San Joaquin Valley Air Pollution Control District

Air Monitoring Network Plan

DRAFT

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For Submittal to the U.S. Environmental Protection Agency in July 2010

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Forthcoming

The District's Core Values and the District's Air Monitoring Network

* Protect Public Health *

The District uses data collected from the Valley air monitoring network to generate daily air quality forecasts and, when needed, issue health advisories. The District also uses data collected from the Valley's air monitoring network as the basis for long-term attainment strategies and to track progress towards health-based air quality standards.

* Active and effective air pollution control efforts with minimal disruption to the Valley's economic prosperity *

The District uses air monitoring data to help determine what kind of air pollution control efforts are needed to achieve health-based air quality standards.

* Outstanding Customer Service *
* Accountability to the public *

The District's website provides timely and easy public access to data from the Valley's real-time air monitors. The public can also access summaries of the previous seven days of air quality for ozone and particulate matter.

* Open and transparent public processes *

In addition to making air quality data available in real-time, the District uses air quality data in a variety of publicly available documents and reports. The District also conducts a public review period for annual monitoring network plans.

* Respect for the opinions and interest of all Valley residents *

The District has actively made daily air quality information available to Valley residents in a variety of formats, from the District website to the media, and even with air quality flags at schools. The District considers public interests in establishing new air monitoring stations.

* Ingenuity and innovation *

The District uses new and improved air monitoring techniques as these techniques are approved by the EPA. The District uses the latest science when siting air monitors. In turn, data collected from the monitoring network contributes to ongoing scientific evaluations.

* Continuous improvement *

The District evaluates the air monitoring network in the annual Monitoring Network plan for opportunities for better data collection and greater efficiency. Furthermore, improved air monitoring is a continuous effort; throughout the year, the District seeks out opportunities to improve the air monitoring network.

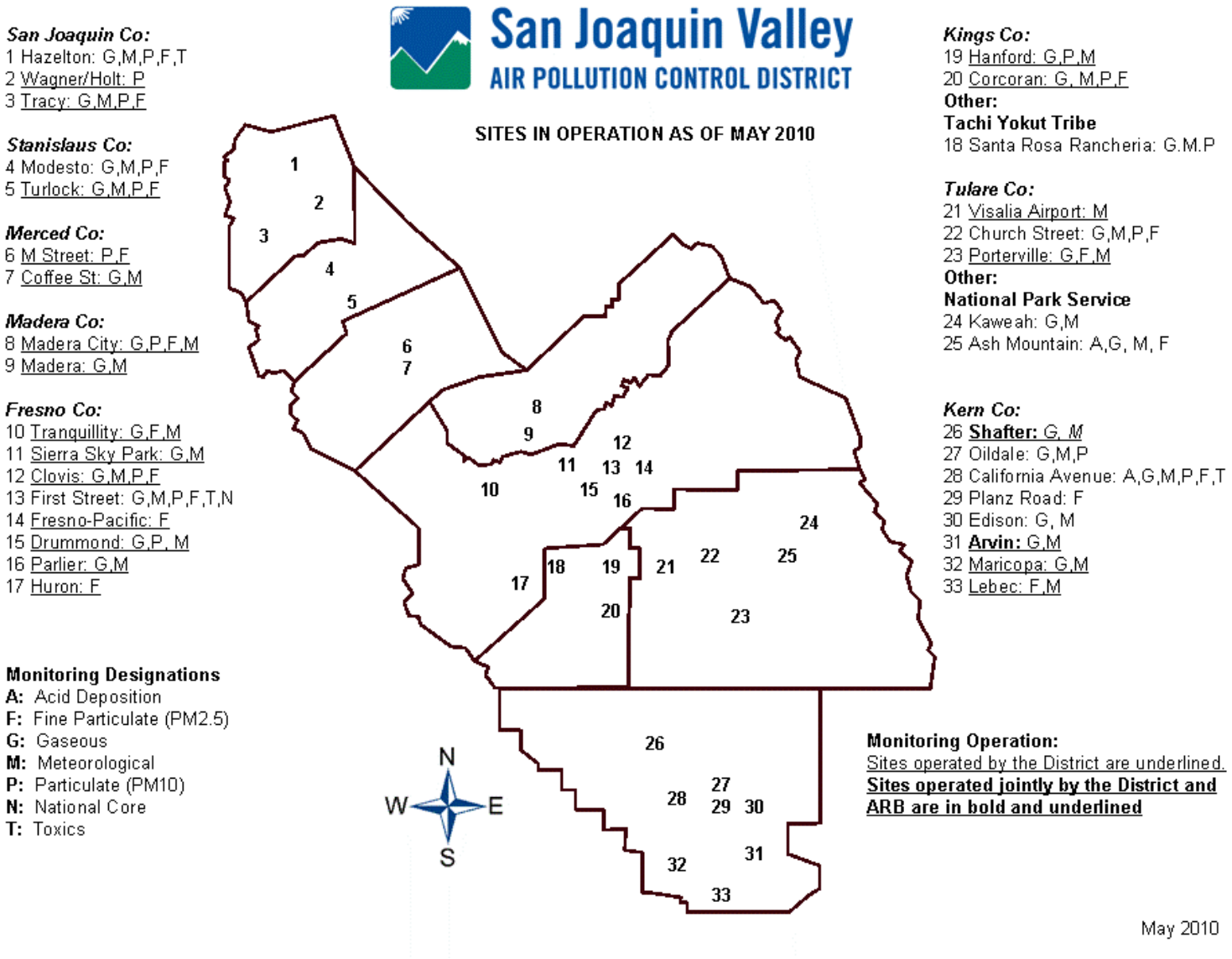
* Recognition of the uniqueness of the San Joaquin Valley *

The San Joaquin Valley is an expansive and diverse area. The District sites air monitors to represent each type of area and each portion of the region.

* Effective and efficient use of public funds *

An air monitoring network requires personnel, instruments, parts, energy, and leases. The District makes the most of limited resources by structuring the air monitoring network in a way that optimizes personnel time and funding for instruments. The result is a robust air monitoring network that helps the Valley reach its air quality goals without unnecessary expenditures.

Figure 1 Map of Air Monitoring Sites in the San Joaquin Valley



Executive Summary

The San Joaquin Valley Air Pollution Control District (District) operates an extensive network of air quality monitors throughout the San Joaquin Valley (Valley) to support its mission of improving and protecting public health. On a short term scale, District staff use the hourly readings from real-time monitors daily to generate an Air Quality Index (AQI) for each of the Valley's eight counties. Through their appearance on the District website, in Valley media, and as school air quality flags, the AQI communicate the current state of air quality to Valley residents so they can keep air quality in mind as they plan their activities. The District also uses real-time air quality data to manage prescribed burning, agricultural burning, and residential wood combustion to make sure these activities do not make air quality unhealthy.

As part of the District's long-term efforts to improve public health, air monitors collect samples that are rigorously analyzed by laboratory technicians and District staff. This data determines the Valley's attainment status for the U.S. Environmental Protection Agency's (EPA) health-based air quality standards. This data is also the foundation of the District's air quality attainment plans (such as the *2007 Ozone Plan*, the *2008 PM2.5 Plan*, and upcoming plans) and the studies that contribute to these plans. These monitoring data are fundamental in the Valley's effort to achieve improved air quality and attainment of EPA's health-based standards as quickly as possible.

The San Joaquin Valley covers an area of 23,490 square miles, and the area is home to one of the most challenging air quality problems in the nation. The Valley is nonattainment for federal PM2.5 and ozone standards, is in attainment of the federal standards for lead, nitrogen dioxide, sulfur dioxide, and carbon monoxide. In addition, the Valley is an attainment/maintenance area for PM10. The Valley is home to approximately 4 million residents, and includes several major metropolitan areas, vast expanses of agricultural land, industrial sources, highways, and schools. This expansive and diverse area comprises many air quality needs, yet there are limited financial and personnel resources for air quality monitoring.

Despite these limitations and challenges, the District maintains a robust air monitoring program. The District follows federal monitoring requirements and guidelines to ensure an efficient and effective monitoring network. This monitoring network plan describes the District's approach for implementing federal air monitoring and quality control requirements and summarizes recent and upcoming changes to the monitoring network. As specified in 40 CFR 58.10(a), this plan is made available for public inspection at least 30 days prior to submission to EPA.

Introduction: What's required in this monitoring network plan

Annual monitoring network plans review a region's existing and proposed monitoring network in compliance with 40 CFR (Code of Federal Regulations) 58.10 as well as requirements linked to the District's EPA 105 Grant. The annual monitoring network plans are updated and submitted to the EPA Regional Administrator each year, and each plan must be made available for public inspection for at least 30 days prior to submission to EPA. The plans are to provide for the establishment and maintenance of an air monitoring network that may include the following types of stations and equipment:

Abbreviation	Full Name	Description
ARM	Approved Regional Method	A method that has been approved within a specific region for comparison to federal air quality standards. *There are no ARM monitors in the San Joaquin Valley.*
FEM	Federal Equivalent Method	These monitors are considered to be equivalent to FRM monitors for the purpose of determining compliance with EPA's health-based air quality standards.
FRM	Federal Reference Method	EPA defines how these monitors are to work, how they are to be engineered, and how they are to measure pollutants. These monitors are used to determine compliance with EPA's health-based air quality standards.
NCore	National Core	Multipollutant monitoring stations; in California, these are operated by the California Air Resources Board (ARB)
PAMS	Photochemical Assessment Monitoring Station	VOC (volatile organic compounds) speciation sites used in serious, severe, or extreme ozone nonattainment areas for precursor evaluation.
SLAMS	State and Local Air Monitoring Station	Monitoring sites that are used for determinations of compliance with federal air quality standards, though they may be used for other purposes as well
SPM	Special Purpose Monitor	Not included when showing compliance with the minimum air monitoring requirements; an example might include a temporary monitoring station set up in an area to measure short term air quality impacts of a source.
STN	Speciated Trends Network	PM2.5 speciation stations that provide chemical speciation data of PM

The monitoring network plan should include a statement of purpose for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of 40 CFR part 58. The plan must contain the following information for each existing and proposed site (40 CFR 58.10 (b)):

- AQS (air quality system) site identification number
- Locations: street address and geographical coordinates
- The MSA, CBSA, CSA, or other area represented by the monitor. MSA, CBSA, and CSA are statistical-based definitions for metropolitan areas provided by the Office of Management and Budget and the Census Bureau (see Table 1):
  - MSA: Metropolitan statistical area
  - CBSA: Core-based statistical area
  - CSA: Combined statistical area
- Sampling and analysis methods for each measured parameter
- Operating schedules for each monitor
- Monitoring objective and spatial scale of representativeness for each monitor (as defined in Appendix D to 40 CFR 58)
- Any proposals to remove or move a monitoring station within 18 months of a plan submittal. Any proposed additions and discontinuations of SLAMS monitors are subject to approval according to 40 CFR 58.14

Table 1 SJV Areas of Representation

Title	***Code***
Combined Statistical Area (CSA)	**CSA Code**
Fresno-Madera CSA	260
Metropolitan Statistical Area (MSA)	**Core-based Statistical Area (CSBA) Code**
Bakersfield [1]	12540
Fresno	23420
Hanford-Corcoran	25260
Madera	31460
Merced	32900
Modesto	33700
Stockton	44700
Visalia - Porterville	47300
Counties	**Federal Information Processing Standard (FIPS) Code**
Fresno	06019
Kern	06029
Kings	06031
Madera	06039
Merced	06047
Stanislaus	06099
San Joaquin	06077
Tulare	06107

[1] Monitors from both the San Joaquin Valley Air District and the Kern County Air Pollution Control District are counted in determining compliance with minimum monitoring requirements for the Bakersfield MSA.

