BAY AREA AIR QUALITY MANAGEMENT DISTRICT

2012 Air Monitoring Network Plan

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Definition of Terms

1:1 ..... Particulate or toxic sample schedule that is taken every day
1:3 ..... Particulate or toxic sample schedule that is taken every 3rd day
1:6 ..... Particulate or toxic sample schedule that is taken every 6th day
1:12 ..... Particulate or toxic sample schedule that is taken every 12th day
AQS ..... Air Quality System; the EPA national air quality database
ADT ..... Average Daily Traffic
AADT ..... Annual Average Daily Traffic
AGL ..... Above Ground Level
AQS ..... Air Quality System; the EPA national air quality database
ARM ..... Approved Regional Method
Air District ..... Bay Area Air Quality Management District
BAM ..... Beta Attenuation Monitor, a type of continuous $PM_{2.5}$ monitor
BAAQMD ..... Bay Area Air Quality Management District
BC ..... Black Carbon
CARB ..... California Air Resources Board
CBSA ..... Core Based Statistic Areas
CDP ..... Census Designated Place
CFR ..... Code of Federal Regulations
CO ..... Carbon Monoxide
CH_4 ..... Methane
DOT ..... Department of Transportation
DL ..... (Tree) Drip Line
EPA ..... U. S. Environmental Protection Agency
FE-AADT ..... Fleet Equivalent Annual Average Daily Traffic
FEM ..... Federal Equivalent Method
FRM ..... Federal Reference Method
GC ..... Gas Chromatograph
GCMS ..... Gas Chromatograph Mass Spectrometer
GIS ..... Geographic Information System
HC ..... Hydrocarbons, including CH_4 and NMHC
HD ..... Heavy Duty (truck)
HiVol ..... High Volume
HPLC ..... High Performance Liquid Chromatograph
H_2S ..... Hydrogen Sulfide
ICPMS ..... Inductively Coupled Plasma Mass Spectrometry
IMPROVE ..... Interagency Monitoring of Protected Visual Environments
Maintenance Plan ..... A Plan submitted by states to EPA that outlines how the NAAQS will be maintained for a particular region.
NAAQS ..... National Ambient Air Quality Standard
NATTS ..... National Air Toxics Trends Station
NCore ..... National Core (Monitoring Program)
NEI ..... National Emissions Inventory
NMHC ..... Non-methane Hydrocarbons

Definition of Terms (continued)

NO ..... Nitric Oxide
NO_2 ..... Nitrogen Dioxide
NO_x ..... Oxides of Nitrogen
NO_y ..... Total Reactive Nitrogen
NSR ..... New Source Review
O_3 ..... Ozone
PAMS ..... Photochemical Assessment Monitoring Stations
PPB ..... Parts per billion
PM ..... Particulate Matter
$PM_{2.5}$ ..... Particulates less than or equal to 2.5 microns in size
$PM_{2.5F}$ ..... $PM_{2.5}$ measured using a filter-based monitor
$PM_{2.5C}$ ..... $PM_{2.5}$ measured using a continuous monitor
PM_{10} ..... Particulates less than or equal to 10 microns in size
PM_{10C} ..... PM_{10} measured using a continuous monitor
$PM_{10-2.5}$ ..... PM Coarse - PM less than or equal to 10 microns and greater than 2.5 microns in size
POC ..... Parameter Occurrence Code
PWEI ..... Population Weighted Emissions Index
SIP ..... State Implementation Plan – A Plan submitted by states to EPA that outlines how the NAAQS will be met for a particular region.
SLAMS ..... State or Local Air Monitoring Station
SO_2 ..... Sulfur Dioxide
SPM ..... Special Purpose Monitor
STN ..... Speciation Trends Network
TAD ..... Technical Assistance Document
TAMS ..... Total Atmospheric Mercury
TSP ..... Total Suspended Particulate
UFP ..... Ultrafine Particulate less than or equal to 0.1 microns
VOC ..... Volatile Organic Compound

Introduction

This annual network plan for the Bay Area Air Quality Management summarizes the air monitoring activities between January 1, 2012 and December 31, 2012 and changes that are planned to occur before June 30, 2014. Site descriptions in later sections, which include specific details of the instruments used in air quality monitoring, pertain to those in operation on December 31, 2012.

Sites that are planned for 2013 are not included in the calendar year 2012 site descriptions unless enough specific detail is known of the new sites. For this report, a new site at Forest Knolls (Marin County) is included because it was planned to be opened in late 2012 but did not open until early 2013. A new lead monitoring site in Redwood City is also included although it did not open until March 2013. It is included at the request of EPA Region 9.

Overview of Network Operation

Network Design

The Bay Area Air Quality Management District (Air District) is the public agency responsible for air quality management in the nine Bay Area counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma. The Air District operates air monitoring stations in each of these nine counties. The Air District began measuring air quality in the San Francisco Bay Area in 1957. In 2012 there were 30 air monitoring stations operated by the Air District and one station (Point Reyes) operated by the California Air Resources Board.

Short-term monitoring sites are trailers and shelters with a comprehensive set of air quality instruments to characterize local air quality. Instruments at these sites are operated on SLAMS sampling schedules for a minimum of one year allowing data comparison with permanent monitoring sites. Statistical data relationships between short-term and nearby permanent sites provides long-term estimates of air quality at temporary monitoring sites.

The Air District also performs air monitoring as part of other programs. These include programs that the Air District has initiated, such as meteorological monitoring, the ambient toxics program, and programs required by EPA. EPA programs currently include the National Air Toxics Trends Stations (NATTS) Program, the National Core (NCore) Program, the Photochemical Assessment Monitoring Stations (PAMS) Program, and the $PM_{2.5}$ Speciation Trends Network (STN) Program. Summaries of these programs can be found later in this report.

Because the Air District has a fully staffed professional Laboratory Services Section, $PM_{2.5}$ filter samples collected by the North Coast and Monterey Bay Air Districts are weighed in the Air District's laboratory by Air District staff. The $PM_{2.5}$ concentrations are sent back to the collecting Air Districts for their review, Quality Assurance, and certification. The Bay

Area Air District is not the Primary Quality Assurance Organization (PQAO) for these samples. The Bay Area Air District is the certifying agency for samples it collects within the Bay Area only.

The San Francisco Bay Area contains over 100 cities. Although resources do not allow placement of air pollution monitors in every city, it can be demonstrated that air pollution levels, in the absence of significant local sources, are similar within each geographical region of the Bay Area. That is, cities within each of the major valleys of the Bay Area can have similar air quality levels. Consequently, a few sites can characterize an area. Generally, locations for permanent air monitoring sites are initially based on knowledge of population density and local wind patterns, while the final site selection is determined after analyzing preliminary air quality measurements collected from field studies, temporary monitoring studies, and mobile monitoring data.

The monitoring objectives of the Air District's air monitoring network are:

- To provide air pollution data to the general public in a timely manner.
- To support compliance with California and national ambient air quality standards. When sites do not meet the standards, attainment plans are developed to attain the standards.
- To support air pollution research studies.

To meet its monitoring objectives the Air District collects ambient air data at locations with a variety of monitoring site types. These site types, as defined in 40 CFR Part 58, Appendix D, Table D-1, and expanded by EPA Region 9 in a memo dated May 8, 2012, are listed below:

Extreme downwind: Sites established to characterize the extreme downwind transported ozone and its precursor concentrations, located in the predominant afternoon downwind direction from the local area of maximum precursor emissions. This site type is only used at sites designated as PAMS or unofficial PAMS.

Highest concentration: Sites expected to have the highest concentration, even if populations are sparse in that area. High concentrations may be found close to major sources, or further downwind if pollutants are emitted from tall stacks. High concentrations may also be found at distant downwind locations when the pollutants such as ozone or secondary particulate matter are a result of chemical reactions in the atmosphere.

Maximum ozone concentration: Sites intended to monitor maximum ozone concentrations occurring downwind from the area of maximum precursor emissions. Locations should be chosen so that urban scale measurements are obtained. Typically, these sites are located 10 to 30 miles from the fringe of the urban area. This site type is only used at sites designated as PAMS or unofficial PAMS.

Maximum precursor impact: Sites established to monitor the magnitude and type of precursor emissions in the area where maximum precursor emissions are representative of the CBSA are expected to impact and are suited for the monitoring of urban air toxic pollutants. This site type is only used at sites designated as PAMS or unofficial PAMS.

Population exposure: Sites in areas with high population density to evaluate exposure to air pollution. In most cases, stations are located within the largest cities in each county. Because people spend more time at home than at work, air monitoring sites are generally located in residential areas rather than at downtown locations.

Source oriented: Sites in areas downwind of potential major sources of pollutants. In the Bay Area, there are five refineries that are potential pollutant sources: Chevron, Shell, Tesoro, Phillips 66, and Valero. The Port of Oakland also can be a significant source of particulates, CO, and toxics. General aviation airports can be sources of lead because piston engine aircraft continue to use leaded fuel.

Upwind background: Sites in areas that have no significant emissions from mobile, area, or industrial sources. At these sites, the measured concentrations reflect the transported air quality levels from upwind areas. This site type is only used at sites designated as PAMS or unofficial PAMS.

General Background: Where there are no significant emission sources upwind of a site, then the site is considered to be a general background site.

Regional Transport: The Air District shares a common boundary with six other air districts: Monterey Bay Unified APCD, San Joaquin Valley APCD, Sacramento Metropolitan AQMD, Yolo-Solano AQMD, Lake County AQMD, and Northern Sonoma County APCD. When upwind areas have significant air pollution sources, pollutants may be transported into the Bay Area Air District and result in overall higher air pollution levels in the Bay Area. The Air District operates monitoring stations near the borders of the Air District to measure the air pollution concentrations transported into and out of the Bay Area Air District.

Welfare-related impacts: Sites located to measure impacts on visibility, vegetative damage, or other welfare-based impacts.

Quality Assurance: Sites where dual or collocated instruments are maintained to confirm that the primary instruments are providing accurate data.

Each site type is associated with a spatial scale. For example, a regional transport site is meant to represent air quality levels over a large area, while a highest concentration site may represent a spatial scale of no more than a few blocks or so, in size. Spatial scales are defined in 40 CFR, Part 58, Appendix D. They are: micro scale – having dimensions of several meters up to 100 meters; middle scale – having dimensions of 100 meters to 0.5 km; neighborhood scale – having dimensions of 0.5 km to 4.0 km; urban scale – having dimensions of 4 to 50 km; and regional scale – having dimensions of up to hundreds of km. Table 1 lists the appropriate scales for each site type.

Table 1. SLAMS Site Types and Appropriate Spatial Scales.

Site Type	Appropriate Spatial Scale
1. Highest Concentration	Micro, middle, neighborhood
2. Population Exposure	Neighborhood, urban
3. Source Oriented	Micro, middle, neighborhood
4. General Background	Urban, regional
5. Regional Transport	Urban, regional

The desired spatial scale of a monitoring site must conform to established criteria for the distance from roadways, based on traffic volumes. There are different distance requirements for each pollutant, which can be found in 40 CFR Part 58, Appendix E. Table 2 lists the stations and the pollutants measured at each site and Figure 1 is a map of the Air District monitoring sites in 2012.

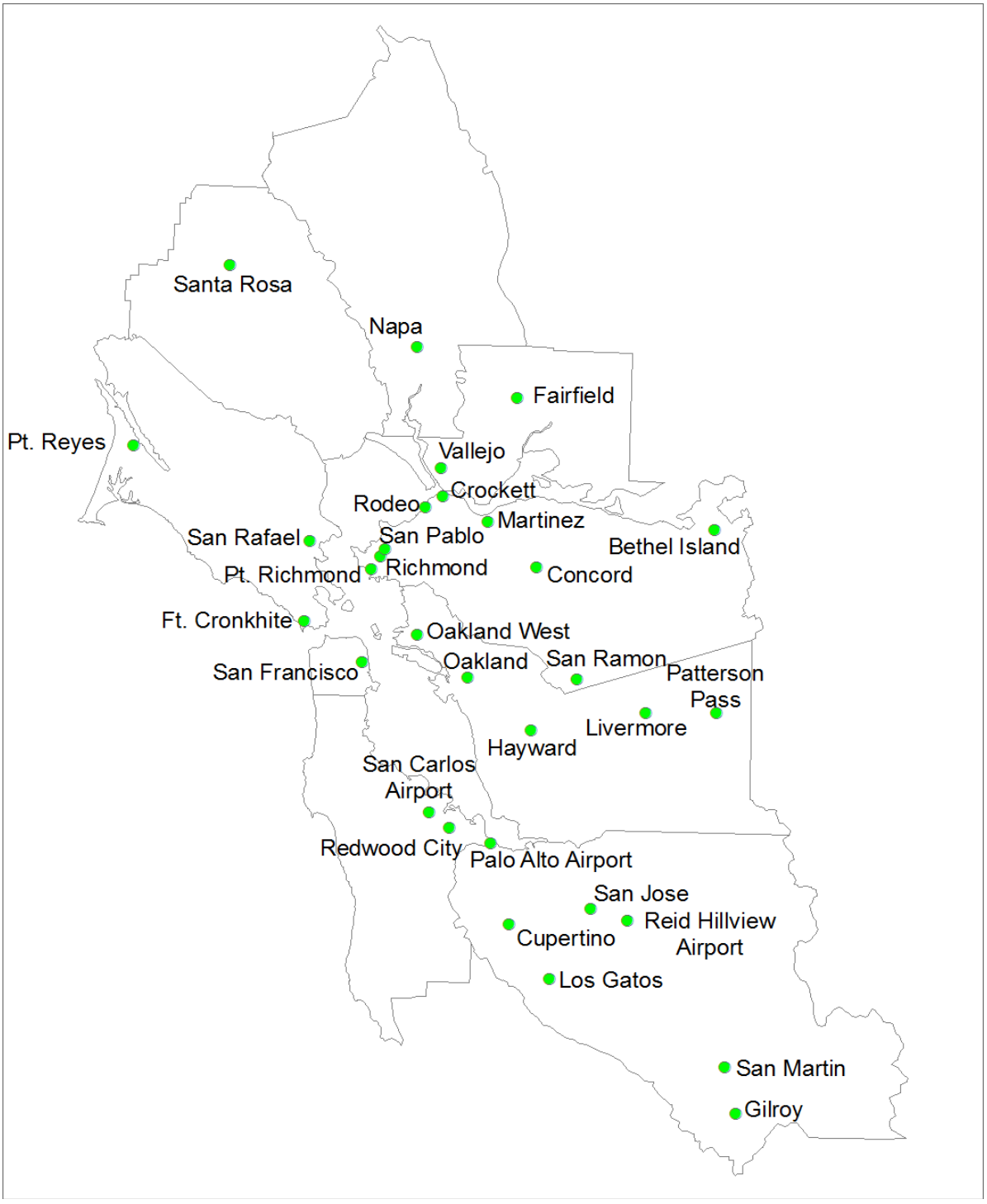
Table 2. List of Monitoring Stations within the Air District in 2012.

Site	Station Name	Pollutants Monitored[1]
1	Bethel Island	O_3, NO_x, SO_2, CO, PM_{10}, Toxics
2	Concord	O_3, NO_x, SO_2, CO, HC, PM_{10}, $PM_{2.5F}$, Toxics
3	Crockett	SO_2, Toxics
4	Cupertino Monta Vista	O_3, NO_x, SO_2, CO, HC, PM_{10}, $PM_{2.5C}$, Toxics, TAMS
5	Fairfield	O_3
6	Fort Cronkhite	Toxics
7	Gilroy	O_3, $PM_{2.5C}$
8	Hayward	O_3
9	Livermore	O_3, NO_x, HC, $PM_{2.5C}$, Speciated $PM_{2.5}$, Toxics, BC, UFP
10	Los Gatos	O_3
11	Martinez	SO_2, Toxics
12	Napa	O_3, NO_x, CO, PM_{10}, $PM_{2.5C}$, Toxics
13	Oakland	O_3, NO_x, CO, $PM_{2.5C}$, Toxics
14	Oakland West	O_3, NO_x, SO_2, CO, $PM_{2.5C}$, Speciated $PM_{2.5}$, Toxics, BC
15	Palo Alto Airport	Lead (TSP)
16	Patterson Pass	NO_x
17	Point Reyes	$PM_{2.5C}$
18	Point Richmond	H_2S
19	Redwood City	O_3, NO_x, CO, $PM_{2.5F}$, $PM_{2.5C}$, Toxics, UFP
20	Reid-Hillview Airport	Lead (TSP)
21	Richmond 7th	SO_2, H_2S, Toxics
22	Rodeo	H_2S
23	San Carlos Airport	Lead (TSP)
24	San Francisco	O_3, NO_x, CO, PM_{10}, $PM_{2.5C}$, Toxics
25	San Jose	O_3, NO_x, NO_y, SO_2, CO, PM_{10}, $PM_{2.5F}$, $PM_{2.5C}$, Speciated $PM_{2.5}$, Toxics, Lead (PM_{10})
26	San Martin	O_3

Site	Station Name	Pollutants Monitored[1]
27	San Pablo	O_3, NO_x, SO_2, CO, PM_{10}, $PM_{2.5\ C}$, Toxics, UFP
28	San Rafael	O_3, NO_x, CO, PM_{10}, $PM_{2.5C}$, Toxics
29	San Ramon	O_3, NO_x
30	Santa Rosa	O_3, NO_x, CO, $PM_{2.5C}$, Toxics, UFP
31	Vallejo	O_3, NO_x, SO_2, CO, $PM_{2.5C}$, Speciated $PM_{2.5}$, Toxics

[1] See pages 6 and 7 for acronym definitions.

Figure 1. Map of Bay Area SLAMS and SPM Sites in 2012.

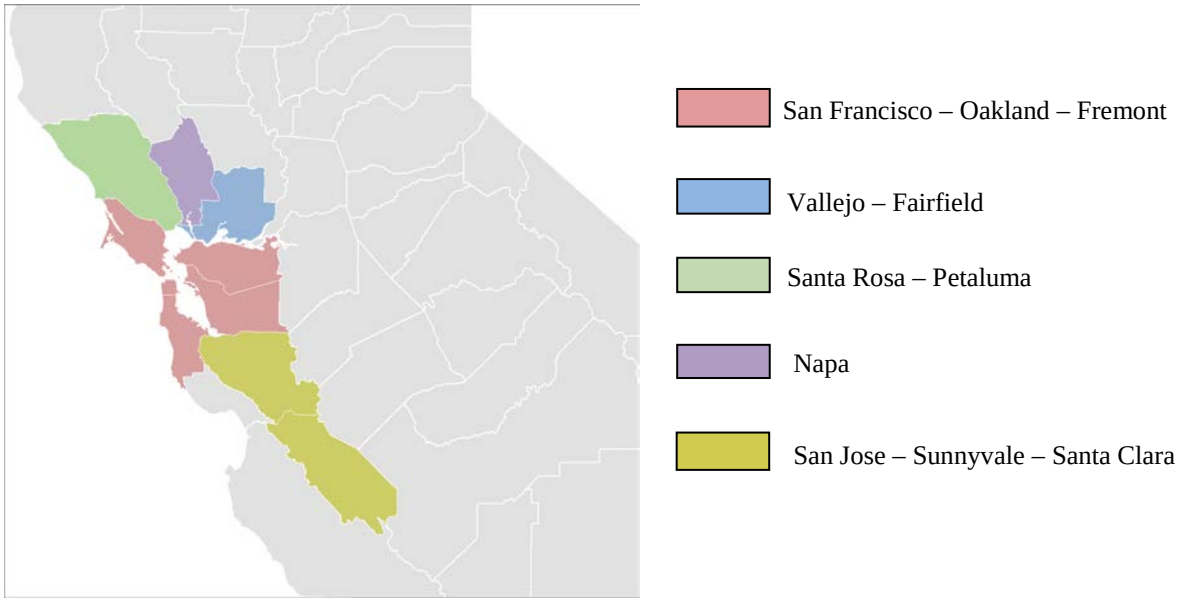


Minimum Monitoring Requirements

The Bay Area exceeded all minimum monitoring requirements for all criteria pollutants in 2012. During the past three years, no exceptional event designations were requested by the Air District. Therefore, none of the design values listed in the tables of this section have been adjusted for exceptional events. In the Bay Area, potential exceptional events would generally be restricted to wildfires that contribute to exceedances of the NAAQS.

EPA minimum monitoring requirements are not based on the Air District boundary. Instead, they are based on Core Based Statistical Areas (CBSA) or Metropolitan Statistical Areas (MSA) which are essentially identical for the Bay Area. Therefore, some monitors listed in the tables which follow are counted toward the minimum monitoring requirements even though the monitor is located in another Air District. CBSA boundaries for the Bay Area are shown in Figure 2.

Figure 2. Core Based Statistical Areas (CBSA) for the San Francisco Bay Area.



Minimum Monitoring Requirements for Ozone

The number of required ozone monitors in each CBSA is determined by the CBSA population and design value, as specified in Table D-2 of 40 CFR Part 58, Appendix D. Ozone design values are a calculated concentration[a] used for comparison with the national standard to determine the attainment status of an area. Table 3 shows that the Air District monitoring network meets or exceeds the ozone minimum monitoring requirements.

On April 12, 2012 the EPA's final designation for the 2008 National 8-hour ozone standard for the Bay Area was "nonattainment" with an area classification of "marginal". Current design values based on the last 3 years of data (2010-2012) show ozone now to be in

attainment; however, the Bay Area will continue to be designated as "non-attainment" for the national 8-hour ozone standard until the Air District elects to submit a redesignation request and a maintenance plan to the EPA, and EPA approves the proposed redesignation. No additional monitors are required in the State Implementation Plan (SIP) or Maintenance Plan for ozone. A map of ozone monitoring locations in the San Francisco Bay Area for 2012 is shown in Figure 3.

Table 3. Minimum Monitoring Requirements for Ozone.

CBSA	County or Counties	Pop. 2010 Census	Design Value[a] (ppb) 2012	Design Value Site & AQS ID	Required SLAMS Monitors	Active SLAMS Monitors	Additional SLAMS Monitors Needed
San Francisco-Oakland-Fremont	SF, Marin, Alameda, San Mateo, Contra Costa	4,335,391	73	Bethel Island 060131002 Livermore 060010007	3	7	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	72	San Martin 060852006	2	5[b]	0
Santa Rosa-Petaluma	Sonoma	483,878	47	Santa Rosa 060970003	1	2[c]	0
Vallejo-Fairfield	Solano	413,344	69	Vacaville 060953003	2	3[d]	0
Napa	Napa	136,484	63[e]	Napa 060550003	0[e]	1	0

a Design values are calculated at each monitoring site by taking the 3-year mean (2010-2012) of the 4th highest 8-hour concentration. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the 0.075 ppm National Ambient Air Quality 8-hour Ozone Standard meet the standard.

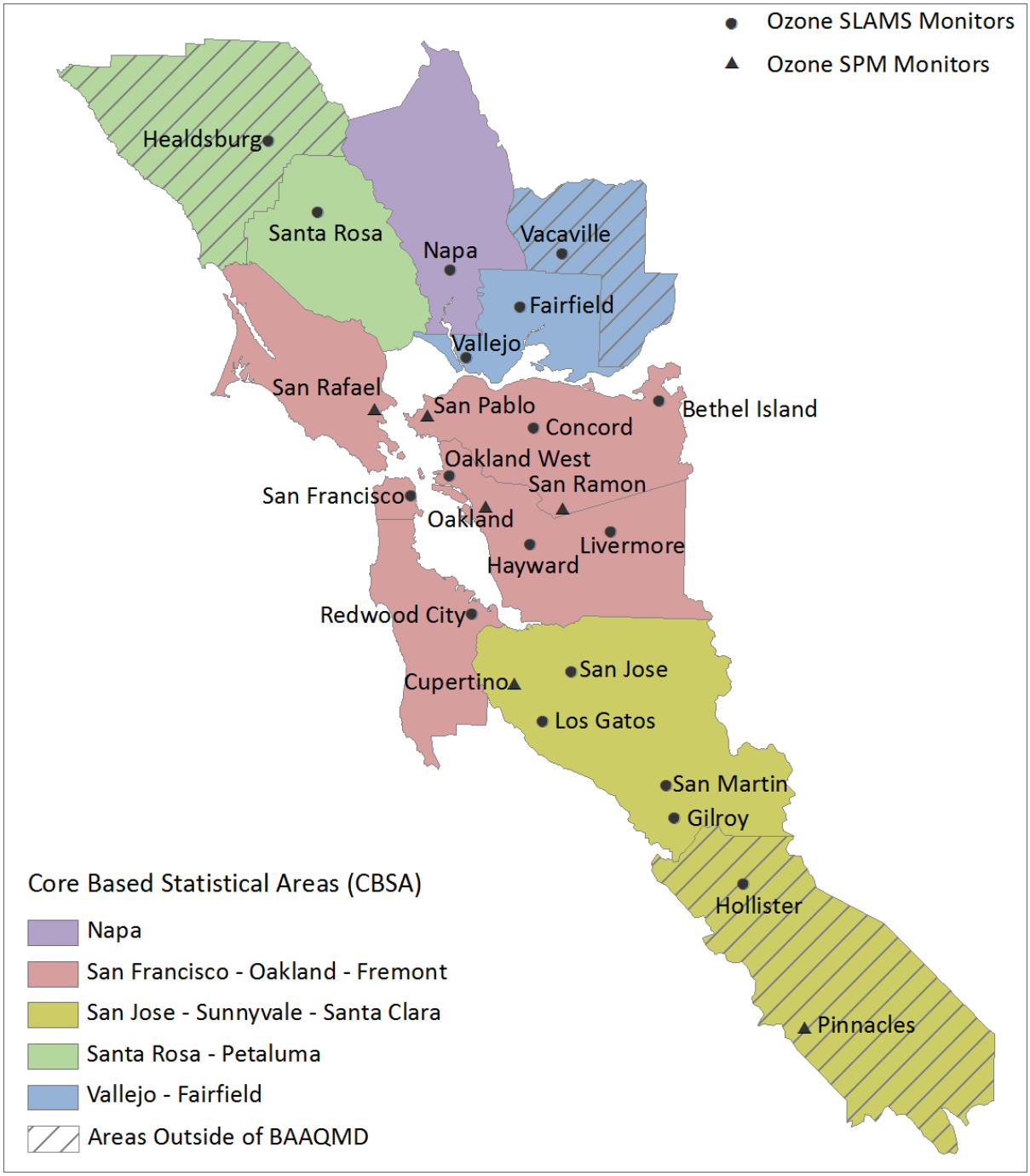
b One of the five monitors is not in the BAAQMD. It is in Hollister which is in the Monterey Bay Unified Air Pollution Control District.

c One of the two monitors is not in the BAAQMD. It is in Healdsburg which is in the Northern Sonoma County Air Pollution Control District.

d One of the three monitors is not in the BAAQMD. It is in Vacaville which is in the Yolo-Solano Air Quality Management District.

e EPA Region 9 analysis of this site (Appendix E) showed that the design value would be increased by 2 ppb due to the shorter than required minimum distance between the roadway and the monitor for a Neighborhood scale designation. Based on that calculation Napa's design value would change from 63 ppb to 65 ppb, and the required number of SLAMS monitors would change from 0 to 1 for the Napa CBSA.

Figure 3. Ozone monitoring in the San Francisco Bay Area in 2012



Ozone Monitoring Season Waivers and Waiver Request
From January 1 through March 31, 2012, the following four sites did not measure ozone during the non-ozone season: Fairfield, Gilroy, Hayward, and San Martin. In December 2012, the following six sites did not measure ozone: Fairfield, Gilroy, Hayward, Los Gatos, San Martin, and San Ramon. Monitoring waivers in accordance with 40 CFR, Part 58, Appendix D, Section 4.1 are in Appendix A. A waiver was not required to discontinue ozone monitoring at San Ramon because it is a Special Purpose Monitor (SPM). However, the Air District included San Ramon in its waiver request for transparency and completeness.

The BAAQMD requests a similar waiver for the period December 1, 2013 through March 31, 2014 for monitoring sites Fairfield, Gilroy, Hayward, San Martin, and Los Gatos. We do not intend to operate the SPM ozone monitor at San Ramon during this period as well.

Napa Ozone Spatial Scale, Waiver Request
The Napa ozone monitor does not meet EPA requirements for distance from major roadways as described in 40 CFR Part 58. A BAAQMD analysis concluded that ozone levels at Napa are not appreciably affected by NO_2 emissions from the nearest roadway. Subsequently, the Air District applied for a waiver from EPA Region 9. The waiver request is in Appendix E.

In response to this request EPA used a conservative approach to estimate how much ozone is decreased due to NO emitted from the nearby roadways. Based on this approach, Napa's 2010-2012 ozone design value would increase 2 ppb from 63 ppb to 65 ppb which is well below the 8-hour ozone NAAQS of 75 ppb. Therefore, EPA granted a waiver but also stated that the waiver request must be renewed with each annual network plan.

The BAAQMD hereby requests a renewal of this waiver for 2013 based on no significant changes in traffic count, population or ozone levels as recorded in 2012.

Minimum Monitoring Requirements for $PM_{2.5}$

The number of required $PM_{2.5}$ monitors in each CBSA is determined by the CBSA population and design value, as specified in Table D-5 of Appendix D to 40 CFR Part 58. A map of SLAMS $PM_{2.5}$ and continuous SLAMS $PM_{2.5}$ monitoring locations in the San Francisco Bay Area are shown in Figure 4 and Figure 5, respectively. Table 4 shows that the Air District's network met the $PM_{2.5}$ minimum monitoring requirements in 2012. Table 4 is based on the national standards and calculation methods that were in effect during 2012 (the 2006 rule).

On March 18, 2013 EPA revised the national ambient air quality standards (NAAQS) for $PM_{2.5}$. Although EPA maintained the 24-hour standard at 35 µg/m3 they did change the daily design value calculation method. In short, EPA removed seasonal sampling allowances in the calculation of the daily design value which led to an increase in the daily design values at some locations where the Air District was monitoring on a less than daily schedule in calendar years 2010 and 2011. However, the change did not significantly affect the Air District's minimum monitoring requirements. Table 5 shows the 2013 design value

calculations and the related minimum monitoring requirements based on the new method of calculating design values (the 2013 rule).

There are additional minimum monitoring requirements in 40 CFR Part 58. One requirement is to operate continuous $PM_{2.5}$ monitors equal to at least one-half (round up) the number of $PM_{2.5}$ SLAMS monitors. Table 6 shows that the Air District network met this requirement in 2012. Another requirement is for collocation of monitors depending on the number of FRM or FEMs deployed in the air monitoring network. This requirement is discussed on page 25. There are other requirements related to collocation of $PM_{2.5}$ monitors at near-road monitoring sites which are discussed in Appendix D. Near-road monitors are not included in any of the tables which follow because they are thoroughly covered in Appendix D.

At the close of 2012, every $PM_{2.5}$ monitor in the Air District network was a FRM or FEM except at Cupertino. A non-regulatory BAM monitor was used because resource allocations for FRM and FEMs were limited, the site was scheduled to be closed in September 2012 (later revised to late 2013), and all monitoring instruments at this site are designated as SPM for a special temporary study.

Shared Particulate Monitoring Agreement with Monterey Air District
The Bay Area network shares particulate monitoring responsibilities with the Monterey Bay Unified Air Pollution Control District in the San Jose–Sunnyvale–Santa Clara CBSA. The agreement to share $PM_{2.5}$ monitoring responsibilities is presented in Appendix B.

$PM_{2.5}$ Filter Analysis for other Air Districts and PQAO Responsibility
Because the Air District has a fully staffed professional Laboratory Services Section, $PM_{2.5}$ filter samples collected by the North Coast and Monterey Bay Air Districts are weighed in the Air District's laboratory by Air District staff. The $PM_{2.5}$ concentrations are sent back to the collecting Air Districts for their review, Quality Assurance, and certification. The Bay Area Air District is not the Primary Quality Assurance Organization (PQAO) for these samples. The Bay Area Air Quality Management District is the certifying agency for samples collected within the Bay Area only.

State Implementation Plan (SIP) Requirements
EPA designated the Bay Area as nonattainment of the $PM_{2.5}$ standard on October 8, 2009. The effective date of the designation was December 14, 2009 and the Air District had three years to develop a State Implementation Plan (SIP) to demonstrate that the Bay Area will achieve the revised standard by December 14, 2014. However, in October 2012, EPA proposed to suspend the SIP requirements after making a Clean Data Determination, as described below.

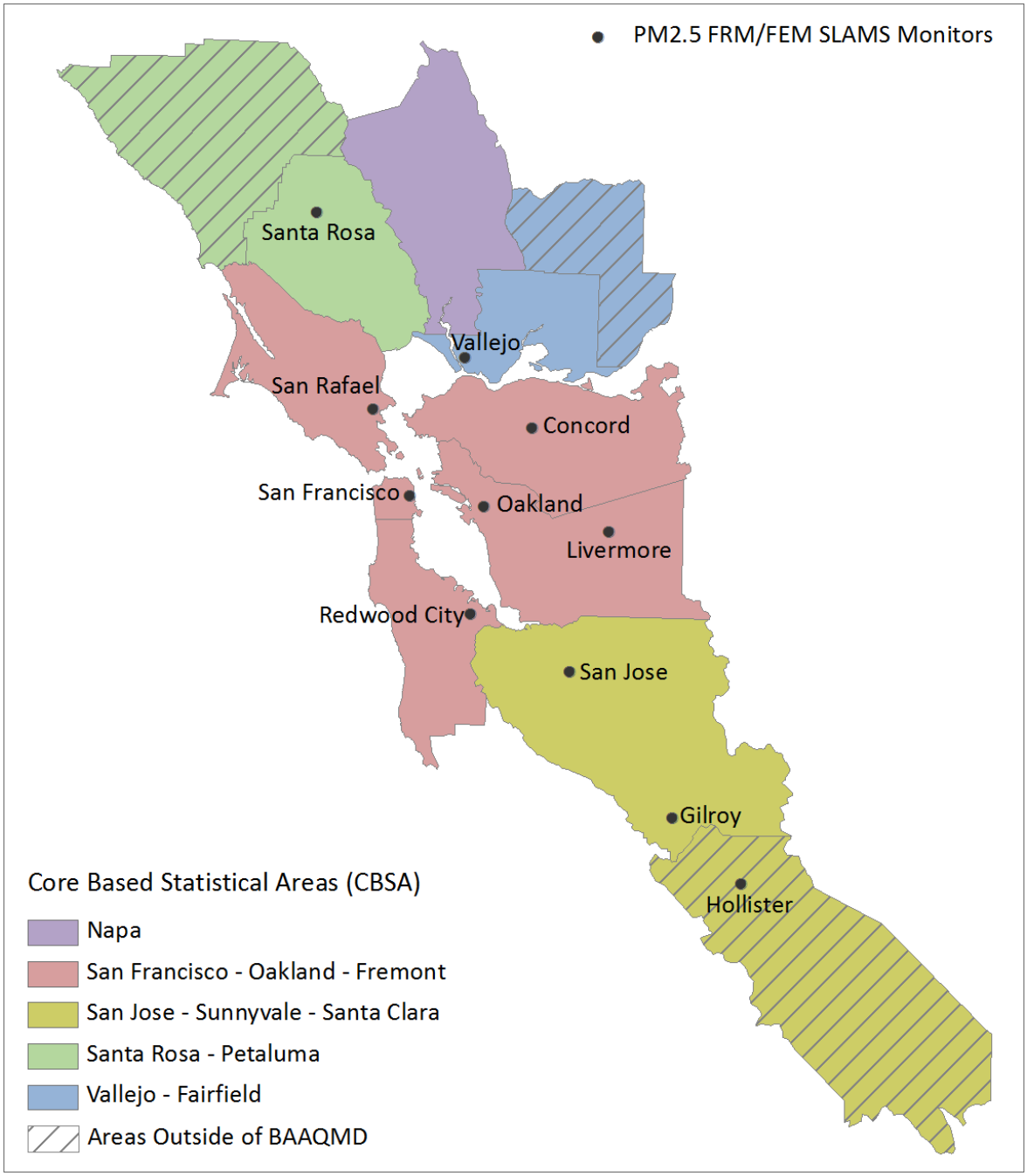
Clean Data Determination by US EPA
On October 29, 2012, EPA issued proposed rule-making to determine that the Bay Area is attaining the 24-hour $PM_{2.5}$ national standard. When the proposed rule is finalized, key SIP requirements to demonstrate how the Bay Area will achieve the standard will be suspended as long as monitoring data continues to show that the Bay Area attains the $PM_{2.5}$ standard.

The Bay Area will continue to be designated as "non-attainment" for the national 24-hour $PM_{2.5}$ standard until the Air District elects to submit a redesignation request and a

maintenance plan to the EPA, and EPA approves the proposed redesignation. Although most SIP requirements may be suspended, the Bay area will still be required to prepare an abbreviated SIP submittal to address the required elements, including:

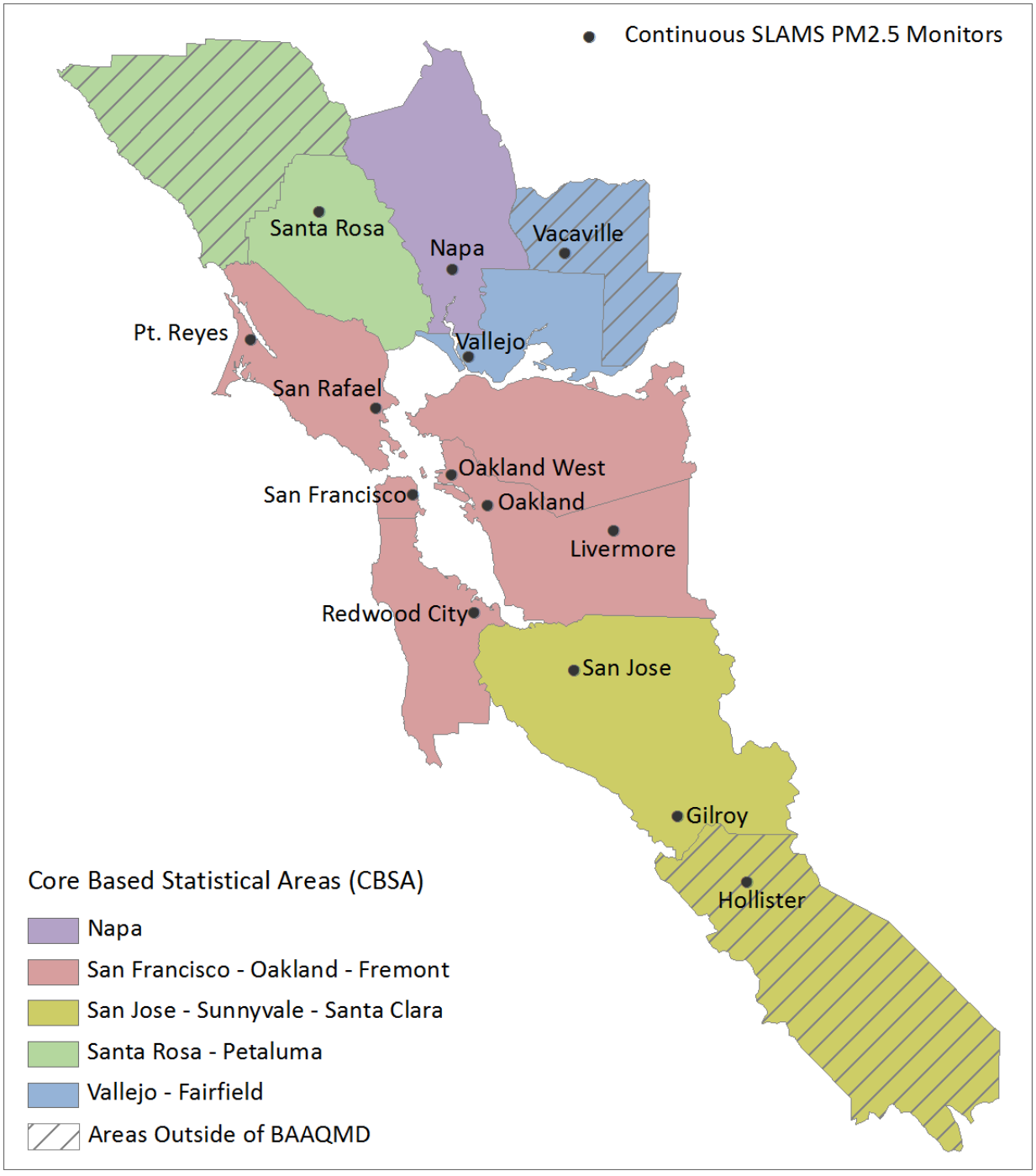
- An emission inventory for primary $PM_{2.5}$, as well as precursor pollutants that contribute to formation of secondary PM; and
- Amendments to the Air District's New Source Review (NSR) to address $PM_{2.5}$ (as well as other revisions). Amendments to the NSR were adopted by the Air District's Board of Director's on December 19, 2012.

Figure 4. SLAMS $PM_{2.5}$ monitoring in the San Francisco Bay Area in 2012



The sites shown above met minimum $PM_{2.5}$ monitoring requirements for calendar year 2012. A new FEM BAM was deployed at San Pablo in December 2012. The Oakland West and Napa sites were upgraded from non-FEM BAM to FEM BAM in December 2012. These three sites are not shown on this map because they did not met completeness requirements for minimum monitoring requirements for calendar year 2012.

Figure 5. Continuous SLAMS $PM_{2.5}$ monitoring in the San Francisco Bay Area in 2012



The sites shown above met minimum continuous $PM_{2.5}$ monitoring requirements for calendar year 2012. A new FEM BAM was deployed at San Pablo in December 2012 but is not shown on the map above because it opened so late in the year.

Table 4. Minimum Monitoring Requirements for $PM_{2.5}$ SLAMS in 2012 (2006 Rule)

CBSA	County or Counties	Pop. 2010 Census	Annual Design Value[a] ($\mu g/m^3$) 2012	Annual Design Value site & AQS ID	Daily Design Value[b] ($\mu g/m^3$) 2012	Daily Design Value site & AQS ID	Required SLAMS Monitors	Active SLAMS Monitors	Additional SLAMS Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	9.5	Oakland 060010009	25	Livermore 06010007	2	6[d]	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	9.1	San Jose 060850005	28	San Jose 060850005	2	3[e]	0
Santa Rosa-Petaluma	Sonoma	483,878	8.2	Santa Rosa 060970003	22	Santa Rosa 060970003	0	1	0
Vallejo-Fairfield	Solano	413,344	9.0	Vallejo 060950004	25	Vallejo 060950004	0	1	0
Napa	Napa	136,484	N/A[c]	N/A[c]	N/A[c]	N/A[c]	0	0[f]	0

a Annual design values are calculated at each monitoring site by taking the 3-year mean (2010-2012) of the annual averages for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ annual standard of 15 $\mu g/m^3$ indicate the area meets the standard.

b Daily design values are calculated by taking the 3-year mean (2010-2012) of the 98th percentiles for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ 24-hour standard of 35 $\mu g/m^3$ indicate the area meets the standard.

c There were no FRM or FEM $PM_{2.5}$ monitors in Napa County until December 2012, therefore there is no design value.

d Two sites are not counted in this table because they opened late in the year. Oakland West (opened on 12/18/12) and San Pablo (opened on 12/12/12).

e One of the three monitors is not in the BAAQMD. It is in Hollister which is in the Monterey Bay Unified Air Pollution Control District.

f. A FEM BAM began operation in Napa on December 10, 2012. There was no FRM/FEM monitoring for $PM_{2.5}$ in the Napa CBSA prior to this date but there was a non-FEM BAM. We are not counting the new FEM BAM toward the 2012 minimum monitoring requirements because it opened late in the year.

Table 5. Minimum Monitoring Requirements for $PM_{2.5}$ SLAMS in 2012 (2013 Rule)

CBSA	County or Counties	Pop. 2010 Census	Annual Design Value[a] ($\mu g/m^3$) 2012	Annual Design Value site & AQS ID	Daily Design Value[b] ($\mu g/m^3$) 2012	Daily Design Value site & AQS ID	Required SLAMS Monitors	Active SLAMS Monitors	Additional SLAMS Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	9.5	Oakland 060010009	27	Concord 060130002	2	6[d]	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	9.1	San Jose 060850005	32	San Jose 060850005	3	3[e]	0
Santa Rosa-Petaluma	Sonoma	483,878	8.2	Santa Rosa 060970003	22	Santa Rosa 060970003	0	1	0
Vallejo-Fairfield	Solano	413,344	9.0	Vallejo 060950004	26	Vallejo 060950004	0	1	0
Napa	Napa	136,484	N/A[c]	N/A[c]	N/A[c]	N/A[c]	0	0[f]	0

a Annual design values are calculated at each monitoring site by taking the 3-year mean (2010-2012) of the annual averages for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ annual standard of 12 $\mu g/m^3$ indicate the area meets the standard.

b Daily design values are calculated by taking the 3-year mean (2010-2012) of the 98th percentiles for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ 24-hour standard of 35 $\mu g/m^3$ indicate the area meets the standard.

c There were no FRM or FEM $PM_{2.5}$ monitors in Napa County until December 2012, therefore there is no design value.

d Two sites are not counted in this table because they opened late in the year. Oakland West (opened on 12/18/12) and San Pablo (opened on 12/12/12).

e One of the three monitors is not in the BAAQMD. It is in Hollister which is in the Monterey Bay Unified Air Pollution Control District.

f. A FEM BAM began operation in Napa on December 10, 2012. There was no FRM/FEM monitoring for $PM_{2.5}$ in the Napa CBSA prior to this date but there was a non-FEM BAM. We are not counting the new FEM BAM toward the 2012 minimum monitoring requirements because it opened late in the year.

Table 6. Minimum Monitoring Requirements for continuous $PM_{2.5}$ monitors (2013 rule).

CBSA	County or Counties	Pop. 2010 Census	Annual Design Value[a] ($\mu g/m^3$) 2012	Annual Design Value site & AQS ID	Daily Design Value[b] ($\mu g/m^3$) 2012	Daily Design Value site & AQS ID	Required Continuous Monitors	Active Continuous Monitors	Additional Continuous Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	9.5	Oakland 060010009	27	Concord 060130002	1	7[d]	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	9.1	San Jose 060850005	32	San Jose 060850005	2	3[e]	0
Santa Rosa-Petaluma	Sonoma	483,878	8.2	Santa Rosa 060970003	22	Santa Rosa 060970003	0	1	0
Vallejo-Fairfield	Solano	413,344	9.0	Vallejo 060950004	26	Vallejo 060950004	0	2	0
Napa	Napa	136,484	N/A[c]	N/A[c]	N/A[c]	N/A[c]	0	1[f]	0

a Annual design values are calculated at each monitoring site by taking the 3-year mean (2010-2012) of the annual averages for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ annual standard of 15 $\mu g/m^3$ (12.0 $\mu g/m^3$ for 2013) indicate the area meets the standard.

b Daily design values are calculated by taking the 3-year mean (2010-2012) of the 98th percentiles for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ 24-hour standard of 35 $\mu g/m^3$ indicate the area meets the standard.

c There were no FRM or FEM PM2.5 monitors in Napa County until December 2012, therefore there is no design value, (see note f below as well).

d One of the seven continuous monitors is at Point Reyes and is operated by the California Air Resources Board. Two sites opened in December 2012, San Pablo and Oakland West and are not counted in this total. In January 2013, Concord added a continuous monitor and it also is not counted in this total.

e One of the three continuous monitors is not in the BAAQMD. It is at Hollister operated by the Monterey Bay Unified Air Pollution Control District.

f This instrument was a non-FEM BAM from January 1, 2012 through December 5, 2012. It was replaced by a FEM BAM which began operation on December 10, 2012.

Minimum monitoring requirements for Collocated $PM_{2.5}$

Collocation requirements for $PM_{2.5}$ monitoring are based on the number of $PM_{2.5}$ monitors within a Primary Quality Assurance Organization (PQAO) by measurement method (FRM or FEM). The BAAQMD is its own PQAO so monitoring locations outside of the BAAQMD are not counted in the collocation requirements show in Table 7, Table 8, and Table 9 below.

Table 7. Collocated $PM_{2.5}$ monitors for FRM method 145 in 2012.

Time Period in 2012	Method Code	# Primary Monitors in PQAO and site	# Required Collocated Monitors in PQAO	Location of Collocated Monitoring	# Active Collocated FRM Monitors in PQAO
Jan-Sep	145	2 Concord San Jose	1	Concord	1
Oct-Dec	145	1 Concord	1	Concord	1

Table 8. Collocated $PM_{2.5}$ monitors for FEM method 170 in 2012.

Time Period in 2012	Method Code	# Primary Monitors in PQAO	# Required Collocated Monitors in PQAO	# Active Collocated With FRM Monitors in PQAO	# Active Collocated FEM Monitors (same method designation as primary) in PQAO
Jan-Sep	170	9	1	1 Redwood City	0
Oct-Dec	170	9	1	1 San Jose	0

Note that three FEM BAMs (method code 170) went into operation in the middle of December 2012 and are not counted in this table. They are counted in the table below which pertains to 2013.

Table 9. Collocated $PM_{2.5}$ monitors for FEM method 170 in 2013.

Time Period in 2012	Method Code	# Primary Monitors in PQAO	# Required Collocated Monitors in PQAO	# Active Collocated With FRM Monitors in PQAO	# Active Collocated FEM Monitors (same method designation as primary) in PQAO
Jan-Dec	170	12	2	1 San Jose	1 Vallejo

In 2012, the BAAQMD operated a primary and collocated FRM at Concord all year. From January through September, the BAAQMD operated a FRM collocated monitor at Redwood City with a FEM as primary. From October through December the location of collocated FRM/FEM pair was changed from Redwood City to San Jose because San Jose has the highest design value for $PM_{2.5}$ in the Bay Area and a FEM became operational at San Jose on October 1.

When the San Jose FEM became operational in October, the existing FRM at San Jose was changed from primary (POC 1) to collocated in the EPA AQS database. However, BAAQMD decided to maintain the POC 1 designation of the FRM at San Jose. Ideally, a FRM collocated monitor would be designated as POC 2 but maintaining the designation as POC 1 is permitted by EPA policy memos and it was simpler to not change the POC due to complications with internal and external databases. In summary, effective October 1, 2012, the San Jose FEM was primary (POC 3) and the FRM was collocated (POC 1).

Although this document is not intended to cover 2013, we do want to clarify that in January 2013, the FRM/FRM pair at Concord was replaced with a single primary FEM and the Bay Area no longer had any primary FRMs in its PQAO. As a result, for 2013, there is no collocation requirement to operate FRM/FRM primary/collocated samplers in the Bay Area. However, because of the increased number FEM monitors in 2013, the Air District is required to operate a FEM/FEM primary/collocated monitoring pair and this is at Vallejo. Also in 2013, San Jose will continue to operate a FEM/FRM collocation pair. Historically, San Jose and Vallejo have had the first and second highest design values for $PM_{2.5}$ in the Bay Area.

