2016
ANNUAL MONITORING NETWORK PLAN

SACRAMENTO METROPOLITAN
AIR QUALITY MANAGEMENT DISTRICT

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

List of Abbreviations and Acronyms

AADT	Annual average daily traffic
AGL	Above ground level
AIR	Sacramento-Airport Road Air Monitoring Site
ANP	Annual network plan
ARM	Approved Regional Monitor
AQS	Air Quality System
BAM	Beta Attenuation Monitor
BC	Sacramento-Branch Center #2 Air Monitoring Site
BL	General/Background
BRU	Elk Grove-Bruceville Air Monitoring Site
Caltrans	California Department of Transportation
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
ECW	Sacramento-El Camino/Watt Air Monitoring Site
EPA	U.S Environmental Protection Agency
ER	Emission ratio
ERG	Eastern Research Group, Inc.
FE AADT	Fleet equivalent annual average daily traffic
FEM	Federal Equivalent Method
FID	Flame Ionization Detector
FOL	Folsom-Natoma Air Monitoring Site
FRM	Federal Reference Method
GC	Gas Chromatography
GOL	Sacramento-Goldenland Court Air Monitoring Site
HC	Highest Concentration
IM	Source Impact
MET	Meteorological sensor
MI	Microscale
MS	Middle Scale
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standard

NCore	National Core, a multi-pollutant ambient monitoring network
NDIR	Non-dispersive Infrared Spectrometry
NEI	National Emission Inventory
NH	North Highlands-Blackfoot Air Monitoring Site
NMHC	Non-Methane Hydrocarbon
NO2	Nitrogen Dioxide
NOX	Oxides of Nitrogen
NOY	Reactive Oxides of Nitrogen
NPAP	National Performance Audit Program (Criteria pollutant monitors)
NPEP	National Performance Evaluation Program (PM2.5 FRM)
NS	Neighborhood Scale
O3	Ozone
PAMS	Photochemical Assessment Monitoring Sites
Pb	Lead
PEP	Performance Evaluation Program (PM2.5 FRM)
PM	Particulate Matter
PM2.5	Particulate Matter 2.5 micron
PM10	Particulate Matter 10 micron
PM-Coarse	Particulate Matter > 2.5 micron and < 10 micron (PM10-2.5)
POC	Parameter occurrence code
PPB	Parts per Billion
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RC	Representative Concentration
RH	Relative Humidity
RS	Rancho Seco monitoring site
RTI	Research Triangle Institute
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
SJV	San Joaquin Valley
SLAMS	State and Local Air Monitoring Sites
SLU	Sloughhouse Air Monitoring Site
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO2	Sulfur Dioxide
SO4	Sulfate
SPM	Special Purpose Monitoring
SR	State Route

SRD	Solar Radiation
SSI	Size Selective Inlet (PM10 FRM sampler)
STN	Speciation Trends Network
TAPI	Teledyne Advanced Pollution Instrumentation
TCCR	Transportation Corridor Concept Report
TEI	Thermo Environmental Instruments
TEOM	Tapered Element Oscillating Microbalance
THC	Total Hydrocarbon
TNMHC	Total Non-methane hydrocarbon
TPY	Ton per Year
TST	Sacramento-T Street Air Monitoring Site
US	Urban Scale
UV	Ultraviolet
VCAPCD	Ventura County Air Pollution Control District
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. The public review period was open from August 15, 2016 thru September 15, 2016. No comment was received during this period. This report covers the period: January 1, 2015-December 31, 2015. 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-SPM monitors) 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 monitors and instruments information that are a part of State and Local Air Monitoring sites (SLAMS), National Core (NCore) multi-pollutant monitoring stations, Chemical Speciation Network (CSN), Special Purpose Monitoring (SPM), and Photochemical Assessment Monitoring (PAMS) sites, operated by our District and California Air Resources Board (CARB). The plan states whether each monitor in the ambient air monitoring network meets the requirements of 40 CFR 58, including Appendix A, C, D, and E, where applicable. The report will include the Federal Reference Method (FRM), Federal Equivalent Method (FEM), and Approved Regional Method (ARM) monitors.

This report is not an "in depth" analysis of the local air monitoring network design. 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, whether 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 made available for public comment on SMAQMD's website[2] on April 13, 2016, and was submitted to EPA Region 9 on April 22, 2016. As required by Revisions to Ambient Monitoring Quality Assurance and Other Requirements promulgated on April 27, 2016[3], a network modification plan is being submitted, as a part of this annual network plan. It addresses recommendations found in the network assessment report and can be found in Appendix E.

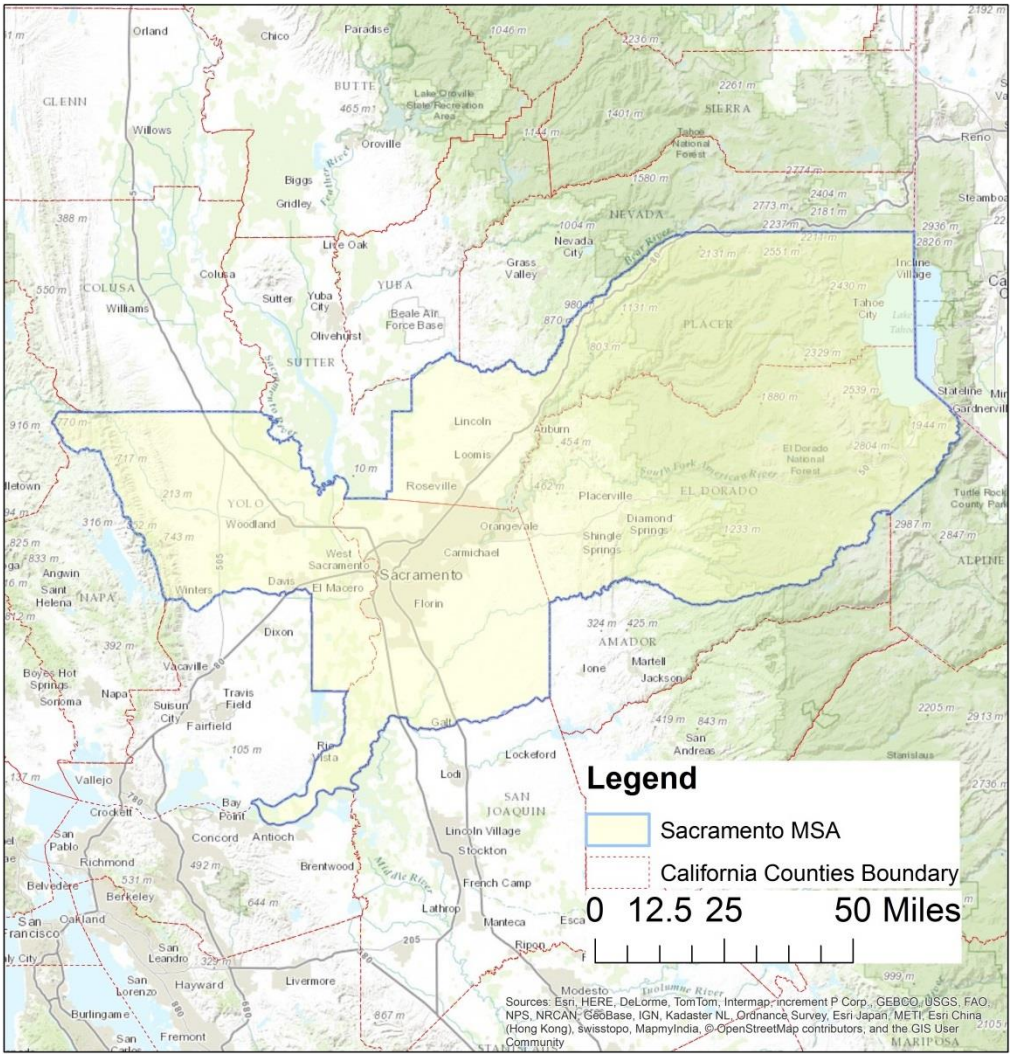
Any shared monitoring responsibility agreement between SMAQMD and neighboring monitoring organizations are discussed in Section 3, Minimum Monitoring Requirement. For details on monitors in neighboring counties within the MSA, please refer to the latest Annual Monitoring Network Plan published by CARB.

[2] Trinity Consultants. 2016. 2015 Air Monitoring Network Assessment (Sacramento Metropolitan Air Quality Management District) [cited 23 Apr 2016].
[3] 80 FR 17248

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 Sacramento-Arden Arcade-Roseville, California, MSA (Sacramento MSA). Sacramento MSA includes Placer, El Dorado, Sacramento and Yolo County. The MSA has 2.3 million people, including 1.5 million in Sacramento County, and is the 27th most populous MSA in the U.S.[4]. Figure 2-1 shows a map of Sacramento MSA.

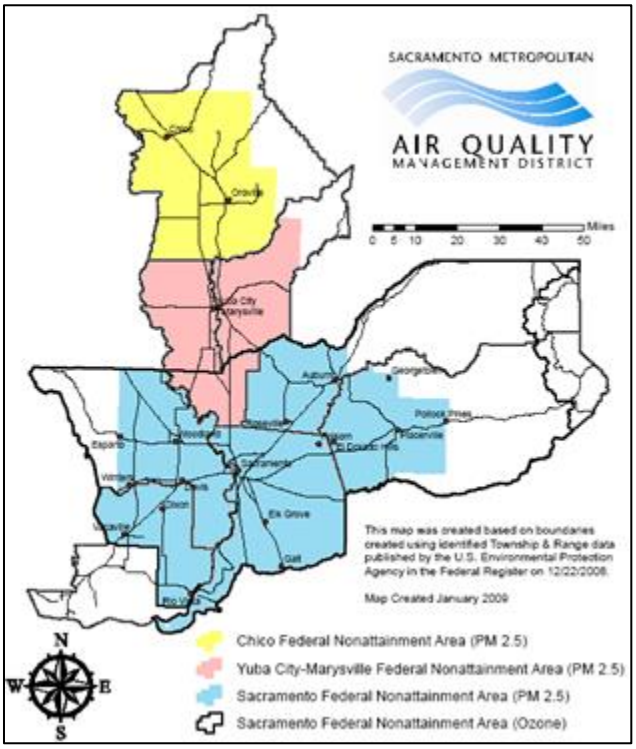
Figure 2-1
Counties within Sacramento-Arden Arcade-Roseville, California, MSA



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

Portions of the Sacramento MSA is a nonattainment area for the Federal 8-hr O_3 standard and is referred to as the Sacramento Federal Nonattainment Area (SFNA)[5]. This area includes all of Sacramento and Yolo counties and portions of Placer, El Dorado, Solano, and Sutter counties. The county has met PM_{10} air quality standard since 2002. The Sacramento region was designated nonattainment for the 2006 24-hour $PM_{2.5}$ standard (figure 2-2). The region met the $PM_{2.5}$ standard in 2012 and will continue to reduce $PM_{2.5}$ levels through various programs and strategies. Sacramento County is in attainment for the Federal CO, NO_2, and SO_2 health standards. EPA has designated Sacramento County as unclassifiable/attainment for the 2008 Federal Pb standard[7].

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



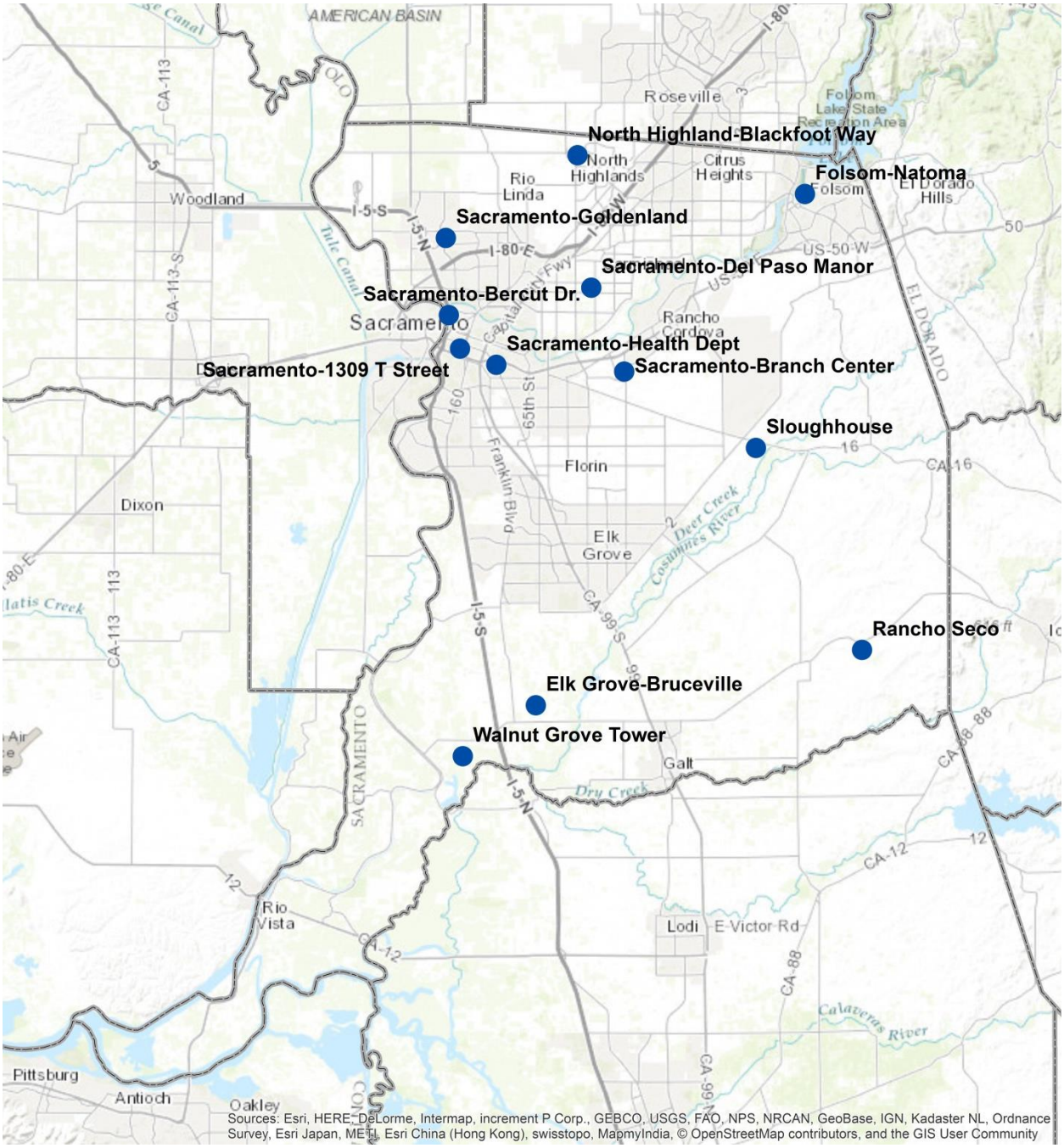
[5] U.S. EPA, 8-Hour Ozone (2008) Nonattainment Area/State/County Report, 2013
[7] https://www.epa.gov/lead-designations/lead-designations-final-nonattainment-designations-rounds-1-and-2; 70 FR 72097

SMAQMD operates ten air monitoring sites within Sacramento County with CARB operating the eleventh at Sacramento-T Street. Also, SMAQMD operates a special purpose site in Walnut Grove, which provides vertical ozone and temperature profile data for research. While most sites operate a suite of instruments to monitor multiple pollutants and meteorological condition, only a few sites monitor a specific pollutant. Each site has monitors that belong to one or more national monitoring networks, such as SLAMS, PAMS, or is a 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 monitored at each site. Figure 2-3 maps the location.

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-Health Dept. (STK)	Sacramento- T St. (TST)
Purpose	SLAMS	×	×	×	×	×	×	×		×	×	×
	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 (NMH)			×	×	×	×					
	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)	×			×							
	Scattering Coefficient				×							
Meteorology	Outdoor Temperature	×		×	×	×	×			×		×
	Relative Humidity			×	×	×	×					×
	Wind Direction	×		×	×	×	×			×		×
	Wind Speed	×		×	×	×	×			×		×
	Solar Radiation			×	×	×	×					
	Ultraviolet Radiation			×								
	Barometric Pressure			×								×
	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 O_3, its photochemical pollutant precursors such as NO_X and VOC, and $PM_{2.5}$. The data collected from area-wide and near-road stations supports SIP development, attainment/nonattainment decisions, public notification, and data for air quality modeling 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. To support these monitoring objectives there are a variety of types of monitoring sites, including sites located to determine the highest pollutant concentration, the representative concentrations in areas of high population density, the impact of major pollution emissions sources, the general background concentration levels, the extent of pollutant transport, and impacts on visibility, vegetation, and other welfare-based impacts. 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-Health Dept. (STK)	Sacramento-T St. (TST)
O_3			N,P	N,P	N,P	N,P	N,R		N,P		N,P
CO	N,P			N,P		N,P	N,R				
NO_2	N,P		N,P	N,P	N,P	N,P	N,R				N,P
NO_Y				P	P						
SO_2				N,P							
NMH			P,R	P,R	P,R	P,R					
VOC			R	R	R						
PM_{10} (Hourly)						P,R				P,R	
PM_{10} (24-hr)		N,P		N,P		N,P	N,P			N,P	N,P
$PM_{2.5}$ (Hourly)			P	P	N,P			P,R	R		P
$PM_{2.5}$ (24-hr)	N,P[8]			N,P						N,P	N,P
$PM_{10-2.5}$				P							
Pb				N,P							

N: NAAQS Comparison
P: Public Info
R: Research

[8] $PM_{2.5}$ will be installed and operational by winter 2016

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 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-Health Dept.	Sacramento- T St. (TST)
Site Type	Ozone			UP	PE	MO PE	PE	PE		MO		PE
	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	PE
	$PM_{2.5}$ (Cont. or Manual)			GB	PE HC	PE			GB	UP	PE HC	PE HC
	$PM_{10-2.5}$				PE							
	Lead				GB							
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	NS
	$PM_{2.5}$ (Cont. or Manual)			NS	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 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 minimum monitoring requirements of all criteria pollutants are provided in Tables 3-1 and 3-2. Monitors in these tables represent Sacramento MSA (or CBSA, ID#40900). As mentioned in Section 2, Sacramento MSA has 2.3 million residents and is comprises of El Dorado, Placer, Sacramento, and Yolo Counties.

SMAQMD has an agreement with CARB to share monitoring responsibility in the MSA. A copy of this agreement is provided in Appendix B. Other monitoring organizations that operate air monitoring stations in the MSA are: Placer County APCD and Yolo-Solano AQMD.

Table 3-1
2015 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	2015 design value [(A)] and location
O_3		2	15	7	0	0.081 ppm Placerville (06-017-0010)
$PM_{2.5}$	FRM/FEM	3	7	4	0	24-hr: 35 µg/m^3 Sacramento-Del Paso Manor (06-067-0006) Annual: 10.2 µg/m^3 Sacramento-Del Paso Manor (06-067-0006)
	Continuous	2	11	5	0	
PM_{10}		2-4	12	6	0	3-year average expected number of exceedance: 0.0
$PM_{10-2.5}$		1	1	1	0	Not applicable

[(A)] Design values from U.S. EPA Air Quality System Design Value Report (AMP 480), accessed on 25-Apr-2016

Table 3-2
2015 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: 251,000 (SR50 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: 1,085 tons[C] Population Weighted Emission Index: 2,468 million persons-tons per year[D] Monitor at Sacramento-Del Paso Manor satisfy NCore
CO		2	4	4	0	Trace monitor at Sacramento-Del Paso satisfy the NCore requirement, which also satisfy the 1 monitor requirement in the CO Maintenance Plan Monitor at Sacramento-Bercut Dr. satisfy the near-road monitoring requirement
Pb	NCore	0[E]	1	1	0	Located at Sacramento-Del Paso Manor
	Non-source oriented	0	0	0	0	Number of non-airport source > 0.5 tpy: 0[C],
	Source oriented	0	0	0	0	Airport source < 1.0 tpy[C]

[A] California Department of Transportation, 2014 Traffic Volumes, accessed 26-Apr-2016 (2015 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). See discussion in Appendix E, page 103.
[C] Source: 2011 National Emission Inventory, accessed 26-Apr 2016
[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 the criteria pollutants, Sacramento MSA also meets minimum monitoring requirement for PAMS, which is required due to the severity of ozone nonattainment classification in 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, there is one of each PAMS type I, II, and III sites. There is also a secondary type II site. Table 3-3 lists the instruments operating at each PAMS and 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) and the network modification plan in Appendix E addresses future year changes and requirements under these new regulations[9].