There are several network plan requirements that pertain specifically to PM2.5 monitoring. For example, the monitoring network plan must identify which sites are suitable and which are not suitable for comparison against the annual PM2.5 national ambient air quality standards (NAAQS) as described in 40 CFR 58.30. The plan must also document how agencies provide for public review of changes to the PM2.5 monitoring network when the change impacts the location of a violating PM2.5 monitor

or the creation/change to a community monitoring zone. This should include a description of the proposed use of spatial averaging for purposes of making comparisons to the annual PM2.5 NAAQS as required in Appendix N to part 50. Agencies should submit any public comments received from PM2.5 monitoring changes in the submittal of the network plan.

In addition, a network assessment must be completed every five years to demonstrate that the monitoring network meets monitoring objectives, whether any sites are no longer needed, whether new technologies might be appropriate. The first assessment is due July 1, 2010. The District engaged a consultant to complete this analysis, which was finalized in the fall of 2009 (this analysis is attached as Appendix C). This comprehensive review is reflected in the 2010 Monitoring Network Plan.

Table 2 SJV 2009 Population

County	Total County Population	Major Urban Area Pop > 100,000	Urban Area Pop. < 100,000 and > 50,000
Fresno	942,298	Fresno	Clovis
Kings	154,743		Hanford
Madera	152,331		Madera
Merced	256,450		Merced
San Joaquin	689,480	Stockton	Lodi, Manteca, Tracy
Stanislaus	526,383	Modesto	Turlock
Tulare	441,481	Visalia	Porterville, Tulare
Kern (Valley Portion)	686,967	Bakersfield	Delano
SJV Total	**3,850,133**		

Data from California Department of Finance E-4 Population Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark. Estimates for 1/1/2009.

What an Air Monitor Represents

Each air monitor is sited to satisfy at least one of three specific objectives, represent generally consistent pollution concentrations, and represent a specific geographic scale.

Appendix D to 40 CFR Part 54 identifies three basic **monitoring objectives**:

- Provide air pollution data to the general public in a timely manner (**timely/public**)
- Support compliance with ambient air quality standards and emissions strategy development (**standards/strategy**)
- Support for air pollution research studies (**research support**)

Appendix D then identifies several general monitoring **site types** to meet the objectives:

- Sites located to determine the **highest concentrations** in the area covered by the network
- **Population oriented** sites to measure typical concentrations in areas of high population density
- **Source impact** sites to determine the impact of significant sources or source categories on air quality
- **General/background sites** determine background concentration levels
- **Regional transport sites** located to determine the extent of regional pollutant transport among populated areas and in support of secondary standards
- Sites located to measure air pollution impacts on visibility, vegetation damage, or other **welfare-related** impacts

Appendix D also identifies several scales of spatial representativeness, described in terms of physical dimensions of the air parcel or zone where air quality is expected to be reasonably consistent around the monitor. The monitor thus represents that area, not just the point of the monitor. The **spatial scales** are:

- **Microscale**: an area ranging from several meters up to about 100 meters
- **Middle scale**: an area covering between about 100 meters to 0.5 kilometers
- **Neighborhood scale**: covering an area between 0.5 and 4.0 kilometers in range
- **Urban scale**: covering an area of city-like dimensions, from about 4 to 50 kilometers
- **Regional scale**: covering a rural area of reasonably homogeneous geography without large sources, extending from tens to hundreds of kilometers
- **National and global scales**: representing concentrations characterizing the nation and the globe as a whole.

Table 3 summarizes all the ambient air monitoring sites in the San Joaquin Valley Air Basin. It should be noted that in addition to the monitoring sites discussed in this monitoring network plan, ARB operates two special purpose monitors in the Valley, Lodi East and Lodi West.

New monitoring stations and new monitors must meet EPA siting criteria. A particular site might be appropriate for one or more pollutants. Some sites might be appropriate for all air pollutant monitoring, while other sites might only be appropriate for a particular pollutant. The San Joaquin Valley Air District balances a wide range of pollutant siting criteria, spatial scales, monitoring objectives, and practical concerns as it plans and operates its monitoring network.

Table 3 Ambient Air Monitoring Sites in the San Joaquin Valley Air Basin (Summary)

As of June 1, 2010

MSA, County	Site Name	AIRS	Agency	Address	Pollutants Monitored
Fresno, Fresno	Clovis-N Villa Avenue	60195001	SJV APCD	908 N. Villa Av, Clovis CA 93612	Ozone, PM10 FRM, PM2.5 BAM/FEM, PM2.5 FRM, CO, NO2, NMHC, NMOC (PAMS), wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Fresno - Drummond Street	60190007	SJV APCD	4706 E. Drummond Street, Fresno CA 93725	Ozone, PM10 FRM, CO, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
	Fresno - First Street	60190008	ARB	3425 N. First St, Fresno CA 93726	Ozone, PM10 FRM, PM10 BAM, PM2.5 FRM, PM2.5 BAM, CO, NO2, SO2, toxics, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure
	Fresno - Pacific	60195025	SJV APCD	1716 Winery, Fresno CA 93726	PM2.5 FRM
	Fresno - Skypark	60190242	SJV APCD	4508 Chennault Ave, Fresno CA 93722	Ozone, CO, NO2, wind speed, wind direction, outdoor temperature
	Huron	60192008	SJVAPCD	16875 4th Street, Huron, CA 93234	PM2.5 BAM
	Parlier	60194001	SJVAPCD	9240 S. Riverbend Av, Parlier CA 93648	Ozone, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Tranquillity	60192009	SJVAPCD	32650 West Adams, Tranquillity CA 93668	Ozone, PM2.5 BAM FEM, wind speed, wind direction, outdoor temperature, barometric pressure
Bakersfield, Kern	Arvin	60295001	SJVAPCD and ARB	20401 Bear Mountain Blvd, Arvin CA 93203	Ozone, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Bakersfield - Airport - Planz	60290016	ARB	401 E. Planz Rd., Bakersfield CA 93307	PM2.5 FRM

MSA, County	Site Name	AIRS	Agency	Address	Pollutants Monitored
	Bakersfield-California Avenue	60290014	ARB	5558 California, Bakersfield CA 93309	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM/FEM, NO2, toxics, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Bakersfield-Muni[1]		SJVAPCD		Ozone, PM10 FRM, PM10 TEOM, PM2.5 FRM, PM2.5 BAM, CO, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Edison	60290007	ARB	Johnson Farm-Shed Rd, Edison CA 93320	Ozone, NO2, wind speed, wind direction, outdoor temperature
	Lebec	60292009	SJVAPCD	Beartrap Road (no #), Lebec, CA 91350	PM2.5 BAM, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Maricopa	60290008	SJVAPCD	755 Stanislaus Street, Maricopa CA 93352	Ozone, wind speed, wind direction, outdoor temperature, barometric pressure
	Oildale	60290232	ARB	3311 Manor St, Oildale CA 93308	Ozone, PM10 FRM, wind speed, wind direction, outdoor temperature
	Shafter	60296001	SJVAPCD and ARB	578 Walker St, Shafter CA 93263	Ozone, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
Hanford – Corcoran, Kings	Corcoran-Patterson Avenue	60310004	SJVAPCD	1520 Patterson Av, Corcoran CA 93212	Ozone, PM10 FRM, PM10 TEOM, PM2.5 FRM, PM2.5 BAM, wind speed, wind direction, outdoor temperature, barometric pressure
	Hanford-S Irwin Street	60311004	SJVAPCD	807 S Irwin St, Hanford CA 93230	PM10 FRM
	Santa Rosa Rancheria		Tachi-Yokut		Ozone, PM10, meteorology
Madera, Madera	Madera - Pump Yard	60390004	SJVAPCD	Av 8 and Road 29 1/2, Madera CA 93637	Ozone, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
Merced, Merced	Merced - Coffee Road	60470003	SJVAPCD	385 S. Coffee St., Merced CA 95340	Ozone, PM2.5 BAM FEM, NO2, wind speed, wind direction, outdoor temperature

MSA, County	Site Name	AIRS	Agency	Address	Pollutants Monitored
	Merced M Street	60472510	SJVAPCD	2334 M Street, Merced CA 95340	PM10 FRM, PM2.5 FRM
Stockton, San Joaquin	Stockton-Hazelton	60771002	ARB	1593 E Hazelton St, Stockton CA 95205	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM, CO, NO2, toxics, wind speed, wind direction, outdoor temperature, relative humidity
	Stockton-Wagner-Holt School	60773010	SJVAPCD	8778 Brattle Pl, Stockton CA 95209	PM10 FRM
	Tracy-Airport	60773005	SJVAPCD	5749 S. Tracy Blvd., Tracy CA 95376	Ozone, PM10 TEOM, PM2.5 BAM, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
Modesto, Stanislaus	Modesto-14th Street	60990005	ARB	814 14th Street, Modesto CA 95354	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM, CO, wind speed, wind direction, outdoor temperature, barometric pressure
	Turlock	60990006	SJVAPCD	1034 S Minaret St, Turlock CA 95380	Ozone, PM10 FRM, PM2.5 BAM FEM, CO, NO2, wind speed, wind direction
Visalia – Porterville, Tulare	Sequoia -Ash Mountain	61070009	National Park Service (NPS)	Ash Mountain, Sequoia National Park CA	Ozone, PM2.5 FRM, PM2.5 BAM, wind speed, wind direction, outdoor temperature, relative humidity, solar radiation
	Sequoia -Lower Kaweah	61070006	National Park Service (NPS)	Lower Kaweah Campground, Sequoia National Park, CA	Ozone, wind speed, wind direction, outdoor temperature, relative humidity, solar radiation
	Visalia-Airport	61073000	SJVAPCD	Airport, Visalia CA 93291	wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Visalia - Church	61072002	ARB	310 N. Church St, Visalia CA 93291	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM, NO2, wind speed, wind direction, outdoor temperature, barometric pressure

[1] Bakersfield – Golden (AIRS 60290010) was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

Ozone

Ozone is formed when its precursors (oxides of nitrogen (NOx) and volatile organic compounds (VOC)) chemically react in the presence of sunlight. The Valley's topography, low precipitation levels, high temperatures, subsidence inversions, and light winds are conducive to elevated ozone levels. Winds (at ground level or at higher altitudes) transport pollutants from other basins into the Valley, within the Valley to areas downwind, and from the Valley into other regions.

