2017
ANNUAL MONITORING NETWORK PLAN

SACRAMENTO METROPOLITAN
AIR QUALITY MANAGEMENT DISTRICT

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List of Abbreviations and Acronyms

AADT	Annual average daily traffic
AGL	Above ground level
ANP	Annual network plan
ARM	Approved Regional Monitor
AQI	Air Quality Index
AQS	Air Quality System
BAM	Beta Attenuation Monitor
BC	Sacramento-Branch Center #2 Air Monitoring Site
BER	Sacramento-Bercut Dr. Air Monitoring Site
BL	General/Background
BP	Barometric pressure
BRU	Elk Grove-Bruceville Air Monitoring Site
Caltrans	California Department of Transportation
CAP III	California Alternative Plan III
CARB	California Air Resources Board
CSN	Chemical Speciation Network
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DPM	Sacramento-Del Paso Manor Air Monitoring Site
DV	Design Value
EPA	(U.S.) Environmental Protection Agency
ERG, Inc.	Eastern Research Group, Inc.
FEM	Federal Equivalent Method
FID	Flame Ionization Detector
FOL	Folsom-Natoma Air Monitoring Site
FRM	Federal Reference Method
GB	General/Background
GOL	Sacramento-Goldenland Court Air Monitoring Site
HC	Highest Concentration
MI	Microscale
MS	Middle Scale
MSA	Metropolitan Statistical Area

NAAQS	National Ambient Air Quality Standards
NCore	National Core, a multi-pollutant ambient monitoring network
NEI	National Emission Inventory
NH	North Highlands-Blackfoot Air Monitoring Site
NMHC	Non-Methane Hydrocarbon
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
NO_Y	Reactive Oxides of Nitrogen
NS	Neighborhood Scale
O_3	Ozone
PAMS	Photochemical Assessment Monitoring Sites
Pb	Lead
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter 2.5 micron
PM_{10}	Particulate Matter 10 micron
PM_C	Particulate Matter > 2.5 micron and < 10 micron (PM10-2.5)
POC	Parameter occurrence code
PQAO	Primary quality assurance organization
PWEI	Population weighted emission index
QA	Quality Assurance
RH	Relative Humidity
RS	Rancho Seco Air Monitoring Site
RTI	Research Triangle Institute
RWP	Radar Wind Profiler
SASS	PM2.5 Speciation sampler
SCC	Sacramento City Code
SCK	Sacramento Health Department-Stockton Blvd. Air Monitoring Site
SFNA	Sacramento Federal Nonattainment Area
SIP	State Implementation Program
SLAMS	State and Local Air Monitoring Sites
SLU	Sloughhouse Air Monitoring Site
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	Sulfur Dioxide
SPM	Special Purpose Monitoring
SRD	Solar Radiation
TAPI	Teledyne Advanced Pollution Instrumentation
TEI	Thermo Environmental Instruments
TEOM	Tapered Element Oscillating Microbalance
TPY	Ton per Year
TST	Sacramento-T Street Air Monitoring Site

US	Urban Scale
UVR	Ultraviolet radiation
VOC	Volatile Organic Compounds
VSCC	Very Sharp Cut Cyclone
WD	Wind Direction
WF	Welfare Based
WS	Wind Speed

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Section 1 Introduction

State and local agencies that conduct ambient air monitoring for regulatory purposes are required, by Title 40, Code of Federal Regulations, Part 58.10, to submit an Annual Monitoring Network Plan (ANP) to the U.S. Environmental Protection Agency (EPA), no later than July 1st, each year. The report must contain specific monitoring network information and the report must be presented for a 30-day public review period prior to submittal to EPA. This report covers the period: January 1, 2016-December 31, 2016. This network plan focuses on the monitors that are operated within Sacramento County, which is a part of Sacramento-Arden Arcade-Roseville Metropolitan Statistical Area (MSA).

The primary purpose of this ambient air monitoring network plan is to document the existing Sacramento County air monitoring network and to discuss proposed changes (additions, relocations, and terminations of non-special purpose monitors (SPM)) in the ambient air monitoring network that may be proposed to occur within an 18 month period following submittal of this report. The plan includes information on monitors and instruments that are a part of State and Local Air Monitoring sites (SLAMS) network, National Core (NCore) multi-pollutant monitoring stations, Chemical Speciation Network (CSN), SPM sites, and Photochemical Assessment Monitoring (PAMS) network, operated by Sacramento Metropolitan Air Quality Management District (SMAQMD) and California Air Resources Board (CARB). The plan states whether each monitor in the ambient air monitoring network meets the requirements of 40 CFR Part 58, including Appendix A, C, D, and E, where applicable. This report includes, but is not limited to, Federal Reference Method (FRM), Federal Equivalent Method (FEM), and Approved Regional Method (ARM) monitors.

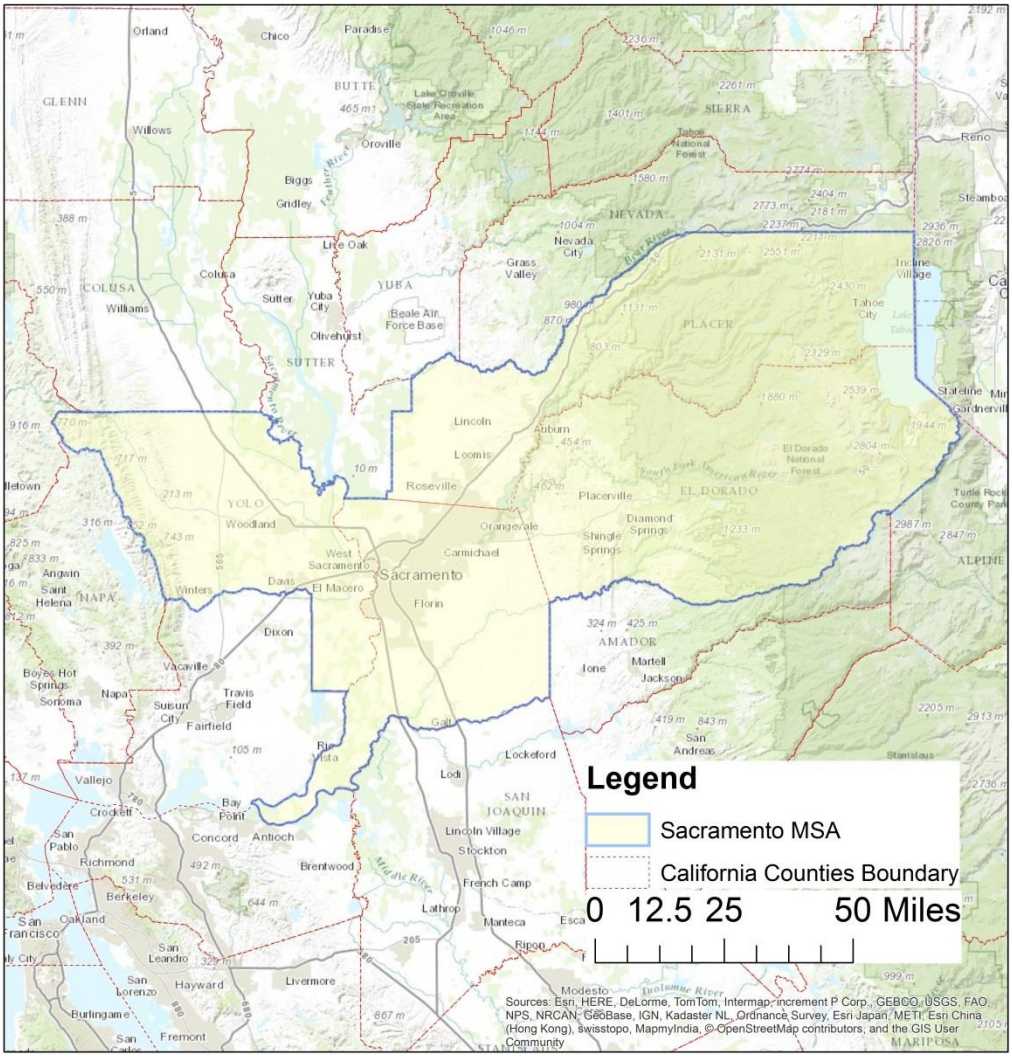
This report is not an extensive analysis of the design of the local air monitoring network. A network assessment report, required every five years, has the analysis to determine if the air monitoring network meets the monitoring objectives defined in 40 CFR Part 58 Appendix D. Network assessments provide recommendations to determine if new sites are needed, whether existing sites are no longer needed, and whether new technologies are appropriate for incorporation in to the ambient air monitoring network. A 2015 network assessment report was completed and submitted to EPA Region 9 on April 22, 2016.

Any shared monitoring responsibility agreement between SMAQMD and neighboring monitoring organizations are discussed in Section 3, Minimum Monitoring Requirement. For details on monitors in neighboring counties within the MSA, please refer to the latest Annual Monitoring Network Plan published by CARB.

Section 2 Network Operations

Sacramento County is located in the middle of California's Central Valley and at the southern end of the Sacramento Valley. Sacramento County is the most populous county within the Sacramento-Arden Arcade-Roseville, California, MSA (Sacramento MSA). The Sacramento MSA includes Placer, El Dorado, Sacramento and Yolo Counties. The MSA has a population estimate of 2.3 million, including 1.5 million in Sacramento County, and is the 27th most populous MSA in the United States[3]. Figure 2-1 shows a map of Sacramento MSA.

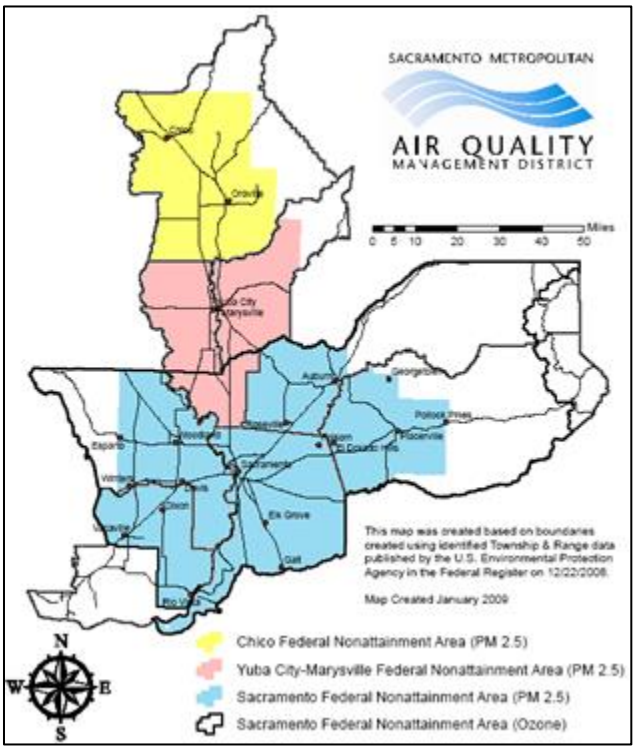
Figure 2-1 Counties within Sacramento-Arden Arcade-Roseville, California, MSA



[3] U.S. Census Bureau, Population Division, released March 2016

A portion of the Sacramento MSA is a nonattainment area for the Federal 2008 8-hr ozone (O_3) standard and is referred to as the Sacramento Federal Nonattainment Area (SFNA)[4]. This area includes all of Sacramento and Yolo counties and portions of Placer, El Dorado, Solano, and Sutter counties. Sacramento County has met the particulate matter $(PM)_{10}$ air quality standard since 2002. The Sacramento region was designated as nonattainment for the 2006 24-hour $PM_{2.5}$ standard (Figure 2-2). The region met the 2006 $PM_{2.5}$ standard in 2012 and will continue to reduce $PM_{2.5}$ levels through various programs and strategies. Sacramento County is in attainment for the most recent Federal carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) health standards. EPA has designated Sacramento County as unclassifiable/attainment for the 2008 Federal lead (Pb) standard[5].

Figure 2-2 Sacramento Valley Federal O_3 and $PM_{2.5}$ Nonattainment Area



SMAQMD operates nine air monitoring sites within Sacramento County with CARB operating the tenth at the Sacramento-T Street location. While most sites operate a suite of instruments to monitor multiple pollutants and meteorological condition, a couple sites monitor only one pollutant. Each site has monitors that belong to one or more national monitoring networks (e.g. SLAMS, PAMS), or is an SPM. In addition, SMAQMD operates one of the 80 NCore sites and one of the 54 $PM_{2.5}$ CSN trend sites nationwide. Table 2-1 lists the type of monitoring networks each site belongs to and the pollutants or meteorological condition monitored at each site. Figure 2-3 maps the location.

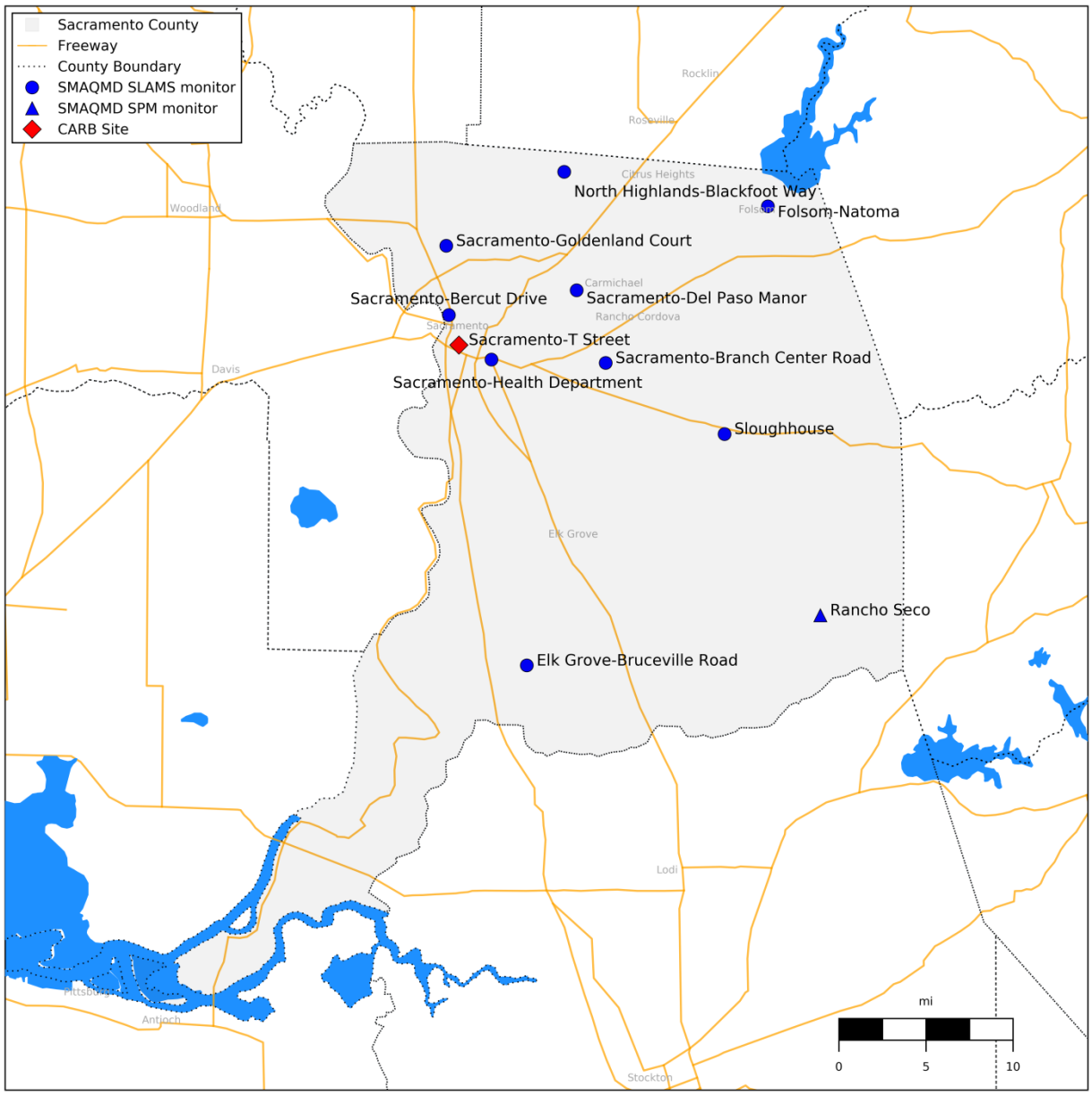
[4] U.S. EPA, 8-Hour Ozone (2008) Nonattainment Area/State/County Report, 2013

[5] https://www.epa.gov/lead-designations/lead-designations-final-nonattainment-designations-rounds-1-and-2; 70 FR 72097

Table 2-1 Purpose and Overview of Pollutants Monitored

		Sacramento-Bercut Dr. (BER)	Sacramento-Branch Center Rd #2 (BC)	Elk Grove-Bruceville Rd. (BRU)	Sacramento-Del Paso Manor (DPM)	Folsom-Natoma (FOL)	Sacramento-Goldenland Ct. (GOL)	North Highlands-Blackfoot Way (NH)	Rancho Seco (RS)	Sloughhouse (SLU)	Sacramento- T St. (TST)
Purpose	SLAMS	×	×	×	×	×	×	×		×	×
	Near-road	×									
	PAMS			×	×	×	×				
	CSN				×						×
	NCore				×						
	SPM			×	×			×	×	×	
Pollutants	Ozone (O_3)			×	×	×	×	×		×	×
	Carbon Monoxide (CO)	×			×		×	×			
	Nitrogen Dioxide (NO_2)	×		×	×	×	×	×			×
	Total Reactive Nitrogen (NO_Y)				×	×					
	Sulfur Dioxide (SO_2)				×						
	Non-methane Hydrocarbon (NMHC)			×	×	×	×				
	Speciated VOC			×	×	×					
	Carbonyl				×						
	PM_{10} (Hourly, continuous)						×				
	PM_{10} (24-hr)		×		×		×	×			×
	$PM_{2.5}$ (Hourly, continuous)			×	×	×			×	×	×
	$PM_{2.5}$ (24-hr)	×			×						×
	Speciated $PM_{2.5}$				×						×
	$PM_{10-2.5}$ (24-hr)				×						
	Lead (Pb)				×						
	Black Carbon (BC)	×			×						
Meteorology	Outdoor Temperature (TMP)	×		×	×	×	×				×
	Relative Humidity (RH)			×	×	×	×				×
	Wind Direction (WD)	×		×	×	×	×			×	×
	Wind Speed (WS)	×		×	×	×	×			×	×
	Solar Radiation (SRD)			×	×	×	×				
	Ultraviolet Radiation (UVR)			×							
	Barometric Pressure (BP)			×							×
	Precipitation			×							
	Upper Level Meteorology			×							

Figure 2-3 Air Monitoring Sites in Sacramento County



The primary focus of the current ambient air monitoring network is the collection of criteria pollutants. The data collected from area-wide and near-road stations supports SIP development, attainment/nonattainment decisions, public notification, and data for air quality modeling and research efforts. The network is designed to meet three basic monitoring objectives: (1) provide air pollution data to the general public in a timely manner; (2) support compliance with ambient quality standards and emissions strategy development; and (3) support air pollution research studies. An overview of monitoring objectives is in Table 2-2.

Table 2-2 Monitoring Objective

	Sacramento-Bercut Dr. (BER)	Sacramento-Branch Center Rd #2 (BC)	Elk Grove-Bruceville Rd. (BRU)	Sacramento-Del Paso Manor (DPM)	Folsom-Natoma (FOL)	Sacramento-Goldenland Ct. (GOL)	North Highlands-Blackfoot Way (NH)	Rancho Seco (RS)	Sloughhouse (SLU)	Sacramento-T St. (TST)
O_3			N,P	N,P,R	N,P	N,P	N,R		N,P	N,P
CO	N,P,R			N,P,R		N,P	N,R			
NO_2	N,P,R		N,P	N,P,R	N,P	N,P	N,R			N,P
NO_Y				P	P,R					
SO_2				N,P,R						
NMH			P,R	P,R	P,R	P,R				
VOC			R	R	R					
PM_{10} (Hourly)						N,P				
PM_{10} (24-hr)		N,P		N,P		N,P	N,P			N,P
$PM_{2.5}$ (Hourly)			P	P,R	N,P,R			P,R	P,R	P
$PM_{2.5}$ (24-hr)	N,P,R			N,P,R						N,P
$PM_{10-2.5}$				N,P,R						
Pb				N,P,R						

N: National Ambient Air Quality Standards (NAAQS) Comparison
P: Public Info
R: Research

There are different types of monitoring sites to support these monitoring objectives. Examples of these sites are: sites that are located in highest pollutant concentration area, sites that are located in area of high population density to monitor for population exposure, sites that determines general background concentration levels, etc. Different types of monitoring sites are listed in Appendix D to 40 CFR Part 58. In addition, the physical siting of an air monitoring station must achieve a spatial scale of representativeness that is consistent with the monitoring objective of the monitor. The spatial scale results from the physical location of the site with respect to the pollutant sources. It estimates the size of the area surrounding the monitoring site that experiences uniform pollutant concentrations. Table 2-3 summarizes the site type and spatial scale. For in-depth details on individual monitors, including monitoring objective and statement of purpose, see Appendix A, Detailed Site Information. Site type and spatial scale description can be found in Appendix D to 40 CFR Part 58.

Table 2-3 Type of Site and Spatial Scale

		Sacramento-Bercut Dr. (BER)	Sacramento-Branch Center Rd	Elk Grove-Bruceville Rd.	Sacramento-Del Paso Manor	Folsom-Natoma (FOL)	Sacramento-Goldenland Ct.	North Highlands-Blackfoot Way	Rancho Seco (RS)	Sloughhouse (SLU)	Sacramento- T St. (TST)
Site Type	Ozone			UP	PE	MO PE	PE	PE		MO	GB
	Carbon Monoxide	SO			PE		PE	PE			
	Nitrogen Dioxide	SO		UP	PE	HC	PE	PE			PE
	Sulfur Dioxide				PE						
	PM_{10} (Cont. or Manual)		HC		PE		PE	PE			PE
	$PM_{2.5}$ (Cont. or Manual)			GB	PE HC	PE			UP	UP	PE HC
	$PM_{10-2.5}$				PE						
	Lead				PE						
Spatial Scale	Ozone			US	NS	NS	US	US		NS	US
	Carbon Monoxide	MC			NS		NS	NS			
	Nitrogen Dioxide	MC		NS	NS	NS	NS	NS			NS
	Sulfur Dioxide				US						
	PM_{10} (Cont. or Manual)		NS		NS		NS	NS			NS
	$PM_{2.5}$ (Cont. or Manual)			NS	NS	NS			NS	NS	NS
	$PM_{10-2.5}$				NS						
	Lead				US						

Site Type:
ED - Extreme downwind
GB - General/background
HC - Highest concentration
MO - Maximum O_3 concentration
PE - Population exposure
QA - Quality assurance
MP - Maximum precursor emission
OT - Other
RT - Regional transport
SO - Source oriented
UP - Upwind/background
WF - Welfare related impacts

Spatial Scale:
MC - Microscale
MD - Middle scale
NS - Neighborhood scale
US - Urban scale
RS - Regional scale
NG - National/global scale

Section 3 Minimum Monitoring Requirements

Depending on the specific pollutant, the minimum number of monitoring sites required for each pollutant is based on the one or more applicable factors as described in Appendix D to 40 CFR Part 58: MSA population, pollutant design value, pollutant maximum concentration, attainment status, annual average daily traffic (AADT), state implantation plan (SIP), maintenance plan, population weighted emission index (PWEI), and EPA's national emission inventory (NEI) data.

Sacramento MSA meets or exceeds minimum monitoring requirement for all criteria pollutants – O_3, $PM_{2.5}$ (manual and continuous methods), PM_{10}, NO_2, SO_2, CO, and Pb. Details of the monitors representing Sacramento MSA (or CBSA, ID#40900), including the minimum monitoring requirements of all criteria pollutants are provided in Tables 3-1 and 3-2. As mentioned in Section 2, Sacramento MSA has 2.3 million residents and includes all of El Dorado, Placer, Sacramento, and Yolo Counties.

SMAQMD has an agreement with CARB to share specific portions of the monitoring responsibility in the MSA. A copy of this agreement is provided in Appendix B. Placer County Air Pollution Control District and Yolo-Solano Air Quality Management District also operate air monitoring stations within the MSA.