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 58
[(B)] Per Appendix D to 40 CFR 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

Furthermore, 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, $PM_{2.5}$ BAM, and PM_{10} TEOM, report hourly data and monitor pollutant year-round, unless otherwise specified in Appendix A, Detailed Site Information. Sampling schedule for non-continuous monitors is summarized in Table 3-4. Design value is included in the table if it is needed 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 thru September, and 2) special purpose $PM_{2.5}$ monitor at Rancho Seco operates from November thru February. For further details on sampling season and operating schedule, please refer to Appendix A.

[9] Per 40 CFR 58.13, new PAMS requirement must be implemented by June 1, 2019

Table 3-4
Sampling Schedule and 2015 Design Value for PM, Pb, 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: 44 Ratio to standard: 0.29				
Sacramento-Bercut Dr.		1 in 3 days (planned)			
Elk Grove-Bruceville		(Continuous Monitor)			During O_3 episode only
Sacramento-Del Paso Manor	Max. 24-hr concentration: 40 Ratio to standard: 0.27	24-hr DV: 35 Annual DV: 10.2	1 in 3 days	Max rolling 3-mo. average: 0.0035	1 in 3 days (Jul-Sep)
Folsom-Natoma St.		(Continuous Monitor)			1 in 3 days (Jul-Sep)
Sacramento-Goldenland Ct.	Max. 24-hr concentration: 53 Ratio to standard: 0.35				
North Highlands-Blackfoot Way	Max. 24-hr concentration: 45 Ratio to standard: 0.30				
Sacramento-Health Department	Max. 24-hr concentration: 44 Ratio to standard: 0.29	24-hr DV: 30 Annual DV: 9.2			
Rancho Seco		(Continuous Monitor)			
Sloughhouse		(Continuous Monitor)			
Sacramento-T St	Max. 24-hr concentration: 57 Ratio to standard: 0.38	24-hr DV: 30 Annual DV: 9.5			

Legend:

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

[(A)] Per 40 CFR 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 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 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 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."
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 25-Apr-2016

Section 4. Recent and Proposed Modification to the Network

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

Sacramento-Bercut Dr.
This site became operational on October 13, 2015. It currently monitors for CO, NO_2, black carbon, wind direction and speed, and outdoor temperature. As required by Appendix D to 40 CFR Part 58, a $PM_{2.5}$ sampler will be installed in winter 2016 and be operational by January 1, 2017. It will be a manual filter-based FRM sampler with 1 in 3 day schedule.

Sacramento-Branch Center #2
No change anticipated.

Elk Grove-Bruceville Rd.
The District is considering discontinuing the speciated VOC (episodic) measurement at this site. Speciated VOC measurement at this site is not specifically required by Appendix D to 40 CFR Part 58, but is included as a measurement in Sacramento's portion of the California Alternative Plan (CAP III)[11]. Speciated VOC concentrations collected at this site are low, representing background concentration.

Sacramento-Del Paso Manor
The Nephelometer is terminated as of April 1, 2016. It was a special purpose monitor originally installed in 1999 for the California Regional Particulate Air Quality Study (CRPAQS).

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

Folsom-Natoma St
No change anticipated.

[11] Appendix D

Sacramento-Goldenland Ct

The District will submit a request to terminate this site. The District will work with the CARB and EPA to request an approval for termination of these monitors. Sacramento-Goldenland Ct. is a redundant secondary type II PAMS, as nearby Sacramento-Del Paso Manor is a primary type II PAMS that measures a full suite of VOC. Furthermore, preliminary analysis shows this site does not measure the highest concentration of criteria pollutants. If this site is terminated, there are still enough monitors within this CBSA to satisfy the monitoring requirement in Appendix D to 40 CFR Part 58. For further discussion, please refer to the 2015 network assessment report[12] and Appendix E of this report.

North Highlands-Blackfoot Way

The District is in the process of negotiating a lease with the new property manager. If an agreement is not reached, the District will evaluate its options for relocation to an adjacent nearby property or possible termination of the monitoring station.

Sloughhouse-Sloughouse Rd

No change anticipated.

Sacramento Health Dept.-Stockton Blvd.

The District will submit a request for termination of the PM_{10} TEOM and PM_{10} SSI monitors. The District will work with the CARB and EPA to request an approval for termination of these monitors. The TEOM monitor is not required, and its data is not used for forecasting or analysis due to its negative bias during the winter time when there is an abundance of wood combustion. The SSI monitor also is not required because there is a sufficient number of SSI monitors in Sacramento MSA to meet the minimum monitoring requirement.

Also, the District is considering moving the $PM_{2.5}$ FRM monitor to the new Near Road NO_2 monitoring site. This monitor is redundant as it collects the same $PM_{2.5}$ data as the nearby Sacramento-T Street.

For further discussion, please refer to Section 4.1.7 of the 2015 network assessment report[13] and Appendix E of this report.

Rancho Seco

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

[12] Trinity Consultants. 2016. 2015 Air Monitoring Network Assessment (Sacramento Metropolitan Air Quality Management District) [cited 23 Apr 2016].

[13] Trinity Consultants. 2016. 2015 Air Monitoring Network Assessment (Sacramento Metropolitan Air Quality Management District) [cited 23 Apr 2016].

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. PQAO with only NCore and no source-oriented Pb monitoring do not have to collocate for Pb[14]. 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[15].

For complete details on PM and Pb collocation, please refer to the latest edition of Annual Monitoring Network Report published by CARB[16].

[14] 40 CFR Part 58, Appendix A, 3.3.4.3
[15] 40 CFR Part 58, Appendix A, 3.3.6
[16] California Air Resources Board. 2016. Annual Monitoring Network Report [cited 8 Aug 2016]

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 Part 58 in 40 CFR 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.

An informational comparison, which is not required by air monitoring regulation, on the number of $PM_{2.5}$ monitors by area and population has been included. The analysis can be found in Appendix D.

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 will be posted to our District Website for no less than 30 days for public review and comment. It will then be forwarded to EPA-Region IX for approval. The public review period was open from August 15, 2016 thru September 15, 2016. No comment was received during this period.

Section 7. Data Submission Requirements

CARB submits precision, accuracy, and raw data for all District operated monitors in 2015. 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

- 2015 Precision/Accuracy reports submitted to AQS: Quarterly
- 2015 Annual data certification submitted: May 10, 2016

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 58 requirements, including Appendix 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 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 Appendix A requirement

Section 9. Reference

"Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; State of California; PM10; Redesignation of Sacramento To Attainment; Approval of PM10 Redesignation Request and Maintenance Plan for Sacramento" 78 Federal Register 187 (26 September, 2013), pp. 59261 – 59263

California Department of Transportation. "2013 Annual Average Daily Truck Traffic on the California State Highway System." 2013. Traffic Census. http://traffic-counts.dot.ca.gov/docs/2013_aadt_truck.pdf. 3 April 2015

U.S. Census. "Metropolitan and Micropolitan Statistical Area Totals Dataset: Population and Estimated Components of Change: April 1, 2010 to July 1, 2014." December 2014. <http://www.census.gov/popest/data/metro/totals/2014/>. 10 April 2015

U.S. Environmental Protection Agency. "8-Hour Ozone (2008) Nonattainment Area/State/County Report ." 5 December 2013. *Green Book.* http://www.epa.gov/airquality/greenbook/hnca.html#6921. 21 March 2014.

U.S. Environmental Protection Agency. "The 2011 National Emissions Inventory. Version 2" 4 March, 2015. Technology Transfer Network Clearinghouse for Inventories & Emissions Factors. http://www.epa.gov/ttnchie1/net/2011inventory.html. 3 April 2015.

Appendix A Detailed Site and Monitor information

Detailed site information covered in this appendix reflects air monitoring operation from January 1, 2015-December 31, 2015.

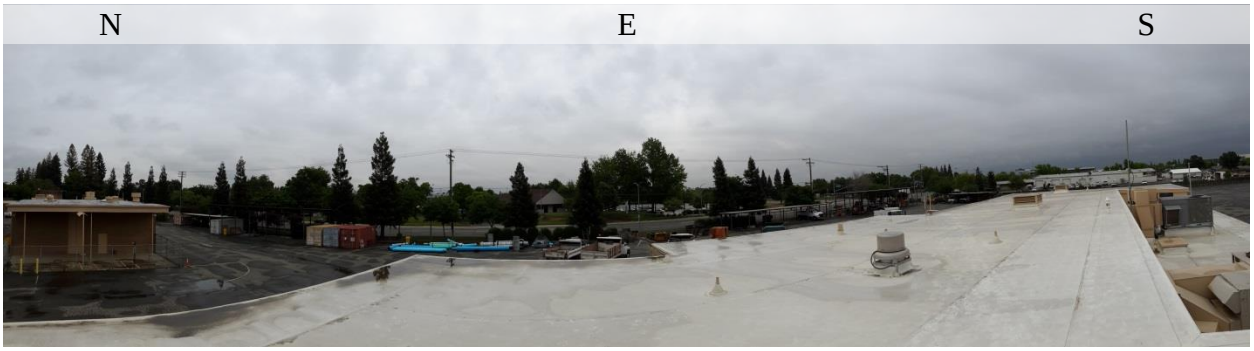
A.1 Sacramento-Branch Center #2

Sacramento-Branch Center #2 is a PM_{10} SSI 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.

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

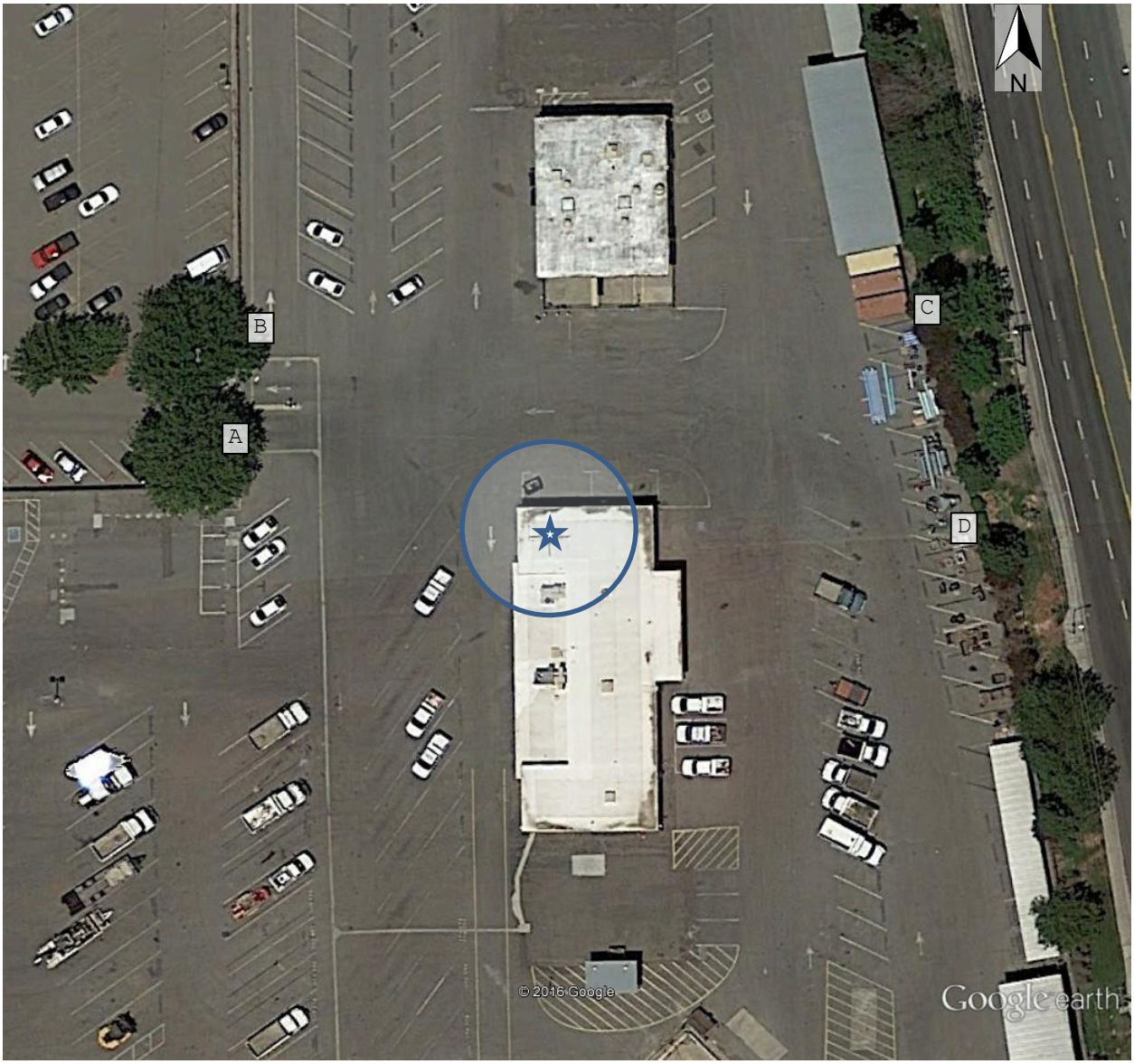
Panoramic view toward north from roof (May 2016)



Panoramic view toward east from roof (May 2016)

Panoramic view toward south from roof (May 2016)

Panoramic view toward west from roof (May 2016)



Google Earth image taken 7/13/15 shows some trees around Sacramento-Branch Center #2 air monitoring station. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, heights of the trees were calculated on-site on 5/6/16. Object C and D marks the tallest tree northeast and southeast of the station, respectively. Analyses in the following pages shows the object identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe
Object A (Tree)	25.70
Object B (Tree)	38.50
Object C (Tree)	46.90
Object D (Tree)	37.70

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe
Object A (Tree)	6.54
Object B (Tree)	2.92
Object C (Tree)	9.59
Object D (Tree)	5.38

Distance vs. Protrusion Ratio (must be ≥ 2)[18]

	Gaseous Probe
Object A (Tree)	3.93
Object B (Tree)	13.18
Object C (Tree)	4.89
Object D (Tree)	7.01

[18] 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."

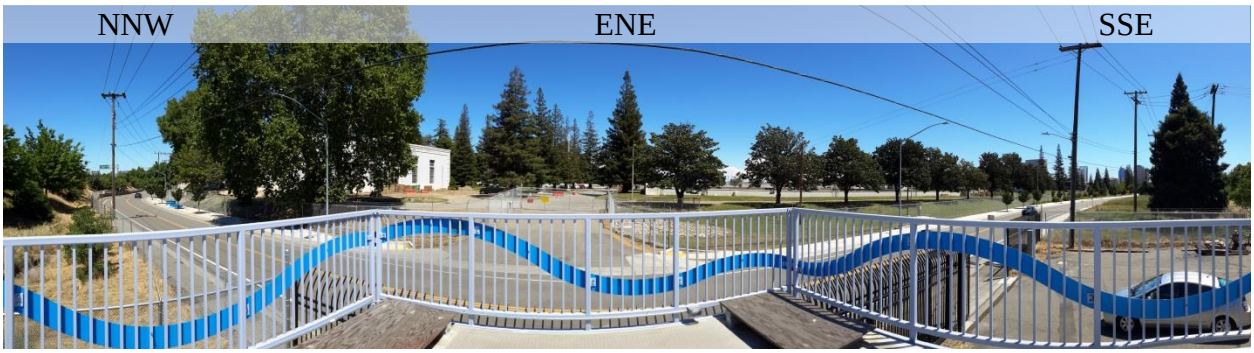
Site	Sacramento-Branch Center
Start Date	4/1/2006
Collecting Agency	SMAQMD
Analytical Lab	SMAQMD
Reporting Agency	CARB
Pollutant	PM10
Parameter code	81102
POC	1
Instrument manufacturer and model	Sierra Anderson 1200
Sampling Method	Hi Volume
Method Code	063
Analysis Method	Gravimetric
FRM/FEM/ARM/Other	FRM
Comparable to annual PM2.5 NAAQS?	Not applicable
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	2.0 m
Distance from flow obstructions on roof	No obstructions
Distance from flow obstructions not on roof	No obstructions
Distance from nearest tree drip line	36.6 m
Distance to furnace or incinerator flue	No furnace/flue
Distance between collocated PM monitors	Not collocated
Distance with nearest PM monitor and its type	No other PM monitors
Unrestricted airflow (deg)	360
Probe height (agl)	6.3 m
Probe material	Not applicable
Residence time	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Monthly
Last Annual Performance Evaluation	4/13/15, 10/7/15

A.2 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.

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: 186,000 (Caltrans, 2013) 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

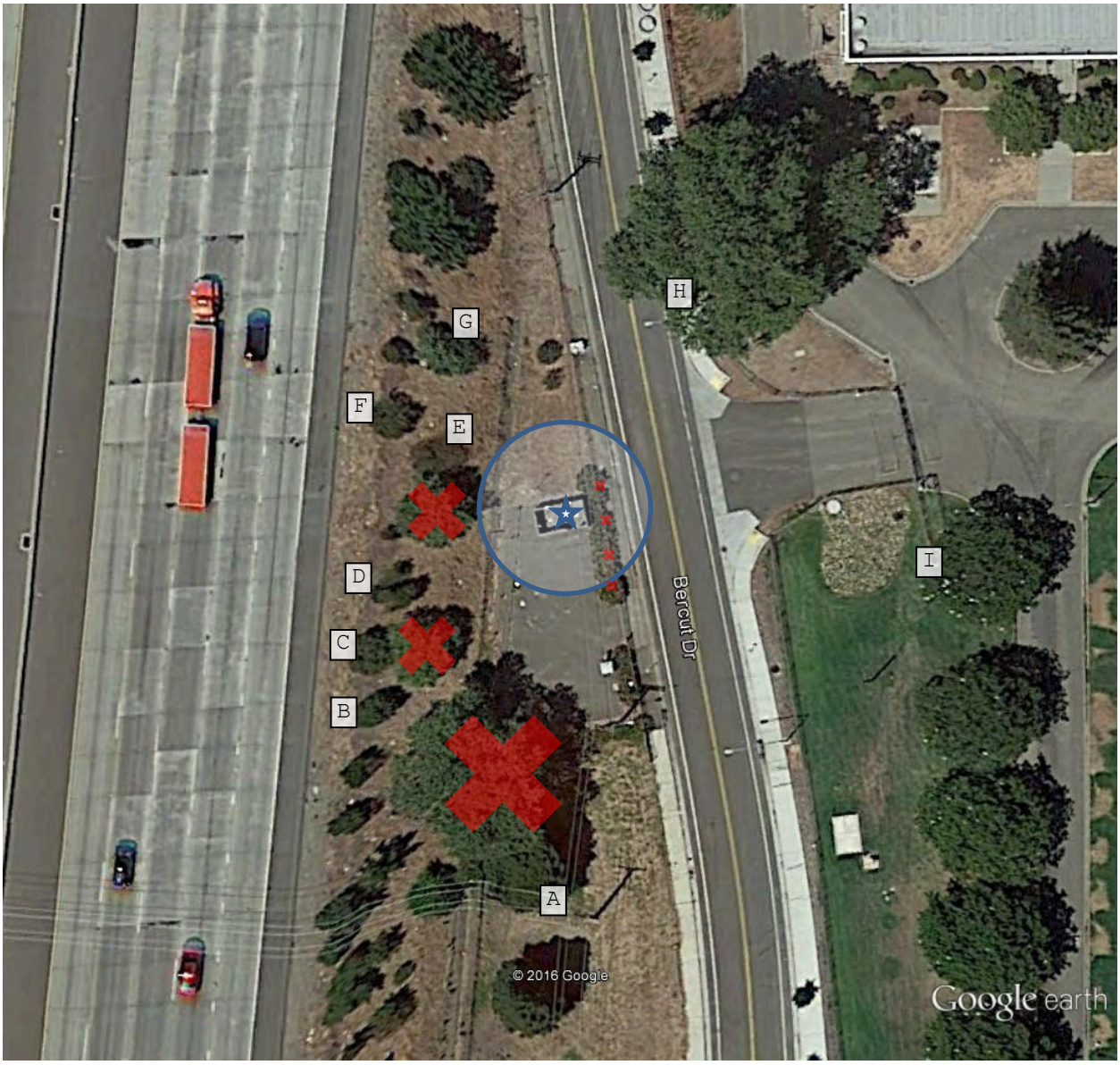
Panoramic view toward north from air monitoring station roof (April 2016)



Panoramic view toward east from air monitoring station roof (April 2016)

Panoramic view toward south from air monitoring station roof (April 2016)

Panoramic view toward west from air monitoring station roof (April 2016)



Above is a Google Earth image from 7/13/15, which is prior to the construction date of this site. The Google Earth image has not been updated since then to be included in this report. During construction, some vegetation was removed, as indicated by red "X," to satisfy siting criteria. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, height of the tree and building was calculated on-site on 4/28/16 and is provided in the table on the following page. It shows the object identified in the image above do not restrict air flow to the roof top inlets and samplers. Therefore, 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. During pre-construction planning effort, EPA staff found this tree acceptable to the near-road site[20].