Ozone formation and transport has been studied in the Valley for many years. One of the more recent efforts has been the Central California Ozone Study (CCOS), which includes most of northern California and all of central California. CCOS monitoring was conducted during the summer of 2000. Emission inventory development, data analysis, and modeling are complete. New tools and assessments, such as cluster analysis, are being conducted to gain further value from the developments of CCOS. The District expects that the final CCOS analysis will by synthesized into a report in 2012 to update the conceptual understanding of ozone. CCOS work is directed by the Policy and Technical Committees, comprised of representatives from federal agencies, ARB, the California Energy Commission, local air pollution agencies, researchers, and industry and sponsoring organizations. CCOS results have been used in the development of attainment plans, such as the District's *2007 Ozone Plan* and for the improvement of forecasting tools, which are used on a daily basis.

More recently, the District has been involved in CalNex 2010, which is a major climate and air quality field study in California conducted by the National Oceanic and Atmospheric Administration (NOAA) and the California Air Resources Board (ARB), with the participation of numerous academic researchers. It will occur in May and June of 2010. NOAA's deployment of two aircraft in the state for 4 to 6 weeks will generate a dataset of unprecedented chemical completeness, spatial extent and temporal resolution. The presence of the research vessel Atlantis will provide data about the emissions and impacts of shipping off California's coast. The study will answer important scientific questions about emissions, chemical transformations, climate processes, transport, and meteorology in California. The air quality and meteorological data collected during CalNex will improve ARB's emission inventories of greenhouse gases, traditional air pollutants and precursors. In addition the study would improve ARB's air quality models used in SIP development and our understanding of the atmospheric formation of ozone and PM.

The Valley's SLAMS ozone monitors are continuous analyzers that detect ozone through ultraviolet absorption. As continuous devices, these monitors meet the "Timely/Public" objective, providing District staff with the data used in AQI forecasting and reporting. Ozone monitoring site requirements are based on MSA population and on design values based on MSA, as shown in Table 4. Table 5 shows that the Valley's ozone network meets the requirements of Table 4. Sites are intended to represent population exposures and maximum concentrations, so most ozone monitors are

represent neighborhood or urban scale measurements. Table 6 shows the Valley's ozone monitoring sites.

PAMS

The monitoring objective of Photochemical Assessment Monitoring Stations is research support. Federal regulations (Clean Air Act Section 182 and 40 CFR 58) require serious, severe, and extreme ozone nonattainment areas to have PAMS sites to take speciated measurements of ozone precursors and allow for better understanding of the effect of precursors, control measures, and photochemistry on ozone formation. PAMS sites measure ozone, NOx, speciated VOC (NMOC and NMHC), CO, and meteorology concurrently.

There are four classifications of PAMS sites:

- Type 1: Background sites upwind of urban areas, where ozone concentrations are presumed not to be influenced by nearby urban emissions
- Type 2: Maximum ozone precursor emissions sites, typically located in an urban center, where emissions strengths are the greatest
- Type 3: Maximum ozone concentration sites, intended to show the highest ozone concentrations
- Type 4: Extreme downwind monitoring sites, which are expected to capture concentrations of transported pollutants but have lower ozone concentrations due to a lack of more local emissions sources (currently not required for the SJV)

The District has a total of six PAMS sites configured as two small networks, one centered on Fresno and one on Bakersfield (see Table 7). The PAMS program operates from June 1 through August 31 every year on a 1 in 3 day sampling schedule. At least four, three-hour integrated samples are collected each sampling day, referred to as a "Trend Day." However, additional samples are collected on "Episode Days," days that are forecasted to have high ozone concentrations. The goal is to sample on three to five multi-day episodes in an ozone season.

Table 4 SLAMS Minimum Ozone Monitoring Requirements (Table D-2 of Appendix D to Part 58)

MSA population, based on latest available census figures	Number of monitors required if:	
	Most recent 3-year design value concentrations ≥85% of any ozone NAAQS	Most recent 3-year design value concentrations <85% of any ozone NAAQS
> 10 million	4	2
4 – 10 million	3	1
350,000 – < 4 million	2	1
50,000 – < 350,000	1	0

Table 5 Ozone Requirements for the San Joaquin Valley

Metropolitan Statistical Area (MSA)	2009 Population	Highest 2006-2008 Ozone Design Value in MSA (ppb)[1]	≥85% of 2008 ozone NAAQS (75 ppb)[1]	Number of monitors required (Table 4)	Number of active SLAMS ozone monitors
Bakersfield	827,173 [2]	105	Yes	2	7 [2]
Fresno	942,298	100	Yes	2	5
Hanford-Corcoran	154,743	87	Yes	1	1
Madera	152,331	84	Yes	1	2
Merced	256,450	89	Yes	1	1
Modesto	526,383	89	Yes	2	2
Stockton	689,480	83	Yes	2	2
Visalia - Porterville	441,481	103	Yes	2	2

[1] These data are preliminary. Air quality data may include data influenced by exceptional events and/or data completeness and substitution requirements.

[2] The population listed for Bakersfield here reflects the population for all of Kern County, not just the Valley portion. Air monitors in the Eastern Kern Air District would count towards the monitors required for the Bakersfield MSA. However, the "Number of active ozone monitors" listed here includes those in the San Joaquin Valley Air Basin only.

Table 6 San Joaquin Valley Ozone Monitors, SLAMS and SPM

As of June 1, 2010

MSA	County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective
SLAMS							
Fresno	Fresno	Clovis	60195001	SJVAPCD	Neighborhood	Population	All sites meet the objectives of: • Timely/public • Standards/ strategy • Research support
		Fresno – Drummond	60190007	SJVAPCD	Neighborhood	Population, Regional transport	
		Fresno – First	60190008	ARB	Neighborhood	Population	
		Fresno – Skypark	60190242	SJVAPCD	Neighborhood	Population, Regional transport	
		Parlier	60194001	ARB	Neighborhood	High Concentration, Regional transport	
Bakersfield	Kern	Arvin	60295001	ARB and SJVAPCD	Neighborhood	High Concentration, Regional transport	
		Bakersfield – California	60290014	ARB	Neighborhood	Population	
		Bakersfield – Muni[2]	60290010	SJVAPCD	Neighborhood	Population	
		Edison	60290007	ARB	Neighborhood	High concentration, regional transport	
		Maricopa	60290008	SJVAPCD	Neighborhood	regional transport	
		Oildale	60290232	ARB	Neighborhood	regional transport	
		Shafter	60296001	ARB and SJVAPCD	Neighborhood	General/background	
Hanford-Corcoran	Kings	Hanford [1]	60311004	SJVAPCD	Neighborhood	Population	
Madera	Madera	Madera – Pump Yard	60390004	SJVAPCD	Neighborhood	General/background	
		Madera City	60392010	SJVAPCD	Neighborhood	Population	

MSA	County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective
Merced	Merced	Merced – Coffee	60472510	SJVAPCD	Neighborhood	Population	
Stockton	San Joaquin	Stockton – Hazelton	60771002	ARB	Neighborhood	Population	
		Tracy - Airport		SJVAPCD	Neighborhood	Regional transport	
Modesto	Stanislaus	Modesto – 14th	60990005	ARB	Neighborhood	Population	
		Turlock	60990006	SJVAPCD	Neighborhood	Population	
Visalia - Porterville	Tulare	Visalia – Church	61072002	ARB	Neighborhood	Population	
		Porterville	61072010	SJVAPCD	Neighborhood	Population	
SPM							
Fresno	Fresno	Tranquillity	60192009	SJVAPCD	Urban Scale	Population	Timely/public
Hanford-Corcoran	Kings	Santa Rosa Rancheria		Tachi-Yokut Tribe			
Visalia - Porterville	Tulare	Ash Mountain – Sequoia National Park	61070009	NPS	Regional	Regional transport	
		Lower Kaweah – Sequoia National Park	61070006	NPS	Regional	Regional transport	

[1] Shutdown of the Corcoran ozone monitor occurred in November 2009. The monitor was reinstalled at reconstructed Hanford monitoring site in February 2010. During the months in between, the monitor was serviced, calibrated and tested.

[2] Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

Table 7 SJV PAMS sites
As of June 1, 2010

Fresno MSA	Type 1: Upwind/Background site	Madera-Pump Yard
	Type 2: Maximum precursor emissions	Clovis-Villa
	Type 3: Maximum ozone concentrations	Parlier
Bakersfield MSA	Type 1: Upwind/Background site	Shafter-Walker
	Type 2: Maximum precursor emissions	Bakersfield-Muni [1]
	Type 3: Maximum ozone concentrations	Arvin

[1] Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

Particulate Matter (PM)

Particulate matter (PM) can be emitted directly as primary PM, and it can form in the atmosphere through chemical reactions of precursors to form secondary PM. Primary PM can be emitted either naturally (windblown dust and wildfires) or from human (anthropogenic) activity: agricultural operations, industrial processes, combustion of wood and fossil fuels, construction and demolition activities, and entrainment of road dust. The resulting ambient PM mixture includes aerosols consisting of components of nitrates, sulfates, elemental carbons, organic carbon compounds, acid aerosols, trace metals, geological materials, etc.

Under current regulations, particulate matter (PM) is differentiated by particle size as opposed to composition. State and federal air quality standards differentiate two size fractions of PM: PM that is 10 microns or less in diameter (PM10) and the smaller subset that is 2.5 microns or less in diameter (PM2.5). The San Joaquin Valley is designated nonattainment for PM2.5. The San Joaquin Valley has been redesignated to attainment for PM10, and the District's *2007 PM10 Maintenance Plan* and ongoing PM10 monitoring will assure continued compliance with federal standards.

The Valley's surrounding mountain ranges contribute to PM retention. Over the summer, long periods with little or no rainfall result in extreme drying of soils, increasing emissions from traffic movement and mechanical disturbance. Winter brings rainfall, but also creates an atmospheric environment that forms more secondary particulates. The Valley's frequent and severe temperature inversions block the normal rising air and traps particulates close to the ground, especially during the winter months.

The Valley's comprehensive particulate field study is the California Regional Particulate Air Quality Study (CRPAQS). CRPAQS monitoring occurred between December 1999 and February 2001 through the use of over 70 SPM PM10 sites and 50 SPM PM2.5 sites. Researchers have used CRPAQS measurements for database development, analysis, and modeling. A final report synthesizing all CRPAQS analysis and updating the conceptual understanding of particulates is expected to be completed in 2012. In addition to CRPAQS, other studies assess particulate emissions from agricultural operations, unpaved and paved road particulate emissions, and particulate formation in fog episodes. The design of the Valley's current PM network is an outgrowth of the results and analysis from CRPAQS.