Minimum Monitoring Requirements for PM_{10}

The number of required PM_{10} monitors in each CBSA is specified in Table D-4 of Appendix D to 40 CFR Part 58. Table 10 shows that the Air District monitoring network meets or exceeds the PM_{10} minimum monitoring requirements[a]. No additional monitors are required for the State Implementation Plan (SIP) or Maintenance Plan because the Bay Area has never been designated as non-attainment for PM_{10}, and no SIP or Maintenance Plans have been prepared for PM_{10}.

Table 10. Minimum Monitoring Requirements for PM_{10} for 2012

CBSA	County or Counties	Pop. 2010 Census	Highest 24-hr conc. ($\mu g/m^3$) 2012	Highest 24-hr conc. site & AQS ID	Monitors Required[a]	Monitors Active	Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	51	Bethel Island 060131002	2	5	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	105	Hollister 060690002	2	2[b]	0
Santa Rosa-Petaluma	Sonoma	483,878	35	Healdsburg 060970002	0	3[c]	0
Vallejo-Fairfield	Solano	413,344	26	Vacaville 060953001	0	1[d]	0
Napa	Napa	136,484	36	Napa 060550003	0	1	0

a For PM_{10} in the Bay Area, the number of monitors required depends on the population of the CBSA and whether the ambient concentration of PM_{10} exceed 80% of the 150 $\mu g/m^3$ NAAQS. No stations in the CBSAs listed exceed the 80% threshold. Therefore, the minimum monitoring requirement is determined from Table D-4 of Appendix D, Part 58 of 40 CFR under the "low concentration" category.

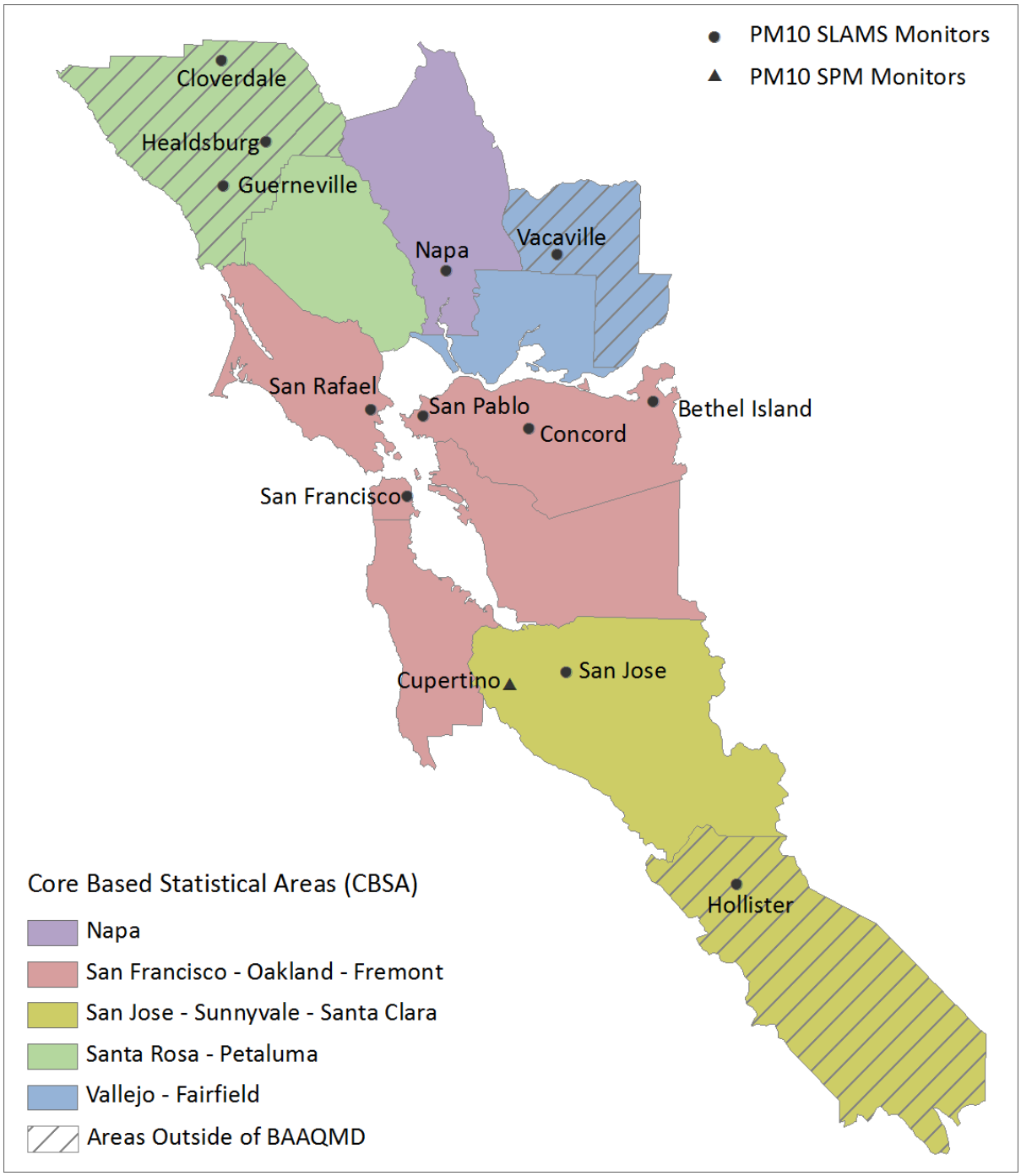
b One of the two monitors is not in the BAAQMD. It is in Hollister which is in the Monterey Bay Unified Air Pollution Control District.

c These monitors are not in the BAAQMD. They are in Healdsburg, Guerneville, and Cloverdale; and all are in the Northern Sonoma Air Pollution Control District.

d This monitor is not in the BAAQMD. It is in Vacaville which is in the Yolo-Solano Air Quality Management District.

A map showing PM_{10} monitoring locations in the San Francisco Bay Area in 2012 is shown in Figure 6 below.

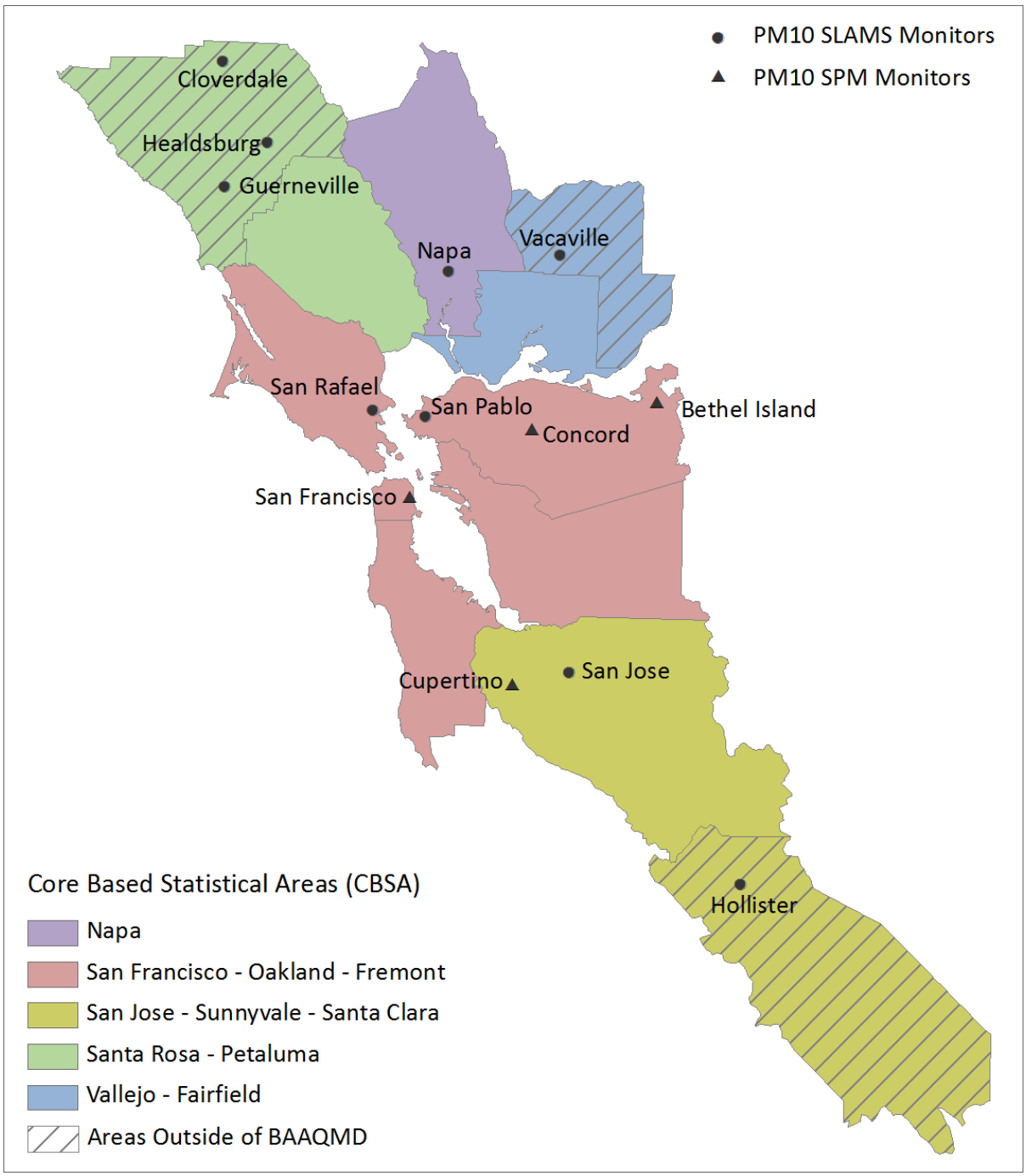
Figure 6. PM_{10} monitoring in the San Francisco Bay Area in 2012.



Effective January 1, 2013 PM_{10} monitoring at Bethel Island, Concord, and San Francisco was changed from 1:6 to 1:12 as shown in Figure 7. Because the Air District is no longer

monitoring on the SLAMS 1:6 schedule, these sites were changed to Special Purpose Monitors (SPM). The Air District will still meet PM_{10} minimum monitoring requirements for the San Francisco-Oakland-Fremont CBSA in 2013 because 1:6 SLAMS monitoring will continue at San Pablo and San Rafael and only two sites are required. Changing the monitors from SLAMS to SPM with a 1:12 sampling schedule was approved by EPA Region 9 on January 10, 2013 as shown in Appendix C.

Figure 7. PM_{10} monitoring in the San Francisco Bay Area in 2013.



Shared Particulate Monitoring Agreement with Monterey Air District
The Bay Area network shares particulate monitoring responsibilities with the Monterey Bay Unified Air Pollution Control District in the San Jose–Sunnyvale–Santa Clara CBSA. The agreement to share PM_{10} monitoring responsibilities is presented in Appendix B.

Minimum monitoring requirements for Collocated PM_{10}

40 CFR, Part 58, Appendix A requires each network of manual PM_{10} samplers to have collocated monitoring at 15% (or at least one) of the monitoring sites within a PQAO. The PM_{10} network in the Bay Area uses one sampling method for manual samplers. Two method codes are used for AQS data submittal because the instruments came from two different manufactures, but they employ the same method. At San Jose, the sampler is an automated low volume $PM_{2.5}$ instrument with the cyclone modified for measurement of PM_{10} and is not subject to the collocation requirement. Table 11 summarizes the collocation for PM_{10} in 2012 and 2013 in the Bay Area.

Table 11. Collocated PM_{10} monitoring in the Bay Area in 2012 & 2013

Year	Method Code	# Primary SLAMS Manual Monitors in PQAO	# Required SLAMS Collocated Manual Monitors in PQAO	# Active SLAMS Collocated Manual Monitors in PQAO
2012	063/141	6	1	1 Napa
2013	063/141	3[a]	1	1 Napa

a. There are three fewer primary PM_{10} monitors in 2013 compared to 2012 because the sampling frequency at Bethel Island, Concord, and San Francisco was reduced to 1:12 and these monitors can longer be considered SLAMS.

Although the Napa collocated sampler is only required to operate on a 1:12 schedule, the Bay Area operates the sampler 1:6 throughout the year.

Minimum Monitoring Requirements for SO_2

The number of required SO_2 monitors in each CBSA is proportional to the product of the total amount of SO_2 emissions in the CBSA and its population as specified in 40 CFR Part 58, Appendix D, Section 4.4. The resulting value is defined as the Population Weighted Emissions Index (PWEI). SO_2 emissions are from the 2008 National Emissions Inventory (NEI). Table 12 shows that the Air District monitoring network meets or exceeds the SO_2 minimum monitoring requirements.

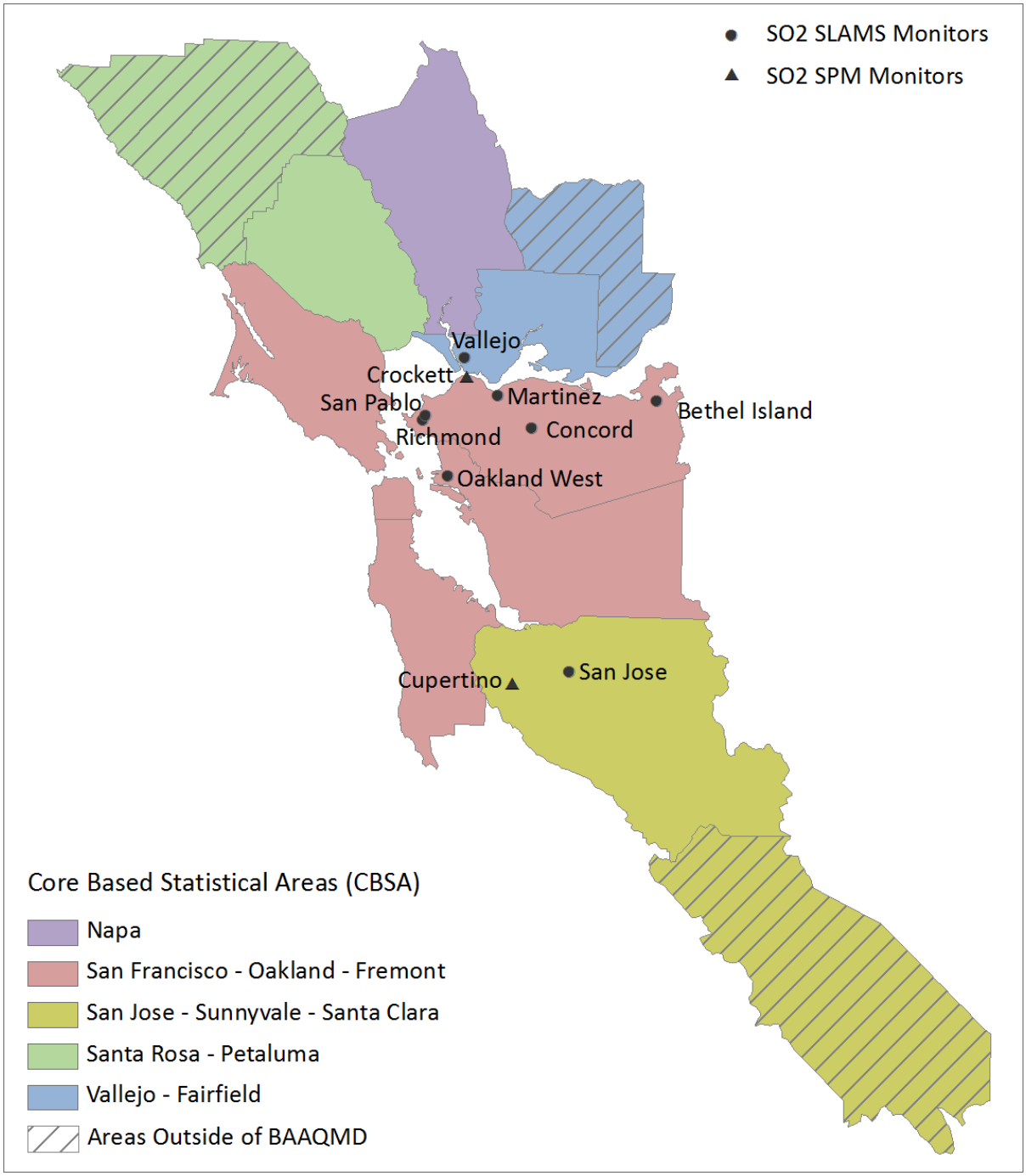
No additional SO_2 monitors are required for SIP or Maintenance Plans because the Air District has never been designated as non-attainment for SO_2 and no SIP or maintenance plans have been prepared for SO_2. In 2012 the Air District operated eight permanent SO_2

monitors in its SLAMS network and two SO_2 monitors at SPM sites which are shown in Figure 8.

Table 12. Minimum Monitoring Requirements for SO_2 in 2012.

CBSA	County or Counties	Pop. 2010 Census	Total SO_2 (tons/yr) 2008	PWEI (million-person-tons/yr)	Monitors Required	Monitors Active	Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	12666	54912	1	6	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	707	1299	0	1	0
Santa Rosa-Petaluma	Sonoma	483,878	177	86	0	0	0
Vallejo-Fairfield	Solano	413,344	5459	2256	0	1	0
Napa	Napa	136,484	44	6	0	0	0

Figure 8. SO_2 monitoring in the San Francisco Bay Area in 2012



Minimum Monitoring Requirements for NO_2

On April 12, 2010 EPA revised the minimum monitoring requirements for NO_2 in 40 CFR Part 58, Appendix D, Section 4.3 and required the Air District to operate NO_2 monitors at population-oriented sites and at sites within 50 meters of major freeways (near-road sites). In addition, the new rule required the EPA Regional Administrations to require an additional 40 sites nationwide to monitor NO_2 in areas with susceptible and vulnerable populations by January 1, 2013.

On March 14, 2013, EPA updated the implementation date for near-road monitoring sites. The first near-road monitoring site within a CBSA had to be operational by January 1, 2014 and the second within a CBSA, if required, had to be operational by January 1, 2015.

Based on Bay Area population and traffic counts, the Air District is required to operate at least two monitors sited to measure the area-wide NO_2 concentrations (by January 1, 2013) and three near-road monitoring sites (two required by January 1, 2014 and one additional monitor by January 1, 2015). A more complete discussion of near-road monitoring sites and the Air Districts proposed sites are included in Appendix D.

No additional monitors were required for the SIP or Maintenance Plans because the Air District had not been designated as non-attainment for NO_2 and no SIP or maintenance plans were prepared for NO_2.

In 2012, the Air District operated 15 area-wide NO_2 monitors in the Bay Area (13 SLAMS sites plus two SPM sites). None of the near-road sites were operational in 2012 as approval of the sites is still pending and they are not required until 2014. The Oakland West air monitoring site is one of the forty nationwide sites for monitoring NO_2 in areas with susceptible and vulnerable populations.

Table 13 shows the minimum NO_2 monitoring requirements.

Table 13. Minimum Monitoring Requirements for NO_2.

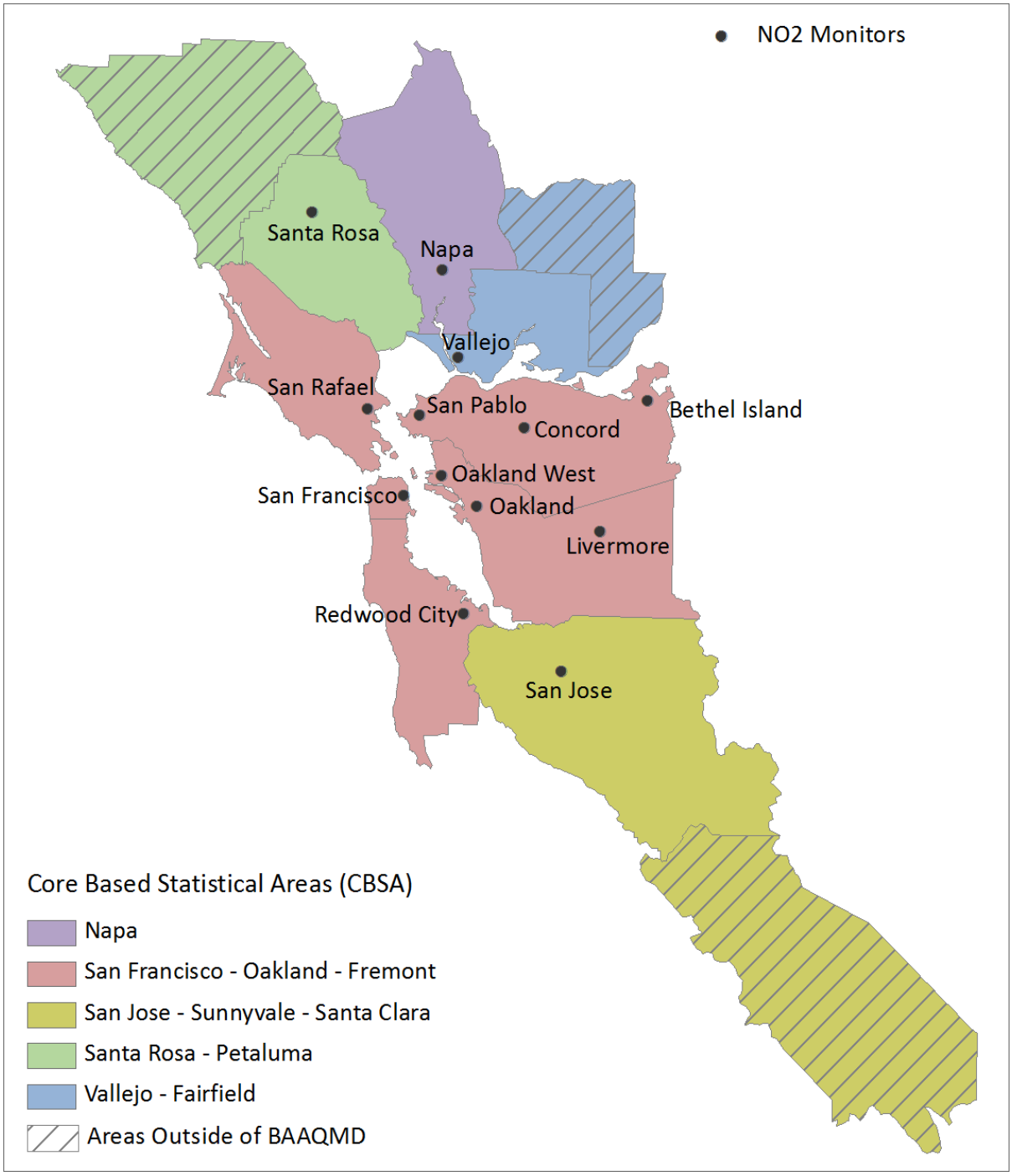
CBSA	County or Counties	Pop. 2010 Census	Annual Design[a] Value (ppb) 2012	Daily Design[b] Value (ppb) 2012	Area-wide Monitors Required (2013) / Near-road Monitors Required (2014-15)	Area-wide Monitors Active / Near-road Monitors Active	Area-wide Monitors Needed / Near-road Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	15	74	1[c]	9	0
					2	0	2
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	13	50	1	1	0
					1	0	1
Santa Rosa-Petaluma	Sonoma	483,878	9	36	0	1	0
					0	0	0
Vallejo-Fairfield	Solano	413,344	9	41	0	1	0
					0	0	0
Napa	Napa	136,484	8	37	0	1	0
					0	0	0

[a] Annual design values are determined for each monitoring site by calculating the arithmetic average of all of the reported 1-hour values for the most current year. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national NO_2 annual standard of 53 ppb meet the standard.

[b] Daily design values are calculated at each monitoring site by taking the 3-year mean (2010-2012) of the 8th highest daily maximum 1-hour concentration. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national NO_2 1-hour standard of 100 ppb meet the standard.

[c] One area-wide monitor is required however the Oakland West monitoring site was selected as one of the 40 nationwide sites for monitoring near susceptible and vulnerable populations. Therefore, there are two required for this CSBA (one based on population and one for Regional Administrator Required Monitoring).

Figure 9. NO_2 Monitoring in the San Francisco Bay Area in 2012



Minimum Monitoring Requirements for CO

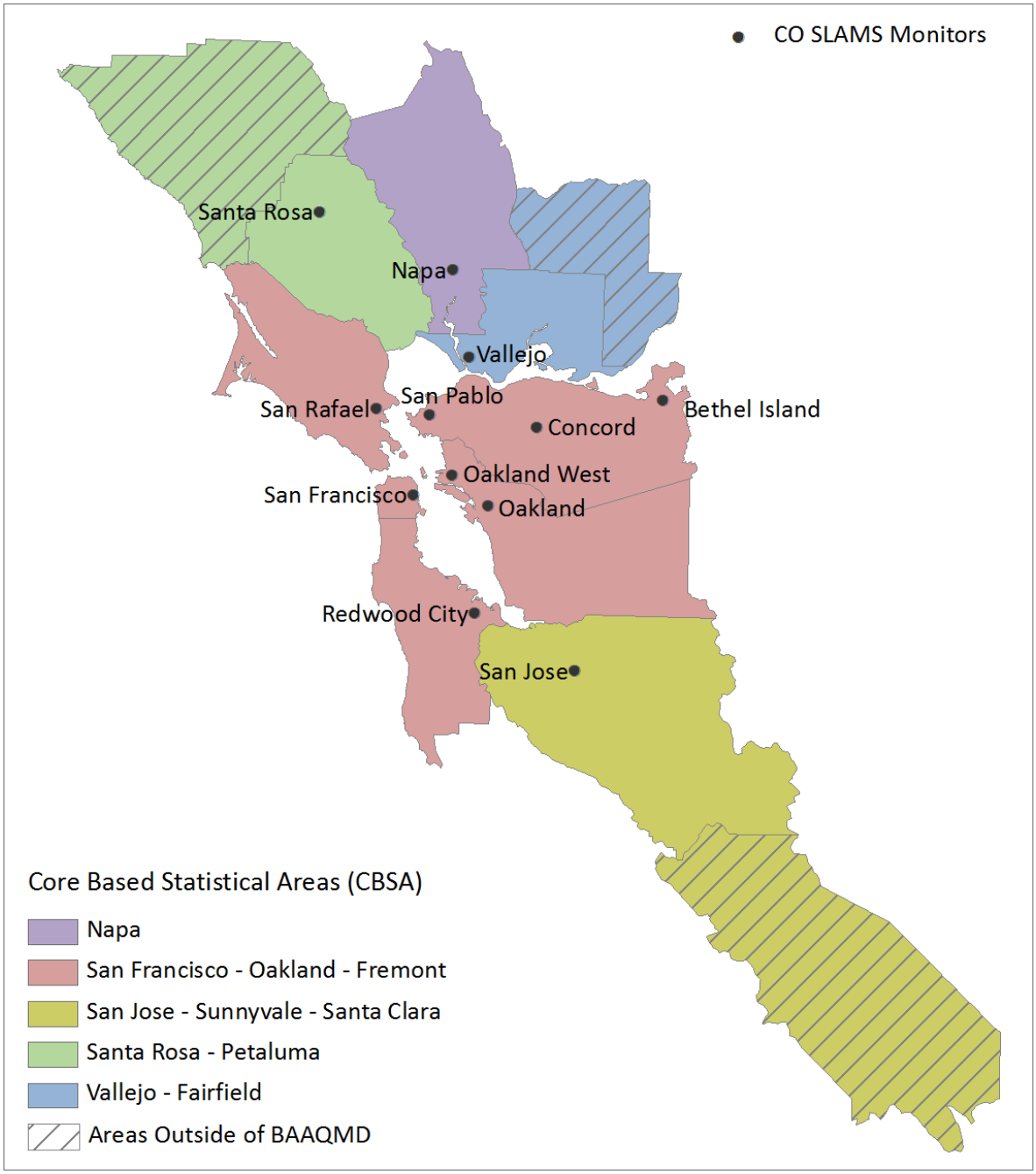
Effective October 31, 2011, 40 CFR Part 58, Appendix D was revised for Carbon Monoxide (CO) monitoring. The new rule requires one CO monitor to operate collocated with a near-road NO_2 monitor by January 1, 2015 in CBSAs having a population of 2,500,000 or more. If a CBSA is required to have more than one near-road NO_2 monitor, only one CO monitor is required to be collocated with the NO_2 monitor within that CBSA. Additionally, in CBSAs with a population between 1 and 2.5 million, a CO monitor is required to be collocated with a near-road NO_2 monitor by January 1, 2017. There are no other minimum requirements for CO monitoring as shown in Table 14. The Air District intends to operate collocated CO monitors with all required near-road NO_2 monitors.

The Air District was re-designated attainment for the CO 8-hour NAAQS in 1998. The Air District CO maintenance plan is contained within the California Air Resource Board document "2004 Revision to the California State Implementation Plan for Carbon Monoxide." The plan does not specify the number of CO monitors needed. The Air District operates one CO monitor within each of the nine Bay Area counties plus additional CO monitors in large cities. There are currently 9 CO monitors in the SLAMS network and 4 other SPM CO monitors in the San Francisco Bay Area as shown in Figure 10.

Table 14. Minimum Monitoring Requirements for CO.

CBSA	County or Counties	Pop. 2010 Census	Near-Road Monitors Required (2015-2017)	Near-Road Monitors Active	Near-Road Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	1	0	1
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	1	0	1
Santa Rosa-Petaluma	Sonoma	483,878	0	0	0
Vallejo-Fairfield	Solano	413,344	0	0	0
Napa	Napa	136,484	0	0	0

Figure 10. CO monitoring the San Francisco Bay Area in 2012



Minimum Monitoring Requirements for Lead

40 CFR Part 58, Appendix D, Section 4.5 requires lead monitoring near sources expected to contribute to a maximum lead concentration in ambient air in excess of the NAAQS. In the Bay Area there are no sources meeting this criteria according to the 2008 National Emissions Inventory (NEI). However, additional sections of 40 CFR do require source oriented

monitoring near three airports in the Bay Area (Palo Alto, San Carlos, and Reid-Hillview) because emissions from piston engine aircraft using leaded fuel may approach 0.50 tons per year. One of the airport lead monitoring sites is also required to operate a collocated sampler. Additionally, lead monitoring is required at San Jose because it is an NCore monitoring location. Minimum monitoring requirements for source oriented lead at airports and the population oriented NCore site at San Jose are provided in Table 15, Table 16 and Table 17.

Table 15. Source Oriented lead monitoring at airports.

Source Name	Address	Pb Emissions (tons/yr)	Emission Inventory Source Data & Yr	Monitors Required	Monitors Active	Monitors Needed
San Carlos Airport	620 Airport Dr. San Carlos 94070	0.53	NEI/2008	1	1	0
Palo Alto Airport	1925 Embarcadero Rd. Palo Alto 94303	0.66	NEI/2008	1	1	0
Reid-Hillview Airport	2500 Cunningham Ave. San Jose 95148	0.53	NEI/2008	1	1	0

Table 16. Collocated Source Oriented lead monitoring at airports.

Source Name	Address	Pb Emissions (tons/yr)	Emission Inventory Source Data & Yr	Collocated Monitors Required	Monitors Active	Monitors Needed
San Carlos Airport	620 Airport Dr. San Carlos 94070	0.53	NEI/2008	1	1	0

Table 17. Minimum Monitoring Requirements for lead at NCore (not Source Oriented).

NCore Site	CBSA	Pop. 2010 Census	Monitors Required	Monitors Active	Monitors Needed
San Jose	San Jose-Sunnyvale-Santa Clara	1,836,911	1	1	0

Modifications Made to Network in 2012

Airport Lead Monitoring (source oriented)

Airport lead monitoring began on February 3, 2012 at Palo Alto and Reid-Hillview airports; and on March 10, 2012 at San Carlos airport. The San Carlos site has both a primary and a collocated sampler. At all sites, samplers operate on a 1:6 schedule except for the collocated sampler at San Carlos which operates on a 1:12 schedule.

Reclassification of Monitor Type

Oakland, San Pablo, and San Rafael: Ozone monitoring scales are middle scale. Following an EPA Region 9 review of the distance between the gaseous probe and the roadway, and the corresponding traffic volume, Region 9 suggested these monitors be changed from SLAMS to SPM and the Air District agreed to the change. Consequently, these monitors cannot be used for ozone minimum monitoring requirements.

Napa: The ozone monitor at Napa was not changed to middle scale although Region 9 initially suggested it in their review of the 2011 Annual Network Plan. Instead, the Air District completed a study and presented arguments for keeping this monitor classified as a neighborhood scale SLAMS monitor. Region 9 approved the waiver request to continue this monitor as neighborhood scale. The waiver request and the wavier approval documents are presented in Appendix E.

Photochemical Assessment Monitoring Stations (PAMS)

EPA is funding hourly VOC speciated hydrocarbon measurements at three sites in the Bay Area: Livermore, Patterson Pass, and San Ramon. The Livermore and Patterson Pass sites were operational prior to 2012. At San Ramon, NOx monitoring began on January 1, 2012 and VOC speciated hydrocarbon monitoring began on May 1, 2012.

PM2.5 Monitoring

Napa: The non-FEM BAM was shut down on December 5, 2012 and was replaced by a FEM BAM which began operation on December 13, 2012. The FEM BAM is classified as middle scale based on its distance from the roadway and nearby traffic volume. However, the Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations in the Napa CBSA.

Oakland West: The non-FEM BAM was shut down on December 10, 2012 and was replaced by a FEM BAM which began operation on December 18, 2012. The FEM BAM is classified as middle scale based on its distance from the roadway and nearby traffic volume.

Redwood City: On September 30, 2012 the collocated $PM_{2.5}$ FRM instrument was shut down. The Bay Area $PM_{2.5}$ monitoring network is only required to operate one site with a FRM/FEM pair and effective October 1, 2012 that pairing was shifted to San Jose. San Jose is the NCore site for the Bay Area and San Jose has the highest $PM_{2.5}$ design value in the Bay Area.

San Jose: On October 1, 2012 the existing $PM_{2.5}$ non-FEM BAM was replaced with a $PM_{2.5}$ FEM BAM (POC3). Also on October 1, 2012 the existing FRM was changed from primary to collocated but remained POC1 in the AQS database. This sampler operated on a 1:3 schedule from October 1, 2012 to the end of the year although only 1:12 was required for a collocated FRM. The 1:3 schedule was needed to support NCore requirements to report PM coarse every 3rd day.

San Pablo: A $PM_{2.5}$ FEM BAM began operation on December 12, 2012. The FEM BAM is classified as middle scale based on its distance from the roadway and nearby traffic volume. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations.

San Rafael: The FEM BAM that has operated since 2009 was reclassified as middle scale based on its distance from the roadway and nearby traffic volume. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations.

Ultrafine particulate

Ultrafine particulate (UFP) are nanoscale particles with sizes less than 100 nanometers or 0.1 microns. Monitoring for UFP began at San Pablo in February 2012; Redwood City and Santa Rosa in April 2012; and Livermore in May 2012.

Proposed Modifications to Network in 2013-2014

Bethel Island:

This site was shut down temporarily to construct a new monitoring station on the existing site because the monitoring trailer had deteriorated over the years. The shutdown began on May 8th, 2013. The site is expected to be back in full operation by July 31, 2013.

Cupertino Monta Vista

The Air District will discontinue this site at the end of 2013 after the completion of a three year monitoring study.

Forest Knolls

The Air District began monitoring Black Carbon (BC) in the in the San Geronimo Valley of Marin County in January 2013. This monitoring will help understand and characterize the wood smoke source category in sheltered valley locations where winter wood burning often is the primary source of home heating.

Near-Road Monitoring (NO_2, CO, PM2.5, and Ultrafine Particles)

Based on CBSA population, the Air District is required to operate three near-road NO_2 monitoring sites. Two are required in the San Francisco-Oakland-Fremont CBSA (one operational by January 1, 2014 and the other by January 1, 2015) with another required in the San Jose-Sunnyvale-Santa Clara CBSA, operational by January 1, 2014. Although only one near-road CO and $PM_{2.5}$ monitor is required in each CBSA collocated with the NO_2 monitor,

the Air District will collocate CO and $PM_{2.5}$ monitors with all near-road NO_2 monitors. EPA has a staggered schedule for CO and $PM_{2.5}$ to become operational but the Air District intends to collocate CO and $PM_{2.5}$ when the NO_2 near-road monitors are operational.

Ultrafine particulate monitoring (UFP) is not required by EPA regulations but the Air District intends to equip each near-road monitoring site with instrumentation capable of detecting nanoscale particles with sizes less than 0.1 microns (100 nanometers). Toxics monitoring may also be included at all sites if staff resources permit. A description of proposed near-road monitoring locations can be found in Appendix D.

Lead

Lead monitoring began in Redwood City near the San Carlos Airport in March 2013. This site is called Redwood City – Twin Dolphin and monitoring will continue every 6th day for one year unless monitoring results indicate that additional monitoring is needed.

NO2 Regional Administrator (RA) monitoring

Effective January 1, 2013, the Oakland West site became one of the forty nationwide sites for community monitoring of NO_2 in areas with susceptible and vulnerable populations.

PM2.5 Monitoring

Collocation: Effective January 1, 2013 the Bay Area has two collocated $PM_{2.5}$ instruments. One is at San Jose (a FEM/FRM pair) and the other is at Vallejo (a FEM/FEM pair). San Jose and Vallejo have traditionally had the first and second highest design values for $PM_{2.5}$ in the Bay Area, although they occasionally swap positions from year to year. Because the Bay Area monitoring network operates no FRM monitors as primary, there is no requirement to operate a FRM/FRM pair.

Concord: The primary and collocated $PM_{2.5}$ FRM samplers were shut down at the end of 2012. A FEM BAM began operation on January 1, 2013.

San Jose: On January 1, 2013, the FRM (collocated, POC1) sampling schedule was changed in AQS from 1:3 to 1:6 but raw data continues to be reported to AQS on a 1:3 schedule. The required frequency for this collocated sampler is 1:12 but sampling every 3rd day is required for the NCore program. We opted to show this monitor as 1:6 to be consistent with the sampling frequency for PM_{10}.

Vallejo: On January 1, 2013 a collocated $PM_{2.5}$ FEM BAM began operation. This site now runs two FEM BAM instruments: a primary (previously existing) and a collocated (new) for quality assurance purposes. Vallejo was selected for collocation because this site has one of the highest $PM_{2.5}$ design values in the Bay Area.

PM10 monitoring

Bethel Island, Concord, and San Francisco: The sampling frequency was reduced from 1:6 to 1:12 effective January 1, 2013. These monitors were reclassified from SLAMS to SPM because they do not meet SLAMS sampling frequency requirements. These monitors will not be counted for PM_{10} minimum monitoring requirements in

2013. The change was done to better utilize personnel resources noting that this pollutant is not a significant contributor to pollution in the Bay Area.

Effective January 1, 2013, the San Jose PM10 sampler frequency was changed to 1:6 but raw data continues to be reported to AQS on a 1:3 schedule. This adjustment was done to clarify that the minimum required PM10 frequency is not 1:3, but 1:6 thus allowing the use of the 1:3 extra samples to be counted as make-up samples in EPA AQS report summaries. When a sampler operates on a 1:3 schedule, make-up samples are required before the next scheduled sample date, which makes doing make-ups very impractical.

Removing a NAAQS Compliance Monitor

When the Air District proposes changes to the air monitoring network, the proposed changes are included in the Annual Monitoring Network Plan. The Annual Monitoring Network Plan is posted on the Air District web site for 30 days for public comment on the proposed changes. After the public comment period, the Air District reviews and considers the comments before making a final decision on a change to air monitoring network. The Air District submits the Annual Monitoring Network Plan with public comments to the EPA Region 9 Regional Administrator by July 1 each year.

Before shutting down a SLAMS (State or Local Air Monitoring Station) monitor, 40 CFR Part 58.14c requires that the Air District obtain the Regional Administrator's written approval. The Regional Administrator will normally approve the shutdown of a SLAMS monitor when any of the following situations apply:

1) Criteria pollutant monitors which have shown attainment of the national standards during the previous five years may be removed if the probability is less than 10% that the monitor will exceed 80% of NAAQS during the next three years, and if the monitor is not required by an attainment or maintenance plan.
2) CO, PM_{10}, SO_2, or NO_2 monitors may be removed if the monitor has shown consistently lower concentrations than another monitor for the same pollutant in the same county during the previous five years.
3) Criteria pollutant monitors that have not violated the national standards in the most recent five years may be removed if the State Implementation Plan (SIP) provides a method of representing the air quality in the applicable county.
4) $PM_{2.5}$ monitors may be removed when EPA determines that measurements are not comparable to the relevant NAAQS because of siting issues.
5) Criteria pollutant monitors which are located upwind of an urban area to characterize transport may be removed if the monitor has not recorded violations of the relevant NAAQS in the previous five years, and if the monitor is being replaced by another monitor that characterizes transport.
6) Criteria pollutant monitors not eligible for removal under any of the above criteria may be moved to a nearby location with the same scale of representation if logistical problems beyond the agency's control make it impossible to continue operation at its current site.

The closure of a SPM (Special Purpose Monitor) monitor does not require approval from EPA, but a change in the designation of a monitoring site from SLAMS to SPM requires approval of the Regional Administrator.

Data Submission Requirement

After all data review procedures are complete, the Air District submits monthly air quality and associated precision and accuracy reports to the EPA AQS database within 90 days of the end of every month. By May 1 each year, the Air District submits a data certification letter to Region 9 stating that the previous calendar year of data is complete and correct. The certification letter for 2012 data was submitted to EPA Region 9 on May 1, 2013.

Site Information Definitions

The next section describes each air quality station operated within the Bay Area Air Quality Management District. In 2012 there were 31 stations operating in the Air District. The station description includes siting information about the station and the individual monitors at the station. Monitors must be operated following EPA requirements found in 40 CFR Part 58. These regulations also specify monitor siting criteria.

Included in each site description is the number of days when a criteria pollutant measurement exceeded the National Ambient Air Quality Standard (NAAQS). The national standards for hourly and daily averaging times are shown in Table 18 below. Based on the past ten years of air monitoring data, only ozone and $PM_{2.5}$ are pollutants of interest to Bay Area residents because the other pollutants rarely, if ever, exceed the NAAQS. The table below is abbreviated for clarity. A full list of national and California air quality standards and the air district's attainment status for each pollutant can be viewed at: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm

Table 18. National Ambient Air Quality Standards (as of December 31, 2012)

Pollutant	Averaging Time	Standard
Ozone	8 hour	0.075 ppm
$PM_{2.5}$	24 hour	35 µg/m^3
PM_{10}	24 hour	150 µg/m^3
Carbon Monoxide	1 hour	35 ppm
	8 hour	9 ppm
Sulfur Dioxide	1 hour	75 ppb
Nitrogen Dioxide	1 hour	100 ppb
Lead	Rolling 3-month average	0.15 µg/m^3

More detailed information about NAAQS standards, including past standards, may be found at: http://epa.gov/air/criteria.html. Table 19 below lists the siting criteria for monitoring.

Table 19. Monitor Information and EPA Air Monitoring Siting Criteria.

Site or Monitor Information	Definition of Terms
AQS ID	The 9-digit code that identifies each site in the EPA's AQS database
GPS Coordinates (decimal degrees)	The latitude and longitude of the site from the World Geodetic System (WGS-84) used as the reference coordinate system for Global Positioning System (GPS).
Distance to roadways from the gaseous probe (meters)	*40 CFR Part 58 Appendix E, 6.0*: requires that monitors be located far enough from roadways to minimize local mobile impacts on measurements. Recommended distances are found in Table E-1 for NO_x and ozone, Table E-2 for CO, and Figure E-1 for PM.
Traffic Count	The annual average daily traffic (AADT) count.
Groundcover	*40 CFR Part 58 Appendix E, 3.0*: states that particulate samplers should not be located in an unpaved area unless there is vegetative ground cover year round, so that the impact of wind blown dusts will be kept to a minimum.
Statistical Area	The core based statistical area (CBSA) the site is located within.
Pollutant, POC	The pollutant being measured and its Parameter Occurrence Code (POC). There may be multiple instruments measuring a pollutant at a site. Each instrument is assigned a POC to differentiate it from the others in EPA's AQS database.
Parameter Code	The 5-digit code assigned to each pollutant in the EPA's AQS database.
Basic monitoring objectives(s)	The purpose for monitoring at that location. Choices include public information, NAAQS comparison, and research.
Site type(s)	Choices include extreme downwind, highest concentration, maximum ozone concentration, maximum precursor impact, population exposure, source oriented, upwind background, general background, regional transport, welfare-related impacts, quality assurance, other.
Monitor type(s)	Choice include IMPROVE, index site, industrial, NATTS, NCore, non-EPA Federal, PAMS, proposed NCore, QA Collocated, SLAMS, special purpose, supplemental speciation, trends speciation, tribal monitors, unofficial PAMS.
Instrument manufacturer and model	Details about the instrumentation used to measure the pollutant.
Method code	Based on the Instrument manufacture and model, a method code is assigned and is reported to the EPA AQS database system. *40 CFR Part 58 Appendix C, 2.0*: requires that the monitor used must be from EPA's current List of Designated Reference and Equivalent Methods.
FRM/FEM/ARM/other	A FRM is a federal reference method (the gold standard) for measuring a pollutant. A FEM is a federal equivalent method for measurement. Both are approved by EPA for use in air monitoring programs. ARM (approved regional method) instruments are not used in the Bay Area.
Collecting Agency	The agency that operates the instrument at a site. Usually this is the Air District but at some sites, such as Point Reyes, the California Air Resources Board operates an instrument within the Bay Area.
Analytical Lab	The agency that weighs particulate filters or does chemical or gas analysis of particulate filters and toxics compounds.
Reporting Agency	The agency that uploads air monitoring data to the EPA's AQS database.
Spatial scale	The relative distance over which the air pollution measurements are representative. Choices are micro, middle, neighborhood, urban, regional, national, or global scales.
Monitoring start date	The date valid data collection began for that pollutant at an air monitoring station.
Current sampling frequency	Describes if the monitor is operated continuously (hourly) or intermittently. Intermittent sampling is done for particulate matter collected by a filter and is either 1:1 (every day), 1:3 (every third day), 1:6 (every sixth day), etc. Toxics sampling is also done on an intermittent sampling schedule.
Calculated sampling frequency	If exceptional event exemptions were petitioned to EPA for exclusion in NAAQS attainment or required sample frequency calculations, this column describes the

Site or Monitor Information	Definition of Terms
	sampling frequency with exceptional events included and excluded.
Sampling season	The date range measurements were made. Some ozone sites in the Bay Area are not required to run during the winter.
Probe height (meters)	*40 CFR Part 58 Appendix E, 2.0*: requires that probe height be 2-15 meters above ground level (AGL).
Distance from supporting structure (meters)	*40 CFR Part 58 Appendix E, 2.0*: requires the probe be at least 1 meter vertically or horizontally away from any supporting structure.
Distance from obstructions on roof (meters)	*40 CFR Part 58 Appendix E, 4.0*: requires that the distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe or inlet. PM samplers must have a 2 meter separation from walls, parapets and structures. 4.0 (b)
Distance from obstructions not on roof (meters)	*40 CFR Part 58 Appendix E, 4.0*: requires that the distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe or inlet.
Distance from trees (meters)	*40 CFR Part 58 Appendix E, 5.0*: requires that probe be at least 10 meters from the nearest tree drip line.
Distance to furnace or incinerator flue (meters)	*40 CFR Part 58 Appendix E, 3.0*: requires that scavenging be minimized by keeping the probe away from furnace or incineration flues or other minor sources of SO_2 or NOx. The separation distance should take into account the heights of the flues, type of waste or fuel burned, and the sulfur content of the fuel.
Distance between collocated monitors (meters)	*40 CFR Part 58 appendix A, 3.2.5.6*: requires that PM monitors be 2-4 meters apart for flow rates >200L/m and have a 1-4 meter separation for flow rates <200 L/m.
Unrestricted airflow (degrees)	*40 CFR Part 58 Appendix E, 4.0*: requires the probe or inlet to have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.
Probe material for reactive gases	*40 CFR Part 58, Appendix E, 9.0*: requires that either Pyrex glass or FEP Teflon be used for intake sampling lines.
Residence time (seconds)	*40 CFR Part 58, Appendix E, 9.0*: recommends a residence time of 20 seconds or less for gaseous sampling.
Will there be changes within the next 18 months? (Y/N)	Describes if any changes are expected to occur to that monitor at that station within the next 18 months.
Is it suitable for comparison against the annual $PM_{2.5}$?	*40 CFR 58.30*: requires that $PM_{2.5}$ data that are representative, not of area-wide, but rather of relatively unique population-oriented micro-scale, localized hot spot, or unique population-oriented middle-scale impact sites are only eligible for comparison to the 24-hour $PM_{2.5}$ NAAQS.
Frequency of flow rate verification for manual PM samplers	*40 CFR 58, Appendix A, 3.3.2*: requires that a one-point flow rate verification check must be performed at least once every month for low-volume PM samplers and quarterly for hi-volume PM samplers.
Frequency of flow rate verification for automated PM analyzers	*40 CFR 58, Appendix A 3.2.3*: requires a one-point flow rate verification check must be performed at least once every month.
Frequency of one-point QC check (gaseous)	*40 CFR Part 58 Appendix A, 3.2.1*: requires that QC checks be performed at least once every two weeks.
Last Annual Performance Evaluation for gaseous parameters	*40 CFR Part 58 Appendix A, 3.2.2*: requires that SO_2, CO, O_3, and NO_2 monitors have annual performance evaluations. Section 3.2.7 requires that performance evaluations of PM monitors must be performed annually through the PEP (Performance Evaluation Program).
Last two semi-annual flow rate audits for PM monitors	*40 CFR Part 58 Appendix A, 3.2.4 (automated methods) and 3.3.3 (manual methods)*: require that PM samplers have flow rate checks every six months.

Detailed Site Information for SLAMS and SPM Sites

Bethel Island

Site Name	Bethel Island
AQS ID	06-013-1002
GPS coordinates	38.006311, 121.641918
Location	Trailer in parking lot
Address	5551 Bethel Island Rd, Bethel Island, CA 94511
County	Contra Costa
Distance to road from gaseous probe (meters)	Bethel Island Rd: 63 Sandmound Blvd: 110
Traffic count (AADT, year)	Bethel Island Rd: 5,550 (2009) Sandmound Blvd: 1,537 (2006)
Groundcover	Gravel surrounded by grassy fields
Statistical Area	San Francisco-Oakland-Fremont CBSA

Bethel Island was chosen for an air monitoring site to measure pollutant transport between the California Central Valley and the San Francisco Bay Area. The site is 26 miles east of the only sea-level gap (the Carquinez Strait) between the two regions. Local pollution emissions are low due to the rural nature of the area and the lack of any industrial sources within six miles of the site. The nearest town is Bethel Island, 0.6 miles to the north, with a population of 2,137 according to the 2010 census. The Bethel Island station was operated by CARB from 1981 until late 1986 and then it was transferred to the Air District.