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

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	33.83	33.83
Object B (Tree)	24.68	25.60
Object C (Tree)	21.03	21.94
Object D (Tree)	17.37	17.37
Object E (Tree)	10.97	11.88
Object F (Tree)	16.45	17.37
Object G (Tree)	16.45	16.45
Object H (Tree)	23.77	23.77
Object I (Tree)	38.40	38.40

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	8.83	8.93
Object B (Tree)	0.94	1.04
Object C (Tree)	0.95	1.05
Object D (Tree)	-0.17	-0.07
Object E (Tree)	0.00	0.09
Object F (Tree)	0.24	0.34
Object G (Tree)	1.80	1.90
Object H (Tree)	23.54	23.64
Object I (Tree)	7.69	7.79

Note: negative value indicates inlet or prober is taller
Than the object, thus airflow is not obstructed

Distance vs. Protrusion Ratio (must be ≥ 2)[21]

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	3.83	3.79
Object B (Tree)	26.26	24.62
Object C (Tree)	22.14	20.90
Object D (Tree)	N/A	N/A
Object E (Tree)	N/A	132.00
Object F (Tree)	68.54	51.09
Object G (Tree)	9.14	8.66
Object H (Tree)	1.0(A)	1.0(A)
Object I (Tree)	4.99	4.93

(A) See discussion on page 27
Legend:
Yellow shade denotes criteria not met
Note: N/A value indicates inlet or prober is taller than the object, thus airflow is not obstructed

[21] 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	
Start Date	10/13/2015	10/13/2015
Collecting Agency	SMAQMD	SMAQMD
Analytical Lab	Not applicable	Not applicable
Reporting Agency	CARB	CARB
Pollutant	Nitrogen Dioxide	Carbon Monoxide
Parameter code	42602	42101
POC	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable
Monitoring objective	NAAQS comparison, public info, research	NAAQS comparison, public info, research
Statement of Purpose	Monitors near road emission at region's highest FE-AADT roadway	Monitors near road emission at region's highest FE-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	1.7 m	1.7 m
Distance from flow obstructions on roof	No obstructions	No obstructions
Distance from flow obstructions not on roof	24 m	24 m
Distance from nearest tree drip line	11 m	11 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable
Distance with nearest PM monitor and its type	1.1 m (lo vol)	1.1 m (lo vol)
Unrestricted airflow (deg)	336	336
Probe height (agl)	4.4 m	4.4 m
Probe material	Teflon	Teflon
Residence time	19 s	18 s
Changes in next 18 months?	No	No
Frequency of one-point QC check	Every other day	Every other day
Last Annual Performance Evaluation	None [A]	None [A]

[A] No audit was conducted yet because the monitor started in October 2016

Site	Sacramento-Bercut Dr	
Start Date	10/30/2015	1/1/2017[A]
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
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable	Yes
Monitoring objective	Public info, research	NAAQS comparison, public info, research
Statement of Purpose	Determines component of PM emission at region's highest FE-AADT roadway	Monitors near road emission at region's highest FE-AADT roadway
Monitor type	SLAMS	SLAMS
Affiliation	Near Road	Near Road
Site type	Source Oriented	Source Oriented
Spatial scale	Neighborhood	Neighborhood
Sampling Frequency	Continuous	1 in 3 days
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top	1.8 m	Not yet in operation
Distance from flow obstructions on roof	No obstructions	Not yet in operation
Distance from flow obstructions not on roof	24 m	Not yet in operation
Distance from nearest tree drip line	11 m	Not yet in operation
Distance to furnace or incinerator flue	No furnace/flue	Not yet in operation
Distance between collocated PM monitors	Not applicable	Not yet in operation
Distance with nearest PM monitor and its type	Not applicable	Not yet in operation
Unrestricted airflow (deg)	336	Not yet in operation
Probe height (agl)	4.3 m	5.0 m (estimated)
Probe material	Aluminum	Unknown
Residence time	Not applicable	Not yet in operation
Changes in next 18 months?	No	Installation of monitor
Frequency of flow rate verification	Monthly	Not yet in operation
Last Annual Performance Evaluation	None[B]	Not yet in operation

[A] Anticipated start date

[B] No audit was conducted yet because the monitor started in October 2016

Site	Sacramento-Bercut Dr			
Start Date	10/30/2015	10/30/2015	10/30/2015	10/30/2015
Collecting Agency	SMAQMD	SMAQMD	SMAQMD	SMAQMD
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	Outdoor Temperature	Relative Humidity	Wind Direction	Wind Speed
Parameter code	62101	62201	61104	61103
POC	1	1	1	1
Instrument manufacturer and model	Climatronics 100093	Climatronics 101669	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	042	012	020	020
Analysis Method	Machine Average	Hygroscopic Plastic Film	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable	Not applicable	Not applicable
Monitoring objective	Public info, research	Public info, research	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	Near Road	Near Road	Near Road	Near Road
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	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
Distance from flow obstructions not on roof	36 m	36 m	36 m	36 m
Distance from nearest tree drip line	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	336	336	336	336
Probe height (agl)	10 m	10 m	10 m	10 m
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	Not applicable	Not applicable	Not applicable	Not applicable
Last Annual Performance Evaluation	None [A]	None [A]	None [A]	None [A]

[A] No audit was conducted yet because the monitor started in October 2016

A.3 Elk Grove-Bruceville

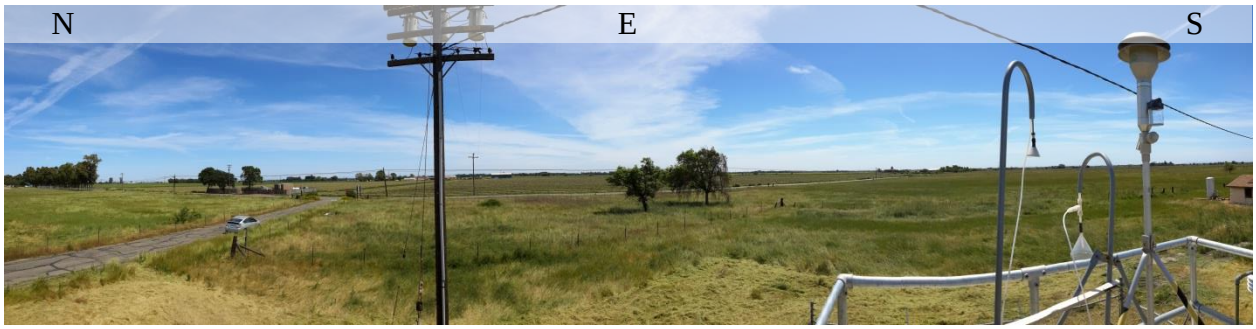
Bruceville air monitoring site is sited in a rural area 4 miles south of Elk Grove, CA, and 20 miles south of Downtown Sacramento. It was initiated in 1992 to replace the former Sacramento-Meadowview Road O_3 monitoring site.

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, UV radiation, precipitation, and atmospheric pressure

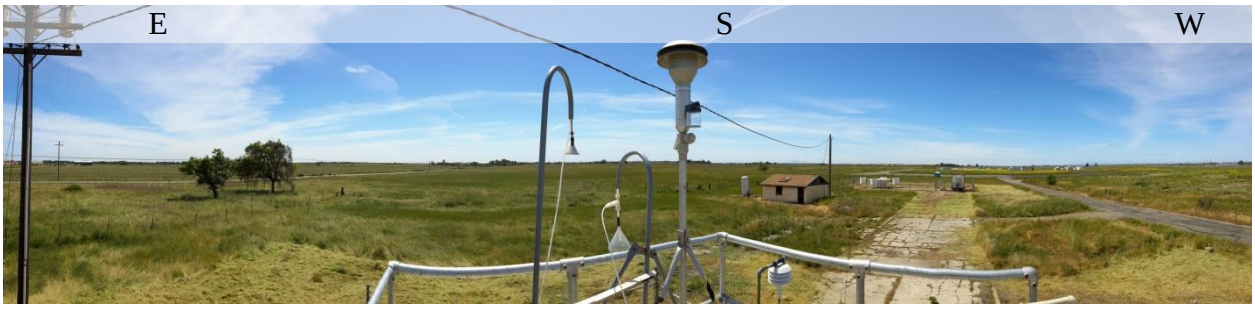
Adjacent to the air monitoring site is the Franklin Field Radar Wind Profiler (RWP) for measurement of upper level winds and temperature. This RWP is operated year-round. Collection of upper air meteorology data is a requirement for the PAMS program.

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

Panoramic view toward north from air monitoring station roof (April 2016)

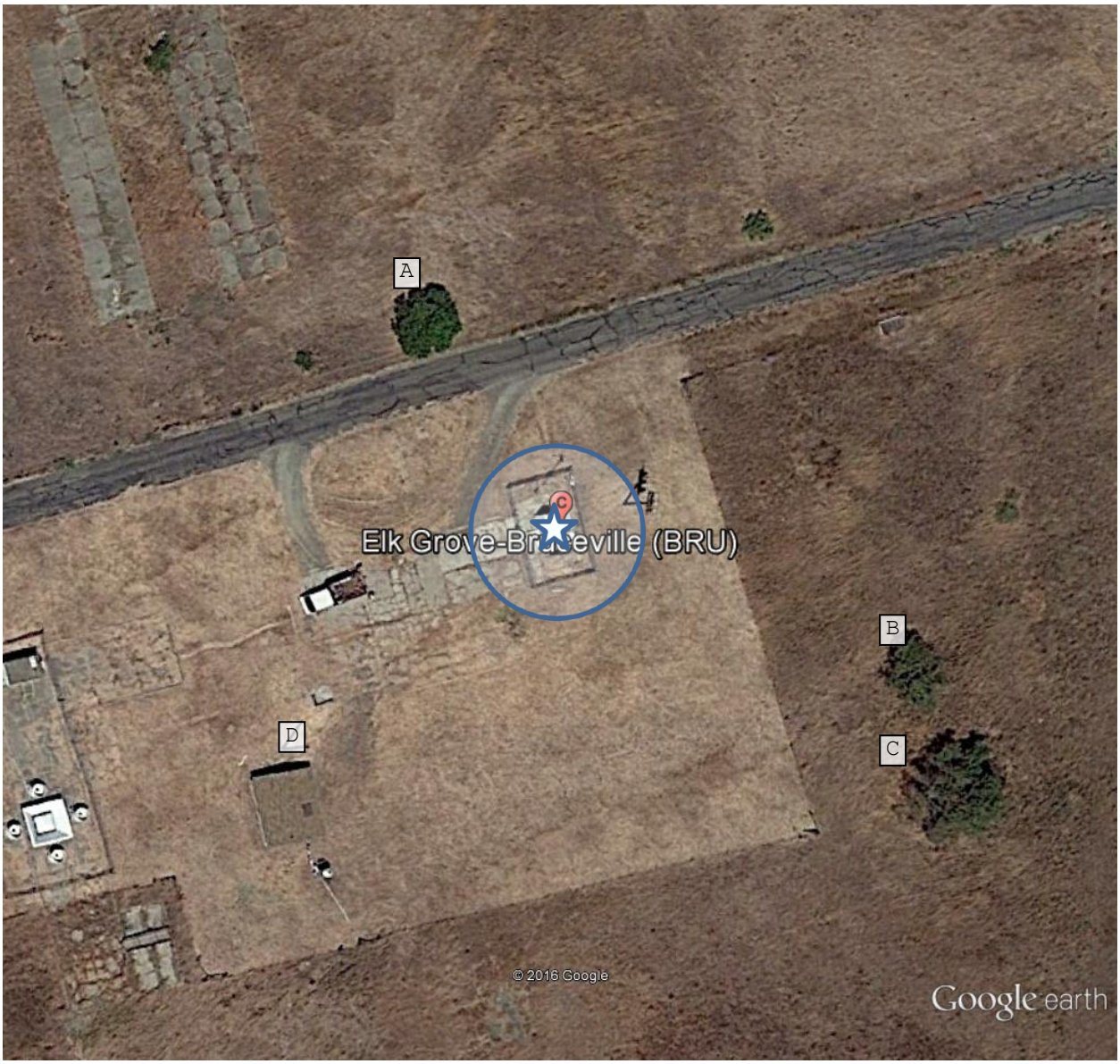


Panoramic view toward east from air monitoring station roof (April 2016)



Panoramic view toward south from air monitoring station roof (April 2016)

View toward west from air monitoring station roof (April 2016)



Google Earth image from 7/13/15 shows only a couple tree in the vicinity of the station. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, height of the trees were calculated on-site on 4/20/16. Analyses in the following pages shows the object identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	25.70	24.90
Object B (Tree)	38.50	39.70
Object C (Tree)	46.90	47.70
Object D (Building)	37.70	37.00

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	0.45	-0.04
Object B (Tree)	2.21	1.71
Object C (Tree)	3.64	3.14
Object D (Building)	-1.68	-2.18

Note: negative value indicates inlet or prober is taller than the object, thus airflow is not obstructed

Distance vs. Protrusion Ratio (must be ≥ 2)[22]

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	57.11	N/A
Object B (Tree)	17.42	23.22
Object C (Tree)	12.88	15.19
Object D (Building)	N/A	N/A

Note: N/A indicates inlet or prober is taller than the object, thus airflow is not obstructed

[22] 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	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	Ozone	Nitrogen Dioxide	Total NMHC	Speciated VOC
Parameter code	44201	42602	43102	43102
POC	1	1	1	2
Instrument manufacturer and model	TAPI 400E	TEI 42I	TEI 55C	Xontech 910A/912
Sampling Method	Instrumental	Instrumental	Instrumental	6L Pressurized Canister
Method Code	087	074	164	123
Analysis Method	Ultra Violet Absorption	Chemiluminescence	Flame ionization detector	Dual Fid - Pams
FRM/FEM/ARM/Other	FEM	FRM	Other	Other
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable	Not applicable	Not applicable
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info, research	Research
Statement of Purpose	Measures background O_3 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	Neighborhood	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	1.7 m from roof top	1.7 m from roof top	1.7 m from roof top	1.7 m from roof top
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	26 m	26 m	26 m	26 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)
Unrestricted airflow (deg)	360	360	360	360
Probe height (agl)	4.9 m	4.9 m	4.9 m	4.9 m
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	Stainless Steel
Residence time	18.0 s	17.8 s	16.9 s	2 s
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 Annual Performance Evaluation	4/14/15	4/14/15	2/17/16	N/A

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
Instrument 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
Comparable to annual PM2.5 NAAQS?	No
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	SLAMS
Affiliation	None
Site type	General/Background
Spatial scale	Neighborhood
Sampling Frequency	Continuous
Sampling season	Year Round
Distance from supporting structure/roof top	2.1 m from roof top
Distance from flow obstructions on roof	No obstructions
Distance from flow obstructions not on roof	No obstructions
Distance from nearest tree drip line	25 m
Distance to furnace or incinerator flue	No furnace/flue
Distance between collocated PM monitors	Not Collocated
Distance with nearest PM monitor and its type	Not applicable
Unrestricted airflow (deg)	360
Probe height (agl)	5.4 m
Probe material	Not applicable
Residence time	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Bi-monthly
Last Annual Performance Evaluation	4/14/15, 10/7/15

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	Outdoor Temperature	Relative Humidity	Barometric Pressure	Precipitation
Parameter code	62101	62201	64101	65102
POC	1	1	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable	Not applicable	Not applicable
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	SLAMS	SLAMS	SLAMS	SLAMS
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	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
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360
Probe height (agl)	10 m	10 m	4.5 m	1.6 m
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	Not applicable	Not applicable	Not applicable	Not applicable
Last Annual Performance Evaluation	4/14/15	Not audited	4/14/15	Not audited

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
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable	Not applicable	Not applicable
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	SLAMS	SLAMS	SLAMS	SLAMS
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	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
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360
Probe height (agl)	10 m	10 m	10 m	10 m
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	Not applicable	Not applicable	Not applicable	Not applicable
Last Annual Performance Evaluation	Not audited	Not audited	4/14/15	4/14/15

Site	Elk Grove-Bruceville
Start Date	6/1/1996
Collecting Agency	SMAQMD
Analytical Lab	N/A
Reporting Agency	N/A
Pollutant	Upper Level Wind Direction/Wind Speed and Virtual Temp
Parameter code	Not applicable
POC	Not applicable
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable
Monitoring objective	Public info, research
Statement of Purpose	Measures representative upper level meteorology
Monitor type	SLAMS
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	No supporting structure
Distance from flow obstructions on roof	No obstructions
Distance from flow obstructions not on roof	No obstructions
Distance from nearest tree drip line	> 20 m
Distance to furnace or incinerator flue	No furnace/flue
Distance between collocated PM monitors	Not applicable
Distance with nearest PM monitor and its type	Not applicable
Unrestricted airflow (deg)	360
Probe height (agl)	Not applicable
Probe material	Not applicable
Residence time	Not applicable
Changes in next 18 months?	No
Frequency of one-point QC check	N/A
Last Annual Performance Evaluation	6/22/15

A.4 Sacramento-Del Paso Manor

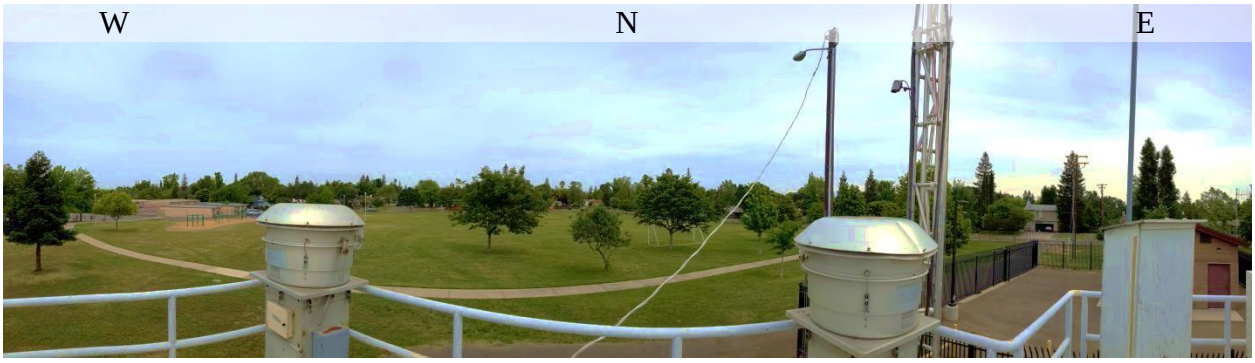
This air monitoring site was initiated in 1979 and eventually became the largest air monitoring site in the Sacramento Valley air basin. This site is also one of the largest in Northern California, in terms of number of parameters measured. In October 2009, EPA-Region IX approved this monitoring site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

It measures O_3, CO (trace level), NO_2, NOy, SO_2 (trace level), PM_{10} (SSI- main and collocated), PM_{10} TEOM, PM_{10} coarse, Pb-PM_{10}, $PM_{2.5}$ FRM (main and collocated), $PM_{2.5}$ BAM, Speciated $PM_{2.5}$ (SASS), Black Carbon (Aethalometer), Scattering Coefficient (Nephelometer), WD-resultant, WS-resultant, ambient temperature, relative humidity, and total solar radiation. This site is the current $PM_{2.5}$ design value site for this MSA.