The Valley's PM monitoring network includes Federal Reference Method (FRM) monitors, Federal Equivalent Method (FEM) monitors, Beta Attenuation Monitors (BAM), and Tapered Element Oscillating Microbalance (TEOM). FRM monitors for PM are manual filter-based monitors; samples are collected on an either one-in-six day sampling schedule or a one-in-three day sampling schedule. FRM monitors meet the "Standards/Strategy" objective, helping agencies determine the Valley's attainment status and helping shape the strategies for reaching or maintaining PM attainment. FRM filters can also be analyzed for PM speciation, so they are sometimes used for "Research Support" objectives as well.

BAMs and TEOMs are continuous, near real-time monitors that provide the hourly PM data used in AQI and Smoke Management System (SMS) forecasting. Data from these monitors are also reporting in hazard reduction burning allocations and in residential wood burning declarations. As such, these monitors help meet the "Timely/Public" objective.

Not all real-time monitors meet the "Standards/Strategy" objective because they do not meet the rigorous engineering design, quality assurance, and quality control standards necessary for comparison to the NAAQS. An FEM monitor is often a real-time monitor that has been designated by EPA as being equivalent to FRM monitors. FEMs satisfy both the "Standards/Strategy" objective and the "Timely/Public" objective. All of the Valley's TEOMs are FEMs, and some of the Valley's BAMs are FEMs.

Table 8 shows the minimum number of PM10 sites required per MSA, and Table 9 shows the minimum number of PM2.5 sites required per MSA. Table 10 applies the requirements of Tables 8 and 9 to the Valley. Tables 11 and 12 summarize the Valley's SLAMS and SPM PM monitoring stations, respectively.

Table 8 Minimum PM10 Monitoring Requirements (Table D-4 of Appendix D to Part 58)

(A range is presented, and the actual number of stations per area is jointly determined by EPA, the State, and the local agency)

Population category	**High concentration:** Ambient concentrations exceed the PM10 NAAQS by 20% or more **(≥180 µg/m³)**	**Medium concentration:** Ambient concentrations exceed 80% of the PM10 NAAQS **(>120 µg/m³)**	**Low concentration:** Ambient concentrations less than 80% of the PM10 NAAQS **(< 120 µg/m³)**, or no design value
> 1,000,000	6 – 10	4 – 8	2 – 4
500,000 – 1,000,000	4 – 8	2 – 4	1 – 2
250,000 – 500,000	3 – 4	1 – 2	0 – 1
100,000 – 250,000	1 – 2	0 – 1	0

Table 9 Minimum PM2.5 Monitoring Requirements

MSA population	**Most recent 3-year design value ≥85% of any PM2.5 NAAQS** (equivalent to an annual design value ≥ 12.8 µg/m³ or a 24-hour design value ≥ 29.8 µg/m³)	**Most recent 3-year design value <85% of any PM2.5 NAAQS** (equivalent to an annual design value < 12.8 µg/m³ or a 24-hour design value < 29.8 µg/m³), or no design value
> 1,000,000	3	2
500,000 – 1,000,000	2	1
50,000 - < 500,000	1	0

Table 10 PM Monitoring Requirements and SLAMS monitors for the Valley

Metropolitan Statistical Area (MSA)	County	2009 Population	PM10			PM2.5			
			24-hour 2009 Highest concen-tration in MSA (µg/m³) [1]	Monitors required	Actual # of primary SLAMS sites in MSA	24-hour 2007-2009 Design Value in MSA (µg/m³) [1]	Annual 2007-2009 Design Value in MSA (µg/m³)	Monitors required	Actual # of primary SLAMS sites in MSA
Bakersfield	Kern	827,173 [2]	138	2 – 4	3	76	21.5	2	2
Fresno	Fresno	942,298	84	1 – 2	3	58	16.3	2	3
Hanford-Corcoran	Kings	154,743	121	0 – 1	2	51	17.2	1	2
Madera	Madera	152,331	-	0	1	-	-	0	1
Merced	Merced	256,450	64	0	1	48	14.1	1	1
Modesto	Stanislaus	526,383	65	1 – 2	2	54	14.0	2	2
Stockton	San Joaquin	689,480	61	1 – 2	3	45	12.2	2	1 (with 1 planned)[3]
Visalia - Porterville	Tulare	441,481	92	0 - 1	1	57	18.2	1	1

[1] These data are preliminary. Air quality data may include data influenced by exceptional events and/or data completeness and substitution requirements.

[2] The population listed for Bakersfield here reflects the population for all of Kern County, not just the Valley portion. Air monitors in the Eastern Kern Air District would count towards the monitors required for the Bakersfield MSA. However, the "Actual # of monitors in MSA" listed here includes those in the San Joaquin Valley Air Basin only.

[3] The Manteca site is tentatively scheduled to begin operation in October 2010 to meet this requirement.

Table 11 PM SLAMS monitors in the Valley

As of June 1, 2010

MSA, County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective	Size Fraction		Instru-ment type	Sampling Schedule
							PM10	PM2.5		
Fresno, Fresno	Fresno Pacific – Winery	60195025	SJVAPCD	Neighborhood	Population	Standards/ strategy, research support		**X**	FRM	1 in 3 day or 1 in 6 day (seasonal)
	Fresno Drummond	60190007	SJVAPCD	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
	Fresno – First Street	60190008	ARB	Neighborhood	High Concentration	Standards/ strategy, research support	X		FRM	1 in 6 day
						Timely/public	X		BAM	1-Hour
						Timely/public		X	BAM	1-Hour
						Standards/ strategy, research support		**X**	FRM	Daily
	Clovis - Villa	60195001	SJVAPCD	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
						Timely/public		X	BAM FEM	1-Hour

MSA, County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective	Size Fraction		Instru-ment type	Sampling Schedule
							PM10	PM2.5		
Bakersfield, Kern	Oildale	60290232	ARB	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
	Bakersfield – California Ave	60290014	ARB	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
						Timely/public	X		BAM FEM	1-Hour
						Timely/public		X	BAM FEM	1-Hour
						Standards/ strategy, research support		**X**	FRM	Daily
	Bakersfield – Muni[1]	*pending*	*SJVAPCD*	*Neighborhood*	*High Concentration*	*Standards/ strategy, research support*	*X*		*FRM*	*1 in 6 day*
						Timely/public	*X*		*TEOM*	*1-Hour*
	Bakersfield – Planz	60290016	ARB	Neighborhood	Population	Standards/ strategy, research support		**X**	FRM	1 in 3 day

MSA, County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective	Size Fraction		Instru-ment type	Sampling Schedule
							PM10	PM2.5		
Hanford/ Corcoran, Kings	Hanford	60311004	SJVAPCD	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
						Timely/public	X		TEOM	1-hour
						Timely/public		x	BAM	1-hour
	Corcoran – Patterson	60310004	SJVAPCD	Neighborhood	High Concentration	Timely/public	X		TEOM	1-Hour
						Standards/ strategy, research support	X, X col-locat-ed		FRM	1 in 3 day
						Standards/ strategy, research support		**X**	FRM	1 in 3 day or 1 in 6 day (seasonal)
Madera, Madera	Madera City	60392010	SJVAPCD	Neighborhood	Population	Timely/public	X		TEOM	1-hour
						Timely/public		x	BAM FEM	1-hour
Merced, Merced	Merced – M Street	60472510	SJVAPCD	Neighborhood	Representative concentration	Standards/ strategy, research support	X		FRM	1 in 6 day
						Standards/ strategy, research support		**X**	FRM	1 in 3 day or 1 in 6 day (seasonal)

MSA, County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective	Size Fraction		Instru-ment type	Sampling Schedule
							PM10	PM2.5		
Stockton, San Joaquin	Stockton Hazelton	60771002	ARB	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
						Timely/public		X	BAM	1-Hour
						Standards/ strategy, research support		**X**	FRM	1 in 3 day
	Stockton – Wagner – Holt	60773010	SJVAPCD	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
	Tracy – Airport	60773005	SJVAPCD	Neighborhood	Regional transport	Timely/public	X		TEOM	1-Hour
Modesto, Stanislaus	Modesto – 14th	60990005	ARB	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
						Timely/public		X	BAM	1-Hour
						Standards/ strategy, research support		**X**	FRM	1 in 3 day
	Turlock	60990006	SJVAPCD	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day

MSA, County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective	Size Fraction		Instru-ment type	Sampling Schedule
							PM10	PM2.5		
						Timely/public		X	BAM FEM	1-Hour
Visalia - Porterville, Tulare	Visalia - Church	61072002	ARB	Neighborhood	Population	Standards/ strategy, research support	X		FRM	1 in 6 day
						Timely/public		X	BAM	1-Hour
						Standards/ strategy, research support		X	FRM	1 in 3 day

[1] Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

Table 12 PM SPM monitors in the Valley
As of June 1, 2010

MSA, County	Site	AIRS Code	Agency	Scale	Site Type	Monitoring Objective	Size Fraction		Instru-ment type	Sampling Schedule
							PM10	PM2.5		
Fresno, Fresno	Huron	60192008	SJVAPCD	Neighborhood	Population	Timely/public		X	BAM	1-Hour
	Tranquillity	60190009	SJVAPCD	Urban	Urban	Timely/public		X	BAM	1-Hour
Bakersfield, Kern	Bakersfield - Muni [1]	60290010	SJVAPCD	Neighborhood	High Concentration	Timely/public		X	BAM	1-Hour
	Lebec	60292009	SJVAPCD	Neighborhood	Population	Timely/public		X	BAM	1-Hour
Hanford/ Corcoran, Kings	Corcoran-Patterson	60310004	SJVAPCD	Neighborhood	High Concentration	Timely/public		X	BAM	1-Hour
Merced, Merced	Merced-Coffee	60470003	SJVAPCD	Neighborhood	Population	Timely/public		X	BAM	1-Hour
Stockton, San Joaquin	Tracy-Airport	60773005	SJVAPCD	Neighborhood	Regional transport	Timely/public		X	BAM	1-Hour
Visalia - Porterville, Tulare	Ash Mountain (Sequoia National Park)	61070009	National Park Service	Regional	Regional transport	Research support		X	FRM	1 in 6 day
						Timely/public		X	BAM	1-Hour

[1] Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

PM Collocation Requirements
(40 CFR 58 Appendix A, Sections 3.2.5 and 3.2.6)

Monitors are said to be collocated if these monitors are at the same monitoring site, measure the same pollutant, and are the same type of instrument. Monitors are said to be parallel when these monitors are at the same monitoring site and measure the same pollutant but use different types of instruments (such as an FRM paired with a BAM). Monitors that measure the same pollutant with the same technique but at different monitoring sites are also said to be parallel. Collocation requirements are based on a "primary quality assurance organization" (PQAO), not on individual air basis. ARB is the PQAO for the Valley as well as several other air basins, so ARB must meet collocation requirements for the PQAO as a whole.