Table 3-1 2016 Sacramento MSA Design Value and Monitoring Site Requirement, Part 1

Pollutant	Type (if applicable)	Number of SLAMS sites required	Active SLAMS sites in MSA	Active SLAMS sites in Sacra-mento County	Additional SLAMS sites needed	2016 design value [A] and location
O_3		2	15	7	0	0.085 ppm Placerville (06-017-0010)
$PM_{2.5}$	FRM/FEM	3	7[B]	4[B]	0	24-hr: 31 µg/m^3 Sacramento-Del Paso Manor (06-067-0006)
	Continuous	2	11	5	0	Annual: 9.3 µg/m^3 Sacramento-Del Paso Manor (06-067-0006)
PM_{10}		2-4	10	6	0	3-year average expected number of exceedance: 0.0 Max 24-hr concentration (FRM): 45 µg/m^3 Sacramento-Branch Center #2 (06-067-0284) Max 24-hr concentration (FEM): 104 µg/m^3 Sacramento-T Street (06-067-0010)
$PM_{10-2.5}$		1	1	1	0	Not applicable

[A] Design values from U.S. EPA Air Quality System Design Value Report (AMP 480), accessed on 26-Apr-2017
[B] $PM_{2.5}$ monitoring ceased in November 2016 at Sacramento-Health Dept. Subsequently, the near road monitoring station (Bercut Drive) started $PM_{2.5}$ sampling in December 2016. The net number of active $PM_{2.5}$ FRM/FEM monitors in operation during 2016 remains as four

Table 3-2 2016 Sacramento MSA Design Value and Monitoring Site Requirement, Part 2

Pollutant	Type (if applicable)	Number of SLAMS sites required	Active SLAMS sites in MSA	Active SLAMS sites in Sacramento County	Additional SLAMS sites Needed	Notes
NO_2	Near-road	1	1	1	0	Highest AADT: 258,000 (U.S. Highway 50 east of 15/16th Street) [A][B] NO_2 monitor at Sacramento-Del Paso Manor (06-067-0006) serves as both PAMS and area-wide monitor
	Area-wide	1	8	6	0	
SO_2		1	1	1	0	Total SO_2: 4,201 tons[C] Population Weighted Emission Index: 9,467 million persons-tons per year[D] Monitor at Sacramento-Del Paso Manor satisfy NCore
CO	Near-road	1	1	1	0	Monitor at Sacramento-Bercut Dr. satisfy the near-road monitoring requirement Trace monitor at Sacramento-Del Paso satisfy the NCore requirement, which also satisfy the monitor requirement in the CO Maintenance Plan
	Non-near-road	1	3	3	0	
Pb	NCore	0[E]	1	1	0	Located at Sacramento-Del Paso Manor
	Source oriented	0	0	0	0	Number of non-airport source > 0.5 tpy: 0[C] Number of airport source >= 1.0 tpy: 0[C]

[A] California Department of Transportation, 2015 Traffic Volumes, accessed 14-Feb-2017 (2016 data is not yet available)

[B] Sacramento MSA has recently surpassed the 250,000 threshold for a second near-road monitoring site per 40 CFR Part 58 Appendix D, 4.3.2(a)

[C] Source: 2014 National Emission Inventory, accessed 14-Feb-2017

[D] Per Appendix D to 40 CFR Part 58, $PWEI = \frac{Total\ SO_2 \times MSA\ population}{1{,}000{,}000}$

[E] Revisions to Ambient Monitoring Quality Assurance and Other Requirements promulgated on April 27, 2016, revokes the lead monitoring requirement at NCore sites

In addition to criteria pollutants, the Sacramento MSA also meets minimum monitoring requirements for PAMS, which are required due to the nonattainment classification for ozone in the Sacramento MSA. The PAMS network is operated in accordance with the California Alternative Plan III (CAP III). A copy of CAP III is located in Appendix D.

Currently, SMAQMD operates one of each PAMS type I, II, and III sites as well as one secondary type II site. Table 3-3 lists the instruments operating at each PAMS site and the current number of monitors required. New PAMS requirements were promulgated with the 2015 revision of the National Ambient Air Quality Standards for Ozone (80 FR 65292).

Table 3-3 PAMS Minimum Monitoring Requirement

PAMS Parameter	# Required	# Active	Elk Grove-Bruceville Rd. (Type 1)	Sacramento-Del Paso Manor (Type II)	Sacramento-Goldenland Ct. (Type II, secondary)	Folsom-Natoma St. (Type III)
O_3	4[A]	4	×	×	×	×
CO	1	2		×	×	
NO_X	2	4	×	×	×	×
NO_Y	1	1		×[B]		×
Speciated VOC	2	2		×		×
Carbonyl Sampling	1	1		×		
Surface Met	4[A]	4	×	×	×	×
Upper Air Meteorology	1	1	×			

[A] This requirement is dependent on the number of PAMS site; see Appendix D to 40 CFR Part 58
[B] Per Appendix D to 40 CFR Part 58, this monitor does not count toward PAMS requirement but is required for NCore; NO_Y for PAMS must be at Type I or III site. This requirement is fulfilled by the Folsom-Natoma St. site

All instruments operated by SMAQMD meets the operating schedule requirements as specified in 40 CFR Part 58.12. All continuous monitors, including O_3, CO, NO_2, SO_2, $PM_{2.5}$ beta attenuation monitor (BAM), and PM_{10} tapered element oscillating microbalance (TEOM), report hourly data and monitor pollutant year-round, unless otherwise specified in Appendix A. The sample schedule for non-continuous monitors is summarized in Table 3-4. Design values are included in the table if necessary to determine an appropriate schedule for non-continuous monitors (in accordance to Appendix D, Network Design, to 40 CFR Part 58). All non-continuous monitors are operated year-round with the following exceptions: 1) speciated VOC and carbonyl samplers at PAMS operate from July through September, and 2) the special purpose $PM_{2.5}$ monitor at Rancho Seco operates from November through February if there are sufficient resources. For further details on sampling season and operating schedule, please refer to Appendix A.

Table 3-4 Sampling Schedule and 2016 Design Value for PM, Pb, and VOC Monitors in Sacramento County All units in µg/m^3

Site	PM10[A]	PM2.5[B] [C]	$PM_{10-2.5}$[D]	Pb	VOC
Sacramento-Branch Center #2	Max. 24-hr concentration: 45 Ratio to standard: 0.3				
Sacramento-Bercut Dr.		1 in 3 days monitoring started 12/2/16[E]			
Elk Grove-Bruceville		(Continuous Monitor)			During summer O_3 episode only
Sacramento-Del Paso Manor	Max. 24-hr concentration: 31 Ratio to standard: 0.21	24-hr DV: 31 Annual DV: 9.3	1 in 3 days	Max rolling 3-mo. average: 0.0027	1 in 3 days (Jul-Sep)
Folsom-Natoma St.		(Continuous Monitor)			1 in 3 days (Jul-Sep)
Sacramento-Goldenland Ct.	Max. 24-hr concentration: 74 Ratio to standard: 0.49				
North Highlands-Blackfoot Way	Max. 24-hr concentration: 31 Ratio to standard: 0.21				
Sacramento-Health Department	Max. 24-hr concentration: 34 Ratio to standard: 0.23	24-hr DV: 24 Annual DV: 8.4			
Rancho Seco		(Continuous Monitor)			
Sloughhouse		(Continuous Monitor)			
Sacramento-T St	Max. 24-hr concentration: 104 Ratio to standard: 0.69	24-hr DV: 27 Annual DV: 8.7			

Source: Design values from U.S. EPA Air Quality System Design Value Report (AMP 480) and Raw Data Report (AMP350) on Pb (85129), accessed on 29-Mar-2017

Legend:

Blue denotes daily sampling	Yellow denotes 1 in 3 day sampling	Green denotes 1 in 6 day sampling

[A] Per 40 CFR Part 58.12(e), PM_{10} (non-continuous) operates on a minimum of 1in 6 days sampling schedule. More frequent sampling may be required if ratio to the 24-hr PM_{10} NAAQS (standard) exceeds 0.8

[B] Per 40 CFR Part 58.12(d)(1)(iii), "required SLAMS stations whose measurements determine the 24-hour design value for their area and whose data are within ±5 percent of the level of the 24-hour PM2.5 NAAQS must have an FRM or FEM operate on a daily schedule if that area's design value for the annual NAAQS is less than the level of the annual PM2.5 standard."

[C] Per 40 CFR Part 58.12 (d)(1)(i), "manual PM2.5 samplers at required SLAMS stations without a collocated continuously operating PM2.5 monitor must operate on at least a 1-in-3 day schedule unless a waiver for an alternative schedule has been approved per paragraph (d)(1)(ii) of this section.

[D] Per 40 CFR Part 58.12(f)(1), "manual PM10-2.5 samplers at NCore stations must operate on at least a 1-in-3 day schedule at sites without a collocated continuously operating federal equivalent PM10-2.5 method."

[E] There is no design value because monitoring began on 12/2/16

Section 4 Recent and Proposed Modification to the Network

This section discusses recent and proposed modifications to the air monitoring network. As required by 40 CFR Part 58.10, modifications within the next 18 months are included in this report. SMAQMD is not formally requesting approval for modification through this network plan. Prior to a network modification, SMAQMD will work with the CARB to submit to EPA the required documentation for official review and approval of proposed system modifications. CARB is the primary quality assurance organization of the SMAQMD.

Sacramento-Bercut Dr.

As required by Appendix D to 40 CFR Part 58, a $PM_{2.5}$ FRM sampler was installed and has been operational since December 2, 2016.

Sacramento-Branch Center #2

No change anticipated.

Elk Grove-Bruceville Rd.

SMAQMD is considering discontinuing the speciated VOC episodic measurements at this site. Speciated VOC measurements at this site are not specifically required by Appendix D to 40 CFR Part 58 but are included as a measurement in Sacramento's portion of the California Alternative Plan (CAP III)[8]. Speciated VOC concentrations collected at this site are low, indicative of robust representations of background concentrations.

Elk Grove-Bruceville $PM_{2.5}$ BAM monitor is being considered for an equipment upgrade. This monitor currently reports data to AirNow with parameter code 88501 even though the data can also be used for air quality index (AQI) forecasting. SMAQMD will continue to report this data under 88501 to maintain continuity of historical data records. After the equipment upgrade (summer/fall 2017), SMAQMD will changed the parameter code to 88502 to promote consistency on data reporting practices for data that can be used for AQI forecasting.

Sacramento-Del Paso Manor

In Revisions to Ambient Monitoring Quality Assurance (QA) and Other Requirements promulgated on March 28, 2016 (81 FR 17248), EPA removed the lead monitoring requirement at urban NCore sites provided that the sampler has collected sufficient data to calculate a design value. Since SMAQMD meets the condition, termination of this lead monitor is being evaluated.

Sacramento-Del Paso Manor is one of the NCore sites in the country that is required to have new PAMS measurements by June 2019 as stipulated by 40 CFR Part 58 Appendix D 5(c). EPA has requested that agencies submit waivers as part of the 2016 Annual Network Plan if they are requesting to install monitors at locations other than the NCore sites. SMAQMD is requesting a wavier to install the required ceilometer at Elk Grove-Bruceville Rd. Refer to Appendix G for further discussion.

[8] A copy is provided in Appendix D

Folsom-Natoma St

In late Fall 2017, the building that shelters air monitoring instruments will be replaced. Exact blueprint of building and instrument towers may be slightly altered for increase safety and better site design. For example, SMAQMD may increase clearance distance between the meteorology tower and the building. Staff will try to reduce instruments down time during this renovation process.

Sacramento-Goldenland Ct

EPA approved a discontinuation request for this site on May 2, 2017. Refer to Appendix E for the approval letter. According to the discontinuation request, "Goldenland site is making redundant measurements to other nearby monitoring stations for… O_3, PM_{10}, and NO_2." Analysis within the assessment shows CO attained NAAQS for the previous five years and is not likely to exceed NAAQS based on current ambient concentration levels. Also, Sacramento-Goldenland Ct. is a redundant secondary type II PAMS, as nearby Sacramento-Del Paso Manor is the primary type II PAMS site that measures a full suite of VOC species. Anticipate shut down of the station will occur in Summer 2017.

North Highlands-Blackfoot Way

Since 2016, SMAQMD has been in the process of negotiating a lease with the new property manager. If an agreement is not reached, SMAQMD will evaluate options to relocate or discontinue the monitoring station.

Sloughhouse-Sloughhouse Rd.

SMAQMD will upgrade/replace the $PM_{2.5}$ BAM monitor in summer 2017. Data from this monitor is used to determine the $PM_{2.5}$ background concentration and for AQI forecasting. Once the monitor is upgraded or replaced, SMAQMD will change the parameter code from 88501 to 88502 to be consistent with data reporting practices for data that can be used for AQI forecasting.

Sacramento Health Dept.-Stockton Blvd.

On November 14, 2016, EPA approved a discontinuation request for this site, and Sacramento Health Dept.-Stockton Blvd. was discontinued on November 17, 2016. See Appendix F for a copy of the closure approval letter.

Rancho Seco

This is a special purpose monitoring site that operates seasonally. SMAQMD will operate this site in the winter season as staff resources are available.

Near-road site #2

40 CFR Part 58 requires state or local air monitoring organization to operate a second near-road monitoring site if any traffic count in the metropolitan area surpasses 250,000 in AADT. Sacramento MSA has recently surpassed the threshold and triggered the requirement. The location of the exceedance is on U.S. Highway 50 east of $15^{th}/16^{th}$ Street. SMAQMD is working with EPA and CARB to determine the appropriate timing, location, and funding for a second near-road monitoring site.

Section 5 PM and Lead Collocation Requirement

Quality Assurance Requirements for SLAMS found in Appendix A to 40 CFR Part 58 requires collocation for PM_{10}, $PM_{2.5}$ FRM and FEM, $PM_{10-2.5}$, and Pb monitors. Section 3 in the appendix states that each method within a "primary quality assurance organization (PQAO) must have 15 percent of the monitors collocated."

SMAQMD is a part of CARB's PQAO. Therefore, collocated monitors operated by SMAQMD are part of the CARB PQAO. Currently, there are collocated $PM_{2.5}$ FRM and PM_{10} FRM monitors at Sacramento-Del Paso Manor. There is a collocated $PM_{2.5}$ FEM monitor at Folsom-Natoma St.

The CARB PQAO requires no source or non-source Pb monitoring. However, the CARB PQAO does have two NCore sites which are located at Fresno-Garland and Sacramento-Del Paso Manor. A PQAO with only NCore and no source-oriented Pb monitoring do not have to collocate for Pb[11]. The CARB PQAO, including the Del Paso Manor site, does not require any collocation for Pb. Similarly, SMAQMD is not required to collocate its $PM_{10-2.5}$ monitors because it is determined on a national scale[12].

For complete details on PM and Pb collocation, please refer to the latest edition of Annual Monitoring Network Report published by CARB[13].

[11] 40 CFR 58, Appendix A, 3.3.4.3
[12] 40 CFR 58, Appendix A, 3.3.6
[13] https://www.arb.ca.gov/aqd/amnr/amnr.htm

Section 6 Process to Review Changes to $PM_{2.5}$ Monitoring Network

40 CFR Part 58 requires that this Annual Monitoring Plan "document how State and Local Agencies provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor or the creation/change to a community monitoring zone, including a description of the proposed use of spatial averaging for purposes of making comparisons to the annual $PM_{2.5}$ NAAQS as set forth in Appendix N to 40 CFR Part 58. The affected State or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan." Note that spatial averaging does not apply in California because the state and local air monitoring districts collectively elected not to establish community monitoring zones in the 1990s.

The general process for any proposed change to the monitoring network is that the proposed change is discussed in this Annual Monitoring Plan. This report was posted to our District Website for no less than 30 days for public review and comment. No comment was received during the public comment period, which was open from May 24 thru June 23. This report is now forwarded to EPA-Region IX for approval.

Section 7 Data Submission Requirements

CARB submits precision, accuracy, and raw data for all District operated monitors in 2016. CARB is also the lead agency on annual data certification. The following submission dates are provided by CARB. A copy of the annual data certification is provided in Appendix C

- 2016 Annual data certification submitted: June 2, 2017
- 2016 1-pt QC data submitted to AQS: Quarterly
- 2016 flow rate verification data submitted to AQS: Quarterly

Section 8 Review of Existing SMAQMD Air Monitoring Sites

For each monitor at each monitoring site, the tables in Appendix A to this network plan provides details to determine if each monitor meets 40 CFR Part 58 requirements, including Appendices A (QA Requirements), C (FRM/FEM/ARM Requirements), D (Network Design Criteria), and E (Probe Sitting Criteria), when applicable. Unless as noted otherwise, each monitor operated in the SMAQMD ambient air monitoring network meets the requirements of 40 CFR Part 58, including Appendices A, C, D, and E.

$PM_{2.5}$ monitor at Rancho Seco is a special purpose monitor but is not a FRM, FEM, or ARM monitor; it is not subject to requirements in Appendix A to 40 CFR Part 58.

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Appendix A Detailed Site and Monitor information

Detailed site information covered in this appendix reflects air monitoring operation from January 1, 2016-December 31, 2016.

A.1 Sacramento-Bercut Dr.

This is an approved near-road monitoring site. Located one mile from Downtown Sacramento, this site is expected to measure the highest NO_2 concentration due to the emission from car and truck on Interstate 5, which is about 20 m from the site. The site started operation on October 13, 2015.

Table A-1 Sacramento-Bercut Dr. Metadata

Site Name	Sacramento-Bercut
AQS Site No.	06-067-0015
Geographic Coordinates	38.593328°N, 121.503728°W
Location	On the downwind side of Interstate 5, one mile north-northwest of downtown Sacramento.
Address	100 Bercut Dr., Sacramento, CA
County	Sacramento
Distance from roadway	Interstate 5: 20 m Bercut Dr.: 5 m
Annual Average Daily Traffic (Vehicles/Day)	Interstate 5: 188,700 (Caltrans, 2015) Bercut Dr. south of Richards Blvd.: 2,709 (City of Sacramento, 2012)
Ground Cover	Pavement, with vegetation
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Figure A-1 Panoramic view toward north from air monitoring station roof

Figure A-2 Panoramic view toward east from air monitoring station roof

Figure A-3 Panoramic view toward south from air monitoring station roof

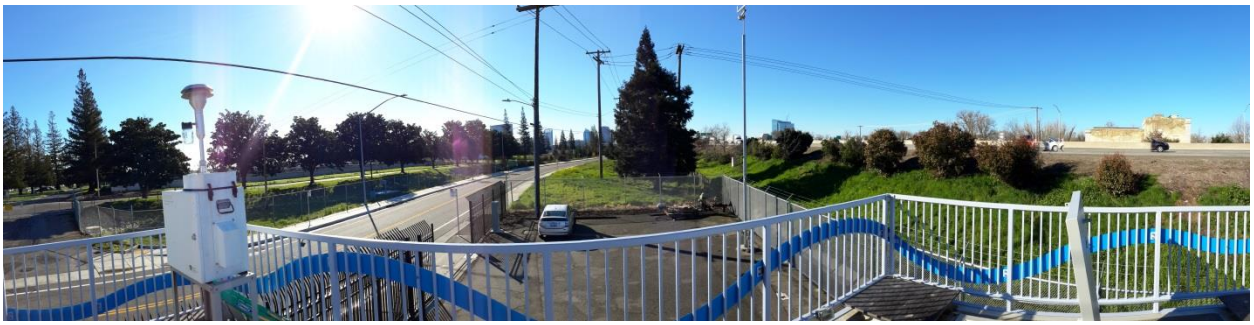


Figure A-4 Panoramic view toward west from air monitoring station roof

Figure A-5 Google Earth satellite image of Sacramento-Bercut Dr.

The circle in figure A-5 indicates there are no trees within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Also, heights of potential flow obstacles were calculated on-site with trigonometry on 2/23/17 and are provided in Tables A-2 thru A-4. With the exception of tree "H," each inlet and sampler has 360° of unrestricted airflow. Tree H is an old growth heritage tree, as defined by Chapter 12.64 of Sacramento City Code (SCC). It is protected by SCC from removal or significant pruning. Since the tree is directly downwind of emission source, it has limited scavenging effect and does not interfere with the emission source being monitored. Before the air monitoring site was established, EPA staff had approved for this tree to remain in place[14].

[14] Per email correspondence with Elfego Felix, EPA Region 9, on August 6, 2013

Table A-2 Distance between Object and Inlet or Probe at Sacramento-Bercut Dr. All units in meter

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	36.58	32.00
Object B (Tree)	24.69	25.60
Object C (Tree)	21.95	22.86
Object D (Tree)	18.29	20.12
Object E (Tree)	15.54	20.12
Object F (Tree)	18.29	22.86
Object G (Tree)	25.60	30.18
Object H (Tree)	34.75	34.75
Object I (Tree)	41.15	39.32

Table A-3 Object Protrusion above Inlet or Probe at Sacramento-Bercut Dr. All units in meter

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	10.08	9.68
Object B (Tree)	1.73	1.33
Object C (Tree)	2.00	1.60
Object D (Tree)	1.11	0.71
Object E (Tree)	0.81	0.41
Object F (Tree)	2.97	2.57
Object G (Tree)	7.50	7.10
Object H (Tree)	24.12	23.72
Object I (Tree)	8.64	8.24

Table A-4 Distance vs. Protrusion Ratio at Sacramento-Bercut Dr. (must be ≥ 2)[15]

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	3.6	3.3
Object B (Tree)	14.2	19.2
Object C (Tree)	11.0	14.3
Object D (Tree)	16.5	28.4
Object E (Tree)	19.2	49.0
Object F (Tree)	6.2	8.9
Object G (Tree)	3.4	4.3
Object H (Tree)	1.4[(A)]	1.5[(A)]
Object I (Tree)	4.8	4.8

[(A)] See discussion on page 21

[15] Per Appendix E to 40 CFR Part 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	Sacramento-Bercut Dr	Sacramento-Bercut Dr
Start Date	10/13/2015	10/13/2015
Collecting Agency	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A
Reporting Agency	CARB	CARB
Pollutant	NO2	CO
Parameter Code	42602	42101
POC	1	1
Manufacturer and model	TAPI200UP	TAPI 300U
Sampling Method	Instrumental	Instrumental
Method Code	200	593
Analysis Method	Photolytic-Chemiluminescence	Gas Filter Correlation
FRM/FEM/ARM/Other	FEM	FRM
Monitoring objective	NAAQS comparison, public info, research	NAAQS comparison, public info, research
Statement of Purpose	Monitors near road emission at region's highest fleet equivalent AADT roadway	Monitors near road emission at region's highest fleet equivalent AADT roadway
Monitor type	SLAMS	SLAMS
Affiliation	Near Road	Near Road
Site type	Source Oriented	Source Oriented
Spatial scale	Microscale	Microscale
Sampling Frequency	Continuous	Continuous
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top (m)	1.8	1.8
Distance from flow obstructions on roof (m)	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	34.8	34.8
Distance from nearest tree drip line (m)	15.5	15.5
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	4.6 m (lo vol)	4.6 m (lo vol)
Unrestricted airflow (deg)	336.0	336.0
Probe height (m, agl)	4.6	4.6
Probe material	Teflon	Teflon
Residence time (seconds)	18.6	18.0
Changes in next 18 months?	No	No
Frequency of one-point QC check	Every other day	Every other day
Last Performance Evaluation	4/19/16	4/19/16

Site	Sacramento-Bercut Dr	
Start Date	10/30/2015	12/2/2016
Collecting Agency	SMAQMD	SMAQMD
Analytical Lab	N/A	CARB
Reporting Agency	CARB	CARB
Pollutant	Black Carbon	PM2.5
Parameter Code	84313	88101
POC	1	1
Manufacturer and model	Magee Scientific M633	R & P 2025
Sampling Method	Aethalometer	Low volume with VSCC
Method Code	894	118
Analysis Method	Optical Absorption	Gravimetric
FRM/FEM/ARM/Other	Other	FRM
Monitoring objective	Public info, research	NAAQS comparison, public info, research
Statement of Purpose	Determines component of PM emission at region's highest fleet equivalent AADT roadway	Monitors near road emission at region's highest fleet equivalent AADT roadway
Monitor type	SLAMS	SLAMS
Affiliation	Near Road	Near Road
Site type	Source Oriented	Source Oriented
Spatial scale	None	Neighborhood
Sampling Frequency	Continuous	1 in 3 days
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top (m)	1.8	2.2
Distance from flow obstructions on roof (m)	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	34.8	34.8
Distance from nearest tree drip line (m)	15.5	18.3
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	No other PM monitors
Unrestricted airflow (deg)	336.0	336.0
Probe height (m, agl)	4.6	5.0
Probe material	Aluminum	Aluminum
Residence time (seconds)	Not applicable	Not applicable
Changes in next 18 months?	No	No
Frequency of one-point QC check	Monthly	Monthly
Last Performance Evaluation	Not applicable	Sampling started 12/1/16

Site	Sacramento-Bercut Dr		
Start Date	10/30/2015	10/30/2015	10/30/2015
Collecting Agency	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB
Pollutant	10 m temperature	Wind Direction	Wind Speed
Parameter Code	62101	61104	61103
POC	1	1	1
Manufacturer and model	Climatronics 100093	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental
Method Code	042	020	020
Analysis Method	Machine Average	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other
Monitoring objective	Public info, research	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	Other	Other	Other
Affiliation	Near Road	Near Road	Near Road
Site type	Not applicable	Not applicable	Not applicable
Spatial scale	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	Not applicable	Not applicable	Not applicable
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	336.0	336.0	336.0
Probe height (m, agl)	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No
Frequency of one-point QC check	N/A	N/A	N/A
Last Performance Evaluation	4/19/16	4/19/16	4/19/16

A.2 Sacramento-Branch Center #2

Sacramento-Branch Center #2 is a PM_{10} site. This site was established, in early 2006, to replace the former Sacramento-Branch Center site, which was approximately one-quarter mile to the north.

The objective of this site is to measure the representative concentration, as documented in the original site initiation reports filed in the late 1980s. The old site was relocated since nearby trees were a flow obstacle.