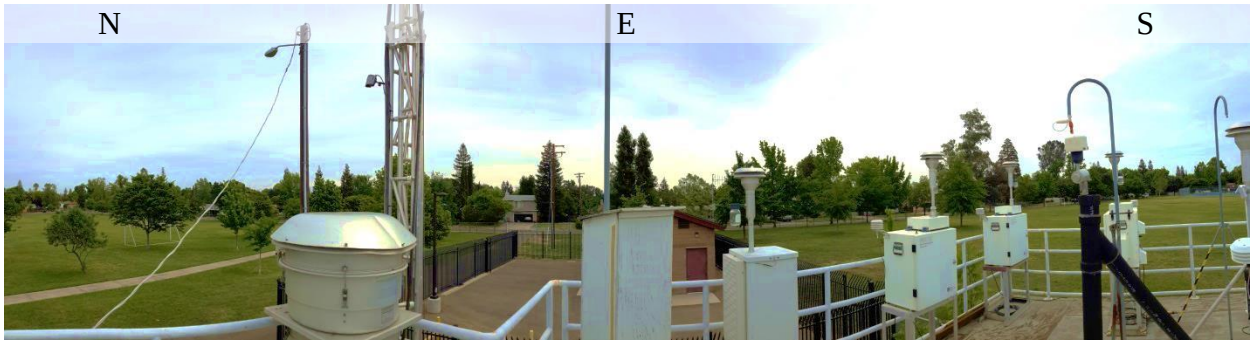
Located just downwind of Downtown Sacramento, Del Paso Manor has been selected as a PAMS Type II primary site. Besides the required meteorological parameters, this site also monitors for NMHC year-round and speciated VOC (C2-C12) and carbonyl during summertime.

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.

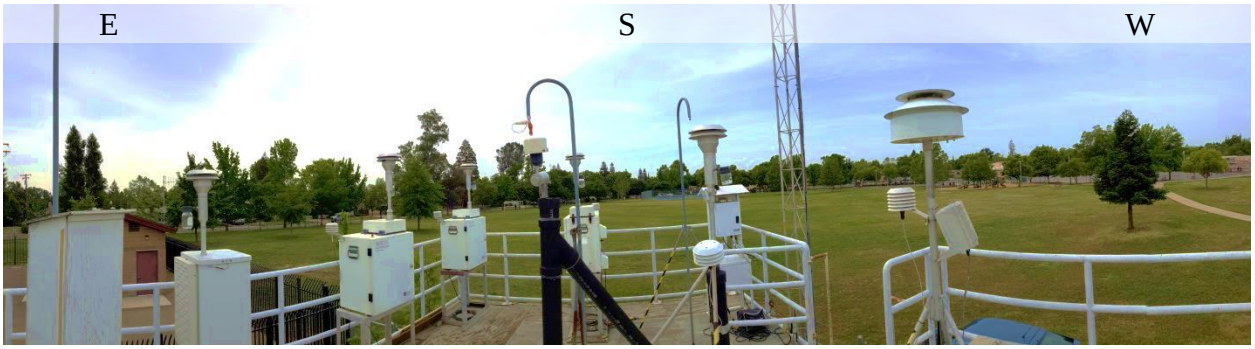
Site Name	Sacramento-Del Paso Manor
AQS Site No.	06-067-0006
Geographic Coordinates	38.613804°, -121.368007° (WGS84)
Location	Neighborhood park located 7 miles east-northeast of downtown Sacramento.
Address	2701 Avalon Drive, Sacramento, CA 95821
County	Sacramento
Distance from roadway	56 m
Annual Average 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



Panoramic view toward north from air monitoring station roof (May 2016)



Panoramic view toward east from air monitoring station roof (May 2016)



Panoramic view toward south from air monitoring station roof (May 2016)

Panoramic view toward west from air monitoring station roof (May 2016)

Google Earth image from 7/13/15 shows some trees around Sacramento-Del Paso Manor air monitoring station. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, heights of the trees and building were calculated on-site on 5/3/16. Analyses in the following pages shows the object identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe	NO_y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	22.86	22.86	21.94	22.86	23.77	21.03
Object B (Tree)	32.00	28.34	27.43	28.34	31.08	32.91
Object C (Tree)	26.51	22.86	22.86	22.86	23.77	26.51
Object D (Tree)	36.57	32.91	32.91	32.91	34.74	37.49
Object E (Tree)	53.94	48.46	49.37	48.46	50.29	54.86
Object F (Tree)	27.43	26.51	27.43	26.51	25.60	29.26
Object G (Tree)	45.72	41.14	42.97	41.14	42.06	46.63
Object H (Building)	17.37	16.45	19.20	16.45	16.45	17.37
Object I (Tree)	36.57	36.57	42.06	36.57	36.57	37.49
Object J (Tree)	45.72	43.89	45.72	43.89	41.14	42.97
Object K (Tree)	42.06	45.72	45.72	45.72	42.97	42.06

	$PM_{2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Collocated)	$PM_{10-2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Continuous)	$PM_{2.5}$ Inlet (Speciation)	Carbon Speciation Inlet
Object A (Tree)	22.86	23.77	22.86	21.03	21.94	21.94
Object B (Tree)	33.83	34.74	32.91	31.08	30.17	32.91
Object C (Tree)	27.43	27.43	25.60	25.60	24.68	28.34
Object D (Tree)	38.40	38.40	37.49	36.57	36.57	38.40
Object E (Tree)	54.86	54.86	53.94	54.86	54.86	54.86
Object F (Tree)	28.34	27.43	26.51	27.43	29.26	30.17
Object G (Tree)	46.63	46.63	45.72	46.63	49.37	49.37
Object H (Building)	16.45	15.54	15.54	17.37	20.11	18.28
Object I (Tree)	37.49	34.74	37.49	37.49	37.49	39.31
Object J (Tree)	41.14	40.23	40.23	42.97	44.80	40.23
Object K (Tree)	41.14	41.14	42.06	43.89	45.72	41.14

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe	NO_y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	3.07	-1.62	3.47	3.47	3.17	2.87
Object B (Tree)	3.69	-1.00	4.09	4.09	3.79	3.49
Object C (Tree)	0.26	-4.43	0.66	0.66	0.36	0.06
Object D (Tree)	2.91	-1.78	3.31	3.31	3.01	2.71
Object E (Tree)	5.03	0.33	5.43	5.43	5.13	4.83
Object F (Tree)	4.85	0.15	5.25	5.25	4.95	4.65
Object G (Tree)	3.76	-0.93	4.16	4.16	3.86	3.56
Object H (Building)	-0.78	-5.48	-0.38	-0.38	-0.68	-0.98
Object I (Tree)	5.98	1.28	6.38	6.38	6.08	5.78
Object J (Tree)	4.10	-0.59	4.50	4.50	4.20	3.90
Object K (Tree)	6.63	1.93	7.03	7.03	6.73	6.43

	$PM_{2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Collocated)	$PM_{10-2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Continuous)	$PM_{2.5}$ Inlet (Speciation)	Carbon Speciation Inlet
Object A (Tree)	2.97	2.97	2.97	3.07	3.07	2.97
Object B (Tree)	3.59	3.59	3.59	3.69	3.69	3.59
Object C (Tree)	0.16	0.16	0.16	0.26	0.26	0.16
Object D (Tree)	2.81	2.81	2.81	2.91	2.91	2.81
Object E (Tree)	4.93	4.93	4.93	5.03	5.03	4.93
Object F (Tree)	4.75	4.75	4.75	4.85	4.85	4.75
Object G (Tree)	3.66	3.66	3.66	3.76	3.76	3.66
Object H (Building)	-0.88	-0.88	-0.88	-0.78	-0.78	-0.88
Object I (Tree)	5.88	5.88	5.88	5.98	5.98	5.88
Object J (Tree)	4.00	4.00	4.00	4.10	4.10	4.00
Object K (Tree)	6.53	6.53	6.53	6.63	6.63	6.53

Note: negative value indicates inlet or prober is taller than the object, thus airflow is not obstructed

Distance vs. Protrusion Ratio (must be ≥ 2)[23]

	Gaseous Probe	NO_y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	7.45	N/A	6.32	6.59	7.50	7.33
Object B (Tree)	8.67	N/A	6.71	6.93	8.20	9.43
Object C (Tree)	101.96	N/A	34.64	34.64	66.03	441.83
Object D (Tree)	12.57	N/A	9.94	9.94	11.54	13.83
Object E (Tree)	10.72	146.85	9.09	8.92	9.80	11.36
Object F (Tree)	5.66	176.73	5.22	5.05	5.17	6.29
Object G (Tree)	12.16	N/A	10.33	9.89	10.90	13.10
Object H (Building)	N/A	N/A	N/A	N/A	N/A	N/A
Object I (Tree)	6.12	28.57	6.59	5.73	6.01	6.49
Object J (Tree)	11.15	N/A	10.16	9.75	9.80	11.02
Object K (Tree)	6.34	23.69	6.50	6.50	6.38	6.54

	Gaseous Probe	NO_y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	7.70	8.00	7.70	6.85	7.15	7.39
Object B (Tree)	9.42	9.68	9.17	8.42	8.18	9.17
Object C (Tree)	171.44	171.44	160.00	98.46	94.92	177.13
Object D (Tree)	13.67	13.67	13.34	12.57	12.57	13.67
Object E (Tree)	11.13	11.13	10.94	10.91	10.91	11.13
Object F (Tree)	5.97	5.77	5.58	5.66	6.03	6.35
Object G (Tree)	12.74	12.74	12.49	12.40	13.13	13.49
Object H (Building)	N/A	N/A	N/A	N/A	N/A	N/A
Object I (Tree)	6.38	5.91	6.38	6.27	6.27	6.69
Object J (Tree)	10.29	10.06	10.06	10.48	10.93	10.06
Object K (Tree)	6.30	6.30	6.44	6.62	6.90	6.30

Note: N/A indicates inlet or prober is taller than the object, thus airflow is not obstructed

[23] 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-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	Not applicable	Not applicable	Not applicable	Not applicable
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	Ozone	Carbon Monoxide (trace level)	Nitrogen Dioxide	Reactive Nitrogen Oxide
Parameter code	44201	42101	42602	42600
POC	1	1	1	1
Instrument manufacturer and model	TAPI 400E	TAPI 300EU	TAPI200UP	TEI 42I-Y
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	087	593	074	574
Analysis Method	Ultra Violet Absorption	Gas Filter Correlation	Photolytic-Chemiluminescence	Chemiluminescence
FRM/FEM/ARM/Other	FEM	FRM	FEM	Other
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A	N/A
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 dow nw ind edge of the central business district	Measures representative w intertime CO concentration in populated area	Measures O3 precursor emission near dow nw ind 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	2.0 m from roof top	2.0 m from roof top	2.0 m from roof top	No supporting structure
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	23 m	23 m	23 m	23 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance betw een collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable
Distance w ith nearest PM monitor and its type	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)	Not applicable
Unrestricted airflow (deg)	360	360	360	360
Probe height (agl)	5.3 m	5.3 m	5.3 m	10 m
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	FEP Teflon
Residence time	15 seconds	13 seconds	14 seconds	4 seconds
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 Annual Performance Evaluation	10/19/15	4/2/15	10/19/15	NA

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	Sulfur Dioxide (trace level)	Total NMHC	Speciated VOC	Carbonyl
Parameter code	42401	43102	43102	Multiple
POC	2	2	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A	N/A
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 dow nw ind edge of central business district	Measures O3 precursor emission near dow nw ind edge of central business district	Measures O3 precursor emission near dow nw ind 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	Neighborhood	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	2.0 m from roof top	2.0 m from roof top	2.2 m from roof top	2.2 m from roof top
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	23 m	23 m	21 m	21 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance betw een collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable
Distance w ith nearest PM monitor and its type	1.1 m (lo vol)	1.1 m (lo vol)	1.0 m (lo vol)	1.0 m (lo vol)
Unrestricted airflow (deg)	360	360	360	360
Probe height (agl)	5.3 m	5.3 m	5.5 m	5.5 m
Probe material	FEP Teflon	FEP Teflon	Stainless Steel	Stainless Steel
Residence time	14 seconds	17 seconds	3 seconds	3 seconds
Changes in next 18 months?	No	No	No	No
Frequency of one-point QC check	Every fourth day	Every fourth day	Not applicable	Not applicable
Last Annual Performance Evaluation	4/2/15	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	CARB	RTI
Reporting Agency	CARB	CARB	CARB
Pollutant	Black Carbon	PM10 (Primary Monitor)	PM10 (Audit Monitor)
Parameter code	84313	81102	81102
POC	1	1	2
Instrument manufacturer and model	Anderson RTAA 800	Sierra-Anderson 1200	Sierra-Anderson 1200
Sampling Method	Aethalometer	Hi Volume	Hi Volume
Method Code	862	063	063
Analysis Method	Optical Absorption	Gravimetric	Gravimetric
FRM/FEM/ARM/Other	Other	FRM	FRM
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A
Monitoring objective	Research	NAAQS comparison, public info	NAAQS comparison, public info
Statement of Purpose	Installed for CRPAQS study in 1999	Measures w intertime elevated PM level from motor vehicles and residential w ood 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	Neighborhood	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	2.0 m from roof top	2.0 m from roof top	2.0 m from roof top
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	24 m	22 m	23 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance betw een collocated PM monitors	Not applicable	2.2 m	2.2 m
Distance w ith nearest PM monitor and its type	1.8 m (lo vol)	2.1 m (lo vol)	2.2 m (hi vol)
Unrestricted airflow (deg)	360	360	360
Probe height (agl)	5.2 m	5.1 m	5.1 m
Probe material	Aluminum	Not applicable	Not applicable
Residence time	1 seconds	Not applicable	Not applicable
Changes in next 18 months?	No	No	No
Frequency of flow rate verification	Not applicable	Monthly	Monthly
Last Annual Performance Evaluation	Not applicable	5/7/15, 10/19/15	5/7/15, 10/19/15

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
Instrument 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
Comparable to annual PM2.5 NAAQS?	Yes	Yes	No	No
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	2.1 m from roof top	2.1 m from roof top	2.0 m from roof top	2.0 m from roof top
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	23 m	24 m	21 m	22 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	1.6 m	1.6 m	Not applicable	Not applicable
Distance with nearest PM monitor and its type	1.5 m (lo vol)	1.6 m (lo vol)	1.1 (lo vol)	2.2 m (hi vol)
Unrestricted airflow (deg)	360	360	360	360
Probe height (agl)	5.4 m	5.4 m	5.3 m	5.3 m
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of flow rate verification	Bi-Monthly	Bi-Monthly	Bi-monthly	Monthly
Last Annual Performance Evaluation	5/7/15, 10/19/15	5/7/15, 10/19/15	5/7/15, 10/19/15	5/28/15, 11/24/15

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	RTI
Reporting Agency	RTI	CARB	CARB
Pollutant	Organic and elemental carbon	PM10 ($PM_{10-2.5}$)	Lead
Parameter code	(multiple)	85101	85129
POC	5	7	4
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A
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 6 days	1 in 6 days
Sampling season	Year Round	Year Round	Year Round
Distance from supporting structure/roof top	2.1 m from roof top	2.1 m from roof top	2.1 m from roof top
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	22 m	23 m	23 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	1.5 m (lo vol)	1.8 m (lo vol)	1.8 m (lo vol)
Unrestricted airflow (deg)	360	360	360
Probe height (agl)	5.4 m	5.4 m	5.4 m
Probe material	Not applicable	Not applicable	Not applicable
Residence time	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	Yes
Frequency of flow rate verification	Monthly	Bi-monthly	Bi-monthly
Last Annual Performance Evaluation	5/28/15, 11/24/15	5/7/15, 10/19/15	5/7/15, 10/19/15

[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	Outdoor Temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter code	62101	62201	63301	61104	61103
POC	1	1	1	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A	N/A	N/A
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	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
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	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	No obstructions	No obstructions	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (agl)	10 m	10 m	10 m	10 m	10 m
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time	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 Annual Performance Evaluation	10/19/15	N/A	N/A	10/19/15	10/19/15

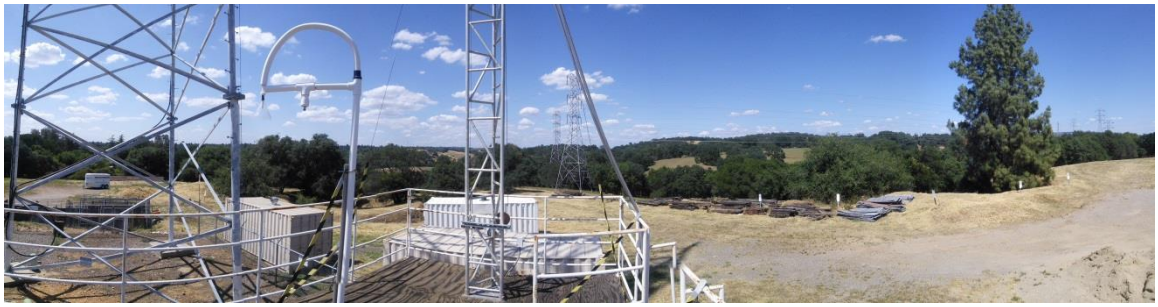
A.5 Folsom-Natoma St

This site is in operation since 1996. This site replaced the former Folsom-Liedesdoff 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 beta attenuation monitor (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.