In a network of manual PM10 FRMs, 15% of the monitors should have collocated sampling, with at least one collocated pair. These collocated monitors should be at sites recording annual PM10 concentrations in the highest 25% of all sites in the network, or at EPA-selected sites.

If an area is using PM10-2.5 FEMs, then the Regional EPA Administrator will select the sites for collocated PM10 monitoring. An area should have 15% of its FEM PM10-2.5 monitors collocated, with at least 2 collocated pairs. With 2 collocated pairs, one should be two FRM monitors, and the other pair should be two FEM monitors (and these pairs can be at the same monitoring site). The District currently does not have any monitors in the PM10-2.5 size range, and none are required.

EPA's PM2.5 monitoring collocation requirements indicate that 15% of all FRM or FEM monitors in an area must be collocated, with at least 1 collocated pair. For each collocated pair, one PM2.5 sampler is designated as the primary monitor for air quality reporting, and the other PM2.5 monitor is an audit monitor. All primary collocated monitors using FRM monitoring just be collocated with FRM audit monitors. Of all the primary collocated monitors using FEM monitoring, half must collocated with an FEM audit monitor, and half must be paired with an FRM parallel audit monitor. If there is an odd number of FEM primary monitors, then the additional monitor should be paired with an FRM audit monitor.

Of all the collocated PM2.5 monitoring sites, 80% should be sites with annual average or daily PM2.5 concentrations within a range of ±20% of the NAAQS. So ideally, 80% of the collocated PM2.5 sites would be recording annual averages between 12 µg/m³ and 18 µg/m³ and daily PM2.5 concentrations between 28 µg/m³ and 42 µg/m³. However, if an area does not have enough sites that meet these criteria, then 60% of the collocated audit monitors should be at the sites with the highest PM2.5 concentrations (within the top 25% for the area).

Public Review of Changes to the PM2.5 Monitoring Network

The District is required to seek public input whenever proposing to move an existing violating PM2.5 monitor (40 CFR 58.10(c)). The District uses the annual Air Monitoring Network Plan to notify and seek comment from the public of any planned changes to the existing PM2.5 network. The public has 30 days to comment on the Monitoring Network Plan (and any PM2.5 network changes). The plan is posted in the District website, and public notice is published in a newspaper of general circulation in each affected CBSA. In the event of unanticipated changes to the PM2.5 network that occur outside the Monitoring Network Plan process, the District will post public notice in Valley newspapers, post a document describing the proposed changes on its website, and seek public comment.

Carbon Monoxide

Monitoring has shown that the Valley's CO concentrations have not exceeded the NAAQS for over a decade. As noted in section 4.2 of Appendix D of 40 CFR Part 58, there are no minimum requirements of the number of Carbon Monoxide (CO) monitoring sites. The District continues CO monitoring to supplement related meteorological and criteria pollutant data. The District has added a trace-level CO analyzer at Clovis and a trace level CO monitor to the Bakersfield-Golden site. Table 13 summarizes the Valley's CO monitoring sites.

Table 13 Carbon Monoxide Monitoring Stations in the San Joaquin Valley
As of June 1, 2010

Site Name	AIRS	Sampling Frequency	Scale	Site Type	Objective	Agency
Bakersfield-Muni[1]	060290010	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Clovis – Villa	060175001	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Fresno – Drummond	060190007	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Fresno – 1st	060190008	Continuous	Neighborhood	Population	Standards/ Strategy	ARB
Fresno – Sky Park	060190242	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Modesto – 14th Street	060990005	Continuous	Neighborhood	Population	Standards/ Strategy	ARB
Stockton – Hazelton	060771002	Continuous	Neighborhood	Population	Standards/ Strategy	ARB
Turlock - Minaret	060990006	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD

[1] Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

Nitrogen Dioxide

As noted in section 4.3 of Appendix D of 40 CFR Part 58, there are no minimum requirements of the number of NO_2 monitoring sites. Although the Valley does not exceed federal or state standards for NO_2, NOx reductions contribute to air quality improvement for both ozone and PM. NO/NOy measurements are collected at both the NCore multipollutant and PAMS sites to improve understanding of ozone photochemistry. Table 14 summarizes the Valley's NO_2 monitoring sites.

On January 22, 2010, EPA strengthened the health-based NAAQS for NO_2, setting a new 1-hour NO_2 standard at the level of 100 parts per billion (ppb). The monitoring requirements for this new standard will be based upon population of an area as well as the annual average daily traffic (AADT) count. Monitors are to be placed close to major roadways with the highest AADT counts. NO_2 monitors that are required under this new standard are to be operational by January 1, 2013. These requirements will be addressed in the 2011 Annual Monitoring Network Plan.

Table 14 NO_2 Monitoring Stations in the San Joaquin Valley
As of June 1, 2010

Site Name	AIRS	Sampling Frequency	Scale	Site Type	Objective	Agency
Arvin	060295001	Continuous	Neighborhood	Population	Standards/ Strategy, Research	ARB
Bakersfield – California	060290014	Continuous	Neighborhood	Population	Standards/ Strategy,	ARB
Bakersfield-Muni [1]	060290010	Continuous	Neighborhood	High Concentration	Standards/ Strategy, Research	SJV APCD
Clovis – Villa	060175001	Continuous	Neighborhood	High Concentration	Standards/ Strategy, Research	SJV APCD
Edison – Johnson Ranch	060290007	Continuous	Neighborhood	Population	Standards/ Strategy	ARB
Fresno – Drummond	060190007	Continuous	Neighborhood	High Concentration	Standards/ Strategy	SJV APCD
Fresno – 1st	060190008	Continuous	Neighborhood	Population	Standards/ Strategy	ARB
Fresno – Sky Park	060190242	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Madera – Pump Yard	060390004	Continuous	Neighborhood	Population	Standards/ Strategy,	SJV APCD

					Research	
Merced – Coffee	060470003	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Parlier	060194001	Continuous	Neighborhood	Population	Standards/ Strategy, Research	SJV APCD
Shafter – Walker Street	060296001	Continuous	Neighborhood	Population	Standards/ Strategy, Research	ARB
Stockton – Hazelton	060771002	Continuous	Neighborhood	Population	Standards/ Strategy	ARB
Tracy – Airport	060773005	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Turlock - Minaret	060990006	Continuous	Neighborhood	Population	Standards/ Strategy	SJV APCD
Visalia - Church	061072002	Continuous	Neighborhood	Population	Standards/ Strategy	ARB

[1] Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

Sulfur Dioxide

Section 4.4 of Appendix D of 40 CFR Part 58 notes that there are no minimum requirements of the number of SO_2 monitoring sites. The Valley does not exceed federal or state standards for SO_2. There is just one SO_2 monitoring site in the Valley, shown in Table 15.

Table 15 SO_2 Monitoring Station in the San Joaquin Valley
As of June 1, 2010

Site Name	AIRS	Sampling Frequency	Scale	Site Type	Objective	Agency
Fresno – 1st	060190008	Continuous	Neighborhood	Population	Standards/ Strategy	ARB

Lead

EPA revised the lead (Pb) NAAQS and monitoring requirements in the Federal Register on November 12, 2008 (73 FR 66964 – 67062, codified in 40 CFR 58.10). This would have required the District to install non-source oriented Pb monitors by January 1, 2011 in CBSAs that exceed a population of 500,000: the Stockton, Modesto, Fresno, and

Bakersfield. However, in response to a petition for reconsideration, EPA proposed changes to the lead monitoring requirements in December 2009 (74 FR 69050-69059).

EPA has proposed replacing the 500,000-population-CBSA requirement with an approach utilizing NCore sites. The District has thus suspended its previous lead monitoring plans. Once the proposed NCore-based lead monitoring approach is approved, EPA expects to require monitoring agencies to commence lead sampling at NCore sites no later than January 1, 2011. ARB would then be required to begin operating a lead monitor at the Fresno-First NCore site by January 2011.

Also, EPA is proposing to change the source-oriented lead monitoring requirements, lowering the threshold from 1.0 tons per year (tpy) to 0.5 tpy. The Valley has no sources at the 1.0 tpy threshold. EPA documentation suggested that the Valley had one lead source at the 0.5 tpy threshold. However, this information was based on old emissions inventory information, and the District has since determined that the source in question closed in 2003. Therefore, neither the original source-oriented monitoring requirements nor the proposed changes affect the Valley.

Toxics

Airborne toxic substances are monitored by the ARB at Bakersfield – California, Fresno – 1st Street, and Stockton – Hazelton. Periodic, 24-hour samples are analyzed for the following gases: benzene, carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, methyl chloroform, methylene chloride, perchloroethylene, toluene, trichloroethylene, and m-, p-, and o-xylene. The samples are also analyzed for the following particulate metals: arsenic and chromium-6. ARB's Integrated NMOC sampling program and the District's PAMS NMOC sampling program also identify and quantify several toxic hydrocarbon species.

Green House Gases

ARB is installing Picarro multi-gas analyzers (CO2, CH4, and water vapor) and a Teledyne-API 300 EU (CO) analyzer at the Madera-Pump, Tranquillity, and Arvin sites as part of its Green House Gases (GHG) monitoring program. While the data will not be submitted to AQS at this time, the data will be used by ARB's Research Division.

Meteorology

Data for a variety of meteorological variables are collected to aid in daily forecasting for weather conditions and air quality, exceptional events, long-term planning, and pollutant trend assessment. These forecasting activities help protect public health and have made the public and media more aware of air quality and what can be done to reduce

air pollution. See Table 16 for the meteorological parameters measured in the Valley. Forecasting activities include:

- Reporting and forecasting the AQI for ozone, PM2.5, and PM10 for each of the Valley's eight counties. These forecasts are transferred to EPA's AIRNOW.
- Agricultural burn emissions collection for more than 100 burn-zones.
- Issuance of Public Health Advisories and Health Cautionary Statements when required.
- Prescribed (controlled) burn planning in consultation with the California Department of Forestry, National Park Service, National Forest Service and local fire districts
- Residential wood burning declarations from November 1 through February 28
- Emergency consultations

NCore

EPA's October 2006 ambient air monitoring amendments established a requirement for National Core (NCore) multi-pollutant monitoring stations. An NCore plan was to be submitted to EPA, and NCore stations must be operational by January 1, 2011. EPA selected the Fresno-First Street air monitoring station (operated by ARB) as an NCore site.