Table A-5 Sacramento-Branch Center #2 Metadata

Site Name	Sacramento-Branch Center #2
AQS Site No.	06-067-0284
Geographic Coordinates	38.553611°, -121.336111° (NAD27)
Location	Rooftop of building in the middle of County Maintenance Yard, located 10 miles east-southeast of downtown Sacramento.
Address	3847 Branch Center Road, Sacramento, CA 95827
County	Sacramento
Distance from roadway	62 m
Annual Average Daily Traffic (Vehicles/Day)	Bradshaw Rd South of Old Placerville Rd.: 37,938 (SACDOT, 3/26/2014)
Ground Cover	Paved
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

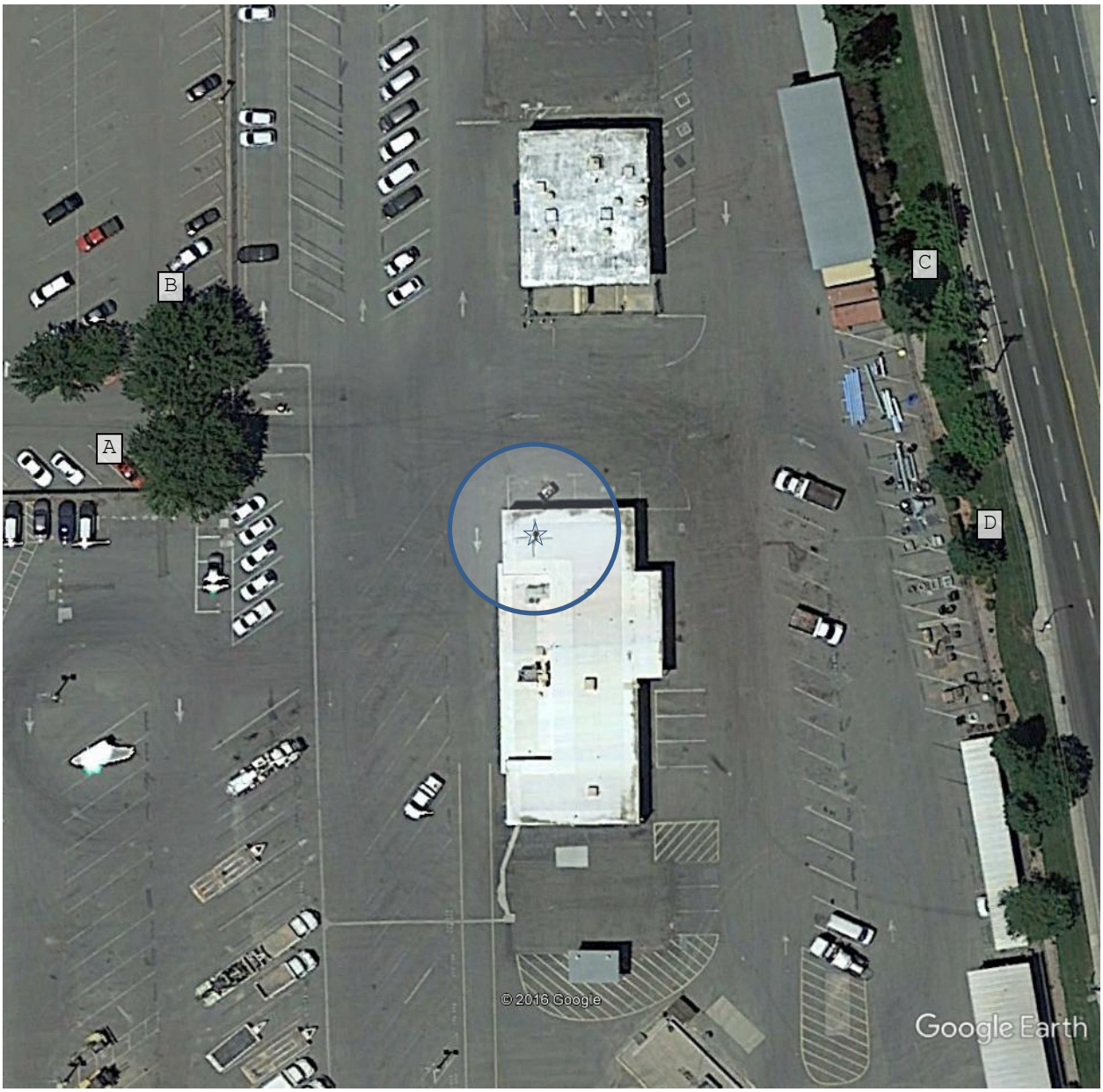
Figure A-6 Panoramic view toward north from air monitoring station roof

Figure A-7 Panoramic view toward east from air monitoring station roof

Figure A-8 Panoramic view toward south from air monitoring station roof

Figure A-9 Panoramic view toward west from air monitoring station roof

Figure A-10 Google Earth satellite image of Sacramento-Branch Center #2



The circle in Figure A-10 indicates no trees exist within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Also, heights of the trees were calculated on-site with trigonometry on 3/23/17. Object C and D marks the tallest tree northeast and southeast of the station, respectively. Analyses in Tables A-6 thru A-8 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Table A-6 Distance between Object and Inlet or Probe at Sacramento-Branch Center #2
All units in meter

	PM_{10} Inlet
Object A (Tree)	37.49
Object B (Tree)	41.15
Object C (Tree)	50.29
Object D (Tree)	50.29

Table A-7 Object Protrusion above Inlet or Probe at Sacramento-Branch Center #2
All units in meter

	PM_{10} Inlet
Object A (Tree)	8.11
Object B (Tree)	4.70
Object C (Tree)	11.48
Object D (Tree)	5.59

Table A-8 Distance vs. Protrusion Ratio at Sacramento-Branch Center #2
(must be ≥ 2)[16]

	PM_{10} Inlet
Object A (Tree)	4.6
Object B (Tree)	8.7
Object C (Tree)	4.4
Object D (Tree)	9.0

[16] Per Appendix E to 40 CFR Part 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	Sacramento-Branch Center
Start Date	4/1/2006
Collecting Agency	SMAQMD
Analytical Lab	SMAQMD
Reporting Agency	CARB
Pollutant	PM10
Parameter Code	81102
POC	1
Manufacturer and model	Sierra Anderson 1200
Sampling Method	Hi Volume
Method Code	063
Analysis Method	Gravimetric
FRM/FEM/ARM/Other	FRM
Monitoring objective	NAAQS comparison, public info
Statement of Purpose	Measures PM10 concentration
Monitor type	SLAMS
Affiliation	None
Site type	Highest concentration
Spatial scale	Neighborhood
Sampling Frequency	1 in 6 days
Sampling season	Year Round
Distance from supporting structure/roof top (m)	2.0
Distance from flow obstructions on roof (m)	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions
Distance from nearest tree drip line (m)	36.6
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not collocated
Distance with nearest PM monitor (m)	No other PM monitors
Unrestricted airflow (deg)	360.0
Probe height (m, agl)	6.5
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Monthly
Last Performance Evaluation	4/26/16, 10/17/16

A.3 Elk Grove-Bruceville

Bruceville air monitoring site is sited in a rural area 4 miles south of Elk Grove, CA, and 20 miles south of Downtown Sacramento. It was initiated in 1992 to replace the former Sacramento-Meadowview Road O_3 monitoring site.

This site is the upwind O_3 and ozone precursor monitoring site for our network, also known as a PAMS Type I site. It measures O_3, NO_2, total NMHC, speciated VOC (episodic only), $PM_{2.5}$ BAM, WD, WS, TMP, RH, SRD, UVR, precipitation, and BP.

Adjacent to the air monitoring site is the Franklin Field Radar Wind Profiler (RWP) for measurement of upper level winds and temperature. This RWP is operated year-round. Collection of upper air meteorology data is a requirement for the PAMS program.

Table A-9 Elk Grove-Bruceville Metadata

Site Name	Elk Grove-Bruceville
AQS Site No.	06-067-0011
Geographic Coordinates	38.302630° -121.420850° (WGS84)
Location	Rural area located 4 miles south of Elk Grove, CA.
Address	12490 Bruceville Rd, Elk Grove, CA 95758
County	Sacramento
Distance from roadway	76 m
Annual Average Daily Traffic (Vehicles/Day)	Bruceville Rd south of Lambert Rd.: 1,717 (SACDOT, 7/16/2014)
Ground Cover	Vegetated
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Figure A-11 Panoramic view toward north from air monitoring station roof

Figure A-12 Panoramic view toward east from air monitoring station roof

Figure A-13 Panoramic view toward south from air monitoring station roof

Figure A-14 Panoramic view toward west from air monitoring station roof

Figure A-15 Google Earth satellite image of Elk Grove-Bruceville

The circle in Figure A-15 indicates no trees exist within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Also, heights of the trees were calculated on-site with trigonometry on 3/8/17. Analyses in Tables A-10 thru A-12 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Table A-10 Distance between Object and Inlet or Probe at Elk Grove-Bruceville
All units in meter

	Gaseous Probe	VOC Probe	$PM_{2.5}$ Inlet
Object A (Tree)	23.77	23.77	22.86
Object B (Tree)	36.58	36.58	37.49
Object C (Tree)	45.72	45.72	45.72
Object D (Building)	35.66	35.66	35.66

Table A-11 Object Protrusion above Inlet or Probe at Elk Grove-Bruceville
All units in meter

	Gaseous Probe	VOC Probe	$PM_{2.5}$ Inlet
Object A (Tree)	1.01	0.54	0.09
Object B (Tree)	1.87	1.40	0.95
Object C (Tree)	4.06	3.59	3.14
Object D (Building)	-1.45	-1.92	-2.37

Note: negative value indicates inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-12 Distance vs. Protrusion Ratio at Elk Grove-Bruceville
(must be ≥ 2)[17]

	Gaseous Probe	VOC Probe	$PM_{2.5}$ Inlet
Object A (Tree)	23.4	43.7	242.1
Object B (Tree)	19.5	26.1	39.3
Object C (Tree)	11.3	12.7	14.5
Object D (Building)	N/A	N/A	N/A

Note: N/A indicates inlet or probe is taller than the object and airflow is not obstructed; refer to the note in the previous table

[17] Per Appendix E to 40 CFR 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	Elk Grove-Bruceville			
Start Date	7/1/1992	7/1/1992	7/1/1996	7/1/1996
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	ERG, Inc
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	O3	NO2	Total NMHC	Speciated VOC
Parameter Code	44201	42602	43102	43102
POC	1	1	1	2
Manufacturer and model	TAPI 400E	TAPI200UP	TEI 55C	Xontech 910A/912
Sampling Method	Instrumental	Instrumental	Instrumental	6L Pressurized Canister
Method Code	087	200	164	123
Analysis Method	Ultra Violet Absorption	Photolytic-Chemiluminescence	Flame ionization detector	Dual Fid - Pams
FRM/FEM/ARM/Other	FEM	FEM	Other	Other
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info, research	Research
Statement of Purpose	Measures background O3 concentration at upwind site	Measures background ozone precursor concentration	Measures background ozone precursor concentration	Measures background ozone precursor concentration
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	PAMS (Type I)	PAMS (Type I)	PAMS (Type I)	PAMS (Type I)
Site type	Upwind/Background	Upwind/Background	Upwind/Background	Upwind/Background
Spatial scale	Urban	Neighborhood	None	Neighborhood
Sampling Frequency	Continuous	Continuous	Continuous	Episodic Sampling
Sampling season	Year Round	Year Round	Year Round	July thru Sep
Distance from supporting structure/roof top (m)	1.2	1.2	1.2	1.2
Distance from flow obstructions on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	22.9	22.9	22.9	22.9
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	4.5	4.5	4.5	4.5
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	Stainless Steel
Residence time (seconds)	18.0	18.2	16.9	2.0
Changes in next 18 months?	No	No	No	Yes
Frequency of one-point QC check	Every other day	Every other day	Every other day	Pre- and post-seasonally check
Last Performance Evaluation	4/26/16	4/26/16	2/17/16	Not applicable

Site	Elk Grove-Bruceville
Start Date	12/1/2000
Collecting Agency	SMAQMD
Analytical Lab	N/A
Reporting Agency	CARB
Pollutant	PM2.5
Parameter Code	88501
POC	3
Manufacturer and model	Met One 1020 BAM
Sampling Method	Very sharp cut cyclone
Method Code	731
Analysis Method	Beta Attenuation
FRM/FEM/ARM/Other	Other
Monitoring objective	Public info
Statement of Purpose	Measures background concentration and transport of PM2.5 from San Joaquin Valley for PM2.5 forecasting
Monitor type	SPM
Affiliation	None
Site type	General/Background
Spatial scale	Neighborhood
Sampling Frequency	Continuous
Sampling season	Year Round
Distance from supporting structure/roof top (m)	2.1
Distance from flow obstructions on roof (m)	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions
Distance from nearest tree drip line (m)	21.9
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not Collocated
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360.0
Probe height (m, agl)	5.4
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Bi-monthly
Last Performance Evaluation	4/26/16, 10/17/16

Site	Elk Grove-Bruceville			
Start Date	8/1/1996	8/1/1996	7/1/1997	8/1/1997
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	10 m temperature	Relative Humidity	Barometric Pressure	Precipitation
Parameter Code	62101	62201	64101	65102
POC	1	1	1	1
Manufacturer and model	Climatronics 100093	Climatronics 101669	Climatronics 101448	Climatronics 100508
Sampling Method	Instrumental	Instrumental	Instrumental	Bucket
Method Code	042	012	011	011
Analysis Method	Machine Average	Hygroscopic Plastic Film	Aneroid	Continuous Or Incremental
FRM/FEM/ARM/Other	Other	Other	Other	Other
Monitoring objective	Public info	Public info	Public info	Public info
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	Other	Other	Other	Other
Affiliation	PAMS (Type I)	PAMS (Type I)	PAMS (Type I)	PAMS (Type I)
Site type	Not applicable	Not applicable	Not applicable	Not applicable
Spatial scale	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	10.0	10.0	10.0	1.6
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	N/A	N/A	N/A	N/A
Last Performance Evaluation	Temporary shutdown[(A)]	Not applicable	Temporary shutdown[(A)]	Not applicable

[(A)] Per email correspondence with EPA on July 27, 2016

Site	Elk Grove-Bruceville			
Start Date	8/1/1996	8/1/1997	8/1/1996	8/1/1996
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	Solar Radiation	UV Radiation	Wind Direction	Wind Speed
Parameter Code	63301	63302	61104	61103
POC	1	1	1	1
Manufacturer and model	Climatronics 100848	Climatronics 100TUVR	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	011	011	020	020
Analysis Method	Pyranometer	UV Radiometer (Photometer)	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other
Monitoring objective	Public info	Public info	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	Other	Other	Other	Other
Affiliation	PAMS (Type I)	PAMS (Type I)	PAMS (Type I)	PAMS (Type I)
Site type	Not applicable	Not applicable	Not applicable	Not applicable
Spatial scale	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	N/A	N/A	N/A	N/A
Last Performance Evaluation	Not applicable	Not applicable	Temporary shutdown[(A)]	Temporary shutdown[(A)]

[(A)] Per email correspondence with EPA on July 27, 2016

Site	Elk Grove-Bruceville
Start Date	6/1/1996
Collecting Agency	SMAQMD
Analytical Lab	N/A
Reporting Agency	N/A
Pollutant	Upper Level Wind and Virtual Temperature
Parameter Code	Not applicable
POC	Not applicable
Manufacturer and model	Radian LAP-3000 with RASS option
Sampling Method	Not applicable
Method Code	Not applicable
Analysis Method	915 MHz Radar Wind Profiler, with RASS
FRM/FEM/ARM/Other	Other
Monitoring objective	Public info, research
Statement of Purpose	Measures representative upper level meteorology
Monitor type	Other
Affiliation	PAMS (Type I)
Site type	Not applicable
Spatial scale	Not applicable
Sampling Frequency	Continuous
Sampling season	Year Round
Distance from supporting structure/roof top (m)	No supporting structure
Distance from flow obstructions on roof (m)	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions
Distance from nearest tree drip line (m)	> 20 m
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360.0
Probe height (m, agl)	Not applicable
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of one-point QC check	N/A
Last Performance Evaluation	5/12/16

A.4 Sacramento-Del Paso Manor

This air monitoring site was initiated in 1979 and eventually became the largest air monitoring site in the Sacramento Valley air basin. This site is also one of the largest in Northern California, in terms of number of parameters measured. In October 2009, EPA-Region IX approved this monitoring site as an NCore site. This is one of six NCore sites operating in California.

It measures O_3, CO (trace level), NO_2, NO_Y, SO_2 (trace level), PM_{10} (main and collocated), PM_{10} TEOM, PM_{10} coarse, Pb-PM_{10}, $PM_{2.5}$ FRM (main and collocated), $PM_{2.5}$ BAM, speciated $PM_{2.5}$ Speciation Air Sampling System (SASS), black carbon (aethalometer), WD, WS, TMP, RH, and SRD. This is the current $PM_{2.5}$ design value site for this MSA.

Located just downwind of Downtown Sacramento, Del Paso Manor has been selected as a PAMS Type II primary site. Besides the required meteorological parameters, this site also monitors for NMHC year-round and speciated VOC (C2-C12) and carbonyl during summertime.

Speciation monitors at this site are part of the Chemical Speciation Network (CSN) and Speciated Trends Network. A URG300N sampler was installed in April 2009 joining the Met One Spiral Aerosol Speciation Sampler (SASS) that has been in service for many years.

Table A-13 Sacramento-Del Paso Manor Metadata

Site Name	Sacramento-Del Paso Manor
AQS Site No.	06-067-0006
Geographic Coordinates	38.613804°, -121.368007° (WGS84)
Location	Neighborhood park located 7 miles east-northeast of downtown Sacramento.
Address	2701 Avalon Drive, Sacramento, CA 95821
County	Sacramento
Distance from roadway	56 m
Annual Average Daily Traffic (Vehicles/Day)	Avalon Dr. south of Annette St.: 1,000 (estimated, two-lanes suburban local residential road)
Ground Cover	Vegetated
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

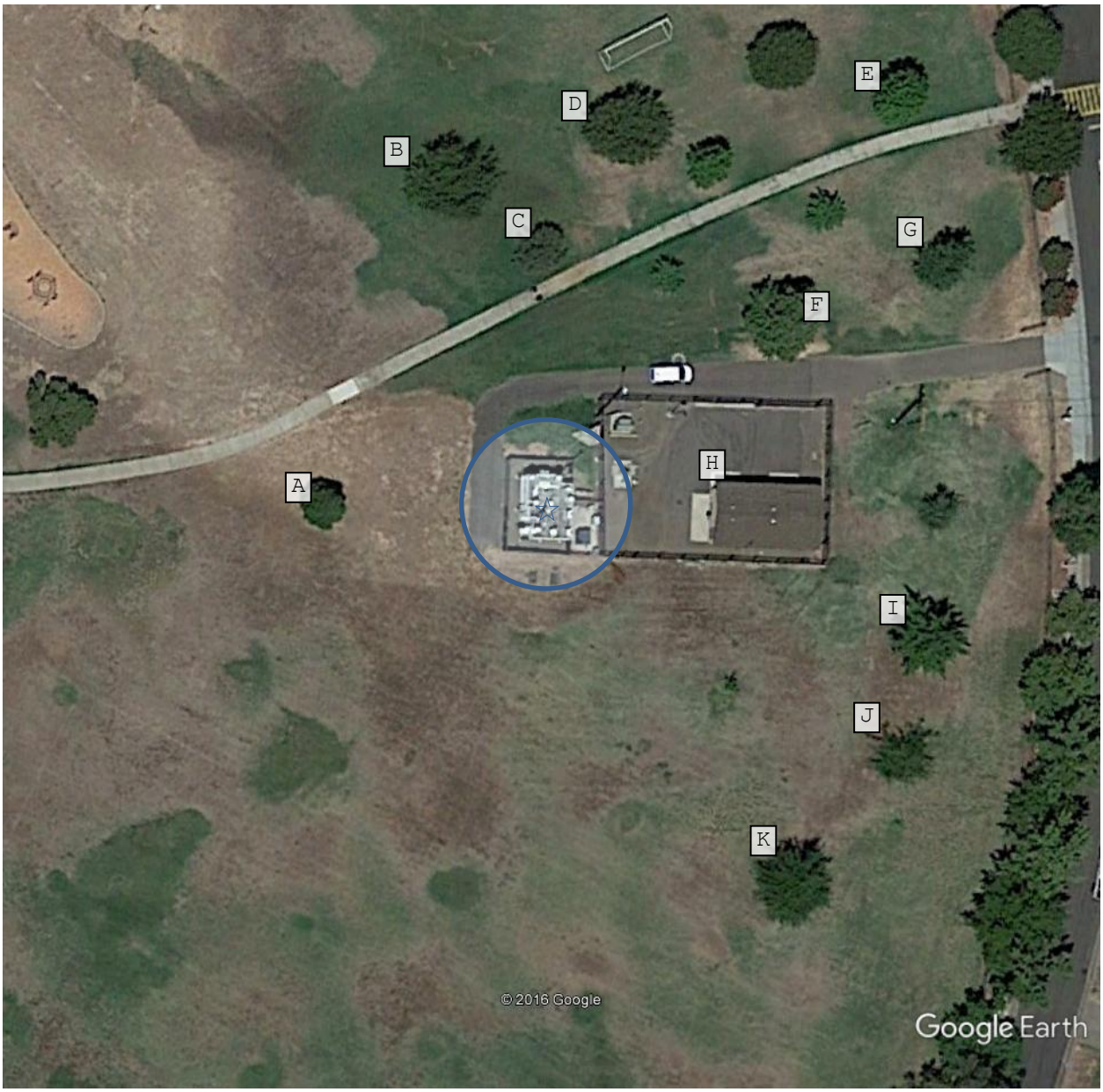
Figure A-16 Panoramic view toward north from air monitoring station roof

Figure A-17 Panoramic view toward east from air monitoring station roof

Figure A-18 Panoramic view toward south from air monitoring station roof

Figure A-19 Panoramic view toward west from air monitoring station roof

Figure A-20 Google Earth satellite image of Sacramento-Del Paso Manor



The circle in Figure A-20 indicates no trees exist within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Also, heights of the trees and building were calculated on-site with trigonometry on 3/29/17. Analyses in Tables A-14 thru A-16 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Table A-14 Distance between Object and Inlet or Probe at Sacramento-Del Paso Manor
All units in meter

	Gaseous Probe	NO_Y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	23.77	23.77	24.69	22.86	23.77	21.95
Object B (Tree)	32.92	31.09	31.09	30.18	32.00	34.75
Object C (Tree)	27.43	22.86	22.86	21.95	23.77	27.43
Object D (Tree)	42.06	35.66	35.66	36.58	39.32	41.15
Object E (Tree)	55.78	53.04	53.04	53.95	54.86	56.69
Object F (Tree)	31.09	29.26	29.26	30.18	30.18	32.00
Object G (Tree)	46.63	44.81	44.81	45.72	46.63	47.55
Object H (Building)	17.40	16.50	19.20	16.50	16.50	17.40
Object I (Tree)	40.23	42.06	41.15	43.89	41.15	41.15
Object J (Tree)	42.06	44.81	44.81	45.72	43.89	44.81
Object K (Tree)	44.81	47.55	46.63	48.46	46.63	45.72
	$PM_{2.5}$ Inlet	$PM_{2.5}$ Inlet	$PM_{10\text{-}2.5}$ Inlet	$PM_{2.5}$ Inlet	$PM_{2.5}$ Inlet	Carbon
Object A (Tree)	22.86	23.77	23.77	21.95	21.03	21.95
Object B (Tree)	36.58	36.58	36.58	32.92	32.92	36.58
Object C (Tree)	28.35	28.35	27.43	28.35	28.35	28.35
Object D (Tree)	42.06	42.06	41.15	42.06	41.15	42.06
Object E (Tree)	55.78	55.78	54.86	55.78	55.78	57.61
Object F (Tree)	30.18	30.18	30.18	32.00	31.09	31.09
Object G (Tree)	47.55	47.55	47.55	48.46	49.38	49.38
Object H (Building)	16.50	15.50	15.50	17.40	20.10	18.30
Object I (Tree)	39.32	38.40	39.32	41.15	43.89	41.15
Object J (Tree)	42.06	41.15	41.15	43.89	45.72	42.98
Object K (Tree)	43.89	42.06	44.81	45.72	45.72	43.89

Table A-15 Object Protrusion above Inlet or Probe at Sacramento-Del Paso Manor

	Gaseous Probe	NO_Y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	3.12	-4.88	3.5	3.52	3.22	2.92
Object B (Tree)	3.43	-4.57	3.8	3.83	3.53	3.23
Object C (Tree)	0.20	-7.80	0.6	0.60	0.30	0.00
Object D (Tree)	3.11	-4.89	3.5	3.51	3.21	2.91
Object E (Tree)	4.15	-3.85	4.55	4.55	4.25	3.95
Object F (Tree)	5.19	-2.81	5.59	5.59	5.29	4.99
Object G (Tree)	4.48	-3.52	4.88	4.88	4.58	4.28
Object H (Building)	-0.78	-8.78	-0.38	-0.38	-0.68	-0.98
Object I (Tree)	6.70	-1.30	7.10	7.10	6.80	6.50
Object J (Tree)	3.76	-4.24	4.16	4.16	3.86	3.56
Object K (Tree)	6.79	-1.21	7.19	7.19	6.89	6.59
	$PM_{2.5}$ Inlet	$PM_{2.5}$ Inlet	$PM_{10\text{-}2.5}$ Inlet	$PM_{2.5}$ Inlet	$PM_{2.5}$ Inlet	Carbon
Object A (Tree)	3.02	3.02	3.02	3.12	3.12	3.02
Object B (Tree)	3.33	3.33	3.33	3.43	3.43	3.33
Object C (Tree)	0.10	0.10	0.10	0.20	0.20	0.10
Object D (Tree)	3.01	3.01	3.01	3.11	3.11	3.01
Object E (Tree)	4.05	4.05	4.05	4.15	4.15	4.05
Object F (Tree)	5.09	5.09	5.09	5.19	5.19	5.09
Object G (Tree)	4.38	4.38	4.38	4.48	4.48	4.38
Object H (Building)	-0.88	-0.88	-0.88	-0.78	-0.78	-0.88
Object I (Tree)	6.60	6.60	6.60	6.70	6.70	6.60
Object J (Tree)	3.66	3.66	3.66	3.76	3.76	3.66
Object K (Tree)	6.69	6.69	6.69	6.79	6.79	6.69