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



Panoramic view toward north from air monitoring station roof (May 2014)

Panoramic view toward east from air monitoring station roof (May 2014)

Panoramic view toward south from air monitoring station roof (May 2014)

Panoramic view toward west from air monitoring station roof (May 2014)

A virtual 3-D Google Earth image is not available. However, this image from 4/18/14 shows limited obstruction in a 50 m radius, if any. Heights of the trees and buildings were calculated on-site on 5/12/15. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, analyses in the following pages shows the object identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe	NOy Probe	VOC	PM2.5 (Primary)	PM2.5 (Collocation)
Object A (TV Tower)	7.31	5.48	7.31	9.14	6.40
Object B (Building)	10.97	10.97	10.97	13.71	12.80
Object C (Building)	15.54	13.71	15.54	17.37	17.37
Object D (Building)	6.40	5.48	6.40	9.14	10.05
Object E (Building)	12.80	14.63	12.80	11.88	10.97
Object F (Building)	7.31	9.14	7.31	7.31	5.48
Object G (Tree)	16.45	18.28	16.45	15.54	14.63

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe	NOy Probe	VOC	PM2.5 (Primary)	PM2.5 (Collocation)
Object A (TV Tower)	19.70	15.20	19.70	19.50	19.50
Object B (Building)	-3.10	-7.60	-3.10	-3.30	-3.30
Object C (Building)	-3.10	-7.60	-3.10	-3.30	-3.30
Object D (Building)	-3.10	-7.60	-3.10	-3.30	-3.30
Object E (Building)	-3.00	-7.50	-3.00	-3.20	-3.20
Object F (Building)	-2.50	-7.00	-2.50	-2.70	-2.70
Object G (Tree)	0.44	-4.05	0.44	0.24	0.24

Note: negative value indicates inlet or prober is taller than the object, thus airflow is not obstructed

Distance vs. Protrusion Ratio (must be ≥ 2)[24]

	Gaseous Probe	NOy Probe	VOC	PM2.5 (Primary)	PM2.5 (Collocation)
Object A (TV Tower)	0.37[(A)]	0.36[(A)]	0.37[(A)]	0.47[(A)]	0.33[(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)	37.39	N/A	37.39	64.75	60.96

[(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 value indicates inlet or prober is taller than the object, thus airflow is not obstructed

[24] 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	Folsom-Natoma St.				
Start Date	7/1/1996	7/1/1996	7/1/2011	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	Ozone	Nitrogen Dioxide	NOY	Total NMHC	Speciated VOC
Parameter code	44201	42602	42600	43102	43102
POC	1	1	1	1	2
Instrument manufacturer and model	TAPI 400E	TEI 42C	TEI 42I-Y	TEI 55C	Xontech 910A/912
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental	6L Pressurized Canister
Method Code	087	074	574	164	123
Analysis Method	Ultra Violet Absorption	Chemiluminescence	Chemiluminescence	FID	Dual FID
FRM/FEM/ARM/Other	FEM	FRM	Other	Other	Other
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable	Not applicable	N/A	N/A
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info	Public info, research	Research
Statement of Purpose	Measure highest summer O3 level dow nw ind of urban area	Measures concentration dow nw ind of urban area	Measures representative concentration	Measures concentration dow nw ind of urban area	Measures concentration dow nw ind of urban area
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	PAMS (Type III)	PAMS (Type III)	PAMS (Type III)	PAMS (Type III)	PAMS (Type III)
Site type	Max O3 Concentration, Population Exposure	Highest concentration	Population Exposure	Highest concentration	Highest concentration
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Continuous	Continuous	Continuous	Continuous	1 in 3 days
Sampling season	Year Round	Year Round	Year Round	Year Round	July thru Sep
Distance from supporting structure/roof top	1.9 from roof top	1.9 from roof top	6.4 from roof top	1.9 from roof top	1.9 from roof top
Distance from flow obstructions on roof	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line	13 m	13 m	15 m	13 m	13 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance betw een collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance w ith nearest PM monitor and its type	2.3 m	2.3 m	Not applicable	2.3 m	2.3 m
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (agl)	5.5 m	5.5 m	10 m	5.5 m	5.5 m
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	FEP Teflon	Stainless Steel
Residence time	12.0 s	12.7 s	9 seconds	13.7 s	3 s
Changes in next 18 months?	No	No	No	No	No
Frequency of one-point QC check	Every other day	Every other day	Every other day	Every other day	Not applicable
Last Annual Performance Evaluation	4/23/15	4/23/15	Not available	2/12/15	Not available

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)	PM2.5 (Audit Monitor)
Parameter code	88101	88101
POC	3	4
Instrument 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
Comparable to annual PM2.5 NAAQS?	Yes	Yes
Monitoring objective	Public info	Public info
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	2.1. from roof top	2.1. from roof top
Distance from flow obstructions on roof	No obstruction	No obstruction
Distance from flow obstructions not on roof	No obstruction	No obstruction
Distance from nearest tree drip line	12 m	11 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	2.0 m	2.0 m
Distance with nearest PM monitor and its type	2.0 m (lo vol)	2.0 m (lo vol)
Unrestricted airflow (deg)	360	360
Probe height (agl)	5.7 m	5.7 m
Probe material	Aluminum	Aluminum
Residence time	Not applicable	Not applicable
Changes in next 18 months?	No	No
Frequency of flow rate verification	Bi-monthly	Bi-monthly
Last Annual Performance Evaluation	4/23/15, 10/7/15	10/7/15

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	Outdoor Temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter code	62101	62201	63301	61104	61103
POC	1	1	1	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A	N/A	N/A
Monitoring objective	Public info	Public info	Public info	Public info	Public info
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
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	No supporting structure	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (agl)	10 m	10 m	10 m	10 m	10 m
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time	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 Annual Performance Evaluation	4/23/15	Not available	Not available	4/23/15	4/23/15

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.

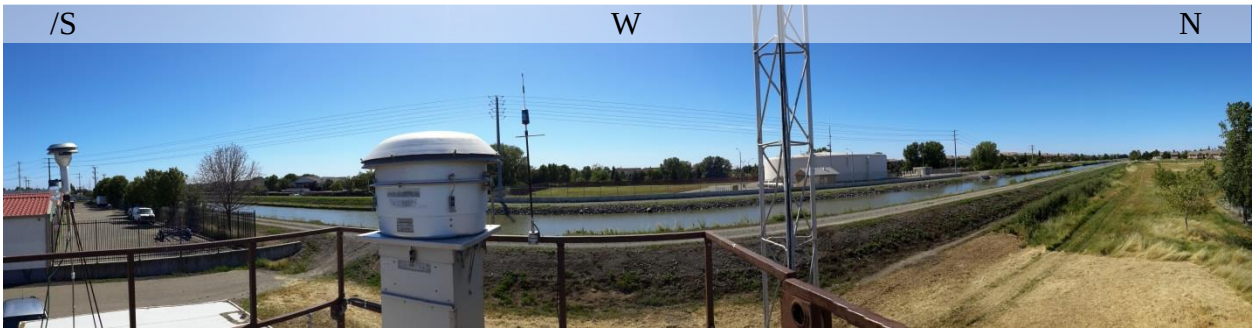
This site measures O_3, CO, NO_2, Total NMHC, PM_{10}, WD, WS, Temp, RH, and SRD.

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

Panoramic view toward north from air monitoring station roof (April 2016)

Panoramic view toward east from air monitoring station roof (April 2016)

Panoramic view toward south from air monitoring station roof (April 2016)



Panoramic view toward west from air monitoring station roof (April 2016)

Google Earth image from 7/13/15 shows limited obstruction in a 50 m radius, if any. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, height of the tree and building were calculated on-site on 4/28/16. Analyses in the following pages shows the object identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Continuous)
Object A (Tree)	35.66	37.49	39.31
Object B (Building)	21.03	21.03	19.20
Object C (Tree)	24.68	24.68	23.77

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Continuous)
Object A (Tree)	6.42	6.42	6.22
Object B (Building)	-0.28	-0.28	-0.48
Object C (Tree)	4.40	4.40	4.20

Note: negative value indicates inlet or prober is taller than the object, thus airflow is not obstructed

Distance vs. Protrusion Ratio (must be ≥ 2)[25]

	Gaseous Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Continuous)
Object A (Tree)	5.55	5.84	6.32
Object B (Building)	N/A	N/A	N/A
Object C (Tree)	5.61	5.61	5.66

Note: N/A value indicates inlet or prober is taller than the object, thus airflow is not obstructed

[25] 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-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	Ozone	Carbon Monoxide	Nitrogen Dioxide	Total NMHC
Parameter code	44201	42101	42602	43102
POC	1	1	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable	Not applicable	Not applicable
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	NAAQS comparison, public info	Public info, research
Statement of Purpose	Measures O3 concentration near dow nw ind edge of Central Business District	Measures representation concentrations	Measures precursor concentration near dow nw ind edge of Central Business District	Measures precursor concentration near dow nw ind 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	Neighborhood
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top	1.6 m from rooftop	1.6 m from rooftop	1.6 m from rooftop	1.6 m from rooftop
Distance from flow obstructions on roof	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line	25 m	25 m	25 m	25 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance betw een collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable
Distance w ith nearest PM monitor and its type	2.0 m (hi vol)	2.0 m (hi vol)	2.0 m (hi vol)	2.0 m (hi vol)
Unrestricted airflow (deg)	360	360	360	360
Probe height (agl)	5.1 m	5.1 m	5.1 m	5.1 m
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	FEP Teflon
Residence time	7.5 seconds	7.7 seconds	7.9 seconds	9 seconds
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 Annual Performance Evaluation	5/27/15	5/27/15	5/27/15	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)	PM10
Parameter code	81102	81102
POC	1	3
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable
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	2.0 m from rooftop	2.0 m from rooftop
Distance from flow obstructions on roof	No obstruction	No obstruction
Distance from flow obstructions not on roof	No obstruction	No obstruction
Distance from nearest tree drip line	25 m	24 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	2.0 m	2.0 m
Distance with nearest PM monitor and its type	2.0 m	2.0 m
Unrestricted airflow (deg)	360	360
Probe height (agl)	5.1 m	5.3 m
Probe material	Not applicable	Not applicable
Residence time	Not applicable	Not applicable
Changes in next 18 months?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Last Annual Performance Evaluation	5/1/15, 10/5/15	5/1/15, 10/5/15

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	Outdoor Temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter code	62101	62201	63301	61104	61103
POC	1	1	1	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Monitoring objective	Public info	Public info	Public info	Public info	Public info
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
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	No supporting structure	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line	24 m	24 m	24 m	24 m	24 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (agl)	10 m	10 m	10 m	10 m	10 m
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time	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	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Last Annual Performance Evaluation	5/27/15	Not available	Not available	5/27/15	5/27/15

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, the District 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.

In its comments on the District's 2013 Annual Network Plan, U.S. EPA "recommend for the District to evaluate in particular the purpose of continuing to operate SPM parameters for extended periods of time." The District does not have any plan to terminate this site. It will re-classify all monitors currently operating as SPM, O_3, CO, and NO_2, as SLAMS.

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

Panoramic view toward north from air monitoring station roof (May 2014)

Panoramic view toward east from air monitoring station roof (May 2014)

Panoramic view toward south from air monitoring station roof (May 2014)

Panoramic view toward west from air monitoring station roof (May 2014)

Google Earth image from 7/13/15 shows limited obstruction in a 50 m radius, if any. Each of the markers identifies the tallest tree in its local cluster of vegetation. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, height of the tree was calculated on-site with trigonometry on 5/4/16. Analyses in the following pages shows most objects identified above do not restrict air flow to the roof top inlets and samplers. Tree D has grown enough to be a flow obstacle. The District will resolve this during 2016.

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	49.37	48.46
Object B (Tree)	34.74	33.83
Object C (Tree)	22.86	22.86
Object D (Tree)	13.71	14.63
Object E (Tree)	39.31	40.23

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	8.26	8.26
Object B (Tree)	5.01	5.01
Object C (Tree)	2.11	2.11
Object D (Tree)	7.20	7.20
Object E (Tree)	9.38	9.38

Distance vs. Protrusion Ratio (must be ≥ 2)[27]

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	5.98	5.87
Object B (Tree)	6.93	6.75
Object C (Tree)	10.83	10.83
Object D (Tree)	1.90[(A)]	2.03
Object E (Tree)	4.19	4.29

[(A)] The District noted this tree has become a flow obstacle and will take necessary action to meet siting criteria

Legend: Yellow shade denotes criteria not met

[27] 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	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	Ozone	Carbon Monoxide	Nitrogen Dioxide
Parameter code	44201	42101	42602
POC	1	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A
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	SLAMS	SLAMS	SLAMS
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	2.0 m from roof top	2.0 m from roof top	2.0 m from roof top
Distance from flow obstructions on roof	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line	14 m	14 m	14 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	1.1 (hi vol)	1.1 (hi vol)	1.1 (hi vol)
Unrestricted airflow (deg)	360	360	360
Probe height (agl)	5.2 m	5.2 m	5.2 m
Probe material	FEP Teflon	FEP Teflon	FEP Teflon
Residence time	16.4 seconds	15.8 seconds	16.3 seconds
Changes in next 18 months?	No	No	No
Frequency of one-point QC check	Every Other Day	Every Other Day	Every Other Day
Last Annual Performance Evaluation	4/16/15	4/16/15	4/16/15

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
Instrument manufacturer and model	Sierra Anderson 1200
Sampling Method	Hi Volume
Method Code	063
Analysis Method	Gravimetric
FRM/FEM/ARM/Other	FRM
Comparable to annual PM2.5 NAAQS?	N/A
Monitoring objective	NAAQS comparison, public info
Statement of Purpose	Measures representative concentrations
Monitor type	SLAMS
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	2.0 m from roof top
Distance from flow obstructions on roof	No obstruction
Distance from flow obstructions not on roof	No obstruction
Distance from nearest tree drip line	15 m
Distance to furnace or incinerator flue	No furnace/flue
Distance between collocated PM monitors	Not Collocated
Distance with nearest PM monitor and its type	Not applicable
Unrestricted airflow (deg)	360
Probe height (agl)	5.2 m
Probe material	Not applicable
Residence time	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Monthly
Last Annual Performance Evaluation	4/16/15, 10/7/15

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.

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. The District is not submitting data collected with the e-BAM because it is not an FEM, FRM or ARM monitor, and 40 CFR §58.20(b) only require data submittal of FEM, FRM or ARM monitor.

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
Instrument 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
Comparable to annual PM2.5 NAAQS?	No
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	Not applicable
Distance from flow obstructions on roof	No obstruction
Distance from flow obstructions not on roof	No obstruction
Distance from nearest tree drip line	15.0 m
Distance to furnace or incinerator flue	No furnace/flue
Distance between collocated PM monitors	Not Collocated
Distance with nearest PM monitor and its type	Not applicable
Unrestricted airflow (deg)	360
Probe height (agl)	2 m
Probe material	Not applicable
Residence time	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Monthly
Last Annual Performance Evaluation	Not available

[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 District'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 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. The District is voluntarily submitting data collected with the non-FEM SPM BAM sampler.

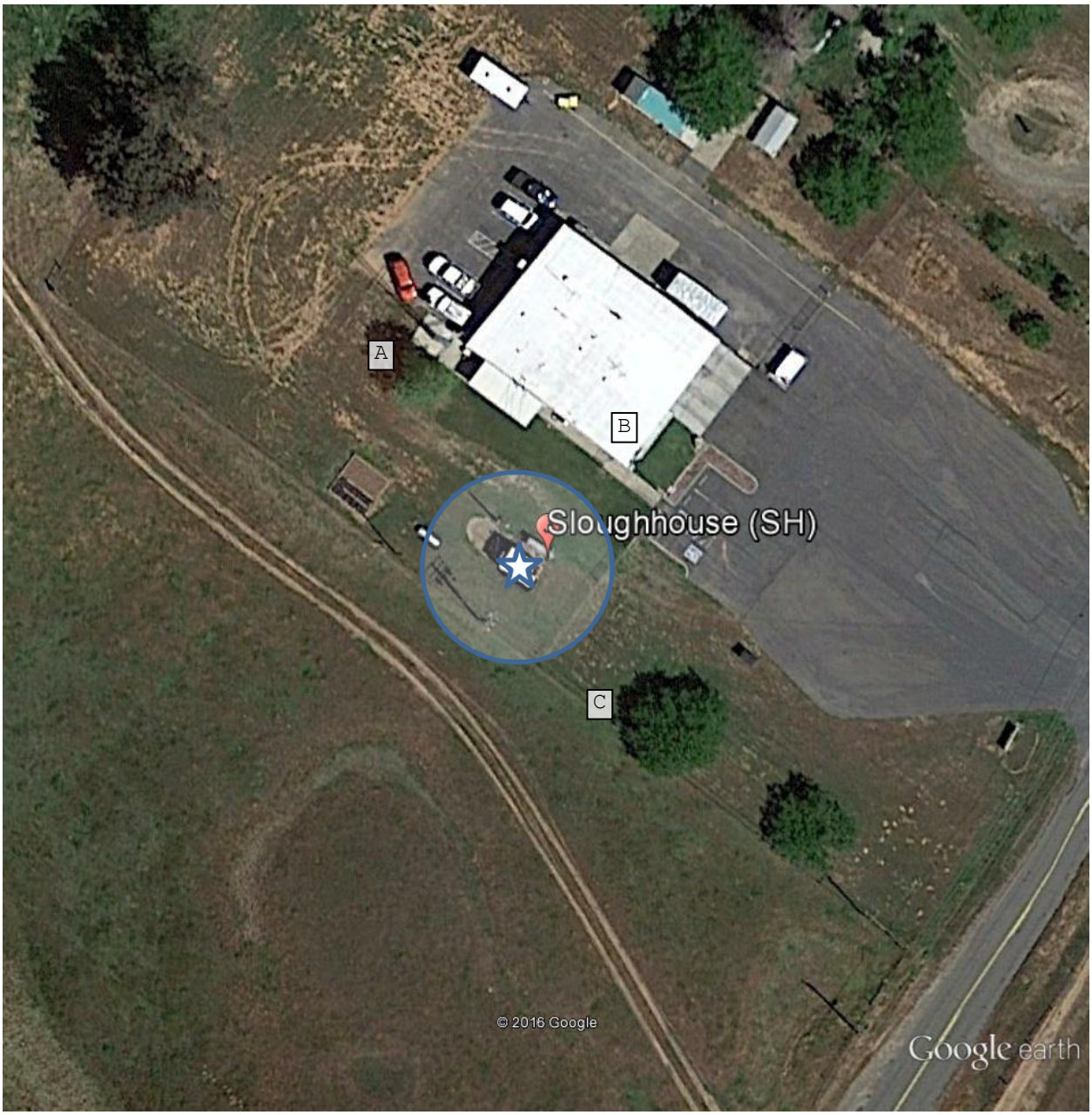
Site Name	Sloughhouse
AQS Site No.	06-067-5003
Geographic Coordinates	38.494475°, -121.211131° (WGS84)
Location	Fire Station in rural area located 16.5 miles east-southeast of downtown Sacramento.
Address	7520 Sloughhouse Road, Sloughhouse, CA 95683
County	Sacramento
Distance from roadway	27 m
Annual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

Panoramic view toward north from air monitoring station roof (April 2015)

Panoramic view toward east from air monitoring station roof (April 2015)

Panoramic view toward south from air monitoring station roof (April 2015)

Panoramic view toward west from air monitoring station roof (April 2015)



Google Earth image from 4/16/15 shows limited obstruction in a 50 m radius, if any. The circle above indicates no tree exist within a 10 m radius, which satisfy a siting criteria (Appendix E to 40 CFR Part 58) that requires drip lines of tree to be at least 10 m away from probes and inlets. Also, height of the tree and building was calculated on-site on 4/19/16. Analyses in the following pages shows the object identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler has 360° of unrestricted airflow.

Distance between Object and Inlet or Probe (in meters)

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	22.00	23.00
Object B (Building)	17.00	17.00
Object C (Tree)	20.00	19.00

Object Protrusion above Inlet or Probe (in meters)

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	7.17	6.57
Object B (Building)	-1.20	-1.80
Object C (Tree)	1.95	1.35

Note: negative value indicates inlet or prober is taller than the object, thus cannot be obstructed by the object

Distance vs. Protrusion Ratio (must be ≥ 2)[29]

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	3.07	3.50
Object B (Building)	N/A	N/A
Object C (Tree)	10.26	14.07

Note: N/A indicates inlet or prober is taller than the object, thus cannot be obstructed by the object

[29] 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	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	Ozone	Wind Direction	Wind Speed
Parameter code	44201	61104	61103
POC	1	1	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A	N/A
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	SLAMS	SLAMS
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	1.7 m from roof top	2.8 m	2.8 m
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	18 m	18 m	18 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor and its type	1.2 m (lo vol)	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360
Probe height (agl)	4.6 m	5.8 m	5.8 m
Probe material	FEP Teflon	Not applicable	Not applicable
Residence time	6 seconds	Not applicable	Not applicable
Changes in next 18 months?	No	No	No
Frequency of one-point QC check	Daily	N/A	N/A
Last Annual Performance Evaluation	4/13/15	4/13/15	4/13/15

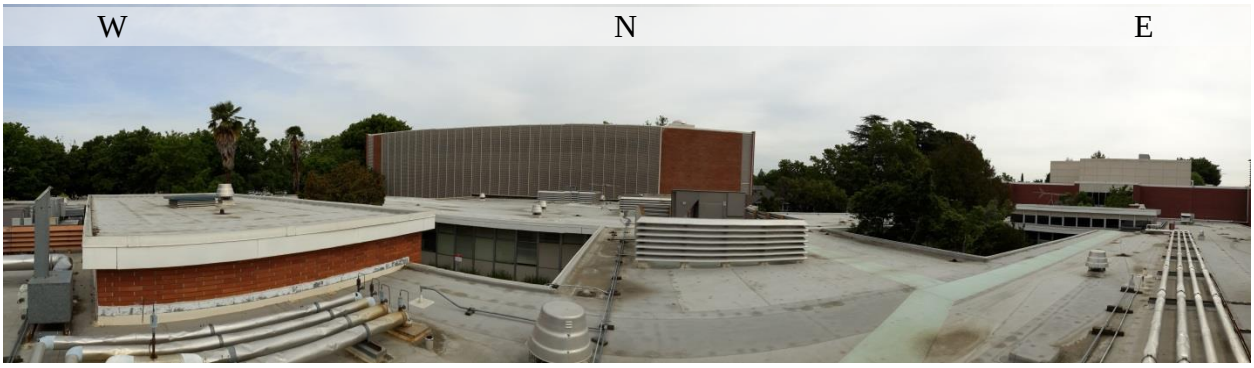
Site	Sloughhouse-Sloughhouse Rd.
Start Date	11/5/2013
Collecting Agency	SMAQMD
Analytical Lab	N/A
Reporting Agency	N/A
Pollutant	PM2.5
Parameter code	88501
POC	3
Instrument manufacturer and model	Met One 1020 BAM
Sampling Method	Very sharp cut cyclone
Method Code	731
Analysis Method	Beta Attenuation
FRM/FEM/ARM/Other	Other
Comparable to annual PM2.5 NAAQS?	No
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	2.3 m from roof top
Distance from flow obstructions on roof	No obstructions
Distance from flow obstructions not on roof	No obstructions
Distance from nearest tree drip line	18 m
Distance to furnace or incinerator flue	No furnace/flue
Distance between collocated PM monitors	Not Collocated
Distance with nearest PM monitor and its type	Not applicable
Unrestricted airflow (deg)	360
Probe height (agl)	5.0 m
Probe material	Not applicable
Residence time	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Bi-monthly
Last Annual Performance Evaluation	4/13/15

A.10 Sacramento Health Dept.-Stockton Blvd

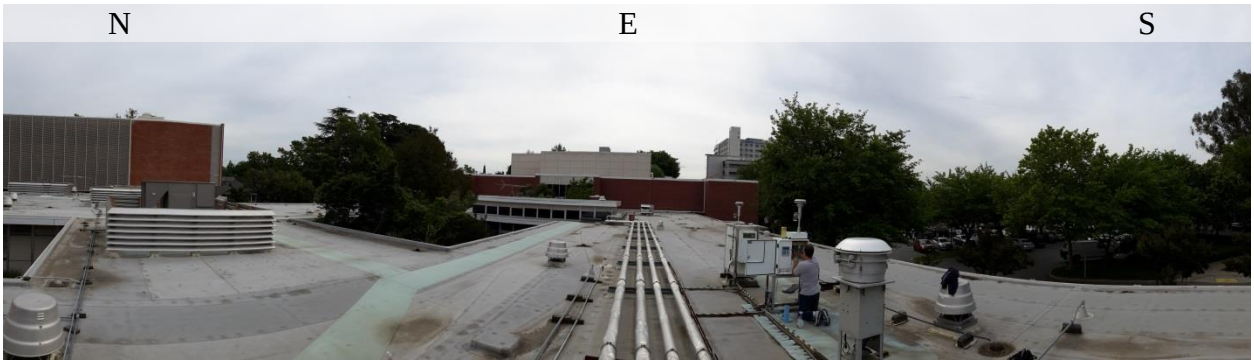
According to old documentation, this PM monitoring site has been in existence since the late 1950s. This site measures PM_{10} SSI, PM_{10} TEOM, and $PM_{2.5}$ FRM.