Ozone and NO/NO_2 are measured because the area is in the transport corridor between the San Francisco Bay Area and the Central Valley, both of which are major sources of ozone, ozone precursors, and particulates. Traffic volume near the site is low, so CO measurements tend to be representative of natural background levels, or regional transport. SO_2 is measured because the area is downwind from numerous refineries, which can be large sources of SO_2. PM_{10} is measured because easterly winds occasionally transport particulates from the Central Valley, and because the filters can be analyzed to determine sulfate and nitrate levels transported from the Central Valley.

Toxic compounds are determined from canister samples taken at Bethel Island on a 1:12 schedule and later analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded 8 exceedances of the national 8-hour ozone standard and no exceedances of the national standards for PM_{10}, NO_2, SO_2, or CO.

PM_{10} monitoring was changed from 1:6 to 1:12 schedule effective January 1, 2013. Because the Bay Area is well above the minimum monitoring requirements for PM_{10}, it was decided to convert PM_{10} monitoring from SLAMS to SPM, thus allowing a less frequent monitoring schedule due to limited resources. Therefore, this monitor will no longer be counted in meeting PM_{10} minimum monitoring requirements after 2012.

This site was shut down temporarily to construct a new monitoring station on the existing site because the monitoring trailer had deteriorated over the years. The shutdown began on May 8th, 2013. The site is expected to be back in full operation by July 31, 2013.

Bethel Island Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**SO2, 1**	**PM10, 1**
Parameter code	44201	42101	42601 / 42602	42401	81102
Basic monitoring objectives(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Regional Transport & Highest Conc.	General Background	Regional Transport	Regional Transport	Regional Transport
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	TECO 43i	Andersen GUV-16HBLA
Method code	047	054	074	060	063
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM	FRM
Collecting Agency	Air District	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A	Air District
Reporting Agency	Air District	Air District	Air District	Air District	Air District
Spatial scale	Urban	Urban	Urban	Urban	Neighborhood
Monitoring start date	03/01/1981	03/01/1981	03/01/1981	03/01/1981	11/05/1986
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	1:6
Calculated sampling frequency	N/A	N/A	N/A	N/A	N/A – No EE Flags
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	6.7	6.7	6.7	6.7	5.2
Distance from supporting structure (meters)	3.0	3.0	3.0	3.0	1.5
Distance from obstructions on roof (meters)	None	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None	None
Distance from trees (meters)	13.3	13.3	13.3	13.3	14.4
Distance to furnace or incinerator flue (meters)	None	None	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	270	270	270	270	270
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	14	15	15	15	N/A
Will there be changes within the next 18 months?	N	N	N	N	Y
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day	N/A
Last Annual Performance Evaluation for gaseous parameters	10/23/2012	10/23/2012	10/23/2012	10/23/2012	N/A
Last two semi-annual flow rate	N/A	N/A	N/A	N/A	10/23/2012

audits for PM monitors					05/02/2012

Concord

Site Name	Concord
AQS ID	06-013-0002
GPS coordinates	37.936013, 122.026154
Location	One story commercial building
Address	2956-A Treat Blvd, Concord CA 94518
County	Contra Costa
Distance to road from gaseous probe (meters)	Treat Blvd: 181 Oak Grove Rd: 244 Interstate 680: 2971
Traffic count (AADT, year)	Treat Blvd: 41,600 (2008) Oak Grove Rd: 19,973 (2008) Interstate 680: 242,000 (2008)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Concord was chosen for an air monitoring site because it is the largest city in Contra Costa County, with a population of 122,067 according to the 2010 census; and because of the high pollution potential due to locally emitted and transported pollutants into the area. Since Concord is located in the Diablo Valley, locally emitted pollutants can become trapped when winds are light. Large emission sources in the valley include the two major freeways, Interstate 680 and California Highway 4; and two refineries at the north end of the valley.

The air monitoring site is located in the back of a shopping center, near the intersection of two major streets, and surrounded by residential neighborhoods. There is no industry in the immediate vicinity. NO/NO_2 is measured because of local mobile emissions.

Ozone is measured at the site because hot, inland summertime temperatures combined with precursor pollutants stagnating in the surrounding valley often produces high ozone levels. Carbon monoxide is measured because the site is near two major roads, Treat Blvd and Oak Grove Road. SO_2 is measured because the site is six miles south of the Tesoro and the Shell Refineries, both potential major sources of SO_2. PM_{10} and $PM_{2.5}$ are measured because light winds combined with surface-based inversions during the winter months can cause elevated particulate levels in the valley.

The primary FRM $PM_{2.5}$ sampler operated all year with a daily sample schedule in winter and a 1:3 schedule in summer. At the end of 2012, the primary sampler was closed and was replaced with a FEM BAM on January 1, 2013. The collocated FRM $PM_{2.5}$ sampler operated on a 1:6 schedule all year and was closed on December 31, 2012. As of January 1, 2013, the Bay Area no longer had any $PM_{2.5}$ FRM samplers as primary because over the past few years the entire network had been transitioned to FEM BAMs. Since there were no primary samplers using the FRM method, there was no requirement to continue operating the collocated FRM sampler.

PM_{10} monitoring was changed from 1:6 to 1:12 schedule effective January 1, 2013. Because the Bay Area is well above the minimum monitoring requirements for PM_{10}, it was decided to convert PM_{10} monitoring from SLAMS to SPM, thus allowing a less frequent monitoring schedule due to limited resources. Therefore, this site will no longer be counted in meeting PM_{10} minimum monitoring requirements after 2012.

VOC toxic compounds are sampled at Concord on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded five exceedances of the national 8-hour ozone standard, three exceedances of the national 24-hour $PM_{2.5}$ standard, and no exceedances of the national standards for $PM_{10,}$ $NO_{2,}$ SO_2, or CO.

Concord Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	SO2, 1
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objectives(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	TECO 43i
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	04/09/1980	02/21/1980	NO2: 02/21/1980 NO: 03/01/1980	02/21/1980
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	9.2	9.2	9.2	9.2
Distance from supporting structure (meters)	3.1	3.1	3.1	3.1
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	24.0	24.0	24.0	24.0
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	9	10	11	10
Will there be changes within the next 18 months?	No	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	07/31/2012	07/31/2012	07/31/2012	07/31/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

Concord Monitor Information

Pollutant, POC	**PM10, 1**	**PM2.5, 1**	**PM2.5, 2**
Parameter code	81102	88101	88101
Basic monitoring objectives(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure & Highest Conc.	Quality Assurance
Monitor type(s)	SLAMS	SLAMS	QA Collocated
Instrument manufacturer and model	Andersen HiVol 1200	Partisol-Plus 2025 w/VSCC	Partisol-Plus 2025 w/VSCC
Method code	063	145	145
FRM/FEM/ARM/other	FRM	FRM	FRM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	Air District	Air District	Air District
Reporting Agency	Air District	Air District	Air District
Spatial scale	Urban	Urban	Urban
Monitoring start date	11/04/1986	01/08/1999	01/01/2000
Current sampling frequency	1:6	Apr-Sep: 1:3 Oct-Mar: 1:1	1:6
Calculated sampling frequency	N/A – No EE Flags	N/A – No EE Flags	N/A – No EE Flags
Sampling season	01/01-12/31	01/01-12/31	01/01-12/31
Probe height (meters)	5.8	6.0	6.0
Distance from supporting structure (meters)	1.5	1.7	1.7
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	15.0	22.0	22.0
Distance to furnace or incinerator flue (meters)	None	None	None
Distance between collocated monitors (meters)	N/A	3.2	3.2
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A	N/A
Will there be changes within the next 18 months?	Y	Y	Y
Is it suitable for comparison against the annual PM2.5?	N/A	Y	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	Monthly	Monthly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	07/30/2012 01/25/2012	07/30/2012 01/25/2012	07/30/2012 01/25/2012

Crockett

Site Name	Crockett
AQS ID	06-013-1001
GPS coordinates	38.054920, 122.233229
Location	Pump house
Address	End of Kendall Avenue, Crockett CA 94525
County	Contra Costa
Distance to road from gaseous probe (meters)	San Pablo Ave: 68.4
Traffic count (AADT, year)	San Pablo Ave: 8,763 (2007)
Groundcover	Vegetative
Statistical Area	San Francisco-Oakland-Fremont CBSA

Crockett was chosen for SO_2 source oriented monitoring because it is downwind of the Phillips 66 Refinery. Prevailing winds in the area are from the west, which transport SO_2 emissions from the refinery over the town of Crockett, a predominately residential community with a population of 3,094 according to the 2010 census. The monitoring site is located on the west side of Crockett 0.9 miles northeast of the refinery boundary. The only other major industry near Crockett is C&H Sugar, which is not a significant source of SO_2 emissions.

VOC toxic compounds are sampled at Crockett on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Crockett is classified as an SPM site. EPA siting criteria specifies that the probe be located at least 10 meters from the drip line of all trees within the 180 degree arc of unrestricted airflow for source oriented monitoring as determined by the predominant wind direction and the direction of the refinery. The closest tree drip line within the 180 degree arc is less than 10 meters from the probe, which does not meet siting criteria. The Air District has been unable to negotiate with the local homeowner's association for the removal of this tree. Even though one of the siting criteria for a SLAMS site cannot be met, the site is still suitable for source oriented monitoring as an SPM site.

SO_2 concentrations measured at Crockett did not exceed the national 1-hour 75 ppb standard during the last three years.

Crockett Monitor Information

Pollutant, POC	**SO2, 1**
Parameter code	42401
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	Special Purpose
Instrument manufacturer and model	TECO 43C
Method code	060
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitoring start date	01/01/1979
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01 – 12/31
Probe height (meters)	6.2
Distance from supporting structure (meters)	2.4
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	1.2
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	270
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	10
Will there be changes within the next 18 months?	No
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers audit	N/A
Frequency of flow rate verification for automated PM analyzers audit	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Last Annual Performance Evaluation for gaseous parameters	10/17/2012
Last two semi-annual flow rate audits for PM monitors	N/A

[*] Closest tree within the 180 degree arc of unrestricted air flow for source oriented monitoring.

Cupertino Monta Vista Park

Site Name	Cupertino Monta Vista
AQS ID	06-085-2009
GPS coordinates	37.318435, 122.069705
Location	Trailer in parking lot
Address	22601 Voss Ave, Cupertino, CA 95104
County	Santa Clara
Distance to road from gaseous probe (meters)	Foothill Blvd: 91 Voss Ave: 63 McKlintock Lane: 118 Woodbridge Ct: 70
Traffic count (AADT, year)	Foothill Blvd: 8,960 (2009) Voss Ave: 1,000 (est. 2012) McKlintock Lane: 200 (est. 2012) Woodbridge Ct: 1,000 (est. 2012)
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

The Air District began a three year ambient air monitoring study in Cupertino on September 1, 2010 to determine the pollution impacts to local residents from vehicle traffic and the Lehigh Cement Plant located one mile west of the site. According to the 2010 census, the City of Cupertino has a population of 58,302. The Air District plans to close this station on December 31, 2013.

The air monitoring station is located in Monta Vista Park. Although the purpose of the study is primarily source-oriented exposure from the cement plant and the associated truck traffic, the Air District is also monitoring population exposure to criteria pollutants including ozone, NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$, as well as toxics, metals, and mercury. An Air District meteorological system is also located in the park.

Ozone and its precursors (NO/NO_2) are measured because the area is downwind of precursor sources during the warmer months. Carbon monoxide is measured because of car and truck traffic on residential streets and because two freeways pass through Cupertino. SO_2 is measured because the cement plant uses petroleum coke as fuel to heat the cement kiln. Continuous $PM_{2.5}$ and filter based PM_{10} are also measured because light winds combined with surface-based inversions during the winter months may cause elevated particulate levels.

On April 1, 2011, the Air District started measuring ozone precursors CH_4/NMHC at Cupertino. These compounds were intended to be measured when the station opened but they require high pressure compressed hydrogen gas cylinders in order to operate. The gas cylinders were not permitted by the Santa Clara County Fire Department. As an alternate to compressed gas cylinders, new laboratory grade equipment was procured by the Air District. The new equipment required extensive modification of the monitoring trailer and required

additional permits, thus delaying the start of CH_4/NMHC monitoring. The last day of monitoring for CH_4/NMHC at Cupertino was December 31, 2012.

Gaseous toxic compounds and metals are sampled at Cupertino on a 1:6 schedule and are analyzed at the Air District laboratory. Metals analysis was done by CARB for samples collected through March 2011 and by the Air District's laboratory thereafter.

Information about toxics monitoring by the Air District can be found in the Toxics Program section of this report. Total Atmospheric Mercury is sampled for 24-hour periods on a 1:6 schedule with laboratory analysis done by Frontier Geosciences. Toxic monitoring results, including mercury, are posted on a monthly basis on the Air District's website at: http://www.baaqmd.gov/sitecore-s/~/media/Files/Technical%20Services/Cupertino_toxics.ashx

Since opening in September 2010, one exceedance of the national 8-hr ozone standard has been measured, but no exceedances of the national standards for PM_{10}, NO_2, SO_2 or CO have been measured. Additionally, the continuous $PM_{2.5}$ (BAM) monitor has not recorded any concentrations above the national 24-hour $PM_{2.5}$ standard. However, this monitor is not a recognized FRM or FEM method, and the data cannot be used to determine violations of the national $PM_{2.5}$ standards, or its attainment status. Only FRM or FEM based $PM_{2.5}$ measurements may be used for comparison with national $PM_{2.5}$ standards.

Cupertino Monta Vista Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**SO2, 1**	**CH4, 1 / NMHC, 1**
Parameter code	44201	42101	42601 / 42602	42401	43201 / 43102
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	Research
Site type(s)	Population Exposure	Population Exposure & Source Oriented	Population Exposure & Source Oriented	Population Exposure & Source Oriented	Population Exposure
Monitor type(s)	Special Purpose	Special Purpose	Special Purpose	Special Purpose	Special Purpose
Instrument manufacturer and model	TECO 49C	TECO 48i	TECO 42i	TECO 43C	TECO 55C
Method code	047	054	074	060	164
FRM/FEM/ARM other	FEM	FRM	FRM	FEM	N/A
Collecting Agency	Air District	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	09/01/2010	09/01/2010	09/01/2010	09/01/2010	CH4: 04/01/2011 NMHC: 04/01/2011
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	4.6	4.6	4.6	4.6	4.6
Distance from supporting structure (meters)	2.0	2.0	2.0	2.0	2.0
Distance from obstructions on roof (meters)	None	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None	None
Distance from trees (meters)	5.2	5.2	5.2	5.2	5.2
Distance to furnace or incinerator flue (meters)	None	None	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	12	13	15	15	16
Will there be changes within the next 18 months?	Y	Y	Y	Y	Y
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	07/06/2012	07/06/2012	07/06/2012	07/06/2012	07/06/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A	N/A

Cupertino Monta Vista Monitor Information

Pollutant. POC	**PM10, 1**	**PM2.5, 1**
Parameter code	81102	88502
Basic monitoring objective(s)	NAAQS comparison	Public Information
Site type(s)	Population exposure & Source Oriented	Population exposure & Source Oriented
Monitor type(s)	Special Purpose	Special Purpose
Instrument manufacturer and model	Andersen HiVol 1200	Met One BAM 1020
Method code	063	731
FRM/FEM/ARM other	FRM	N/A
Collecting Agency	Air District	Air District
Analytical Lab	Air District	N/A
Reporting Agency	Air District	Air District
Spatial scale	Urban	Urban
Monitoring start date	09/09/2012	09/15/2010
Current sampling frequency	1:6	Continuous
Calculated sampling frequency	N/A – No EE Flags	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	4.3	4.9
Distance from supporting structure (meters)	1.5	2.2
Distance from obstructions on roof (meters)	None	None
Distance from obstructions not on roof (meters)	None	None
Distance from trees (meters)	2.0	3.4
Distance to furnace or incinerator flue (meters)	None	None
Distance between collocated monitors (meters)	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	Y	Y
Is it suitable for comparison against the annual PM2.5?	N/A	N
Frequency of flow rate verification for manual PM samplers	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	01/05/2012 07/05/2012	01/05/2012 07/05/2012

Fairfield

Site Name	Fairfield
AQS ID	06-095-0005
GPS coordinates	38.227066, 122.075624
Location	Small trailer in open field
Address	1010 Chadbourne Rd, Fairfield CA 94534
County	Solano
Distance to road from gaseous probe (meters)	Cordelia Rd: 194 Chadbourne Rd: 705
Traffic count (AADT, year)	Cordelia Rd: 2,145 (2011) Chadbourne Rd: 2547 (2011)
Groundcover	Vegetative
Statistic Area	Vallejo-Fairfield CBSA

Fairfield was chosen for monitoring ozone transport between the San Francisco Bay Area and the Sacramento Valley. Fairfield lies in the northeast part of the Air District in the Carquinez Strait Region, the only sea level gap between the Bay Area and the Central Valley. Prevailing westerly winds carry ozone and its precursors from the Bay Area to the Sacramento Valley.

The monitoring site is located in a rural area between Fairfield/Suisun City and the greater Bay Area. Prevailing winds are westerly during the summer season. Therefore, the monitor normally measures ozone concentrations coming from the Bay Area. Occasionally easterly winds transport ozone from the Central Valley to Fairfield and the Bay Area.

Over the past decade the Fairfield/Suisun City area has grown considerably. According to the 2010 census the area has a combined population of 138,815, the largest urban area in Solano County. As a result, Fairfield is also a population exposure ozone monitoring site.

Ozone concentrations measured at Fairfield exceeded the national 8-hour ozone standard on four days during the last three years.

Fairfield Monitor Information

Pollutant, POC	**O3, 1**
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Regional Transport
Monitor type(s)	SLAMS
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	Air District
Reporting Agency	Air District
Spatial scale	Urban
Monitoring start date	05/29/2002
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	04/01-11/30
Probe height (meters)	3.7
Distance from supporting structure (meters)	1.0
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	>50
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	3
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check (gaseous)	Every other day
Last Annual Performance Evaluation for gaseous parameters	11/06/2012
Last two semi-annual flow rate audits for PM monitors	N/A

Forest Knolls

Site Name	Forest Knolls
AQS ID	06-041-2001
GPS coordinates	38.015136, 122.689531
Location	Roof
Address	6 Castro Street
County	Marin
Distance to road from probe (meters)	Sir Francis Drake Blvd: 14.1 Montezuma Road: 48.2 Castro St: 6.4 Arroyo Rd: 316
Traffic count (AADT, year)	Sir Francis Drake Blvd: 2370 (2007) Montezuma Road: < 300 (est. 2012) Castro St: <300 (est. 2012) Arroyo Rd: <300 (est. 2012)
Groundcover	Paved
Statistic Area	San Francisco-Oakland-Fremont CBSA

Forest Knolls was chosen for monitoring Black Carbon (BC) due to community interest about wood smoke in the San Geronimo Valley and to better understand and characterize the wood smoke source category in sheltered valley locations where winter wood burning often is the primary source of home heating. The site will address independent monitoring done using non-FEM/FRM/ARM instruments that indicated valley areas may be more prone to variable localized impacts that are difficult to capture and characterize. Lagunitas-Forest Knolls is considered a Census Designated Place (CDP) with a population of 1,819 based on the 2010 census.

The monitoring site is located in a semi-rural west to east valley about 10 miles west to northwest of San Rafael. Wintertime meteorological conditions are frequently conducive to trapping wood smoke in the valley, particularly during cold, still evenings. Many of the homes do not have residential gas for heating and, therefore, burn wood. Wood smoke may become trapped in the valley at all times of year, although winter is believed to have the largest concentration of wood smoke.

Forest Knolls Monitor Information

Pollutant, POC	**BC, 1**
Parameter code	84313
Basic monitoring objective(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	Special Purpose
Instrument manufacturer and model	MaGee Sci AE-16
Method code	866
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitoring start date	01/16/2013
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01-12/31
Probe height (meters)	5.2
Distance from supporting structure (meters)	1.4
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	3.9
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check (gaseous)	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A
Last two semi-annual flow rate audits for PM monitors	N/A

Fort Cronkhite

Site Name	Fort Cronkhite
AQS ID	06-041-0004
GPS coordinates	37.832725, 122.527658
Location	At ground level behind a ranger residence
Address	Building 1111, Fort Cronkhite, Sausalito CA
County	Marin
Distance to road from probe (meters)	Bunker Road: 16
Traffic count (AADT, year)	Bunker Road: 948 (2007)
Groundcover	Vegetative
Statistical Area	San Francisco-Oakland-Fremont CBSA

Fort Cronkhite was chosen for an air toxics monitoring site because it is representative of ambient levels of toxics compounds transported into the Bay Area from the Pacific Ocean due to prevailing westerly winds. The site is ½ mile east of the Pacific Ocean, on the north side of the Golden Gate gap which opens into the San Francisco Bay. The monitor is located within the Golden Gate National Recreation Area (GGNRA) near the visitor center at Fort Cronkhite. Low concentrations of toxics from this site provide a baseline to compare other toxics measurements in the Bay Area.

Toxics concentrations measured at this site should not be considered to be at pristine natural background levels. There are toxics contributions from emissions transported across the Pacific Ocean from Asia, from ships headed to and from the Bay Area and Central Valley ports, and from ships sailing along the coast. Additionally, there can be a small contribution from vehicle traffic in areas upwind of the site within the GGNRA. In spite of these contributions, when winds are from the west, the toxics levels at this site reflect the lowest levels in the Bay Area.

The closest industrial sources are in San Francisco about eight miles southeast of the site. The closest towns are Sausalito, three miles to the east northeast with a population of 7,061, and Marin City, three miles to the northeast with a population of 2,666 based on the 2010 census. Sausalito and Marin City have little impact on the monitoring site because winds are typically from the west so the site is upwind of these towns, and the towns have no significant industrial sources.

This site is operated as part of the Air District's Toxics Program with samples taken on a 1:12 schedule. Samples are collected using a Xontech canister and are analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Fort Cronkhite Monitor Information

Pollutant, POC	**Toxics, 3**
Parameter Code	See toxics section
Basic monitoring objectives(s)	Research
Site type(s)	General / Background
Monitor type(s)	Special Purpose
Instrument manufacturer and model	Xontech 910A
Method code	153
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	Air District
Reporting Agency	Air District
Spatial scale	Regional
Monitoring start date	03/26/1987
Current sampling frequency	1:12
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	7.3
Distance from supporting structure (meters)	0.9
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A
Last two semi-annual flow rate audits for PM monitors	N/A

Gilroy

Site Name	Gilroy
AQS ID	06-085-0002
GPS coordinates	36.999571, 121.574684
Location	Air monitoring shelter next to water pump station
Address	9th and Princevalle St, Gilroy, CA 95020
County	Santa Clara
Distance to road from gaseous probe (meters)	Princevalle St: 18.3 9th St: 15.7 10th St. 185.0
Traffic count (AADT, year)	Princevalle St: 5,000 (2008) 9th St: 1,400 (est. 2012) 10th St. 12,700 (2008)
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Gilroy was originally chosen as an air monitoring site to measure ozone and particulate transport between the San Francisco and Monterey Bay Areas. Prevailing northwesterly afternoon winds carry ozone and ozone precursors from the San Jose area southward through the Santa Clara Valley. When temperatures are hot, and solar insolation is strong, these precursors react and can form high concentrations of ozone in the Gilroy area. As Gilroy grew in population (48,821 according to the 2010 census) the site was considered not only a regional ozone transport site but also a population exposure ozone site. $PM_{2.5}$ is measured because light winds combined with surface-based inversions during the winter months can cause elevated particulate levels in the valley.

The monitoring site is located in a residential area of Gilroy on the west side of the Santa Clara Valley. Air quality studies have shown that the west side of the valley has higher ozone levels than the east side. This is due to elevated terrain on the west side that shelters the western part of Gilroy from the strong winds in the afternoon produced by the Monterey Bay sea breeze. Residents have preferred the sheltered area and built most of the town on the west side of the valley.

In the most recent three years, the national 8-hour ozone standard was exceeded four times and the national 24-hour $PM_{2.5}$ standard was exceeded once.

Gilroy Monitor Information

Pollutant, POC	**O3, 1**	**PM2.5, 3**
Parameter code	44201	88101
Basic monitoring objectives(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure & Regional Transport	Population Exposure & Regional Transport
Monitor type(s)	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	Met One FEM BAM 1020
Method code	047	170
FRM/FEM/ARM/other	FEM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	N/A	N/A
Reporting Agency	Air District	Air District
Spatial scale	Neighborhood	Neighborhood
Monitoring start date	07/01/1980	10/31/2009
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	N/A	N/A
Sampling season	04/01-11/30	01/01 - 12/31
Probe height (meters)	4.7	3.0
Distance from supporting structure (meters)	2.6	No supporting structure / ground level
Distance from obstructions on roof (meters)	None	N/A
Distance from obstructions not on roof (meters)	N/A	1.8*
Distance from trees (meters)	26	26
Distance to furnace or incinerator flue (meters)	14.3	14.3
Distance between collocated monitors (meters)	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	Teflon	N/A
Residence time for reactive gases (seconds)	16	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	N/A
Last Annual Performance Evaluation for gaseous parameters	11/07/2012	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	11/07/2012 04/18/2012

* The $PM_{2.5}$ monitor is outdoors, ground based. The probe is 3m above ground. A nearby shelter is 1.8m away and is the eve of the shelter is 0.12m above the probe height. This is not an obstruction because the probe is more than twice the distance that the eve extends above the probe. The shelter has a slanted roof that peaks at a height of 3.99m. The probe is 3.9m away from the roof peak which is 0.99m above the probe. This is not an obstruction because the probe is more than twice the distance that the roof peak extends above the probe.

Hayward

Site Name	Hayward
AQS ID	06-001-2001
GPS coordinates	37.654456, 122.031547
Location	Pump house near water tank
Address	3466 La Mesa Drive, Hayward, CA 94542
County	Alameda
Distance to road from gaseous probe (meters)	Hayward Blvd: 26.2 La Mesa Dr: 38 Farmhill Drive: 205
Traffic count (AADT, year)	Hayward Blvd: 4,293 (2010) La Mesa Drive: 500 (est. 2012) Farmhill Drive: 2,500 (2005)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Hayward air monitoring site was chosen to measure ozone at a higher elevation. The city of Hayward has a population of 144,186 according to the 2010 census. Located on the east side of Hayward at an elevation of 951 feet, it is the highest elevation ozone monitoring site in the Air District. Studies had shown that on high ozone days, a cloud of ozone and ozone precursors moves southward from Oakland on the west side of the East Bay Hills.

Because ozone monitoring sites were already in place in the low-lying areas of the East and South Bay, i.e. in Oakland and San Jose, this site was chosen to be between them, but at a higher elevation. Thus, the site gives an indication of ozone levels aloft and sub-regional transport. The Hayward site is also important because it provides air quality forecasting information concerning residual ozone from the previous day. Although there is a large water tank onsite in the upwind direction, the instrument probe is high enough to avoid the tank being an obstacle. The scale of this site is considered to be regional because it is representative of ozone levels aloft.

The Hayward site was shut down during the 2010 ozone season due to the demolition and reconstruction of the water tank nearby. In 2011 and 2012, the national 8-hour ozone standard was not exceeded at this site.

Hayward Monitor Information

Pollutant, POC	**O3, 1**
Parameter	44201
Basic monitoring objective(s)	NAAQS comparison & Research
Site type(s)	Other (Sub-Regional Transport) & Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	Air District
Reporting Agency	Air District
Spatial scale	Urban
Monitoring start date	05/31/1977
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	04/01-11/01
Probe height (meters)	6.7
Distance from supporting structure (meters)	3.1
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	11.4
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	15
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check (gaseous)	Every other day
Last Annual Performance Evaluation for gaseous parameters	11/14/2012
Last two semi-annual flow rate audits for PM monitors	N/A

Livermore

Site Name	Livermore
AQS ID	06-001-0007
GPS coordinates	37.687526, 121.784217
Location	One story commercial building
Address	793 Rincon Avenue, Livermore, CA 94551
County	Alameda
Distance to road from gaseous probe (meters)	Rincon Ave: 67 Pine St: 94 Interstate 580: 1,320 Portola Ave: 722
Traffic count (AADT, year)	Rincon Ave: 2,400 (2005) Portola Ave: 14,500 (2009) Pine St: 4,800 (2005) Interstate 580: 184,000 (2010)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Livermore was chosen for an air monitoring site because it is the largest city in eastern Alameda County, with a population of 80,968 according to the 2010 census. Past measurements have shown this area to have the highest ozone levels in the Bay Area. Livermore is located within the Livermore Valley, an east-west oriented inland valley between the San Francisco Bay and the Central Valley. Wind analyses of high ozone days show ozone precursors moving to this valley from the Hayward and Niles Canyon Gaps to the west, and from the San Ramon Valley to the north. The air monitoring site is west of the city center, in a residential neighborhood. The station is in a small one-story shopping center, with a little-used parking lot in front of the station and a city park behind it.

There are no industrial sources in the immediate vicinity of the site. Ozone and its precursors, CH_4/NMHC and NO/NO_2, are measured because the area is downwind of large sources of ozone precursors. $PM_{2.5}$ is measured because light winds combined with surface-based inversions during the winter months can cause elevated particulate levels. Black Carbon (BC) is measured to better determine the composition and relationship between BC and $PM_{2.5}$.

VOC toxic compounds are sampled at Livermore on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

The Livermore site is part of a Bay Area Photochemical Assessment Monitoring Stations (PAMS) program. This is a program to measure hourly speciated hydrocarbons using a gas chromatograph analyzer at three Bay Area locations. The other two locations are San Ramon and Patterson Pass. A full description of the PAMS program can be found in this document.

During the most recent three years, this site recorded eight exceedances of the national 8-hour ozone standard, two exceedances of the national 24-hour $PM_{2.5}$ standard, and no exceedances of the national NO_2 standard.

Livermore Monitor Information

Pollutant, POC	**O3, 1**	**NO, 1 / NO2, 1**	**CH4, 1 / NMHC, 1**
Parameter code	44201	42601 / 42602	43102 / 43201
Basic monitoring objectives(s)	NAAQS comparison	NAAQS comparison & Research	Research
Site type(s)	Population Exposure & Highest Conc.	Population Exposure	Population Exposure
Monitor type(s)	SLAMS & Unofficial PAMS	SLAMS & Unofficial PAMS	Special Purpose
Instrument manufacturer and model	TECO 49i	TECO 42i	TECO 55C
Method code	047	074	164
FRM/FEM/ARM/other	FRM	FRM	N/A
Collecting Agency	Air District	Air District	Air District
Analytical Lab	Air District	Air District	Air District
Reporting Agency	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	01/01/2000	NO2:12/31/1999 NO: 01/01/2000	CH4: 12/31/1999 NMHC:04/20/2005
Current sampling frequency	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	6.1	6.1	6.1
Distance from supporting structure (meters)	3.3	3.3	3.3
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	51	51	51
Distance to furnace or incinerator flue (meters)	16.5	16.5	16.5
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	10	10	10
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	08/07/2012	08/07/2012	08/07/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A

Livermore Monitor Information

Pollutant, POC	**PM2.5, 3**	**Speciated PM2.5, 5**	**BC, 1**
Parameter code	88101	88502 (pm mass) – many others see SASS section	84313
Basic monitoring objectives(s)	NAAQS comparison	Research	Research
Site type(s)	Population Exposure & Highest Conc.*	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	Sup. Speciation	Special Purpose
Instrument manufacturer and model	Met One FEM BAM 1020	Met One SASS	MaGee Sci AE-16
Method code	170	810	866
FRM/FEM/ARM/other	FRM	N/A	N/A
Collecting Agency	Air District	Air District	Air District
Analytical Lab	Air District	DRI	N/A
Reporting Agency	Air District	DRI	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	03/01/2011	06/11/2008	01/01/2012
Current sampling frequency	Continuous	1:6	Continuous
Calculated sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01-12/31
Probe height (meters)	5.1	5.1	5.7
Distance from supporting structure (meters)	2.0	2.0	2.1
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	52	55	52
Distance to furnace or incinerator flue (meters)	21	17	None
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A	N/A
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	Y	N	N/A
Frequency of flow rate verification for manual PM samplers	N/A	Monthly	N/A
Frequency of flow rate verification for automated PM analyzers	Bi-weekly	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	08/06/2012 02/06/2012	08/16/2012 02/06/2012	N/A

* Concord has the highest daily design value (DV) for the San Francisco-Oakland-Fremont CBSA using the 2013 methodology for DV calculation at 27µg/m3. Livermore has the highest daily DV using the 2006 methodology at 26µg/m3.

Los Gatos

Site Name	Los Gatos
AQS ID	06-085-1001
GPS coordinates	37.226862, 121.979675
Location	Top of fire station's hose drying tower
Address	306 University Ave, Los Gatos, CA 95030
County	Santa Clara
Distance to road From gaseous probe (meters)	University Ave: 37.2 Bentley Ave: 26.5 State Route 17: 291 State Route 9: 121
Traffic count (AADT, year)	University Ave: 13,600 (2005) Bentley Ave: 400 (est. 2012) State Route 17: 58,000 (2010) State Route 9: 34,000 (2010)
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Los Gatos was chosen for an ozone monitoring site because prevailing northerly winds transport ozone and ozone precursors from the densely populated area around the south Bay Area to the west side of the Santa Clara Valley. Mobile sampling studies as well as long-term monitoring in the Saratoga and Los Gatos areas showed Los Gatos to have the highest ozone levels in the area.

High ozone levels are in part due to Los Gatos being situated at the base of the Santa Cruz Mountains, which act as a barrier to the movement of polluted air. The monitoring site is located near the downtown area at a fire station surrounded by residential neighborhoods. The city of Los Gatos has a population of 29,413 according to the 2010 census.

In the most recent three years, this site recorded two exceedances of the national 8-hour ozone standard.

Los Gatos Monitor Information

Pollutant, POC	**O3, 1**
Parameter code	44201
Basic monitoring objectives(s)	NAAQS comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor Start date	04/01/1972
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	11.0
Distance from supporting structure (meters)	3.2
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	15.5
Distance to furnace or incinerator flue (meters)	4.3
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	16
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Daily
Last Annual Performance Evaluation for gaseous parameters	10/18/2012
Last two semi-annual flow rate audits for PM monitors	N/A

Martinez

Site Name	Martinez
AQS ID	06-013-2001
GPS coordinates	38.012816, 122.134467
Location	Small sampling shelter next to fire station
Address	521 Jones St, Martinez, CA 94553
County	Contra Costa
Distance to road from gaseous probe (meters)	Jones St: 22 Alhambra Ave: 19
Traffic count (AADT, year)	Jones St: 2,000 (2008) Alhambra Ave: 9,800 (2008)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Martinez was chosen for SO_2 source oriented monitoring because the Shell and Tesoro oil refineries are located in north and east sections of the city. Because the Carquinez Strait boarders the city to the north, the prevailing winds are from the west. However, north and east winds can transport SO_2 emissions from the refineries over populated areas of the city.

The monitoring site is located near downtown Martinez and is 0.5 miles south of the Shell Refinery and 2.5 miles west of the Tesoro Refinery. According to the 2010 census, Martinez has a 2010 population of 35,824. There are no industrial activities or SO_2 sources nearby other than the refineries.

VOC toxic compounds are sampled at Martinez on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

SO_2 concentrations measured at Martinez did not exceed the national 1-hour 75-ppb standard during the last three years.

Martinez Monitor Information

Pollutant, POC	**SO2, 1**
Parameter code	42401
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	SLAMS
Instrument manufacturer and model	TECO 43C
Method code	060
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	Air District
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitoring start date	07/02/1973
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	7.2
Distance from supporting structure (meters)	2.7
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	11.2
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	14
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check (gaseous)	Every other day
Last Annual Performance Evaluation for gaseous parameters	07/12/2012
Last two semi-annual flow rate audits for PM monitors	N/A

Napa

Site Name	Napa
AQS ID	06-055-0003
GPS coordinates	38.310942, 122.296189
Location	One story commercial building
Address	2552 Jefferson Street, Napa ,CA 94558
County	Napa
Distance to road from gaseous probe (meters)	Jefferson St: 16 Brown St: 79 Lincoln Ave: 283 Central Ave: 122
Traffic count (AADT, year)	Jefferson St: 19,143 (2007) Brown St: 3,392 (2008) Lincoln St: 23,061 (2004) Central Ave: 2,927 (2007)
Groundcover	Paved
Statistical Area	Napa CBSA

Napa was chosen for an air monitoring location because it is the largest city in Napa County with a 2010 population of 76,915 according to the 2010 census. The city is located in the center of Napa Valley where agricultural burning and fireplace usage during the fall and winter can result in high particulate levels. In summer months, Napa can have elevated ozone levels when central Bay Area ozone precursors are transported north to the city.

The air monitoring site is situated about a mile north of downtown Napa in a mixed residential and commercial neighborhood. There are no industrial sources in the immediate vicinity. Ozone and NO/NO_2 are measured because southerly winds carry ozone and its precursors into Napa. Carbon monoxide is measured because the Napa Valley is a major tourist attraction with resulting high traffic volumes through the city. PM_{10} and continuous $PM_{2.5}$ are measured because of agricultural and household wood burning.

Based on traffic counts and EPA siting guidelines, the ozone monitor at Napa would be considered middle scale, and therefore not meet the requirements to classify the monitor as SLAMS. However, the Air District requested this monitor be considered a neighborhood scale and submitted a waiver request to EPA Region 9 (see Appendix E). After review by EPA Region 9, the ozone monitor was approved as a neighborhood scale SLAMS monitor.

VOC toxic compounds are sampled at Napa on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded two exceedances of the nation 8-hour ozone standard but no exceedances of the national standards for PM_{10}, NO_2 or CO.

The continuous $PM_{2.5}$ non-FEM BAM recorded two days above the national 24-hour $PM_{2.5}$ standard during the most recent three years. Because this monitoring was not a FRM or FEM method, the data could not be used to determine violations of the nation $PM_{2.5}$ standard.

The $PM_{2.5}$ non-FEM BAM was shut down on December 5, 2012 and was replaced by a FEM BAM which began operation on December 13, 2012. The FEM BAM is classified as middle scale based on its distance from the roadway (18 meters) and nearby traffic volume*. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations in the Napa CBSA.

* The gaseous probe is 16 meters from the roadway and is not in the same location as the FEM BAM monitoring inlet which is 18 meters from the roadway.

Napa Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**
Parameter code	44201	42101	42601 / 42602
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i
Method code	047	054	074
FRM/FEM/ARM other	FEM	FRM	FRM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Neighborhood	Middle	Middle
Monitoring start date	07/01/1976	07/01/1973	07/01/1973
Current sampling frequency	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	8.9	8.9	8.9
Distance from supporting structure (meters)	5.2	5.2	5.2
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	25	25	25
Distance to furnace or incinerator flue (meters)	5.7	5.7	5.7
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	8	8	9
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	08/16/2012	08/16/2012	08/16/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A

Napa Monitor Information

Pollutant, POC	**PM10, 1**	**PM10, 2**	**PM2.5, 3***
Parameter code	81102	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Quality Assurance	Population Exposure & Highest Conc.
Monitor type(s)	SLAMS	QA Collocated	SLAMS
Instrument manufacturer and model	Tisch Env. HiVol TE-6000	Tisch Env. HiVol TE-6000	Met One FEM BAM 1020
Method code	141	141	170
FRM/FEM/ARM other	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	Air District	Air District	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle
Monitoring start date	11/04/1986	06/08/2004	12/13/2012
Current sampling frequency	1:6	1:6	Continuous
Calculated sampling frequency	N/A – No EE Flags	N/A – No EE Flags	N/A – No EE Flags
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01-12/31
Probe height (meters)	5.5	5.5	5.5
Distance from supporting structure (meters)	1.8	1.8	1.8
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	21	17.6	26.0
Distance to furnace or incinerator flue (meters)	5.0	3.5	8.8
Distance between collocated monitors (meters)	3.4	3.4	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A	N/A
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	08/15/2012 02/22/2012	08/15/2012 02/22/2012	None - Opened in December

* Non-FEM BAM closed on 12/5/12 and replaced by FEM BAM opened on 12/13/12. See discussion regarding FEM BAM suitability in comparison to NAAQS in network modification section and in the Napa site discussion above.

Oakland

Site Name	Oakland
AQS ID	06-001-0009
GPS coordinates	37.743065, 122.169935
Location	Two-story commercial building
Address	9925 International Blvd, Oakland, CA 94603
County	Alameda
Distance to road from gaseous probe (meters)	International Blvd: 19 99^{th} St: 23 98^{th} St: 43
Traffic count (AADT, year)	International Blvd: 26,912 (2006) 99^{th} St: 100 (2008) 98^{th} St: 31,340 (2002)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Oakland is an important area for air pollution monitoring because it is the largest city in Alameda County, with a population of 390,724 according to the 2010 census. It has large emission sources within its boundaries, such as a major maritime port, an international airport, extensive areas of industry, and a number of major freeways. These sources have the potential to emit significant amounts of CO and ozone precursors, as well as particulates and toxic compounds.

The monitoring site is located seven miles southeast of downtown Oakland, on a commercial strip in a residential area. Ozone and NO/NO_2 are measured to monitor population exposure to these pollutants. Carbon monoxide is measured because of the high volume of traffic in the city, which includes several major freeways. $PM_{2.5}$ is measured due to the large emission sources in the area, and because light winds combined with wood burning, vehicular traffic, and surface-based inversions during winter can cause elevated particulate concentrations.

The monitoring scale for ozone is middle scale. Following an EPA Region 9 review of the distance between the gaseous probe and the roadway, and the corresponding traffic count, EPA Region 9 suggested this monitor be changed from SLAMS to SPM and the Air District agreed to the change. Consequently, this monitor cannot be used toward meeting the minimum monitoring requirements for ozone.

The $PM_{2.5}$ FEM BAM is middle scale based on the monitors distance from the roadway and nearby traffic count. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area wide emissions.

VOC toxic compounds are sampled at Oakland on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, the national 24-hour $PM_{2.5}$ standard was exceeded on three days. No exceedances of the national standards for ozone, NO_2 or CO were measured during the last three years.

Oakland Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	PM2.5, 3
Parameter code	44201	42101	42601 / 42602	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	Special Purpose	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	API 300E	TECO 42i	Met One FEM BAM 1020
Method code	047	093	074	170
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle	Middle
Monitoring start date	11/01/2007	11/01/2007	11/01/2007	10/01/2009
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	10.0	10.0	10.0	8.0
Distance from supporting structure (meters)	4.0	4.0	4.0	2.4
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	21.0	21.0	21.0	21.0
Distance to furnace or incinerator flue (meters)	N/A	N/A	N/A	N/A
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	13	14	13	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A
Last Annual Performance Evaluation for gaseous parameters	10/26/2012	10/26/2012	10/26/2012	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	10/25/2012 05/10/2012

Oakland West

Site Name	Oakland West
AQS ID	06-001-0011
GPS coordinates	37.814781, 122.282347
Location	Shelter in parking lot
Address	1100 21st St, Oakland, CA 94607
County	Alameda
Distance to road from gaseous probe (meters)	Grand Ave: 34 Linden St: 33 Adeline St: 168 21st St: 80
Traffic count (AADT, year)	Grand Ave: 19,796 (2012) Linden St: 500 (2012) Adeline St: 7,586 (2012) 21st St: 500 (2012)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Air District opened a monitoring station one mile downwind of the Port of Oakland in February 2009 because the Port of Oakland is considered a major area source of diesel particulate matter emissions. Studies have shown that the West Oakland community is exposed to higher concentrations of diesel particulate matter than elsewhere in the Bay Area, resulting in higher potential cancer risks.

A $PM_{2.5}$ FEM BAM began operation on December 18, 2012. This monitor replaced the continuous $PM_{2.5}$ BAM which had been in operation at the site since February 2009. Carbon monoxide, NO/NO_2, and continuous $PM_{2.5}$ are measured to determine the impact of emissions from the Port of Oakland and its associated diesel-truck traffic, and vehicle traffic from nearby highways. SO_2 is measured to determine the impact of emissions from ship traffic. Black Carbon (BC) is measured to better determine the composition and relationship between BC and $PM_{2.5}$.

This site became one of the forty nationwide sites for community monitoring of NO_2 in areas with susceptible and vulnerable populations (effective January 1, 2013).

VOC toxic compounds are sampled at Oakland West on a 1:12 schedule, and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the last three years, there have been no exceedances of the national standards for ozone, NO_2, SO_2, or CO. The continuous $PM_{2.5}$ BAM monitor that operated until December 2012 recorded one exceedance of the national 24-hour $PM_{2.5}$ standard. However, this monitor did not employ a recognized FRM or FEM method, and the data cannot be used to determine violations of the national $PM_{2.5}$ standards, or its attainment status. The new $PM_{2.5}$ FEM BAM did not record any exceedances of the national 24-hour $PM_{2.5}$ standard since it was deployed on December 18, 2012.

Oakland West Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	SO2, 1
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure & Source Oriented	Population Exposure & Source Oriented	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49C	TECO 48i	TECO 42C	TECO 43C
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	12/13/2010	02/25/2009	02/25/2009	02/25/2009
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	5.7	5.7	5.7	5.7
Distance from supporting structure (meters)	3.1	3.1	3.1	3.1
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	40.0	40.0	40.0	40.0
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	10	10	10	10
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	11/15/2012	11/15/2012	11/15/2012	11/15/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

Oakland West Monitor Information

Pollutant, POC	**PM2.5, 3**	**Speciated PM2.5**	**BC, 1**
Parameter code	81101	88502 (pm mass) – many others see SASS section	84313
Basic monitoring objective(s)	NAAQS comparison	Research	Research
Site type(s)	Population Exposure & Source Oriented	Population Exposure & Source Oriented	Population Exposure
Monitor type(s)	SLAMS	Sup. Speciation	Special Purpose
Instrument manufacturer and model	Met One FEM BAM 1020	Met One SASS	MaGee Sci AE-16
Method code	170	810	866
FRM/FEM/ARM/other	Other	N/A	N/A
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	RTI	N/A
Reporting Agency	Air District	RTI	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	12/18/2012	02/12/2009	03/17/2009
Current sampling frequency	Continuous	1:6	Continuous
Calculated sampling frequency	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	5.2	4.7	5.1
Distance from supporting structures	2.6	2.1	2.5
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	39.7	40.0	39.7
Distance to furnace or incinerator flue (meters)	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	N/A	N/A	Glass
Residence time for reactive gases (seconds)	N/A	N/A	N/A
Will there be changes within the next 18 months?	N	N	N/A
Is it suitable for comparison against the annual PM2.5?	N	N	N/A
Frequency of flow rate verification for manual PM samplers	N/A	Monthly	N/A
Frequency of flow rate verification for automated PM analyzers	Bi-weekly	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A
Last Annual Perform. Evaluation for gaseous parameters	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	None – opened in December	11/14/2012 05/14/2012	N/A

Palo Alto Airport

Site Name	Palo Alto Airport
AQS ID	06-085-2010
GPS coordinates	37.457621, 122.112286
Location	The end of the runway in the aircraft run-up zone
Address	1925 Embarcadero Road, Palo Alto, CA 94303
County	Santa Clara
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Palo Alto airport was chosen by EPA as a lead monitoring site because piston engine aircraft utilizing this airport use leaded fuel. Additionally, very few air monitoring studies have been conducted to measure lead emissions near general aviation runways. To better assess lead emissions and possible public exposure to lead in the ambient air near general aviation airports, the EPA selected 15 airports from across the nation to participate in a one year airport lead monitoring study. Lead monitoring at this site began on February 3, 2012.

For all sites in the EPA study, if the rolling three month average exceeds 50% of the 0.15 µg/m3 NAAQS, then the site will continue to operate indefinitely. For Palo Alto airport, results through December 2012 indicate that lead concentrations do exceed 50% of the NAAQS. Consequently, this site will continue indefinitely.

Palo Alto Airport Monitor Information

Pollutant, POC	**Lead (TSP), 3**
Parameter code	14129
Basic monitoring objective(s)	NAAQS Comparison & Research
Site type(s)	Source Oriented
Monitor type(s)	SLAMS
Instrument manufacturer and model	Tisch TE-HVPLUS-BL
Method code	191
FRM/FEM/ARM other	FEM
Collecting Agency	Air District
Analytical Lab	RTI
Reporting Agency	Air District
Spatial scale	Micro
Monitoring start date	02/03/2012
Current sampling frequency	1:6
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	2.0
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	>20
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A
Last two semi-annual flow rate audits for PM monitors	12/20/2012 06/07/2012

Patterson Pass

Site Name	Patterson Pass
AQS ID	06-001-2005
GPS coordinates	37.689615, 121.631916
Location	Trailer
Address	13224 Patterson Pass Road, Livermore, CA 94550
County	Alameda
Distance to road from gaseous probe (meters)	Patterson Pass Road: 400
Traffic count (AADT, year)	Patterson Pass Road: 1,410 (2009)
Groundcover	Vegetative
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Patterson Pass site is part of a Bay Area Photochemical Assessment Monitoring Stations (PAMS) program. This is a program to measure hourly speciated hydrocarbons using a gas chromatograph analyzer at three Bay Area locations (the other two locations are San Ramon and Livermore). A full description of the PAMS program can be found in the PAMS section of this document.

The site is located in a sparsely populated unincorporated area in the hills east of Livermore. It was established in August 2010 to provide additional information about potential transport of ozone precursor compounds eastward from the Bay Area to the Central Valley. EPA is funding the VOC speciated hydrocarbon monitoring. In March 2011, the Air District added a NO/NO_2 monitor at this site.

Since NO_2 monitoring began in March 2011, no exceedances of the national NO_2 standard have been measured.

Patterson Pass Monitor Information

Pollutant, POC	**NO, 1 / NO2, 1**
Parameter code	42601 / 42602
Basic monitoring objectives	Research
Site type(s)	Extreme downwind
Monitor type(s)	Unofficial PAMS
Instrument manufacturer and model	TECO 42i
Method code	074
FRM/FEM/ARM/other	FRM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Regional
Monitor start date	03/01/2011
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01 – 12/31
Probe height (meters)	6.0
Distance from supporting structure (meters)	2.9
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	>50
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	8
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Last Annual Performance Evaluation for gaseous parameters	08/30/2012
Last two semi-annual flow rate audits for PM monitors	N/A

Point Reyes

Site Name	Point Reyes
AQS ID	06-041-0003
GPS coordinates	38.12275, 122.90836
Location	At ground level behind a ranger residence
Address	170 Pierce Point Rd, Point Reyes, CA 94956
County	Marin
Distance to road from gaseous probe (meters)	Pierce Point Road: 95
Traffic count (AADT, year)	Pierce Point Road: 225 (est. 2012)
Groundcover	Grass
Statistical Area	San Francisco-Oakland-Fremont CBSA

Point Reyes was chosen for an air monitoring site because it is representative of background $PM_{2.5}$ levels. Air pollution levels at this site are usually low due to the rural nature of the area and because the upwind air flow is usually from the Pacific Ocean 2.5 miles to the west. This site is operated by the California Air Resources Board.