Note: negative value indicates inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-16 Distance vs. Protrusion Ratio at Sacramento-Del Paso Manor (must be ≥ 2)[18]

	Gaseous Probe	NO_Y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	7.6	N/A	7.0	6.5	7.4	7.5
Object B (Tree)	9.6	N/A	8.1	7.9	9.1	10.8
Object C (Tree)	140.5	N/A	38.4	36.9	80.5	N/A
Object D (Tree)	13.5	N/A	10.2	10.4	12.3	14.2
Object E (Tree)	13.4	N/A	11.7	11.9	12.9	14.3
Object F (Tree)	6.0	N/A	5.2	5.4	5.7	6.4
Object G (Tree)	10.4	N/A	9.2	9.4	10.2	11.1
Object H (Building)	N/A	N/A	N/A	N/A	N/A	N/A
Object I (Tree)	6.0	N/A	5.8	6.2	6.0	6.3
Object J (Tree)	11.2	N/A	10.8	11.0	11.4	12.6
Object K (Tree)	6.6	N/A	6.5	6.7	6.8	6.9
	Gaseous Probe	NO_Y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	7.6	7.9	7.9	7.0	6.7	7.3
Object B (Tree)	11.0	11.0	11.0	9.6	9.6	11.0
Object C (Tree)	297.8	297.8	288.2	145.2	145.2	297.8
Object D (Tree)	14.0	14.0	13.7	13.5	13.3	14.0
Object E (Tree)	13.8	13.8	13.5	13.4	13.4	14.2
Object F (Tree)	5.9	5.9	5.9	6.2	6.0	6.1
Object G (Tree)	10.9	10.9	10.9	10.8	11.0	11.3
Object H (Building)	N/A	N/A	N/A	N/A	N/A	N/A
Object I (Tree)	6.0	5.8	6.0	6.1	6.5	6.2
Object J (Tree)	11.5	11.2	11.2	11.7	12.2	11.7
Object K (Tree)	6.6	6.3	6.7	6.7	6.7	6.6

Note: N/A indicates inlet or probe is taller than the object and airflow is not obstructed; refer to the note in the previous table

[18] Per Appendix E to 40 CFR 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	Sacramento-Del Paso Manor			
Start Date	12/1/1979	7/1/2011	5/1/2013	7/1/2011
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	O3	CO	NO2	NOY
Parameter Code	44201	42101	42602	42600
POC	1	1	1	1
Manufacturer and model	TAPI 400E	TAPI 300EU	TAPI200UP	TEI 42I-Y
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	087	593	200	574
Analysis Method	Ultra Violet Absorption	Gas Filter Correlation	Photolytic-Chemiluminescence	Chemiluminescence
FRM/FEM/ARM/Other	FEM	FRM	FEM	Other
Monitoring objective	NAAQS comparison, public info, research	NAAQS comparison, public info, research	NAAQS comparison, public info, research	Public info, research
Statement of Purpose	Measures elevated summer O3 levels near the downwind edge of the central business district	Measures representative wintertime CO concentration in populated area	Measures O3 precursor emission near downwind edge of central business district	Measures representative concentration in populated area
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	NCORE,PAMS (Type II)	NCORE,PAMS (Type II)	NCORE,PAMS (Type II)	NCORE
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	2.0	2.0	2.0	No supporting structure
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	21.9	21.9	22.0	21.9
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)	Not applicable
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	5.3	5.3	5.3	10.0
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	FEP Teflon
Residence time (seconds)	15.2	12.9	15.0	4.0
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	Every fourth day	Every fourth day	Every fourth day	Every fourth day
Last Performance Evaluation	11/22/16	11/22/16	11/22/16	Not applicable

Site	Sacramento-Del Paso Manor			
Start Date	7/1/2011	8/1/1994	8/1/1994	8/1/1996
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	ERG, Inc.	ERG, Inc.
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	SO2	Total NMHC	Speciated VOC	Carbonyl
Parameter Code	42401	43102	43102	Multiple
POC	1	2	1	1
Manufacturer and model	TAPI 100EU	TEI 55C	Xontech 910A/912	Xontech 925
Sampling Method	Instrumental	Instrumental	6L Pressurized Canister	DNPH Silica gel
Method Code	600	164	123	202
Analysis Method	Ultraviolet Fluorescence	Flame ionization detector	Dual FID	(multiple)
FRM/FEM/ARM/Other	FEM	Other	Other	Other
Monitoring objective	NAAQS comparison, public info, research	Public info, research	Research	Research
Statement of Purpose	Measures representative concentration in populated area	Measures O3 precursor emission near downwind edge of central business district	Measures O3 precursor emission near downwind edge of central business district	Measures O3 precursor emission near downwind edge of central business district
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	NCORE	PAMS (Type II)	PAMS (Type II)	PAMS (Type II)
Site type	Population Exposure	Highest concentration, population exposure	Highest concentration, population exposure	Highest concentration, population exposure
Spatial scale	Urban	None	Neighborhood	Neighborhood
Sampling Frequency	Continuous	Continuous	1 in 3 days	1 in 3 days
Sampling season	Year Round	Year Round	July thru Sep	July thru Sep
Distance from supporting structure/roof top (m)	2.0	2.0	2.2	2.2
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	22.9	21.9	21.0	21.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 m (lo vol)	1.1 m (lo vol)	1.0 m (lo vol)	1.0 m (lo vol)
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	5.3	5.3	5.5	5.5
Probe material	FEP Teflon	FEP Teflon	Stainless Steel	Stainless Steel
Residence time (seconds)	15.0	17.0	3.0	3.0
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	Every fourth day	Every fourth day	Pre- and post-seasonally check	Pre- and post-seasonally check
Last Performance Evaluation	11/22/16	12/27/15	Not applicable	Not applicable

Site	Sacramento-Del Paso Manor		
Start Date	12/1/2001	1/1/1986	1/1/1986
Collecting Agency	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	SMAQMD	SMAQMD
Reporting Agency	CARB	CARB	CARB
Pollutant	Black Carbon	PM10 (Primary monitor)	PM10 (Audit monitor)
Parameter Code	84313	81102	81102
POC	1	1	2
Manufacturer and model	Magee Scientific M633	Sierra Anderson 1200	Sierra Anderson 1200
Sampling Method	Aethalometer	Hi Volume	Hi Volume
Method Code	894	063	063
Analysis Method	Optical Absorption	Gravimetric	Gravimetric
FRM/FEM/ARM/Other	Other	FRM	FRM
Monitoring objective	Research	NAAQS comparison, public info	NAAQS comparison, public info
Statement of Purpose	Installed for CRPAQS study in 1999	Measures wintertime elevated PM level from motor vehicles and residential wood combustion	Collocated for QA purpose and Provides substitute data if necessary
Monitor type	SPM	SLAMS	SLAMS
Affiliation	None	None	None
Site type	Population Exposure	Population Exposure	Population Exposure
Spatial scale	None	Neighborhood	Neighborhood
Sampling Frequency	Continuous	1 in 6 days	1 in 6 days
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	1.9	2.0	2.0
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	21.9	20.1	21.9
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	2.2 m	2.2 m
Distance with nearest PM monitor (m)	1.8 m (lo vol)	2.1 m (lo vol)	2.2 m (hi vol)
Unrestricted airflow (deg)	360.0	360.0	360.0
Probe height (m, agl)	5.2	5.3	5.3
Probe material	Aluminum	Not applicable	Not applicable
Residence time (seconds)	1.0	Not applicable	Not applicable
Changes in next 18 months?	No	No	No
Frequency of flow rate verification	Monthly	Monthly	Monthly
Last Performance Evaluation	Not applicable	4/28/16, 11/22/16	4/28/16, 11/22/16

Site	Sacramento-Del Paso Manor			
Start Date	1/1/1999	2/1/1999	5/1/2000	2/1/2000
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	CARB	CARB	N/A	RTI
Reporting Agency	CARB	CARB	CARB	RTI
Pollutant	PM2.5 (Primary monitor)	PM2.5 (Audit monitor)	PM2.5	PM2.5 Mass Speciated
Parameter Code	88101	88101	88502	88502
POC	1	2	3	5
Manufacturer and model	R & P 2025	R & P 2025	Met One 1020 BAM	Met One SASS
Sampling Method	Low volume with VSCC	Low volume with VSCC	Very sharp cut cyclone	Sharp cut cyclone
Method Code	118	118	731	810
Analysis Method	Gravimetric	Gravimetric	Beta Attenuation	Gravimetric
FRM/FEM/ARM/Other	FRM	FRM	Other	Other
Monitoring objective	NAAQS Comparison, research, public info	NAAQS Comparison, research	Public info, research	Research
Statement of Purpose	Measures wintertime elevated PM level from motor vehicles and residential wood combustion	Collocated for QA purpose and Provides substitute data if necessary	Provides real time PM Measurement from motor vehicles and residential wood combustion	Provides speciation data on urban PM emission
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	NCORE	None	NCORE	CSN STN,NCORE
Site type	Highest concentration, population exposure	Highest concentration, population exposure	Highest concentration, population exposure	Highest concentration, population exposure
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	1 in 3 days	1 in 12 days	Continuous	1 in 3 days
Sampling season	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	2.1	2.1	2.0	2.0
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	21.9	23.8	23.8	21.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	1.6 m	1.6 m	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.5 m (lo vol)	1.6 m (lo vol)	1.4 (lo vol)	2.2 m (hi vol)
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	5.4	5.4	5.3	5.3
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of flow rate verification	Monthly	Monthly	Bi-monthly	Monthly
Last Performance Evaluation	4/28/16, 11/22/16	4/28/16, 11/22/16	4/28/16, 11/22/16	3/17/16, 10/27/16

Site	Sacramento-Del Paso Manor		
Start Date	4/1/2009	4/1/2012	4/1/2012
Collecting Agency	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	RTI	CARB	ERG, Inc.
Reporting Agency	RTI	CARB	CARB
Pollutant	OC & EC (multiple parameter code)	PM10	Pb
Parameter Code	(multiple)	85101	85129
POC	5	7	4
Manufacturer and model	URG 3000N	R & P 2025	R & P 2025
Sampling Method	Quartz filter and cyclone inlet	Low volume with VSCC	Low volume with VSCC
Method Code	842, 826	127	811
Analysis Method	(multiple) (A)	Gravimetric	X-Ray Fluorescence (EDXRF)
FRM/FEM/ARM/Other	Other	FRM	FRM
Monitoring objective	Research	NAAQS comparison, public info, research	NAAQS comparison, public info, research
Statement of Purpose	Provides speciation data on urban PM emission	Measures PM mass to provide PM10-2.5 data	Measures representative Pb concentration
Monitor type	SLAMS	SLAMS	SLAMS
Affiliation	CSN STN,NCORE	NCORE	NCORE (Non-source)
Site type	Highest concentration	Population Exposure	Population Exposure
Spatial scale	Neighborhood	Neighborhood	Urban
Sampling Frequency	1 in 3 days	1 in 3 days	1 in 6 days
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	2.1	2.1	2.1
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	20.0	23.8	23.8
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.7 m (lo vol)	1.9 m (lo vol)	1.8 (lo vol)9
Unrestricted airflow (deg)	360.0	360.0	360.0
Probe height (m, agl)	5.4	5.4	5.4
Probe material	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	Yes
Frequency of flow rate verification	Monthly	Monthly	Monthly
Last Performance Evaluation	3/17/16, 10/27/16	4/28/16, 11/22/16	4/28/16, 11/22/16

(A) 88355, 88357, 88370, 88374, 88375, 88376, 88377, 88378, 88380, 88383, 88384, 88385, 88388

Site	Sacramento-Del Paso Manor				
Start Date	8/1/1994	8/1/1994	9/1/1994	8/1/1994	8/1/1994
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB	CARB
Pollutant	10 m temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter Code	62101	62201	63301	61104	61103
POC	1	1	1	1	1
Manufacturer and model	Climatronics 100093	Climatronics 101669	Climatronics 100848	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	042	012	011	020	020
Analysis Method	Machine Average	Hygroscopic Plastic Film	Pyranometer	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Monitoring objective	Public info, research	Public info, research	Public info	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	Other	Other	Other	Other	Other
Affiliation	NCORE,PAMS (Type II)	NCORE,PAMS (Type II)	NCORE,PAMS (Type II)	NCORE,PAMS (Type II)	NCORE,PAMS (Type II)
Site type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Spatial scale	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	No supporting structure	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0	360.0
Probe height (m, agl)	10.0	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No	No
Frequency of one-point QC check	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Last Performance Evaluation	11/22/16	Not applicable	Not applicable	11/22/16	11/22/16

A.5 Folsom-Natoma St

This site is in operation since 1996. This site replaced the former Folsom-Leidesdorff Street site. Approximately 20 miles northeast of Downtown Sacramento, Folsom-Natoma site is the maximum summertime O_3 monitoring site within Sacramento County, for days with the prevailing afternoon southwesterly winds.

This site measures: O_3, NO_2, $PM_{2.5}$ BAM, Total NMHC, Speciated VOC, WD, WS, Temp, RH, and SRD. This site is a PAMS Type III site.

This site has measured $PM_{2.5}$ since May 2002 with a continuous BAM. A new generation of BAM, meeting federal equivalent method (FEM) criteria, was installed in April 2013. In July 2015, a collocated monitor for the FEM BAM was installed.

Table A-17 Folsom-Natoma St. Metadata

Site Name	Folsom-Natoma Street
AQS Site No.	06-067-0012
Geographic Coordinates	38.683304°, -121.164457° (WGS84)
Location	Folsom City Hall (parking lot), located 20 miles east-northeast of downtown Sacramento.
Address	50 Natoma Street, Folsom, CA 95630
County	Sacramento
Distance from roadway	206 m
Annual Average Daily Traffic (Vehicles/Day)	Natoma St. southwest of Randall Dr.: 11,059 (City of Folsom, 2010)
Ground Cover	Vegetated
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Figure A-21 Panoramic view toward north from air monitoring station roof

Figure A-22 Panoramic view toward east from air monitoring station roof

Figure A-23 Panoramic view toward south from air monitoring station roof

Figure A-24 Panoramic view toward west from air monitoring station roof

Figure A-25 Google Earth satellite image of Folsom-Natoma St.

The circle in Figure A-25 indicates no trees exist within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Also, height of the tree and building were calculated on-site with trigonometry on 3/24/17. Analyses in Tables A-18 thru A-20 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Table A-18 Distance between Object and Inlet or Probe at Folsom-Natoma St. All units in meter

	Gaseous Probe	NO_Y Probe	VOC	PM2.5 (Primary)	PM2.5 (Collocation)
Object A (TV Tower)	7.32	5.49	7.32	9.14	6.40
Object B (Building)	10.97	10.97	10.97	13.72	12.80
Object C (Building)	15.54	13.72	15.54	17.37	17.37
Object D (Building)	6.40	5.49	6.40	9.14	10.06
Object E (Building)	12.80	14.63	12.80	11.89	10.97
Object F (Building)	7.32	9.14	7.32	7.32	5.49
Object G (Tree)	16.46	18.29	16.46	15.54	14.63

Table A-19 Object Protrusion above Inlet or Probe at Folsom-Natoma St. All units in meter

	Gaseous Probe	NO_Y Probe	VOC	PM2.5 (Primary)	PM2.5 (Collocation)
Object A (TV Tower)	19.75	19.75	19.8	19.50	19.50
Object B (Building)	-3.05	-3.05	-3.1	-3.30	-3.30
Object C (Building)	-3.05	-3.05	-3.1	-3.30	-3.30
Object D (Building)	-3.05	-3.05	-3.1	-3.30	-3.30
Object E (Building)	-2.95	-2.95	-2.95	-3.20	-3.20
Object F (Building)	-2.45	-2.45	-2.45	-2.70	-2.70
Object G (Tree)	0.84	0.84	0.84	0.59	0.59

Note: negative value indicates inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-20 Distance vs. Protrusion Ratio at Folsom-Natoma St. (must be ≥ 2)[19]

	Gaseous Probe	NO_Y Probe	VOC	PM2.5 (Primary)	PM2.5 (Collocation)
Object A (TV Tower)	0.4[(A)]	0.3[(A)]	0.4[(A)]	0.5[(A)]	0.3[(A)]
Object B (Building)	N/A	N/A	N/A	N/A	N/A
Object C (Building)	N/A	N/A	N/A	N/A	N/A
Object D (Building)	N/A	N/A	N/A	N/A	N/A
Object E (Building)	N/A	N/A	N/A	N/A	N/A
Object F (Building)	N/A	N/A	N/A	N/A	N/A
Object G (Tree)	19.5	21.7	19.5	26.2	24.7

[(A)] Object A is a broadcast tower with open frame structure. Even though it does not meet the ratio require, it does not block air flow to any probe or inlet

Note: N/A indicates inlet or probe is taller than the object and airflow is not obstructed; refer to the note in the previous table

[19] Per Appendix E to 40 CFR 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	Folsom-Natoma St.		
Start Date	7/1/1996	7/1/1996	7/1/2011
Collecting Agency	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB
Pollutant	O3	NO2	NOY
Parameter Code	44201	42602	42600
POC	1	1	1
Manufacturer and model	TAPI 400E	TAPI200UP	TEI 42I-Y
Sampling Method	Instrumental	Instrumental	Instrumental
Method Code	087	200	574
Analysis Method	Ultra Violet Absorption	Photolytic-Chemiluminescence	Chemiluminescence
FRM/FEM/ARM/Other	FEM	FEM	Other
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info, research
Statement of Purpose	Measure highest summer O3 level downwind of urban area	Measures concentration downwind of urban area	Measures representative concentration
Monitor type	SLAMS	SLAMS	SLAMS
Affiliation	PAMS (Type III)	PAMS (Type III)	PAMS (Type III)
Site type	Max O3 Concentration, Population Exposure	Highest concentration	Population Exposure
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	1.9	1.9	6.4
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	13.0	13.0	15.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	2.2 (lo vol)	2.2 (lo vol)	2.2 (lo vol)
Unrestricted airflow (deg)	360.0	360.0	360.0
Probe height (m, agl)	5.5	5.5	10.0
Probe material	FEP Teflon	FEP Teflon	FEP Teflon
Residence time (seconds)	12.0	11.3	9.0
Changes in next 18 months?	No	No	No
Frequency of one-point QC check	Every other day	Every other day	Every other day
Last Performance Evaluation	4/21/16	4/21/16	Not applicable

Site	Folsom-Natoma St.	
Start Date	7/1/1996	7/1/1996
Collecting Agency	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A
Reporting Agency	CARB	CARB
Pollutant	Total NMHC	Speciated VOC
Parameter Code	43102	43102
POC	1	2
Manufacturer and model	TEI 55C	Xontech 910A/912
Sampling Method	Instrumental	6L Pressurized Canister
Method Code	164	123
Analysis Method	Flame ionization detector	Dual FID
FRM/FEM/ARM/Other	Other	Other
Monitoring objective	Public info, research	Research
Statement of Purpose	Measures concentration downwind of urban area	Measures concentration downwind of urban area
Monitor type	SLAMS	SLAMS
Affiliation	PAMS (Type III)	PAMS (Type III)
Site type	Highest concentration	Highest concentration
Spatial scale	None	Neighborhood
Sampling Frequency	Continuous	1 in 3 days
Sampling season	Year Round	July thru Sep
Distance from supporting structure/roof top (m)	1.9	1.9
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	13.0	13.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	2.2 (lo vol)	2.2 (lo vol)
Unrestricted airflow (deg)	360.0	360.0
Probe height (m, agl)	5.5	5.5
Probe material	FEP Teflon	Stainless Steel
Residence time (seconds)	13.7	3.0
Changes in next 18 months?	No	No
Frequency of one-point QC check	Every other day	Pre- and post-seasonally check
Last Performance Evaluation	2/12/16	Not applicable

Site	Folsom-Natoma St.	
Start Date	4/1/2013	7/1/2015
Collecting Agency	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A
Reporting Agency	CARB	CARB
Pollutant	PM2.5 (Primary monitor)	PM2.5 (Audit monitor)
Parameter Code	88101	88101
POC	3	4
Manufacturer and model	Met One 1020 BAM	Met One 1020 BAM
Sampling Method	Very sharp cut cyclone	Very sharp cut cyclone
Method Code	170	170
Analysis Method	Beta Attenuation	Beta Attenuation
FRM/FEM/ARM/Other	FEM	FEM
Monitoring objective	NAAQS comparison, public info, research	NAAQS comparison, public info, research
Statement of Purpose	Measures representative concentration	Collocated for QA purpose and Provides substitute data if necessary
Monitor type	SLAMS	SLAMS
Affiliation	None	None
Site type	Population Exposure	Population Exposure
Spatial scale	Neighborhood	Neighborhood
Sampling Frequency	Continuous	Continuous
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top (m)	2.1	2.1
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	12.0	11.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	2.0	2.0
Distance with nearest PM monitor (m)	2.0 m (lo vol)	2.0 m (lo vol)
Unrestricted airflow (deg)	360.0	360.0
Probe height (m, agl)	5.7	5.7
Probe material	Aluminum	Aluminum
Residence time (seconds)	Not applicable	Not applicable
Changes in next 18 months?	No	No
Frequency of flow rate verification	Bi-monthly	Bi-monthly
Last Performance Evaluation	4/21/16, 10/19/16	4/21/16, 10/19/16

Site	Folsom-Natoma St.				
Start Date	7/1/1996	7/1/1996	7/1/1996	7/1/1996	7/1/1996
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB	CARB
Pollutant	10 m temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter Code	62101	62201	63301	61104	61103
POC	1	1	1	1	1
Manufacturer and model	Climatronics 100093	Climatronics 101669	Climatronics 100848	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	042	012	011	020	020
Analysis Method	Machine Average	Hygroscopic Plastic Film	Pyranometer	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Monitoring objective	Public info	Public info	Public info	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	Other	Other	Other	Other	Other
Affiliation	PAMS (Type III)	PAMS (Type III)	PAMS (Type III)	PAMS (Type III)	PAMS (Type III)
Site type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Spatial scale	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	No supporting structure	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0	360.0
Probe height (m, agl)	10.0	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No	No
Frequency of one-point QC check	N/A	N/A	N/A	N/A	N/A
Last Performance Evaluation	4/21/16	Not applicable	Not applicable	4/21/16	4/21/16

A.6 Sacramento-Goldenland Ct.

This site was established in late 2008 to replace the former Airport Rd. monitoring site, which was one mile away.

This site measures O_3, CO, NO_2, Total NMHC, PM_{10}, WD, WS, Temp, RH, and SRD.

Table A-21 Sacramento-Goldenland Ct. Metadata

Site Name	Goldenland Court
AQS Site No.	06-067-0014
Geographic Coordinates	38.650716°, -121.506650° (WGS84)
Location	Site located 5 miles north of downtown Sacramento, in a residential/commercial area.
Address	68 Goldenland Court, Sacramento, CA 95834
County	Sacramento
Distance from roadway	120 m
Annual Average Daily Traffic (Vehicles/Day)	Goldenland Ct. west of Gateway Park Dr.: 750 (Estimated)
Ground Cover	Vegetated
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Figure A-26 Panoramic view toward north from air monitoring station roof

Figure A-27 Panoramic view toward east from air monitoring station roof

Figure A-28 Panoramic view toward south from air monitoring station roof

Figure A-29 Panoramic view toward west from air monitoring station roof

Figure A-30 Google Earth satellite image of Sacramento-Goldenland Ct.