ARB submitted an NCore plan to EPA in November 2009. Fresno-First Street already met NCore requirements for filter-based and continuous PM2.5, speciated PM2.5, ozone, and meteorology. To meet additional NCore requirements, ARB will be installing trace level CO, SO_2, and NO_y monitors at this site in 2010. ARB is also installing a gas dilution calibrator, a zero air generator, and digital data loggers to support NCore monitoring. NCore sites must also measure PM10-2.5 mass and speciation, but EPA has not yet approved monitoring methods for PM10-2.5.

Table 16 Meteorology Monitoring Stations in the San Joaquin Valley
As of June 1, 2010

Site	Wind Speed	Wind Direction	Outdoor Temperature	Relative Humidity	Barometric Pressure	Solar Radiation
Arvin	X	X	X	X	X	X
Bakersfield – California	X	X	X	X	X	X
Bakersfield – Muni[1]	X	X	X	X	X	X
Clovis – Villa	X	X	X	X	X	X
Corcoran – Patterson	X	X	X		X	
Edison – Johnson	X	X	X			
Fresno – Drummond	X	X	X		X	
Fresno – First	X	X	X	X	X	
Fresno – Sky Park	X	X	X			
Lebec	X	X	X		X	
Madera – City	X	X	X		X	
Madera – Pump Yard	X	X	X	X	X	X
Maricopa – Stanislaus	X	X	X		X	
Merced – Coffee	X	X	X			
Modesto – 14th	X	X	X		X	
Oildale – Manor	X	X	X			
Parlier	X	X	X	X	X	X
Sequoia Nat'l Park – Ash Mountain	X	X	X	X		X
Sequoia National Park – Kaweah	X	X	X	X		X
Shafter – Walker Street	X	X	X	X	X	X
Stockton – Hazelton	X	X	X	X		
Tracy – Airport	X	X	X		X	
Turlock – Minaret	X	X	X		X	
Visalia – Church	X	X	X		X	
Visalia - Airport	X	X	X	X	X	X

[1] Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010.

Five-Year Monitoring Network Assessment

40 CFR 58.10.d requires that the District perform a network assessment every five years, with the first assessment due in 2010. This assessment is to take a critical look at the air monitoring network and determine whether it is meeting all of EPA's requirements. The District contracted with Sonoma Technology, Incorporated (STI) to review the air monitoring network, and STI's findings were used, in part, to fulfill EPA's requirements for a network assessment as described in the CFR. After considering STI's review (described in more detail below), the District finds that its monitoring network meets all EPA's requirements.

The assessment evaluated the following:

- Does the network meet the monitoring objectives defined in appendix D?
- Are any new sites needed?
- Whether existing sites are no longer needed and can be terminated?
- Whether new technologies are appropriate for incorporation into the ambient air monitoring network?
- Does the network support air quality characterization for areas with relatively high populations of susceptible individuals?
- For any site proposed for discontinuance, does it have an effect on data users other than the agency?
- For PM2.5, are there needed changes to population-oriented sites?
- A copy of the 5-year assessment, along with a revised annual network plan needs to be submitted to EPA by July 1, 2010.

Does the network meet the monitoring objectives defined in appendix D?

Yes, with the addition of the Porterville and the new site in San Joaquin County (Manteca) the District meets the monitoring objectives defined in appendix D.

Are any new sites needed?

EPA requirements are being met with existing and planned sites.

Whether existing sites are no longer needed and can be terminated?

There aren't any sites that are redundant and should be terminated. However, there is no need for the CO monitors at Fresno-Drummond, Fresno-Sierra Sky Park, and the Turlock Air Monitoring sites because of the very low levels of CO measured in the District. The District is proposing to discontinue measuring CO at these sites. See the CO section for more details.

Whether new technologies are appropriate for incorporation into the ambient air monitoring network?

As time progresses, analyzers increase in sophistication and capabilities. When EPA changes the requirements or when the District replaces worn out equipment, we replace them with analyzers that have the most advanced and reliable technology. For instance we are replacing several older PM2.5 monitors with real-time analyzers and we recently replaced two CO monitors with trace level CO monitors.

Does the network support air quality characterization for areas with relatively high populations of susceptible individuals?

Yes, the network supports air quality characterization for areas with relatively high populations of susceptible individuals. The majority of the air monitoring sites are located in areas of the highest population density.

For any site proposed for discontinuance, does it have an effect on data users other than the agency?

The five-year network assessment is not proposing to discontinue any sites. However, the Bakersfield-Golden State Avenue site is being moved due to the widening of a nearby highway, and the Arvin site is being moved due to the termination of the lease agreement.

For PM2.5, are there needed changes to population-oriented sites?

The District will meet the EPA's requirements for PM2.5 monitoring once the new site in San Joaquin County is completed. Currently, the District is planning to put the site in Manteca. In addition, the District is planning on installing a PM2.5 monitor at Fresno-Drummond to run in parallel with the Fresno-Winery (Pacific College) PM2.5 monitor. If the District can determine that the two sites are equivalent, then the District proposes to shut down the Fresno-Winery site in order to streamline operations. If the sites are not equivalent, the District will remove the PM2.5 monitor at Fresno-Drummond. Before we can do this, some infrastructure improvements are necessary at Fresno-Drummond. Furthermore, the new monitoring site in Madera will have a PM2.5 BAM FEM, as well as a PM10 TEOM.

A copy of the five-year assessment, along with a revised annual network plan needs to be submitted to EPA by July 1, 2010.

A copy of the assessment performed by Sonoma Technology, Incorporated is attached to this report as Appendix C.

Additional Findings

STI did a thorough analysis of the air monitoring network, looking at many aspects of the network. They made many findings, some of which were used to develop the responses above. Two major findings were that there are regional gaps in the air monitoring network not covered by monitoring requirements and that there is some

question whether the Parlier Air Monitoring Station is correctly designated as a PAMS type 3 site.

STI determined that there were large areas not represented by air monitoring stations and there were other places where meteorological stations (no air monitoring equipment, only meteorological measurements) would be useful to have. Specifically the District should consider placing air quality monitors in the Los Banos area, northeast of Clovis (in the foothills), and between Corcoran and Bakersfield. The idea of operating metrological only sites is novel. The places STI suggest, mainly at the foot of passes and other important metrological locations, would provide useful information in forecasting air pollution levels for today and tomorrow.

In a District as large as the SJV, locating a monitor at every place of interest is not possible. Air monitoring stations are expensive to build, maintain, and operate. It takes significant staff time to run a site. Frequently, short-term funding is available for the construction of an air monitoring site, yet this still does not cover the long-term cost of its year-to-year operation. However, if permanent funding became available, covering both short-term and long-term costs, we would consider installing additional sites not required by the EPA.

The Parlier air monitoring site is classified as a PAMS type 3 site. This means that it is supposed to measure the downwind peak ozone values. STI found that the peak ozone readings in Fresno County move around between Parlier, Fresno-Sierra Sky Park, Fresno-First, Fresno-Drummond, and Clovis monitors. This is due in part to the Fresno Eddy, a recirculation pattern that brings downwind air back up to the Fresno area. It can also mean that the downwind peak has moved further downwind and into the foothills. The District needs to take a careful look at this and will do so during our next ozone SIP. SIPs require air pollution modeling and the District will investigate where the downwind peak is located.

Summary of monitoring changes, January 2009 – July 2010

The Lebec monitoring station was initiated by the Tejon Ranch in 2004, and the District assumed responsibility for this site as of January 2009. This site allows the District to better understand pollution impacts in the southern San Emigdio Mountains. The site measures meteorological parameters and PM2.5. This SPM site is used for residential wood burning declarations for the Greater Frazier Park Area from November through February. This site started reporting to AQS in January 2010.

The District replaced an older PM2.5 SPM monitor with a newer PM2.5 FEM monitor at Bakersfield-Golden State Avenue on June 4, 2009. The District had been operating both a filter-based FRM and the new continuous FEM as parallel monitors at Bakersfield-Golden (as well as Corcoran and Clovis) to improve understanding of differences in measurements, if any. However, the Bakersfield-Golden site was shut down in January 2010 for relocation due to adjacent highway construction. The expanded highway would invalidate EPA's siting criteria.

The District's Tranquillity monitoring site began operating in the fourth quarter of 2009. This SPM site measures PM2.5, meteorology, and ozone; and was established for research purposes, and not regulatory purposes.

The Hanford monitoring site was rebuilt due to safety and structural concerns of the previous shelter. The new site began reporting meteorology in February 2010, and the ozone monitor that had been temporarily operating in Corcoran was returned to Hanford at the same time. The District will also be adding a PM10 TEOM, which will be replacing a filter-based PM10 monitor.

The Porterville site began reporting ozone, PM2.5, and meteorology in March 2010. With this site, the Visalia-Porterville CBSA now has two ozone monitors designed to report population exposures. It should be noted that the PM2.5 monitor in Porterville is non-regulatory.

As mentioned above, ARB is installing Picarro multi-gas analyzers (CO2, CH4, and water vapor) and a Teledyne-API 300 EU (CO) analyzer at the Madera-Pump, Tranquillity, and Arvin sites as part of its Green House Gases (GHG) monitoring program. While the data will not be submitted to AQS at this time, the data will be used by ARB's Research Division.

The District had planned to begin monitoring lead in 2010 to meet federal requirements. However, EPA proposed changes to the lead monitoring requirements in December 2009 (74 FR 69050-69059). The District has thus suspended lead monitoring plans.

Summary of changes planned, July 2010 – December 2011

The Valley air monitoring network is continually being improved. As one overall change, the District will be replacing filter-based PM monitors with continuous, real-time PM2.5 and real-time PM10 monitors in the future, particularly in rural areas. These monitors are more economically efficient than filter-based monitors and give the District more data for forecasting. Simultaneously, the District will be investigating to see how real-time data compares to filter-based data at sites with parallel monitoring.

The planned site-specific changes are described below.

Stockton CBSA/MSA

Stockton CBSA/MSA needs an additional PM2.5 monitor suitable for comparing to the NAAQS. The District has chosen Sierra High School in Manteca for this site. The District posted a request for proposal (RFP) to solicit bids for site construction in March 2010. In response, the Governing Board of the SJVAPCD approved a contract in May 2010 with a contractor to construct this new site, which should be completed by the fourth quarter of 2010.

The District meets all other EPA monitoring requirements for the other pollutants in this CBSA.

Modesto CBSA/MSA

The District currently meets all EPA monitoring requirements in this CBSA.

The District plans to improve its meteorological equipment at the Turlock Air Monitoring Site by installing a meteorological tower by the third quarter of 2010.

Merced CBSA/MSA

The District currently meets all EPA monitoring requirements in this CBSA.

Although the District had received notice that the Merced-Coffee Street site had to be vacated by December 31, 2011, the District renegotiated the contract so the site can now remain through 2015. The District may relocate sooner, but there are no definite relocation plans at this time.