The site is located within the Point Reyes National Seashore. Within the park are scattered dairy farms. There are no industrial sources within 20 miles of the park. Between the ocean and the air monitoring site the land is relatively flat with low vegetation. The air monitoring site is located behind a ranger residence at the north end of the park. The closest towns are Marshall, three miles to the northeast with a population of a few hundred; and Inverness three miles to the southeast with a population of 1304 according to the 2010 census.

The continuous $PM_{2.5}$ (BAM) monitor at Point Reyes recorded no days above the national 24-hour $PM_{2.5}$ standard during the most recent three years. However, this monitor is not a recognized FRM or FEM method, and the data cannot be used to determine violations of the national $PM_{2.5}$ standards, or its attainment status. Only FRM or FEM based $PM_{2.5}$ measurements may be used for comparison with national $PM_{2.5}$ standards.

Point Reyes Monitor Information

Pollutant, POC	**PM2.5, 3**
Parameter code	88501
Basic monitoring objective(s)	Research & Public Information
Site type(s)	General Background
Monitor type(s)	Non-Regulatory
Instrument manufacturer and model	Met One BAM 1020
Method code	731
FRM/FEM/ARM other	N/A
Collecting Agency	California Air Resources Board
Analytical Lab	N/A
Reporting Agency	California Air Resources Board
Spatial scale	Urban
Monitoring start date	12/01/2000
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	3.0
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	35
Distance to furnace or incinerator flue (meters)	>50
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	Twice per month
Frequency of one-point QC check for gaseous instruments	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A
Last two semi-annual flow rate audits for PM monitors	02/23/2012 08/10/2011

Point Richmond

Site Name	Point Richmond
AQS ID	06-013-0005
GPS coordinates	37.926162, 122.385561
Location	Air monitoring shelter next to fire station
Address	140 W. Richmond Ave, Richmond, CA 94801
County	Contra Costa
Distance to road From gaseous probe (meters)	Washington Ave: 25.0 W. Richmond Ave: 10.2 Park Place: 27.0 Interstate 580: 266
Traffic count (AADT, year)	Washington Ave: 1,000 (2012) W. Richmond Ave: 1,340 (2003) Park Place: 250 (2012) Interstate 580: 68,200 (2010)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Point Richmond was chosen for H_2S source oriented monitoring because the community is at the immediate southern periphery of the Chevron Refinery. The monitoring site is located in downtown Point Richmond, 0.2 miles south of the Chevron Refinery boundary. Point Richmond, a neighborhood within the City of Richmond, has a population of 3,780 according to the 2010 census.

Although prevailing winds in the area are from the south-southwest, occasional northerly winds will transport H_2S emissions from the refinery over the community. H_2S gases at Chevron can be emitted from the processing units, one mile to the north, or the Chevron Richmond Long Wharf Complex, one mile to the west, where crude oil and other feedstock chemicals from tankers are unloaded.

Point Richmond Monitor Information

Pollutant, POC	**H2S, 1**
Parameter code	42402
Basic monitoring objectives(s)	Public Information
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	Special Purpose
Instrument manufacturer and model	TECO 45C
Method code	020
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitoring start date	01/01/1999
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	3.4
Distance from supporting structure (meters)	0.9
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	17
Distance to furnace or incinerator flue (meters)	7.3
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	7
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other week
Last Annual Performance Evaluation for gaseous parameters	10/15/2012
Last two semi-annual flow rate audits for PM monitors	N/A

Redwood City

Site Name	Redwood City
AQS ID	06-081-1001
GPS coordinates	37.482934, 122.203500
Location	One story commercial building
Address	897 Barron Ave, Redwood City, CA 94063
County	San Mateo
Distance to road from gaseous probe (meters)	Barron Ave: 13 Bay Road: 24 Warrington Ave: 131 US Highway 101: 455
Traffic count (AADT, year)	Barron Ave: 1,200 (2009) Warrington Ave: 1,140 (2008) Bay Road: 8,715 (2008) US Highway 101: 202,000 (2011)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Redwood City was chosen for an air monitoring site because it is one of the largest cities in San Mateo County, with a population of 76,815 according to the 2010 census. Being midway between San Francisco and San Jose, the site is well positioned to monitor ozone precursors and ozone moving southward across the peninsula as they are channeled by the coastal mountains to the west. Generally, Redwood City characterizes an area between South San Francisco and Palo Alto, which has a low air pollution potential due to the frequent presence of the sea breeze. Although the sea breeze typically keeps pollution levels low, when winds are light, high levels of ozone precursors, ozone, or particulates can occur due to the large number of sources in the area.

The air monitoring site is located in a commercial/industrial zone bordered by US Highway 101 on one side and residential areas on the other three sides. NO/NO_2 and ozone are collected because the area is a large source of ozone precursor emissions and ozone. Carbon monoxide is monitored because of the high traffic volume in the area with US Highway 101 0.3 miles north of the site. $PM_{2.5}$ is collected because light winds combined with surface-based inversions during the winter months can cause particulate levels to become elevated.

VOC toxic compounds are sampled at Redwood City on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

A collocated FRM $PM_{2.5}$ monitor operated on a 1:6 schedule at the start of 2012 (a FEM BAM was primary) but was shut down on September 30, 2012. On October 1, 2012 the collocation of FRM/FEM was moved to San Jose because San Jose has the highest design value in the Bay Area.

In the most recent three years, this site recorded one exceedance of the national 8-hour ozone standard and two exceedances of the national 24-hour $PM_{2.5}$ standard. No exceedances of the national standards for NO_2 or CO were measured during the last three years.

Redwood City Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	PM2.5, 3
Parameter code	44201	42101	42601 / 42602	88101
Basic monitoring Objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site types(s)	Population exposure	Population exposure	Population exposure	Population exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacture and model	TECO 49i	TECO 48i	TECO 42i	Met One FEM BAM 1020
Method code	047	054	074	170
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	07/01/1976	03/01/1967	03/01/1967	10/01/2009
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	6.8	6.8	6.8	5.3
Distance from supporting structures (meters)	3.6	3.6	3.6	2.2
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	46.3	46.3	46.3	43.5
Distance to furnace or incinerator flue (meters)	12.7	12.7	12.7	11.0
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	15	16	15	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A
Last Annual Performance Evaluation for gaseous parameters	08/22/2012	08/22/2012	08/22/2012	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	08/21/2012 02/15/2012

Redwood City – Twin Dolphin

Site Name	Redwood City – Twin Dolphin
AQS ID	06-081-2003
GPS coordinates	37.518769, 122.249353
Location	One story building - Redwood City water pumping station
Address	1050 Twin Dolphin Drive, Redwood City, CA 94065
County	San Mateo
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

This Special Purpose Monitoring (SPM) site was established to measure potential population exposure to lead by piston engine aircraft at San Carlos Airport. The site was opened on March 17, 2013 because the nearby source-oriented, microscale lead monitor near the runway at San Carlos Airport was recording lead levels above the national 24-hour standard.

The Twin Dolphin site is 0.3 miles north to northeast of San Carlos Airport in a commercial area with a nearby hotel and public works buildings for the City of Redwood City. Samples are collected every 6th day and are analyzed in the Air District laboratory using an XRF method. This SPM site will be closed after collection of one year of data unless monitoring results indicate a need for continued sampling.

Redwood City – Twin Dolphin Monitor Information

Pollutant, POC	**Lead (PM10), 3**
Parameter code	85129
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	Special Purpose
Instrument manufacturer and model	Lo-Vol Partisol 2025
Method code	811
FRM/FEM/ARM other	FRM
Collecting Agency	Air District
Analytical Lab	Air District
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitoring start date	03/18/2013
Current sampling frequency	1:6
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	6.2
Distance from supporting structure (meters)	2.2
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	6.7
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	Unknown – depends on monitoring results
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	Monthly
Frequency of flow rate verification for automated PM samplers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A
Last two semi-annual flow rate audits for PM monitors	None – site just opened in March 2013

Reid-Hillview Airport

Site Name	Reid-Hillview Airport
AQS ID	06-085-2011
GPS coordinates	37.329841, 121.815438
Location	The end of the runway in the aircraft run-up zone
Address	2500 Cunningham Ave., San Jose, CA 95148
County	Santa Clara
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Reid-Hillview airport was chosen by EPA as a lead monitoring site because piston engine aircraft utilizing this airport use leaded fuel. Additionally, very few air monitoring studies have been conducted to measure lead emissions near general aviation runways. To better assess lead emissions and possible public exposure to lead in the ambient air near general aviation airports, the EPA selected 15 airports from across the nation to participate in a one year airport lead monitoring study. Lead monitoring at this site began on February 3, 2012.

For all airport lead monitoring sites in the EPA study, if the rolling three month average exceeds 50% of the 0.15 µg/m3 NAAQS, then the site will continue to operate indefinitely. For Reid-Hillview airport, results through December 2012 indicate that lead concentrations do exceed 50% of the NAAQS. Consequently, this site will continue indefinitely.

Reid-Hillview Airport Monitor Information

Pollutant, POC	**Lead (TSP), 3**
Parameter code	14129
Basic monitoring objective(s)	NAAQS Comparison & Research
Site type(s)	Source Oriented
Monitor type(s)	SLAMS
Instrument manufacturer and model	Tisch TE-HVPLUS-BL
Method code	191
FRM/FEM/ARM other	FEM
Collecting Agency	Air District
Analytical Lab	RTI
Reporting Agency	Air District
Spatial scale	Micro
Monitoring start date	02/03/2012
Current sampling frequency	1:6
Calculated sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	1.6
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	> 20
Distance to furnace or incinerator flue (meters)	None
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	Quarterly
Frequency of flow rate verification for automated PM samplers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A
Last two semi-annual flow rate audits for PM monitors	12/20/2012 06/07/2012

Richmond 7th

Site Name	Richmond 7th
AQS ID	06-013-0006
GPS coordinates	37.948172, 122.364852
Location	Fire station
Address	1065 7th Street, Richmond, CA 94801
County	Contra Costa
Distance to road from gaseous probe (meters)	7th St: 21.5 Hensley St: 29.9 Richmond Parkway: 200
Traffic count (AADT, year)	7th St: 3,125 (2007) Hensley St: 2,125 (2007) Richmond Parkway: 35,650 (2007)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Richmond 7th Street was chosen for H_2S and SO_2 source oriented monitoring because it is near the eastern boundary of the Chevron Refinery. Richmond has a population of 103,701 according to the 2010 census and the site is located 0.5 miles east of the refinery boundary, where public exposure to the highest H_2S and SO_2 concentrations are expected. Normally, monitoring is done downwind of the prevailing wind direction. However, the prevailing winds are from the south, and carry emissions over San Pablo Bay. Since it is impractical to monitor over San Pablo Bay, a monitoring site was chosen downwind of the secondary wind direction, on the east side of the refinery.

VOC toxic compounds are sampled at Richmond 7th on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

SO_2 concentrations measured at Richmond 7th did not exceed the national 1-hour 75 ppb standard during the last three years.

Richmond 7th Monitor Information

Pollutant, POC	**SO2, 1**	**H2S, 1**
Parameter code	42401	42402
Basic monitoring objective(s)	NAAQS comparison	Public information
Site type(s)	Population Exposure & Source Oriented	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	Special Purpose
Instrument manufacturer and model	TECO 43i	TECO 43C
Method code	060	020
FRM/FEM/ARM/other	FEM	N/A
Collecting Agency	Air District	Air District
Analytical Lab	N/A	N/A
Reporting Agency	Air District	Air District
Spatial scale	Neighborhood	Neighborhood
Monitoring start date	07/01/1980	01/01/1999
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	8.4	8.4
Distance from supporting structure (meters)	2.8	2.8
Distance from obstructions on roof (meters)	None	None
Distance from obstructions not on roof (meters)	None	None
Distance from trees (meters)	10.0	10.0
Distance to furnace or incinerator flue (meters)	None	None
Distance between collocated monitors (meters)	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	Teflon	Teflon
Residence time for reactive gases (seconds)	11	11
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other week
Last Annual Performance Evaluation for gaseous parameters	10/16/2012	10/16/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A

Rodeo

Site Name	Rodeo
AQS ID	06-013-0007
GPS coordinates	38.034331, 122.270336
Location	Single story storage area at fire station
Address	326 Third Street, Rodeo, CA 94572
County	Contra Costa
Distance to road from gaseous probe (meters)	Third St: 13.3 Parker St: 249.0
Traffic count (AADT, year)	Third St: 500 (2007) Parker St: 7,417 (2008)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Rodeo was chosen for H_2S source oriented monitoring because the Phillips 66 Refinery is on the eastern boundary of the town of Rodeo. Although the prevailing winds in the area are from the southwest, northeast winds can transport H_2S emissions from the refinery over the populated area of the town. The population of Rodeo was 8,679 at the 2010 census. The monitoring site is located in a residential area 0.6 miles southwest of the Phillips 66 Refinery.

Rodeo Monitor Information

Pollutant, POC	**H2S, 1**
Parameter code	42402
Basic monitoring objective(s)	Public information
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	Special Purpose
Instrument manufacturer and model	TECO 45C
Method code	020
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitoring start date	04/01/2002
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	01/01 – 12/31
Probe height (meters)	7.0
Distance to supporting structure (meters)	2.5
Distance from obstructions on roof (meters)	None
Distance from obstructions not on roof (meters)	None
Distance from trees (meters)	>50
Distance to furnace or incinerator flue (meters)	10.9
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	12
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other week
Last Annual Performance Evaluation for gaseous parameters	07/10/2012
Last two semi-annual flow rate audits for PM monitors	N/A

San Carlos Airport

Site Name	San Carlos Airport
AQS ID	06-081-2002
GPS coordinates	37.508813, 122.247291
Location	The end of the runway in the aircraft run-up zone
Address	620 Airport Drive, San Carlos, CA 94070
County	San Mateo
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Carlos airport was chosen by EPA as a lead monitoring site because piston engine aircraft utilizing this airport use leaded fuel. Additionally, very few air monitoring studies have been conducted to measure lead emissions near general aviation runways. To better assess lead emissions and possible public exposure to lead in the ambient air near general aviation airports, the EPA selected 15 airports from across the nation to participate in a one year airport lead monitoring study. Lead monitoring at this site began on March 10, 2012. A collocated lead sampler is located at this site.

For all airport lead monitoring sites in the EPA study, if the rolling three month average exceeds 50% of the 0.15 µg/m3 NAAQS, then the site will continue to operate indefinitely. For San Carlos airport, results through December 2012 indicate that lead concentrations exceed the NAAQS. Consequently, this site will continue for an indefinite period.

San Carlos Airport Monitor Information

Pollutant, POC	Lead (TSP), 3	Lead (TSP), 5
Parameter code	14129	14129
Basic monitoring objective(s)	NAAQS Comparison & Research	NAAQS Comparison & Research
Site type(s)	Source Oriented	Source Oriented
Monitor type(s)	SLAMS	QA Collocated
Instrument manufacturer and model	Tisch TE-HVPLUS-BL	Tisch TE-HVPLUS-BL
Method code	191	191
FRM/FEM/ARM other	FEM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	RTI	RTI
Reporting Agency	Air District	Air District
Spatial scale	Micro	Micro
Monitoring start date	03/10/2012	03/10/2012
Current sampling frequency	1:6	1:12
Calculated sampling frequency	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	1.6	1.6
Distance from supporting structure (meters)	N/A	N/A
Distance from obstructions on roof (meters)	None	None
Distance from obstructions not on roof (meters)	None	None
Distance from trees (meters)	>20	>20
Distance to furnace or incinerator flue (meters)	None	None
Distance between collocated monitors (meters)	3.1	3.1
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	Quarterly	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	12/20/2012 06/07/2012	12/20/2012 06/07/2012

San Francisco

Site Name	San Francisco
AQS ID	06-075-0005
GPS coordinates	37.765946, 122.399044
Location	One-story commercial building
Address	10 Arkansas St, Suite N, San Francisco, CA 94107
County	San Francisco
Distance to road from gaseous probe (meters)	16th St: 32 Interstate 280: 300 Arkansas St: 17 US Highway 101: 504
Traffic count (AADT, year)	16th St: 12,278 (2006) Arkansas St: 500 (est. 2008) Interstate 280: 99,000 (2010) U.S. Highway 101: 215,000 (2010)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Francisco was chosen for an air monitoring site because it is the second largest city in the Bay Area with a population of 805,235 according to the 2010 census. Although the sea breeze usually keeps pollution levels low, light wind conditions can result in high levels of ozone precursors or particulates due to the large number of sources in the city. The east side of the city was selected for air monitoring because it is densely populated (including a large number of daytime visitors and commuters), has some industry, and, as a transportation hub, has generally higher traffic volume. The site is located near the fringe of the central business district, in an area of light industry that is close to a residential area and two major freeways.

Ozone and NO/NO_2 are measured to monitor population exposure to these pollutants, and because this is a source area for ozone precursors. Carbon monoxide is measured due to high traffic volume. PM_{10} and $PM_{2.5}$ are measured due to stagnant days, surface-based inversions, and heavy vehicular traffic can cause elevated PM levels.

PM_{10} monitoring was changed from 1:6 to 1:12 schedule effective January 1, 2013. Because the Bay Area is well above the minimum monitoring requirements for PM_{10}, it was decided to convert PM_{10} monitoring from SLAMS to SPM, thus allowing a less frequent monitoring schedule due to limited resources. Therefore, this site will no longer be counted in meeting PM_{10} minimum monitoring requirements after 2012.

VOC toxic compounds are sampled at San Francisco by both the Air District and CARB on a 1:12 schedule and analyzed by their respective laboratories. Carbonyls and metals are also sampled by CARB on the same 1:12 schedule. Details about the CARB toxics monitoring program can be found at http://www.arb.ca.gov/toxics/toxics.htm. Information about toxics monitoring by the Air District can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded six exceedances of the national 24-hour $PM_{2.5}$ standard and one exceedance of the national 1-hour NO_2 standard. There were no exceedances of the national standards for ozone, PM_{10}, or CO recorded.

San Francisco Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	PM10, 1	PM2.5, 3
Parameter Code	44201	42101	42601 / 42602	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site types(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	Andersen HiVol 1200	Met One FEM BAM 1020
Method code	047	054	074	063	170
FRM/FEM/ARM/other	FEM	FRM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	Air District	N/A
Reporting Agency	Air District	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	01/01/1986	01/01/1986	NO: 12/01/1985 NO2: 01/01/1986	11/16/1986	10/01/2009
Current sampling frequency	Continuous	Continuous	Continuous	1:6	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A – No EE Flags	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	10.5	10.5	10.5	7.6	8.3
Distance from supporting structure (meters)	4.4	4.4	4.4	1.5	2.2
Distance from obstructions on roof (meters)	None	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None	None
Distance from trees (meters)	15.3	15.3	15.3	17.5	15.9
Distance to furnace or incinerator flue (meters)	5.2	5.2	5.2	7.0	7.3
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A	N/A
Residence time for reactive gases (seconds)	10	10	11	N/A	N/A
Will there be changes within the next 18 months?	N	N	N	Y	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	12/04/2012	12/04/2012	12/04/2012	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	12/03/2012 06/05/2012	12/03/2012 06/05/2012

San Jose

Site Name	San Jose
AQS ID	06-085-0005
GPS coordinates	37.348497, 121.894898
Location	Top floor of two-story commercial building
Address	158 E. Jackson St, San Jose, CA 95112
County	Santa Clara
Distance to road from gaseous probe (meters)	Jackson St: 15.1 4th St: 34.7
Traffic count (AADT, year)	Jackson St: 5,992 (2007) 4th St: 6,164 (2007)
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

San Jose was chosen for an air monitoring site because it is the largest city in Santa Clara County and the largest city in the Bay Area, with a population of 945,942 according to the 2010 census. The air monitoring site is located in the center of northern Santa Clara Valley, in a commercial and residential part of downtown San Jose. This area is encircled by major freeways with an international airport 1.5 miles to the northwest.

Ozone precursors emitted within the central San Francisco Bay Area are often carried into the San Jose area by the prevailing northwesterly winds. The northern half of the Santa Clara Valley is densely populated and the associated activities of the residents also add significant pollutant emissions into the air. The air quality in this location is representative of a large part of the valley due to the diurnal up valley and down valley air flow, which mixes the pollutants throughout the valley.

NO/NO_2 and ozone are monitored because of the large amount of ozone precursor emissions near the area as well as from upwind areas. Carbon monoxide is measured because of the significant traffic volume in the area. PM_{10} and $PM_{2.5}$ are monitored because light winds combined with surface-based inversions within the valley during winter months can cause elevated particulate levels.

Gaseous VOC toxic compounds, carbonyls, and metals are sampled at San Jose on a 1:6 schedule as part of the NATTS program. Gaseous toxic compounds and carbonyls are analyzed by the Air District laboratory while metals are analyzed by an outside laboratory. CARB also does sampling for VOC toxic compounds, carbonyls, and metals at San Jose but on a 1:12 schedule with the analysis is done by the CARB laboratory. More information about CARB toxics monitoring can be found at http://www.arb.ca.gov/toxics/toxics.htm. Information about toxics monitoring by the Air District can be found in the Toxics Program section of this report.

The San Jose station was approved by EPA as a National Core (NCore) multi-pollutant monitoring station on October 30, 2009 and NCore air monitoring began on January 1, 2011.

The NCore program requires reporting of PM coarse ($PM_{10-2.5}$) every 3rd day. $PM_{10-2.5}$ at San Jose is determined by subtracting the concentration of $PM_{2.5}$ from PM_{10}. In 2012 the PM_{10} sampling frequency was 1:3 all year and $PM_{2.5}$ was 1:1 from January through March and 1:3 for the rest of the year which facilitated the calculation of $PM_{10-2.5}$ every 3rd day.

On December 14, 2010, EPA revised the monitoring requirements for lead and required lead monitoring on a 1:6 schedule at NCore sites. At San Jose, monitoring began in January 2008 (before NCore) and the lead measurements are non-source oriented from PM_{10} filters. Because PM_{10} is sampled on a 1:3 schedule, only every 2nd PM_{10} filter is used for lead analysis.

In May 2012, the Air District received verbal approval from EPA to replace the $PM_{2.5}$ BAM at San Jose with a $PM_{2.5}$ FEM BAM. The existing $PM_{2.5}$ FRM sampler continued to operate, but changed from primary to collocated (it remained POC1). The new $PM_{2.5}$ FEM BAM became the primary monitor (POC3) on October 1, 2012.

On January 1, 2013, the $PM_{2.5}$ FRM (collocated, POC1) sampling schedule was changed in AQS from 1:3 to 1:6 but raw data continues to be reported to AQS on a 1:3 schedule. The required frequency for this collocated sampler is 1:12 but sampling every 3rd day is required for the NCore program. We opted to show this monitor as 1:6 to be consistent with the sampling frequency for PM_{10} as described below.

On January 1, 2013, the PM_{10} sampler frequency was changed to 1:6 but raw data continues to be reported to AQS on a 1:3 schedule. This adjustment was done to clarify that the minimum required PM_{10} frequency is not 1:3, but 1:6 thus allowing the use of the 1:3 extra samples to be counted as make-up samples in EPA AQS report summaries. When a sampler operates on a 1:3 schedule, make-up samples are required before the next scheduled sample date, which makes doing make-ups very impractical.

In the most recent three years, this site recorded three exceedances of the national 8-hour ozone standard and eight exceedances of the national 24-hour $PM_{2.5}$ standard. No exceedances of the national standards for PM_{10}, NO_2, SO_2, or CO were measured during the last three years.

San Jose Monitor Information

Pollutant, POC	O3, 1	CO*, 1	NO, 1 / NO2, 1	SO2*, 1
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison & Research	NAAQS comparison & Research	NAAQS comparison & Research	NAAQS comparison & Research
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	SLAMS & NCore	SLAMS & NCore	SLAMS	SLAMS & NCore
Instrument manufacturer and model	TECO 49i	TECO 48iTLE	TECO 42i	TECO 43iTLE
Method code	047	554	074	560
FRM/FEM/ARM/other	FEM	FRM	FRM	FRM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Urban
Monitoring start date	11/01/2002	11/01/2002	11/01/2002	02/10/2009
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	11.9	11.9	11.9	11.9
Distance from supporting structure (meters)	4.3	4.3	4.3	4.3
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	13.1	13.1	13.1	13.1
Distance to furnace or incinerator flue (meters)	4.6	4.6	4.6	4.6
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	13	14	13	13
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	11/20/2012	11/20/2012	11/20/2012	09/06/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

* High sensitivity instruments required for CO and SO_2 at NCore sites.

San Jose Monitor Information

Pollutant, POC	**NOy, 2**	**NO, 2 (from NOy)**	**Lead (from PM10), 1**
Parameter code	42600	42601	85129*
Basic monitoring objective(s)	Research	Research	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population exposure (not source oriented)
Monitor type(s)	NCore	NCore	NCore
Instrument manufacturer and model	API 200 EU/NOy	API 200 EU/NOy	Partisol 2025 without VSCC
Method code	599	599	110
FRM/FEM/ARM/other	N/A	N/A	FEM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	ERG
Reporting Agency	Air District	Air District	ERG
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	01/01/2011	01/01/2011	01/01/2008
Current sampling frequency	Continuous	Continuous	1:6
Calculated sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	10.9	10.9	8.9
Distance from supporting structure (meters)	3.3	3.3	2.2
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	13.0	13.0	14.9
Distance to furnace or incinerator flue (meters)	4.5	4.5	1.5
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	1	1	N/A
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Monthly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A	NA
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	11/19/2012 05/22/2012

* AQS parameter entries by contractor from Jan 2011 to May 2012 were 85128 (non-FRM/FEM) but should be corrected to 85129 (FEM). EPA, the Air District, and our contractor are working to resolve this matter.

San Jose Monitor Information

Pollutant, POC	PM10, 1	PM2.5*, 1	PM2.5, 3	Speciated PM2.5, 5
Parameter code	81102	88101	88101	88502 (pm mass) – many others see SASS section
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison4.0sds	NAAQS comparison & Highest Conc.	Research
Site type(s)	Population exposure	Quality Assurance	Population exposure	Population exposure
Monitor type(s)	SLAMS & NCore	QA Collocated* SLAMS & NCore	SLAMS & NCore	NCore Sup. Speciation
Instrument manufacturer and model	Partisol 2025 without VSCC	Partisol-Plus 2025 w/VSCC	Met One FEM BAM 1020	Met One SASS
Method code	127	176	170	810
FRM/FEM/ARM/other	FRM	FRM	FEM	N/A
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	Air District	Air District	N/A	RTI
Reporting Agency	Air District	Air District	Air District	RTI
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	10/15/2002	10/05/2002	10/01/2012	10/05/2002
Current sampling frequency	1:3	1:3**	Continuous	1:3
Calculated sampling frequency	N/A – No EE Flags	N/A – No EE Flags	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	8.9	8.9	10.0	8.6
Distance from supporting structure (meters)	2.2	2.2	2.4	2.0
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	14.9	11.0	11.9	16.1
Distance to furnace or incinerator flue (meters)	2.8	2.0	3.5	3.7
Distance between collocated monitors (meters)	N/A	4.0	4.0	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A	N/A	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y	Y	N
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	Monthly
Frequency of flow rate verification for automated PM analyzers	Monthly	Monthly	Bi-weekly	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	11/19/2012 05/22/2012	11/19/2012 05/22/2012	11/19/2012	11/19/2012 05/22/2012

* The Air District replaced a non-FEM BAM with a FEM BAM on 10/01/2012. The FEM BAM (POC 3) became the primary monitor and the FRM (POC1) became a collocated monitor effective 10/01/2012.

** The PM2.5 FRM operated daily from 01/01/2012 through 03/31/2012 and operated every third day for the rest of 2012.

San Martin

Site Name	San Martin
AQS ID	06-085-2006
GPS coordinates	37.079379, 121.600031
Location	Air monitoring shelter next to maintenance shed
Address	13030 Murphy Ave, San Martin, CA 95046
County	Santa Clara
Distance to road from gaseous probe (meters)	Murphy Ave: 57 US Highway 101: 455 Monterey Rd: 562 San Martin Ave: 920
Traffic count (AADT, year)	Murphy Ave: 350 (2011) US Highway 101: 109,000 (2011) Monterey Rd: 9350 (2011) San Martin Ave: 8360 (2011)
Groundcover	Vegetative
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

San Martin was chosen as an ozone air monitoring site because earlier field measurements showed this area to have the highest ozone concentrations in the Santa Clara Valley. Prevailing winds transport ozone and ozone precursors down the valley from the densely populated San Jose area as well as the surrounding San Francisco Bay. Because ozone is formed by a chemical reaction between organic and nitrogen oxide gases in the presence of sunlight, the highest ozone concentrations are usually observed tens of miles downwind from the highest concentration of emission sources (freeways, power generating facilities, etc.) because the reactions involving the organic gases are relatively slow.

San Martin is located in an agricultural area at the south end of the Santa Clara Valley approximately 24 miles southeast of downtown San Jose and is a Census Designated Place (CDP) with a population of 7,027 based on the 2010 census. The monitoring site is located at the South County Airport, in the center of the valley and about 0.3 miles west of US Highway 101.

In the most recent three years, this site recorded four exceedances of the national 8-hour ozone standard.

San Martin Monitor Information

Pollutant, POC	**O3, 1**
Parameter code	44201
Basic monitoring Objective(s)	NAAQS comparison
Site types(s)	Highest Concentration & Population Exposure & Regional Transport
Monitor type(s)	SLAMS
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical lab	N/A
Reporting Agency	Air District
Spatial scale	Urban
Monitoring start date	04/30/1994
Current sampling frequency	Continuous
Calculated sampling frequency	N/A
Sampling season	04/01-11/30
Probe height (meters)	4.8
Distance from supporting structure (meters)	2.8
Distance from obstructions on roof (meters)	N/A
Distance from obstructions not on roof (meters)	N/A
Distance from trees (meters)	23
Distance to furnace or incinerator flue (meters)	N/A
Distance between collocated monitors (meters)	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	18
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Last Annual Performance Evaluation for gaseous parameters	11/07/2012
Last two semi-annual flow rate audits for PM monitors	N/A

San Pablo

Site Name	San Pablo
AQS ID	06-013-1004
GPS coordinates	37.960400, 122.356811
Location	One story commercial building
Address	1865-D Rumrill Blvd, San Pablo, CA 94806
County	Contra Costa
Distance to road from gaseous probe (meters)	Rumrill Blvd: 15.8
Traffic count (AADT, year)	Rumrill Blvd: 16,800 (2010)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Pablo was chosen for an air monitoring site because the area is in the most populated portion of western Contra Costa County. The population was 29,139 at the 2010 census. It is almost completely surrounded by the city of Richmond which has a population of 103,701 according to the 2010 census. This area has heavy industry, high traffic volume including two major freeways, and it is very close to the Chevron Refinery. Ozone and NO/NO_2 are measured because the area is downwind of the central San Francisco Bay Area, which is a large source of ozone precursor emissions. Carbon monoxide is measured due to the high traffic volume in the area. SO_2 is measured because the site is 1.2 miles downwind of the Chevron refinery, which can be a significant source of SO_2 emissions. PM_{10} is measured because stagnant days in the fall and winter can result in elevated particulate levels.

A $PM_{2.5}$ FEM BAM began operation on December 12, 2012. The FEM BAM is classified as middle scale based on its distance from the roadway and nearby traffic volume. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations.

The monitoring scale for ozone is middle scale. Following an EPA Region 9 review of the distance between the gaseous probe and the roadway, and the corresponding traffic count, EPA Region 9 suggested this monitor be changed from SLAMS to SPM and the Air District agreed to the change. Consequently, this monitor cannot be used toward meeting the minimum monitoring requirements for ozone.

VOC toxic compounds are sampled at San Pablo on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

The station was temporarily closed from March 2009 to May 2010 due to heavy damage from a fire in the building.

This site recorded one exceedance of the national 8-hour ozone standard during the last three years. No exceedances of the national standards for NO_2, SO_2, CO or PM_{10} were measured during the past three years. The new $PM_{2.5}$ FEM BAM did not record any exceedances of the national 24-hour $PM_{2.5}$ standard since it was deployed on December 12, 2012.

San Pablo Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	SO2, 1
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Source Oriented
Monitor type(s)	Special Purpose	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	TECO 43i
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle	Neighborhood
Monitoring start date	09/13/2002	09/13/2002	09/13/2002	09/13/2002
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	9.0	9.0	9.0	9.0
Distance from supporting structure (meters)	5.6	5.6	5.6	5.6
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	>50	>50	>50	>50
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	8	7	5	5
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Last Annual Performance Evaluation gaseous parameters	07/17/2012	07/17/2012	07/17/2012	07/17/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

San Pablo Monitor Information

Pollutant, POC	PM10, 1	PM2.5, 3
Parameter code	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS
Instrument manufacturer and model	Tisch Env. HiVol TE-60	Met One FEM BAM 1020
Method code	141	170
FRM/FEM/ARM/other	FRM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	Air District	Air District
Reporting Agency	Air District	Air District
Spatial scale	Middle	Middle
Monitoring start date	09/23/2002	12/12/2012
Current sampling frequency	1:6	Continuous
Calculated sampling frequency	N/A – No EE Flags	N/A – No EE Flags
Sampling season	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	5.1	5.3
Distance from supporting structure (meters)	1.6	1.8
Distance from obstructions on roof (meters)	None	None
Distance from obstructions not on roof (meters)	None	None
Distance from trees (meters)	>50	>50
Distance to furnace or incinerator flue (meters)	None	None
Distance between collocated monitors (meters)	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Last Annual Performance Evaluation gaseous parameters	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	07/17/2012 01/18/2012	None – opened in December

San Rafael

Site Name	San Rafael
AQS ID	06-041-0001
GPS coordinates	37.972310, 122.520004
Location	Second floor of two-story commercial building
Address	534 4th Street, San Rafael, CA 94901
County	Marin
Distance to road from gaseous probe (meters)	4th St: 1 Irwin St: 48 US Highway 101: 112 3rd St: 124
Traffic count (AADT, year)	4th St: 4,248 (2010) Irwin St: 17,531 (2007) US Highway 101: 159,000 (2010) 3rd St: 20,870 (2000)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Rafael was chosen for an air monitoring site because it is the largest city in Marin County with a population of 57,713 according to the 2010 census. The city's climate and air quality is representative of that found throughout the populous eastern side of the county. Afternoon sea breezes typically keep pollution levels low. However, when the sea breeze is absent, local sources can cause elevated pollution levels.

The monitoring site is located in a commercial building about a block east of US Highway 101 and near major highway access ramps. It is one half mile east of the downtown San Rafael business district. There is no industrial activity in the immediate area. Ozone and NO/NO_2 are measured to monitor general population exposure to these pollutants. Carbon monoxide and PM_{10} are measured because the site is close to a major transportation corridor. $PM_{2.5}$ is measured because light winds combined with wood burning, vehicular traffic, and surfaced-based inversions during winter can cause elevated particulate concentrations.

VOC toxic compounds are sampled at San Rafael on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

The monitoring scale for ozone is middle scale. Following an EPA Region 9 review of the distance between the gaseous probe and the roadway, and the corresponding traffic count, EPA Region 9 suggested this monitor be changed from SLAMS to SPM and the Air District agreed to the change. Consequently, this monitor cannot be used toward meeting the minimum monitoring requirements for ozone.

The $PM_{2.5}$ FEM BAM that has operated since 2009 was reclassified as middle scale based on its distance from the roadway and nearby traffic volume. The Air District considers this

monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations.

Since $PM_{2.5}$ monitoring began in October 2009, five exceedances of the national 24-hour $PM_{2.5}$ standard have been measured. No exceedances of the national standards for ozone, PM_{10}, NO_2 or CO were measured during the last three years.

San Rafael Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	PM10, 1	PM2.5, 3
Parameter code	44201	42101	42601 / 42602	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	Special Purpose	SLAMS	SLAMS	SLAMS	SLAMS
Sampling method	TECO 49i	TECO 48i	TECO 42i	Andersen HiVol 1200	Met One FEM BAM 1020
Method code	047	054	074	063	170
FRM/FEM/ARM/other	FEM	FRM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	Air District	N/A
Reporting Agency	Air District	Air District	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle	Middle	Middle
Monitor start date	07/01/1976	10/01/1967	NO: 01/01/1968 NO2:10/01/1967	11/04/1986	10/27/2009
Current sampling frequency	Continuous	Continuous	Continuous	1:6	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A – No EE Flags	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	11.9	11.9	11.9	7.0	7.1
Distance from supporting structure (meters)	5.2	5.2	5.2	1.9	2.0
Distance from obstructions on roof (meters)	None	None	None	None	None
Distance from obstructions not on roof (meters)	21.0	21.0	21.0	20.0	18.5
Distance from trees (meters)	14.0	14.0	14.0	15.0	12.5
Distance to furnace or incinerator flue (meters)	3.5	3.5	3.5	2.3	3.4
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow (meters)	360	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A	N/A
Residence time for reactive gases (seconds)	10	11	12	N/A	N/A
Will there be changes within the next 18 months?	N	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A	N/A
Last Annual Performance Evaluation gaseous parameters	09/12/2012	09/12/2012	09/12/2012	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	09/11/2012 03/20/2012	09/11/2012 03/20/2012

San Ramon

Site Name	San Ramon
AQS ID	06-013-2007
GPS coordinates	37.743649, 121.934188
Location	Top of trailer
Address	9885 Alcosta Blvd, San Ramon, CA 94582
County	Contra Costa
Distance to road from gaseous probe (meters)	Alcosta Blvd: 300 Pine Valley Rd: 100 Estero Dr: 250 Del Mar Dr: 350
Traffic count (AADT, year)	Alcosta Blvd: 8,277 (2010) Pine Valley Rd: <500 (est. 2012) Estero Dr: <500 (est. 2012) Del Mar Dr: <500 (est. 2012)
Groundcover	Gravel
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Ramon was chosen to be an upwind ozone and ozone precursor background site to better characterize ozone levels in the Livermore Valley where the highest ozone design values in the Bay Area occur. San Ramon is also a population oriented monitoring site and has a population of 72,148 according to the 2010 census. The site is located along the I-680 corridor which connects the Livermore Valley with San Ramon Valley and other major cities of Contra Costa County.

During summer, localized north winds can be channeled southward from Concord and Walnut Creek along the I-680 corridor and pass through San Ramon before turning eastward into the Livermore Valley. Consequently, ozone and NOx are measured at Sam Ramon in support of the Bay Area Photochemical Assessment Monitoring Stations (PAMS) program. PAMS is a program that measures ozone, NOx, and hourly speciated hydrocarbons using a gas chromatograph analyzer at three Bay Area locations (the other two locations are Patterson Pass and Livermore). A full description of the PAMS program can be found in the PAMS section of this document.

Since ozone monitoring began in January 2011, three exceedances of the national 8-hour ozone standard have been recorded. During the same period, no exceedances of the national NO_2 standard have been measured.

San Ramon Monitor Information

Pollutant, POC	**O3, 1**	**NO, 1 / NO2, 1**
Parameter code	44201	42601 / 42602
Basic monitoring objective(s)	Research	Research
Site type(s)	Population Exposure Upwind Background	Population Exposure & Max precursor impact
Monitor type(s)	Unofficial PAMS	Unofficial PAMS
Instrument manufacturer and model	TECO 49i	TECO 42i
Method code	047	074
FRM/FEM/ARM other	FEM	FRM
Collecting Agency	Air District	Air District
Analytical Lab	N/A	N/A
Reporting Agency	Air District	Air District
Spatial scale	Urban	Urban
Monitoring start date	01/01/2012	01/01/2012
Current sampling frequency	Continuous	Continuous
Calculated sampling frequency	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	5.8	5.8
Distance from supporting structure (meters)	3.1	3.1
Distance from obstructions on roof (meters)	None	None
Distance from obstructions not on roof (meters)	None	None
Distance from trees (meters)	62	62
Distance to furnace or incinerator flue (meters)	None	None
Distance between collocated monitors (meters)	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	Teflon	Teflon
Residence time for reactive gases (seconds)	16	16
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	08/28/2012	08/28/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A

Santa Rosa

Site Name	Santa Rosa
AQS ID	06-097-0003
GPS coordinates	38.443503, 122.710169
Location	Second floor of two-story commercial building
Address	837 5th St, Santa Rosa, CA 95404
County	Sonoma
Distance to road from gaseous probe (meters)	5th St: 24 E St: 79 College Ave: 210 Brookwood Ave: 228 US Highway 101: 918
Traffic count (AADT, year)	5th St: 2,347 (2009) E St: 5,876 (2009) College Ave: 13,304 (2009) Brookwood Ave: 15,604 (2009) US Highway 101: 121,000 (2010)
Groundcover	Paved
Statistical Area	Santa Rosa-Petaluma CBSA

Santa Rosa was chosen for an air monitoring site because it is the largest city in Sonoma County with a population of 167,814 according to the 2010 census. The city's climate is strongly influenced by the Pacific Ocean and the marine air flow typically keeps pollution levels low. However, during light winds or strong nighttime temperature inversions, local sources can cause elevated pollution levels. The monitoring site is located just east of the downtown urban core and 0.5 miles east of US Highway 101.

There are no industrial sources in the immediate area. Ozone and NO/NO_2 are measured to monitor general population exposure to these pollutants. Carbon monoxide is measured because of the local urban traffic volume and proximity to the Highway 101 transportation artery. $PM_{2.5}$ is measured because light winds combined with wood burning, vehicular traffic, and surface-based inversions in winter can cause elevated particulate concentrations.

VOC toxic compounds are sampled at Santa Rosa on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Pollutant concentrations measured at Santa Rosa did not exceed the national standards for ozone, $PM_{2.5}$, NO_2 or CO during the last three years.

The lease for this site expired at the end of 2011 and the property owner declined to exercise an option to renew the lease for five years. As of June 2013, this site is on a month to month occupancy agreement. The owners are agreeable to giving the Air District two to three months advance notice if they choose that the property must be vacated.

Santa Rosa Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**PM2.5, 3**
Parameter code	44201	42101	42601 / 42602	88101
Basic monitoring objectives(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Highest Conc.
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	Met One FEM BAM 1020
Method code	047	054	074	170
FRM/FEM/ARM/other	FRM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	04/17/1981	04/17/1981	NO: 01/01/1982 NO2:04/17/1981	10/23/2009
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	All year	All year	All year	All year
Probe height (meters)	10.7	10.7	10.7	8.1
Distance from supporting structure (meters)	5.2	5.2	5.2	2.0
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	21	21	21	21
Distance from trees (meters)	13.7	13.7	13.7	13.7
Distance to furnace or incinerator flue (meters)	4.7	4.7	4.7	5.7
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	8	10	9	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A
Last Annual Performance Evaluation for gaseous parameters	12/11/2012	12/11/2012	12/11/2012	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	12/11/2012 06/11/2012

Vallejo

Site Name	Vallejo
AQS ID	06-095-0004
GPS coordinates	38.102507, 122.237976
Location	One story commercial building
Address	304 Tuolumne St, Vallejo, CA 94590
County	Solano
Distance to road from probe (meters)	Tuolumne St: 18 Solano Ave: 33 Capitol St: 30 Interstate 80: 700
Traffic count (AADT, year)	Tuolumne St: 5,093 (2008) Capitol St: 500 (2008) Solano Ave: 8,588 (2008) Interstate 80: 137,000 (2011)
Groundcover	Paved
Statistical Area	Vallejo-Fairfield CBSA

Vallejo was chosen for an air monitoring site because it is the largest city in Solano County with a population of 115,942 according to the 2010 census. The monitoring site is located in a mixed commercial and residential neighborhood one mile east of downtown and 0.5 miles west of Interstate 80.

Ozone and NO/NO_2 are measured because southerly winds can transport ozone and its precursors into Vallejo from the heavily populated central Bay Area and easterly winds can transport ozone from the Central Valley through the Carquinez Strait. $PM_{2.5}$ is measured because high concentrations often occur during winter when nighttime valley drainage winds, wood burning, and shallow temperature inversions trap pollutants from local sources and the Napa Valley to the north. East winds can also transport particulate into Vallejo through the Carquinez Strait from the Central Valley. Carbon monoxide is measured because Interstate 80 passes through the middle of the urban area east of the monitoring site. SO_2 is measured to monitor general population exposure and because refineries located to the south and east can be significant sources of SO_2.

On January 1, 2013 a collocated $PM_{2.5}$ FEM BAM began operation. This site now runs two FEM BAM instruments: a primary (previously existing) and a collocated for quality assurance purposes. Vallejo was selected for collocation because this site has one of the highest $PM_{2.5}$ design values in the Bay Area.

VOC toxic compounds are sampled at Vallejo on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded one exceedance of the national 8-hour ozone standard and seven exceedances of the national 24-hour $PM_{2.5}$ standard. No exceedances of the national standards for NO_2, SO_2, or CO were measured during the last three years.

Vallejo Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	SO2, 1
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 48i	TECO 48i
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Urban
Monitoring start date	07/01/1976	07/01/1976	07/01/1976	07/01/1976
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	9.6	9.6	9.6	9.6
Distance from supporting structure (meters)	4.3	4.3	4.3	4.3
Distance from obstructions on roof (meters)	None	None	None	None
Distance from obstructions not on roof (meters)	None	None	None	None
Distance from trees (meters)	>50	>50	>50	>50
Distance to furnace or incinerator flue (meters)	3.7	3.7	3.7	3.7
Distance between collocated monitors (meters)	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	8	10	10	10
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Last Annual Performance Evaluation for gaseous parameters	11/29/2012	11/29/2012	11/29/2012	11/29/2012
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

Vallejo Monitor Information

Pollutant, POC	**PM2.5, 3**	**PM2.5, 5 Speciated**
Parameter Code	88101	88502 (pm mass) – many others see SASS section
Basic monitoring objective(s)	NAAQS comparison	Research
Site type(s)	Population exposure & Highest Conc.	Population exposure
Monitoring type(s)	SLAMS	Sup. Speciation
Instrument manufacturer and model	Met One FEM BAM 1020	Met One SASS
Method Code	170	810
FRM/FEM/ARM/other	FEM	N/A
Collecting Agency	Air District	Air District
Analytical Lab	Air District	DRI
Reporting Agency	Air District	DRI
Spatial scale	Neighborhood	Neighborhood
Monitoring start date	03/01/2011	06/11/2008
Current sampling frequency	Continuous	1:6
Calculated sampling frequency	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	5.8	6.6
Distance from supporting structure (meters)	1.9	2.3
Distance from obstructions on roof (meters)	None	None
Distance from obstructions not on roof (meters)	None	None
Distance from trees (meters)	>50	>50
Distance to furnace or incinerator flue (meters)	2.5	5.4
Distance between collocated monitors	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	Y	N
Frequency of flow rate verification for manual PM samplers	N/A	Monthly
Frequency of flow rate verification for automated PM analyzers	Bi-weekly	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Last Annual Performance Evaluation for gaseous parameters	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	11/28/2012 05/30/2012	11/28/2012 05/30/2012

Special Monitoring Programs Conducted in 2012

Meteorology Program

The Air District operates a meteorological monitoring program to provide accurate measurements of ambient meteorological parameters to meet the requirements of many programs within the Air District. Air District programs using meteorological data are: air quality forecasting, photochemical modeling, source modeling, and data analysis. To obtain high quality data to be used for regulatory applications, the Air District considers EPA recommendations for siting, instrumentation, data accuracy, and quality assurance.

The placement of meteorological stations depends on the use of the data. Sites chosen for air quality forecasting are located in areas that show the general wind and temperature patterns within the Air District. Photochemical modeling sites are chosen to show boundary conditions, general conditions, and upper air measurements. Source modeling sites are chosen to be representative of the source and receptor domain to be modeled. Sites used for data analysis are usually located near high pollution areas to determine the trajectories between source areas and downwind high concentration areas, as well as the general atmospheric conditions occurring during the episodes.

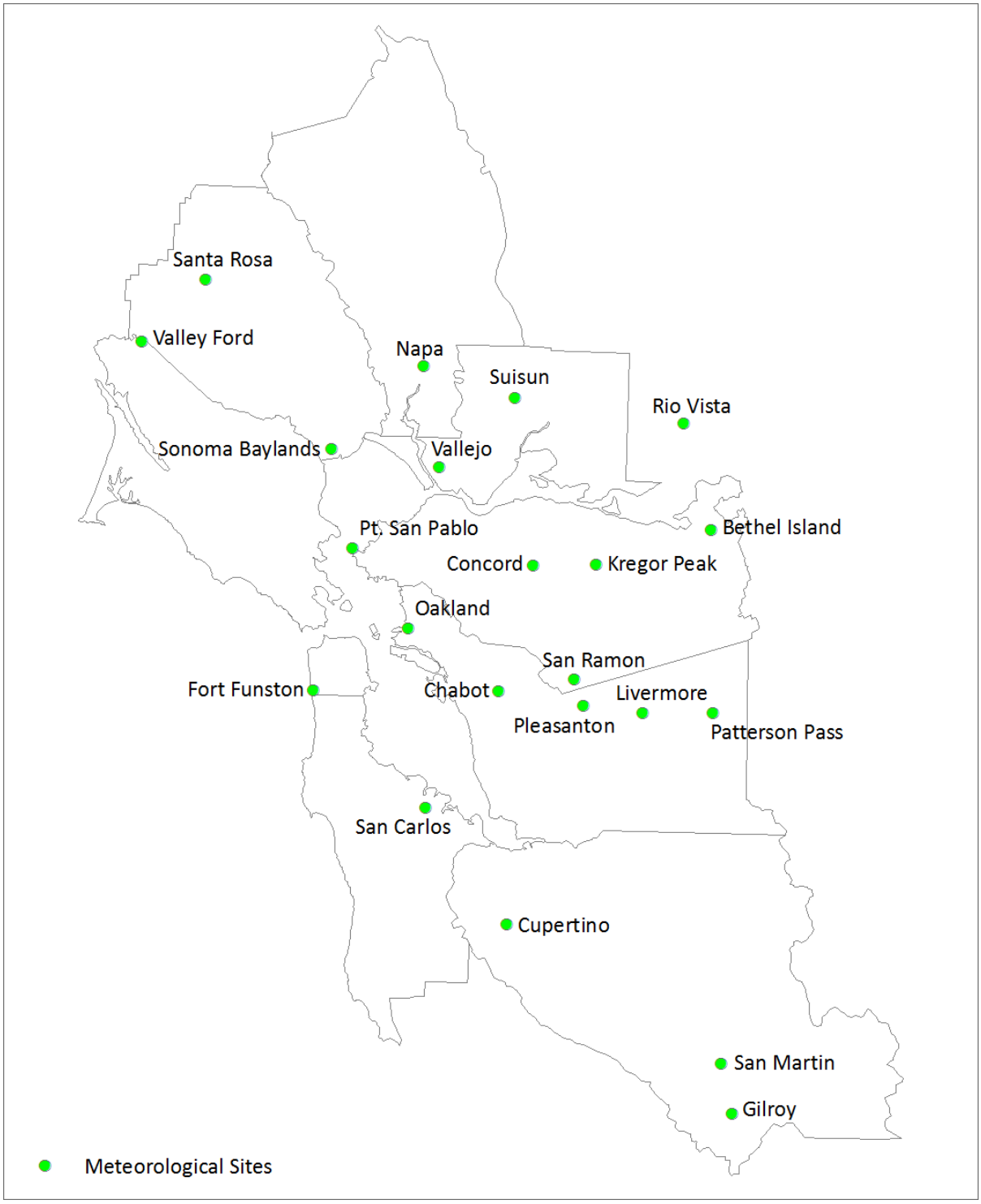
Because most Air District air monitoring stations are in urban or suburban neighborhoods where multistory buildings and trees are nearby, it is not possible to place meteorological systems at all Air District air monitoring stations and meet EPA meteorological siting recommendations. EPA recommends wind systems be located at a height of 10 meters or at plume height if the use is source oriented modeling. In addition, the distance between the wind instrument and any obstruction should be at least 10 times the height of the obstruction.