The circle in Figure A-30 indicates no trees exist within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Also, height of the tree and building were calculated on-site with trigonometry on 3/24/17. Analyses in Tables A-22 thru A-24 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Table A-22 Distance between Object and Inlet or Probe at Sacramento-Goldenland Ct. All units in meter

	Gaseous Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Continuous)
Object A (Tree)	41.15	41.15	42.98
Object B (Building)	21.95	20.12	24.69
Object C (Tree)	25.60	24.69	23.77

Table A-23 Object Protrusion above Inlet or Probe at Sacramento-Goldenland Ct. All units in meter

	Gaseous Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Continuous)
Object A (Tree)	5.96	5.96	5.76
Object B (Building)	-0.32	-0.32	-0.52
Object C (Tree)	3.15	3.15	2.95

Note: negative value indicates inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-24 Distance vs. Protrusion Ratio at Sacramento-Goldenland Ct. (must be ≥ 2)[20]

	Gaseous Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Continuous)
Object A (Tree)	6.9	6.9	7.5
Object B (Building)	N/A	N/A	N/A
Object C (Tree)	8.1	7.8	8.0

Note: N/A indicates inlet or probe is taller than the object and airflow is not obstructed; refer to the note in the previous table

[20] Per Appendix E to 40 CFR 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	Sacramento-Goldenland Ct.			
Start Date	10/1/2008	10/1/2008	10/1/2008	10/1/2008
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	O3	CO	NO2	Total NMHC
Parameter Code	44201	42101	42602	43102
POC	1	1	1	1
Manufacturer and model	TAPI 400E	TEI 48	TAPI200UP	TEI 55C
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	087	054	200	164
Analysis Method	Ultra Violet Absorption	**Nondispersive Infrared**	Photolytic-Chemiluminescence	Flame ionization detector
FRM/FEM/ARM/Other	FEM	FRM	FEM	Other
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	NAAQS comparison, public info	Public info, research
Statement of Purpose	Measures O3 concentration near downwind edge of Central Business District	Measures representation concentrations	Measures precursor concentration near downwind edge of Central Business District	Measures precursor concentration near downwind edge of Central Business District
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	PAMS (Type II)	None	PAMS (Type II)	PAMS (Type II)
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Spatial scale	Urban	Neighborhood	Neighborhood	None
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	1.6	1.6	1.6	1.6
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	27.4	27.4	27.4	27.4
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.6 m (lo vol)	1.6 m (lo vol)	1.6 m (lo vol)	1.6 m (lo vol)
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	5.1	5.1	5.1	5.1
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	FEP Teflon
Residence time (seconds)	7.1	7.6	6.8	9.0
Changes in next 18 months?	Yes	Yes	Yes	Yes
Frequency of one-point QC check	Every other day	Every other day	Every other day	Every other day
Last Performance Evaluation	4/20/16	4/20/16	4/20/16	12/30/15

Site	Sacramento-Goldenland Ct.	
Start Date	10/1/2008	6/1/2010
Collecting Agency	SMAQMD	SMAQMD
Analytical Lab	SMAQMD	N/A
Reporting Agency	CARB	CARB
Pollutant	PM10 (Primary monitor)	PM10
Parameter Code	81102	81102
POC	1	3
Manufacturer and model	Sierra Anderson 1200	R & P 1400A
Sampling Method	Hi Volume	Instrumental
Method Code	063	079
Analysis Method	Gravimetric	TEOM-Gravimetric
FRM/FEM/ARM/Other	FRM	FEM
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info
Statement of Purpose	Measures representation concentrations	Measures representation concentrations
Monitor type	SLAMS	SLAMS
Affiliation	None	None
Site type	Population Exposure	Population Exposure
Spatial scale	Neighborhood	Neighborhood
Sampling Frequency	1 in 6 days	Continuous
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top (m)	2.0	2.0
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	28.3	29.3
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	2.0	2.0
Distance with nearest PM monitor (m)	2.0 m (lo vol)	2.0 m (hi vol)
Unrestricted airflow (deg)	360.0	360.0
Probe height (m, agl)	5.5	5.3
Probe material	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable
Changes in next 18 months?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Last Performance Evaluation	4/20/16, 10/19/16	4/20/16, 10/19/16

Site	Sacramento-Goldenland Ct.				
Start Date	10/1/2008	10/1/2008	10/1/2008	10/1/2008	10/1/2008
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB	CARB
Pollutant	10 m temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter Code	62101	62201	63301	61104	61103
POC	1	1	1	1	1
Manufacturer and model	Climatronics 100093	Climatronics 101669	Climatronics 100848	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	042	012	011	020	020
Analysis Method	Machine Average	Hygroscopic Plastic Film	Pyranometer	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Monitoring objective	Public info	Public info	Public info	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	Other	Other	Other	Other	Other
Affiliation	PAMS (Type II)	PAMS (Type II)	PAMS (Type II)	PAMS (Type II)	PAMS (Type II)
Site type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Spatial scale	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	No supporting structure	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0	360.0
Probe height (m, agl)	10.0	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	Yes	Yes	Yes	Yes	Yes
Frequency of one-point QC check	N/A	N/A	N/A	N/A	N/A
Last Performance Evaluation	4/20/16	Not applicable	Not applicable	4/20/16	4/20/16

A.7 North Highlands-Blackfoot

North Highlands-Blackfoot has been in operation since 1979. The original site objective was to collect data in support of a proposed power plant project (Prevention of Significant Deterioration) at McClellan Air Force Base, which was located 3 miles southwest of the site. The purposed power plant project was canceled during the early 1980's; and the air force base was closed in 2001.

This entire site was designated as SPM upon its establishment. During an annual review of network design in the mid-1990s, SMAQMD needed additional NAMS sites for SO_2 and PM_{10} to meet minimum monitoring requirements. Thus, the designation of the SO_2 and PM_{10} monitors at North Highlands was changed from SPM to NAMS, which is now categorized as SLAMS. The SO_2 monitor was terminated in late 2010.

Table A-25 North Highlands-Blackfoot Metadata

Site Name	North Highlands-Blackfoot
AQS Site No.	06-067-0002
Geographic Coordinates	38.71209°, -121.38109° (WGS84)
Location	Residential area located 11 miles north-northeast of downtown Sacramento.
Address	7823 Blackfoot Way, Antelope, CA 95843
County	Sacramento
Distance from roadway	100 m
Annual Average Daily Traffic (Vehicles/Day)	Navaho Dr. east of Aztec Way: <100 (estimated, two-lanes suburban circular local residential road)
Ground Cover	Paved (to north), vegetated (to south)
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Figure A-31 Panoramic view toward north from air monitoring station roof

Figure A-32 Panoramic view toward east from air monitoring station roof

Figure A-33 Panoramic view toward south from air monitoring station roof

Figure A-34 Panoramic view toward east from air monitoring station roof

Figure A-35 Google Earth satellite image of North Highlands-Blackfoot Way

The circle in Figure A-34 indicates no trees exist within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Each of the markers identifies the tallest tree in its local cluster of vegetation. Also, height of the tree was calculated on-site with trigonometry on 3/23/17. Analyses in Tables A-26 thru A-28 show objects identified above do not restrict air flow to the roof top inlets and samplers.

Table A-26 Distance between Object and Inlet or Probe at North Highlands-Blackfoot Way
All units in meter

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	55.78	54.86
Object B (Tree)	40.23	39.32
Object C (Tree)	22.86	22.86
Object D (Tree)	21.03[(A)]	21.03[(A)]
Object E (Tree)	49.38	50.29
Object F (Tree)	44.81	45.72

[(A)] There is a substantial adjustment because the 2016 measurement was incorrect. The 13 m figure was the distance from the probe/inlet to the closest tree branch, which was close to the ground level

Table A-27 Object Protrusion above Inlet or Probe at North Highlands-Blackfoot Way
All units in meter

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	7.17	7.17
Object B (Tree)	9.42	9.42
Object C (Tree)	2.49	2.49
Object D (Tree)	7.42	7.42
Object E (Tree)	11.04	11.04
Object F (Tree)	5.18	5.18

Table A-28 Distance vs. Protrusion Ratio at North Highlands
(must be ≥ 2)[21]

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	7.8	7.7
Object B (Tree)	4.3	4.2
Object C (Tree)	9.2	9.2
Object D (Tree)	2.8	2.8
Object E (Tree)	4.5	4.6
Object F (Tree)	8.7	8.8

[21] Per Appendix E to 40 CFR 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	North Highlands-Blackfoot Way		
Start Date	12/1/1979	12/1/1979	12/1/1979
Collecting Agency	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB
Pollutant	O3	CO	NO2
Parameter Code	44201	42101	42602
POC	1	1	1
Manufacturer and model	TAPI 400E	TEI 48C	TEI 42I
Sampling Method	Instrumental	Instrumental	Instrumental
Method Code	087	054	074
Analysis Method	Ultra Violet Absorption	Nondispersive Infrared	Chemiluminescence
FRM/FEM/ARM/Other	FEM	FRM	FRM
Monitoring objective	NAAQS comparison, research	NAAQS comparison, research	NAAQS comparison, research
Statement of Purpose	Measures representative concentrations	Measures representative concentrations	Measures representative concentrations
Monitor type	SPM	SPM	SPM
Affiliation	None	None	None
Site type	Population Exposure	Population Exposure	Population Exposure
Spatial scale	Urban	Neighborhood	Neighborhood
Sampling Frequency	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	1.6	1.6	1.6
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	12.8	12.8	12.8
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 (hi vol)	1.1 (hi vol)	1.1 (hi vol)
Unrestricted airflow (deg)	360.0	360.0	360.0
Probe height (m, agl)	5.0	5.0	5.0
Probe material	FEP Teflon	FEP Teflon	FEP Teflon
Residence time (seconds)	16.4	15.8	16.4
Changes in next 18 months?	No	No	No
Frequency of one-point QC check	Every Other Day	Every Other Day	Every Other Day
Last Performance Evaluation	4/28/16	4/28/16	4/28/16

Site	North Highlands-Blackfoot Way
Start Date	1/1/1989
Collecting Agency	SMAQMD
Analytical Lab	SMAQMD
Reporting Agency	CARB
Pollutant	PM10
Parameter Code	81102
POC	1
Manufacturer and model	Sierra Anderson 1200
Sampling Method	Hi Volume
Method Code	063
Analysis Method	Gravimetric
FRM/FEM/ARM/Other	FRM
Monitoring objective	NAAQS comparison, public info
Statement of Purpose	Measures representative concentrations
Monitor type	SPM
Affiliation	None
Site type	Population Exposure
Spatial scale	Neighborhood
Sampling Frequency	1 in 6 days
Sampling season	Year Round
Distance from supporting structure/roof top (m)	2.0
Distance from flow obstructions on roof (m)	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction
Distance from nearest tree drip line (m)	12.8
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not Collocated
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360.0
Probe height (m, agl)	5.4
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Monthly
Last Performance Evaluation	4/28/16, 10/19/16

A.8 Rancho Seco

This outlying site is the furthest away from the urban area. It was established in 2008 as a seasonal $PM_{2.5}$ special purpose monitoring site. The $PM_{2.5}$ data collected during the months of November through February is used for the South Sacramento County Winter $PM_{2.5}$ Study. This study is extended due to poor data capture rate at the beginning of the study period. SMAQMD will operate this site as staff resources are available.

This SPM meets siting criteria in Appendix E to 40 CFR Part 58 but does not meet quality assurance criteria in Appendix A; specifically, semi-annual flow rate audit for particulate matter was not conducted. SMAQMD is not submitting data collected with the e-BAM because it is not an FEM, FRM or ARM monitor, and 40 CFR Part 58.20(b) only require data submittal of FEM, FRM or ARM monitor.

Table A-29 Rancho Seco Metadata

Site Name	Rancho Seco
AQS Site No.	NA
Geographic Coordinates	38.343812°, -121.109977° (WGS84)
Location	Located at former Rancho Seco Nuclear Power Plant in rural area located 27 miles southeast of downtown Sacramento.
Address	No street address, Herald, CA 95638
County	Sacramento
Distance from roadway	13 m
Annual Average Daily Traffic (Vehicles/Day)	Rancho Seco Park (access road): <500 (estimated, two-lane rural access road to a nearby regional park)
Ground Cover	Vegetated
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Site	Rancho Seco
Start Date	11/1/2008
Collecting Agency	SMAQMD
Analytical Lab	N/A
Reporting Agency	N/A
Pollutant	PM2.5
Parameter Code	88501
POC	3
Manufacturer and model	Met One E-BAM
Sampling Method	Very sharp cut cyclone
Method Code	731
Analysis Method	Beta Attenuation
FRM/FEM/ARM/Other	Other
Monitoring objective	Public info, research
Statement of Purpose	Measures rural, background PM2.5 concentration
Monitor type	SPM (A)
Affiliation	None
Site type	Upwind/ Background
Spatial scale	Neighborhood
Sampling Frequency	Continuous
Sampling season	November-February
Distance from supporting structure/roof top (m)	Not applicable
Distance from flow obstructions on roof (m)	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction
Distance from nearest tree drip line (m)	15.0
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not Collocated
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360.0
Probe height (m, agl)	2.0
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Monthly
Last Performance Evaluation	Not applicable

(A) This SPM does not meet requirement in Appendix A but meet requirement in Appendix E to 40 CFR Part 58

A.9 Sloughhouse

Located in a rural area 16.5 miles southeast of Downtown Sacramento, this site measures O_3, wind direction, wind speed, and $PM_{2.5}$.

Sloughhouse was established in 1997 as a seasonal (April-October) O_3 special purpose monitoring site to measure elevated afternoon O_3 concentrations, under northwesterly winds, in support of the SMAQMD's summer Spare the Air (O_3 episodic control measure) program. It was sited to cover "data gaps" in the O_3 monitoring network, which is used for forecasting summer AQI levels.

A tree 10 m southeast of the O_3 inlet was removed in May 2011 in order to comply with Appendix E to 40 CFR Part 58 (Probe and Monitoring Path Siting Criteria). At that time, the O_3 monitor was then re-classified from SPM to SLAMS and began continuous monitoring year round.

From November 2008 thru February 2013, seasonal (November–February) $PM_{2.5}$ data was collected with a special purpose monitor (Met One Instruments e-BAM). In November 2013, a non-FEM BAM sampler was relocated here to improve data quality, and sampling season was also increased to year-round. This monitor meets quality assurance criteria and siting criteria in Appendix A and E to 40 CFR Part 58. SMAQMD is voluntarily submitting data collected with the non-FEM SPM BAM sampler. In summer 2017, SMAQMD will upgrade this monitor to minimize data loss due to malfunction. After the upgrade, parameter code will be changed from the current 88501 ($PM_{2.5}$ raw data) to 88502 (acceptable $PM_{2.5}$ data).

Table A-30 Sloughhouse Metadata

Site Name	Sloughhouse
AQS Site No.	06-067-5003
Geographic Coordinates	38.494475°, -121.211131° (WGS84)
Location	Fire Station in rural area located 16.5 miles east-southeast of downtown Sacramento.
Address	7520 Sloughhouse Road, Sloughhouse, CA 95683
County	Sacramento
Distance from roadway	27 m
Annual Average Daily Traffic (Vehicles/Day)	Sloughhouse Rd south of Jackson Rd: 400 (Estimated)
Ground Cover	Vegetated
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Figure A-36 Panoramic view toward north from air monitoring station roof

Figure A-37 Panoramic view toward east from air monitoring station roof

Figure A-38 Panoramic view toward south from air monitoring station roof

Figure A-39 Panoramic view toward west from air monitoring station roof

Figure A-40 Google Earth satellite image of Sloughhouse

The circle in Figure A-40 indicates no trees exist within a 10 m radius, which satisfy a siting criteria that requires drip lines of trees to be at least 10 m away from probes and inlets (Appendix E to 40 CFR Part 58). Also, height of the tree and building was calculated on-site with trigonometry on 3/23/17. Analyses in Tables A-31 thru A-33 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Table A-31 Distance between Object and Inlet or Probe at Sloughhouse
All units in meter

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	53.9	54.9
Object B (Tree)	20.1	21.0
Object C (Building)	15.5	15.5
Object D (Tree)	21.0	22.9

Table A-32 Object Protrusion above Inlet or Probe at Sloughhouse
All units in meter

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	13.46	12.98
Object B (Tree)	7.82	7.34
Object C (Building)	-3.46	-3.94
Object D (Tree)	3.03	2.55

Note: negative value indicates inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-33 Distance vs. Protrusion Ratio at Sloughhouse
(must be ≥ 2)[22]

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	4.0	4.2
Object B (Tree)	2.6	2.9
Object C (Building)	N/A	N/A
Object D (Tree)	6.9	9.0

Note: N/A indicates inlet or probe is taller than the object and airflow is not obstructed; refer to the note in the previous table

[22] Per Appendix E to 40 CFR 58, "the distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path."

Site	Sloughhouse-Sloughhouse Rd.		
Start Date	7/1/1997	7/1/1997	7/1/1997
Collecting Agency	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB
Pollutant	O3	Wind Direction	Wind Speed
Parameter Code	44201	61104	61103
POC	1	1	1
Manufacturer and model	TAPI 400E	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental
Method Code	087	020	020
Analysis Method	Ultra Violet Absorption	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	FEM	Other	Other
Monitoring objective	NAAQS comparison, public info	Public info	Public info
Statement of Purpose	Measures elevated O3 concentration under northwesterly wind	Measures representative meteorology	Measures representative meteorology
Monitor type	SLAMS	Other	Other
Affiliation	None	None	None
Site type	Max O3 concentration	Not applicable	Not applicable
Spatial scale	Neighborhood	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	1.7	2.8	2.8
Distance from flow obstructions on roof (m)	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	19.2	18.0	18.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.2 m (lo vol)	Not applicable	Not applicable
Unrestricted airflow (deg)	360.0	360.0	360.0
Probe height (m, agl)	5.1	5.8	5.8
Probe material	FEP Teflon	Not applicable	Not applicable
Residence time (seconds)	3.9	Not applicable	Not applicable
Changes in next 18 months?	No	No	No
Frequency of one-point QC check	Every other day	N/A	N/A
Last Performance Evaluation	4/25/16	4/25/16	4/25/16

Site	Sloughhouse-Sloughhouse Rd.
Start Date	11/5/2013
Collecting Agency	SMAQMD
Analytical Lab	N/A
Reporting Agency	CARB
Pollutant	PM2.5
Parameter Code	88501
POC	3
Manufacturer and model	Met One 1020 BAM
Sampling Method	Very sharp cut cyclone
Method Code	731
Analysis Method	Beta Attenuation
FRM/FEM/ARM/Other	Other
Monitoring objective	Public info, research
Statement of Purpose	Measures rural, background PM2.5 concentration
Monitor type	SPM
Affiliation	None
Site type	Upwind/ Background
Spatial scale	Neighborhood
Sampling Frequency	Continuous
Sampling season	Year Round
Distance from supporting structure/roof top (m)	2.2
Distance from flow obstructions on roof (m)	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions
Distance from nearest tree drip line (m)	17.4
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not Collocated
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360.0
Probe height (m, agl)	5.5
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	Yes
Frequency of flow rate verification	Bi-monthly
Last Performance Evaluation	4/25/16

A.10 Sacramento Health Dept.-Stockton Blvd

According to old documentation, this PM monitoring site has been in existence since the late 1950s. This site measures PM_{10}, and $PM_{2.5}$ FRM.

EPA approved a request to discontinue all air monitoring at this site in 2016. Hence, Sacramento Health Dept.-Stockton Blvd. site was closed on November 17, 2016. See Appendix E for a copy of the closure approval letter.

Table A-34 Sacramento Health Department-Stockton Blvd Metadata

Site Name	Sacramento Health Department-Stockton Blvd.
AQS Site No.	06-067-4001
Geographic Coordinates	38.556326°, -121.458499° (WGS84)
Location	Rooftop in urban area located 2 miles east-southeast of downtown Sacramento.
Address	2221 Stockton Blvd, Sacramento, CA 95817
County	Sacramento
Distance from roadway	46 m
Annual Average Daily Traffic (Vehicles/Day)	Stockton Blvd. south of U St.: 24,015 (City of Sacramento, 2012)
Ground Cover	Rooftop (surrounding area is paved)
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Site	Sacramento-Health Dept.		
Start Date	1/1/1986	8/1/1994	1/1/1999
Collecting Agency	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	SMAQMD	N/A	CARB
Reporting Agency	CARB	CARB	CARB
Pollutant	PM10 (Primary monitor)	PM10	PM2.5
Parameter Code	81102	81102	88101
POC	2	3	1
Manufacturer and model	Sierra Anderson 1200	R & P 1400A	R & P 2025
Sampling Method	Hi Volume	Instrumental	Low volume with WINS
Method Code	063	079	118
Analysis Method	Gravimetric	TEOM-Gravimetric	Gravimetric
FRM/FEM/ARM/Other	FRM	FEM	FRM
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	NAAQS comparison, public info
Statement of Purpose	Measures representative concentration in urban area	Measures representative concentration in urban area	Measures representative concentration in urban area
Monitor type	SLAMS	SLAMS	SLAMS
Affiliation	None	None	None
Site type	Population Exposure	Population Exposure	Population exposure
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	1 in 6 days	Continuous	1 in 3 days
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	2.0	2.0	2.0
Distance from flow obstructions on roof (m)	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	12.8	10.1	12.8
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	5.1	5.1	Not applicable
Distance with nearest PM monitor (m)	2.0 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol) 2.0 m (hi vol)
Unrestricted airflow (deg)	360.0	300 (B)	360.0
Probe height (m, agl)	5.5	5.5	5.6
Probe material	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	Site terminated 11/15/16	Site terminated 11/15/16	Site terminated 11/15/16
Frequency of flow rate verification	Monthly	Monthly	Monthly
Last Performance Evaluation	4/25/16, 10/17/16	3/8/11, 10/6/11 (A)	4/25/16, 10/17/16

(A) This site was terminated in Nov 2016

(B) Estimated with Google satellite imagery (4/16/2015) and protractor

(C) Malfunctioning since 2012

A.11 Sacramento-1309 T Street

The Sacramento-1309 T Street site is operated by the California Air Resources Board/Monitoring and Laboratory Division/Special Purpose Monitoring Section. This site has been in existence since 1989. Monitor details provided in the remainder of section A.11 are provided by CARB's Monitoring and Laboratory Division.

This middle scale SLAMS air monitoring site measures O_3, NO_2, $PM_{2.5}$ FRM, Speciated $PM_{2.5}$, $PM_{2.5}$ BAM, PM_{10}, WD, WS, TMP, RH, and Atmospheric Pressure.

Met One SASS has been in service since January 2002, and the URG3000N sampler has been in operation since April 2009.

Table A-35 Sacramento-T Street Metadata

Site Name	Sacramento-1309 T Street
AQS Site No.	06-067-0010
Geographic Coordinates	38.558333°, -121.491944 (NAD27)
Location	Residential area located in downtown Sacramento
Address	1309 T Street, Sacramento, CA 95814
County	Sacramento
Distance from roadway	30 m
Annual Average Daily Traffic (Vehicles/Day)	T St. east of 11th St.: 3,102 (City of Sacramento, 2009)
Ground Cover	Rooftop site (residential area is paved)
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA

Site	Sacramento-1309 T St.	
Start Date	12/1/1998	5/15/2013
Collecting Agency	CARB	CARB
Analytical Lab	N/A	N/A
Reporting Agency	CARB	CARB
Pollutant	O3	NO2
Parameter Code	44201	42602
POC	1	3
Manufacturer and model	TAPI 400E	TAPI 200 EU/501
Sampling Method	Instrumental	Instrumental
Method Code	087	599
Analysis Method	Ultra Violet Absorption	Chemiluminescence
FRM/FEM/ARM/Other	FEM	FEM
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info
Statement of Purpose	Measures representative concentration in urban area	Measures representative concentration in urban area
Monitor type	SLAMS	SLAMS
Affiliation	None	None
Site type	General/Background	Population Exposure
Spatial scale	Urban	Neighborhood
Sampling Frequency	Continuous	Continuous
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top (m)	3.0	3.0
Distance from flow obstructions on roof (m)	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions
Distance from nearest tree drip line (m)	50.0	50.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.0 - 2.0 m	1.0 - 2.0 m
Unrestricted airflow (deg)	360.0	360.0
Probe height (m, agl)	11.7	11.7
Probe material	FEP Teflon	FEP Teflon
Residence time (seconds)	5.4	6.0
Changes in next 18 months?	No	No
Frequency of one-point QC check	Daily	Daily
Last Performance Evaluation	11/23/16	11/23/16

Source: Monitoring and Laboratory Division, CARB

Site	Sacramento-1309 T St.			
Start Date	5/1/2013	12/13/1998	5/1/2004	4/1/2007
Collecting Agency	CARB	CARB	CARB	CARB
Analytical Lab	CARB	CARB	N/A	CARB
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	PM10	PM2.5 (Primary monitor)	PM2.5	PM2.5 Mass Speciated
Parameter Code	81102	88101	88502	88502
POC	4	1	3	5
Manufacturer and model	Met One 4 Models	Thermo 2025i	Met One 1020 BAM	Met One 5
Sampling Method	Instrumental	Low volume with VSCC	Sharp cut cyclone	Sharp cut cyclone
Method Code	122	145	731	810
Analysis Method	Beta Attenuation	Gravimetric	Beta Attenuation	Gravimetric
FRM/FEM/ARM/Other	FEM	FRM	Other	Other
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info	Research
Statement of Purpose	Measures representative concentration in urban area	Measures representative concentration in urban area	Measures representative concentration in urban area	Provide speciation data of urban emission
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	None	None	None	None
Site type	Population Exposure	Highest concentration, population exposure	Highest concentration, population exposure	Highest concentration, population exposure
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Continuous	1 in 3 days	Continuous	1 in 3 days
Sampling season	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top (m)	2.0	2.0	2.0	2.0
Distance from flow obstructions on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line (m)	50.0	50.0	50.0	50.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m
Distance with nearest PM monitor (m)	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m
Unrestricted airflow (deg)	360.0	360.0	360.0	360.0
Probe height (m, agl)	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	Yes	Yes	No
Frequency of flow rate verification	Bi-Monthly	Monthly	Bi-monthly	Monthly
Last Performance Evaluation	5/25/16, 11/21/16	5/25/16, 11/21/16	5/25/16, 11/21/16	Not applicable

Source: Monitoring and Laboratory Division, CARB

Site	Sacramento-1309 T St.	
Start Date	2/1/1992	2/1/1992
Collecting Agency	CARB	CARB
Analytical Lab	N/A	N/A
Reporting Agency	CARB	CARB
Pollutant	Wind Direction	Wind Speed
Parameter Code	61104	61103
POC	1	1
Manufacturer and model	RM Young Model 81000	RM Young Model 81000
Sampling Method	Instrumental	Instrumental
Method Code	066	066
Analysis Method	Ultrasonic Anemometer	Ultrasonic Anemometer
FRM/FEM/ARM/Other	Other	Other
Monitoring objective	Public info	Public info
Statement of Purpose	Measures representative meteorology	Measures representative meteorology
Monitor type	Other	Other
Affiliation	None	None
Site type	Not applicable	Not applicable
Spatial scale	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top (m)	9.0	9.0
Distance from flow obstructions on roof (m)	No obstructions	No obstructions
Distance from flow obstructions not on roof (m)	No obstructions	No obstructions
Distance from nearest tree drip line (m)	50.0	50.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable
Unrestricted airflow (deg)	360.0	360.0
Probe height (m, agl)	15.0	15.0
Probe material	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable
Changes in next 18 months?	No	No
Frequency of flow rate verification	N/A	N/A
Last Performance Evaluation	Not applicable	Not applicable