Since the District will submit a request to terminate this site (see Section 4, Recent and Proposed Modification to the Network), it will postpone trimming a vigorous, old-growth tree that protrudes higher than allowed by siting criteria in Appendix E to 40 CFR Part 58 to prevent unnecessary trimming of the tree if the termination request is approved..

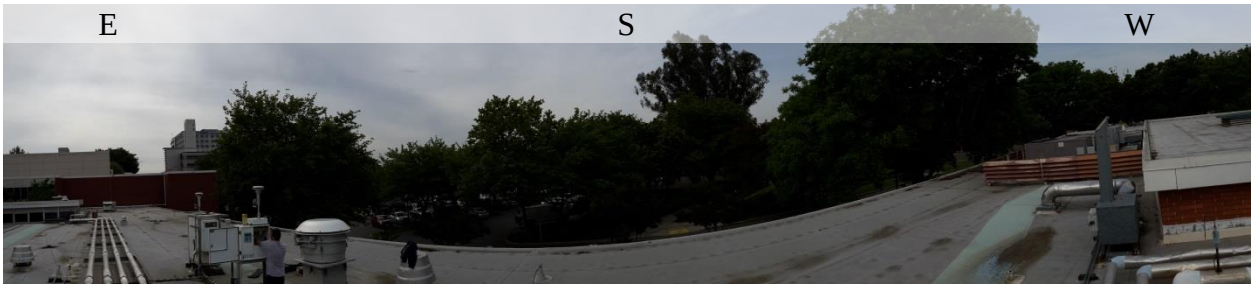
Site Name	Sacramento Health Department-Stockton Blvd.
AQS Site No.	06-067-4001
Geographic Coordinates	38.556326°, -121.458499° (WGS84)
Location	Rooftop in urban area located 2 miles east-southeast of downtown Sacramento.
Address	2221 Stockton Blvd, Sacramento, CA 95817
County	Sacramento
Distance from 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



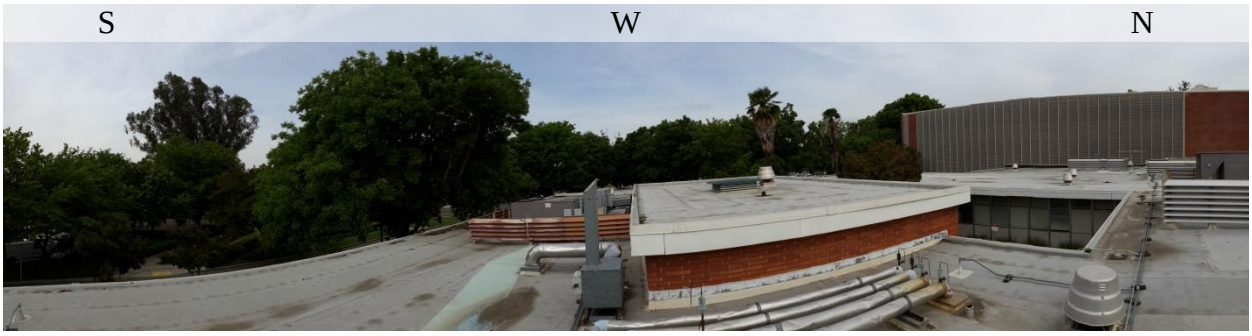
Panoramic view toward north from air monitoring station roof (May 2016)



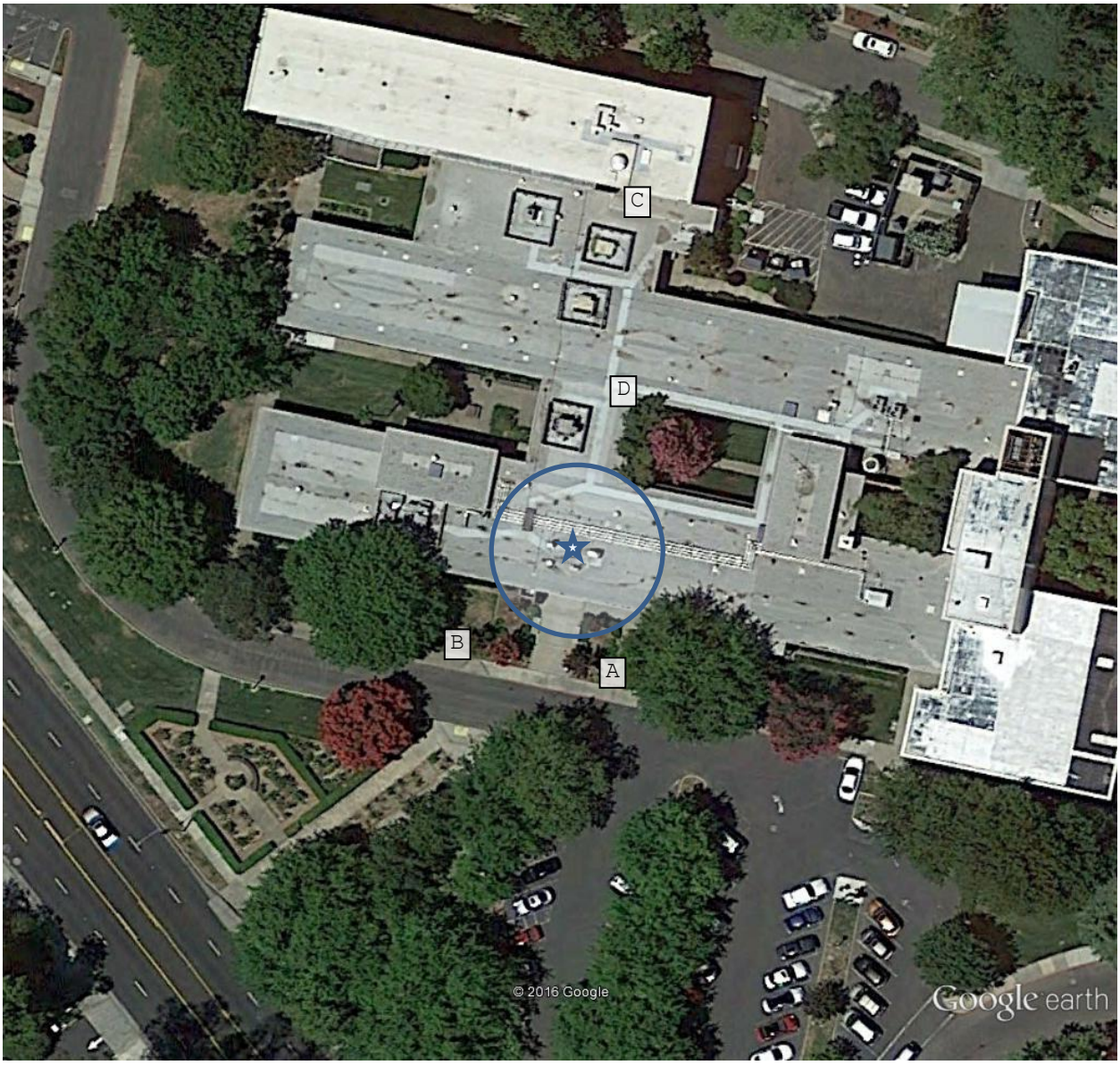
Panoramic view toward north from air monitoring station roof (May 2016)



Panoramic view toward north from air monitoring station roof (May 2016)



Panoramic view toward north from air monitoring station roof (May 2016)



Google Earth from 7/13/15 image shows a number of potential flow obstacles around Sacramento-Health Dept. air monitoring station. The circle above indicates a 10 m radius. Heights of the trees and building were calculated on-site on 5/4/16. Analyses on page 83 shows two trees (Object A & B) causing siting criteria to not be met per 40CFR Part 58 Appendix E. As noted in Section 4, Recent and Proposed Modification to the Network, the District will submit a termination request for this monitoring site. If the termination request is not approved, the District will work to resolve the obstructions.

Distance between Object and Inlet or Probe (in meters)

	PM10 Inlet (Primary)	PM10 Inlet (Continuous)	PM2.5 Inlet
Object A (Tree)	15.54	10.05	12.80
Object B (Tree)	12.80	19.20	16.45
Object C (Building)	40.23	40.23	40.23
Object D (Tree)	11.88	10.05	11.88

Object Protrusion above Inlet or Probe (in meters)

	PM10 Inlet (Primary)	PM10 Inlet (Continuous)	PM2.5 Inlet
Object A (Tree)	8.15	8.15	8.05
Object B (Tree)	7.55	7.55	7.45
Object C (Building)	6.48	6.48	6.38
Object D (Tree)	1.35	1.35	1.25

Note: negative value indicates inlet or prober is taller than the object, thus airflow is not obstructed

Distance vs. Protrusion Ratio (must be ≥ 2)[31]

	PM10 Inlet (Primary)	PM10 Inlet (Continuous)	PM2.5 Inlet
Object A (Tree)	1.91	1.23	1.59
Object B (Tree)	1.70	2.54	2.21
Object C (Building)	6.21	6.21	6.31
Object D (Tree)	8.80	7.44	9.50

Note: N/A indicates inlet or prober is taller than the object, thus airflow is not obstructed

Legend: Yellow shade denotes criteria not met

[31] 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-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)	PM10	PM2.5
Parameter code	81102	85101	88101
POC	2	3	1
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A	Yes
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	2.0 m from rooftop	2.0 m from rooftop	2.0 m from rooftop
Distance from flow obstructions on roof	No obstructions	No obstructions	No obstructions
Distance from flow obstructions not on roof	No obstructions	No obstructions	No obstructions
Distance from nearest tree drip line	12.8 m	10.1 m	12.8 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	5.1 m	5.1 m	Not applicable
Distance with nearest PM monitor and its type	2.0 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol) 2.0 m (hi vol)
Unrestricted airflow (deg)	360	300 [B]	360
Probe height (agl)	5.5 m	5.5 m	5.6 m
Probe material	Not applicable	Not applicable	Not applicable
Residence time	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	Yes	Yes	Yes
Frequency of flow rate verification	Monthly	Bi-Monthly	Monthly
Last Annual Performance Evaluation	5/6/14, 10/3/14	3/8/11, 10/6/11 [A]	5/6/14, 10/3/14

[A] Malfunctioning since 2012 [B] Estimated with Google satellite imagery (4/16/2015) and protractor

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.

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} SSI, WD, WS, TMP, RH, and Atmospheric Pressure.

T Street is part of the CSN and STN. Met One SASS has been in service since January 2002, and the URG3000N sampler has been in operation since April 2009.

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	4/1/1989	5/15/2013
Collecting Agency	CARB	CARB
Analytical Lab	N/A	N/A
Reporting Agency	CARB	CARB
Pollutant	Ozone	Nitrogen Dioxide
Parameter code	44201	42602
POC	1	3
Instrument 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
Comparable to annual PM2.5 NAAQS?	N/A	N/A
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	3.0 m	3.0 m
Distance from flow obstructions on roof	N/A	N/A
Distance from flow obstructions not on roof	N/A	N/A
Distance from nearest tree drip line	50 m	50 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not applicable	Not applicable
Distance with nearest PM monitor and its type	Not available	Not available
Unrestricted airflow (deg)	360	360
Probe height (agl)	11.7	11.7
Probe material	FEP Teflon	FEP Teflon
Residence time	5.4 seconds	6 seconds
Changes in next 18 months?	No	No
Frequency of one-point QC check	Daily	Daily
Last Annual Performance Evaluation	11/9/15	11/9/15

Site	Sacramento-1309 T St.				
Start Date	5/1/2013	12/13/1998	5/1/2004	5/20/2014[A]	4/1/2007
Collecting Agency	CARB	CARB	CARB	CARB	CARB
Analytical Lab	CARB	CARB	N/A	N/A	CARB
Reporting Agency	CARB	CARB	CARB	CARB	CARB
Pollutant	PM10	PM2.5 (Primary)	PM2.5	PM2.5	PM2.5 Mass Speciated
Parameter code	81102	88101	88502	88101	88502
POC	4	1	3	3	5
Instrument manufacturer and model	Met One 4 Models	RP2025	Met One 1020 BAM	Met One 1020 BAM	Met One SASS
Sampling Method	Instrumental	Low volume with VSCC	Sharp cut cyclone	Very sharp cut cyclone	Sharp cut cyclone
Method Code	122	145	731	170	810
Analysis Method	Beta Attenuation	Gravimetric	Beta Attenuation	Beta Attenuation	Gravimetric
FRM/FEM/ARM/Other	FEM	FRM	SLAMS	FEM	Other
Comparable to annual PM2.5 NAAQS?	N/A	Yes	No	No	No
Monitoring objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info	Public info, NAAQS comparison	Research
Statement of Purpose	Measures representative concentration in urban area	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	SPM	SLAMS
Affiliation	None	None	None	None	CSN Supplemental
Site type	Population Exposure	Highest concentration, population exposure	Highest concentration, population exposure	Population Exposure	Highest concentration, population exposure
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Continuous	1 in 3 days	Continuous	Continuous	1 in 3 days
Sampling season	Year Round	Year Round	Year Round	Year Round	Year Round
Distance from supporting structure/roof top	2.0m	2.0m	2.0 m	2.0 m	2.0m
Distance from flow obstructions on roof	N/A	N/A	N/A	N/A	N/A
Distance from flow obstructions not on roof	N/A	N/A	N/A	N/A	N/A
Distance from nearest tree drip line	50 m	50 m	50 m	50 m	50 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors	Not available	Not available	Not available	Not available	Not available
Distance with nearest PM monitor and its type	Not available	Not available	Not available	Not available	Not available
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (agl)	10 m	10 m	10 m	10 m	10 m
Probe material	N/A	N/A	N/A	N/A	N/A
Residence time	N/A	N/A	N/A	N/A	N/A
Changes in next 18 months?	No	Yes	Yes	Yes	No
Frequency of flow rate verification	Bi-Monthly	Monthly	Bi-monthly	Bi-monthly	Monthly
Last Annual Performance Evaluation	5/11/15, 11/9/15	5/11/15, 11/16/15	11/6/15	5/11/15	N/A

[A] This monitor was removed on 6/1/2015

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	61102	61101
POC	1	1
Instrument manufacturer and model	Rm Young 3D Sonic	Rm Young 3D Sonic
Sampling Method	Instrumental	Instrumental
Method Code	066	066
Analysis Method	Ultrasonic Anemometer	Ultrasonic Anemometer
FRM/FEM/ARM/Other	Other	Other
Comparable to annual PM2.5 NAAQS?	N/A	N/A
Monitoring objective	Public info	Public info
Statement of Purpose	Measures representative meteorology	Measures representative meteorology
Monitor type	SLAMS	SLAMS
Affiliation	None	None
Site type	N/A	N/A
Spatial scale	N/A	N/A
Sampling Frequency	Continuous	Continuous
Sampling season	Year Round	Year Round
Distance from supporting structure/roof top	9.0 m	9.0 m
Distance from flow obstructions on roof	N/A	N/A
Distance from flow obstructions not on roof	N/A	N/A
Distance from nearest tree drip line	50 m	50 m
Distance to furnace or incinerator flue	No furnace/flue	No furnace/flue
Distance betw een collocated PM monitors	Not applicable	Not applicable
Distance w ith nearest PM monitor and its type	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360
Probe height (agl)	15 m	15 m
Probe material	N/A	N/A
Residence time	N/A	N/A
Changes in next 18 months?	No	No
Frequency of one-point QC check	N/A	N/A
Last Annual Performance Evaluation	N/A	N/A

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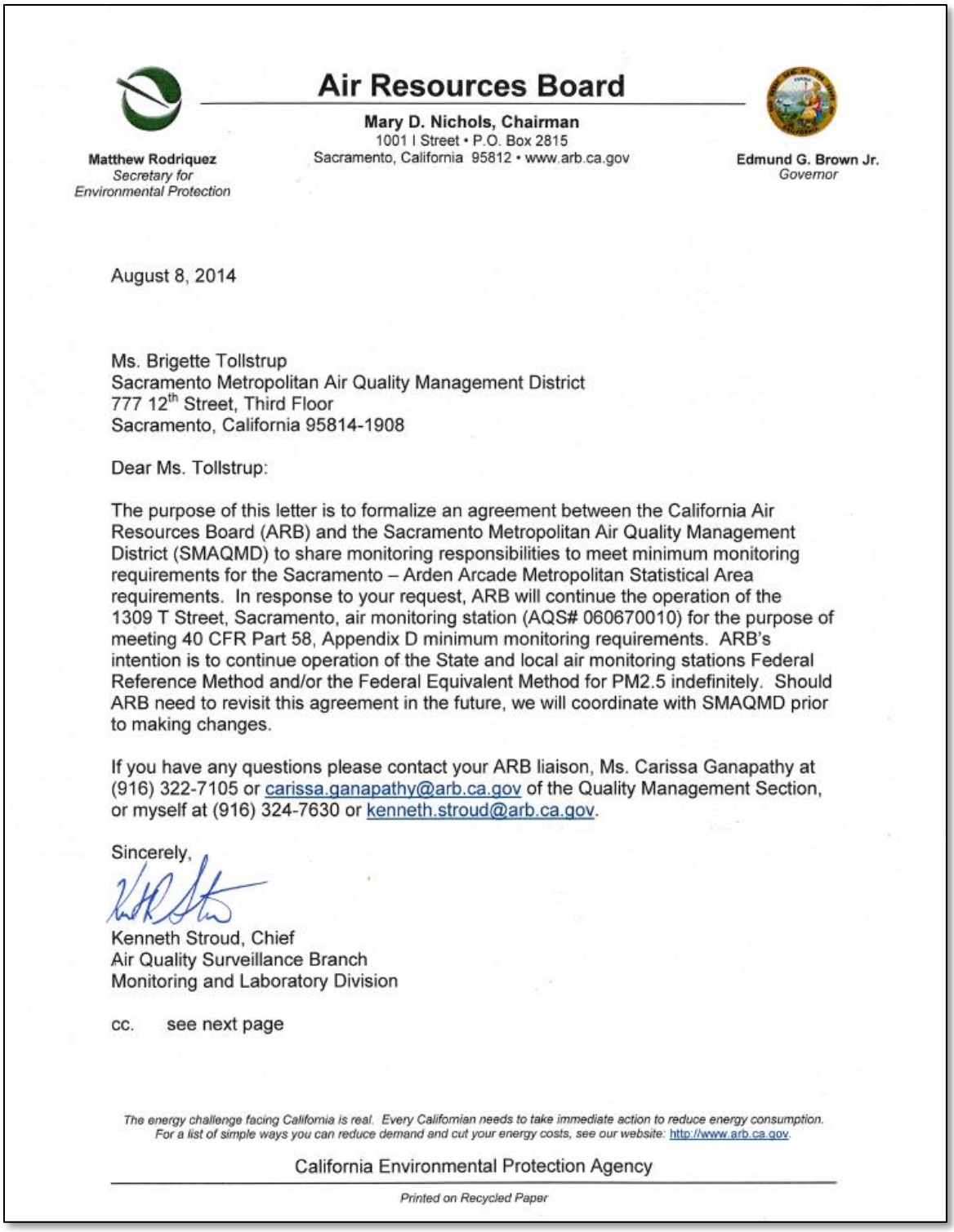
Appendix B Minimum Monitoring Requirement Assessment

Table B-1
Number of SLAMS Monitoring Site within Sacramento MSA[32]

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	2	0	0	0	1	0	1
SO_2		1	0	0	0	1	0	1
Pb	NCore	1	0	0	0	1	0	1
	Non-Source Oriented	0	0	0	0	0	0	0
	Source Oriented	0	0	0	0	0	0	0
PM_{10}		2-4	3	0	2	5	2	12
$PM_{2.5}$	FEM/FRM	3	2	0	1	3	1	7
	Continuous	2	2	0	4	5	0	11[(A)]
$PM_{10-2.5}$		1	0	0	0	1	0	1

[32] U.S. EPA Air Quality System Monitor Description Report (AMP 390), accessed on 25-Apr-2016

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

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: http://www.arb.ca.gov.