The current meteorological network has 23 sites. Figure 11 shows the locations of the sites in 2012. Ten of these sites are located at or adjacent to air monitoring stations (Bethel Island, Cupertino Monta Vista Park, Suisun, Concord, Patterson Pass, San Ramon, Vallejo, Livermore, Gilroy, and San Martin). The other air monitoring stations have obstructions to air flow nearby, necessitating placement of the meteorological sites further away. Additionally, to meet forecasting or photochemical modeling needs, some meteorological sites have been placed on ridges or mountain tops, such as at Chabot, Patterson Pass, and Kregor Peak. Sensors used in the Air District's meteorological network include wind speed and direction, temperature, relative humidity, precipitation, and pressure.

Hourly-averaged data are made available to District staff and the public on the Air District's web page, and are archived in the Technical Service Division's database. Each site is visited monthly by Air District staff for a visual inspection of the instrumentation. If problems are seen, a technician visits the site to correct problems. Data is also reviewed on an ongoing basis by Air District meteorologist providing daily air quality forecasts for the Bay Area.

Data recorded at airports, oil refineries, sewage treatment plants, universities, and private companies are included in the Technical Services Division meteorological database as long as they meet EPA recommended siting and maintenance specifications. If requested by facilities, Air District staff will advise where to place meteorological stations and how to maintain the sensors so the data can be used for regulatory purposes.

Figure 11. Map of Air District Meteorological Monitoring Sites in 2012



National Air Toxics Trends Station (NATTS) at San Jose

EPA established the National Air Toxics Trends Stations (NATTS) network in 2003. The program was created to improve national toxics monitoring with the goal of identifying toxics trends in urban and rural settings in the United States. EPA and the Air District agreed to include San Jose in the NATTS network because of its high quality air toxics data since 1991, and because San Jose is the largest city in Northern California with a 2010 population of 945,942. The Air District began operating a NATTS site at the San Jose air monitoring station on January 1, 2003 with samples taken on a 1:6 schedule.

Hazardous Air Pollutants (HAPs) Measurements

NATTS pollutants can be grouped into four categories: hazardous air pollutants, continuous measurements, polycyclic aromatic hydrocarbons, and metals. In 2012, the NATTS program required 19 compounds to be measured, as listed in Table 20. These compounds were selected for analysis based on toxicity, available measurement methods, measurement cost, correlation with other important HAPs, and expected concentration levels. Hexavalent chromium is the only required NATTS airborne toxic compound that the Air District does not directly measure, because the current sampling methodology allows significant deterioration of the compound before the analysis can be performed. Chromium is measured instead as an estimate of hexavalent chromium concentrations. In the future, the Air District may sample for hexavalent chromium when better sampling techniques are developed.

Table 20. List of the 19 NATTS HAPs Monitored by the Air District in 2012

Hazardous Air Pollutant or Species	Parameter	Method Code	Year NATTS Measurements Began	Parameter Type	Sample Source (24-hr Period)	Analyzing Lab	Analysis Equipment
1, 3 Butadiene	43218	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Benzene	45201	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Carbon tetrachloride	43804	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Chloroform	43803	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Tetrachloroethylene	43817	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Trichloroethylene	43824	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Vinyl Chloride	43860	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Acrolein	43505	153	2008	VOC	SUMMA canister	BAAQMD	GCMS
Formaldehyde	43502	202	2006	Carbonyl	Cartridge	BAAQMD	HPLC
Acetaldehyde	43503	202	2006	Carbonyl	Cartridge	BAAQMD	HPLC
Benzo(a)pyrene	17242	118	2008	PAH	Hi-Vol Polyurethane filter	ERG	GCMS
Naphthalene	17141	118	2008	PAH	Hi-Vol Polyurethane filter	ERG	GCMS
Arsenic	85103	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Beryllium	85105	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Cadmium	85110	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Chromium[1]	85112	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Lead	85129	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Manganese	85132	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Nickel	85136	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS

[1]Chromium is measured as an estimate of hexavalent chromium.

Emission sources of the NATTS HAPs:

- Benzene and 1, 3 butadiene are emitted by mobile sources (cars and trucks).
- Carbon tetrachloride, tetrachloroethylene and trichloroethylene are used for cleaning, but Air District regulations have significantly reduced their use.
- Chloroform is produced in the chlorination of water.
- Vinyl chloride is emitted by discharge of exhaust gases from factories that manufacture or process vinyl chloride, plastics and vinyl products as well as waste of mentioned products.
- Acrolein is generated by diesel and jet engines.
- Formaldehyde and acetaldehyde are formed during combustion processes. Formaldehyde is also created during the manufacture of some building materials and household products, and continues to off gas after manufacturing.
- Arsenic compounds originate from soil and the smelting of metals.
- Nickel and cadmium compounds are naturally found in some soils and can be emitted from fossil fuel combustion, cement manufacturing and electroplating. Also, cadmium comes from tire wear.
- Manganese compounds naturally occur in some soils and can be emitted from steel plants, power plants and coke ovens.
- Hexavalent chromium is emitted during chrome plating operations, and is believed to be a byproduct of the cement-making process.

Benzene; 1, 3 butadiene; acrolein; trichloroethylene; carbon tetrachloride; chloroform; trichloroethylene and vinyl chloride are collected in canisters using a Xontech 910a sampler. The canister contents are then analyzed in the Air District laboratory using a Gas Chromatograph Mass Spectrometer (GCMS) method TO-15.

Formaldehyde and acetaldehyde (carbonyls) are collected using a cartridge on one sampling channel of a Xontech 924 toxics sampler. In the Air District laboratory, exposed cartridges are analyzed for carbonyls using High Performance Liquid Chromatograph (HPLC) method TO-11.

Benzo(a)pyrene and Naphthalene (two PAH compounds) are collected using a HiVol Polyurethane Foam (PUF) filter and sent to ERG (EPA's designated contract laboratory) for analysis using GCMS method TO-13.

Metals are collected on a PM_{10} Low Volume Teflon filter and sent to ERG for analysis using Inductively Coupled Plasma Mass Spectrometry (ICPMS).

<u>Additional Polycyclic Aromatic Hydrocarbons (PAHs) Measurements</u>
The PAHs are products of incomplete combustion, and are found primarily in soil, sediment and oily substances, as opposed to in water or air. However, they are also a component of concern in particulate matter in air and have probable human carcinogenic (cancer), mutagenic (genetic mutation), and taratogenic (birth defects) properties.

In May 2008, the Air District began sampling for two PAHs for the NATTS program at San Jose (Benzo(a)pyrene and Naphthalene) as listed in Table 20. The PAH compounds are collected on a HiVol Polyurethane Foam (PUF) sampler on the NATTS 1:6 sampling schedule. ERG provides the filter media and does the analysis. Also, ERG provides the Air District with analysis results for 20 additional PAH compounds as listed in Table 21.

Table 21. Additional 20 PAH Compounds Measured by the Air District in 2012

Hazardous Air Pollutant or Species	Parameter	Method Code	Year Measurements Began	Sample Source (24-hr Period)	Analyzing Lab	Analysis Equipment
9-Fluorenone	17159	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Acenaphthene	17147	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Acenaphthylene	17148	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Anthracene	17151	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(a)anthracene	17215	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(b)fluoranthene	17220	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(e)pyrene	17224	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(g,h,i)perylene	17237	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(k)fluoranthene	17223	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Chrysene	17208	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Coronene	17211	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Cyclopenta(cd)pyrene	17160	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Dibenzo(a,h)anthracene	17231	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Fluoranthene	17201	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Fluorene	17149	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Indeno(1,2,3-cd)pyrene	17243	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Perylene	17212	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Phenanthrene	17150	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Pyrene	17204	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Retene	17158	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS

Summary NATTS data are available from the EPA's AirData web site at http://www.epa.gov/airdata/ad_maps.html. These data may also be found on the Air District web site in the Toxic Air Contaminant Control Program Annual Report at http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Toxic-Air-Contaminant-Control-Program-Annual-Report.aspx.

In addition to the NATTS analytes discussed in this section, the Air District also samples for other toxics compounds at San Jose. These are discussed in the Toxics Program section of this report.

NCore Program

In October 2006 the EPA revised 40 CFR Parts 53 and 58 to enhance ambient air quality monitoring to improve air quality measurements. One significant revision was the requirement to establish National Core (NCore) multi-pollutant monitoring stations. These stations will provide data on several pollutants at lower detection limits and replace the National Air Monitoring Station (NAMS) networks that have existed for several years. NCore stations will also be used to monitor trends of pollutants already in attainment. EPA recognized that pollutants already in attainment, and likely to remain so, did not need to be measured at all sites in a monitoring network. NCore stations are to be located in areas which represent the highest pollution levels for both attainment and non-attainment pollutants within an agency's boundaries. By reducing the number of monitors needed in a network, agencies can allocate scarce resources to other monitoring programs.

NCore stations are intended to:

- Report data to the public in a timely manner through AirNOW, air quality forecasting, and other public reporting mechanisms.
- Support development of emissions control strategies through air quality model evaluation and other observational methods.
- Track long-term trends for accountability of emissions control programs and health assessments that contribute to ongoing reviews and attainment of the National Ambient Air Quality Standards (NAAQS).
- Support scientific studies ranging across technological, health, and atmospheric disciplines including ecosystem assessments.

EPA designed the national NCore network to have a mixture of urban and rural sites. In Northern California, EPA desired a monitoring station that would represent a large urban area. Recommendations for locating NCore urban sites are found in 40 CFR Part 58 Appendix D and other EPA publications:

- Urban NCore stations are to be located at neighborhood or urban scale to provide representative exposure levels throughout the metropolitan area population.
- Urban NCore stations should be located where significant pollution levels exist.
- Population exposure monitoring is highly recommended.
- No biasing local pollutant emission sources should be within 500 meters at urban stations.
- Collocation with other network programs (such as NATTS, STN, CASTNET, IMPROVE, NADP, PAMS) is encouraged.
- Siting of monitors at NCore sites must meet SLAMS requirements as specified in 40 CFR Part 58.

EPA and the Air District cooperatively agreed to establish the Northern California NCore station in San Jose effective January 1, 2011. EPA provides funding and the Air District operates the station. San Jose was chosen as the NCore site because it is the city with largest population in the Bay Area with nearly one million residents based on 2010 census data. Exceedances of both the ozone and 24-hour $PM_{2.5}$ national standards have been measured in

San Jose. Consequently, operating an NCore station in the San Jose area would meet the requirement of being in an urban area with significant air pollution problems.

San Jose is located in the southern part of the Bay Area, and lies within the Santa Clara Valley. Wind patterns in the Santa Clara Valley are influenced greatly by the terrain, resulting in a prevailing flow roughly parallel to the valley's northwest-southeast orientation. During the daytime a sea breeze commonly carries pollutants from San Francisco, San Mateo and Alameda counties southward into the Santa Clara Valley, while a drainage flow carrying pollutants toward the bay, in the opposite direction, occurs during the nighttime hours. This diurnal up valley and down valley air flow mixes pollutants throughout the valley, making San Jose representative of a large part of the Bay Area.

The monitoring objective for the current San Jose air quality monitoring station is population exposure. Monitoring at a population-oriented station is intended to represent air quality levels over a large area having a high population density. Consequently, the site cannot be too close to large emission sources such as industrial sources or highways, and the surrounding land use should be relatively uniform. EPA has defined neighborhood or urban scale as the appropriate area of representativeness for population exposure monitoring. Neighborhood scale has dimensions of 4 km around the monitoring station, and urban scale has a 50 km radius. Figure 12 shows the location of the current San Jose monitoring station (as a blue balloon), and a 4 km circle around the site representing a neighborhood scale area.

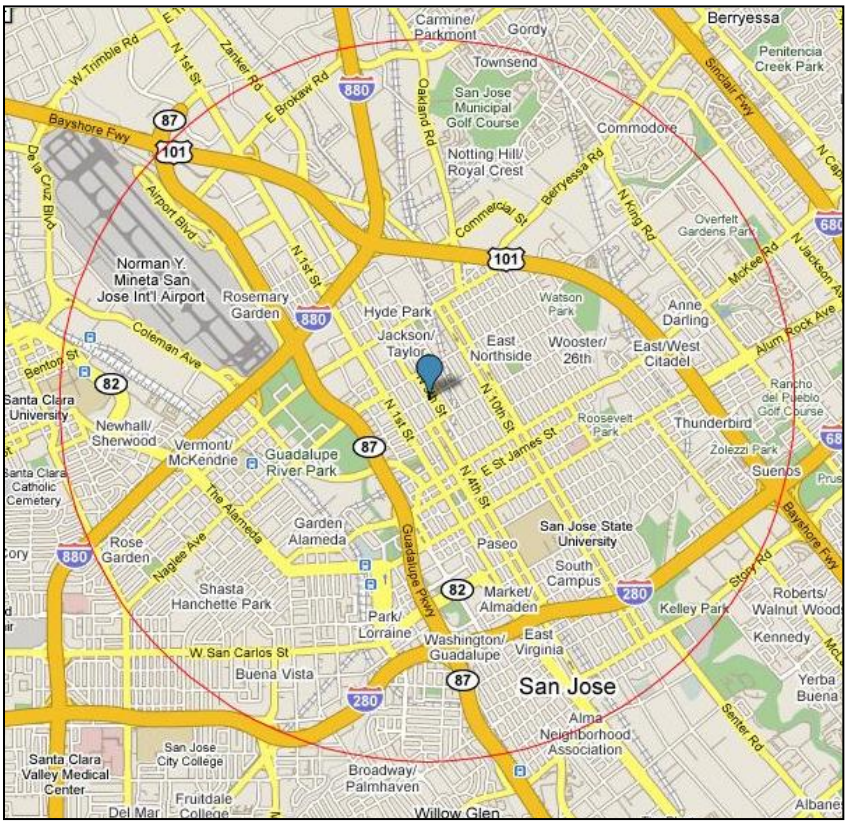


Figure 12. Map showing area of Neighborhood Scale at the San Jose NCore station.

The map shows that the current station is located in a residential/commercial area of San Jose. The station is located on Jackson Street, 1.6 km NW of the downtown core. The Air District has operated air monitoring stations at various locations near downtown San Jose since 1968, and current station has been in operation since 2002. The downtown area is encircled by freeways, but the closest freeway to the air monitoring station is 800 meters to the WSW, which is sufficiently distant to prevent vehicular emissions from dominating the general air quality at the San Jose station. The San Jose Airport is 2 to 4 km from the air monitoring station, distant enough that impacts from airport emissions would be relatively low at the monitoring station. There are no large point sources within 500 meters of the station. The only significant emission sources within a 4 km radius of the San Jose air monitoring station are:

- The Norman Y. Mineta San José International Airport, located from 2-4 km NW of the site, is a significant source. The airport averaged 256 commercial and 141 general aviation departures and landings per day in 2008.
- Reed & Graham, Inc. (an asphalt batch plant) - located 3.7 km SSW of the site.
- Central Concrete Supply Company, Inc. - located 1.9 km SSW of the site.
- San Jose State University Cogeneration Plant - located 2.6 km SSE of the site.

The San Jose air monitoring station was located to provide air quality data representative of neighborhood scale monitoring. The station currently monitors all criteria pollutants, toxics, and is part of the EPA NATTS and STN programs. This existing station meets all the site selection criteria for an NCore station.

NCore Monitors

Table 22 lists the NCore monitors operating at the San Jose station as well as the sampling methodology, sampling frequency and spatial scale for the monitors. Because ambient concentrations of the criteria pollutants CO and SO_2 are well below the NAAQS at population exposure sites across the U.S., EPA requires NCore sites to use higher sensitivity instruments than conventional instruments for these pollutants (note the use of TLE type instruments for CO and sulfur dioxide, meaning Trace Level-Enhanced). $PM_{10-2.5}$ is measured using the difference between measurements of a pair of Partisol-Plus Model 2025 Sequential samplers, with one configured as a $PM_{2.5}$ sampler and the other configured as a PM_{10} sampler. Lead is collected using the PM_{10} Teflon filter, which is sent to ERG (EPA's designated contract laboratory) for analysis using Inductively Coupled Plasma Mass Spectrometry (ICPMS).

Table 22. NCore Monitors

Monitor Type	Sampling Method	Sampling Frequency	Spatial Scale
Carbon Monoxide (CO)	TECO 48i TLE	Continuously	Neighborhood
Ozone (O_3)	TECO 49i	Continuously	Neighborhood
Sulfur Dioxide (SO_2)	TECO 43i TLE	Continuously	Neighborhood
FRM $PM_{2.5}$	Partisol-Plus 2025 w/VSCC	Jan-Mar: 1:1 Apr-Dec: 1:3	Neighborhood
BAM $PM_{2.5}$*	Met One FEM BAM 1020	Continuously	Neighborhood
$PM_{2.5}$ Speciation	Met One SASS	1:3	Neighborhood
Total Reactive Nitrogen (NO_y)	API 200EU/NOy	Continuously	Neighborhood
Nitric Oxide (NO) from NO_y	API 200EU/NOy	Continuously	Neighborhood
$PM_{10-2.5}$	Partisol-Plus 2025 Sequential $PM_{10-2.5}$ Air Sampler Pair	1:3	Neighborhood
Lead	PM_{10} Teflon filter analyzed by ERG using ICPMS	1:6	Neighborhood
Meteorological	EPA approved a waiver to use meteorological data from the San Jose Airport as official data for the NCore site.	Continuously	N.A.

*The Air District changed this instrument to a $PM_{2.5}$ FEM BAM effective October 1, 2012.

Photochemical Assessment Monitoring Stations (PAMS)

The 1990 Clean Air Act Amendments required EPA to promulgate rules for the enhanced monitoring of ozone and its precursors (NO/NO_2 and VOCs) because of continued nonattainment of the National Ambient Air Quality Standard (NAAQS) for ozone nationwide. Subsequent revisions to EPA's Air Monitoring regulations, 40 CFR Part 58, required air pollution agencies to establish Photochemical Assessment Monitoring Stations (PAMS) in ozone nonattainment areas classified as serious, severe, or extreme. The Bay Area is not in any of these categories, but is in marginal nonattainment of the ozone NAAQS. Consequently, the Air District applied for and received funding from EPA to conduct measurements of VOC speciated hydrocarbons. Monitoring began in 2010 (at Livermore and Patterson Pass) and in 2012 (at San Ramon) and will continue indefinitely.

The objectives of the Bay Area PAMS program are to:

- Measure air quality improvement progress
- Track emission trends
- Improve photochemical model performance
- Adjust ozone control strategies

Traditionally, summertime Bay Area ozone concentrations are highest in the Livermore and Santa Clara Valleys. Meteorological conditions are ideal for ozone formation in these areas when precursor NO/NO_2 and hydrocarbons are present in upwind areas. To better understand the atmospheric chemistry, emissions sources, emission reductions strategies, and pollutant transport, three locations in the Livermore area monitor for speciated hydrocarbons. Each PAMS site has meteorological wind and temperature sensors.

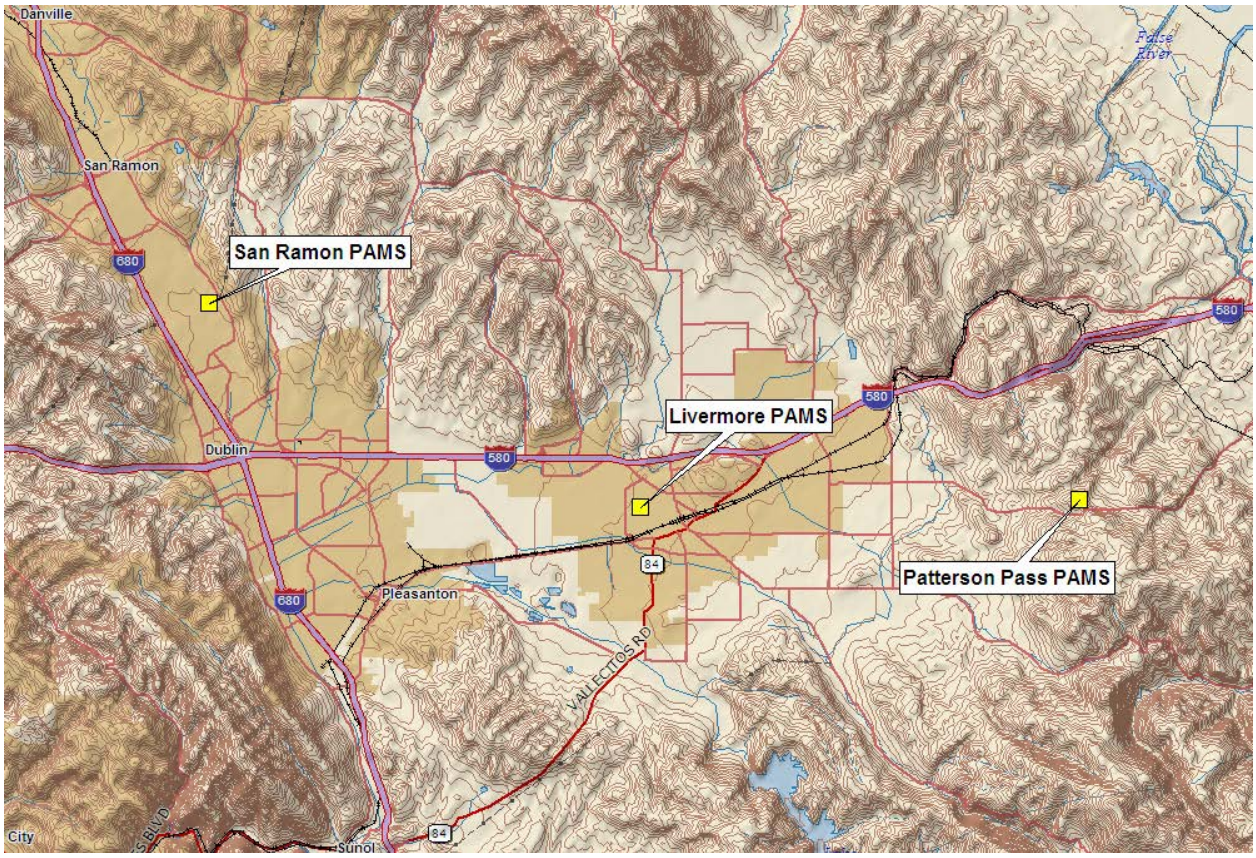
Site	Parameter	Start Date for PAMS Data Collection
Livermore	Air Monitoring	August 1, 2010
	Meteorology	August 1, 2010
San Ramon	Air Monitoring	January 1, 2012 (NO/NO_2)
		May 1, 2012 (hydrocarbons)
	Meteorology	December 14, 2011
Patterson Pass	Air Monitoring	March 1, 2011 (NO/NO_2)
		August 1, 2010 (hydrocarbons)
	Meteorology	October 27, 2011

The Air District's long existing Livermore air monitoring station was selected as a PAMS site because Livermore usually has the highest annual number of days exceeding the ozone NAAQS in the Bay Area. The site already had meteorological sensors measuring wind, temperature, and solar radiation; and air monitoring instruments measuring NO/NO_2 and ozone. As a result, the cost to add speciated hydrocarbon monitoring at Livermore was minimal.

The San Ramon and Patterson Pass sites are temporary sites operated solely for the PAMS program. The San Ramon PAMS provides information on ozone precursors and ozone

formation in the San Ramon Valley that may contribute to ozone concentrations in the Livermore Valley. While the EPA provided funding for speciated hydrocarbon monitoring at San Ramon, the Air District added ozone and NO/NO_2 so data from this site can be compared to data collected at Livermore. This site may become a permanent location for ozone and NO/NO_2 monitoring if these pollutants frequently exceed the NAAQS. The Patterson Pass site is located in the hills east of Livermore and provides additional information on the potential transport of ozone precursor compounds eastward from the Bay Area to the Central Valley. EPA funded speciated hydrocarbon monitoring and the Air District added a NOx monitor at this site. The three PAMS locations are shown in Figure 13.

Figure 13. Map of the three PAMS sites in the Livermore Valley.



EPA identifies 57 organic ozone precursor compounds usually measured at PAMS locations because of their significance in photochemical ozone pollution. The Air District measures 55 of the 57 compounds every hour using a gas chromatograph (GC) instrument. The GC does not analyze for two compounds EPA considers important ozone precursors: formaldehyde and acetone. The Air District determined that it is too costly to measure these compounds hourly. Table 23 below lists the 55 compounds measured by the GC.

Table 23. List of speciated hydrocarbons measured by Gas Chromatograph in 2012

Compound	Parameter Code	Method Code
Ethane	43202	142
Ethylene	43203	142
Propane	43204	142
Propylene	43205	142
Acetylene	43206	142
n-butane	43212	142
Isobutane	43214	142
t-2-butene / trans-2-butene	43216	142
c-2-butene / cis-2-butene	43217	142
n-pentane	43220	142
Isopentane	43221	142
1-pentene	43224	142
t-2-pentene / trans-2-pentene	43226	142
c-2-pentene / cis-2-pentene	43227	142
3-methulpentane	43230	142
n-hexane	43231	142
n-heptane	43232	142
n-octane	43233	142
n-nonane	43235	142
n-decane	43238	142
Cyclopentane	43242	142
Isoprene	43243	142
2-2-dimethylbutane	43244	142
2-4-dimethylpentane	43247	142
1-hexene	43245	142
Cyclohexane	43248	142
3-methylhexane	43249	142
2-2-4-trimethylpentane	43250	142
2-3-4-trimethylpentane	43252	142
3-methylheptane	43253	142
Methylcyclohexane	43261	142
Methylcyclopentane	43262	142
2-methylhexane	43263	142
1-butene	43280	142
2-3-dimethylbutane	43284	142
2-methylpentane	43285	142
2-3-dimethylpentane	43291	142
n-undecane	43954	142

Compound	Parameter Code	Method Code
2-methylheptane	43960	142
m/p xylene	45109	142
Benzene	45201	142
Toluene	45202	142
Ethylbenzene	45203	142
o-xylene	45204	142
1-3-5-trimethylbenzene	45207	142
1-2-4-trimethylbenzene	45208	142
n-propylbenzene	45209	142
Isopropylbenzene	45210	142
o-ethyltoluene	45211	142
m-ethyltoluene	45212	142
p-ethyltoluene	45213	142
m-diethylbenzene	45218	142
p-diethylbenzene	45219	142
Styrene	45220	142
1-2-3-trimethylbenzene	45225	142

The GCs operated year-round from their initial start date in 2010 (2012 for San Ramon) until December 2012 and then were shut down through the winter, and were put back online in April 2013. Ozone monitoring at San Ramon was also shut down for the same winter period.

All ozone, NO/NO_2, and speciated hydrocarbon data are submitted to EPA's AQS database. When enough data is collected to yield a better understanding of emissions and photochemical processes in the Livermore area, the Air District will evaluate whether the instrumentation should be moved to the Santa Clara Valley for a similar PAMS program.

$PM_{2.5}$ Speciation Sampling Programs

In 1997, the EPA established national 24-hour and annual standards for fine particles less than or equal to 2.5 microns in diameter, known as $PM_{2.5}$ and required each state and local agency to begin ambient monitoring using Federal Reference Method (FRM) samplers. EPA also established a network of speciation monitors at sites expected to exceed the $PM_{2.5}$ standards. Speciation monitors provide chemical composition of $PM_{2.5}$ which aides in identification of emissions sources. This network was known then as the Speciation Trends Network (STN). In 2008, the EPA changed the program name from Speciation Trends Network to Chemical Speciation Network (CSN).

Chemical Speciation Network (CSN)
CSN monitoring has the primary objective of defining concentration trends of the elements, ions, and organic and elemental carbon components of $PM_{2.5}$. In January 1999, a $PM_{2.5}$ FRM sampler was installed in San Jose and the first year of data showed exceedances of the national standard. Consequently, EPA requested that a Met One Spiral Ambient Speciation Sampler (SASS) sampler be installed at the San Jose monitoring site which was located on Fourth Street at the time. The site was relocated to Jackson Street in 2002. San Jose was chosen by the EPA to be part of the CSN network because of its extensive PM sampling history and is the most populated city in the Bay Area at close to one million people. The sampler operates 24 hours from midnight to midnight, and samples are on a 1:3 schedule.

In April 2005, the Clean Air Scientific Advisory Committee supported changes to the EPA $PM_{2.5}$ speciation network to improve comparability with the rural Interagency Monitoring of Protected Visual Environments (IMPROVE) $PM_{2.5}$ carbon concentration data. The EPA process, designed to achieve this comparability, included replacing the carbon sampling method with the IMPROVE carbon Thermal Optical Reflectance (TOR) analysis method instead of the Thermal Optical Transmittance (TOT) method. Additionally, the EPA also requested the manufacturer of the IMPROVE sampler, URG Corporation, to modify the sampler to incorporate mass flow control versus fixed-orifice flow control. This effort resulted in a new instrument called the URG-3000N Sequential Particulate Speciation System. In the Bay Area, the Air District began operating the URG 3000 to collect $PM_{2.5}$ carbon concentrations at San Jose starting on April 1, 2009 while continuing to operate the SASS sampler to collect all the other compounds.

The SASS samplers draw air through size-selective nozzles that exclude particles greater than 2.5 microns. SASS samplers uses Teflon, nylon and quartz filters upon which to collect the samples, which are later weighed using a mass balance and analyzed using energy-dispersive X-ray fluorescence, ion chromatography, and thermal/optical analysis techniques to measure the components. The San Jose filter analysis is done by RTI, an EPA contract laboratory in North Carolina. Sixty-five chemical species listed in Table 24 are measured from each SASS filter sample at RTI, and can be viewed on the EPA's AirData web site at http://www.epa.gov/airdata/ad_maps.html.

BAAQMD Supplemental Speciation Network Program

In 2008, the Air District added SASS samplers at Vallejo and Livermore and in 2009 another SASS sampler was installed at the Oakland West air monitoring station. Vallejo and Livermore were selected for sampling because there was an interest in determining the source of $PM_{2.5}$ particles on days that exceed the standard at those sites. These sites may have a different $PM_{2.5}$ composition from that of San Jose because exceedances often occur on days when the air flow is from the Central Valley. Oakland West was selected because it is downwind of the Port of Oakland, a major source of diesel particulate matter. The Air District operates these samplers on a 1:6 schedule. Additionally, DRI provides the filters, does the analysis, and submits the data to AQS; and the filters are also analyzed for palladium, thallium and uranium.

Table 24. $PM_{2.5}$ Speciation Measurements at Air District Sites in 2012

Compound	Parameter Code at San Jose	Parameter Code at Other Sites	Method Code at San Jose	Method Code at Other Sites
Metals				
Antimony	88102	88102	811	811
Arsenic	88103	88103	811	811
Aluminum	88104	88104	811	811
Barium	88107	88107	811	811
Bromine	88109	88109	811	811
Cadmium	88110	88110	811	811
Calcium	88111	88111	811	811
Chromium	88112	88112	811	811
Cobalt	88113	88113	811	811
Copper	88114	88114	811	811
Chlorine	88115	88115	811	811
Cerium	88117	88117	811	811
Cesium	88118	88118	811	811
Europium	88121	88121	811	811
Gallium	88124	88124	811	811
Gold	88143	88143	811	811
Hafnium	88127	88127	811	811
Iron	88126	88126	811	811
Indium	88131	88131	811	811
Iridium	88133	88133	811	811
Lanthanum	88146	88146	811	811
Lead	88128	88128	811	811
Manganese	88132	88132	811	811
Molybdenum	88134	88134	811	811
Magnesium	88140	88140	811	811
Mercury	88142	88142	811	811
Nickel	88136	88136	811	811
Niobium	88147	88147	811	811
Palladium[1]	-	88151	-	811
Phosphorous	88152	88152	811	811

Compound	Parameter Code at San Jose	Parameter Code at Other Sites	Method Code at San Jose	Method Code at Other Sites
Potassium	88180	88180	811	811
Rubidium	88176	88176	811	811
Samarium	88162	88162	811	811
Scandium	88163	88163	811	811
Selenium	88154	88154	811	811
Silicon	88165	88165	811	811
Silver	88166	88166	811	811
Sodium	88184	88184	811	811
Strontium	88168	88168	811	811
Sulfur	88169	88169	811	811
Tantalum	88170	88170	811	811
Terbium	88172	88172	811	811
Thallium[1]	-	88173	-	811
Tin	88160	88160	811	811
Titanium	88161	88161	811	811
Tungsten	88186	88186	811	811
Uranium[1]	-	88179	-	811
Vanadium	88164	88164	811	811
Yttrium	88183	88183	811	811
Zinc	88167	88167	811	811
Zirconium	88185	88185	811	811
Anions and Cations				
Ammonium Cation	88301	88301	812	812
Sodium Cation	88302	88302	812	812
Chloride Anion	88203	88203	812	812
Sulfate Anion	88403	88403	812	812
Potassium Cation	88303	88303	812	812
Nitrate Anion	88306	88306	812	812
Organic and Elemental Carbon				
Total Organic Carbon (sum of the OC Fractions below)	88370	88320	838	815
Elemental Carbon Fraction 1 (carbon released at 550ºC in 10% oxygen/90% helium gas)	88383	88329	841	814
Elemental Carbon Fraction 2 (carbon released at 700ºC in 10% oxygen/90% helium gas)	88384	88330	841	814
Elemental Carbon Fraction 3 (carbon released at 800ºC in 10% oxygen/90% helium gas)	88384	88331	841	814
Organic Carbon Fraction 1 (carbon released at 120ºC in helium gas)	88374	88324	841	814
Organic Carbon Fraction 2 (carbon released at 250ºC in helium gas)	88375	88325	841	814
Organic Carbon Fraction 3 (carbon released at 450ºC in helium gas)	88376	88326	841	814
Organic Carbon Fraction 4 (carbon released at 550ºC in helium gas)	88377	88327	841	814

[1] Elements measured only at Vallejo, Livermore, and Oakland West.

Toxics Program

The Clean Air Act Amendments of 1990 required EPA to set emission standards for major sources of Hazardous Air Pollutants (HAPs). The Act also required EPA to assess the risks to human health from HAPs. As of 2012 EPA had listed 187 compounds as HAPs and are known to cause or are suspected of causing cancer, birth defects, reproduction problems, and other serious illnesses. Exposure time to certain levels of some HAPs can cause difficulty in breathing, nausea or other illnesses and can even cause death.

Toxic pollutants (HAPs) are emitted daily by industrial and chemical manufacturing processes, commercial activities, refinery operations, gasoline marketing and motor vehicles within the Bay Area. Ambient concentrations vary by proximity to sources and current meteorological conditions.

The Air District established an ambient air toxics monitoring program with the objectives of:

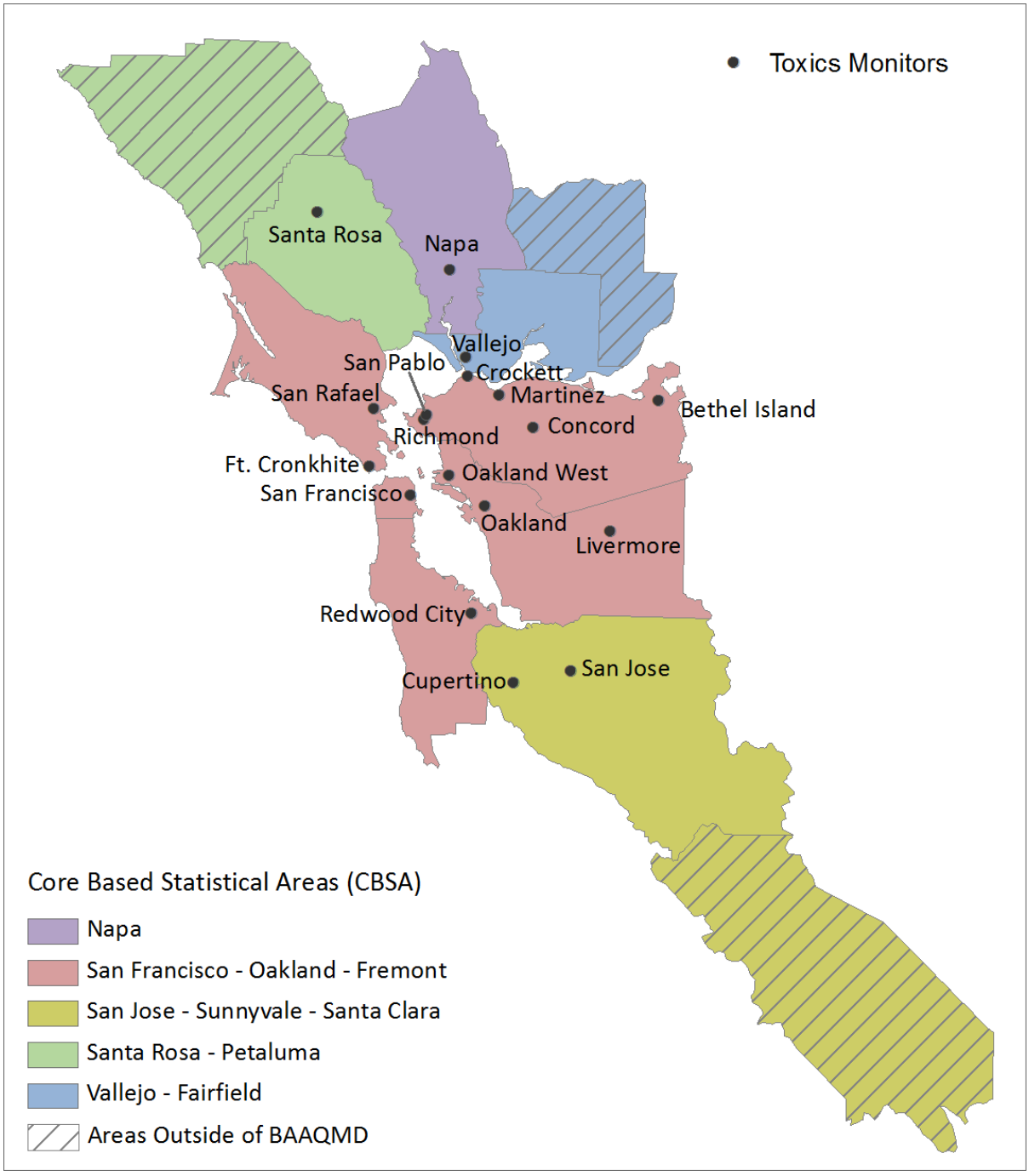
- Establishing trends and evaluating the effectiveness of HAP reduction strategies.
- Characterizing ambient concentrations in local areas.
- Providing data to support and evaluate dispersion and deposition models.
- Providing data to the scientific community to support studies to reduce uncertainty about the relationships between ambient levels of HAPs, actual human exposure to air toxics, and health effects from such exposures.

Figure 14 is a map of the 18 toxics monitoring sites operating in 2012. They are located at existing Air District monitoring stations to measure a wide range of contaminant levels throughout the Bay Area. The sites are generally located in major population centers or downwind of major industrial sources such as refineries. There is also an ambient background site at Fort Cronkhite. The toxics data collected at San Jose are reported to EPA as part of the NATTS program.

Air samples are collected at Air District toxics monitoring sites for a 24 hour period on a 1:12 schedule except at special study sites such as Cupertino and San Jose where sampling is on a 1:6 schedule as described later in this section. A 1:12 schedule allows samples to be taken on a different day of the week over the course of months. This is the same schedule EPA and CARB use for their toxics monitoring programs, thereby allowing Bay Area toxics concentrations to be compared to concentrations measured elsewhere across the country.

Gaseous (VOC) toxics are collected in 6-liter SUMMA stainless steel canisters using Xontech 910 samplers. The sampler continuously collects an ambient air sample for 24-hours to ensure capturing transient and intermittent toxic releases. In 2012, samples were analyzed using gas chromatography mass spectrometry.

Figure 14. Map of Air District Toxics Monitoring Sites in 2012.



Both the Air District and CARB have toxic monitoring programs in the Bay Area. CARB conducts toxic monitoring on a 1:12 schedule at two sites: San Francisco and San Jose. CARB supplies the canisters and performs the laboratory analyses, while Air District staff operates the CARB sampler and ships the canisters to CARB. Because the Air District also does toxics monitoring at San Francisco and San Jose, the two sets of data allow calculation of the measurement precision at these sites, and by extrapolation, an estimate of the precision of the toxics measurement program.

For Quality Assurance purposes, once a quarter at San Francisco, an additional canister sample is taken on a scheduled sample day using a collocated sampler. Both samples are analyzed by the Air District laboratory, and the results allow an additional measure of precision. Additionally, at least one canister per month is chosen at random for a second analysis. The results are sent to AQS for both the San Francisco collocated sample and the randomly selected replicate analysis.

From each canister sample, the Air District laboratory analyzes for the 23 gaseous toxic compounds shown in Table 25 from canister samples collected using a gas chromatography mass spectrometry instrument. The compounds selected for analysis were those that had high toxicity or were known to have high emissions in the Bay Area, or a combination of the two. Another consideration was whether the current methodology could accurately detect a compound at reasonable expense, based on previous CARB studies. Some compounds, such as carbon tetrachloride, are measured because their concentration in the ambient air does not change much over time. This is useful because carbon tetrachloride or other similar, stable compounds can be used for quality control purposes. If the measurement of such a control is unusually high or low, there may be a problem in the sampling, transport, storage, or analysis procedures.

Table 25. List of Toxic Compounds Measured by the Air District in 2012

Compound	Parameter Code	Method Code
1,3-Butadiene	43218	120
Acetone	43551	120
Acetonitrile	43702	120
Acrolein - Unverified	43505	120
Acrylonitrile	43704	120
Benzene	45201	120
Carbon tetrachloride	43804	120
Chloroform	43803	120
Dichloromethane	43802	120
Ethyl alcohol	43302	120
Ethylbenzene	45203	120
Ethylene dibromide	43843	120
Ethylene dichloride	43815	120
Freon 113	43207	120

Compound	Parameter Code	Method Code
m/p Xylene	45109	120
Methyl chloroform	43814	120
Methyl ethyl ketone	43552	120
o-Xylene	45204	120
Tetrachloroethylene	43817	120
Toluene	45202	120
Trichloroethylene	43824	120
Trichlorofluoromethane	43811	120
Vinyl chloride	43860	120

Additional Toxics Monitoring at San Jose

In addition to the compounds listed in Table 25, formaldehyde and acetaldehyde are measured at San Jose on a 1:6 schedule as part of the NATTS program. These compounds are highly reactive and cannot be accurately measured using a canister sample. Instead, they are collected on a chemically treated cartridge using a Xontech 924 sampler, operated on the same 1:6 schedule as the Xontech 910 used for canister samples. Samples are analyzed at the Air District laboratory using High Performance Liquid Chromatography.

Metals are also measured at San Jose as part of the NATTS program. A full description of the NATTS program can be found in the NATTS section of this document.

Additional Toxics Monitoring at Cupertino

In 2012, the Air District operated a Xontech 910 sampler to collect toxic samples in canisters at Cupertino on a 1:6 schedule. In addition to the compounds listed in Table 25, there was interest in measuring formaldehyde and acetaldehyde. These compounds are highly reactive and cannot be accurately measured using a canister sample. Instead, they are collected on a chemically treated cartridge using a Xontech 924 sampler, operated on the same 1:6 schedule as the Xontech 910 used for canister samples. Samples are analyzed at the Air District laboratory using High Performance Liquid Chromatography.

At Cupertino, the Xontech 924 sampler is also used to collect metals on TSP Teflon filters on the same 1:6 schedule used for other toxics sampling. The Air District laboratory analyzed for 28 metals listed in Table 26 by using X-Ray Fluorescence Spectrometry (XRF). Results are posted on the Air District web site at:
http://www.baaqmd.gov/sitecore-s/~/media/Files/Technical%20Services/Cupertino_toxics.ashx

Table 26. Metals measured at Cupertino using XRF in 2012

Metals	Parameter Code	Method Code
Aluminium	12101	304
Antimony	12102	304
Arsenic	12103	304

Metals	Parameter Code	Method Code
Barium	12107	304
Bromine	12109	304
Calcium	12111	304
Chlorine	12191	304
Chromium	12112	304
Cobalt	12113	304
Copper	12114	304
Iron	12126	304
Lead	12128	304
Manganese	12132	304
Mercury	12142	304
Molybdenum	12134	304
Nickel	12136	304
Phosphorus	12152	304
Potassium	12180	304
Rubidium	12176	304
Selenium	12154	304
Silicon	12165	304
Strontium	12168	304
Sulfur	12169	304
Tin	12160	304
Titanium	12161	304
Vanadium	12164	304
Yttrium	12183	304
Zinc	12167	304

Additional Mercury Monitoring at Cupertino Monta Vista

Due to public concern about mercury emissions from the nearby Lehigh Southwest Cement Plant in Cupertino, the Air District began monitoring for Total Atmospheric Mercury (TAMS) at the Cupertino Monta Vista site on September 11, 2010.

Total atmospheric mercury includes both vapor and particulate forms of mercury whereas mercury measured on a filter using XRF methods yields solely the particulate form of mercury. Total atmospheric mercury is collected on a carbon trap using a Xontech 924 sampler on the same 1:6 schedule as the particulate mercury collected on Teflon filters. The carbon trap is analyzed by Frontier Geosciences. Results are on the Air District web site at: http://www.baaqmd.gov/sitecore-s/~/media/Files/Technical%20Services/Cupertino_toxics.ashx

Summary toxics data are available from the EPA's AirData web site at http://www.epa.gov/airdata/. These data may also be found on the Air District web site in the Toxic Air Contaminant Control Program Annual Report at http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Toxic-Air-Contaminant-Control-Program-Annual-Report.aspx.

Appendixes A through E

Appendix A. Ozone monitoring waiver correspondences

Request for waiver - December 1, 2011 through March 31, 2012

COPY
10/27/11

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

October 25, 2011

Matthew Lakin, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. ~~Lakin~~ LIATT:

As has been the practice since 1996, the Bay Area Air Quality Management District (BAAQMD) is requesting that a waiver from ambient ozone air monitoring be granted in accordance with 40 CFR Part 58.12 (a.3) from December 1, 2010 through March 31, 2011. We request that the following four SLAMS ozone stations be considered under this waiver:

1.	Hayward	AIRS# 060012001
2.	Gilroy	AIRS# 060850002
3.	San Martin	AIRS# 060852006
4.	Fairfield	AIRS# 060950005

Historical data indicates the probability of these sites reaching any national or state standard during the winter months is extremely low. Fifteen ambient ozone analyzers at other BAAQMD air monitoring stations will continue operating during the waiver period.

Please contact Glen Colwell at (415) 749-4672 if you have any questions or concerns.

Sincerely,

Eric D. Stevenson
Director of Technical Services

cc: C. Owen
J. Forrest

Request for ozone monitoring waiver December 1, 2012 through March 31, 2013 (part 1)

October 10, 2012

Matthew Lakin, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. Lakin:

As has been the practice since 1996, the Bay Area Air Quality Management District (BAAQMD) is requesting that a waiver from ambient ozone air monitoring be granted in accordance with 40 CFR Part 58.12 (a.3) from December 1, 2012 through March 31, 2013. We request that the following four SLAMS ozone stations be considered under this waiver:

1.	Hayward	AIRS# 060012001
2.	Gilroy	AIRS# 060850002
3.	San Martin	AIRS# 060852006
4.	Fairfield	AIRS# 060950005

Historical data indicates the probability of these sites reaching any national or state standard during the winter months is extremely low. Fifteen ambient ozone analyzers at other BAAQMD air monitoring stations will continue operating during the waiver period.

Please contact Glen Colwell at (415) 749-4672 if you have any questions or concerns.

Sincerely,

Eric Stevenson
Director of Technical Services

cc: C. Owen
J. Forrest

Request for ozone monitoring waiver December 1, 2012 through March 31, 2013 (part 2)

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

December 7, 2012

Matthew Lakin, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. Lakin:

On October 10, 2012, as has been the practice since 1996, the Bay Area Air Quality Management District (BAAQMD) requested that a waiver from ambient ozone air monitoring be granted in accordance with 40 CFR Part 58.12 (a.3) from December 1, 2012 through March 31, 2013. In our October 10 letter we requested that the following four SLAMS ozone stations be considered under this waiver:

1. Hayward AQS# 060012001
2. Gilroy AQS# 060850002
3. San Martin AQS# 060852006
4. Fairfield AQS# 060950005

The Air District is sending this updated waiver request to include one additional Ozone SLAMS monitor, and to provide notification of our intent to stop winter operation of an Ozone SPM as well;

5. Los Gatos AQS# 060851001
6. San Ramon AQS# 060132007

The San Ramon ozone monitor began operation on Jan 1, 2012 as a SPM as part of the District's unofficial PAMS network, and is not a required monitor for the San Francisco-Oakland-Fremont MSA. Historical data indicates the probability of these sites reaching any national or state standard during the winter months is extremely low. Fifteen ambient ozone analyzers at other BAAQMD air monitoring stations will continue operating during the waiver period.

Please contact Glen Colwell at (415) 749-4672 if you have any questions or concerns.