Source: Monitoring and Laboratory Division, CARB

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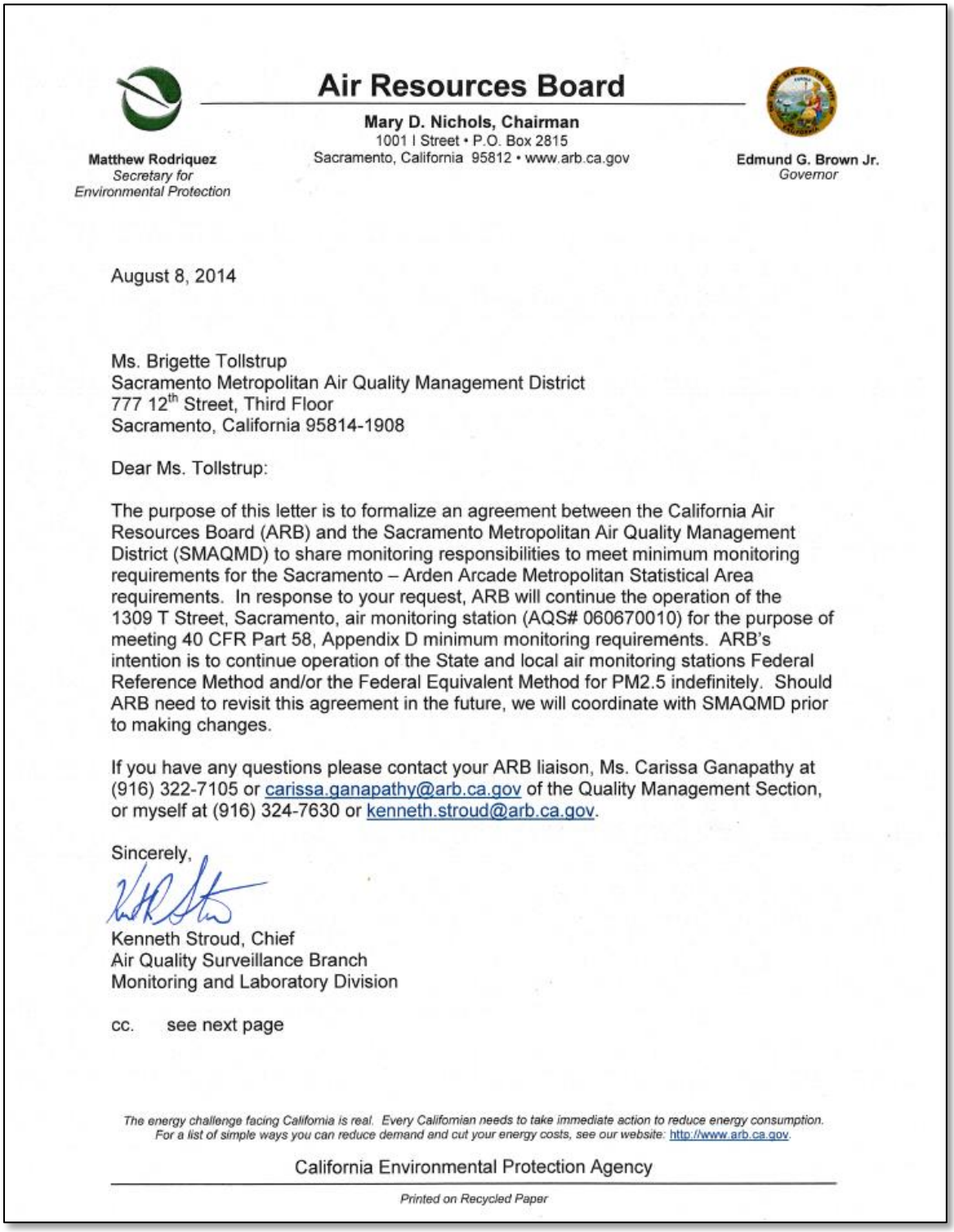
Appendix B Minimum Monitoring Requirement Assessment

Table B-1 Number of SLAMS Monitoring Site within Sacramento MSA

Pollutant		Required Monitors in Sacramento MSA	California Air Resources Board (CARB)	El Dorado County APCD	Placer County AQMD	Sacramento Metropolitan AQMD	Yolo-Solano AQMD	Total Monitors in Sacramento MSA
O_3		2	4	0	4	6	1	15
CO		2	0	0	0	4	0	4
NO_2	Area Wide	1	3	0	0	5	0	8
	Near-Road	1	0	0	0	1	0	1
SO_2		1	0	0	0	1	0	1
Pb	NCore	1	0	0	0	1	0	1
	Source Oriented	0	0	0	0	0	0	0
PM_{10}		2-4	2	0	1	5	2	10
$PM_{2.5}$	FEM/FRM	3	2	0	1	3	1	7
	Continuous	2	3	0	4	4	0	11
$PM_{10-2.5}$		1	0	0	0	1	0	1

Source: U.S. EPA Air Quality System Monitor Description Report (AMP 390), accessed on 22-Mar-2017

Figure B-1 MOU on Shared Monitoring Responsibility with CARB, Page 1



Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

August 8, 2014

Ms. Brigette Tollstrup
Sacramento Metropolitan Air Quality Management District
777 12th Street, Third Floor
Sacramento, California 95814-1908

Dear Ms. Tollstrup:

The purpose of this letter is to formalize an agreement between the California Air Resources Board (ARB) and the Sacramento Metropolitan Air Quality Management District (SMAQMD) to share monitoring responsibilities to meet minimum monitoring requirements for the Sacramento – Arden Arcade Metropolitan Statistical Area requirements. In response to your request, ARB will continue the operation of the 1309 T Street, Sacramento, air monitoring station (AQS# 060670010) for the purpose of meeting 40 CFR Part 58, Appendix D minimum monitoring requirements. ARB's intention is to continue operation of the State and local air monitoring stations Federal Reference Method and/or the Federal Equivalent Method for PM2.5 indefinitely. Should ARB need to revisit this agreement in the future, we will coordinate with SMAQMD prior to making changes.

If you have any questions please contact your ARB liaison, Ms. Carissa Ganapathy at (916) 322-7105 or carissa.ganapathy@arb.ca.gov of the Quality Management Section, or myself at (916) 324-7630 or kenneth.stroud@arb.ca.gov.

Sincerely,

Kenneth Stroud, Chief
Air Quality Surveillance Branch
Monitoring and Laboratory Division

cc. see next page

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California Environmental Protection Agency

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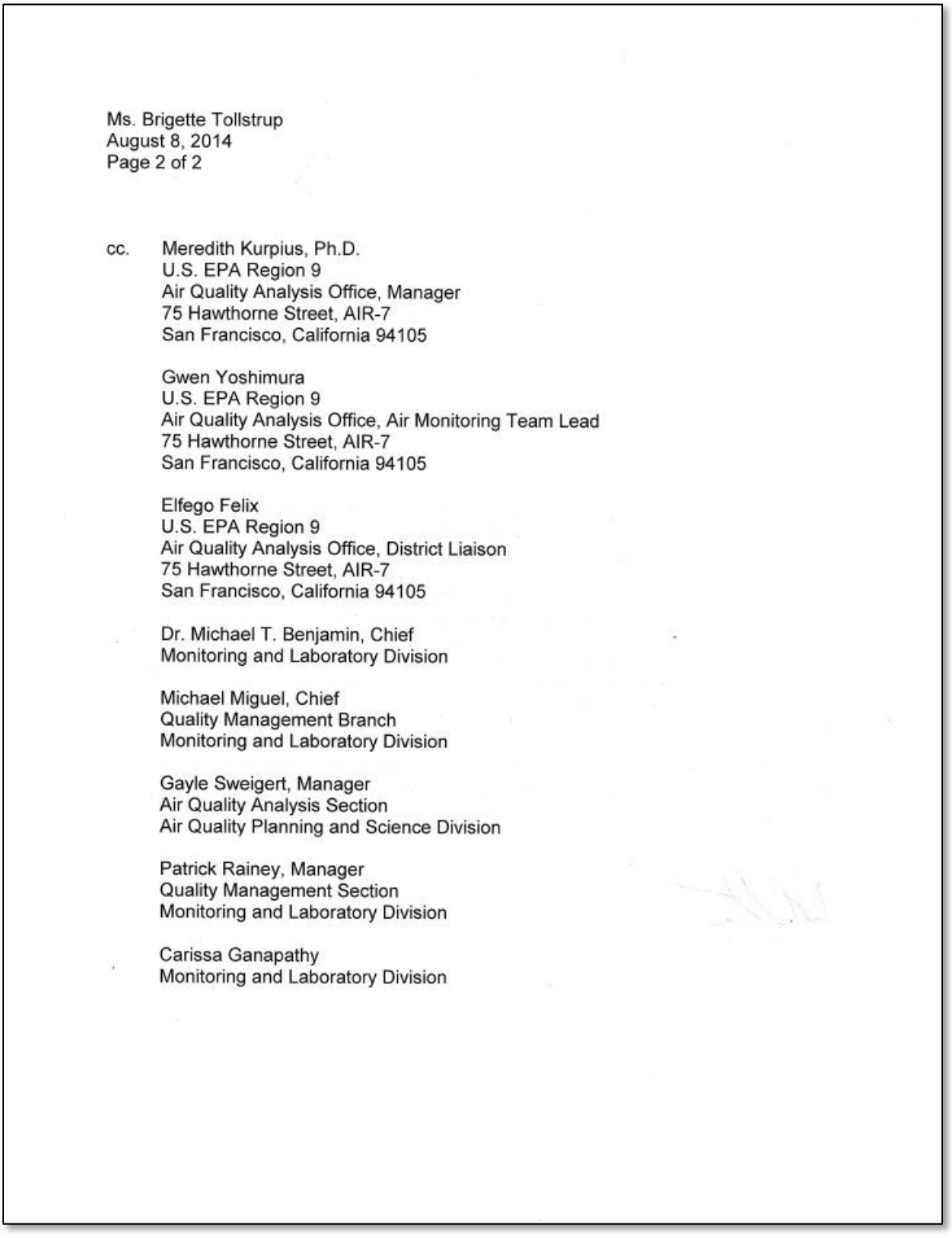
Figure B-2 MOU on Shared Monitoring Responsibility with CARB, Page 2



Ms. Brigette Tollstrup
August 8, 2014
Page 2 of 2

cc. Meredith Kurpius, Ph.D.
U.S. EPA Region 9
Air Quality Analysis Office, Manager
75 Hawthorne Street, AIR-7
San Francisco, California 94105

Gwen Yoshimura
U.S. EPA Region 9
Air Quality Analysis Office, Air Monitoring Team Lead
75 Hawthorne Street, AIR-7
San Francisco, California 94105

Elfego Felix
U.S. EPA Region 9
Air Quality Analysis Office, District Liaison
75 Hawthorne Street, AIR-7
San Francisco, California 94105

Dr. Michael T. Benjamin, Chief
Monitoring and Laboratory Division

Michael Miguel, Chief
Quality Management Branch
Monitoring and Laboratory Division

Gayle Sweigert, Manager
Air Quality Analysis Section
Air Quality Planning and Science Division

Patrick Rainey, Manager
Quality Management Section
Monitoring and Laboratory Division

Carissa Ganapathy
Monitoring and Laboratory Division

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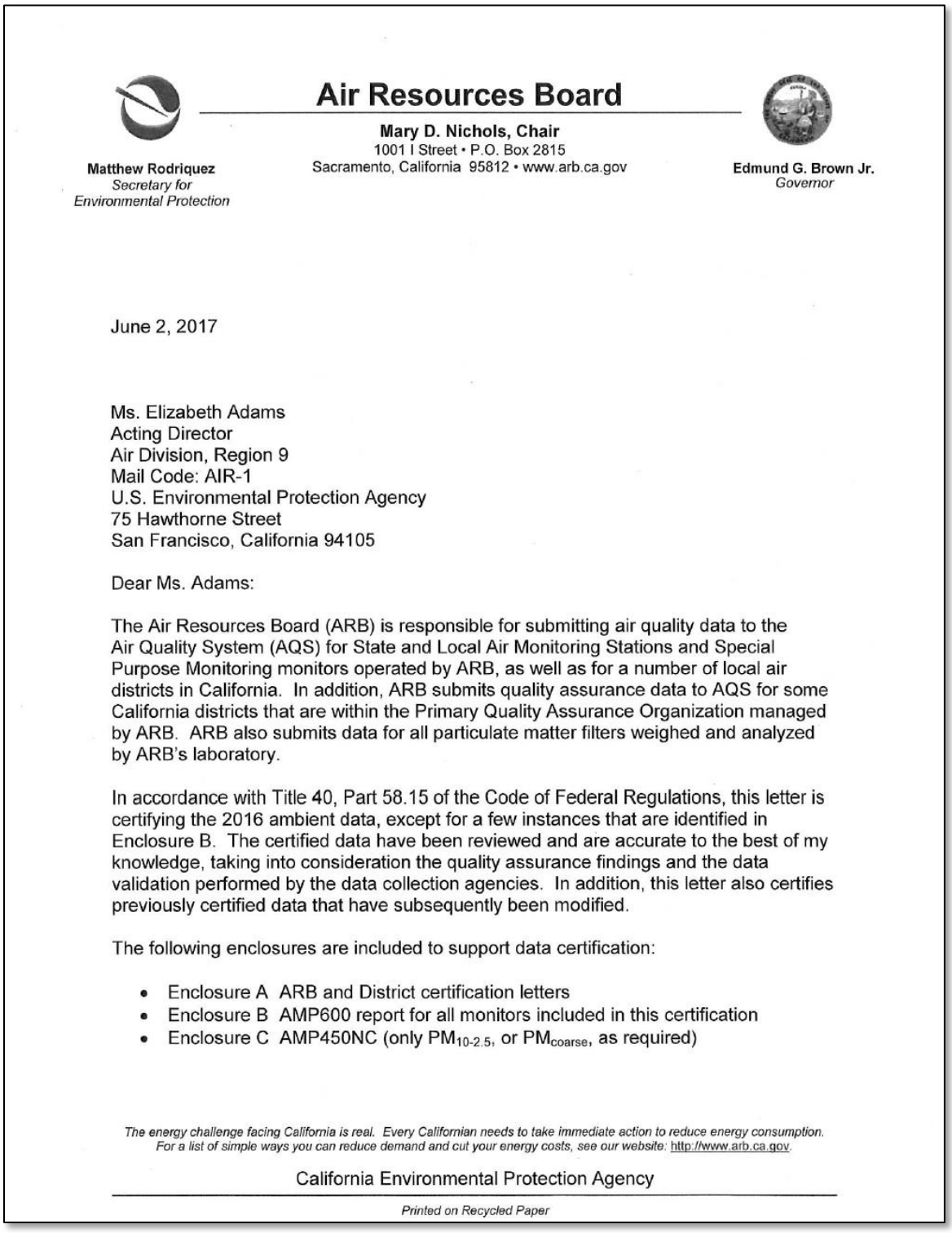
Appendix C Copy of Annual Data Certification Letter

Figure C-1 Copy of SMAQMD data review letter, Page 1



Air Resources Board

Mary D. Nichols, Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

June 2, 2017

Ms. Elizabeth Adams
Acting Director
Air Division, Region 9
Mail Code: AIR-1
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105

Dear Ms. Adams:

The Air Resources Board (ARB) is responsible for submitting air quality data to the Air Quality System (AQS) for State and Local Air Monitoring Stations and Special Purpose Monitoring monitors operated by ARB, as well as for a number of local air districts in California. In addition, ARB submits quality assurance data to AQS for some California districts that are within the Primary Quality Assurance Organization managed by ARB. ARB also submits data for all particulate matter filters weighed and analyzed by ARB's laboratory.

In accordance with Title 40, Part 58.15 of the Code of Federal Regulations, this letter is certifying the 2016 ambient data, except for a few instances that are identified in Enclosure B. The certified data have been reviewed and are accurate to the best of my knowledge, taking into consideration the quality assurance findings and the data validation performed by the data collection agencies. In addition, this letter also certifies previously certified data that have subsequently been modified.

The following enclosures are included to support data certification:

- Enclosure A ARB and District certification letters
- Enclosure B AMP600 report for all monitors included in this certification
- Enclosure C AMP450NC (only $PM_{10-2.5}$, or PM_{coarse}, as required)

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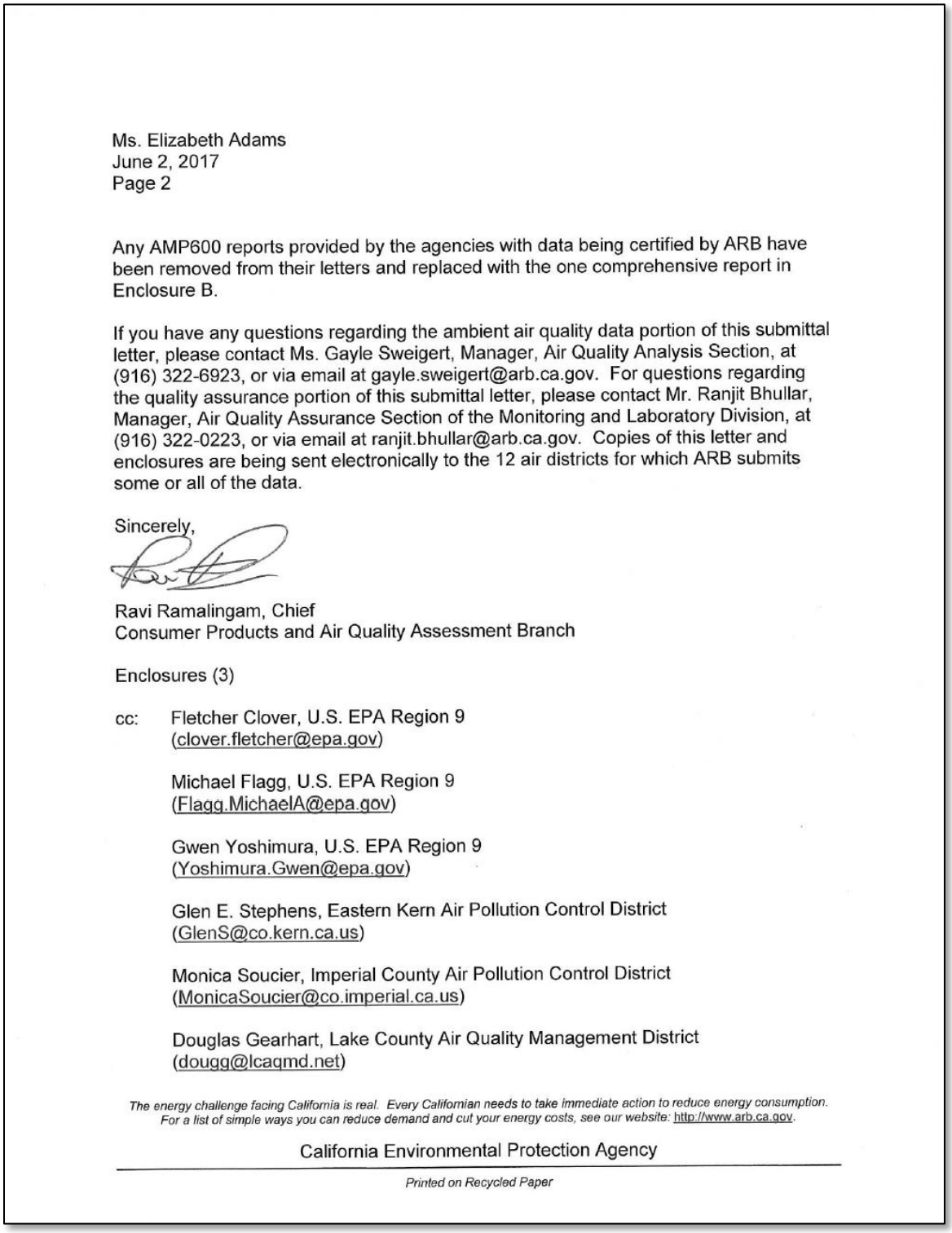
Figure C-2 Copy of SMAQMD data review letter, Page 2



Ms. Elizabeth Adams
June 2, 2017
Page 2

Any AMP600 reports provided by the agencies with data being certified by ARB have been removed from their letters and replaced with the one comprehensive report in Enclosure B.

If you have any questions regarding the ambient air quality data portion of this submittal letter, please contact Ms. Gayle Sweigert, Manager, Air Quality Analysis Section, at (916) 322-6923, or via email at gayle.sweigert@arb.ca.gov. For questions regarding the quality assurance portion of this submittal letter, please contact Mr. Ranjit Bhullar, Manager, Air Quality Assurance Section of the Monitoring and Laboratory Division, at (916) 322-0223, or via email at ranjit.bhullar@arb.ca.gov. Copies of this letter and enclosures are being sent electronically to the 12 air districts for which ARB submits some or all of the data.

Sincerely,

Ravi Ramalingam, Chief
Consumer Products and Air Quality Assessment Branch

Enclosures (3)

cc: Fletcher Clover, U.S. EPA Region 9
(clover.fletcher@epa.gov)

Michael Flagg, U.S. EPA Region 9
(Flagg.MichaelA@epa.gov)

Gwen Yoshimura, U.S. EPA Region 9
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Glen E. Stephens, Eastern Kern Air Pollution Control District
(GlenS@co.kern.ca.us)

Monica Soucier, Imperial County Air Pollution Control District
(MonicaSoucier@co.imperial.ca.us)

Douglas Gearhart, Lake County Air Quality Management District
(dougg@lcaqmd.net)

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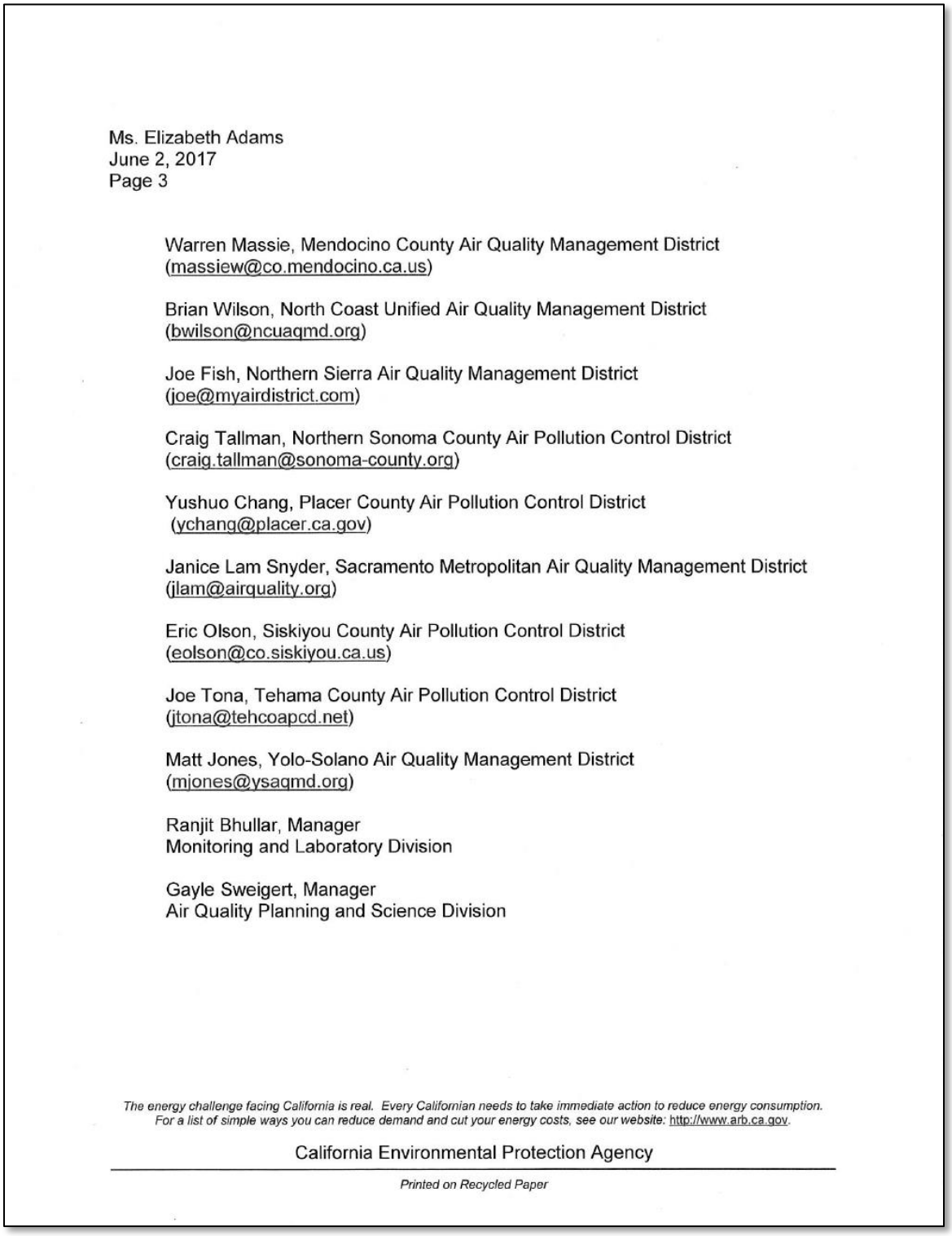
Figure C-3 Copy of SMAQMD data review letter, Page 3



Ms. Elizabeth Adams
June 2, 2017
Page 3

Warren Massie, Mendocino County Air Quality Management District
(massiew@co.mendocino.ca.us)

Brian Wilson, North Coast Unified Air Quality Management District
(bwilson@ncuaqmd.org)

Joe Fish, Northern Sierra Air Quality Management District
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Craig Tallman, Northern Sonoma County Air Pollution Control District
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Yushuo Chang, Placer County Air Pollution Control District
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Eric Olson, Siskiyou County Air Pollution Control District
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Joe Tona, Tehama County Air Pollution Control District
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Matt Jones, Yolo-Solano Air Quality Management District
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Ranjit Bhullar, Manager
Monitoring and Laboratory Division

Gayle Sweigert, Manager
Air Quality Planning and Science Division

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The enclosure to this letter is not reproduced in this annual network plan. Please contact SMAQMD for a copy of this letter in its entirety.