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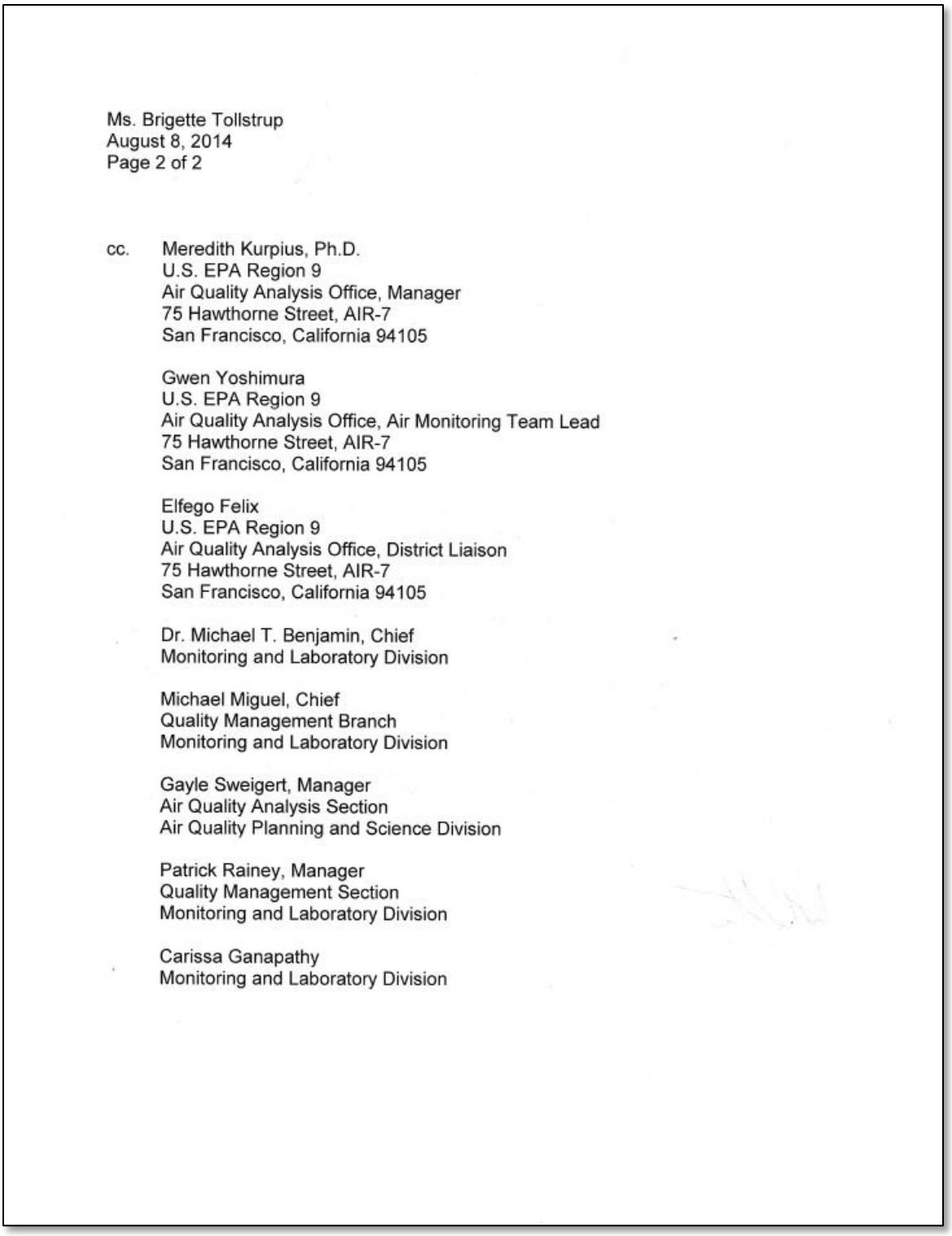
Figure B-2
MOU on Shared Monitoring Responsibility with CARB, Page 2



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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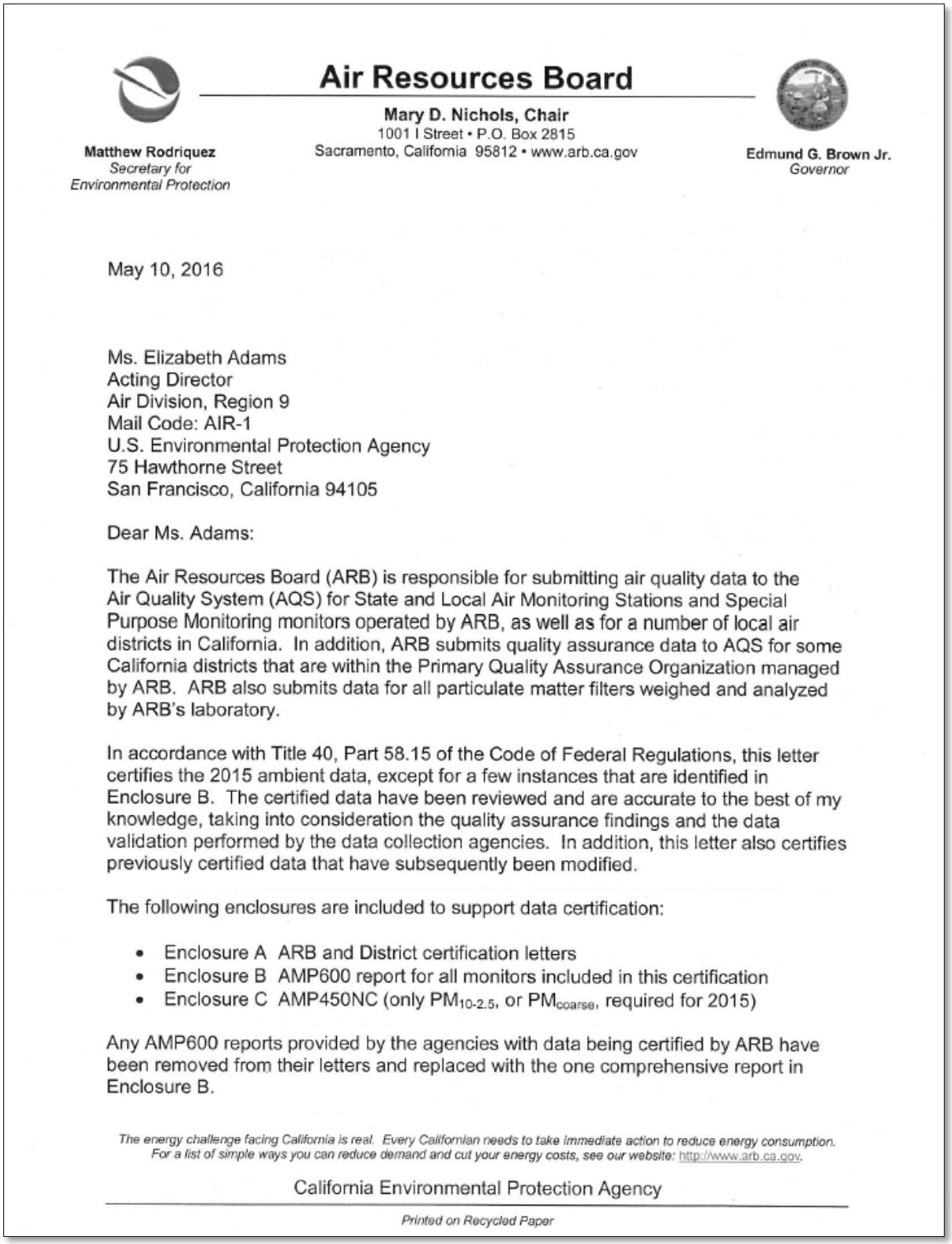
Appendix C Copy of Annual Data Certification Letter

Figure C-1
A Copy of 2016 Data Certification Letter, Page 1



Air Resources Board

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Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

May 10, 2016

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 certifies the 2015 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}, required for 2015)

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.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: http://www.arb.ca.gov.

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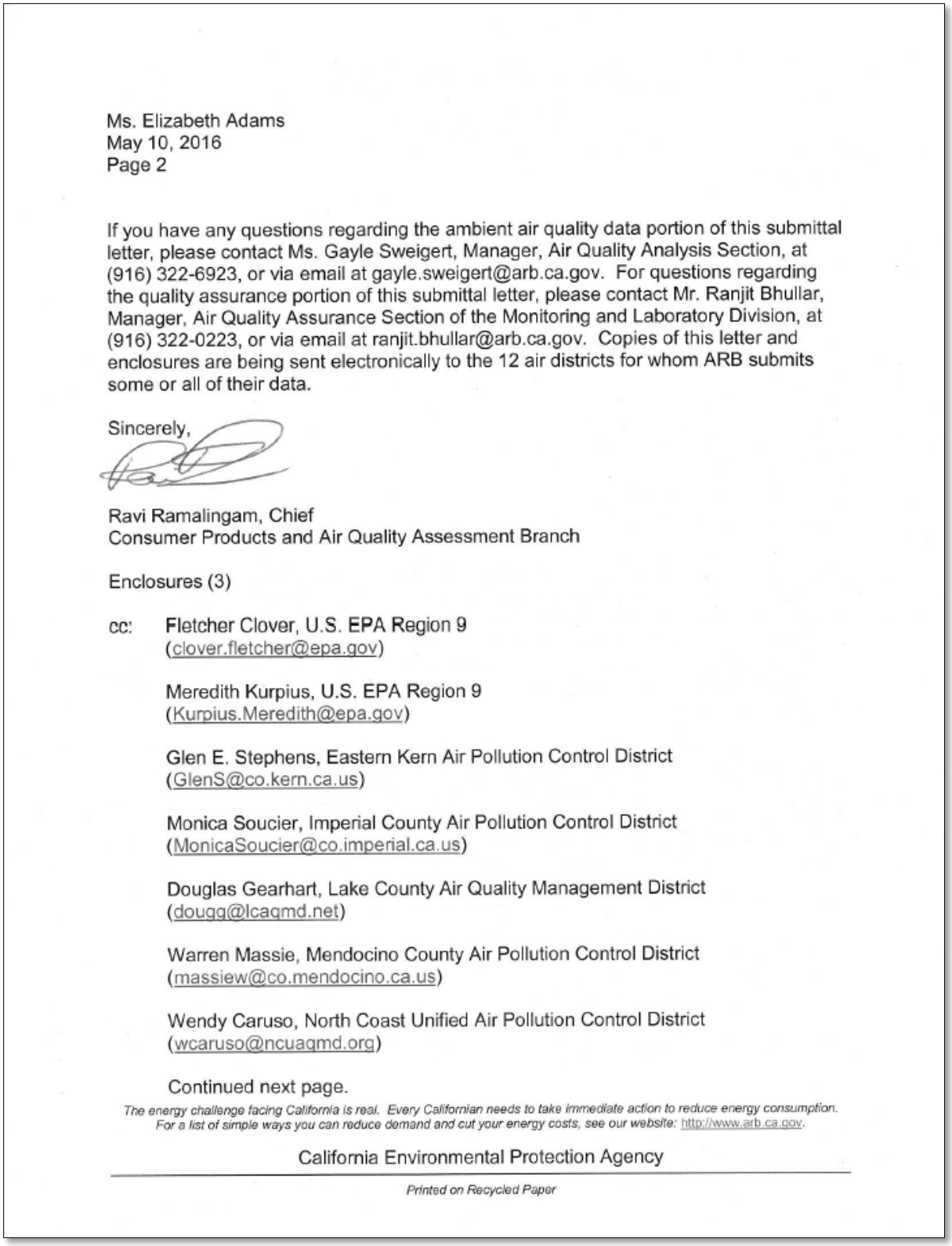
Figure C-2
A Copy of 2016 Data Certification Letter, Page 2



Ms. Elizabeth Adams
May 10, 2016
Page 2

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 whom ARB submits some or all of their 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)

Meredith Kurpius, U.S. EPA Region 9
(Kurpius.Meredith@epa.gov)

Glen E. Stephens, Eastern Kern Air Pollution Control District
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Monica Soucier, Imperial County Air Pollution Control District
(MonicaSoucier@co.imperial.ca.us)

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

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

Wendy Caruso, North Coast Unified Air Pollution Control District
(wcaruso@ncuaqmd.org)

Continued next page.

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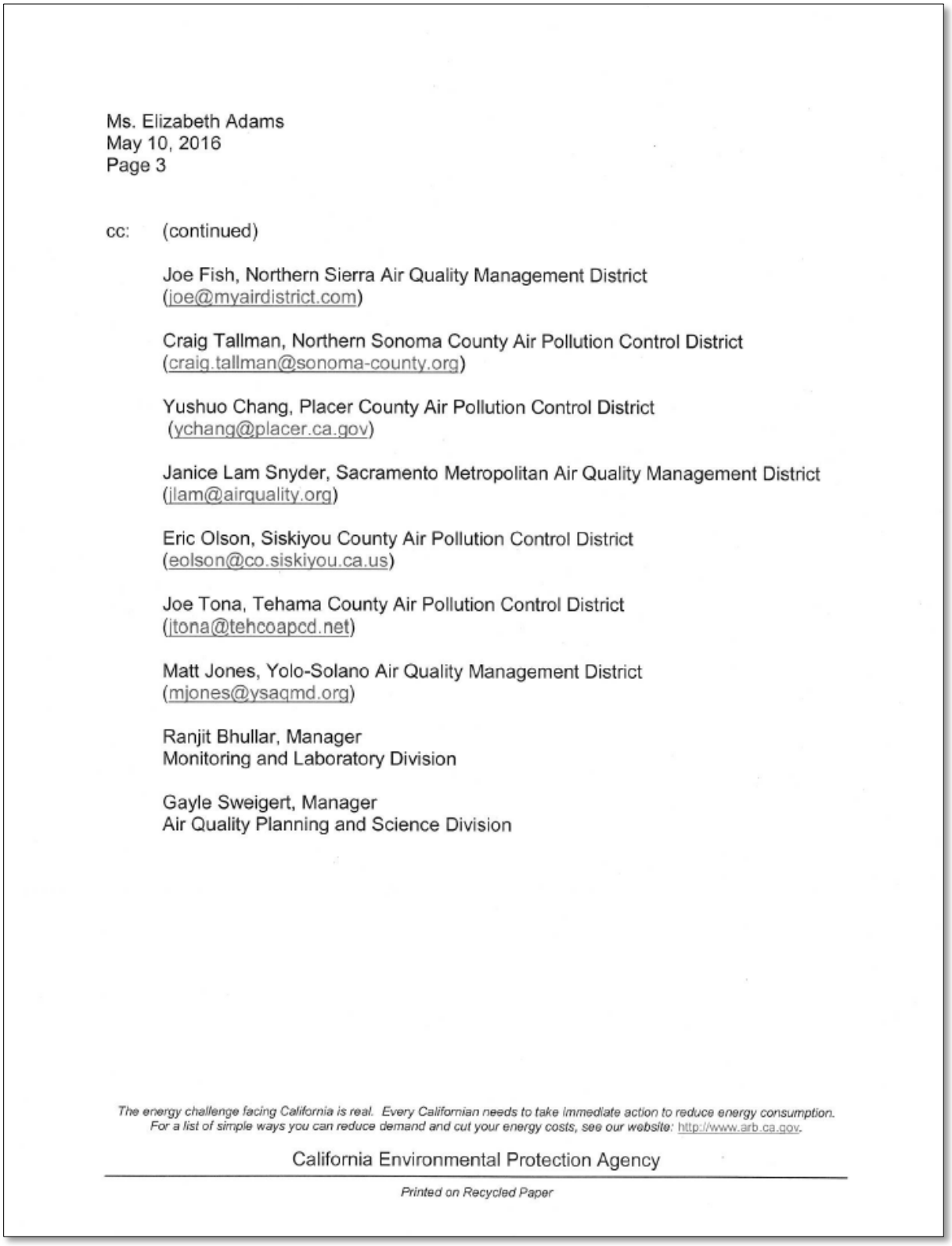
Figure C-3
Copy of 2016 Data Certification Letter, Page 3[33]



Ms. Elizabeth Adams
May 10, 2016
Page 3

cc: (continued)

Joe Fish, Northern Sierra Air Quality Management District
(joe@myairdistrict.com)

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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Janice Lam Snyder, Sacramento Metropolitan Air Quality Management 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

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: http://www.arb.ca.gov.