Sincerely,

Eric D. Stevenson
Director of Technical Services

cc: G. Yoshimura
F. Clover

Approval for ozone monitoring waiver December 1, 2012 through March 31, 2013

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

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BAY AREA AIR QUALITY
MANAGEMENT DISTRICT

Mr. Eric Stevenson
Director of Technical Services
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

Dear Mr. Stevenson:

This letter is in response to your request dated December 7, 2012 for a waiver to suspend operation of six District ozone analyzers (Hayward – AQS ID 06-085-2007, Gilroy – AQS ID 06-085-0002, San Martin – AQS ID 06-085-2006, Fairfield – AQS ID 06-095-0005, Los Gatos – AQS ID 06-085-1001, San Ramon – AQS ID 06-013-2007) from December 1st, 2012 through March 31st, 2013. Per 40 CFR 58, Appendix D Section 4.1(i), monitoring agencies must have ozone season deviations approved by EPA, documented in the annual monitoring network plan, and updated in EPA's Air Quality System (AQS) database.

The historic data from the San Francisco Bay Area shows a low probability that these sites would measure an exceedance of national or state ozone standards during these winter months. As shown in the attached AQS report, the past six years of data show no exceedances of the National Ambient Air Quality Standard (NAAQS) for ozone at any Bay Area monitors between December and March. In addition, Bay Area Air Quality Management District (BAAQMD) will continue operating fifteen ambient ozone analyzers at other BAAQMD stations during the waiver period. EPA therefore approves the waiver for the six sites listed above.

If you have any questions, please contact me at (415) 972-3851 or Gwen Yoshimura of my staff at (415) 947-4134. Thank you for your continued attention to detail.

Sincerely,

Matthew Lakin
Manager, Air Quality Analysis Office

Enclosures

cc: Glen Colwell, BAAQMD

Appendix B. PM monitoring agreement between Bay Area and Monterey

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

December 13, 2012

Mr. William Chevalier
Supervising Air Monitoring Specialist
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940

Dear Mr. Chevalier:

During a recent review of the Annual Network Report for the Bay Area Air Quality Management District (BAAQMD), EPA Region 9 pointed out that we do not have a written agreement to share minimum monitoring requirements with neighboring Air Districts. For $PM_{2.5}$ monitoring in the San Jose-Sunnyvale-Santa Clara Metropolitan Statistical Area (MSA), both of our agencies are required to meet the full minimum monitoring requirements of 40 CFR Part 58 Appendix D, section (2)(e) in the absence of a $PM_{2.5}$ monitoring agreement.

The San Jose-Sunnyvale-Santa Clara MSA must have three SLAMS $PM_{2.5}$ monitors to meet EPA minimum monitoring requirements. The BAAQMD operates two SLAMS $PM_{2.5}$ monitors (San Jose and Gilroy) and both instruments are FEM BAM operating continuously. Additionally, the San Jose site has a collocated filter measurement as of October 1, 2012 for quality assurance purposes. The BAAQMD will continue to operate all of the above instruments indefinitely.

The BAAQMD requests Monterey reply to this letter confirming agreement to continue operation of the SLAMS $PM_{2.5}$ FEM BAM at Hollister. As part of the agreement, both agencies will advise each other if changes to the instruments (as shown below) are planned.

	AQS#	Parameter	Method	POC
San Jose	060850005	88101	170	3 (Primary)
San Jose	060850005	88101	145	1 (QA – collocated)
Gilroy	060850002	88101	170	3
Hollister	060690002	88101	170	3

Sincerely,

Eric D. Stevenson
Director, Technical Services Division

939 Ellis Street • San Francisco California 94109 • 415.771.6000 • www.baaqmd.gov

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

January 14, 2013

Mr. William Chevalier
Supervising Air Monitoring Specialist
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940

Dear Mr. Chevalier:

During a recent review of the Annual Network Report for the Bay Area Air Quality Management District (BAAQMD), EPA Region 9 pointed out that we do not have a written agreement to share minimum monitoring requirements with neighboring Air Districts. For PM_{10} monitoring in the San Jose-Sunnyvale-Santa Clara Metropolitan Statistical Area (MSA), both of our agencies are required to meet the full minimum monitoring requirements of 40 CFR Part 58 Appendix D, section (2)(e) in the absence of a PM_{10} monitoring agreement.

The San Jose-Sunnyvale-Santa Clara MSA must have two SLAMS PM_{10} monitors to meet EPA minimum monitoring requirements. The BAAQMD operates one SLAMS PM_{10} monitor at San Jose and will continue to operate this instrument indefinitely.

The BAAQMD requests Monterey Bay Unified Air Pollution Control District reply to this letter confirming agreement to continue operating the SLAMS PM_{10} monitor at Hollister. As part of the agreement, both agencies will advise each other if changes to the instruments (as shown below) are planned.

	AQS#	Parameter	Method	POC
San Jose	060850005	81102	127	1
Hollister	060690002	81102	122	3

Sincerely,

Eric D. Stevenson
Director, Technical Services Division

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MBUAPCD
Monterey Bay Unified Air Pollution Control District
Serving Monterey, San Benito, and Santa Cruz Counties

24580 Silver Cloud Court
Monterey, CA 93940
PHONE: (831) 647-9411 • FAX: (831) 647-8501

January 22, 2013

Mr. Eric D. Stevenson
Director, Technical Services Division
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Dear Mr. Stevenson,

In response to your letters dated December 13, 2012, and January 14, 2013, the District will continue the operation of the Hollister air monitoring station (AQS#: 060690002) for purpose of meeting 40 CFR Part 58, Appendix D minimum monitoring requirements. The District's intention is to continue operation of this SLAMs site for both PM_{10} and $PM_{2.5}$ FEM BAM indefinitely. Should the District need to revisit this in the future, we will coordinate with BAAQMD prior to any changes to the station.

Sincerely,

Michael J Gilroy
Deputy Air Pollution Control Officer
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Ct.
Monterey, CA 93940
(831) 647-9411

Appendix C. Change PM_{10} monitors to SPM with 1:12 sampling frequency

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

November 5, 2012

COPY

Matthew Lakin, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. ~~Lakin~~ MATT

The SF-Oakland-Fremont MSA requires two PM_{10} samplers per EPA network design. The Bay Area Air Quality Management District (Air District) currently operates five PM_{10} samplers, located at Bethel Island, San Pablo, Concord, San Rafael and San Francisco. It appears we have the option to request closing three of these five sites, which, due to ongoing constraints imposed by the economic climate and by staffing issues at our agency, is a needed option from a resource management standpoint. Specific site details and justifications are provided in this request. We propose that these changes become effective January 1st, 2013.

Below is a table summarizing the Air District's current PM_{10} network, from our 2011 Air Monitoring Network Plan;

Table 6. Minimum Monitoring Requirements for PM_{10}.

MSA	County or Counties	Pop. 2010 Census	Highest 24-hr conc. ($\mu g/m^3$) 2011	Highest 24-hr conc. site & AQS ID	Monitors Required[a]	Monitors Active	Monitors Needed
San Francisco-Oakland-Fremont	SF. San Mateo. Alameda. Marin. Contra Costa	4.335.391	72	Bethel Island 060131002	2	5	0
San Jose-Sunnyvale-Santa Clara	Santa Clara. San Benito	1.836.911	75	Hollister 060690002	2	2[b]	0
Santa Rosa-Petaluma	Sonoma	483.878	42	Healdsburg 060970002	0	3[c]	0
Vallejo-Fairfield	Solano	413.344	35	Vacaville 060953001	0	1[d]	0
Napa	Napa	136.484	54	Napa 060550003	0	1	0

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The Air District is proposing to continue normal operation of the San Rafael and San Pablo PM_{10} samplers while modifying the sample frequency of the Bethel Island, Concord and San Francisco samplers to a 1:12 sampling schedule rather than 1:6. This action allows these three sites to continue to provide modeling data valuable to the Air District, but would no longer allow these sites to be classified as PM_{10} State and Local Air Monitoring Stations (SLAMS). While the Bethel Island PM_{10} sampler has twice measured the highest 24-hour concentration in our network over the last five years ($78\mu g/m^3$ in 2010 and $69\mu g/m^3$ in 2010) the measured values have been close to or less than 50% of the PM_{10} NAAQS. Due to the geographic location of the Bethel Island site, travel distances and staff time required to service this sampler every six days, modifying the sample frequency to 1:12 will free up staff time for more critical duties. The San Rafael PM_{10} sampler will continue as a SLAMS monitor due to high community interest in Marin County PM issues. The San Pablo sampler will continue due to Chevron's proximity and high community interest.

Because the Bay Area has never been designated as non-attainment for PM_{10}, and no SIP or Maintenance Plans have been prepared for PM_{10}, it appears we have a strong case for meeting the criteria below to request changing the sampling schedule of the three PM_{10} samplers listed above.

Before shutting down a SLAMS (State or Local Air Monitoring Station) monitor, 40 CFR Part 58.14c requires that the Air District obtain the Regional Administrator's written approval. The Regional Administrator will normally approve the shutdown of a SLAMS monitor when any of the following situations apply:

1) Criteria pollutant monitors which have shown attainment of the national standards during the previous five years may be removed if the probability is less than 10% that the monitor will exceed 80% of NAAQS during the next three years, and if the monitor is not required by an attainment or maintenance plan.

2) CO, PM10, SO2, or NO2 monitors may be removed if the monitor has shown consistently lower concentrations than another monitor for the same pollutant in the same county during the previous five years.

3) Criteria pollutant monitors that have not violated the national standards in the most recent five years may be removed if the State Implementation Plan (SIP) provides a method of representing the air quality in the applicable county.

The Air District has completed its assessment for these requested site modifications following guidance in the 2007 *Ambient Air Monitoring Network Assessment Guidance* document (EPA-454/D-07-001 February 2007), including use of equation 1 to demonstrate that the probability is less than 10% that the monitor(s) will exceed 80% of NAAQS during the next three years.

Equation 1;
$$\overline{X} + \frac{t^* s}{\sqrt{n}} < 0.8 * NAAQS$$

We can provide our supporting calculations for this request, but also would appreciate independent verification by EPA Region 9 to provide confirmation and additional documentation of your agreement with our findings.

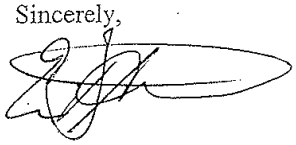
In addition, we are requesting a waiver from the Regional Administrator to allow us to continue operation of our collocated PM_{10} sampler at our Napa site as allowed under 40 CFR Part 58, Appendix A, Section 3.3.1. This Section requires collocation at a site that is "among the highest 25 percent of the annual mean concentrations for all the sites in the network", but also allows for this waiver request. While this location does not currently fall within the 25% category based on the last three year average, it has in the past. The Air District believes that collocation at this location will likely better meet the goals of determining method precision by providing precision information over a more variable range of concentrations than other locations, and better represent precision of the method by limiting the number of variables involved, such as variations caused by different staff operating the instrument at different locations over time. This will also provide better network stability and will likely result in higher data capture since movement of instrumentation will be limited.

Concerning the Air District's ongoing PM monitoring efforts in general, we are adding a new continuous FEM $PM_{2.5}$ monitor at the District's San Pablo monitoring site, upgrading non-FEM $PM_{2.5}$ monitors to FEM at our Oakland West and Napa sites, and will be adding a collocated FEM $PM_{2.5}$ monitor at Vallejo to meet EPA collocation requirements.

As we continue to add new instruments, new regulatory monitoring programs and new sites to our network without the ability to add staff, we need to explore options to allocate resources effectively and maintain the quality of our regulatory data. Modifying the PM_{10} sampling frequency at the three sites listed above will help us to achieve these goals.

Please contact Glen Colwell at (415) 749-4672 if you have any questions or concerns.

Sincerely,



Eric Stevenson
Director of Technical Services

cc: K. Hoag, EPA Reg. 9
G. Yoshimura, EPA Reg. 9
M. Flagg, EPA Reg. 9

cc: K. Malone, BAAQMD
J. Hesson, BAAQMD
M. Beacon, BAAQMD

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

JAN 10 2013

Mr. Eric Stevenson
Director of Technical Services
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

Dear Mr. Stevenson:

I am responding to Bay Area Air Quality Management District's (BAAQMD) November 5, 2012 letter requesting approval to shut down the State or Local Air Monitoring Stations (SLAMS) PM_{10} monitors at Bethel Island (06-013-1002), Concord (06-013-0002), and San Francisco (06-075-0005), as well as a request for a waiver from PM_{10} collocation requirements.

EPA approves the discontinuation of the three SLAMS monitors. The shut down satisfies 40 CFR Part 58.14(c)(1) requirements: Appendix D requirements will still be met without these monitors (e.g., Bay Area will continue to satisfy minimum monitoring requirements), all three monitors have shown attainment over the past five years, the probability is less than 10 percent that the monitors will exceed 80 percent of the National Ambient Air Quality Standard (NAAQS) for PM_{10} during the next three years, and the monitors are not specifically required by an attainment or maintenance plan. As recognized in BAAQMD's letter, should BAAQMD continue to operate these monitors on a 1:12 sampling frequency instead of the required minimum 1:6 sampling frequency, the data would not be relevant for comparison to the NAAQS, the monitors would not be considered SLAMS and could not be used to meet minimum monitoring requirements.

EPA also considered BAAQMD's request for a waiver from the PM_{10} collocation requirement specified in 40 CFR Part 58, Appendix A, Section 3.3.1, which states that collocation must be conducted at site(s) with annual mean concentrations among the highest 25 percent of the annual mean concentrations for all the sites in the network. BAAQMD currently conducts collocation at their Napa station, and would like a waiver to continue to do so. Napa had the highest PM_{10} annual mean concentration in the most recent data year available, 2011. Should BAAQMD desire to collocate at the site that has most frequently had the highest annual mean concentration over the past five years, they could collocate at San Jose. However, such a move is not required per the CFR, nor is a waiver necessary for EPA to determine that this particular collocation requirement is being met with the existing collocation at Napa.

If you have any questions, please contact me at (415) 972-3851 or Gwen Yoshimura of my staff at (415) 947-4134. Thank you for your continued attention to detail.

Sincerely,

Matthew Lakin
Manager, Air Quality Analysis Office

Enclosure

cc: Glen Colwell, BAAQMD

BAAQMD PM10 Network Change request – dated November 5, 2012.

Request to shut down Bethel Island, Concord, and San Francisco PM_{10} monitors as SLAMs.

1. Verify affected network requirements. For PM_{10}: Minimum # according to table D-4; collocation for each manual method (collocate at monitor with the highest 25% of annual mean value).
    a. Are all of the PM_{10} samplers in the SF-Oakland-Fremont MSA? What is the monitoring scale?
        i. Yes. 5 PM_{10} monitors total in SF-Oakland-Fremont MSA:
            1. Bethel Island (regional scale),
            2. Concord (neighborhood scale),
            3. San Pablo (middle scale),
            4. San Rafael (middle scale),
            5. San Francisco (neighborhood scale).
    b. Are any collocated?
        i. No. Only collocated PM_{10} monitoring for BAAQMD is at Napa (in the Napa MSA). Unclear whether they are meeting the collocation requirements. This is an ANP comment.
2. What would they need to be allowed to shut down 3 SLAMS monitors (BI, Concord, SF)?
    a. CFR requirements:

58.14 (c) State, or where appropriate, local agency requests for SLAMS monitor station discontinuation, subject to the review of the Regional Administrator, will be approved if any of the following criteria are met and if the requirements of appendix D to this part, if any, continue to be met. Other requests for discontinuation may also be approved on a case-by-case basis if discontinuance does not compromise data collection needed for implementation of a NAAQS and if the requirements of appendix D to this part, if any, continue to be met.

(1) Any $PM_{2.5}$, O_3, CO, PM_{10}, SO_2, Pb, or NO_2 SLAMS monitor which has shown attainment during the previous five years, that has a probability of less than 10 percent of exceeding 80 percent of the applicable NAAQS during the next three years based on the levels, trends, and variability observed in the past, and which is not specifically required by an attainment plan or maintenance plan. In a nonattainment or maintenance area, if the most recent attainment or maintenance plan adopted by the State and approved by EPA contains a contingency measure to be triggered by an air quality concentration and the monitor to be discontinued is the only SLAMS monitor operating in the nonattainment or maintenance area, the monitor may not be discontinued.

(2) Any SLAMS monitor for CO, PM_{10}, SO_2, or NO_2 which has consistently measured lower concentrations than another monitor for the same pollutant in the same county (or portion of a county within a distinct attainment area, nonattainment area, or maintenance area, as applicable) during the previous five years, and which is not specifically required by an attainment plan or maintenance plan, if control measures scheduled to be implemented or discontinued during the next five years would apply to the areas around both monitors and have similar effects on measured concentrations, such that the retained monitor would remain the higher reading of the two monitors being compared.

(3) For any pollutant, any SLAMS monitor in a county (or portion of a county within a distinct attainment, nonattainment, or maintenance area, as applicable) provided the monitor has not measured violations of the applicable NAAQS in the previous five years, and the approved SIP provides for a specific, reproducible approach to representing the air quality of the affected county in the absence of actual monitoring data.

(4) A $PM_{2.5}$ SLAMS monitor which EPA has determined cannot be compared to the relevant NAAQS because of the siting of the monitor, in accordance with § 58.30.

(5) A SLAMS monitor that is designed to measure concentrations upwind of an urban area for purposes of characterizing transport into the area and that has not recorded violations of the relevant NAAQS in the previous five years, if discontinuation of the monitor is tied to start-up of another station also characterizing transport.

(6) A SLAMS monitor not eligible for removal under any of the criteria in paragraphs (c)(1) through (c)(5) of this section may be moved to a nearby location with the same scale of representation if logistical problems beyond the State's control make it impossible to continue operation at its current site.

    i. Appendix D requirement: Minimum monitoring in SF-Oak-Fre MSA still met? -- Yes.
    ii. PM_{10} SLAMS that has shown attainment past 5 years? -- Yes

iii. Probability of < 10% of exceeding 80% of the applicable NAAQS during next 3 years? -- Yes.

		Bethel Island	Concord	San Francisco		
2nd high, per year:	2007	46	49	58		
	2008	59	34	39		
	2009	31	29	30		
	2010	45	29	36		
	2011	44	40	35		
Average:		45	36.2	39.6		
St. Dev:		9.92	8.47	10.78		
Equation 1:		54.45	44.27	49.87	< 0.8*150?	= YES FOR ALL.

iv. Not specifically required by attainment or maintenance plan? -- Yes. Never a nonattainment area

3. Conclusion
   a. PM_{10} monitors Bethel Island, Concord, and San Francisco may be discontinued as SLAMS, as they satisfy 58.14(c)(1).

Request for a waiver to continue operating the collocated PM_{10} sampler at Napa.

1. Collocation Requirements, per 40 CFR 58, Appendix A, section 3.3.1:
   3.3.1 Collocated Sampling Procedures for PM_{10} . ...PM_{10} and TSP sites having annual mean particulate matter concentrations among the highest 25 percent of the annual mean concentrations for all the sites in the network must be selected or, if such sites are impractical, alternative sites approved by the EPA Regional Administrator may be selected.
2. Annual mean concentrations for BAAQMD PM_{10} network (note: Bethel Island, Concord, and San Francisco will be operated as SPMs and not relevant for NAAQS comparison starting in 2013. They were therefore not considered during this evaluation):

		San Pablo	San Rafael	Napa	San Jose	*Bethel Island*	*Concord*	*San Francisco*
Annual Means:	2007	19.3	16.5	20.5	20.7	*17.9*	*15.9*	*20.3*
	2008	19.7	17.6	20.6	22.2	*23.2*	*16.7*	*20.7*
	2009	15	15.3	17.5	19.1	*16.4*	*13.8*	*17.6*
	2010	17.8	15.7	16.6	18.5	*17.8*	*13.1*	*18.8*
	2011	18.5	15.5	19.2	18.1	*16.8*	*14.8*	*18.3*

3. Conclusion:
   a. Over the past five years, San Jose has had the highest annual mean concentration for four years, while Napa had the highest annual mean concentration in the most recent year (2011). (note: If you chose to consider Bethel Island, Concord, and San Francisco in this analysis, San Jose would have the highest annual mean concentration for two of the past five years, with Bethel Island, San Francisco, and Napa each being highest for one of the five years.) The CFR does not specify over what time span the highest 25 percent of the annual mean concentrations should be determined. EPA therefore finds that the Napa collocation satisfies the Appendix A requirement to have collocation at a site that is among the highest 25 percent of the annual mean concentrations, and no waiver is required. If there is room at Bay Area's San Jose site for a collocated PM_{10} monitor, BAAQMD could consider moving collocation there, but it is not required at this time.

Appendix D. Proposed Sites for Near-road NO_2/CO/$PM_{2.5}$ Monitoring

Background

On April 12, 2010 the minimum monitoring requirements for NO_2 in 40 CFR Part 58, Appendix D, Section 4.3 were revised to include at least one near-road monitoring site in a CBSA with a population of 500,000 or more based on the latest available census figures. Also, a second near-road site was required if the CBSA had a population of 2.5 million or more. In addition, all near-road sites must be within 50 meters of the roadway. Initially, EPA regulations required near-road monitors to be operational by January 1, 2013 but the regulations were later revised in favor of a series of deadlines coincident with 40 CFR being expanded to include CO and $PM_{2.5}$ at near-road sites as described below.

On March 14, 2013, EPA revised (delayed) the implementation of the NO_2 near-road monitoring sites. The first near-road monitoring site within a CBSA had to be operational by January 1, 2014. The second near-road site within a CBSA, if required, had to be operational by January 1, 2015.

Effective October 31, 2011, 40 CFR Part 58, Appendix D was revised for Carbon Monoxide (CO) monitoring. The new rule required one CO monitor to operate collocated with a near-road NO_2 monitor by January 1, 2015 in CBSAs having a population of 2.5 million or more. If a CBSA has more than one required near-road NO_2 monitor, only one CO monitor is required to be collocated with the NO_2 monitor within the CBSA. Additionally, in CBSAs with a population between 1 and 2.5 million, a CO monitor is required to be collocated with a near-road NO_2 monitor by January 1, 2017.

Effective March 18, 2013, 40 CFR Part 58 was revised and required at least one $PM_{2.5}$ monitor at a near-road site in CBSAs with populations of 1 million or more. The monitor is required to be operational by January 1, 2015 in CBSAs populations of 2.5 million or more and by January 1, 2017 in CBSAs with populations between 1 and 2.5 million.

Based on CBSA population, the Air District is required to operate three near-road NO_2 monitoring sites. Two monitors are required in the San Francisco-Oakland-Fremont CBSA (one operational by January 1, 2014 and the other by January 1, 2015) with another required in the San Jose-Sunnyvale-Santa Clara CBSA, operational by January 1, 2014. Although only one near-road CO and $PM_{2.5}$ monitor is required in each CBSA collocated with the NO_2 monitor, the Air District will collocate CO and $PM_{2.5}$ monitors with all near-road NO_2 monitors.

Although the San Francisco-Oakland-Fremont CBSA is fully within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), the San Jose-Sunnyvale-Santa Clara CBSA includes San Benito County which is within the jurisdiction of the Monterey Unified Air Pollution Control District. EPA Region 9 advised the BAAQMD that it would have to operate the sole near-road monitoring site required for the San Jose-Sunnyvale-Santa Clara CBSA because San Benito County has much lower traffic volumes than Santa Clara County.

Site Selection Criteria

EPA regulations require that multiple factors be considered in determining locations for near-road monitoring, including the annual average daily traffic count (AADT) on candidate road segments in each CBSA where monitoring is required. The Air District obtained this information and ranked all segments by AADT as shown in Table 27. EPA also requires consideration of fleet mix, roadway design and grade, congestion patterns, terrain, obstructions to air flow from the roadway, and meteorology. Fleet mix is the percentage of total traffic that is heavy duty (HD) trucks and is an important consideration because HD trucks can produce 10 to 100 times more NOx and particulate matter than light duty vehicles.

To begin the site selection process, candidate road segments in each CBSA were ranked by AADT and Fleet Equivalent (FE-AADT). Mathematically, FE-AADT is defined as:

$$\text{FE-AADT} = (\text{AADT} - \text{HD counts}) + (\text{HD counts} \times 10)$$

After FE-AADT was calculated and ranked (as shown in Table 28), Air District personnel surveyed potential monitoring locations along freeway segments with the highest FE-AADT and then located property owners. The difficulty the Air District encountered was that property owners would not enter into long-term leases or allow monitoring shelters and electrical infrastructure to be installed. Also, many of the candidate properties did not meet EPA required siting criteria such as:

- Site free from obstructions to air flow (dense trees, tall buildings, and sound walls)
- Roadway not at the same level as the candidate property (elevated or dipped)
- Lack of safe access (rail lines or unshielded from freeway traffic)

Choosing a suitable location for monitoring also depended on pending road construction or other planned changes in roadway usage or design. Ideally, monitoring sites are along flat, non-elevated roadway segments, near public property, with a representative meteorological site within 2-3 miles, within 50 meters of the roadway, and with no obstructions to the air flow between the freeway and the site.

In addition, to address community concerns about air quality near roadways and to garner community input when prioritizing potential near road monitoring locations, the Air District met with and/or collaborated with EPA Region 9, Natural Resources Defense Council (NRDC), West Oakland Environmental Indicators Project (WOEIP), Bay Area Healthy 880 Communities, and other groups.

In urban areas such as the San Francisco-Oakland-Fremont CBSA and the San Jose-Sunnyvale-Santa Clara CBSA, locating public or private property owners willing to enter into lease agreements became an overriding factor in the near-road site selection process. Instead of following the EPA Technical Assistance Document (TAD) solely from the top down, the Air District found itself addressing the property owner issue in parallel with the road segment ranking process as a practical means to expedite the creation of candidate sites. The Air District could not always locate a feasible site adjacent to the highest FE-AADT road segment, but instead, located sites as close as practical to the highest FE-AADT

segment where electrical power was available (or could be made available at a reasonable cost), and an agreement with a property owner could be obtained.

As of late May 2013, the Air District has identified three sites and is working with land owners to secure long-term leases and has moved forward to secure the power needed to operate the near-road sites. Substantial communication issues still exist with Caltrans concerning the site in San Jose that has necessitated the involvement of State and Federal agencies to grant appropriate permissions to operate near-road monitors on Caltrans property.

The Air District request for approval of the three near-road sites was sent to EPA Region 9 on April 23, 2013 and begins on page 169. EPA Region 9 responded to the Air District near-road approval request letter on May 14, 2013. The response letter and an attachment to the letter begin on page 248.

The pages which follow include the attachments sent with the approval request to Region 9 and the attachments include several detailed tables. Although Air District and Region 9 staff may be familiar with many of the phrases and terms used to define roadway segments within the tables, not everyone in the public is so informed. Therefore, additional discussion about the content of the tables is included before each table that was not included in the original approval letter and attachments sent to EPA Region 9.

Explanation of Tables included in the Near-road site Approval Request to Region 9
For the Annual Network Plan, the Air District felt that some of the tables should be freshly inserted to this document instead of posting scanned versions that would be blurry and less easily read by the public. Also, some terms used in the tables are explained below:

- Table 27 shows the AADT ranking of Bay Area freeway segments based on 2010 information from Caltrans at http://traffic-counts.dot.ca.gov/.

- Table 28 shows the rank of Fleet Equivalent AADT (FE-AADT) road segments in the Bay Area as provided to the Air District by EPA Region 9.

- Table 29, Table 30, and Table 31 are descriptions of the proposed near-road monitoring sites. This information is referred to as the “site matrix” in EPA documents. The Air District has included a narrative of the site, for completeness. The narratives were not included in the initial approval request to Region 9.

- The postmile at a given location usually remains the same year after year. When a section of road is relocated, new postmiles are established (noted by an alphabetical prefix or suffix such as "R", "M", “T” in the table below – for more details about mileposts and realignment of mileposts check the Caltrans link above). Postmiles are zero at County boarders, then increase.

- Ahead AADT means the traffic count to the north or east of the count location. Back AADT means the traffic count to the south or west of the count location.

Cover letter requesting EPA Region 9 approval of the three Bay Area near-road sites.

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

April 23, 2013

Matthew Lakin, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Dr. Lakin: MATT

As you know, 40 CFR Part 58.10 requires the design of a near roadway monitoring network based on guidance provided by EPA's Near-road NO_2 Monitoring Technical Assistance Document (TAD) published in June of 2012. The operational start date and number of monitoring locations is based on Core Based Statistical Area (CBSA) population, requiring that the first locations be operational no later than January 1, 2014 for CBSAs with a population of 1 million or more. CBSAs with a population of 2.5 million or more require a second location that must be operational no later than January 1, 2015. The plan for establishing these locations are to be submitted to the EPA Region as part of the monitoring agencies Annual Network Plan no later than July 1 of the year prior to required start of operations of the location.

The Bay Area Air Quality Management District (Air District) is required to have two locations, one in the San Francisco/Oakland/Fremont CBSA and one in the San Jose/Sunnyvale/Santa Clara CBSA, operational by the January 1, 2014 deadline. An additional site located in the San Francisco/Oakland/Fremont CBSA must be operational by the January 1, 2015 deadline. In order to ensure that the locations the Air District has chosen meet the guidelines specified in the TAD and can be operational prior to the deadlines, the Air District is requesting that EPA Region 9 treat this document as a portion of the Annual Network Plan, review the attached information and approve the proposed locations as quickly as possible. In the event that the proposed locations are not approvable, the Air District requests specific, timely guidance on the necessary measures needed to receive approval.

The attachments include a matrix supplied by Region 9 to quantify and evaluate metrics developed in the TAD as well as wind rose and maps of the specific proposed locations. In addition, the Air District has visited the proposed locations with EPA Region 9 staff, conferred with site property owners and other interested parties to share information, garner feedback and assess feasibility of the proposed locations.

This letter and attached information will also be submitted as part of the Air District's larger Annual Network Plan, and this request, along with the attachments, will be posted to the Air District's website to allow for public comment.

939 ELLIS STREET • SAN FRANCISCO CALIFORNIA 94109 • 415.771.6000 • *www.baaqmd.gov*

Please contact me if you have any questions or concerns about this request at (415) 749-4695. If you have any questions regarding the attached information, please contact Glen Colwell, our Air Monitoring Manager, at (415) 749-4985.

Sincerely,

Eric D. Stevenson
Director of Technical Services

cc: G. Yoshimura
M. Kurpius

Table 27. AADT ranking of all Bay Area Freeway segments in 2010.

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	80		ALA		6.62		BERKELEY, GILMAN ST	272,000	1
4	80		ALA		3.786		EMERYVILLE, POWELL ST	265,000	2
4	80		ALA		4.582		BERKELEY, JCT. RTE. 13 EAST	262,000	3
4	80		ALA		5.823		BERKELEY, UNIVERSITY AVE	259,000	4
4	680		CC		15.606		WALNUT CREEK, N. MAIN	255,000	5
4	680		CC		16.89		PLEASANT HILL, OAK PARK	252,000	6
4	101		SM		11.895		SAN MATEO, JCT. RTE. 92	250,000	7
4	101		SM		12.69		SAN MATEO, KEHOE AVE	248,000	8
4	880		ALA		17.604		WINTON AVE	247,000	9
4	101		SM		13.461		SAN MATEO, THIRD AVE	247,000	10
4	80		ALA		1.27	L	END INDEP ALIGN	245,000	11
4	80		ALA		1.989		OAKLAND BAY BR TOLL	245,000	12
4	101		SCL		33.034			244,000	13
4	280		SCL	R	2.875		SAN JOSE, BIRD AVE	241,000	14
4	101		SM		14.69		SAN MATEO, PENINSULA AVE	239,000	15
4	880		ALA		18.353		HAYWARD, A ST	238,000	16
4	280		SCL	R	0.366		MCLAUGHLIN AVE	238,000	17
4	101		SM		14.33		SAN MATEO, POPLAR/DORE	238,000	18
4	101		SM		16.575		BURLINGAME, BRDWAY	238,000	19
4	880		ALA		16.696		HAYWARD, JCT. RTE. 92	235,000	20
4	680		CC		14.383		WALNUT CREEK, RTE. 24 W.	233,000	21

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	680		CC		14.846		WALNUT CREEK, YGNACIO VAL	233,000	22
4	680		CC		16.403		GEARY RD	233,000	23
4	680		CC	R	17.29		PLEASANT HILL, CONTRA COSTA	233,000	24
4	280		SCL	R	1.992		SAN JOSE, JCT. RTE. 82	232,000	25
4	101		SM		19.12		SAN FRANCISCO AIRPORT	232,000	26
4	101		SM	R	20.719		S SAN FRANCISCO, JCT RTE 380 W	232,000	27
4	680		CC	R	17.702		PLEASANT HILL, MONUMENT	227,000	28
4	101		SM		9.552		BELMONT, RALSTON AVE	226,000	29
4	280		SM	R	26.042		JUNIPERO SIERRA	226,000	30
4	101		SF		1.108		SAN FRANCISCO, PAUL AVE	225,000	31
4	101		SM		11.147		SAN MATEO, EAST HILLSDALE	225,000	32
4	580		ALA		45.151		OAKLAND, JCT. RTES. 24/980	222,000	33
4	580		ALA		46.009		OAKLAND, JCT. RTE. 123	222,000	34
4	580		ALA		47.168	L	END INDEP ALIGN	222,000	35
4	880		ALA		28.934		OAKLAND, 23RD AVE	222,000	36
4	880		ALA		29.8		OAKLAND, EMBARCADERO	221,000	37
4	101		SM		17.947		MILLBRAE, MILLBRAE AVE	221,000	38
4	101		SF		1.976		SAN FRANCISCO, JCT. RTE. 280	220,000	39
4	101		SM		21.915		S SAN FRANCISCO, GRAND AVE	220,000	40
4	680		SCL	M	0.385		SAN JOSE, KING RD	218,000	41
4	880		ALA		20.162		HESPERIAN BLVD	217,000	42
4	101		SF		0.774		SAN FRANCISCO, THIRD ST	217,000	43
4	880		ALA		30.38		OAKLAND, 10TH/5TH AVE	216,000	44
4	280		SCL	R	1.294		SAN JOSE, 10TH ST	216,000	45
4	101		SM		22.713		S SAN FRANCISCO, OYSTER POINT	216,000	46
4	280		SM	R	24.627		DALY CITY, COLLINS AVE	216,000	47
4	880		ALA		28.687		OAKLAND, 29TH/FRUITVALE	215,000	48
4	101		SF		2.92		SAN FRANCISCO, ARMY ST	215,000	49
4	101		SM		6.623		REDWOOD CITY, WHIPPLE AVE	214,000	50
4	101		SM		8.401		HOLLY ST	214,000	51
4	101		SM		21.691		SB OFF TO PRODUCE/AIRPORT	214,000	52
4	880		ALA		20.678		JCT. RTE. 238 EAST	212,000	53
4	880		ALA		27.709		OAKLAND, JCT. RTE. 77	211,000	54
4	880		ALA		26.607		OAKLAND, 66TH AVE	210,000	55
4	880		ALA		22.837		SAN LEANDRO, MARINA	209,000	56
4	280		SM	R	25.28		DALY CITY, JCT. RTE. 1 S.	209,000	57
4	880		ALA		14.537		HAYWARD, INDUSTRIAL PKWY	208,000	58
4	880		ALA		15.645		HAYWARD, TENNYSON	208,000	59
4	580		ALA		18.821		HACIENDA DRIVE	207,000	60
4	101		SF		4.1		SAN FRANCISCO, VERMONT ST	207,000	61
4	880		ALA		23.644		RTE 112, DAVIS ST	205,000	62
4	101		SCL		31.695		SAN JOSE, CAPITOL EXPRESS	205,000	63
4	280		SCL	L	5.954		SAN JOSE, WINCHESTER	204,000	64
4	280		SCL	L	4.663		SAN JOSE, LELAND AVE	203,000	65

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	880		ALA		25.497		OAKLAND, HEGENBERGER	202,000	66
4	101		SM		5.385		REDWOOD CITY, JCT. RTE. 84	202,000	67
4	101		SM		3.592		MENLO PARK, MARSH RD	201,000	68
4	880		ALA		7.189		FREMONT, MOWERY AVE	200,000	69
4	880		ALA		8.842		FREMONT, S.H JCT. RTE. 84	200,000	70
4	101		SCL		48.103		MOUNTAIN VIEW, JCT. RTE. 85 S	200,000	71
4	101		SCL		50.323		PALO ALTO, SAN ANTONIO RD	200,000	72
4	880		SCL		8.422		JCT. RTE. 237	200,000	73
4	80		SOL		13.486		SUISUN VALLEY RD	198,000	74
4	880		ALA		13.051		UNION CITY, ALVARADO/NILES	197,000	75
4	101		SF		0		SAN FRANCISCO/S MATEO CO LINE	197,000	76
4	101		SM		25.7		BRISBANE, CANDLESTICK PARK	197,000	77
4	280		SCL	R	2.522		SAN JOSE, JCT. RTE. 87	196,000	78
4	101		SM		23.393		S SAN FRANCISCO, OLD BAYSHORE	196,000	79
4	880		ALA		13.669		HAYWARD, WHIPPLE	195,000	80
4	880		ALA		31.23		OAKLAND, JACKSON ST	195,000	81
4	101		SCL		48.974		MOUNTAIN VIEW, MIDDLEFIELD	195,000	82
4	880		ALA		31.091		OAK/MADISON ST	194,000	83
4	80		CC		2.961		RICHMOND, SAN PABLO AVE	194,000	84
4	680		SCL	M	1.189		SAN JOSE, JACKSON AVE	194,000	85
4	880		ALA		10.3		FREMONT, N. JCT. RTE. 84	193,000	86
4	280		SM	R	21.306		SAN BRUNO, SNEATH LANE	193,000	87
4	580		ALA		17.947		TASSAJARA RD	192,000	88
4	880		ALA		6.239		FREMONT, STEVENSON	191,000	89
4	80		CC		2.04		RICHMOND, RTE. 123 SOUTH	191,000	90
4	80		CC		3.795		RICHMOND, MC BRYDE AVE	191,000	91
4	101		SCL		34.87		SAN JOSE, JCT. RTE. 280 W	191,000	92
4	880		ALA		11.404		FREMONT, FREMONT	190,000	93
4	880		ALA		24.767		OAKLAND, 98TH AVE	190,000	94
4	880		ALA	R	0		S. CLARA/ALAMEDA CO LINE	189,000	95
4	101		SCL		52.17		EMBARCADERO /OREGON AVE	189,000	96
4	880		SCL		10.407		DIXON RD	189,000	97
4	101		SM		0		SANTA CLARA/S MATEO CO LINE	189,000	98
4	880		ALA		4.712		FREMONT, DURHAM RD	188,000	99
4	80		CC		2.619		RICHMOND, MAC DONALD AVE	188,000	100
4	101		SM		0.89		EAST PALO ALTO, UNIVERSITY	188,000	101
4	101		MRN		12.19		SAN RAFAEL, LINCOLN/ VILLA	187,000	102
4	80		CC		3.411		RICHMOND, SOLANO AVE	185,000	103
4	101		SCL		49.611		MOUNTAIN VIEW, RENGSTORFF	185,000	104
4	280		SM	R	22.62		S SAN FRANCISCO, WESTBOR	185,000	105
4	580		ALA		13.219		LIVERMORE, PORTOLA	184,000	106
4	580		ALA		42.665		OAKLAND, PARK BLVD	184,000	107
4	580		ALA		43.747		OAKLAND, VAN BUREN/GRAND	184,000	108
4	380		SM		6.373		S SAN FRANCISCO, JCT RTE 101	184,000	109

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	80		SOL		12.839		JCT. RTE. 680 SOUTH	184,000	110
4	80		CC		5.246		EL PORTAL DRIVE	183,000	111
4	101		MRN		9.96		JCT. RTE. 580	183,000	112
4	680		SCL	M	1.74		SAN JOSE, JCT. RTE. 130	183,000	113
4	80		CC		4.341		SAN PABLO, SAN PABLO DAM	182,000	114
4	80		CC		7.597		PINOLE, APPIAN WAY	181,000	115
4	101		MRN		11.25		SAN RAFAEL, MISSION AVE	181,000	116
4	80		SF		4.4		SAN FRANCISCO, 7TH/8TH ST	181,000	117
4	580		ALA		16.703		EL CHARRO RD	180,000	118
4	580		ALA	R	29.365		REDWOOD RD	180,000	119
4	80		CC		1		RICHMOND, CARLSON BLVD	180,000	120
4	101		SM		1.869		JCT. RTE. 114	180,000	121
4	24		CC	R	7.656		LAFAYETTE, PLEASANT HILL RD	179,000	122
4	24		CC		9.119		WALNUT CREEK, JCT RTE 680	179,000	123
4	101		SCL		39.925		JCT. RTE. 87, GUADALUPE PKWY	179,000	124
4	280		SCL	L	5.408		SAN JOSE, JCT. RTES. 17/880	179,000	125
4	280		SM	R	24.197		DALY CITY, HICKEY	179,000	126
4	24		CC	R	6.512		LAFAYETTE, OAK HILL/FIRST	178,000	127
4	680		CC	R	11.28		LIVORNA RD	178,000	128
4	580		ALA		14.974		JCT RTE 84/AIRPORT	177,000	129
4	580		ALA		19.859		HOPYARD RD	177,000	130
4	580		ALA	R	41.427		OAKLAND, FRUITVALE	177,000	131
4	80		CC		6.6		RICHMOND PARKWAY	177,000	132
4	580		ALA		44.279		OAKLAND, OAKLAND AVE	176,000	133
4	680		CC		13.082		WALNUT CREEK, S. MAIN	176,000	134
4	101		MRN		12.694		SAN PEDRO RD	176,000	135
4	880		SCL		4.078		SAN JOSE, JCT. RTE. 101	176,000	136
4	680		CC	R	12.611		WALNUT CREEK, RUDGEAR	175,000	137
4	17		SCL		12.336		CAMPBELL, HAMILTON AVE	175,000	138
4	101		SCL		37.726		SAN JOSE, OAKLAND RD	175,000	139
4	280		SCL		5.949		SAN JOSE, SARATOGA	175,000	140
4	580		ALA		20.726		PLEASANTON, JCT RTE 680	174,000	141
4	880		ALA		2.283		FREMONT, JCT. RTE. 262 E.	174,000	142
4	880		SCL		4.275		SAN JOSE, OLD BAYSHORE	174,000	143
4	280		SF	R	1.768		SAN FRANCISCO, GENEVA	174,000	144
4	80		CC		0.216		RICHMOND, CENTRAL AVE	173,000	145
4	680		CC	R	10.371		ALAMO, STONE VALLEY RD	173,000	146
4	680		SCL	M	2.376		SAN JOSE, MC KEE RD	173,000	147
4	80		SF		3.951		SAN FRANCISCO, RTE 101	173,000	148
4	80		SOL		17.917		TRAVIS BLVD	173,000	149
4	580		ALA	R	38.309		OAKLAND, EDWARDS	172,000	150
4	680		CC	R	8.751		DANVILLE, EL PINTADO RD	172,000	151
4	280		SM	R	21.015		SAN BRUNO, JCT. RTE. 380 E.	172,000	152
4	80		SOL		15.815		FAIRFIELD, EAST JCT. RTE. 12	172,000	153

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	80		ALA	R	7.3		ALBANY, JCT RTE 580	171,000	154
4	580		ALA	R	40.647		OAKLAND, 35TH AVE	171,000	155
4	80		CC		0		ALAMEDA/C. COSTA CO LINE	171,000	156
4	80		CC		8.508		PINOLE, PINOLE VALLEY RD	171,000	157
4	680		CC	R	6.764		DANVILLE, SYCAMORE VAL	170,000	158
4	101		SCL		41.978		SAN TOMAS EXPRESS	170,000	159
4	280		SF	R	0.738		SAN FRANCISCO, JCT. RTE. 82	170,000	160
4	280		SM	R	22.043		S SAN FRANCISCO, AVALON	170,000	161
4	580		ALA	R	21.427		SAN RAMON RD	169,000	162
4	80		CC		5.983		RICHMOND, HILLTOP DRIVE	169,000	163
4	680		CC	R	8.175		EL CERRO BLVD	169,000	164
4	101		SCL	R	36.144		SAN JOSE, MC KEE RD	169,000	165
4	880		SCL		6.712		TRIMBLE RD	169,000	166
4	580		ALA	R	26.228		PALOMARES/EDEN CANYON	168,000	167
4	280		SCL	R	3.764		RACE ST/SW EXWY	168,000	168
4	680		SCL	M	3.842		SAN JOSE, BERRYESSA RD	168,000	169
4	580		ALA		9.683		VASCO RD	167,000	170
4	80		CC		1.671		EL CERRITO, POTRERO AVE	167,000	171
4	680		CC	R	7.553		DANVILLE, DIABLO RD	167,000	172
4	101		MRN		13.713		MANUEL FREITAS PARKWAY	167,000	173
4	880		SCL		7.69		MILPITAS, GREAT MALL PKWY	167,000	174
4	580		ALA		30.354		STROBRIDGE AVE	166,000	175
4	680		SCL	M	1.41		SAN JOSE, CAPITOL EXPRESS	166,000	176
4	580		ALA		12.53		NORTH LIVERMORE	165,000	177
4	580		ALA	R	28.745		CROW CANYON /CENTER	165,000	178
4	880		ALA		3.247		FREMONT, LANDING RD	165,000	179
4	101		SCL		40.701		SAN JOSE, DE LA CRUZ	165,000	180
4	880		SCL		5.337		COYOTE CREEK	165,000	181
4	24		CC	R	3.473		SAINT STEPHENS	164,000	182
4	101		MRN		8.25		CORTE MADERA, LUCKY DR	164,000	183
4	101		SCL		30.097		HELLYER AVE	164,000	184
4	580		ALA	R	38.915		OAKLAND, KUHNLE	163,000	185
4	680		ALA	R	20.057		PLEASANTON, RTE. 580	163,000	186
4	24		CC	R	2.319		CAMINO PABLO	163,000	187
4	680		CC	R	0		ALAMEDA/C COSTA CO LINE	163,000	188
4	101		MRN		7.66		CORTE MADERA, MADERA BLVD	163,000	189
4	101		MRN		7.365		CORTE MADERA, TAMALPAIS DR	162,000	190
4	280		SF	R	3.279		SAN FRANCISCO, ALEMANY	161,000	191
4	280		SF	R	4.009	R	BEG RIGHT ALIGN	161,000	192
4	80		SOL		17.197		FAIRFIELD, WEST TEXAS ST	161,000	193
4	80		SOL		20.925		FAIRFIELD, NORTH TEXAS ST	161,000	194
4	80		SOL		23.958		PLEASANT VALLEY	161,000	195
4	580		ALA		10.689		FIRST ST	160,000	196
4	580		ALA		43.479		OAKLAND, LAKESHORE/PARK	160,000	197

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	24		CC	R	4.397		LAFAYETTE, ACALANES RD	160,000	198
4	880		SCL		3.565		SAN JOSE, N. FIRST ST	160,000	199
4	101		MRN		5.694		JCT. RTE. 131 EAST	159,000	200
4	101		MRN		14.707		LUCAS VALLEY RD	159,000	201
4	101		MRN		15.57		MILLER CREEK RD	159,000	202
4	101		SCL		42.734		GREAT AMERICA PARKWAY	159,000	203
4	380		SM		5.465		SAN BRUNO, JCT. RTE. 82	159,000	204
4	24		CC		1.196		GATEWAY BLVD	158,000	205
4	680		CC	R	4.182		CROW CANYON RD	158,000	206
4	280		SCL		7.388		STEVENS CREEK	158,000	207
4	680		SCL	M	0		SAN JOSE, JCT RTE 101/280	158,000	208
4	280		SF	R	2.701		SAN FRANCISCO, MONTEREY	158,000	209
4	580		ALA	R	37.797		OAKLAND, KELLER	157,000	210
4	24		CC	R	0.4		FISH RANCH/CLAREMONT	157,000	211
4	880		SCL		0		JCT. RTE. 280	157,000	212
4	880		SCL		2.667		SAN JOSE, COLEMAN AVE	157,000	213
4	80		SOL		19.176		AIRBASE PARKWAY	157,000	214
4	101		MRN		18.009		IGNACIO BLVD	156,000	215
4	880		SCL		2.075		SAN JOSE, JCT. RTE. 82	156,000	216
4	680		CC	R	0.01		SAN RAMON, ALCOSTA	155,000	217
4	87		SCL		4.35		SAN JOSE, LELONG ST	155,000	218
4	101		SCL		46.134		SUNNYVALE, JCT. RTE. 237	155,000	219
4	101		SCL		47.014		SUNNYVALE, MOFFETT FIELD	155,000	220
4	880		SCL		1.25		BASCOM AVE	155,000	221
4	24		ALA	R	5.65		CALDECOTT LANE	154,000	222
4	580		ALA	R	36.343		OAKLAND, GOLF LINKS RD	154,000	223
4	24		CC	R	0		ALAMAEDA/CONTRA COSTA CO LINE	154,000	224
4	101		SCL	R	35.759		SAN JOSE, JCT. RTE. 130 E	154,000	225
4	101		SCL		47.891		MOUNTAIN VIEW, MOFFETT BLVD	154,000	226
4	580		ALA	R	35.713		OAKLAND, 106TH AVE	153,000	227
4	580		ALA	R	42.184		OAKLAND, BEAUMONT	153,000	228
4	101		SCL		43.85		SUNNYVALE, LAWRENCE EXPR	153,000	229
4	80		SOL	R	25.306		ALAMO AVE	153,000	230
4	24		ALA	R	1.847		OAKLAND, JCT RTE 580 AND 980	152,000	231
4	580		ALA	R	41.143		OAKLAND, COOLIDGE	151,000	232
4	680		CC	R	2.885		BOLLINGER CANYON RD	150,000	233
4	680		CC		13.93		WALNUT CREEK, OLYMPIC	150,000	234
4	280		SCL		8.375		CUPERTINO, WOLFE RD	150,000	235
4	280		SF	R	5.951	R	END RIGHT ALIGN	150,000	236
4	580		ALA	R	33.43		SAN LEANDRO, BENEDICT	149,000	237
4	101		SCL	R	28.609		SAN JOSE, JCT. RTE. 82 N	149,000	238
4	101		SCL		44.831		SUNNYVALE, FAIR OAKS AVE	149,000	239
4	24		ALA	R	5.117		OAKLAND, JCT. RTE. 13	148,000	240
4	101		MRN		16.641		HAMILTON FIELD RD	148,000	241

