PM10 problem. The District needs to add the recently approved agricultural outreach project by the California Cotton Growers Association in partnership with USDA-NRCS. Funding of \$28,000 will be provided for meetings and information pamphlets regarding air quality and agriculture. Finally, one research project is missing from Table 4-1, and that is the Fertilizer Application Calendar Study being performed by Research for Hire, under a grant by the Fertilizer Research and Education Program.

Response: Staff has revised text language to reflect the focus of agricultural research with respect to seasonality. Text language has been provided to discuss agricultural research projects, such as the STI unpaved road study and the Fertilizer Application Calendar Study.