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

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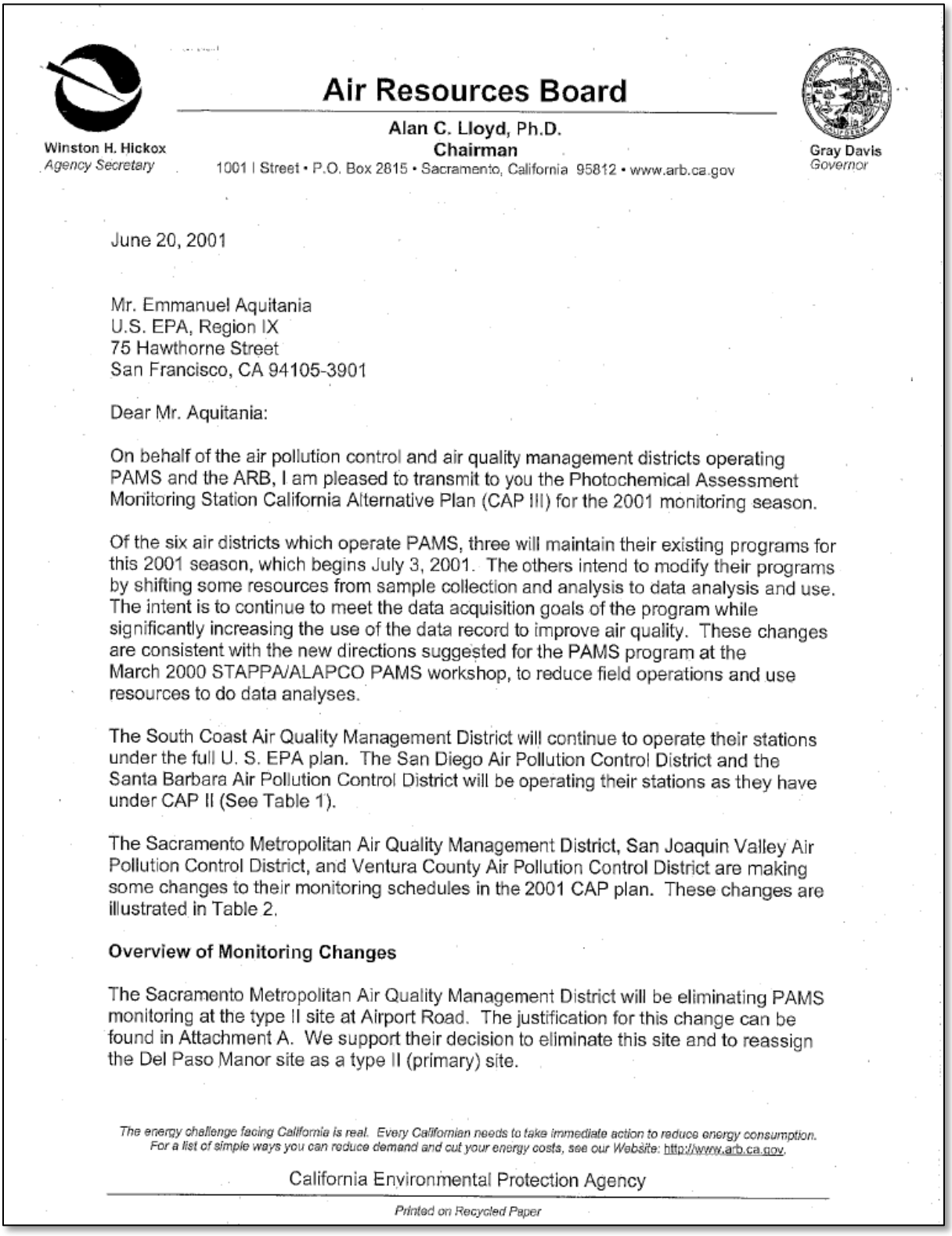
Appendix D California Alternative Plan (CAP III)

Figure D-1
California Alternative Plan, Page 1



Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman
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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.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: http://www.arb.ca.gov.

California Environmental Protection Agency

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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).

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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

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Figure D-4
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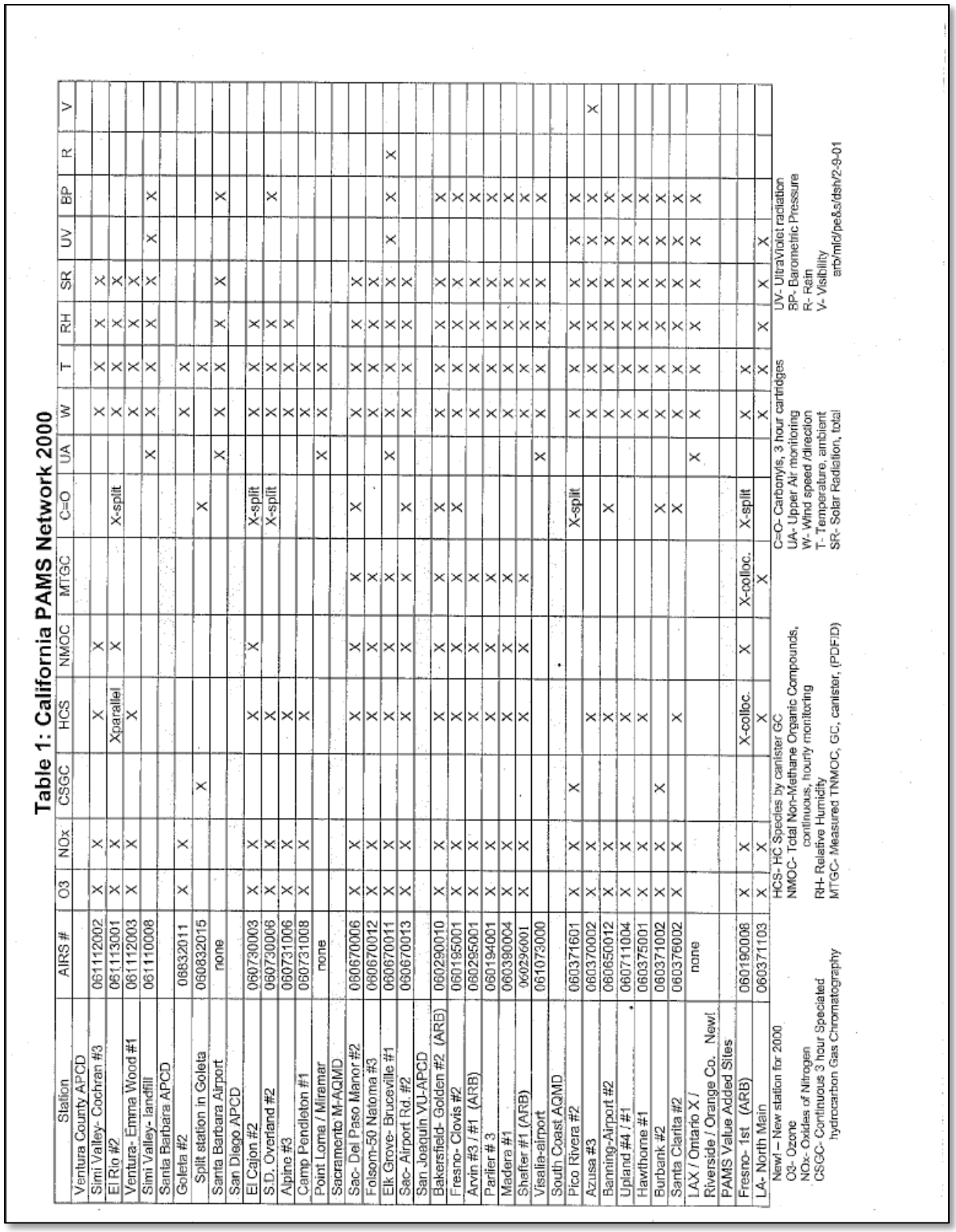

Table 1: California PAMS Network 2000

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	06832011	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. Newl	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			

Newl – 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/mlc/pe&s/dsh/2-9-01

Figure D-5
California Alternative Plan, Page 5[34]

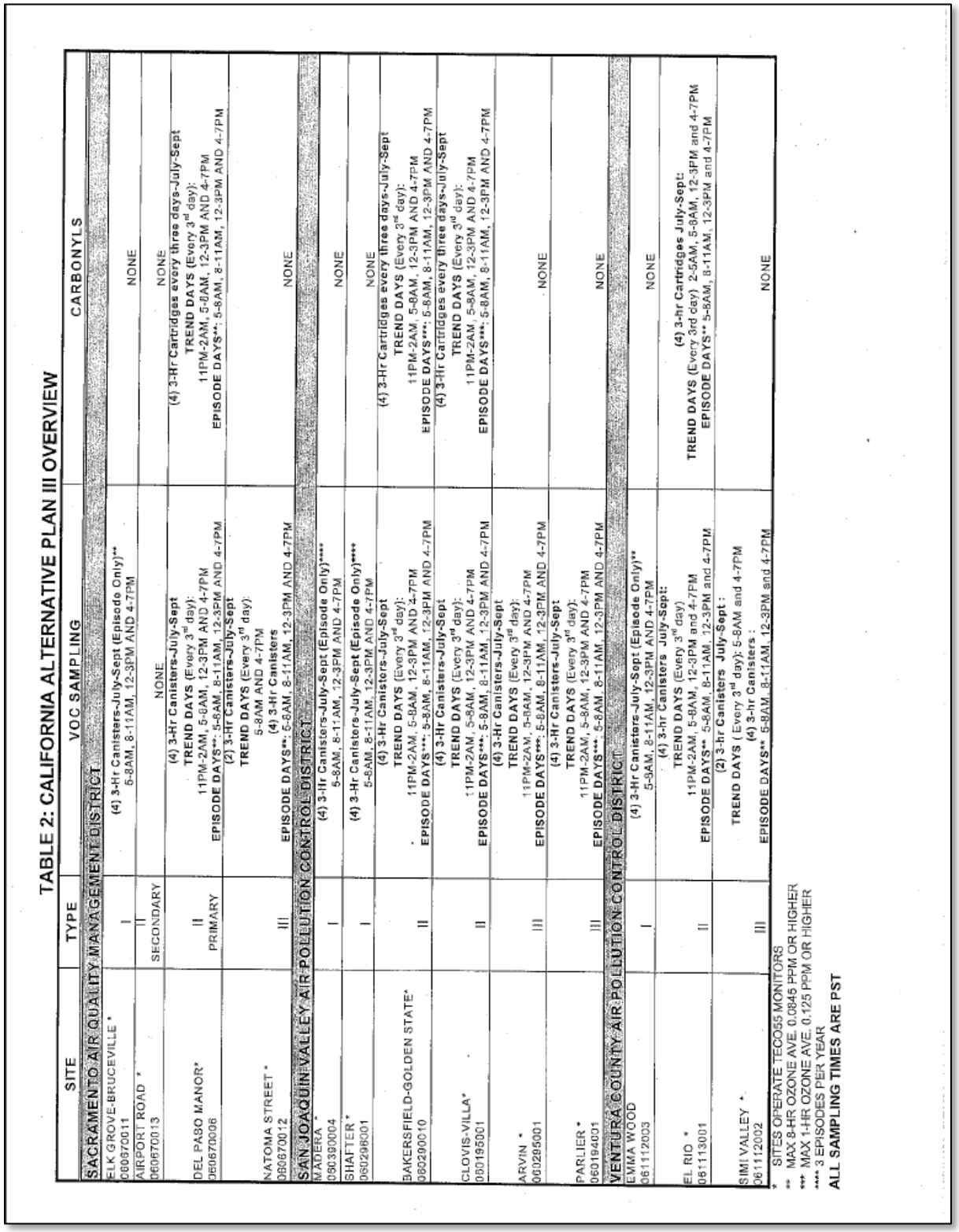

TABLE 2: CALIFORNIA ALTERNATIVE PLAN III OVERVIEW

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	
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 * 060290001	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 * 060290001	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 TECO 55 MONITORS
** MAX 8-HR OZONE AVE. 0.0846 PPM OR HIGHER
*** MAX 1-HR OZONE AVE. 0.125 PPM OR HIGHER
**** 3 EPISODES PER YEAR
ALL SAMPLING TIMES ARE PST

[34] 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 Network Modification Plan

EPA required that states or local air monitoring agencies conduct a network assessment once every five years to determine, at a minimum, if the monitoring network meets the monitoring objectives as defined in Title 40 Code of Federal Regulations (CFR) Part 58, Appendix D. If necessary, the network assessment report proposes additional monitors and/or sites to meet the objectives. Also, with detailed analysis, it optimizes monitoring operation by identifying redundant monitors and/or sites that can be terminated. The District posted the draft 2015 Air Monitoring Network Assessment report[35] (Network Assessment) for a 30 day comment period and received no comments. The District submitted the final copy of the report to CARB and EPA on April 22, 2016. This appendix provides responses to the recommendations, along with a reference of page numbers from the Network Assessment. Where appropriate, the responses include a plan and timeline for implementation.

2nd Near Road Monitoring Site (Executive Summary, p. 5)

Recommendation: Sacramento CBSA currently operates one near-road monitoring site and meets the requirement set forth in 40 CFR Part 58. According to the latest AADT data from Caltrans, Sacramento CBSA has just surpassed the threshold for a second near-road monitoring site.

Response: EPA does not specify a specific time requirement for the site to be installed and operational after the threshold has been surpassed. The District is working to identify a funding source for initial set up, as well, as long term operation of a second near-road site. The appropriate deadline for an implementation plan for this site is 2020, when the next Network Assessment is due.

PAMS Re-Engineering Requirements (Section 4.2, p. 155)

Recommendation: SMAQMD's Sacramento-Del Paso Manor ambient monitoring site is part of the NCore network and is classified as a PAMS Type II monitor. It is recommended that SMAQMD make several upgrades to the site, as detailed below, to meet the new PAMS measurement requirements.

- Enhance the surface meteorological station to satisfy new PAMS monitoring requirements. This includes adding measurements of barometric pressure, precipitation, and ultraviolet radiation.
- Upgrade the mixing height measurement technology. SMAQMD currently operates an upper air profiler at the Elk Grove-Bruceville site to satisfy PAMS upper air measurement requirements; however, the profiler is almost 20 years old, which makes it susceptible to costly maintenance and low data recovery. Adding a ceilometer to the Sacramento-Del Paso NCore site will allow photochemical models to use the more appropriate urban mixing height data.
- NO2 monitoring of "true" or direct NO2 measurements do not contain the inherent bias of NO2 values from standard NOx analyzers. The site is already equipped with an analyzer capable of measuring true concentrations of NO2.

[35] Trinity Consultants [Internet]. 2016. 2015 Air Monitoring Network Assessment (Sacramento Metropolitan Air Quality Management District) [cited 23 Apr 2016]. Available from http://www.airquality.org/monitoringplans/2015SMAQMDNetworkAssessment.pdf

- Add hourly speciated VOC measurements using an auto-gas chromatograph (auto-GC). Adding an auto-GC to Sacramento-Del Paso will satisfy the new requirement to collect hourly speciated VOC data at NCore stations required to make PAMS measurements.
- Consider adding continuous (hourly) monitoring of formaldehyde. Aldehyde measurements using Method TO-11A are required at NCore/PAMS monitoring sites. Continuous monitoring of formaldehyde may reduce lab costs associated with cartridge analysis.

The revisions to the PAMS network requirements reduce the burden of operating multiple PAMS monitoring sites, with the stipulation that monitoring agencies are required to develop an enhanced monitoring plan (EMP) that allows agencies to design the network based on unique situations within their nonattainment area. Thus, PAMS measurements at Folsom-Natoma, Sacramento-Goldenland Court, and Elk Grove-Bruceville are no longer required; however, if the measurements are used to address the specific needs for planning purposes, the measurement may be rolled into the EMP.

Response: Sacramento-Del Paso Manor will continue to be affiliated with PAMS operation beyond 2019 because it is a part of the existing National NCore network. The District will plan accordingly to purchase and install equipment needed to satisfy the new requirement by June 1, 2019. Additional parameters that will need to be added to meet requirements will include: automated gas chromatograph, a monitor capable of continued measurement of carbonyl parameters, barometric pressure sensor, rain gauge, ultraviolet radiation sensor, and ceilometer. The District may submit to EPA a waiver to install the ceilometer at a different location if, for example, there is insufficient space at Del Paso Manor. This station is already operating at maximum capacity because of its affiliation with NCore and CSN network. The District is evaluating options to expand the station to accommodate the new requirements or to terminate lower priority monitors such as black carbon. PAMS re-engineering planning work will start in early 2017.

In addition, to continue the understanding of ozone formation and transport in the nonattainment area, the District will request to continue to operate its existing PAMS type I & III sites (Bruceville and Folsom). The network assessment noted that "PAMS measurements made at these additional monitor sites may provide value in terms of air quality and meteorological modeling applications. Specifically, concentrations of aerosol and gaseous pollutants as well meteorological conditions may serve as model inputs, model performance checks, and unmonitored area analysis inputs." (p. 156). These two sites will be important sites as input parameters for SIP modeling purposes. In addition, The Network Assessment found that the Folsom monitoring site is an important site to the monitoring network due to its historical high ozone measurements[36]. The Bruceville monitoring site currently houses the upper air wind profile, and measurements from the upper air profiler is used both for forecasting and modeling applications by the District and outside agencies such as National Oceanic and Atmospheric Administration (NOAA). The District will be submitting an Enhanced Monitoring Plan (EMP) to the EPA prior to June 1, 2019 to continue to receive funding to continue the operation of PAMS monitoring at those two sites.

[36] "based on the [ozone] concentration design value" (p. 3)

Removal of Goldenland Court Monitoring Site (Section 4.1.5, p. 150)

Recommendation: The Network Assessment report has detailed analysis to conclude that Sacramento-Goldenland Ct is "making redundant measurements with the nearby monitors at Del Paso Manor, T Street, and North Highlands." If Sacramento-Goldenland Ct. is terminated as suggested in recommendation above, relocate the meteorological equipment to North Highlands. Relocation of the meteorological parameters to North Highlands will help better understand northern pollutant transport into the county.

Response: The District agrees with the recommendation by the Network Assessment and will submit a termination request to EPA and CARB for this site by the fall of 2016. As noted in the assessment, the District will continue to meet air monitoring requirement after the termination of this site. If and when the shutdown of Goldenland Ct. is approved by EPA, the District will use the PM10 monitor from Goldenland to Bruceville to monitor for background concentration in a regional scale and relocate the meteorological equipment to North Highlands.

Elk Grove-Bruceville (Section 4.1.3, p. 149)

Recommendation: Although monitors throughout the network show there is less than a 10% chance that PM10 measurements made in the county will exceed NAAQS, the six monitors comprising the PM10 network are located only in the northern portion of the county, with Branch Center Road being the southernmost monitor in the network. Adding PM_{10} measurements to Elk Grove-Bruceville will provide a regional-scale background concentration.

Response: If the Sacramento-Goldenland is approved to be terminated, the District will relocate the PM_{10} monitor from Goldenland to Bruceville to help characterize PM_{10} concentration in the southern portion of the county.

North Highlands (Section 4.1.6, p. 152)

Recommendation: If Goldenland Court is removed, the network would be deficient of meteorological data collected in the area. If siting requirements can be met, adding basic meteorological parameters (wind speed and direction, ambient temperature, and relative humidity) to North Highlands-Blackfoot is recommended for understanding pollutant transport into the county.

Response: If the Sacramento-Goldenland Court is approved to be terminated, the District will evaluate meteorological siting criteria and install meteorological instruments at North Highlands if appropriate. Installing meteorological instruments at this site is contingent on obtaining a lease with the new property management (see Section 4, Recent and Proposed Modification to the Network).

Sacramento Health Department (Section 4.1.7, p. 152)

Recommendation: As noted in Section 4, Recent and Proposed Modification, Sacramento-Health Dept. is making redundant $PM_{2.5}$ measurement. PM_{10} is not specifically required and also correlates well with nearby monitors.

Response: The District agrees with the recommendation by the Network Assessment and will submit a termination request to EPA and CARB for this site by the fall of 2016. The PM2.5 monitor will be relocated and installed to the near-road air monitoring site – Bercut Dr by winter of 2016.

Rancho Seco (Section 4.1.11, p. 154)

Recommendation: The assessment noted that Rancho Seco "may be suitable as a regional background monitoring site." According to the Network Assessment, "surface meteorology and air quality measurements could be added to Rancho Seco to better understand pollutant transport."

Response: Installed in 2008, this site was established as a temporary site to help understand $PM_{2.5}$ transport into the county. The site has not been operated since March 2015, due to limited staff resources and instability of the e-BAM. Lack of sufficient infrastructure (landline, sufficient cellular coverage, shelter) and remoteness in this area also makes it challenging to maintain this site. The District does not currently have the staff or fiscal resources available to operate Rancho Seco as a permanent site. If funding becomes available, the District will re-evaluate conversion to a regional background monitoring site in the 2020 Network Assessment.

Del Paso Manor (Section 4.4, p. 156)

Recommendation: The Network Assessment found that Sacramento-Del Paso Manor could be considered as an urban scale monitoring site. It also found Elk Grove-Bruceville and Sloughhouse could be considered regional-scale monitors. Given the homogeneity of some pollutant and lack of significant industrial sources, urban scale may be appropriate for some pollutants.

Response: The District will investigate this recommendation and, if appropriate, work with EPA and CARB to determine if a reclassification can better help stakeholders understand the scale of representativeness for these monitors.

Walnut Grove Tower (Section 4.4, p. 157)

Recommendation: The Network Assessment note that Walnut Grove Tower, the CARB/District's site for vertical O_3 and meteorology profiling, "could also serve as a location for monitoring general background concentrations."

Response: The District runs the Walnut Grove Tower as a special purpose monitor for CARB, specifically to measure for vertical ozone and temperature profile for research purposes. Starting in 2016, CARB will be contracting directly for the operation of the Walnut Grove Tower.