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	80		SOL	R	26.01		DAVIS ST	148,000	242
4	24		ALA	R	4.152		OAKLAND, BRDWAY/PATTON	147,000	243
4	580		ALA	R	32.844		150TH AVE	147,000	244
4	580		ALA	R	40.078		OAKLAND, HIGH ST	147,000	245
4	4		CC	R	15.424		CONCORD, PORT CHICAGO W.	147,000	246
4	680		SCL	M	5.068		SAN JOSE, CAPITOL AVE	147,000	247
4	80		ALA		2.509		OAKLAND, JCT RTE 880	145,000	248
4	80		ALA		2.802		OAKLAND, JCT. RTE. 580 EAST	145,000	249
4	680		SCL	M	4.8		SAN JOSE, HOSTETTER RD	145,000	250
4	680		ALA	R	19.3		STONERIDGE DRIVE	144,000	251
4	4		CC	R	16.834		WILLOW PASS RD	144,000	252
4	24		ALA	R	3.063		OAKLAND, TELEGRAPH/CLAREMONT	143,000	253
4	580		ALA	R	34.478		SAN LEANDRO, ESTUDILLO	143,000	254
4	580		ALA	R	35.105		OAKLAND, FOOTHILL	142,000	255
4	80		SOL	R	11.976		JCT. RTE. 12 WEST	141,000	256
4	580		ALA	R	33.943		SAN LEANDRO, GRAND	140,000	257
4	580		ALA	R	39.24		OAKLAND, JCT. RTE. 13 N.	140,000	258
4	680		ALA	M	5.372		FREMONT, WASHINGTON BLVD	140,000	259
4	680		ALA	R	6.396		FREMONT, JCT. RTE. 238 N.	140,000	260
4	680		ALA	R	7.482		FREMONT, VARGAS RD	140,000	261
4	680		ALA	R	11.042		JCT. RTE. 84 WEST	140,000	262
4	80		SOL	R	27.238		VACAVILLE, MONTE VISTA AVE	140,000	263
4	580		ALA	R	1.476		GRANT LINE RD	139,000	264
4	680		ALA	M	4.015		FREMONT, DURHAM RD	139,000	265
4	680		ALA	R	9.709		ANDRADE RD	139,000	266
4	101		MRN		8.6		LARKSPUR, SIR FRANCIS DRAKE BLVD	139,000	267
4	280		SCL		7.123		SAN JOSE, LAWRNCE EXPRESS	139,000	268
4	280		SCL		10.741		SUNNYVALE, JCT. RTE. 85	139,000	269
4	92		SM	R	12.143		SAN MATEO, JCT. RTE. 101	139,000	270
4	380		SM	T	4.703		SAN BRUNO, JCT. RTE. 280	139,000	271
4	580		ALA	R	6.053	L	END LEFT ALIGN	138,000	272
4	680		ALA	M	2.382		FREMONT, JCT. RTE. 262 W.	138,000	273
4	680		ALA	R	8.312		SHERIDAN RD	138,000	274
4	280		SCL		9.433		SARATOGA, SUNNYVALE	138,000	275
4	80		SOL		3.494		VALLEJO, TENNESSEE ST	138,000	276
4	580		ALA	R	8.265		LIVERMORE, GREENVILLE	137,000	277
4	580		ALA	R	30.807		JCT. RTE. 238	137,000	278
4	580		ALA	R	31.714		LIBERTY /164TH AVE	137,000	279
4	680		SCL	M	6.173		MILPITAS, LANDESS AVE	137,000	280
4	80		SOL		3.233		VALLEJO, SPRINGS RD	137,000	281
4	87		SCL		3.563		ALMADEN EXPRESSWAY	136,000	282
4	280		SF	R	0		S MATEO/S FRANCISCO CO LN	136,000	283
4	80		SOL		2.881		VALLEJO, GEORGIA ST	136,000	284
4	680		CC	R	18.707		CONCORD, JCT. RTE. 242 N.	135,000	285

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	101		MRN		10.6		SAN RAFAEL, IRWIN ST	135,000	286
4	101		SCL		45.684		SUNNYVALE, MATILDA AVE	135,000	287
4	680		ALA	R	16.75		PLEASANTON, BERNAL	134,000	288
4	101		SF	R	4.241	R	SAN FRANCISCO, JCT. RTE. 80	134,000	289
4	580		ALA	R	39.91		OAKLAND, MAC ARTHUR	133,000	290
4	237		SCL		9.325		END DIVIDED HIGHWAY	133,000	291
4	101		SON		19.004		BAKER AVE	133,000	292
4	17		SCL		10.498		CAMPBELL, CAMDEN AVE	132,000	293
4	85		SCL		3.93		SAN JOSE, BLOSSOM HILL	132,000	294
4	80		SOL		2.22		VALLEJO, JCT. RTE. 780 SE	132,000	295
4	101		SCL	R	17.82		MORGAN HILL, COCHRAN RD	131,000	296
4	101		SCL		38.8		SAN JOSE, NORTH FOURTH ST	131,000	297
4	237		SCL		8.02		SAN JOSE, ZANKER RD	131,000	298
4	4		CC	R	18.83		CONCORD, PORT CHICAGO E.	130,000	299
4	101		SCL		38.3		SAN JOSE, JCT. RTE. 880	130,000	300
4	101		SON		20.095		SANTA ROSA, FOURTH ST	130,000	301
4	101		MRN		3.334		WALDO MARIN CITY, BRIDGE	129,000	302
4	101		MRN		19.085		NOVATO, JCT. RTE. 37 EAST	129,000	303
4	101		SCL		39.285		SAN JOSE, NORTH FIRST ST	129,000	304
4	4		CC	R	20.102		BAILEY RD	128,000	305
4	680		CC	R	19.236		CONCORD, WILLOW PASS	128,000	306
4	680		SCL	M	7.647		MILPITAS, JCT. RTE. 237 W.	128,000	307
4	680		CC		19.855		PLEASANT HILL, CONCORD AVE	127,000	308
4	101		MRN		4.134		JCT. RTE. 1 WEST	127,000	309
4	80		ALA		1.27	R	UPPER DECK LNS WEST	126,000	310
4	101		MRN		4.754		STRAWBERRY POINT	126,000	311
4	80		SOL		4.432		VALLEJO, REDWOOD ST	126,000	312
4	237		SCL		6.866		SAN JOSE, N FIRST/ TAYLOR	125,000	313
4	80		SF		5.588	L	1ST/HARRISON/BAY BRIDGE	125,000	314
4	80		SOL		42.67		JCT. RTE. 113 NORTH	125,000	315
4	237		SCL	R	5.834		GREAT AMERICA PARKWAY	124,000	316
4	80		SF		5.588	R	1ST/HARRISON/BAY BRIDGE	124,000	317
4	80		ALA		0	R	S FRANCISCO/ALAMEDA CO LINE	123,000	318
4	80		ALA		0	L	S FRANCISCO/ALAMEDA CO LINE	123,000	319
4	238		ALA		14.292		JCT. RTE. 580	123,000	320
4	17		SCL		9.354		LOS GATOS, JCT RTE 85	123,000	321
4	101		SCL	R	16.006		EAST DUNNE AVE	123,000	322
4	80		SF		7.719	R	RIGHT ALIGN TREASURE ISLAND	123,000	323
4	80		SF		7.719	L	LEFT ALIGN TREASURE ISLAND	123,000	324
4	280		SM	M	27.165	R	DALY CITY, JCT. RTE. 1 N.	123,000	325
4	680		ALA	R	12.443		SUNOL RD	122,000	326
4	880		ALA		31.681		OAKLAND, JCT RTE 980	122,000	327
4	85		SCL	R	17.699		CUPERTINO, STEVENS CREEK	122,000	328
4	238		ALA		14.951		JCT. RTE. 185, MISSION BLVD	121,000	329

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	580		ALA	R	32.717		PLAZA DRIVE	121,000	330
4	880		ALA	R	32.79		ADELINE/UNION ST	121,000	331
4	80		SOL	R	28.36		JCT. RTE. 505 NORTH	121,000	332
4	80		SOL		38.21		JCT. RTE. 113 SOUTH	121,000	333
4	101		SON		20.74		SANTA ROSA, COLLEGE AVE	121,000	334
4	680		ALA	M	0		SA CLARA/ALAMEDA CO LINE	120,000	335
4	680		ALA	M	0.125		FREMONT, SCOTT CREEK	120,000	336
4	680		ALA	R	15.261		PLEASANTON/SUNOL	120,000	337
4	87		SCL		1.34		SAN JOSE, TERESA BLVD	120,000	338
4	101		SCL	R	26.78		SAN JOSE, JCT RTE 85	120,000	339
4	680		SCL	M	8.496		MILPITAS, JACKLIN RD	120,000	340
4	85		SCL	R	18.861		CUPERTINO, HOMESTEAD RD	119,000	341
4	280		SCL		14.098		MAGDALENA AVE	119,000	342
4	680		CC		21.191		JCT. RTE. 4	118,000	343
4	280		SCL		11.447		CUPERTINO, FOOTHILL	118,000	344
4	85		SCL		9.277		SAN JOSE, UNION AVE	117,000	345
4	280		SM	R	18.524		MILLBRAE, LARKSPUR DR	117,000	346
4	80		SOL		35.547		DIXON/GRANT RD	117,000	347
4	101		SON		18.492		HEARN AVE	117,000	348
4	101		SON		19.646		SANTA ROSA, JCT. RTE. 12	117,000	349
4	205		ALA		0.213		JCT. RTE. 580	116,000	350
4	680		ALA	R	11.845		JCT. RTE. 84 EAST	116,000	351
4	4		CC		26.007		ANITOCH, SOMERSVILLE	116,000	352
4	80		CC		10.059		HERCULES, JCT. RTE. 4 EAST	116,000	353
4	85		SCL	R	10.997		LOS GATOS, WINCHESTER	116,000	354
4	85		SCL	R	19.856		SUNNYVALE, FREMONT AVE	116,000	355
4	101		SCL	R	15.069		TENNANT AVE	116,000	356
4	980		ALA		0.904		OAKLAND, 18TH ST	115,000	357
4	4		CC		23.049		PITTSBURG, RAILRD	115,000	358
4	242		CC	R	1.468		CONCORD, CONCORD AVE	115,000	359
4	80		NAP		6.814		SOLANO/NAPA CO LINE	115,000	360
4	85		SCL		5.22		JCT. RTE. 87	115,000	361
4	87		SCL		2.826		CURTNER AVE	115,000	362
4	237		SCL	R	4.599		SUNNYVALE, LAWRNCE EXPRSS	115,000	363
4	92		SM	R	12.777		MARINERS ISLAND BLVD	115,000	364
4	85		SCL		8.109		SAN JOSE, CAMDEN AVE	114,000	365
4	280		SM	R	20.218		SAN BRUNO, WHITMAN WAY	114,000	366
4	85		SCL	R	18.448		SUNNYVALE, JCT. RTE. 280	113,000	367
4	242		CC	R	2.145		CONCORD, SOLANO WAY	112,000	368
4	1		SF	R	0		S MATEO/SN FRANCISCO CO LN	112,000	369
4	280		SM	R	17.16		HILLSBOROUGH, TROUSDALE	112,000	370
4	580		ALA		46.262	R	BEGIN RIGHT ALIGN	111,000	371
4	580		ALA		46.46	R	OAKLAND, JCT. RTES. 80/880	111,000	372
4	580		ALA		46.262	L	BEGIN LEFT ALIGN	111,000	373

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	4		CC		24.321		PITTSBURG, LOVERIDGE	110,000	374
4	80		CC		12.753		CUMMINGS SKYWAY	110,000	375
4	101		SCL	R	12.46		SAN MARTIN	110,000	376
4	280		SCL		15.046		LOS ALTOS HILLS, EL MONTE	110,000	377
4	80		SOL		1.776		VALLEJO, MAGAZINE ST	110,000	378
4	80		SOL		8.103		AMERICAN CANYON RD	110,000	379
4	4		CC		26.939		ANTIOCH, CONTRA LOMA	109,000	380
4	85		SCL	R	21.749		MOUNTAIN VIEW, JCT. RTE. 82	109,000	381
4	280		SM	R	12.319		JCT. RTE. 35, BUNKER HILL	109,000	382
4	280		SM	M	27.165	L	DALY CITY, JCT. RTE. 1 N.	109,000	383
4	80		SOL		5.634		VALLEJO, JCT. RTE. 37 WEST	109,000	384
4	80		SOL		8.004		NAPA/SOLANO CO LINE	109,000	385
4	80		SOL	R	11.394		RED TOP RD	109,000	386
4	880		ALA	R	33.27		7TH ST	108,000	387
4	880		ALA	R	33.482		BART UP BR 39C-394	108,000	388
4	80		CC		13.489		CROCKETT	108,000	389
4	101		MRN	R	20.19		NOVATO, ROWLAND AVE	108,000	390
4	85		SCL	R	10.231		SAN JOSE, BASCOM AVE	108,000	391
4	280		SF	R	6.05		INDIANA ST/PENNSYLVNIA	108,000	392
4	80		SOL		0		CARQUINEZ BRIDGE	108,000	393
4	80		CC		10.685		HERCULES, WILLOW AVE	107,000	394
4	101		SCL	R	10.27		MASTEN AVE	107,000	395
4	280		SM	R	14.223		HAYNE RD	107,000	396
4	280		SM	M	26.877	R	BEGIN RIGHT ALIGN	107,000	397
4	101		SON		21.741		SANTA ROSA, STEELE LANE	107,000	398
4	1		SF	R	0.105		SAN FRANCISCO, ALEMANY	106,000	399
4	280		SM		6.654		EDGEWOOD RD	106,000	400
4	280		SM	R	17.921		HILLCREST /MILLBRAE AVE	106,000	401
4	101		SON		15.018		ROHNERT PARK, WILFRED AVE	106,000	402
4	680		CC		22.697		ARTHUR RD	105,000	403
4	101		MRN		0		GOLDEN GATE BRIDGE	105,000	404
4	85		SCL		6.136		ALMADEN EXPRESSWAY	105,000	405
4	101		SF		9.4		SAN FRANCISCO, JCT. RTE. 1	105,000	406
4	101		SF		9.86		SAN FRANCISCO, GOLDEN GATE BR	105,000	407
4	280		SM		10.866		JCT. RTE. 92	105,000	408
4	101		MRN		2.48		SAUSALITO, RODEO AVE	104,000	409
4	85		SCL	R	15.867		CUPERTINO, SARATOGA	104,000	410
4	280		SCL		18.379		PAGE MILL RD	104,000	411
4	92		SM	R	11.606		SAN MATEO, SOUTH DELAWARE	104,000	412
4	280		SM	R	20.747		SAN BRUNO, SAN BRUNO AVE	104,000	413
4	101		SON		16.538		TODD RD	104,000	414
4	4		CC		27.294		ANTIOCH, G ST	103,000	415
4	101		MRN		1.677		SAUSALITO, SPENCER AVE	103,000	416
4	85		SCL	R	10.498		JCT. RTE. 17	103,000	417

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	87		SCL		6.1		SAN JOSE, JULIAN ST	103,000	418
4	280		SM	R	1.61		SAND HILL RD	103,000	419
4	280		SM	R	6.601		CANADA RD	103,000	420
4	680		CC		22.429		MARTINEZ, PACHECO BLVD	102,000	421
4	680		CC		24.264		WATERFRONT, MARINA VISTA	102,000	422
4	101		MRN		0.318		SAUSALITO RD	102,000	423
4	85		SCL		1.973		SAN JOSE, COTTLE RD	102,000	424
4	92		SM	R	11.208		JCT. RTE. 82	102,000	425
4	280		SM	R	3.337		WOODSIDE, JCT. RTE. 84	102,000	426
4	280		SM	R	4.647		FARM HILL BLVD	102,000	427
4	280		SM	R	19.278		SAN BRUNO, JCT. RTE. 35 N.	102,000	428
4	80		SOL		1.144		VALLEJO, JCT. RTE. 29 NW	102,000	429
4	680		SOL	L	0		C COSTA/SOLANO CO LN	102,000	430
4	85		SCL	R	13.684		SARATOGA, SARATOGA AVE	101,000	431
4	92		ALA	R	5.757		HAYWARD, HESPERIAN BLVD	100,000	432
4	101		SON		15.528		SANTA ROSA AVE	100,000	433
4	280		SF	R	6.603		SAN FRANCISCO, MARIPOSA	99,000	434
4	242		CC	R	2.789		CONCORD, OLIVERA RD	98,000	435
4	1		SF	R	0.312		BROTHERHOOD /STANLEY DR	98,000	436
4	280		SCL		20.613		ALPINE RD	97,000	437
4	280		SM	R	0		SANTA CLARA/S MATEO CO LN	97,000	438
4	4		CC	R	27.79		ANTIOCH, A ST/LONETREE	96,000	439
4	101		SCL	R	7.532		GILROY, N JCT RTE 152 W	96,000	440
4	1		SM	R	48.05		NORTH JCT. RTE. 280	95,000	441
4	80		SF		5.454	L	SAN FRANCISCO, BAY BR	94,000	442
4	280		SF	R	4.009	L	BEGIN LEFT ALIGN	94,000	443
4	37		SOL		10.94		VALLEJO, FAIRGROUNDS DR	94,000	444
4	101		SON		13.83		ROHNERT PARK, ROHNERT PK	94,000	445
4	87		SCL		5.156		SAN JOSE, JCT. RTE. 280	93,000	446
4	237		SCL		2.99		SUNNYVALE, MATHILDA AVE	93,000	447
4	92		ALA	R	4.477		HAYWARD, CLAWITER RD	92,000	448
4	101		SON		7.651		PETALUMA, OLD REDWOOD HWY	92,000	449
4	92		ALA	R	5.121		INDUSTRIAL BLVD	90,000	450
4	4		CC	R	14.668		CONCORD, JCT. RTE. 242	90,000	451
4	242		CC	R	0		CONCORD, JCT. RTE. 680	90,000	452
4	101		SON		12.682		COTATI, NORTH JCT. RTE. 116	90,000	453
4	580		CC		1.214		RICHMOND, BAYVIEW / 51ST	89,000	454
4	101		MRN	R	21.111		NOVATO, DE LONG AVE	89,000	455
4	85		SCL	R	22.163		JCT. RTE. 237	89,000	456
4	101		SON		8.8		PEPPER RD CONNECTION	89,000	457
4	101		SON		23.3		HOPPER AVE	89,000	458
4	580		CC	R	2.087		RICHMOND, ERLANDSON	88,000	459
4	17		SCL		8.885		LARK AVE	88,000	460
4	85		SCL	R	22.629		MOUNTAIN VIEW, EVELYN AVE	88,000	461

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	101		SCL	R	6.08		GILROY, JCT. RTE. 152 E	88,000	462
4	237		SCL	R	3.972		SUNNYVALE, FAIR OAKS AVE	88,000	463
4	101		SON		3.664		PETALUMA, SOUTH JCT RTE 116 E	88,000	464
4	101		SON		10.666		RAILRD AVE CONNECTION	88,000	465
4	580		ALA	R	47.35		ALBANY, NORTH JCT. RTE. 80	87,000	466
4	580		CC		0		ALAMEDA/C COSTA CO LINE	87,000	467
4	580		CC		0.236		CENTRAL AVE	87,000	468
4	237		SCL		2.48		SUNNYVALE, JCT. RTE. 101	87,000	469
4	101		SON		4.76		PETALUMA, EAST WASHINGTON	87,000	470
4	92		ALA	R	0		SAN MATEO/ALAMEDA CO LINE	86,000	471
4	92		ALA	R	2.594		S MATEO/HAYWARD BR TOLL	86,000	472
4	280		SF	R	5.951	L	END LEFT ALIGN	86,000	473
4	92		SM	R	10.564		SAN MATEO, DE LAS PULGAS	86,000	474
4	92		SM	R	13.607		FOSTER CITY, FOSTER CITY	86,000	475
4	92		SM	R	14.443		SAN MATEO/HAYWARD BRIDGE	86,000	476
4	4		CC	R	11.126		MILANO WAY	85,000	477
4	101		SON		22.52		BICENTENNIAL WAY	85,000	478
4	17		SCL		7.073		LOS GATOS, JCT. RTE. 9 WEST	84,000	479
4	101		SON		22.814		SANTA ROSA, MENDOCINO	84,000	480
4	87		SCL		0		SAN JOSE, JCT. RTE 85	83,000	481
4	101		SON		11.995		COTATI, SIERRA AVE	83,000	482
4	101		SON		25.902		FULTON RD	82,000	483
4	4		CC		12.667		JCT. RTE. 680	81,000	484
4	4		CC	R	28.94		ANTIOCH, HILLCREST	81,000	485
4	85		SCL	R	23.435		MOUNTAIN VIEW, MOFFETT BLVD	81,000	486
4	101		MRN	R	22		ATHERTON AVE	80,000	487
4	101		MRN		26.9		SAN ANTONIO RD	80,000	488
4	85		SCL		0.79		SAN JOSE, GREAT OAKS	80,000	489
4	101		SON		0		MARIN/SONOMA CO LINE	80,000	490
4	101		SON		2.232		KASTANIA RD	80,000	491
4	4		CC	R	13.65		SOLANO WAY	78,000	492
4	242		CC	R	0.872		CONCORD, WILLOW PASS RD	78,000	493
4	101		SF		8.44		SAN FRANCISCO, MARINA BLVD	78,000	494
4	92		SM	R	9.378		SAN MATEO, WEST HILLSDALE	78,000	495
4	101		SON		24.864		RIVER RD	78,000	496
4	101		SON		26.326		AIRPORT BLVD	78,000	497
4	4		CC	R	10.33		MARTINEZ, MORELLO AVE	77,000	498
4	580		CC	R	2.887		RICHMOND, SOUTH 23RD ST	77,000	499
4	580		ALA		0.39	R	JCT. RTE. 205 EAST	76,500	500
4	262		ALA	R	0		FREMONT, JCT. RTE. 880	76,000	501
4	980		ALA		0.009		OAKLAND, JCT. RTE. 880	76,000	502
4	101		SON		2.925		SOUTH PETALUMA	76,000	503
4	87		SCL		6.69		W. TAYLOR	75,000	504
4	12		SON	R	15.3		SANTA ROSA, DUTTON AVE	75,000	505

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	238		ALA		16.279		SAN LEANDRO, HESPERIAN	74,000	506
4	262		ALA	R	0.7		FREMONT, WARM SPRINGS	74,000	507
4	12		SON	R	16.039		SANTA ROSA, JCT. RTE. 101	74,000	508
4	101		SCL		3.16		JCT. RTE. 25 EAST	73,000	509
4	92		SM	R	8.674		MONTEREY ST	73,000	510
4	580		CC	R	3.6		RICHMOND, HARBOR/CUTTING	72,000	511
4	580		MRN		2.633		SAN RAFAEL, SAN QUENTIN	72,000	512
4	92		SM	R	7.31		ON RALSTON AVE, JCT. RTE. 280	71,500	513
4	580		CC	R	5.428		RICHMOND, CASTRO/MARINE	71,000	514
4	1		SM	R	47.272		DALY CITY, CLARINADA AVE	71,000	515
4	1		SM	R	47.802		SOUTH JCT. RTE. 280	71,000	516
4	13		ALA		9.066		OAKLAND, BRDWAY TERRACE	70,000	517
4	580		CC		6.007		RICHMOND, WESTERN DR	70,000	518
4	580		CC		6.125		SAN RAFAEL BR TOLL PLAZA	70,000	519
4	580		MRN		0		C COSTA/MARIN CO LINE	70,000	520
4	580		MRN		2.477		SAN RAFAEL BRIDGE	70,000	521
4	1		SF	R	0.68		SAN FRANCISCO, 19TH AVE	70,000	522
4	1		SF		1.35		SAN FRANCISCO, WINSTON DR	70,000	523
4	1		SF		1.897		SAN FRANCISCO, JCT. RTE. 35	70,000	524
4	1		SF		2.87		SAN FRANCISCO, QUINTARA ST	70,000	525
4	1		SF		4.05		SAN FRANCISCO, LINCOLN WAY	70,000	526
4	1		SF		5		SAN FRANCISCO, FULTON ST	70,000	527
4	101		SCL	R	4.942		MONTEREY RD	69,000	528
4	680		SOL	R	0.203		BENICIA, JCT. RTE 780	69,000	529
4	580		ALA	R	1.622	R	BEG RIGHT ALIGN	68,000	530
4	580		ALA	R	5.98	R	NORTH FLYNN RD	68,000	531
4	580		ALA	R	6.053	R	END RIGHT ALIGN	68,000	532
4	580		ALA	R	1.622	L	BEGIN LEFT ALIGN	68,000	533
4	13		ALA		8.3		OAKLAND, MORAGA AVE	67,000	534
4	87		SCL		8.755		AIRPORT PARKWAY	67,000	535
4	237		SCL	R	0.81		MOUNTAIN VIEW, SYLVAN AVE	67,000	536
4	237		SCL	M	1.547		MIDDLEFIELD /MAUDE AVE	67,000	537
4	237		SCL	R	8.726	R	BEGIN RIGHT ALIGN	67,000	538
4	237		SCL	R	9.125	R	McCARTHY BLVD	67,000	539
4	237		SCL	R	8.726	L	BEGIN LEFT ALIGN	67,000	540
4	237		SCL	R	9.125	L	McCARTHY BLVD	67,000	541
4	84		ALA	R	4.884		NEWARK BLVD	66,000	542
4	84		ALA	R	6.01		NORTH JCT. RTE. 880	66,000	543
4	237		SCL		10		MAIN ST	66,000	544
4	92		SM	R	7.929		RALSTON /POLHEMUS	66,000	545
4	4		CC	R	9.185		MARTINEZ, PINE ST	64,000	546
4	17		SCL		4.06		BEAR CREEK RD	64,000	547
4	1		SF		5.88		SAN FRANCISCO, LAKE ST	64,000	548
4	1		SM	R	46.722		DALY CITY, JCT. RTE. 35	64,000	549

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	280		SF	R	4.341	L	JCT RTE 101	63,000	550
4	280		SF	R	5.62	L	SAN FRANCISCO, ARMY ST	63,000	551
4	680		SOL	R	1.461		BENCIA, INDUSTRIAL WAY	63,000	552
4	680		SOL	R	2.819		LAKE HERMAN RD	63,000	553
4	12		SON	R	14.45		SANTA ROSA, STONY POINT	63,000	554
4	980		ALA		0.702		OAKLAND, 14TH ST	62,000	555
4	237		SCL	R	0.608		DANA ST/WHISMAN RD	62,000	556
4	237		SCL		9.335		JCT. RTE. 880, NIMITZ FREEWAY	62,000	557
4	12		SON	R	17.081		SANTA ROSA, BROOKWOOD	62,000	558
4	101		SON		27.618		SHILOH RD	62,000	559
4	4		CC	R	8.549		MARTINEZ, ALHAMBRA	61,000	560
4	101		SF	R	4.634	L	END INDEP ALIGN	61,000	561
4	680		SOL	R	1.002		BENICIA, BAYSHORE RD	61,000	562
4	85		SCL		0.181		SAN JOSE, BERNAL RD	60,000	563
4	29		NAP		4.706		JCT. RTE. 12 EAST	59,000	564
4	29		NAP		11.548		FIRST ST	59,000	565
4	780		SOL		6.656		BENECIA, HOME ACRES AVE	59,000	566
4	580		CC	R	4.643		RICHMOND, CANAL BLVD	58,000	567
4	17		SCL		6.16		LOS GATOS, SANTA CRUZ AVE	58,000	568
4	780		SOL		2.015		BENICIA, SECOND ST	58,000	569
4	13		ALA		6.469		OAKLAND, LINCOLN AVE	57,000	570
4	13		ALA		7.397		OAKLAND, PARK BLVD	57,000	571
4	237		SCL	R	0.375		MOUNTAIN VIEW, JCT. RTE. 85	57,000	572
4	780		SOL		3.995		WEST BENICIA	57,000	573
4	780		SOL		5.998		GLEN COVE RD	57,000	574
4	92		ALA		6.392		HAYWARD, JCT. RTE. 880	56,000	575
4	17		SCL		0		SANTA CLARA CO LINE	56,000	576
4	680		SOL		0.679		JCT. RTE. 780 NORTHWEST	56,000	577
4	82		SCL	R	0		SAN JOSE, JCT. RTE. 101	55,000	578
4	280		SF	T	7.07		SAN FRANCISCO, 4TH ST	55,000	579
4	84		ALA	R	3.18		DUMBARTON BRIDGE TOLL	54,000	580
4	29		NAP	R	10.389		NAPA, JCT. RTE. 121 NORTH	54,000	581
4	84		SM	R	28.194		JCT. RTE. 109	54,000	582
4	780		SOL		0.682		BENICIA, JCT. RTE. 680	54,000	583
4	780		SOL		2.955		BENICIA, WEST 7TH ST	54,000	584
4	13		ALA		5.393		OAKLAND, REDWOOD RD	53,000	585
4	92		ALA		6.78		HAYWARD, SANTA CLARA ST	53,000	586
4	280		SF	R	4.341	R	SAN FRANCISCO, JCT. RTE. 101	53,000	587
4	12		SON	R	16.63		SANTA ROSA, BENNETT VAL	53,000	588
4	238		ALA		12.613		HAYWARD, JCT. RTES. 92/185	52,000	589
4	17		SCL		0.108		JCT. RTE. 35 NORTHWEST	52,000	590
4	101		SF		7.8		SAN FRANCISCO, BRODERICK ST	52,000	591
4	280		SM	M	26.877	L	SB ON FR SB RTE 1	52,000	592
4	238		ALA		13.83		HAYWARD, GROVE WAY	51,000	593

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	29		NAP		12.039		NAPA, LINCOLN AVE	51,000	594
4	238		ALA		13.12		HAYWARD, A ST	50,000	595
4	580		MRN		4.498		BELLAM BLVD	50,000	596
4	101		SCL		0.028		SAN BENITO/S CLARA CO LINE	50,000	597
4	280		SF	R	5.62	R	SAN FRANCISCO, ARMY ST	49,000	598
4	82		SM		10.554		SAN MATEO, JCT. RTE. 92	49,000	599
4	82		SCL		18.841		MOUNTAIN VIEW, JCT. RTE. 85	48,500	600
4	1		SM	R	42.583		PACIFICA, REINA DEL MAR	48,500	601
4	37		SOL	R	11.41	R	BEG INDEP ALIGN RT	48,500	602
4	37		SOL	R	11.73	R	JCT. RTE. 80	48,500	603
4	84		SM	R	27.659		JCT. RTE. 114	48,000	604
4	780		SOL		4.77		COLUMBUS PARKWAY	48,000	605
4	17		SCL		1.25		REDWOOD DRIVE	47,500	606
4	101		SF		5.322		SAN FRANCISCO, TURK ST	47,500	607
4	1		SM		42.014		PACIFICA, ROCKAWAY BEACH	47,000	608
4	13		ALA		4.262		OAKLAND, JCT. RTE. 580	46,500	609
4	84		ALA	R	3.747		THORNTON / PASEO PADRE	46,500	610
4	101		SON		29.347		WINDSOR RIVER	46,500	611
4	4		CC	R	5.168		MC EWEN RD	46,000	612
4	82		SCL		22.67		PALO ALTO, CHARLESTON RD	46,000	613
4	101		SF	R	5.139		SAN FRANCISCO, S VAN NESS	46,000	614
4	101		SF		5.26		SAN FRANCISCO, GOLDEN GATE AVE	46,000	615
4	84		SM		24.704		REDWOOD CITY, JCT. RTE. 82	46,000	616
4	101		SON		33.476		GRANT AVE	46,000	617
4	4		CC	T	4.892		CUMMINGS SKYWAY	45,500	618
4	29		NAP	R	8.657		JCT. RTE. 121 SOUTH	45,500	619
4	82		SCL		19.134		MOUNTAIN VIEW, JCT. RTE. 237 E	45,000	620
4	880	S	ALA		0	R	RIGHT LNS PORT OF OAKLND	44,500	621
4	880	S	ALA		1.257	R	END RIGHT LANES AT WB 80	44,500	622
4	880	S	ALA		0	L	LEFT LNS PORT OF OAKLND	44,500	623
4	37		SON		2.06		LAKEVILLE RD	44,000	624
4	29		NAP	R	6.196		JCT. RTE. 221 NORTH	43,500	625
4	13		ALA		5.012		CARSON ST, BEGIN FREEWAY	43,000	626
4	580		MRN		3.087		SIR FRANCIS DRAKE BLVD	43,000	627
4	84		SM		25.058		REDWOOD CITY, MIDDLEFIELD	43,000	628
4	12		SOL	R	4.072		PENNSYLVANIA AVE	43,000	629
4	29		NAP	R	2.767		GREEN ISLAND RD	42,500	630
4	85		SCL		0		SAN JOSE, JCT. RTE. 101	42,500	631
4	101		SF		5.94		SAN FRANCISCO, CALIFORNIA ST	42,500	632
4	4		CC	R	0.778		HERCULES, WILLOW AVE	42,000	633
4	82		SCL		20.67		MOUNTAIN VIEW, EL MONTE AVE	42,000	634
4	82		SCL		21.84		LOS ALTOS, SAN ANTONIO AVE	42,000	635
4	29		NAP		0.69		AMERICAN CANYON RD	41,500	636
4	29		NAP		13.058		JCT. TRANCAS/REDWOOD	41,500	637

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	82		SM		18.963		SAN BRUNO, JCT. RTE. 380	41,500	638
4	92		ALA		7.79		HAYWARD, WINTON AVE	41,000	639
4	4		CC		0		HERCULES, JCT. RTE. 80	41,000	640
4	29		NAP		3.61		KELLY RD SOUTH	41,000	641
4	82		SCL		24.04		PALO ALTO, PAGE MILL RD	41,000	642
4	12		SON		17.697		SANTA ROSA, FARMERS LANE	41,000	643
4	1		SM	R	45.39		PACIFICA, MONTEREY RD	40,500	644
4	82		SCL		14.3		SANTA CLARA, LAWRENCE EXPR	39,500	645
4	113		SOL	R	21.989	L	END LEFT ALIGN	39,500	646
4	112		ALA		0.602		JCT. RTE. 880	39,000	647
4	82		SCL		15.32		SUNNYVALE, WOLFE RD	39,000	648
4	82		SCL		19.87		MOUNTAIN VIEW, CASTRO ST	38,500	649
4	61		ALA		18.52		ALAMEDA, ISLAND DRIVE	38,000	650
4	61		ALA		18.552		ALAMEDA, SAN LEANDRO BR	38,000	651
4	82		SCL		25.877		PALO ALTO, UNIVERSITY AVE	38,000	652
4	12		SOL	L	3.206		FAIRFIELD, BECK AVE	38,000	653
4	82		SCL		25.45		PALO ALTO, EMBARCADERO RD	37,500	654
4	880		ALA	R	34.7	R	WEST GRAND AVE	37,000	655
4	12		SON		18.35		SANTA ROSA, BRUSH CREEK	37,000	656
4	82		SM		3.435		JCT. RTE. 84	36,500	657
4	114		SM		5		MENLO PARK, JCT. RTE. 101	36,500	658
4	12		SON	R	12.94		WRIGHT/FULTON RDS	36,500	659
4	101		SON		34.877		HEALDSBURG, WESTSIDE RD	36,500	660
4	82		SCL		17.035		MATHILDA AVE	36,000	661
4	101		SF		6.712		SAN FRANCISCO, LOMBARD ST	36,000	662
4	82		SM		18.6		SAN BRUNO, SAN BRUNO AVE	36,000	663
4	116		SON		35.03		PETALUMA, JCT. RTE. 101	36,000	664
4	37		SOL	R	7.213		WALNUT AVE	35,500	665
4	37		MRN	R	11.2		NOVATO, JCT. RTE. 101	35,000	666
4	37		MRN		13.773		ATHERTON AVE	35,000	667
4	1		SM	R	43.744		PACIFICA, CLAREDON /OCEANA	35,000	668
4	12		SOL	R	5.15		MARINA BLVD	35,000	669
4	37		MRN		14.473		PETALUMA CREEK	34,500	670
4	221		NAP		2.525		ENTRANCE, NAPA STATE HOSP	34,500	671
4	82		SM		9.33		SAN MATEO, HILLSDALE BLVD	34,500	672
4	505		SOL	R	0		VACAVILLE, JCT. RTE. 80	34,500	673
4	37		SON		0		MARIN/SONOMA CO LINE	34,500	674
4	13		ALA		13.178		JCT. RTE. 123	34,000	675
4	12		NAP		0.24		KELLY RD	34,000	676
4	9		SCL		11.06		LOS GATOS, SANTA CRUZ	34,000	677
4	82		SM		15.946		MILLBRAE, MILLBRAE AVE	34,000	678
4	237		SCL	R	0		MOUNTAIN VIEW, JCT. RTE. 82	33,500	679
4	37		SOL	R	0		SONOMA/SOLANO CO LINE	33,500	680
4	37		SON		3.9		JCT. RTE. 121 NORTH	33,500	681

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	238		ALA		3.314		FREMONT, S. JCT. RTE. 84 W.	33,000	682
4	130		SCL		1.71		SAN JOSE, CAPITOL AVE	33,000	683
4	84		SM		23.497		REDWOOD CITY, VALOTA RD	33,000	684
4	12		SON		19.442		SANTA ROSA, MIDDLE RINCON	33,000	685
4	238		ALA		9.94		HAYWARD, TENNYSON RD	32,500	686
4	1		MRN		0		MANZANITA, JCT. RTE. 101	32,500	687
4	152		SCL	R	21.977		JCT. RTE. 156 SOUTH	32,500	688
4	82		SM		20.662		S SAN FRANCISCO, CHESTNUT	32,500	689
4	12		SOL		0		SOLANO/NAPA CO LINE	32,500	690
4	152		SCL	R	23.409		CASA DE FRUTA	32,000	691
4	1		SM	R	43.464		PACIFICA, SHARP PARK RAD	32,000	692
4	12		SOL	R	2.794		JCT. RTE. 80	32,000	693
4	101		SON		34.551		SOUTH HEALDSBURG	32,000	694
4	82		SCL		16.762		SUNNYVALE, SARATOGA	31,500	695
4	1		SM		29.12		HALF MOON BAY, MAIN ST	31,500	696
4	82		SM		7.69		BELMONT, RALSTON AVE	31,500	697
4	82		SM		11.715		SAN MATEO, THIRD AVE	31,500	698
4	238		ALA		9.32		HAYWARD, ALQUIRE RD	31,000	699
4	82		SCL		2.81		SAN JOSE, CAPITOL EXPRESS	31,000	700
4	82		SCL		4.676		SAN JOSE, TULLY/PETTIS	31,000	701
4	82		SM		22.434		COLMA, MISSION RD	31,000	702
4	238		ALA		4.3		FREMONT, SULLIVAN UNDRPASS	30,500	703
4	29		NAP		15.581		OAK KNOLL AVE	30,500	704
4	35		SM	R	28.687		DALY CITY, JCT. RTE. 1	30,500	705
4	82		SM		1.89		ATHERTON, ATHERTON AVE	30,500	706
4	37		SOL	R	8.01		WILSON AVE	30,500	707
4	238		ALA		3.644		NORTH JCT. RTE 84, NILES	30,000	708
4	238		ALA		11.201		HAYWARD, HARDER RD	30,000	709
4	580		ALA		0.092	R	S JOAQUIN/ALAMEDA CO LN	30,000	710
4	880		ALA	R	34.18	R	RIGHT 880 OAKLAND BAY BR	30,000	711
4	880		ALA	R	34.18	L	LEFT 880 OAKLAND BAY BR	30,000	712
4	82		SM		0		SANTA CLARA/SAN MATEO CO LN	30,000	713
4	82		SM		6.44		SAN CARLOS, SAN CARLOS AVE	30,000	714
4	12		SOL		5.76		GRIZZLY ISLAND/SUNSET AVE	30,000	715
4	505		SOL	R	1.45		VACA VALLEY PARKWAY	30,000	716
4	84		ALA		6.923		SOUTH JCT RTE 880	29,500	717
4	29		NAP		0		SOLANO/NAPA CO LINE	29,500	718
4	121		NAP	R	5.891		JCT. RTE. 221 SOUTH	29,500	719
4	221		NAP		1.511		NAPA, BASALT RD	29,500	720
4	82		SCL	R	0.355		SAN JOSE, BLOSSOM HILL	29,500	721
4	84		SM		21.537		WOODSIDE, JCT. RTE. 280	29,500	722
4	29		SOL		5.85		VALLEJO, MINI DRIVE	29,500	723
4	84		ALA		8.024		FREMONT, THORNTON	29,000	724
4	112		ALA		1.507		SAN LEANDRO, SAN LEANDRO	29,000	725

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	238		ALA		0		FREMONT, JCT. RTE. 680	29,000	726
4	130		SCL		0		SAN JOSE, JCT. RTE. 101	29,000	727
4	130		SCL		0.41		SAN JOSE, KING RD	29,000	728
4	82		SM		11.84		SAN MATEO, CRYSTAL SPRINGS	29,000	729
4	82		SM		17.99		SAN BRUNO, TAYLOR/SAN MATEO	29,000	730
4	12		SON		20.1		SANTA ROSA, CALISTOGA RD	29,000	731
4	112		ALA	R	0		SAN LEANDRO, JCT. RTE. 61	28,500	732
4	82		SCL		9.904		SAN JOSE, JCT. RTE. 880	28,500	733
4	1		SM		40.959		PACIFICA, LINDA MAR	28,500	734
4	82		SM		0.771		MENLO PARK, SANTA CRUZ AVE	28,500	735
4	101		SON		36.274		DRY CREEK RD	28,500	736
4	123		CC		0		ALAMEDA/CNTRA COSTA CO LINE	28,000	737
4	131		MRN		0		JCT. RTE. 101	28,000	738
4	35		SM		30.27		DALY CITY, WESTRIDGE AVE	28,000	739
4	82		SM		4.43		REDWOOD CITY, BRDWAY	28,000	740
4	238		ALA		6.78		UNION CITY, DECOTO RD	27,500	741
4	82		SCL		12.31		SANTA CLARA, SCOTT /GOULD	27,500	742
4	1		SM		30.225		FRENCHMANS CREEK RD	27,500	743
4	1		SM	R	44.88		PACIFICA, MILAGRA PED OVRCR	27,500	744
4	82		SM		23.78		DALY CITY, SAN PEDRO AVE	27,500	745
4	84		SM		22.682		REDWOOD CITY, ALAMEDA	27,500	746
4	121		NAP	R	4.469		SOUTH JCT. RTE. 29	27,000	747
4	35		SF		0.8		SAN FRANCISCO, JOHN MUIR DR	27,000	748
4	1		SM		29.036		HALF MOON BAY, RTE. 92 E.	27,000	749
4	35		SM		29.7		DALY CITY, WESTMOOR AVE	27,000	750
4	29		SOL		4.732		LEWIS BROWN DR	27,000	751
4	121		NAP		1.99		DUHIG RD	26,500	752
4	121		NAP		3.04		CUTTING WHARF RD	26,500	753
4	82		SM		24.846		DALY CITY, HILLSIDE	26,500	754
4	101		SON	R	38.558		LYTTON SPRINGS RD	26,500	755
4	101		SON	R	40.027		INDEPENDENCE LANE	26,500	756
4	123		ALA		0		OAKLAND, JCT. RTE. 580	26,000	757
4	121		NAP		2.18		OLD SONOMA RD	26,000	758
4	130		SCL		2.19		SAN JOSE, WHITE RD	26,000	759
4	82		SM		5.15		REDWOOD CITY/SAN CARLOS	26,000	760
4	84		SM	R	25.81		MENLO PARK, JCT. RTE. 101	26,000	761
4	780		SOL		7.186		VALLEJO, JCT RTE 80	26,000	762
4	84		ALA		9.92		FREMONT, MOWRY AVE	25,500	763
4	84		ALA		17.987		JCT. RTE. 680	25,500	764
4	238		ALA		4.72		FREMONT, NURSERY AVE	25,500	765
4	880		ALA	R	34.7	L	WEST GRAND AVE	25,500	766
4	131		MRN		0.666		STRAWBERRY/BELVEDERE	25,500	767
4	12		NAP		0		JCT. RTE. 29, NAPA, SOUTH	25,500	768
4	121		NAP	R	4.835		NAPA, JEFFERSON ST	25,500	769

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	238		ALA		8.3		HAYWARD, GRESEL ST	25,000	770
4	260		ALA	R	1.124	L	ALAMEDA, WEBSTER TUBE	25,000	771
4	121		NAP		0		SONOMA/NAPA CO LINE	25,000	772
4	505		SOL	R	5.586		ALLENDALE RD	25,000	773
4	116		SON		26.51		SEBASTOPOL, MAIN ST	25,000	774
4	121		SON	R	10.788		NAPA RD	25,000	775
4	221		NAP		0		JCT. RTE. 29	24,700	776
4	29		NAP		19.007		CALIFORNIA DRIVE	24,500	777
4	12		SON		9.23		SEBASTOPOL, RTE. 116	24,500	778
4	12		SON		36.55		SONOMA, PETALUMA/RIVERSIDE	24,500	779
4	116		SON	R	27.38	L	END INDEP ALIGN	24,500	780
4	13		ALA		10.69		BERKELEY, DOMINGO AVE	24,400	781
4	185		ALA		8.69		OAKLAND, 73RD AVE	24,400	782
4	185		ALA		10.37		OAKLAND, 44TH /12TH ST	24,400	783
4	35		SF		2.122		SAN FRANCISCO, SUNSET BLVD	24,400	784
4	82		SCL		10.343		SAN JOSE/SANTA CLARA	24,300	785
4	92		SM		5.191		JCT. RTE. 35 SOUTH	24,300	786
4	29		NAP		22.52		OAKVILLE GRADE RD	24,100	787
4	505		SOL	R	3.075		MIDWAY RD	24,100	788
4	82		SM		6.57		SAN CARLOS, HOLLY ST	24,000	789
4	35		SF		0		SAN MATEO/SAN FRAN CO LINE	23,700	790
4	35		SF		1.83		SAN FRANCISCO, SLOAT BLVD	23,700	791
4	123		ALA		4.69		ALBANY, SOLANO AVE	23,600	792
4	185		ALA		0.38		HAYWARD, A ST	23,600	793
4	185		ALA		1.613		MATTOX RD	23,600	794
4	82		SCL		11.54		SANTA CLARA, ALVISO	23,600	795
4	116		SON		27.3		SEBASTOPOL, PETALUMA	23,400	796
4	152		SCL		14.89		BLOOMFIELD AVE	23,300	797
4	152		SCL	M	10.277		GILROY, JCT. RTE. 101	23,200	798
4	12		SON		9.54		SEBASTOPOL EAST CITY	23,000	799
4	84		ALA	R	27.254		JACK LONDON BLVD	22,800	800
4	29		NAP		26.57		ZINFANDEL LANE	22,700	801
4	82		SCL		6.06		SAN JOSE, ALMA AVE	22,700	802
4	82		SF		0		SAN MATEO/S FRANCISCO CO LN	22,700	803
4	35		SM		30.834		JOHN DALY BLVD	22,700	804
4	123		CC		0.29		EL CERRITO, CENTRAL AVE	22,600	805
4	12		SON		35.11		BOYES BLVD	22,600	806
4	25		SCL		2.528		GILROY, JCT RTE 101	22,400	807
4	152		SCL		12.81		FERGUSON RD	22,400	808
4	92		SM		0.2		HALF MOON BAY, MAIN ST	22,400	809
4	101		SON	R	43.373		JCT. RTE. 128 EAST	22,400	810
4	123		ALA		1.906		BERKELEY, JCT. RTE. 13	22,300	811
4	260		ALA	R	1.124	R	ALAMEDA, POSEY TUBE	22,300	812
4	260		ALA	R	1.924	R	OAKLAND, JCT. RTE. 880	22,300	813

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	101		SON	R	47.852		ASTI	22,300	814
4	185		ALA		3.75		SAN LEANDRO, HESPERIAN	22,200	815
4	101		SON	R	41.43		SOUTH GEYSERVILLE	22,200	816
4	101		SON	R	49.053		DUTCHER CREEK RD	22,200	817
4	152		SCL	M	9.78		GILROY, LEEAVESLEY AVE	21,900	818
4	84		ALA	M	27.747		AIRWAY BLVD	21,800	819
4	84		ALA	R	28.63		JCT RTE 580/KITTY RD	21,800	820
4	92		SM		7.19		RALSTON AVE/SKYLINE	21,800	821
4	12		SON		35.95		VERANO AVE	21,800	822
4	84		ALA	R	26.215		STANLEY BLVD	21,700	823
4	185		ALA		7.24		OAKLAND, 98TH AVE	21,700	824
4	77		ALA		0.098		OAKLAND, JCT. RTE. 880	21,600	825
4	12		SON		21.23		SANTA ROSA, LOS ALAMOS	21,500	826
4	61		ALA		14.8		SAN LEANDRO, JCT. RTE. 112 E	21,400	827
4	35		SM		24.852		SAN BRUNO, SNEATH AVE	21,400	828
4	121		NAP	R	5.08		NAPA, SOUTH COOMBS ST	21,300	829
4	82		SM		14.42		BURLINGAME, BRDWAY	21,300	830
4	123		CC		0.05		EL CERRITO, CARLSON BLVD	21,200	831
4	82		SM		12.963		BURLINGAME, PENINSULA AVE	21,100	832
4	82		SM		16.844		MILLBRAE, CENTER ST	21,100	833
4	123		ALA		3.98		BERKELEY, GILMAN ST	21,000	834
4	185		ALA		9.75		OAKLAND, 55TH AVE	20,900	835
4	61		ALA		16.07		OAKLAND, AIRPORT	20,700	836
4	4		CC		31.13		JCT. RTE. 160	20,700	837
4	123		CC		2.1		CUTTING BLVD	20,600	838
4	131		MRN		1.86		TIBURON, TRESTLE GLEN DR	20,600	839
4	29		NAP		24.595		RUTHERFORD, JCT. RTE. 128 E	20,600	840
4	82		SCL		6.9		SAN JOSE, JCT. RTE. 280	20,600	841
4	116		SON		25.69		SEBASTOPOL, COVERT LANE	20,600	842
4	13		ALA		12.24		BERKELEY, ADELINE ST	20,400	843
4	109		SM		1.103		NOTRE DAME AVE	20,300	844
4	13		ALA		11.61		BERKELEY, TELEGRAPH AVE	20,000	845
4	123		ALA		4.43		ALBANY, MARIN AVE	20,000	846
4	185		ALA		3.693		SAN LEANDRO, 150TH AVE	19,900	847
4	12		SOL		26.276		JCT. RTE. 84 NORTH	19,800	848
4	13		ALA	R	9.621		OAKLAND, JCT. RTE. 24	19,600	849
4	123		ALA		3.15		BERKELEY, UNIVERSITY AVE	19,600	850
4	113		SOL	R	21.989	R	END RIGHT ALIGN	19,600	851
4	4		CC		43.97		MARSH CREEK RD	19,500	852
4	12		SOL		25.579		RIO VISTA, DROUIN DRIVE	19,400	853
4	113		SOL	R	21.24	R	DIXON, WEST JCT. RTE. 80	19,400	854
4	123		ALA		1.12		OAKLAND, STANDFORD AVE	19,200	855
4	4		CC		33.82		OAKLEY, O'HARA RD	19,100	856
4	82		SM		21.91		S SAN FRANCISCO, HICKEY	19,000	857