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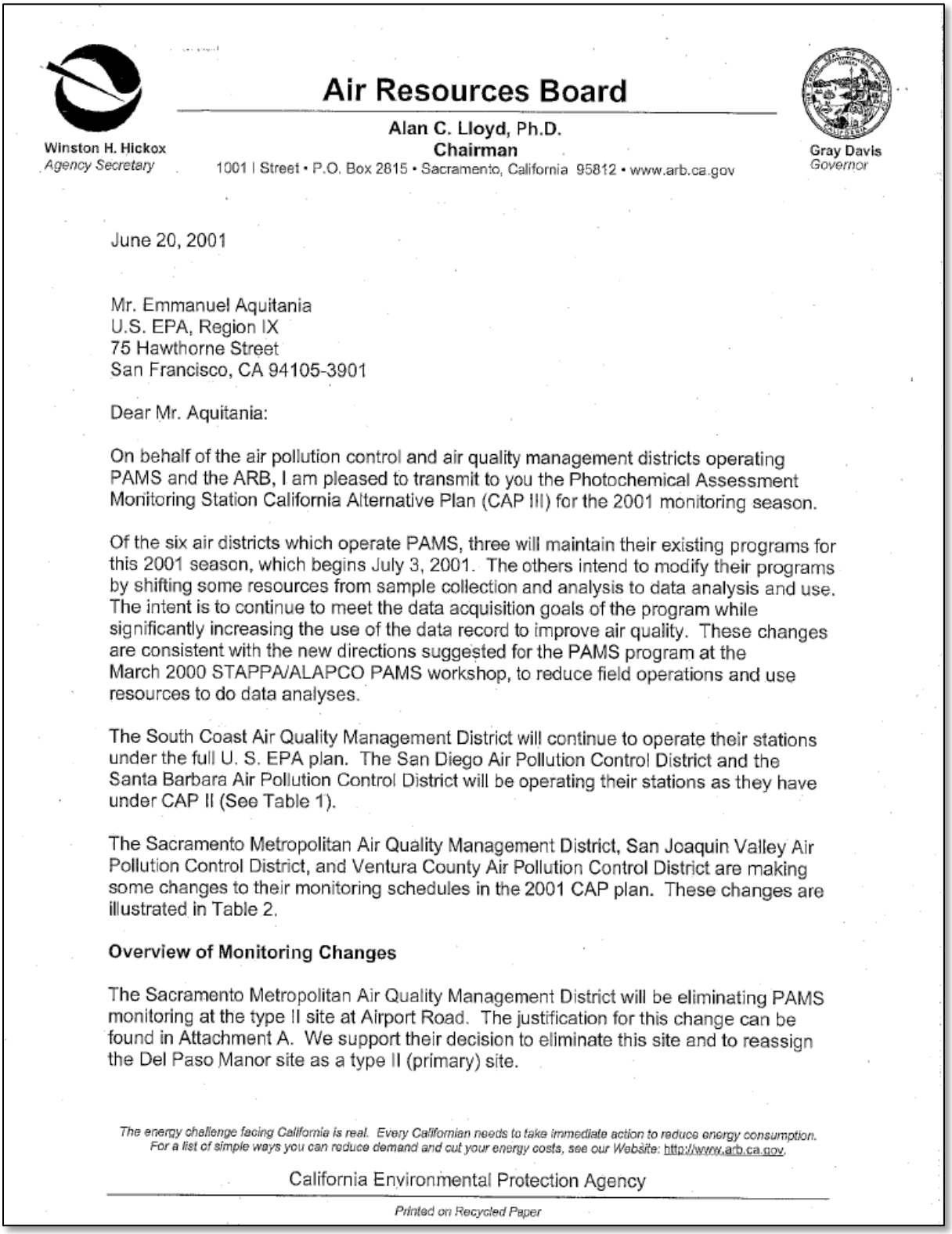
Appendix D California Alternative Plan (CAP III)

Figure D-1 California Alternative Plan, Page 1



Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman
1001 I Street • P.O. Box 2815 • Sacramento, California 95812 • www.arb.ca.gov

Winston H. Hickox
Agency Secretary

Gray Davis
Governor

June 20, 2001

Mr. Emmanuel Aquitania
U.S. EPA, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. Aquitania:

On behalf of the air pollution control and air quality management districts operating PAMS and the ARB, I am pleased to transmit to you the Photochemical Assessment Monitoring Station California Alternative Plan (CAP III) for the 2001 monitoring season.

Of the six air districts which operate PAMS, three will maintain their existing programs for this 2001 season, which begins July 3, 2001. The others intend to modify their programs by shifting some resources from sample collection and analysis to data analysis and use. The intent is to continue to meet the data acquisition goals of the program while significantly increasing the use of the data record to improve air quality. These changes are consistent with the new directions suggested for the PAMS program at the March 2000 STAPPA/ALAPCO PAMS workshop, to reduce field operations and use resources to do data analyses.

The South Coast Air Quality Management District will continue to operate their stations under the full U. S. EPA plan. The San Diego Air Pollution Control District and the Santa Barbara Air Pollution Control District will be operating their stations as they have under CAP II (See Table 1).

The Sacramento Metropolitan Air Quality Management District, San Joaquin Valley Air Pollution Control District, and Ventura County Air Pollution Control District are making some changes to their monitoring schedules in the 2001 CAP plan. These changes are illustrated in Table 2.

Overview of Monitoring Changes

The Sacramento Metropolitan Air Quality Management District will be eliminating PAMS monitoring at the type II site at Airport Road. The justification for this change can be found in Attachment A. We support their decision to eliminate this site and to reassign the Del Paso Manor site as a type II (primary) site.

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Figure D-2 California Alternative Plan, Page 2

The district is also reducing speciated hydrocarbon monitoring at the type III Folsom-Natoma site (see Attachment B-information provided by the Sacramento Metropolitan district).

The San Joaquin Valley and Ventura County districts will be conducting sentinel monitoring on episode days only at their type I sites (Madera and Shafter in San Joaquin Valley, and Emma Wood in Ventura County). In addition, the Ventura County District is reducing speciated hydrocarbon monitoring at the type III Simi Valley site (see Attachments C, from the San Joaquin Valley District and D, from the Ventura County District).

There are several points in the plan that were clarified in response to U.S. EPA comments:

1) Trend day definition: for all districts, a trend day is every third day during the months of July-September.
2) Episode day definition: The Sacramento Metropolitan and Ventura County Districts are changing the criterion for an episode day. An episode is any day that the maximum eight-hour average ozone concentration exceeds 0.0845 PPM. These Districts made these changes in an effort to better represent the levels of ozone that they are testing for in their districts. The Sacramento Metropolitan and Ventura County Districts have a goal of capturing five episodes per PAMS season. The San Joaquin Valley district is maintaining the episode criterion that was applicable under CAP II, which is any day in which the maximum one-hour average ozone concentration exceeds 0.125 PPM. The San Joaquin Valley District has a goal of capturing three episodes per PAMS season.
3) Canister sampling times: In response to the district modeler's requests for more episode data during the early morning hours, the Sacramento Metropolitan, San Joaquin Valley and Ventura County Districts changed the 2300-0200 PST sampling time to an 0800-1100 PST sampling time. Because three of the four sampling times match, data comparisons between trend and episode days can still be done.

Overview of "Add Backs"

Implementing the modifications to monitoring schedules will allow districts the opportunity to 'add-back' resources to other areas of the PAMS program, primarily data analysis and use. In this regard, the Sacramento Metropolitan, San Joaquin Valley, and Ventura County Districts have committed to the following short-term data analysis activities and target dates:

1) Determine one-hour and eight-hour ozone trends; long-term trends, weekend ozone effect, any shifts in location of ozone peaks (December 31, 2001).
2) Conduct exploratory PAMS data analysis on 1998-2000 VOC data (species fingerprint, time series, scatterplots for each PAMS site, and time of day (May 31, 2002).

Figure D-3 California Alternative Plan, Page 3

3) Develop methodologies for determining VOC and NOx ratios and limitations for each site (September 30, 2002).
4) Evaluate early morning NMHC reactivity (San Joaquin Valley District only).

In addition, the Sacramento Metropolitan and San Joaquin Valley Districts have proposed to perform Central California Ozone Study (CCOS) data analysis work. These data analysis projects will be determined jointly by California Air Resources Board (ARB) and the districts during the spring of 2001. Data analysis will begin when CCOS releases the data for use by the study participants (September 30, 2002). In response to your comments, one other change proposed by the Sacramento Metropolitan District includes establishing NOy monitoring at two sites within the district (sites not yet determined).

We appreciate the time and effort that you and John Silvasi expended in reviewing and commenting on the CAP III proposals, and we welcome Sharon Nizich and John Lutz to the PAMS team. We have substantively addressed the informal comments regarding this plan provided by you and John. By implementing monitoring reductions and adding back resources into data analysis and new programs (e.g., NOy monitoring), these efforts will enhance the usefulness of the PAMS program. All of the districts and ARB are committed to support the new emphasis on data analysis and data use while maintaining the data acquisition goals of the program. We look forward to working with you this 2001 PAMS season. If you have any questions, please contact me at (916) 322-6202.

Sincerely,

Cliff Popejoy

Cliff Popejoy, Manager
Program Evaluation and Standards Section
Monitoring and Laboratory Division

Attachments

cc: John Ching, SMAQMD
Corie Choa, SCAQMD
Rudy Eden, SCAQMD
Tom Parsons, SCAQMD
Joel Cordes, SBAPCD
John Gallup, SJVAPCD
Rich Milhorn, SJVAPCD
Mahmood Hossain, SDAPCD
Doug Tubbs, VCAPCD
David Lutz, U. S. EPA
Sharon Nizich, U. S. EPA
Jeff Cook ARB
Donald Hammond ARB
Karen Buckley ARB

25

Figure D-4 California Alternative Plan, Page 4

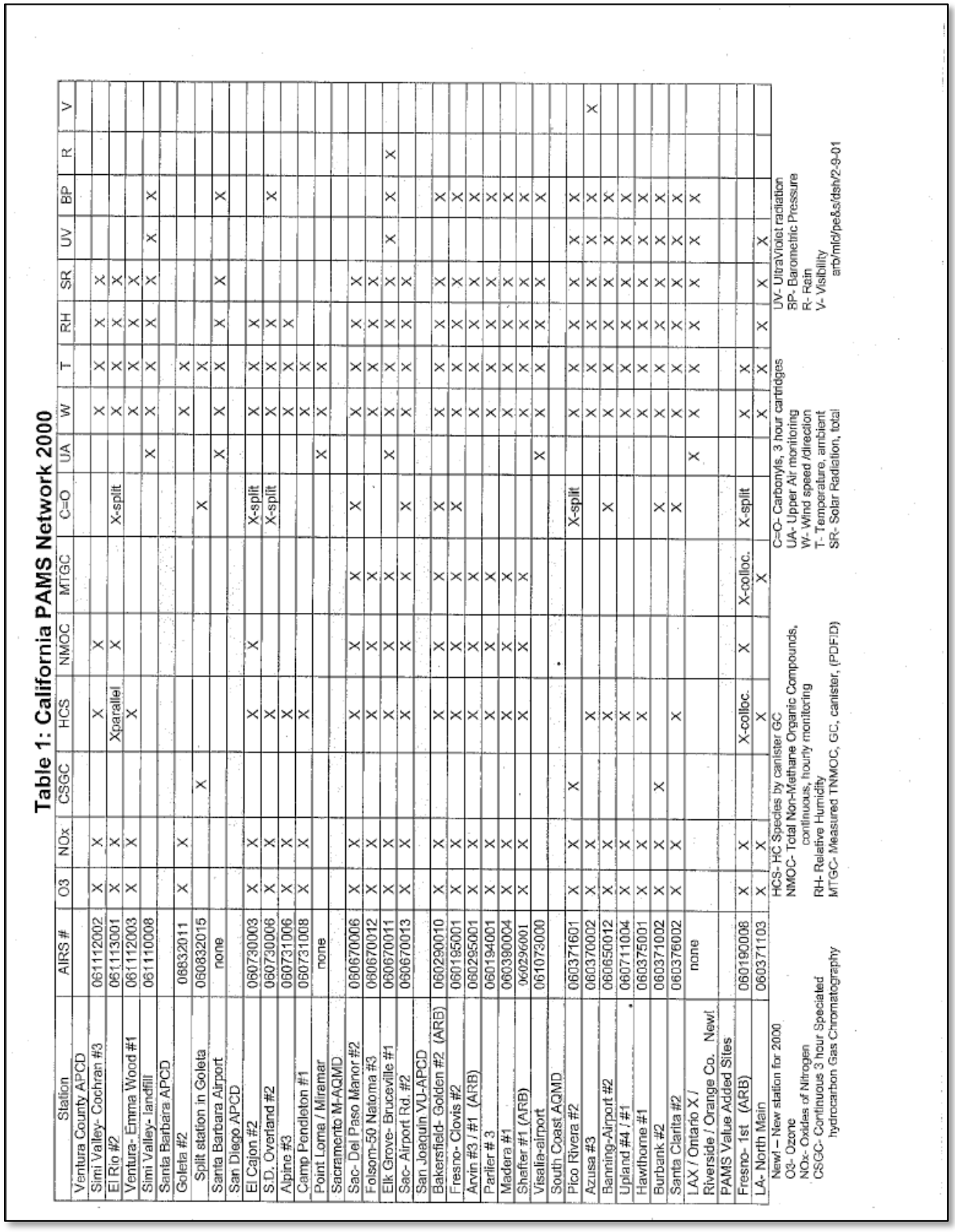

Table 1: California PAMS Network 2000

Station	AIRS #	O3	NOx	CSGC	HCS	NMOC	MTGC	C=O	UA	W	T	RH	SR	UV	BP	R	V
Ventura County APCD																	
Simi Valley- Cochran #3	061112002	X	X		X	X				X	X	X	X				
El Rio #2	061113001	X	X		Xparallel	X		X-split		X	X	X	X				
Ventura- Emma Wood #1	061112003	X	X		X					X	X	X	X				
Simi Valley- landfill	061110008								X	X	X	X	X	X	X		
Santa Barbara APCD																	
Goleta #2	060832011	X	X							X	X						
Split station in Goleta	060832015			X				X			X						
Santa Barbara Airport	none								X	X	X	X	X		X		
San Diego APCD																	
El Cajon #2	060730003	X	X		X	X		X-split		X	X	X					
S.D. Overland #2	060730006	X	X		X			X-split		X	X	X			X		
Alpine #3	060731006	X	X		X					X	X	X					
Camp Pendleton #1	060731008	X	X		X					X	X						
Point Loma / Miramar	none								X	X	X						
Sacramento M-AQMD																	
Sac- Del Paso Manor #2	060670006	X	X		X	X	X	X		X	X	X	X				
Folsom-50 Natoma #3	060670012	X	X		X	X	X			X	X	X	X				
Elk Grove- Bruceville #1	060670011	X	X		X	X	X		X	X	X	X	X	X	X	X	
Sac- Airport Rd. #2	060670013	X	X		X	X	X	X		X	X	X	X				
San Joaquin VU-APCD																	
Bakersfield- Golden #2 (ARB)	060290010	X	X		X	X	X	X		X	X	X	X		X		
Fresno- Clovis #2	060195001	X	X		X	X	X	X		X	X	X	X		X		
Arvin #3 / #1 (ARB)	060295001	X	X		X	X	X			X	X	X	X		X		
Parlier # 3	060194001	X	X		X	X	X			X	X	X	X		X		
Madera #1	060390004	X	X		X	X	X			X	X	X	X		X		
Shafter #1 (ARB)	060296001	X	X		X	X	X			X	X	X	X		X		
Visalia-airport	061073000								X	X	X	X	X		X		
South Coast AQMD																	
Pico Rivera #2	060371601	X	X	X				X-split		X	X	X	X	X	X		
Azusa #3	060370002	X	X		X					X	X	X	X	X	X		X
Banning-Airport #2	060650012	X	X		X			X		X	X	X	X	X	X		
Upland #4 / #1	060711004	X	X		X					X	X	X	X	X	X		
Hawthorne #1	060375001	X	X		X					X	X	X	X	X	X		
Burbank #2	060371002	X	X	X				X		X	X	X	X	X	X		
Santa Clarita #2	060376002	X	X		X			X		X	X	X	X	X	X		
LAX / Ontario X / Riverside / Orange Co. New!	none								X	X	X	X	X	X	X		
PAMS Value Added Sites																	
Fresno- 1st (ARB)	060190008	X	X		X-colloc.	X	X-colloc.	X-split		X	X						
LA- North Main	060371103	X	X		X		X			X	X	X	X	X			

New! – New station for 2000
O3- Ozone
NOx- Oxides of Nitrogen
CSGC- Continuous 3 hour Speciated hydrocarbon Gas Chromatography
HCS- HC Species by canister GC
NMOC- Total Non-Methane Organic Compounds, continuous, hourly monitoring
RH- Relative Humidity
MTGC- Measured TNMOC, GC, canister, (PDFID)
C=O- Carbonyls, 3 hour cartridges
UA- Upper Air monitoring
W- Wind speed /direction
T- Temperature, ambient
SR- Solar Radiation, total
UV- UltraViolet radiation
BP- Barometric Pressure
R- Rain
V- Visibility
arb/mld/pe&s/dsh/2-9-01

Figure D-5 California Alternative Plan, Page 5

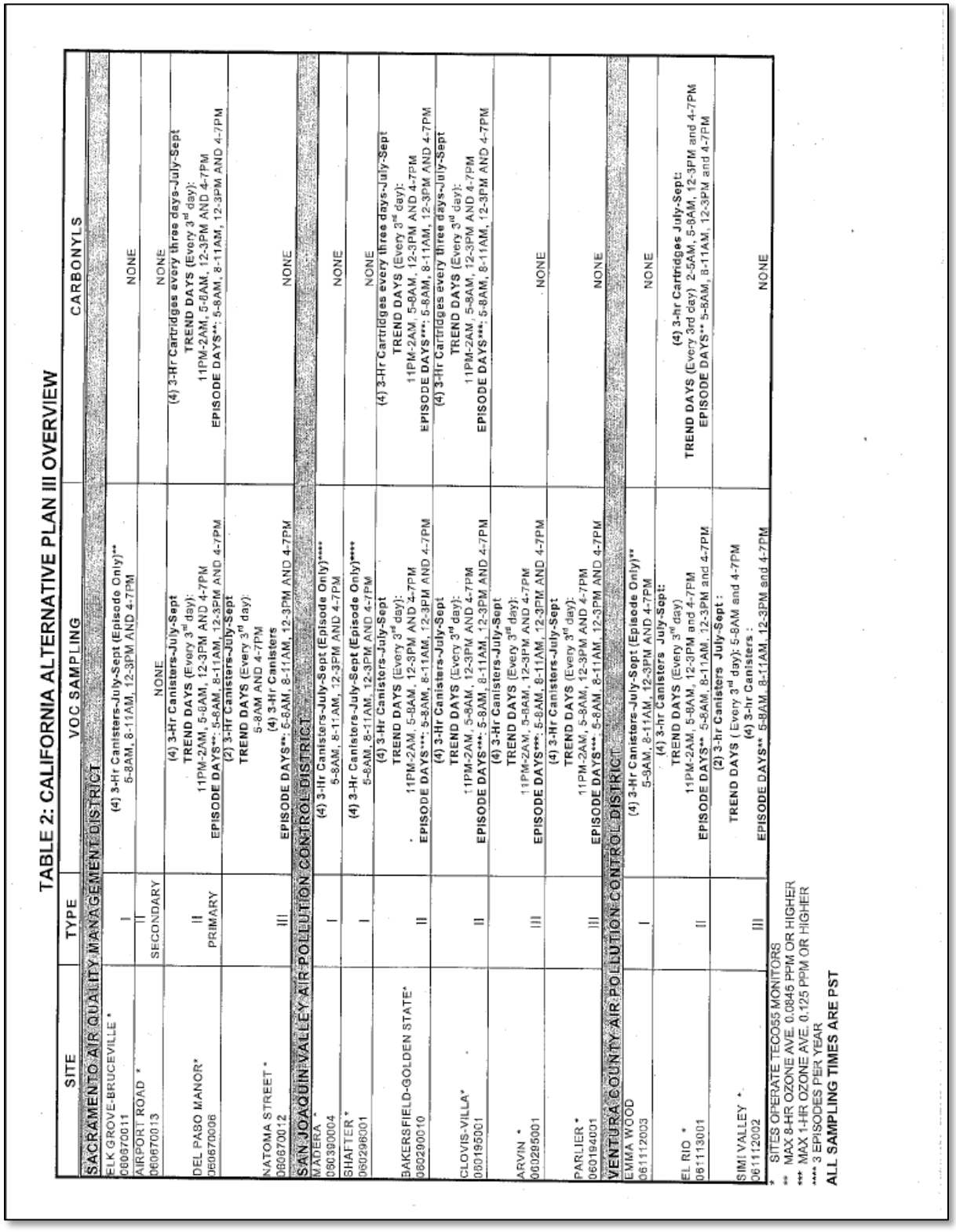

TABLE 2: CALIFORNIA ALTERNATIVE PLAN III OVERVIEW

SITE	TYPE	VOC SAMPLING	CARBONYLS
SACRAMENTO AIR QUALITY MANAGEMENT DISTRICT			
ELK GROVE-BRUCEVILLE * 060670011	I	(4) 3-Hr Canisters-July-Sept (Episode Only)** 5-8AM, 8-11AM, 12-3PM AND 4-7PM	NONE
AIRPORT ROAD * 060670013	II SECONDARY	NONE	NONE
DEL PASO MANOR* 060670006	II PRIMARY	(4) 3-Hr Canisters-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS**: 5-8AM, 8-11AM, 12-3PM AND 4-7PM	(4) 3-Hr Cartridges every three days-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS**: 5-8AM, 8-11AM, 12-3PM AND 4-7PM
NATOMA STREET * 060670012	III	(2) 3-Hr Canisters-July-Sept TREND DAYS (Every 3rd day): 5-8AM AND 4-7PM (4) 3-Hr Canisters EPISODE DAYS**: 5-8AM, 8-11AM, 12-3PM AND 4-7PM	NONE
SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT			
MADERA * 060390004	I	(4) 3-Hr Canisters-July-Sept (Episode Only)**** 5-8AM, 8-11AM, 12-3PM AND 4-7PM	NONE
SHAFTER* 060298001	I	(4) 3-Hr Canisters-July-Sept (Episode Only)**** 5-8AM, 8-11AM, 12-3PM AND 4-7PM	NONE
BAKERSFIELD-GOLDEN STATE* 060290010	II	(4) 3-Hr Canisters-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS***: 5-8AM, 8-11AM, 12-3PM AND 4-7PM	(4) 3-Hr Cartridges every three days-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS***: 5-8AM, 8-11AM, 12-3PM AND 4-7PM
CLOVIS-VILLA* 060195001	II	(4) 3-Hr Canisters-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS***: 5-8AM, 8-11AM, 12-3PM AND 4-7PM	(4) 3-Hr Cartridges every three days-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS***: 5-8AM, 8-11AM, 12-3PM AND 4-7PM
ARVIN * 060295001	III	(4) 3-Hr Canisters-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS***: 5-8AM, 8-11AM, 12-3PM AND 4-7PM	NONE
PARLIER * 060194001	III	(4) 3-Hr Canisters-July-Sept TREND DAYS (Every 3rd day): 11PM-2AM, 5-8AM, 12-3PM AND 4-7PM EPISODE DAYS***: 5-8AM, 8-11AM, 12-3PM AND 4-7PM	NONE
VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT			
EMMA WOOD 061112003	I	(4) 3-Hr Canisters-July-Sept (Episode Only)** 5-8AM, 8-11AM, 12-3PM AND 4-7PM	NONE
EL RIO * 061113001	II	(4) 3-hr Canisters July-Sept: TREND DAYS (Every 3rd day) 11PM-2AM, 5-8AM, 12-3PM and 4-7PM EPISODE DAYS** 5-8AM, 8-11AM, 12-3PM and 4-7PM	(4) 3-hr Cartridges July-Sept: TREND DAYS (Every 3rd day) 2-5AM, 5-8AM, 12-3PM and 4-7PM EPISODE DAYS** 5-8AM, 8-11AM, 12-3PM and 4-7PM
SIMI VALLEY * 061112002	III	(2) 3-hr Canisters July-Sept : TREND DAYS (Every 3rd day): 5-8AM and 4-7PM (4) 3-hr Canisters : EPISODE DAYS** 5-8AM, 8-11AM, 12-3PM and 4-7PM	NONE

* SITES OPERATE TECO55 MONITORS
** MAX 8-HR OZONE AVE. 0.0845 PPM OR HIGHER
*** MAX 1-HR OZONE AVE. 0.125 PPM OR HIGHER
**** 3 EPISODES PER YEAR
ALL SAMPLING TIMES ARE PST

The enclosure to this letter is not reproduced in this annual network plan. Please contact SMAQMD for a copy of this letter in its entirety.