Madera CBSA/MSA

Madera CBSA/MSA needed an additional PM10 monitor suitable for comparing to the NAAQS, so the District built a new site in the County facility located at Avenue 14 and Road 28. The site will begin reporting for continuous PM10, ozone, PM2.5, and meteorology soon. The District may eventually seek permission from EPA to

consolidate the new Madera site with the Madera-Pump PAMS site, pending the comparability of the two sites' ozone data for the next two years.

The District meets all other EPA monitoring requirements for the other pollutants in this CBSA.

Fresno CBSA/MSA

The District currently meets all EPA monitoring requirements in this CBSA.

Recently planted vegetation on adjacent property may require the District to relocate the Sierra Skypark site sometime over the next few years. There are no definite relocation plans at this time.

Hanford-Corcoran CBSA/MSA

The District currently meets all EPA monitoring requirements in this CBSA.

Visalia-Porterville CBSA/MSA

The District and NOAA are upgrading the Visalia-Airport site lower air profiler with newer technology. This should be completed in 2010.

The District meets all other EPA monitoring requirements for the other pollutants in this CBSA.

Bakersfield CBSA/MSA

The Bakersfield Golden site had to be relocated to due adjacent highway expansion. The District will complete the relocation to the Bakersfield Municipal Airport by the end of 2010, if not sooner. This new site is about 790 meters (0.5 miles) away from ARB's Bakersfield-Planz site. The District will investigate the possibility of combining these sites after the data can be compared, but the combined site would have to meet both PAMS and PM2.5 siting criteria.

After the shutdown of the Bakersfield-Golden site, the District requested ARB's permission to temporarily operate a real time PM10 monitor at the Bakersfield-California site (06-029-0014). The sampler (a BAM PM10 FEM) began to operate in March, and its real-time data will contribute to the District's production of more accurate daily AQI forecasting. When the relocation of the new site is completed, this BAM monitor will be removed and the new site will continue PM10 monitoring with the established TEOM sampler.

The District is investigating the possibility of relocating the Lebec monitoring site to an area with a greater population density. However, there are no final plans for relocation at this time.

The Arvin monitoring site, operated by ARB, needs to be relocated due to an expired lease. The site is scheduled to close at the completion of parallel ozone monitoring in the fall of 2010. The new site, Arvin-Di Giorgio is intended to become the long-term replacement for the Arvin-Bear Mountain Road site. In addition of moving all of the existing analyzers to the new site, ARB plans to install methane/CO2 and trace CO analyzers for special purpose monitoring.

The District meets all other EPA monitoring requirements for the other pollutants in this CBSA.

Other PM changes

The District is upgrading many of its filter-based FRM PM2.5 monitors to near continuous FEM (BAM-1020s) monitors, where possible, to allow for both daily AQI reporting and comparisons to the NAAQS. Currently, the District is conducting parallel PM2.5 monitoring at Corcoran to evaluate the comparability of PM2.5 data from the two types of monitors for the SJV.

The District is also upgrading the PM10 monitoring network from filter-based monitors to real-time monitors. The upgrade brings improved temporal resolution to the District's rigorous PM10 monitoring program. The upgrade will also result in a cost savings through less staff travel time, less maintenance, and fewer filters to weigh.

Data Submission Requirements

Precision data are submitted to AQS on an ongoing basis each quarter as the data is uploaded into AQS. The accuracy data is submitted into AQS by ARB based on their scheduled audits.

The District submitted its 2009 data certification to the EPA. Annual certifications are due by May 1 of each year.

Acronyms, Abbreviations, and Initialisms

AIRS: Aerometric Information Retrieval System; replaced with AQS
AQI: Air Quality Index
AQS: Air Quality System
ARB: California Air Resources Board
ARM: approved regional method
BAM: beta attenuation monitor
CAA: Clean Air Act
CBSA: Core-based statistical area
CCOS: Central California Ozone Study
CFR: Code of Federal Regulations
CRPAQS: California Regional Particulate Air Quality Study
CO: Carbon Monoxide
CSA: Combined statistical area
District: San Joaquin Valley Air Pollution Control District
EBAM: environmental beta attenuation monitor
EPA: U.S. Environmental Protection Agency
FEM: Federal Equivalent Method
FIPS: Federal information processing standard
FR: Federal Register
FRM: Federal Reference Method
GHG: green house gases
MSA: Metropolitan statistical area
NAAQS: National Ambient Air Quality Standard
NCore: National Core
NMHC: Non-methane hydrocarbons
NMOC: non-methane organic carbons
NO2: Nitrogen dioxide
NOAA: National Oceanic and Atmospheric Administration
NOx: oxides of nitrogen
NO_y: reactive nitrogen
NPS: National Park Service
O3: ozone
PAMS: Photochemical Assessment Monitoring Station
Pb: lead
PM: particulate matter
PM2.5: particulate matter 2.5 microns or less in diameter
PM10: particulate matter 10 microns or less in diameter
SLAMS: State and Local Air Monitoring Station
SJV: San Joaquin Valley
SJVAPCD: San Joaquin Valley Air Pollution Control District
SMS: Smoke Management System
SO2: Sulfur Dioxide
SPM: Special Purpose Monitor
STN: Speciated Trends Network
TEOM: Tapered Element Oscillating Microbalance
TSP: total suspended particles
Valley: San Joaquin Valley
VOC: Volatile Organic Compounds

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Appendix A: Monitoring Site Descriptions

Sites operated by the SJVAPCD

Bakersfield – Golden State Avenue; Bakersfield - Muni

Bakersfield – Golden was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will begin reporting data in October 2010. Bakersfield, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow, pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Bakersfield-Muni monitoring site is operated by the SJVAPCD and is located in the Bakersfield, CA metropolitan area. Bakersfield-Muni is to begin operating in October 2010 to replace the Bakersfield-Golden site, which operated from June 1994 to December 2009. This site was established as a PAMS Type 2 site, sited to measure maximum ozone precursor emissions. In addition to ozone (SLAMS), the Golden site also monitored PM2.5, PM10, CO, NO2, NMOC, NMHC, and meteorology. The Muni site will monitor PM10 (FRM and TEOM, both SLAMS), PM2.5 (BAM, SPM) and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants, which scavenge the ozone. During the winter months, ozone concentrations decrease due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind blown dust events, when the wind can cause PM2.5 to become suspended in the air. On rare occasions, this region of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase and sometimes exceed the NAAQS.

Clovis – N Villa Avenue

Clovis, CA is located in the central part of the San Joaquin Valley with mountains to the east and northeast. North-south air flow is virtually unobstructed. Pollutant emissions occur locally and are also transported from upwind and nearby locations into the area by the wind. The Clovis-Villa Avenue monitoring site is operated by SJVAPCD and is located in the northeastern portion of the Fresno, CA metropolitan area. It began operating in September 1990. This site is a PAMS Type 2 site, a site intended to measure maximum ozone precursor emissions. In addition to ozone (SLAMS), the site also monitors PM2.5 (BAM FEM/SLAMS), PM10 (FRM, SLAMS), CO, NO2, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants, which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the

winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Corcoran – Patterson Avenue
Corcoran, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutant emissions occur locally and also get transported from upwind locations into the area by the wind. The Corcoran-Patterson monitoring site is operated by SJVAPCD and is located 67 miles south of the Fresno, CA metropolitan area. It began operating in October 1996. The purpose of the site is to monitor representative concentrations of PM10 (TEOM and FRM, both SLAMS) and PM2.5 (FRM, SLAMS and a BAM SPM) responses from surrounding areas. This site also monitors meteorology. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Fresno – Drummond St
Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-Drummond Street monitoring site is operated by SJVAPCD and is located in the Fresno, CA metropolitan area. It began operating in July 1984. The purpose of the site is to monitor representative concentrations of hourly ozone responses in an urban area. In addition to ozone (SLAMS), the site also monitors PM10 (FRM, SLAMS), CO, NO2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Fresno – Pacific
Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-Pacific monitoring site is operated by SJVAPCD and is located in the Fresno, CA metropolitan area. It began operating in January 2000. The purpose of the site is to monitor representative PM2.5 (FRM, SLAMS) concentrations in an urban area. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be

highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Fresno – Sky Park

Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-Sky Park monitoring site is operated by SJVAPCD and is located in the Fresno, CA metropolitan area. It began operating in July 1986. The purpose of the site is to monitor representative concentrations of hourly ozone responses in an urban area. In addition to ozone (SLAMS), the site also monitors CO, NO2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. .

Hanford – S Irwin St

Hanford, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Hanford-S Irwin Street monitoring site is operated by SJVAPCD and is located 51 miles south of the Fresno, CA metropolitan area. The site began operating in October 1993 and was decommissioned in October 2007 due to plans to move it to a different part of the S Irwin Street location. The purpose of the site is to monitor representative concentrations of hourly ozone, PM2.5, and PM10 (FRM and TEOM, both SLAMS) responses from upwind and nearby urban areas. The PM2.5 and ozone monitors were temporarily moved to Corcoran during site reconstruction. In February 2010, the Hanford-S Irwin Street site became operational once again, and the ozone (SLAMS) and PM2.5 (BAM, SLAMS) monitors returned to Hanford. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Huron
Huron, CA is located in southwestern Fresno County, and is about 40 miles southwest of Fresno, CA, with the coastal mountain range just to the west. North-south air flow is virtually unobstructed. This monitoring site was established in January 2007 in order to comply with Assembly Bill (AB) 841. This site currently only measures PM2.5 (SPM), as required by AB 841.

Lebec
Lebec, CA is located in the southern-most portion of the San Joaquin Valley. The Lebec monitoring station was initiated by the Tejon Ranch in 2004, and the District assumed responsibility for this site as of January 2009. This site allows the District to better understand pollution impacts in the southern San Emigdio Mountains. The site measures meteorological parameters and PM2.5 (SPM). This site will be used for general residential wood burning declarations for the Greater Frazier Park Area in the future. The site is not yet reported on AQS.

Madera-City
Madera, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. The Madera-City monitoring site is located closer to the city center of Madera than the Madera-Pump Yard site. It will become operational in June 2010, and it is planned to measure ozone (SLAMS), PM2.5 (BAM FEM, SLAMS), PM10 (TEOM, SLAMS), and meteorology. This is a new monitoring site for the SJVAPCD, and so its air quality trends and characteristics are yet to be known. However, it is intended to measure down wind concentrations of the city of Madera which will provide needed information about the variability of air quality levels on the Valley floor of Madera County.

Madera – Pump Yard
Madera, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations. The Madera-Pump Yard Street monitoring site is operated by SJVAPCD and is located in the Madera, CA. It began operating in August 1997. This site was established as a PAMS Type 1 site, located in an area upwind of Fresno and not to be influenced by upwind or local ozone precursor emissions. In addition to ozone (SLAMS), this site also monitors CO, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Maricopa
Maricopa, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. The Maricopa monitoring site is

operated by the SJVAPCD and is located 45 miles southwest of the Bakersfield, CA metropolitan area. It began operating in July 1987. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) in a rural area. The site also monitors meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Merced – Coffee Rd

Merced, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations. The Merced-Coffee Street monitoring site is operated by SJVAPCD and is located in the Merced, CA. It began operating in October 1991. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) responses from upwind urban areas. The site also monitors PM2.5 (SPM), NO2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Merced – M St

Merced, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations. The Merced-M Street monitoring site is operated by SJVAPCD and is located in the Merced, CA. It began operating in April 1999. The purpose of the site is to monitor representative concentrations of PM2.5 (FRM, SLAMS) and PM10 (FRM, SLAMS) responses from upwind urban areas. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Parlier

Parlier, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Parlier monitoring site is operated by SJVAPCD and is located 20 miles southeast of the Fresno, CA metropolitan area. It began operating in March 1983. The purpose of the site, as a PAMS Type 3 site, is to monitor maximum ozone concentrations (SLAMS) and ozone responses from upwind urban areas. The site also monitors NO2, NMOC,

NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Porterville

Porterville, CA is located in the southern part of the San Joaquin Valley near the foothills of the Sierra Nevada Mountains to the east. This is a new monitoring site for the SJVAPCD, and so its air quality trends and characteristics are yet to be known. It is approximately 25 miles southeast of Visalia, CA, and so transport of pollutants from Visalia towards Porterville is possible. This site will measure ozone (SLAMS), PM2.5 (BAM, SPM), and meteorology. This site will represent air quality levels present near the foothills of the southern Valley and will give the district an indication of exposure of pollutants to the local population.

Stockton – Wagner - Holt School

Stockton, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Stockton-Wagner-Holt School monitoring site is operated by SJVAPCD and is located in the Stockton, CA metropolitan area. It began operating in October 1996. The purpose of the site is to monitor representative concentrations of PM10 (FRM, SLAMS) in an urban area. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Tracy Airport

Tracy, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Tracy Airport monitoring site is operated by SJVAPCD and is located in Tracy, CA. It began operating in January 2005. The purpose of the site is to monitor transport of ozone (SLAMS), PM2.5 (BAM, SPM), and PM10 (TEOM, SLAMS) from upwind and nearby urban areas. The site also monitors NO2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Tranquillity
Tranquillity, CA is located in western Fresno County, and is about 25 miles west of Fresno, CA, with the coastal mountain range just to the west. North-south air flow is virtually unobstructed. This monitoring site was established in November 2009 for research purposes, in an effort to better understand the Valley's background and rural pollutant concentrations. This site measures ozone (SPM), PM2.5 (BAM, SPM) and meteorological parameters.

Turlock – S Minaret St
Turlock, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Turlock-Minaret Street monitoring site is operated by SJVAPCD and is located in the Turlock, CA. It began operating in April 1992. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (BAM FEM, SLAMS), and PM10 (FRM, SLAMS) responses from upwind urban areas. The site also monitors CO, NO2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Visalia – Airport
Visalia, CA is located where the central and southern parts of the San Joaquin Valley meet. The Sierra Nevada mountain range is approximately 20 miles east of Visalia. North-south air flow is virtually unobstructed. The Visalia-Airport monitoring site is operated by SJVAPCD and serves as a wind profiler monitoring surface wind speed and wind direction. It also monitors air temperature, and relative humidity at the surface. It began reporting official meteorological data in January 2001. Meteorological parameters have a direct influence on how and where pollutants are transported and how much pollutant concentrations increase or decrease.

Sites Operated by the ARB

Arvin

Arvin, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Arvin monitoring site is operated by the CARB and is located 24 miles southeast of the Bakersfield, CA metropolitan area. It began operating in June 1989. The purpose of the site, as a PAMS Type 3 site (SLAMS), is to monitor maximum ozone concentrations and transport from upwind urban areas. The site also monitors NO2, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations decrease due to shorter daylight hours and lower temperatures. Pollutants occur locally and also get transported into the area by wind.

Bakersfield – Plantz/Airport

Bakersfield, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Bakersfield-Airport monitoring site is operated by CARB and is located 6 miles north of the Bakersfield, CA metropolitan area. It began operating in September 2000. The purpose of the site is to monitor representative concentrations of PM2.5 (FRM, SLAMS) from upwind and nearby urban areas. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air.

Bakersfield – California

Bakersfield, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Bakersfield-California monitoring site is operated by CARB and is located in the Bakersfield, CA metropolitan area. It began operating in March 1994. The purpose of the site is to monitor representative concentrations of hourly and daily ozone (SLAMS), PM10 (FRM and BAM FEM, both SLAMS), and PM2.5 (FRM and BAM FEM, bother SLAMS) responses in an urban area. The site also monitors NO2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. Elevated

PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air.

Edison

Edison, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Edison monitoring site is operated by CARB and is located 9 miles east of the Bakersfield, CA metropolitan area. It began operating in January 1980. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) from upwind and nearby urban areas. The site also monitors NO2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations decrease due to shorter daylight hours and lower temperatures.

Fresno – First St

Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-First monitoring site is operated by CARB and is located in the Fresno, CA metropolitan area. It began operating in January 1990. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (FRM and BAM, both SLAMS), and PM10 (FRM and BAM, both SLAMS) responses in an urban area. The site also monitors CO, NO2, SO2, NMOC, NMHC, toxics, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Modesto – 14th St

Modesto, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or

through the Sacramento Delta from the Bay Area. The Modesto-14th Street monitoring site is operated by CARB and is located in the Modesto, CA metropolitan area. It began operating in January 1981. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (FRM and BAM, both SLAMS), and PM10 (FRM, SLAMS)responses in local and upwind urban areas. The site also monitors CO and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Oildale

Oildale, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Oildale monitoring site is operated by CARB and is located 6 miles north of Bakersfield, CA within the metropolitan area. It began operating in January 1980. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) responses and PM10 (FRM, SLAMS)(every 6 days) in an urban area. The site also monitors meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. Not only does the metropolitan area generate its own pollution, it is also the recipient of pollutants that get transported by wind. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Shafter

Shafter, CA is located at the southern end of the San Joaquin Valley with mountains to the east and west, and 58 miles to the south. Because the mountains to the south are further away, southward air flow is less obstructed through Shafter so pollutant build-up is less pronounced compared to Bakersfield and the towns further south. Pollutants occur locally and wind can transport pollutants into and through Shafter from nearby and upwind areas. The Shafter monitoring site is operated by CARB and is located 18 miles northwest of the Bakersfield, CA metropolitan area. It began operating in January 1989. This site was established as a PAMS Type 1 site (SLAMS), located in an area upwind of Bakersfield and not to be influenced by upwind or local ozone precursor emissions. The site also monitors NO2, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in

ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. Being located upwind of Bakersfield, the Shafter site tends to have lower ozone concentrations than does the metropolitan area to the south.

Stockton – Hazelton

Stockton, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Stockton-Hazelton monitoring site is operated by CARB and is located in the Stockton, CA metropolitan area. It began operating in June 1976. The purpose of the site is to monitor representative concentrations of ozone (SLAMS), PM2.5 (BAM and FRM, both SLAMS), and PM10 (FRM, SLAMS) in an urban area. The site also monitors CO, NO2, toxics, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Visalia – Church

Visalia, CA is located where the central and southern parts of the San Joaquin Valley meet. The Sierra Nevada mountain range is approximately 20 miles east of Visalia. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Visalia monitoring site is operated by SJVAPCD. It began operating in July 1979. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (BAM and FRM, both SLAMS), and PM10 (FRM, SLAMS) responses from upwind and nearby urban areas. The site also monitors NO2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Special Purpose Monitoring Sites

Sequoia National Park – Ash Mountain

The Ash Mountain monitoring station is operated by Sequoia National Forest and is located at the southern entrance of Sequoia National Park at a 1,500-foot elevation. It originally began operating in 1985, though the site has been relocated several times over the years. The site demonstrates the hourly ozone (SPM) response in the foothills. The site also monitors PM2.5 (BAM, SPM) and meteorology. On summer days, ozone and precursors can be transported to Ash Mountain from other locations. At this location, there are significantly lower hourly emissions of NOx as compared to urban areas such as Bakersfield, or Fresno, CA. The amount of available NOx at Ash Mountain to scavenge the ozone is much lower. Because the ozone scavenging at Ash Mountain is much less than the ozone scavenging in urban areas, Ash Mountain can experience elevated ozone concentrations for a 24-hour period during ozone episodes. Since the ozone concentration is already fairly high at dawn, only a relatively small amount of additional ozone can cause levels in the atmosphere to exceed federal standards.

Sequoia National Park – Lower Kaweah

The Lower Kaweah monitoring station is operated by Sequoia National Forest and is located at the southern entrance of Sequoia National Park at a 6,200-foot elevation. It began operating in April 1987. The site demonstrates the hourly ozone (SPM) response in a rural area. The site also monitors meteorology. On summer days, ozone and precursors can be transported to Ash Mountain from other locations. At this location, there are significantly lower hourly emissions of NOx as compared to urban areas such as Bakersfield, or Fresno, CA. The amount of available NOx at Lower Kaweah to scavenge the ozone is much lower. Because the ozone scavenging at Lower Kaweah is much less than the ozone scavenging in urban areas, Lower Kaweah can experience elevated ozone concentrations for a 24-hour period during ozone episodes. Since the ozone concentration is already fairly high at dawn, only a relatively small amount of additional ozone can cause levels in the atmosphere to exceed federal standards.

Sequoia National Forest – Springville and Pinehurst

The Springville and Pinehurst monitoring stations are permanent sites operated by Sequoia National Forest. They are located at the southern end of the Sierra Nevada at 1,432-foot and 4,985 foot elevations respectively. Sequoia National Forest also operates nine additional portable monitors that are moved to different locations as needed. The Springville and Pinehurst sites demonstrate hourly ozone and PM2.5 responses in rural areas. The SJVAPCD uses these sites for informational purposes when smoke impacts are occurring in communities due to wildfires or prescribed burning projects.

Other Sites

Santa Rosa Rancheria

Santa Rosa Rancheria is Tribal land located in the central portion of the San Joaquin Valley in Lemoore, CA. It is 13 miles southwest of Hanford, CA and 39 miles south of the Fresno, CA metropolitan area. The Diablo Mountain Range is approximately 27 miles east of Santa Rosa Rancheria. North-south air flow is virtually unobstructed. Pollutants occur locally and wind transports pollutants into and through the site from nearby and upwind urban areas as well. The Santa Rosa Rancheria monitoring site is operated by the Tachi-Yokut tribe. It began operating in August 2006. The purpose of the site is to monitor representative concentrations of hourly ozone (SPM) and PM10 responses from upwind and nearby urban areas. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Appendix B: Detailed Air Monitoring Site Information

Forthcoming