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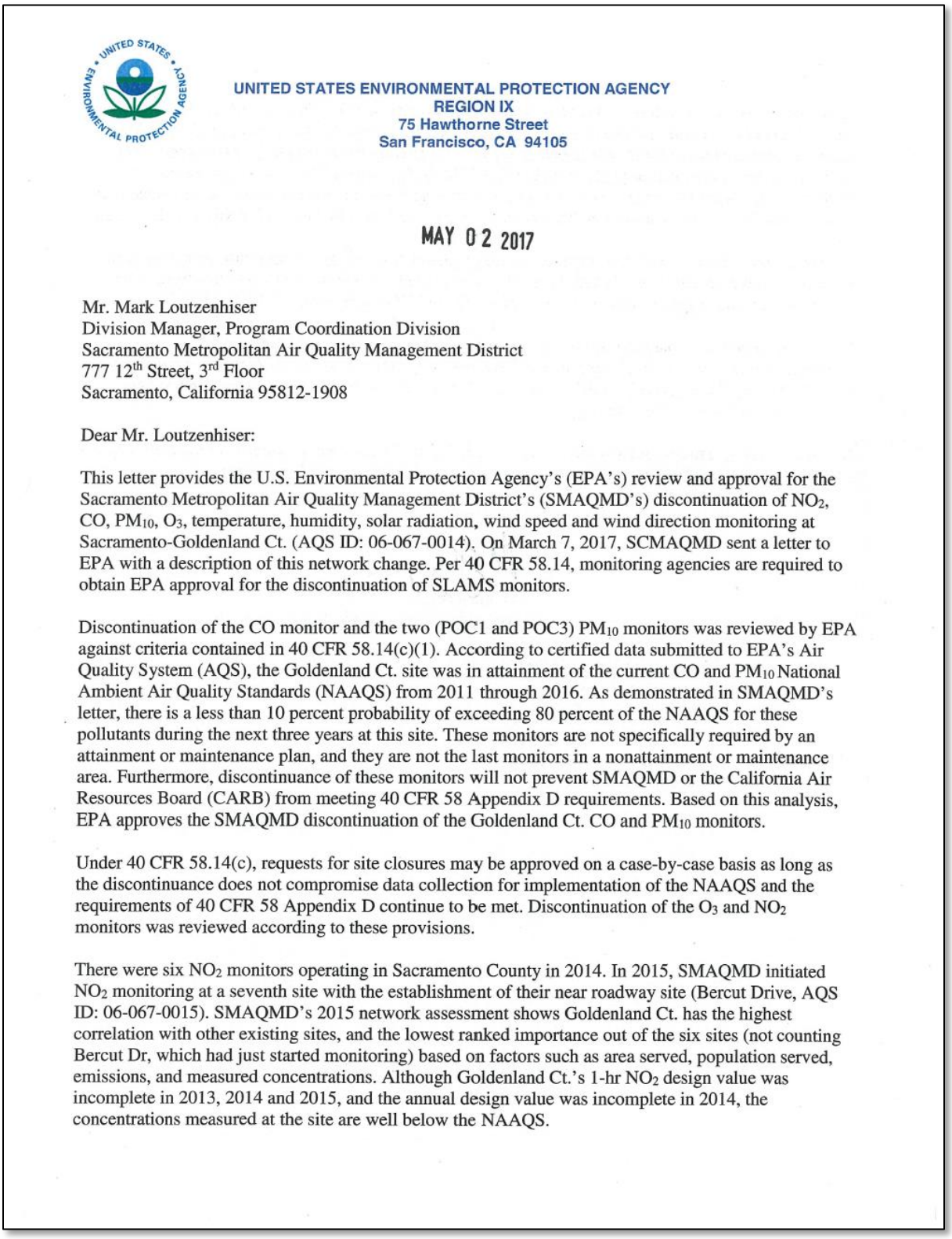
Appendix E Sacramento-Goldenland Ct. Closure Letter

Figure E-1 Sacramento-Goldenland Ct. Closure Approval Letter, Page 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

MAY 02 2017

Mr. Mark Loutzenhiser
Division Manager, Program Coordination Division
Sacramento Metropolitan Air Quality Management District
777 12th Street, 3rd Floor
Sacramento, California 95812-1908

Dear Mr. Loutzenhiser:

This letter provides the U.S. Environmental Protection Agency's (EPA's) review and approval for the Sacramento Metropolitan Air Quality Management District's (SMAQMD's) discontinuation of NO_2, CO, PM_{10}, O_3, temperature, humidity, solar radiation, wind speed and wind direction monitoring at Sacramento-Goldenland Ct. (AQS ID: 06-067-0014). On March 7, 2017, SCMAQMD sent a letter to EPA with a description of this network change. Per 40 CFR 58.14, monitoring agencies are required to obtain EPA approval for the discontinuation of SLAMS monitors.

Discontinuation of the CO monitor and the two (POC1 and POC3) PM_{10} monitors was reviewed by EPA against criteria contained in 40 CFR 58.14(c)(1). According to certified data submitted to EPA's Air Quality System (AQS), the Goldenland Ct. site was in attainment of the current CO and PM_{10} National Ambient Air Quality Standards (NAAQS) from 2011 through 2016. As demonstrated in SMAQMD's letter, there is a less than 10 percent probability of exceeding 80 percent of the NAAQS for these pollutants during the next three years at this site. These monitors are not specifically required by an attainment or maintenance plan, and they are not the last monitors in a nonattainment or maintenance area. Furthermore, discontinuance of these monitors will not prevent SMAQMD or the California Air Resources Board (CARB) from meeting 40 CFR 58 Appendix D requirements. Based on this analysis, EPA approves the SMAQMD discontinuation of the Goldenland Ct. CO and PM_{10} monitors.

Under 40 CFR 58.14(c), requests for site closures may be approved on a case-by-case basis as long as the discontinuance does not compromise data collection for implementation of the NAAQS and the requirements of 40 CFR 58 Appendix D continue to be met. Discontinuation of the O_3 and NO_2 monitors was reviewed according to these provisions.

There were six NO_2 monitors operating in Sacramento County in 2014. In 2015, SMAQMD initiated NO_2 monitoring at a seventh site with the establishment of their near roadway site (Bercut Drive, AQS ID: 06-067-0015). SMAQMD's 2015 network assessment shows Goldenland Ct. has the highest correlation with other existing sites, and the lowest ranked importance out of the six sites (not counting Bercut Dr, which had just started monitoring) based on factors such as area served, population served, emissions, and measured concentrations. Although Goldenland Ct.'s 1-hr NO_2 design value was incomplete in 2013, 2014 and 2015, and the annual design value was incomplete in 2014, the concentrations measured at the site are well below the NAAQS.

Figure E-2 Sacramento-Goldenland Ct. Closure Approval Letter, Page 1

There were seven O_3 monitors operating in Sacramento County in 2015. The network assessment shows that Goldenland Ct. highly correlates with three other sites in the county. As shown in SMAQMD's letter, concentrations measured at Goldenland Ct. are consistently lower than those measured at other sites within the county. Although it has a violating 2016 design value of 0.071 parts per million, Goldenland Ct. is not the design value site for O_3 within the county; it had the lowest design value in the county from 2011 to 2013, and from 2014-2016 it has had the fourth-highest design value in the county.

Discontinuance of the O_3 and NO_2 monitors at Goldenland Ct. would not compromise data collection needed for implementation of a NAAQS, and the requirements of Appendix D would continue to be met. EPA therefore approves discontinuation of the O_3 and NO_2 monitoring at Goldenland Ct.

While PAMS network changes must be approved by the Administrator, EPA Region 9 has recommended EPA Headquarters approve SMAQMD's request to close this PAMS site. A separate letter addressing the requested modification to the Photochemical Assessment Monitoring Stations (PAMS) network will be forthcoming.

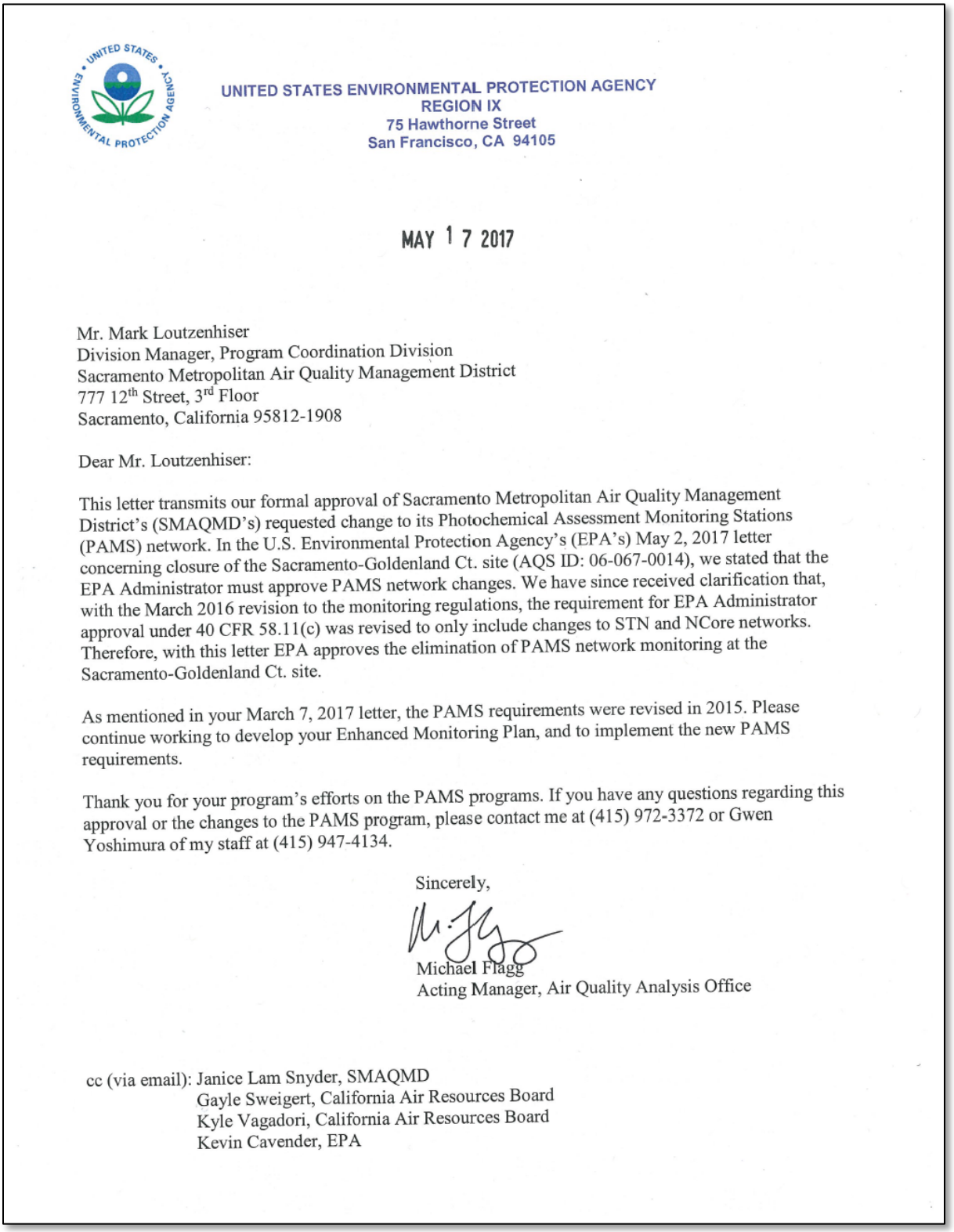
If you have any questions, please contact me at (415) 972-3372 or Gwen Yoshimura of my staff at (415) 947-4134. Thank you for your continued attention to detail and thorough data analyses.

Sincerely,

Michael Flagg
Acting Manager, Air Quality Analysis Office

cc (via email): Janice Lam Snyder, SMAQMD
Gayle Sweigert, CARB
Kyle Vagadori, CARB

Figure E-3 Sacramento-Goldenland Ct. PAMS Closure Approval Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

MAY 17 2017

Mr. Mark Loutzenhiser
Division Manager, Program Coordination Division
Sacramento Metropolitan Air Quality Management District
777 12th Street, 3rd Floor
Sacramento, California 95812-1908

Dear Mr. Loutzenhiser:

This letter transmits our formal approval of Sacramento Metropolitan Air Quality Management District's (SMAQMD's) requested change to its Photochemical Assessment Monitoring Stations (PAMS) network. In the U.S. Environmental Protection Agency's (EPA's) May 2, 2017 letter concerning closure of the Sacramento-Goldenland Ct. site (AQS ID: 06-067-0014), we stated that the EPA Administrator must approve PAMS network changes. We have since received clarification that, with the March 2016 revision to the monitoring regulations, the requirement for EPA Administrator approval under 40 CFR 58.11(c) was revised to only include changes to STN and NCore networks. Therefore, with this letter EPA approves the elimination of PAMS network monitoring at the Sacramento-Goldenland Ct. site.

As mentioned in your March 7, 2017 letter, the PAMS requirements were revised in 2015. Please continue working to develop your Enhanced Monitoring Plan, and to implement the new PAMS requirements.

Thank you for your program's efforts on the PAMS programs. If you have any questions regarding this approval or the changes to the PAMS program, please contact me at (415) 972-3372 or Gwen Yoshimura of my staff at (415) 947-4134.

Sincerely,

Michael Flagg
Acting Manager, Air Quality Analysis Office

cc (via email): Janice Lam Snyder, SMAQMD
Gayle Sweigert, California Air Resources Board
Kyle Vagadori, California Air Resources Board
Kevin Cavender, EPA

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Appendix F Sacramento Health Dept.-Stockton Blvd. Closure Letter

Figure F-1 Sacramento Health Dept.-Stockton Blvd. Closure Approval Letter, Page 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

NOV 14 2016

Mr. Mark Loutzenhiser
Division Manager, Program Coordination Division
Sacramento Metropolitan Air Quality Management District
777 12th Street, 3rd Floor
Sacramento, California 95814-1908

Dear Mr. Loutzenhiser:

This letter provides the Environmental Protection Agency's (EPA's) review and approval for the Sacramento Metropolitan Air Quality Management District (SMAQMD) discontinuation of the PM_{10} and $PM_{2.5}$ State/Local Air Monitoring Station (SLAMS) monitors at the Sacramento-Health Department site (AQS ID: 06-067-4001). On October 21, 2016 SMAQMD sent a letter to EPA with a description of this network change. Per 40 CFR 58.14, monitoring agencies are required to obtain EPA approval for the discontinuation of SLAMS monitors.

The PM_{10} monitor discontinuation was specifically reviewed by EPA against criteria contained in 40 CFR 58.14(c)(1). According to certified data submitted to EPA's Air Quality System (AQS), the Health Department site was in attainment of the 1987 PM_{10} National Ambient Air Quality Standard (NAAQS) from 2011 through 2015. We have determined that there is a less than 10 percent probability of exceeding 80 percent of the PM_{10} NAAQS during the next three years (2016-2018) at this site. This is based on an analysis of data from the POC 2 monitor. A second PM_{10} monitor (POC 3) operated at the site, but 2011 was the last complete year of data from the instrument. SMAQMD's 2016 Annual Monitoring Network Plan indicates that this instrument has been malfunctioning since 2012. An analysis from the last available five complete years of data (2007-2011) for the POC 3 monitor also demonstrates that there was a less than 10 percent probability of exceeding 80 percent of the PM_{10} NAAQS at this site in the subsequent 3 years. Preliminary concentrations currently available for a portion of 2016 from the POC 2 monitor continue to show low values, with a maximum 24-hour concentration of 25 $\mu g/m^3$. The PM_{10} monitor is not specifically required by an attainment or maintenance plan, and SMAQMD and the California Air Resources Board (CARB) will continue to operate five other PM_{10} monitoring sites in the Sacramento, California maintenance area. Furthermore, discontinuance of PM_{10} monitoring at the Health Department site will not prevent SMAQMD from meeting 40 CFR 58, Appendix D requirements. Based on this analysis, EPA approves the SMAQMD

Figure F-2 Sacramento Health Dept.-Stockton Blvd. Closure Approval Letter, Page 2

discontinuation of the Health Department PM_{10} SLAMS (POC 2 and POC 3) monitors.

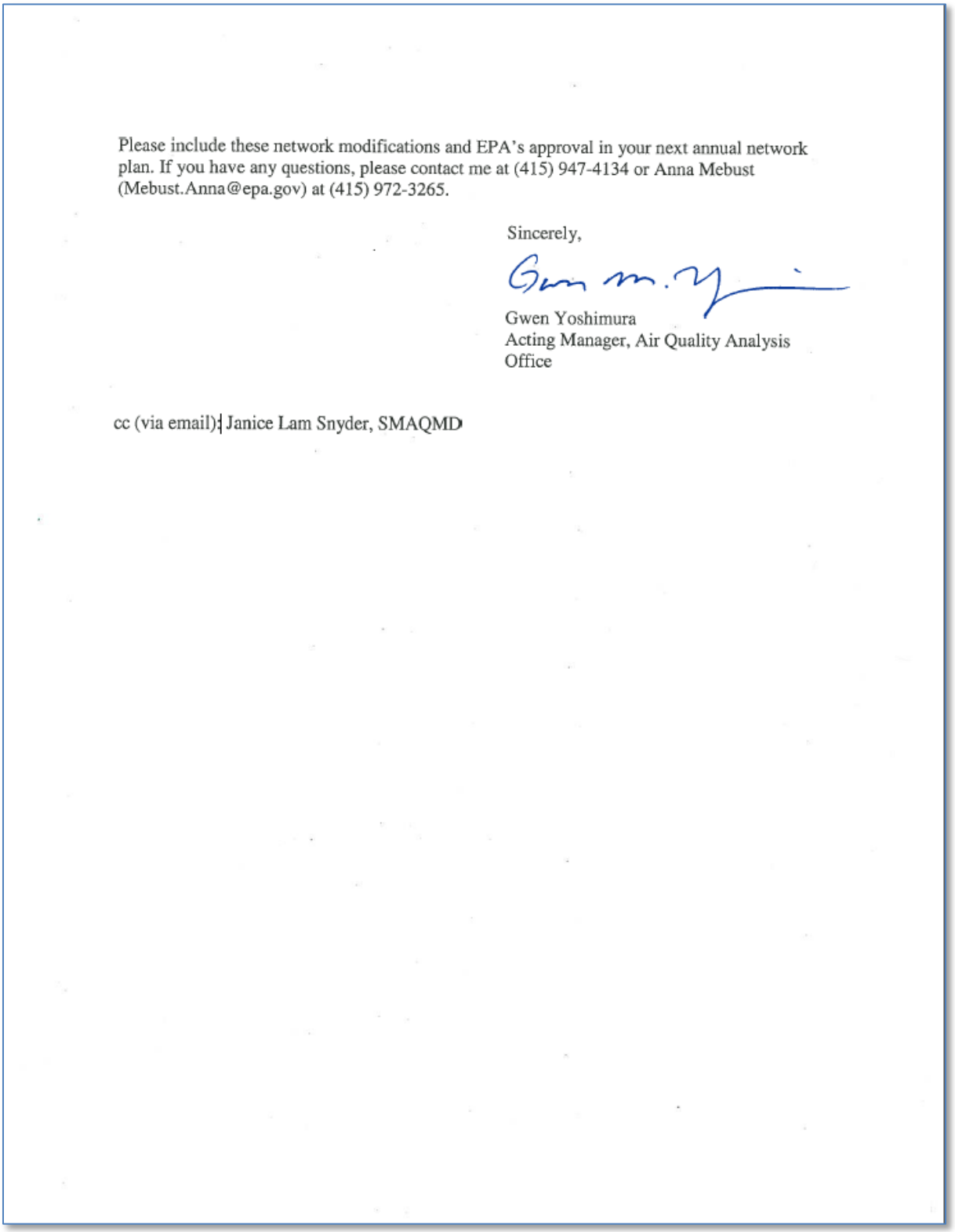
Under 40 CR 58.14(c), requests for site closures may be approved on a case-by-case basis as long as the discontinuance does not compromise data collection for the NAAQS and the requirements of 40 CFR 58 Appendix D continue to be met. $PM_{2.5}$ monitoring at the Health Department site was reviewed according to these provisions.

We have determined that there is a less than 10 percent probability of exceeding 80 percent of the 2012 annual $PM_{2.5}$ NAAQS at this site during the next three years (2016-2018). There is a greater than 10 percent probability of exceeding 80 percent of the 2012 24-hour $PM_{2.5}$ NAAQS during the next three years; however, according to certified data submitted to AQS, the $PM_{2.5}$ monitor at this site has been attaining all relevant NAAQS since 2011. Furthermore, the 2013-2015 design value for the Sacramento area also meets the 2012 24-hour NAAQS. The 24-hour $PM_{2.5}$ design value site for the area is Sacramento-Del Paso Manor (AQS ID: 06-067-0006), which is located 6.3 miles northeast of the Health Department site. The 2013-2015 24-hour design value at the Health Department site is 5 $\mu g/m^3$ below the design value at Del Paso Manor. In addition, 24-hour design values at the Health Department site have been less than or equal to 24-hour design values at the Del Paso Manor site for the past 10 years, and except for in 2011, 98th percentile concentrations have also been higher at Del Paso Manor. Preliminary 2016 concentrations suggest that design values will continue to be higher at the Del Paso Manor site than at the Health Department site. Overall, the Health District site consistently measures $PM_{2.5}$ concentrations below the NAAQS and below the $PM_{2.5}$ design value site for the area.

Additionally, CARB monitors for $PM_{2.5}$ at Sacramento-T Street (AQS ID: 06-067-0010), which is 1.8 miles west of the Health Department site. This site measures very similar concentrations to the Health Department site: design values from 2011-2015 at the two sites are consistently within 2 $\mu g/m^3$. Both sites are rooftop sites surrounded by paved urban areas, and are neighborhood scale for $PM_{2.5}$. Both monitors have monitoring objectives of NAAQS comparison and public information, and are sited to reflect population exposure. In addition to manual $PM_{2.5}$ SLAMS measurements, T Street also has two continuous $PM_{2.5}$ monitors (for AQI purposes and for special purpose monitoring) as well as a $PM_{2.5}$ speciation sampler. The similarities between the two sites in concentrations and in siting ensures that discontinuation of $PM_{2.5}$ monitoring at the Health Department site does not compromise data collection needed for implementation of the $PM_{2.5}$ NAAQS.

The $PM_{2.5}$ monitor is not specifically required by an attainment or maintenance plan, and SMAQMD and CARB will continue to operate five other $PM_{2.5}$ monitoring sites in the Sacramento, California nonattainment area. In addition, SMAQMD is required to begin monitoring $PM_{2.5}$ by January 1, 2017 at their near-road site, Sacramento-Bercut (06-067-0015), which is located approximately 3.5 miles northwest of the Health Department site. SMAQMD's request indicated that if this closure request is approved, the $PM_{2.5}$ monitor currently at the Health Department site will be moved to the Bercut site to meet this requirement. Given the factors presented in this letter, and that discontinuance of $PM_{2.5}$ monitoring at the Health Department site will not prevent SMAQMD from meeting 40 CFR 58, Appendix D requirements, EPA approves the closure of the $PM_{2.5}$ monitor at Health Department on a case-by-case basis per 40 CFR 58.14(c).

Figure F-3 Sacramento Health Dept.-Stockton Blvd. Closure Approval Letter, Page 3



Please include these network modifications and EPA's approval in your next annual network plan. If you have any questions, please contact me at (415) 947-4134 or Anna Mebust (Mebust.Anna@epa.gov) at (415) 972-3265.

Sincerely,

Gwen Yoshimura
Acting Manager, Air Quality Analysis Office

cc (via email): Janice Lam Snyder, SMAQMD

Appendix G Waiver Request for Photochemical Assessment Monitoring Stations Requirement

40 CFR Part 58 requires state and local monitoring agencies to collect and report required PAMS measurements at each NCore[25] site by June 2019. Under 40 CFR Part 58 Appendix D 5(c), the EPA Regional Administrator may grant a waiver to allow the collection of the required PAMS measurement at an alternative location where the monitoring agency can demonstrate that the alternative location will provide representative data useful for regional or national scale modeling and the tracking of trends in ozone precursors.

SMAQMD is requesting for a waiver to relocate the hourly averaged mixing-height measurement from the NCore site (Sacramento-Del Paso Manor, AQS site ID # 06-067-0006) to the existing PAMS type I site (Elk Grove-Bruceville Rd., AQS site ID # 06-067-0011) if the District is unable to secure a bigger footprint for the DPM monitoring station (NCore site). Early discussions with the property owners indicate that expanding the footprint of the station may not be an issue. However, Del Paso Manor station may not be able to accommodate a siting of a ceilometer if the footprint of the site lease is not expanded. SMAQMD believes that relocating the ceilometer to the Bruceville site will continue to provide representative data that is useful for regional or national scale modeling and tracking of trends in ozone precursors as its objective.

[25] Only NCore sites in CBSA with a population of 1,000,000 or more, based on the latest available census figures.