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	185		ALA		2.187		168TH AVE	18,900	858
4	185		ALA		1.992		JCT. RTE. 238	18,800	859
4	4		CC	R	44.367		BYRON HIGHWAY	18,700	860
4	82		SCL	R	11.141		SANTA CLARA, BENTON RD	18,700	861
4	29		NAP		29.25		ST. HELENA, PRATT AVE	18,600	862
4	25		SCL		0		SAN BENITO SNTA CLARA CO LINE	18,600	863
4	35		SM		24.349		SAN BRUNO, SAN BRUNO AVE	18,600	864
4	84		ALA	R	24.706		VINEYARD AVE	18,500	865
4	84		ALA	R	24.972		ALDEN LANE	18,500	866
4	123		CC		1.75		EL CERRITO, POTRERO AVE	18,400	867
4	152		SCL		9.43		MONTEREY ST	18,400	868
4	113		SOL	R	21.772	R	EAST JCT. RTE. 80 NB	18,400	869
4	113		SOL	R	21.653	L	EAST JCT RTE 80 SB	18,400	870
4	1		MRN		0.65		TAMALPAIS, ALMONTE BLVD	18,200	871
4	116		SON		36.36		FRATES RD/CADER LANE	18,200	872
4	4		CC		37.07		LONE TREE WAY	18,100	873
4	35		SM		26.234		PACIFICA, SHARP PARK RD	18,000	874
4	13		ALA		13.738	L	BEGIN INDEP LEFT ALIGN	17,900	875
4	9		SCL		9.88		QUITO RD	17,700	876
4	152		SCL		7.93		GILROY SANTA TERESA BL	17,700	877
4	12		SON		37		SONOMA, FIFTH ST	17,700	878
4	92		SM		0		HALF MOON BAY, JCT. RTE. 1	17,600	879
4	101		SON	R	50.43		SOUTH CLOVERDALE	17,600	880
4	116		SON	R	27.3	R	SEBASTOPOL, PETALUMA AVE	17,600	881
4	84		ALA	R	25.314		CONCANNON BLVD	17,500	882
4	185		ALA		1.88		LEWELLING BLVD	17,200	883
4	29		NAP		28.75		ST. HELENA, ADAMS ST	17,200	884
4	116		SON		41.81		ADOBE RD	17,200	885
4	185		ALA		5.728		JCT. RTE. 112 WEST	17,000	886
4	35		SM		26.86		PACIFICA, MANOR DRIVE	17,000	887
4	12		SON		26.11		ADOBE CANYON RD	17,000	888
4	116		SON		28.56		BLOOMFIELD RD	17,000	889
4	116		SON		30.33		CUNNINGHAM, LONE PINE	17,000	890
4	121		SON		6.692		JCT. RTE. 116 WEST	17,000	891
4	13		ALA		10.79		BERKELEY, CLAREMONT AVE	16,800	892
4	13		ALA		13.906	R	BERKELEY, JCT. RTE. 80	16,600	893
4	116		SON		44.84		ARNOLD DRIVE	16,500	894
4	116		SON		23.05		GRATON/FREI RDS	16,400	895
4	13		ALA		13.738	R	BEG INDEP ALIGN RT	16,300	896
4	185		ALA		0		HAYWARD, JCT. RTE. 92 /238	16,300	897
4	1		SM		33.361		CAPISTRANO/OBISPO RD	16,300	898
4	116		SON	R	24.054		OCCIDENTAL/MOLINO RDS	16,000	899
4	77		ALA		0.365		OAKLAND, EAST 12TH ST	15,900	900
4	84		SM		20.92		WOODSIDE, WHISKEY HILL RD	15,800	901

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	12		SON		37.505		SONOMA, FIRST ST WEST	15,800	902
4	82		SCL		8.43		SAN JOSE, STOCKTON ST	15,700	903
4	1		SM		27.75		HALF MOON BAY, MAIN	15,500	904
4	12		SON		27.03		KENWOOD, WARM SPRINGS	15,500	905
4	12		SON		34.25		AGUA CALIENTE RD	15,500	906
4	121		NAP		8.25		NAPA, LINCOLN AVE	15,400	907
4	84		ALA		10.82		FREMONT, JCT. RTE. 238	15,200	908
4	12		SON		30.07		TRINITY RD	15,100	909
4	1		SM		35.334		VALLEMAR/ETHELDORE ST	15,000	910
4	121		SON		0		JCT. RTE. 37	14,900	911
4	185		ALA		5.18		SAN LEANDRO, SYBIL AVE	14,800	912
4	82		SCL	R	7.31		SAN JOSE, SAN CARLOS ST	14,800	913
4	82		SM		24.929		DALY CITY, MISSION ST	14,800	914
4	116		SON		33.61		STONY POINT RD EAST	14,800	915
4	4		CC	R	34.915		CYPRESS RD	14,700	916
4	1		MRN		1.31		PINE ST	14,500	917
4	82		SCL		8.23		SAN JOSE, AUTUMN /ALAMEDA	14,500	918
4	82		SCL		8.31		SAN JOSE, MONTGOMERY ST	14,500	919
4	116		SON		44.2		WATMAUGH RD	14,500	920
4	82		SCL	R	7.717		SAN JOSE, JCT. RTE. 87	14,300	921
4	35		SM	L	22.76		RTE BRK 280	14,300	922
4	35		SM	R	23.037		JCT. RTE. 280	14,300	923
4	121		SON		7.442		JCT. RTE. 12 NORTH	14,200	924
4	12		SOL		19.169		JCT. RTE. 113 NORTH	14,100	925
4	12		SON		30.65		ARNOLD DRIVE	14,100	926
4	29		NAP		30.66		LODI LANE	14,000	927
4	82		SCL	R	8.084		SAN JOSE, MONTGOMERY ST	14,000	928
4	29		SOL		2.82		VALLEJO, TENNESSEE ST	14,000	929
4	101		SON	R	51.616		CITRUS FAIR DRIVE	14,000	930
4	4		CC		36.58		DELTA RD	13,900	931
4	1		SM		40.752		PACIFICA, SAN PEDRO AVE	13,900	932
4	12		SOL		7.16		SCANDIA RD/LAWLER RANCH	13,800	933
4	121		NAP		6.554		NAPA, SOSCOL AVE	13,700	934
4	4		CC		39.742		BRENTWOOD, SOUTH CITY	13,600	935
4	84		ALA		13		PALOMARES RD	13,500	936
4	84		SM		20.66		WOODSIDE, CANADA RD	13,500	937
4	29		NAP		33.47		LARKMEAD LANE	13,300	938
4	9		SCL		8.84		SARATOGA, FRUITVALE AVE	13,300	939
4	12		SON		33.4		CAVEDALE RD	13,300	940
4	121		SON		8.12		SCHELLVILLE, EIGHTH ST	13,300	941
4	84		ALA		23.559		OLD RTE 84 /ISABEL AVE	13,000	942
4	101		SON	R	53.545		JCT. RTE. 128 WEST	13,000	943
4	116		SON	R	26.65	R	BEGIN RIGHT ALIGN	12,900	944
4	121		SON		9.54		RAMAL RD	12,900	945

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	116		SON	R	26.82	L	SEBASTOPOL, JCT RTE 12	12,800	946
4	131		MRN		3.22		TIBURON, SAN RAFAEL AVE	12,700	947
4	116		SON	R	27.32	L	SEBASTOPOL, PALM AVE	12,500	948
4	4		CC	R	38.81		BRENTWOOD, SECOND ST	12,400	949
4	9		SCL	R	7.4		SARATOGA, JCT. RTE. 85 N.	12,400	950
4	1		SM		26.432		MIRAMONTES POINT RD	12,400	951
4	29		SOL		2.066		VALLEJO, MAINE ST	12,400	952
4	12		SON		38.06		SONOMA, MAC ARTHUR ST	12,400	953
4	160		CC		0.486		WILBUR AVE	12,300	954
4	113		SOL		19.96		DIXON, NORTH ADAMS ST	12,300	955
4	128		NAP		3.62		CALISTOGA, PETRIFIED FOREST	12,200	956
4	12		SON		32.86		MADRONE RD	12,000	957
4	121		NAP		7.37		NAPA, THIRD ST	11,900	958
4	116		SON	R	26.733	R	SEBASTOPOL, JCT RTE 12 E	11,800	959
4	116		SON	R	27.2	R	SEBASTOPOL, PALM AVE	11,800	960
4	116		SON	R	26.65	L	BEGIN LEFT ALIGN	11,800	961
4	29		SOL		1.01		VALLEJO, LEMON ST	11,700	962
4	121		NAP		9.403		NAPA, TRANCAS ST	11,600	963
4	12		SOL		8.89		SCALLY RD	11,500	964
4	156		SCL		0		S BENITO/S CLARA CO LINE	11,300	965
4	116		SON		19.39		FORESTVILLE, MIRABEL RD	10,800	966
4	12		SON		37.69		SONOMA, PATTEN ST	10,400	967
4	160		CC		0		ANTIOCH, JCT. RTE. 4 EAST	10,100	968
4	61		ALA		19.44		ALAMEDA, BRDWAY	10,000	969
4	113		SOL		19.29		DIXON, A ST	9,900	970
4	116		SON		21.8		GUERNEVILLE RD	9,800	971
4	61		ALA		21.27		ALAMEDA, CENTRAL / SHERMAN	9,600	972
4	84		ALA		8.333		FREMONT, PERALTA	9,600	973
4	29		NAP		36.893		CALISTOGA, JCT. RTE. 128 NW	9,100	974
4	113		SOL		18.95		DIXON, CHERRY ST	9,000	975
4	128		NAP		2.66		TUBBS LANE	8,900	976
4	12		SON		38.69		NAPA RD	8,800	977
4	1		MRN		1.91		LORING AVE	8,500	978
4	29		SOL		0		VALLEJO, JCT. RTE. 80	8,500	979
4	116		SON		11.164		GUERNEWOOD PARK	8,350	980
4	29		NAP		39.5		TUBBS LANE	8,300	981
4	61		ALA		19.84		ALAMEDA, BRDWAY/ ENCINAL	8,200	982
4	4		CC		46.46		DISCOVERY BAY	8,100	983
4	116		SON		7.78		MONTE RIO /BOHEMIAN HWY	8,100	984
4	116		SON	R	12.067		GUERNEVILLE, ARMSTRONG	7,900	985
4	84		SM		20		WOODSIDE, KINGS MOUNTAIN	7,800	986
4	82		SCL	R	8.606	R	SAN JOSE, AUTUMN /ALAMEDA	7,200	987
4	1		SM		23.06		MEYN/VERDE RDS	7,200	988
4	84		ALA		17.287		SUNOL, PLEASANTON	7,100	989

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	1		SM		20.98		TUNITAS CREEK RD	7,000	990
4	82		SCL	R	8.216	L	SAN JOSE, LEFT ALIGN	6,900	991
4	9		SCL		7.09		SARATOGA, SIXTH ST	6,600	992
4	1		SON		5.38		BODEGA HIGHWAY	6,400	993
4	12		SON		39.41		WATMAUGH RD	6,400	994
4	9		SCL		5.71		SARATOGA, PIERCE RD	6,200	995
4	152		SCL		0		S CRUZ/S CLARA CO LINE	6,100	996
4	152		SCL		5.03		WATSONVILLE RD	5,800	997
4	1		SM		13.579		PEBBLE BEACH	5,700	998
4	1		SM		18.189		JCT. RTE. 84 EAST	5,700	999
4	185		ALA		10.375		OAKLAND, 44TH AVE	5,000	1000
4	84		SM		18.34		WOODSIDE, PORTOLA RD	4,950	1001
4	82		SCL	R	8.216	R	SAN JOSE, RIGHT ALIGN	4,900	1002
4	82		SCL	R	8.594	L	SAN JOSE, MONTGOMERY	4,900	1003
4	121		NAP		10.55		ATLAS PEAK RD	4,750	1004
4	29		NAP		37.902		CALISTOGA, SILVERADO TRAIL	4,600	1005
4	1		SON		0.19		VALLEY FORD RD	4,500	1006
4	1		MRN		28.6		SIR FRANCIS DRAKE NORTH	4,400	1007
4	128		SON	L	5.883		GEYSERVILLE, S JCT OLD 101	4,300	1008
4	84		SM		14.95		WOODSIDE, JCT. RTE. 35	4,250	1009
4	128		SON		11.49		ALEXANDER VALLEY RD	4,250	1010
4	1		SM		0		S CRUZ/S MATEO CO LINE	4,100	1011
4	1		SON		11.07		BODEGA EASTSIDE RAD	4,000	1012
4	116		SON		4.927		AUSTIN CREEK	3,950	1013
4	1		MRN		5.92		MUIR WOODS RD	3,900	1014
4	113		SOL		0		JCT. RTE. 12	3,900	1015
4	1		MRN		12.21		PANORAMIC HIGHWAY, NORTH	3,850	1016
4	128		SON		11.96		PINE FLAT RD	3,850	1017
4	9		SCL		4.89		SANBORN RD	3,800	1018
4	1		MRN		3.35		SOUTH JCT. PANORAMIC HWY	3,700	1019
4	1		SON		2.42		VALLEY FORD/FREESTONE	3,600	1020
4	128		NAP		19.09		KNOXVILLE /BERRYESSA	3,500	1021
4	121		NAP		10.68		VICHY AVE	3,400	1022
4	84		SOL		0.134		WEST JCT. RTE. 12	3,200	1023
4	113		SOL		11.61		ELMIRA/FRY RDS	3,200	1024
4	116		SON		39.27		LAKEVILLE RD	3,200	1025
4	128		NAP		7.37		SILVERADO TRAIL	3,100	1026
4	35		SM		23.037		JCT. RTE. 92	3,050	1027
4	1		MRN		26.509		SIR FRANCIS DRAKE SOUTH	3,000	1028
4	128		NAP		4.55		CALISTOGA RTE. 29	2,950	1029
4	128		SON	L	5.74		RIVER RD	2,800	1030
4	1		SON		21.3		JENNER	2,750	1031
4	9		SCL		0		JCT. RTE. 35	2,700	1032
4	1		SON		20.1		JCT. RTE. 116 EAST	2,700	1033

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	116		SON		14.05		SANTA NELLA WINERY	2,700	1034
4	128		SON		9.47		GEYSERS RD	2,700	1035
4	128		NAP		0		SONOMA/NAPA CO LINE	2,650	1036
4	128		SOL		0		NAPA/SOLANO CO LINE	2,600	1037
4	84		SM		8.849		LA HONDA	2,550	1038
4	1		MRN		17.2		BOLINAS RD	2,500	1039
4	84		SM		8.328		PESCADERO RD	2,500	1040
4	121		NAP		16.075		WOODEN VALLEY RD	2,400	1041
4	128		SON		4.859		JCT RTE 101U/N CLOVERDALE	2,400	1042
4	1		MRN		17.066		FAIRFAX/BOLINAS RDS	2,300	1043
4	116		SON		0		JCT. RTE. 1, JENNER, S	2,300	1044
4	128		SON		15.42		CHALK HILL RD	2,200	1045
4	1		MRN		29.33		PETALUMA, POINT REYES	2,150	1046
4	130		SCL		3.66		MOUNT HAMILTON RD	2,150	1047
4	128		SON	L	4.97		CANYON RD/OLD REDWOOD	2,100	1048
4	128		SON		21.9		KELLOGG, FRANZ VALLEY RD	1,950	1049
4	84		SM		0.788		SAN GREGORIO /STAGE RD	1,900	1050
4	128		SON		0		MENDOCINO SONOMA CO LINE	1,800	1051
4	128		NAP		11.28		CHILES/POPE VALLEY RDS	1,700	1052
4	1		SON	R	33.038		FORT ROSS RD	1,700	1053
4	1		SON		48.112		STEWARTS POINT/SKAGGS	1,650	1054
4	35		SM		10.518		WOODSIDE, JCT. RTE. 84	1,400	1055
4	1		MRN		38.409		PETALUMA, MARSHALL	1,350	1056
4	84		SM		0		SAN GREGORIO, JCT. RTE. 1	1,350	1057
4	35		SM		16.22		KINGS MOUNTAIN RD	1,300	1058
4	84		SOL		0.91		AIRPORT RD	1,300	1059
4	1		MRN		45.36		PETALUMA, TOMALES	1,250	1060
4	1		MRN		45.66		DILLON BEACH RD	1,250	1061
4	35		SM		2.121		SM/SCL CO LINE	1,200	1062
4	1		MRN		47.86		TWO ROCK RD	1,050	1063
4	1		SON		0		SONOMA/MARIN CO LINE	1,050	1064
4	128		NAP		15.79		LOWER CHILES VALLEY RD	1,000	1065
4	128		NAP		23.896		JCT. RTE. 121 SOUTH	1,000	1066
4	35		SCL		14.1		JCT. RTE. 9	920	1067
4	35		SM		3.213		ALPINE RD	800	1068
4	35		SCL	R	0		NB RT 17 RMP & SUMMIT R	720	1069
4	35		SCL	R	0.053		JCT. RTE. 17	720	1070
4	35		SCL		7.7		BLACK RD	710	1071
4	130		SCL		6.06		CLAYTON RD	630	1072
4	84		SOL		7.246		JCT. RTE. 220 EAST	290	1073
4	130		SCL		11.23		QUIMBY RD	260	1074
4	220		SOL		3.05		RYER RD	260	1075
4	84		SOL		2.485		CACHE SLOUGH FERRY	240	1076
4	84		SOL		12.08		MINER SLOUGH BRIDGE/ RYER	225	1077

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	130		SCL		17.24		KINCAID RD	200	1078
4	35		SCL		7.68		SANTA CRUZ SANTA CLARA CO LINE	170	1079
4	220		SOL		0		JCT. RTE. 84	150	1080
4	1		SF		7.077		MANZANITA, JCT. RTE. 101		
4	1		SM	R	48.558		S MATEO/SN FRANCISCO CO LN		
4	1		MRN		50.509		SONOMA/MARIN CO LINE		
4	1		SON		58.583		SONOMA/MENDOCINO CO LINE		
4	4		CC		48.392		C COSTA/S JOAQUIN CO LINE		
4	9		SCL		11.448		LOS GATOS, JCT. RTE. 17		
4	12		NAP		3.314		SOLANO/NAPA CO LINE		
4	12		SOL		26.41		SOLANO/SACRAMENTO CO LN		
4	12		SON		41.36		JCT. RTE. 121		
4	13		ALA		13.931	L	BERKELEY, JCT. RTE. 80		
4	17		SCL		13.949		SAN JOSE, JCT RTE 280		
4	24		ALA	R	6.241		ALAMAEDA/CONTRA COSTA CO LINE		
4	24		CC		9.684		END OF WB LANES RTE 24		
4	25		SCL		2.56		JCT. RTE. 101, GILROY, SOUTH		
4	29		SOL		5.955		SOLANO/NAPA CO LINE		
4	29		NAP		48.582		NAPA LAKE CO LINE		
4	35		SCL		0.23		SANTA CLARA/ SANTA CRUZ CO LINE		
4	35		SF		3.164		SAN FRANCISCO, JCT. RTE. 1		
4	35		SCL		17.121		SM/SCL CO LINE		
4	35		SM		31.537		SAN MATEO/SAN FRAN CO LINE		
4	37		SON	R	6.245		SONOMA/SOLANO CO LINE		
4	37		SOL	R	12.097	R	END INDEP ALIGN		
4	37		MRN		14.617		MARIN/SONOMA CO LINE		
4	61		ALA		21.967		JCT. RTE. 260 NORTH		
4	77		ALA		0.452		OAKLAND, EAST 14TH ST		
4	80		SOL		6.814		SOLANO/NAPA CO LINE		
4	80		NAP		8.004		NAPA/SOLANO CO LINE		
4	80		ALA		8.036		ALAMEDA/C. COSTA CO LINE		
4	80		SF		8.85	L	S FRANCISCO/ALAMEDA CO LINE		
4	80		CC		14.139		CARQUINEZ BRIDGE		
4	80		SOL	R	44.72		SOLANO/YOLO CO LINE		
4	82		SF	R	0.208		SAN FRANCISCO, JCT. RTE. 280		
4	82		SM		25.15		SAN MATEO/S FRANCISCO CO LN		
4	82		SCL		26.37		SANTA CLARA/SAN MATEO CO LN		
4	84		SOL		13.672		SOLANO/YOLO CO LINE		
4	84		ALA	R	28.714		LIVERMORE, W JCT RTE 580		
4	85		SCL	R	23.867		MOUNTAIN VIEW, JCT. RTE. 101		
4	85		SCL	R	24.059		END ROUTE 85		
4	87		SCL		9.22		JCT. RTE. 101		
4	92		ALA		8.219		HAYWARD, JCT RTES 185/238		
4	92		SM	R	18.801		SAN MATEO/ALAMEDA CO LINE		

These road segments have no AADT in Caltrans Documents. There is no AADT listed because one of the following applies:

a. The freeway ends or joins (a junction) with another freeway. Thus, the Ahead segment does not exist along the listed route.

b. The freeway crosses a county line and the AADT is listed elsewhere in the table under a different county.

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	101		SF		11.182		MARIN/S FRANCISCO CO LINE, GG BR		
4	101		SM		26.107		SAN FRANCISCO/S MATEO CO LINE		
4	101		MRN		27.627		MARIN/SONOMA CO LINE		
4	101		SCL		52.55		SANTA CLARA/S MATEO CO LINE		
4	101		SON	R	56.219		SONOMA/MENDOCINO CO LINE		
4	109		SM		1.87		MENLO PARK, JCT. RTE. 84		
4	112		ALA		1.782		SAN LEANDRO, JCT. RTE. 185		
4	113		SOL	R	22.45		SOLANO/YOLO CO LINE		
4	114		SM		5.926		JCT. RTE. 84		
4	116		SON		46.755		JCT. RTE. 121		
4	121		SON		11.618		SONOMA/NAPA CO LINE		
4	121		NAP		22.083		JCT. RTE. 128		
4	123		CC		2.198		RICHMOND, JCT. RTE. 80		
4	123		ALA		5.177		ALAMEDA/CNTRA COSTA CO LINE		
4	128		SOL		0.754		SOLANO/YOLO CO LINE		
4	128		SON		24.761		SONOMA/NAPA CO LINE	These road segments have no AADT in Caltrans Documents. There is no AADT listed because one of the following applies: a. The freeway ends or joins (a junction) with another freeway. Thus, the Ahead segment does not exist along the listed route. b. The freeway crosses a county line and the AADT is listed elsewhere in the table under a different county.	
4	128		NAP		34.266		NAPA/SOLANO CO LINE		
4	130		SCL		22.503		MOUNT HAMILTON		
4	131		MRN		4.392		MAIN ST		
4	152		SCL	R	35.161		S CLARA/MERCED CO LINE		
4	156		SCL	R	0.602		JCT. RTE. 152		
4	160		CC		1.327		C COSTA/SACRAMENTO CO LN		
4	185		ALA		10.519		OAKLAND, HIGH/ 12TH ST		
4	205		ALA		0.447		ALAMEDA/S JOAQUIN CO LINE		
4	220		SOL		3.2		SOLANO/SACRAMENTO CO LINE		
4	221		NAP		2.682		JCT. RTE. 121		
4	237		SCL		11.08		MILPITAS, JCT. RTE 680		
4	238		ALA		16.696		JCT. RTE. 880		
4	242		CC	R	3.398		CONCORD, JCT. RTE. 4		
4	260		ALA	R	1.924	L	END INDEP ALIGN		
4	262		ALA	R	1.07		FREMONT, JCT. RTE. 680		
4	280		SF	T	7.543		SAN FRANCISCO, BRANNAN		
4	280		SCL		20.625		SANTA CLARA/S MATEO CO LN		
4	280		SM	M	27.433	L	END INDEP ALIGN		
4	380		SM		6.76		SOUTH AIRPORT RD		
4	505		SOL	R	10.626		SOLANO/YOLO CO LINE		
4	580		MRN		4.782		JCT. RTE. 101		
4	580		CC		7.786		C COSTA/MARIN CO LINE		
4	580		ALA		48.044		ALAMEDA/C COSTA CO LINE		
4	680		SCL	M	9.935		SA CLARA/ALAMEDA CO LINE		
4	680		SOL		13.126		CORDELIA, JCT. RTE. 80		
4	680		ALA	R	21.879		ALAMEDA/C COSTA CO LINE		
4	680		CC		25.461		C COSTA/SOLANO CO LN		
4	780		SOL		7.441		LEMON ST		

Dist	Route		County		Postmile		Description	Ahead AADT	AADT Rank
4	880	S	ALA		1.463	L	END OF SPUR	These road segments have no AADT in Caltrans Documents. There is no AADT listed because one of the following applies: a. The freeway ends or joins (a junction) with another freeway. Thus, the Ahead segment does not exist along the listed route. b. The freeway crosses a county line and the AADT is listed elsewhere in the table under a different county.	
4	880		SCL		10.502		S. CLARA/ALAMEDA CO LINE		
4	880		ALA	R	35.4	L	WEST JCT RTE 80		
4	980		ALA		2.036		OAKLAND, JCT. RTE. 580		

Table 28. Rank of Fleet Equivalent AADT road segments in the Bay Area.

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
880	27.709	ALA	OAKLAND, JCT. RTE. 77	210,000	**31**	21,630	10.3	**2**	404,670	**3**	*211,000*	*405,670*	***1***	*SE of Fruitvale*
880	31.091	ALA	OAK/MADISON STREETS	216,000	**26**	23,112	10.7	**1**	424,008	**2**	*194,000*	*402,008*	***2***	*just NW of Laney College*
880	27.709	ALA	OAKLAND, JCT. RTE. 77	211,000	**30**	20,256	9.6	**3**	393,304	**4**	*211,000*	*393,304*	***3***	*SE of Fruitvale*
880	16.696	ALA	HAYWARD, JCT. RTE. 92	235,000	**13**	16,450	7.0	**10**	383,050	**5**	*235,000*	*383,050*	***4***	*Hayward*
80	3.786	ALA	EMERYVILLE, POWELL STREET	265,000	**3**	12,694	4.8	**20**	379,246	**8**	*265,000*	*379,246*	***5***	*between MacArthur and Ashby*
880	20.678	ALA	JCT. RTE. 238 EAST	217,000	**25**	18,445	8.5	**6**	383,005	**6**	*212,000*	*378,005*	***6***	*San Leandro/Hayward*
80	4.582	ALA	BERKELEY, JCT. RTE. 13 EAST	265,000	**2**	12,747	4.8	**19**	379,723	**7**	*262,000*	*376,723*	***7***	*Ashby Ave.*
80	4.582	ALA	BERKELEY, JCT. RTE. 13 EAST	262,000	**4**	12,497	4.8	**21**	374,473	**9**	*262,000*	*374,473*	***8***	*Ashby Ave.*
880	20.678	ALA	JCT. RTE. 238 EAST	212,000	**29**	17,808	8.4	**8**	372,272	**10**	*212,000*	*372,272*	***9***	*San Leandro/Hayward*
880	23.644	ALA	RTE 112, DAVIS STREET	209,000	**32**	18,141	8.7	**7**	372,269	**11**	*205,000*	*368,269*	***10***	*San Leandro*
880	23.644	ALA	RTE 112, DAVIS STREET	205,000	**36**	17,630	8.6	**9**	363,670	**12**	*205,000*	*363,670*	***11***	
880	16.696	ALA	HAYWARD, JCT. RTE. 92	208,000	**34**	13,728	6.6	**17**	331,552	**18**	*235,000*	*358,552*	***12***	
101	13.461	SM	SAN MATEO, THIRD AVENUE	247,000	**8**	10,917	4.4	**33**	345,253	**13**	*247,000*	*345,253*	***13***	
880	25.497	ALA	OAKLAND, HEGENBERGER ROAD	202,000	**37**	15,433	7.6	**13**	340,897	**14**	*202,000*	*340,897*	***14***	
580	10.689	ALA	FIRST STREET	160,000	**77**	19,520	12.2	**4**	335,680	**15**	*160,000*	*335,680*	***15***	
680	15.606	CC	WALNUT CREEK, NORTH MAIN STREET	233,000	**15**	8,877	3.8	**54**	312,893	**26**	*255,000*	*334,893*	***16***	
101	13.461	SM	SAN MATEO, THIRD AVENUE	248,000	**7**	9,449	3.8	**49**	333,041	**16**	*247,000*	*332,041*	***17***	
101	11.895	SM	SAN MATEO, JCT. RTE. 92	250,000	**6**	8,725	3.5	**56**	328,525	**19**	*250,000*	*328,525*	***18***	

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
680	14.383	CC	WALNUT CREEK, JCT. RTE. 24 WEST	233,000	**14**	9,600	4.1	**43**	319,400	**21**	*233,000*	*319,400*	***19***	
880	8.842	ALA	FREMONT, SOUTH JCT. RTE. 84	200,000	**40**	13,200	6.6	**18**	318,800	**22**	*200,000*	*318,800*	***20***	
880	14.537	ALA	HAYWARD, INDUSTRIAL PARKWAY	208,000	**35**	12,272	5.9	**25**	318,448	**23**	*208,000*	*318,448*	***21***	
580	20.726	ALA	PLEASANTON, JCT. RTE. 680	174,000	**67**	15,991	9.2	**12**	317,919	**24**	*174,000*	*317,919*	***22***	
680	15.606	CC	WALNUT CREEK, NORTH MAIN STREET	255,000	**5**	6,758	2.7	**86**	315,822	**25**	*255,000*	*315,822*	***23***	
101	11.895	SM	SAN MATEO, JCT. RTE. 92	225,000	**20**	7,268	3.2	**79**	290,412	**37**	*250,000*	*315,412*	***24***	
101	17.947	SM	MILLBRAE, MILLBRAE AVENUE	238,000	**11**	10,472	4.4	**38**	332,248	**17**	*221,000*	*315,248*	***25***	
280	0.366	SCL	MCLAUGHLIN AVENUE	238,000	**12**	7,973	3.4	**68**	309,757	**27**	*238,000*	*309,757*	***26***	
101	6.623	SM	REDWOOD CITY, WHIPPLE AVENUE	214,000	**28**	10,465	4.9	**39**	308,185	**28**	*214,000*	*308,185*	***27***	
880	8.842	ALA	FREMONT, SOUTH JCT. RTE. 84	200,000	**41**	11,800	5.9	**27**	306,200	**29**	*200,000*	*306,200*	***28***	
680	0.385	SCL	SAN JOSE, KING ROAD	218,000	**24**	9,592	4.4	**44**	304,328	**31**	*218,000*	*304,328*	***29***	
880	8.422	SCL	JCT. RTE. 237	200,000	**43**	11,400	5.7	**31**	302,600	**32**	*200,000*	*302,600*	***30***	
80	1.989	ALA	SAN FRANCISCO-OAKLAND BAY BRIDGE TOLL PL	245,000	**9**	6,321	2.6	**92**	301,889	**33**	*245,000*	*301,889*	***31***	
80	1.989	ALA	SAN FRANCISCO-OAKLAND BAY BRIDGE TOLL PL	245,000	**10**	6,150	2.5	**97**	300,350	**34**	*245,000*	*300,350*	***32***	
101	34.87	SCL	SAN JOSE, JCT. RTE. 280 WEST, JCT. RTE.	191,000	**48**	11,460	6.0	**29**	294,140	**36**	*191,000*	*294,140*	***33***	
880	13.669	ALA	HAYWARD, WHIPPLE ROAD	197,000	**44**	10,835	5.5	**35**	294,515	**35**	*195,000*	*292,515*	***34***	
280	1.992	SCL	SAN JOSE, JCT. RTE. 82	232,000	**16**	6,032	2.6	**100**	286,288	**38**	*232,000*	*286,288*	***35***	
101	5.385	SM	REDWOOD CITY, JCT. RTE. 84	202,000	**38**	9,090	4.5	**51**	283,810	**41**	*202,000*	*283,810*	***36***	
101	5.385	SM	REDWOOD CITY, JCT. RTE. 84	201,000	**39**	9,045	4.5	**52**	282,405	**42**	*202,000*	*283,405*	***37***	

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
580	20.726	ALA	PLEASANTON, JCT. RTE. 680	177,000	**62**	11,983	6.8	**26**	284,847	**39**	*174,000*	*281,847*	***38***	
680	20.057	ALA	PLEASANTON, JCT. RTE. 580	163,000	**74**	12,388	7.6	**23**	274,492	**45**	*163,000*	*274,492*	***39***	
238	14.469	ALA	JCT. RTE. 580	123,000	**132**	16,359	13.3	**11**	270,231	**46**	*123,000*	*270,231*	***40***	
580	8.265	ALA	LIVERMORE, GREENVILLE ROAD	138,000	**114**	14,352	10.4	**14**	267,168	**47**	*137,000*	*266,168*	***41***	
101	28.609	SCL	SAN JOSE, JCT. RTE. 82 NORTH	120,000	**137**	12,348	10.3	**24**	231,132	**81**	*149,000*	*260,132*	***42***	
101	28.609	SCL	SAN JOSE, JCT. RTE. 82 NORTH	149,000	**97**	11,786	7.9	**28**	255,074	**54**	*149,000*	*255,074*	***43***	
580	46.01	ALA	OAKLAND, JCT. RTE. 123	222,000	**21**	3,330	1.5	**144**	251,970	**55**	*222,000*	*251,970*	***44***	
280	26.042	SM	JUNIPERO SIERRA	226,000	**19**	2,757	1.2	**160**	250,813	**57**	*226,000*	*250,813*	***45***	
680	2.382	ALA	FREMONT, JCT. RTE. 262 WEST	138,000	**115**	12,420	9.0	**22**	249,780	**58**	*138,000*	*249,780*	***46***	
238	14.951	ALA	JCT. RTE. 185, MISSION BOULEVARD	121,000	**134**	14,278	11.8	**15**	249,502	**59**	*121,000*	*249,502*	***47***	
580	0.39	ALA	JCT. RTE. 205 EAST	153,000	**92**	19,126	12.5	**5**	325,134	**20**	*76,500*	*248,634*	***48***	
280	2.522	SCL	SAN JOSE, JCT. RTE. 87	232,000	**17**	5,800	2.5	**103**	284,200	**40**	*196,000*	*248,200*	***49***	
580	45.151	ALA	OAKLAND, JCT. RTES. 24/980	222,000	**23**	2,464	1.1	**174**	244,176	**65**	*222,000*	*244,176*	***50***	
205	0.213	ALA	JCT. RTE. 580	116,000	**140**	13,920	12.0	**16**	241,280	**70**	*116,000*	*241,280*	***51***	
680	11.042	ALA	JCT. RTE. 84 WEST	140,000	**106**	11,200	8.0	**32**	240,800	**71**	*140,000*	*240,800*	***52***	
580	8.265	ALA	LIVERMORE, GREENVILLE ROAD	137,000	**117**	11,412	8.3	**30**	239,708	**72**	*137,000*	*239,708*	***53***	
680	11.042	ALA	JCT. RTE. 84 WEST	139,000	**110**	10,564	7.6	**37**	234,076	**77**	*140,000*	*235,076*	***54***	
680	6.396	ALA	FREMONT, JCT. RTE. 238 NORTH	140,000	**107**	10,360	7.4	**40**	233,240	**78**	*140,000*	*233,240*	***55***	
280	25.28	SM	DALY CITY, JCT. RTE. 1 SOUTH	209,000	**33**	2,654	1.3	**163**	232,886	**79**	*209,000*	*232,886*	***56***	
280	25.28	SM	DALY CITY, JCT. RTE. 1 SOUTH	216,000	**27**	2,549	1.2	**169**	238,941	**73**	*209,000*	*231,941*	***57***	

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
101	26.78	SCL	SAN JOSE, JCT. RTE. 85, BERNAL ROAD INTERCHANGE	128,000	**129**	10,906	8.5	**34**	226,154	**85**	*120,000*	*218,154*	***58***	
680	18.707	CC	CONCORD, JCT. RTE. 242 NORTH	227,000	**18**	8,785	3.9	**55**	306,065	**30**	*135,000*	*214,065*	***59***	
680	11.845	ALA	JCT. RTE. 84 EAST	116,000	**141**	10,672	9.2	**36**	212,048	**98**	*116,000*	*212,048*	***60***	
280	27.165	SM	DALY CITY, JCT. RTE. 1 NORTH	452,000	**1**	4,972	1.1	**119**	496,748	**1**	*123,000*	*167,748*	***61***	
580	46.46	ALA	OAKLAND, JCT. RTES. 80/880	222,000	**22**	2,664	1.2	**162**	245,976	**63**	*111,000*	*134,976*	***62***	
980	0.009	ALA	OAKLAND, JCT. RTE. 880	76,000	**179**	5,343	7.0	**112**	124,087	**163**				
980	0.702	ALA	OAKLAND, FOURTEENTH STREET	62,000	**191**	4,030	6.5	**136**	98,270	**183**				
980	2.036	ALA	OAKLAND, JCT. RTE. 580	115,000	**144**	3,324	2.9	**145**	144,916	**141**				
880	0	SCL	JCT. RTE. 280	157,000	**83**	4,443	2.8	**127**	196,987	**106**				
880	2.075	SCL	SAN JOSE, JCT. RTE. 82	156,000	**84**	4,961	3.2	**120**	200,649	**101**				
880	2.075	SCL	SAN JOSE, JCT. RTE. 82	155,000	**89**	4,588	3.0	**123**	196,292	**108**				
880	2.283	ALA	FREMONT, JCT. RTE. 262 EAST	189,000	**51**	8,316	4.4	**61**	263,844	**49**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
880	2.283	ALA	FREMONT, JCT. RTE. 262 EAST	174,000	**68**	8,352	4.8	**59**	249,168	**60**				
880	4.078	SCL	SAN JOSE, JCT. RTE. 101	176,000	**65**	7,568	4.3	**74**	244,112	**66**				
880	4.078	SCL	SAN JOSE, JCT. RTE. 101	160,000	**78**	6,704	4.2	**88**	220,336	**87**				
680	0	SCL	SAN JOSE, JCT. RTES. 101/280	158,000	**81**	3,002	1.9	**152**	185,018	**122**				
680	0.01	CC	SAN RAMON, ALCOSTA BOULEVARD	155,000	**85**	8,215	5.3	**65**	228,935	**83**				
680	0.385	SCL	SAN JOSE, KING ROAD	158,000	**82**	4,424	2.8	**128**	197,816	**104**				
680	1.74	SCL	SAN JOSE, JCT. RTE. 130	183,000	**57**	8,235	4.5	**63**	257,115	**52**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
680	1.74	SCL	SAN JOSE, JCT. RTE. 130	166,000	**73**	7,304	4.4	**78**	231,736	**80**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
680	2.382	ALA	FREMONT, JCT. RTE. 262 WEST	120,000	**135**	8,520	7.1	**57**	196,680	**107**				
680	5.068	SCL	SAN JOSE, CAPITOL AVENUE	147,000	**101**	7,938	5.4	**70**	218,442	**90**				
680	5.068	SCL	SAN JOSE, CAPITOL AVENUE	145,000	**103**	7,830	5.4	**72**	215,470	**94**				
680	6.396	ALA	FREMONT, JCT. RTE. 238 NORTH	140,000	**108**	8,218	5.9	**64**	213,962	**96**				
680	7.647	SCL	MILPITAS, JCT. RTE. 237 WEST	137,000	**119**	6,302	4.6	**93**	193,718	**112**				
680	7.647	SCL	MILPITAS, JCT. RTE. 237 WEST	128,000	**130**	5,248	4.1	**116**	175,232	**127**				
680	14.383	CC	WALNUT CREEK, JCT. RTE. 24 WEST	150,000	**95**	9,570	6.4	**45**	236,130	**74**				
680	18.707	CC	CONCORD, JCT. RTE. 242 NORTH	135,000	**121**	6,669	4.9	**89**	195,021	**110**				
680	20.057	ALA	PLEASANTON, JCT. RTE. 580	144,000	**104**	9,360	6.5	**50**	228,240	**84**				
680	21.191	CC	JCT. RTE. 4	118,000	**138**	8,036	6.8	**67**	190,324	**116**				
680	21.191	CC	JCT. RTE. 4	127,000	**131**	3,429	2.7	**143**	157,861	**136**				
580	10.689	ALA	FIRST STREET	167,000	**70**	7,599	4.6	**73**	235,391	**75**				
580	30.807	ALA	JCT. RTE. 238	166,000	**72**	9,545	5.8	**46**	251,905	**56**				
580	30.807	ALA	JCT. RTE. 238	137,000	**118**	8,453	6.2	**58**	213,077	**97**				
580	39.24	ALA	OAKLAND, JCT. RTE. 13 NORTH	163,000	**76**	831	0.5	**241**	170,479	**131**				
580	39.24	ALA	OAKLAND, JCT. RTE. 13 NORTH	140,000	**109**	1,540	1.1	**198**	153,860	**138**				
580	40.078	ALA	OAKLAND, HIGH STREET	147,000	**100**	588	0.4	**264**	152,292	**139**				
580	40.078	ALA	OAKLAND, HIGH STREET	133,000	**123**	559	0.4	**269**	138,031	**148**				
580	44.279	ALA	OAKLAND, OAKLAND AVENUE	184,000	**55**	1,067	0.6	**224**	193,603	**114**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
580	44.279	ALA	OAKLAND, OAKLAND AVENUE	176,000	**64**	1,214	0.7	**210**	186,926	**119**				
580	47.35	ALA	ALBANY, NORTH JCT. RTE. 80	87,000	**168**	5,342	6.1	**113**	135,078	**151**				
380	4.703	SM	SAN BRUNO, JCT. RTE. 280	139,000	**112**	2,989	2.2	**154**	165,901	**134**				
380	6.373	SM	SOUTH SAN FRANCISCO, JCT. RTE. 101	159,000	**79**	4,277	2.7	**129**	197,493	**105**				
280	0	SCL	SAN JOSE, JCT. RTES. 101/680	152,000	**94**	7,144	4.7	**81**	216,296	**93**				
280	2.522	SCL	SAN JOSE, JCT. RTE. 87	196,000	**45**	2,999	1.5	**153**	222,991	**86**				
280	3.337	SM	WOODSIDE, JCT. RTE. 84	103,000	**154**	3,317	3.2	**146**	132,853	**152**				
280	3.337	SM	WOODSIDE, JCT. RTE. 84	102,000	**156**	2,948	2.9	**157**	128,532	**155**				
280	5.408	SCL	SAN JOSE, JCT. RTES. 17/880	179,000	**60**	5,549	3.1	**107**	228,941	**82**				
280	6.601	SM	CANADA ROAD	102,000	**157**	2,254	2.2	**176**	122,286	**167**				
280	9.433	SCL	SARATOGA, SUNNYVALE/DE ANZA BOULEVARD	150,000	**96**	4,740	3.2	**121**	192,660	**115**				
280	9.433	SCL	SARATOGA, SUNNYVALE/DE ANZA BOULEVARD	138,000	**116**	4,099	3.0	**133**	174,891	**128**				
280	10.741	SCL	SUNNYVALE, JCT. RTE. 85	139,000	**113**	4,587	3.3	**124**	180,283	**126**				
280	10.866	SM	JCT. RTE. 92	106,000	**150**	1,813	1.7	**188**	122,317	**166**				
280	10.866	SM	JCT. RTE. 92	105,000	**151**	1,764	1.7	**189**	120,876	**169**				
280	19.278	SM	SAN BRUNO, JCT. RTE. 35 NORTH	117,000	**139**	281	0.2	**304**	119,529	**171**				
280	19.278	SM	SAN BRUNO, JCT. RTE. 35 NORTH	102,000	**158**	449	0.4	**287**	106,041	**179**				
280	20.747	SM	SAN BRUNO, SAN BRUNO AVENUE	104,000	**153**	2,465	2.4	**173**	126,185	**158**				

Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
280	22.62	SM	SOUTH SAN FRANCISCO, WESTBOROUGH BOULEVARD	185,000	**54**	1,480	0.8	**201**	198,320	**103**				
280	24.197	SM	DALY CITY, HICKEY BOULEVARD	179,000	**59**	1,629	0.9	**193**	193,661	**113**				
262	0	ALA	FREMONT, JCT. RTE. 880	76,000	**178**	5,472	7.2	**109**	125,248	**161**				
262	1.07	ALA	FREMONT, JCT. RTE. 680	74,000	**181**	4,144	5.6	**130**	111,296	**173**				
260	1.924	ALA	OAKLAND, JCT. RTE. 880	44,600	**209**	1,070	2.4	**223**	54,230	**218**				
242	0	CC	CONCORD, JCT. RTE. 680	90,000	**164**	4,500	5.0	**125**	130,500	**153**				
242	3.398	CC	CONCORD, JCT. RTE. 4	98,000	**160**	5,027	5.1	**118**	143,243	**143**				
238	0	ALA	FREMONT, JCT. RTE. 680, MISSION ROAD	29,000	**243**	870	3.0	**236**	36,830	**245**				
238	3.314	ALA	FREMONT, SOUTH JCT. RTE. 84 WEST	33,000	**234**	1,947	5.9	**184**	50,523	**221**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
238	3.314	ALA	FREMONT, SOUTH JCT. RTE. 84 WEST	23,000	**265**	989	4.3	**229**	31,901	**265**				
238	6.78	ALA	UNION CITY, DECOTO ROAD	25,500	**258**	893	3.5	**234**	33,537	**258**				
238	16.696	ALA	JCT. RTE. 880	74,000	**180**	5,624	7.6	**105**	124,616	**162**				
237	0	SCL	MOUNTAIN VIEW, JCT. RTE. 82	33,500	**232**	345	1.0	**297**	36,605	**247**				
237	0.375	SCL	MOUNTAIN VIEW, JCT. RTE. 85	57,000	**196**	3,084	5.4	**148**	84,756	**191**				
237	0.375	SCL	MOUNTAIN VIEW, JCT. RTE. 85	33,500	**233**	1,005	3.0	**227**	42,545	**237**				
237	2.48	SCL	SUNNYVALE, JCT. RTE. 1010	87,000	**169**	2,567	3.0	**167**	110,103	**175**				
237	2.48	SCL	SUNNYVALE, JCT. RTE. 101	67,000	**186**	2,928	4.4	**158**	93,352	**185**				
237	9.335	SCL	JCT. RTE. 880, NIMITZ FREEWAY 9	33,000	**235**	8,326	6.3	**60**	107,934	**177**				
237	9.335	SCL	JCT. RTE. 880, NIMITZ	62,000	**192**	3,267	5.3	**147**	91,403	**187**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
			FREEWAY											
237	10	SCL	MAIN STREET	62,000	**193**	2,480	4.0	**172**	84,320	**192**				
237	11.08	SCL	MILPITAS, JCT. RTE 680	66,000	**189**	2,640	4.0	**164**	89,760	**188**				
185	1.992	ALA	JCT. RTE. 238	17,200	**292**	378	2.2	**294**	20,602	**297**				
185	5.728	ALA	JCT. RTE. 112 WEST	20,000	**285**	324	1.6	**300**	22,916	**292**				
185	5.728	ALA	JCT. RTE. 112 WEST	17,000	**293**	240	1.4	**311**	19,160	**301**				
185	10.37	ALA	OAKLAND, 44TH AVE/12TH STREET	24,400	**261**	595	2.4	**263**	29,755	**273**				
185	10.519	ALA	OAKLAND, HIGH/ 12TH STREETS	3,000	**320**	265	8.8	**309**	5,385	**317**				
160	0	CC	ANTIOCH, JCT. RTE. 4 EAST	10,100	**308**	1,324	13.1	**205**	22,016	**293**				
160	0.486	CC	WILBUR AVENUE	12,300	**307**	802	6.5	**245**	19,518	**299**				
160	1.327	CC	CONTRA COSTA/SACRAMENTO COUNTY LINE	12,300	**306**	1,353	11.0	**204**	24,477	**289**				
152	5.03	SCL	WATSONVILLE RD	6,100	**313**	262	4.3	**310**	8,458	**313**				
152	9.43	SCL	MONTEREY STREET	16,400	**295**	510	3.1	**279**	20,990	**295**				
152	9.914	SCL	GILROY, JCT. RTE. 101	23,200	**264**	2,160	9.3	**178**	42,640	**236**				
152	10.277	SCL	GILROY, JCT. RTE. 101	36,500	**225**	2,526	6.9	**170**	59,234	**209**				
152	12.81	SCL	FERGUSON ROAD	22,400	**271**	3,069	13.7	**149**	50,021	**223**				
152	12.81	SCL	FERGUSON ROAD	18,200	**290**	1,966	10.8	**183**	35,894	**250**				
152	21.977	SCL	JCT. RTE. 156 SOUTH	32,500	**236**	5,532	17.0	**108**	82,288	**194**				
152	21.977	SCL	JCT. RTE. 156 SOUTH	20,100	**284**	2,418	12.0	**175**	41,862	**240**				
152	26.77	SCL	PACHECO CREEK BRIDGE	33,500	**231**	5,327	15.9	**114**	81,443	**195**				

Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
130	0	SCL	SAN JOSE, JCT. RTE. 101	29,000	**245**	682	2.4	**255**	35,138	**254**				
130	3.66	SCL	MOUNT HAMILTON ROAD	6,400	**312**	118	1.9	**317**	7,462	**315**				
130	3.66	SCL	MOUNT HAMILTON ROAD	2,150	**322**	63	3.0	**321**	2,717	**322**				
130	6.06	SCL	CLAYTON ROAD	770	**328**	35	4.5	**325**	1,085	**327**				
130	22.503	SCL	MOUNT HAMILTON	200	**330**	30	15.0	**326**	470	**330**				
123	0	ALA	OAKLAND, JCT. RTE. 580	26,000	**254**	429	1.7	**291**	29,861	**272**				
123	1.906	ALA	BERKELEY, JCT. RTE. 13	21,100	**277**	616	2.9	**259**	26,644	**282**				
123	1.906	ALA	BERKELEY, JCT. RTE. 13	22,300	**272**	466	2.1	**283**	26,494	**285**				
123	2.1	CC	CUTTING BOULEVARD	30,000	**239**	453	1.5	**285**	34,077	**256**				
123	2.198	CC	RICHMOND, JCT. RTE. 80	20,600	**281**	496	2.4	**280**	25,064	**286**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
114	5	SM	MENLO PARK, JCT. RTE. 101	36,500	**223**	2,154	5.9	**179**	55,886	**212**				
114	5.926	SM	JCT. RTE. 84	36,500	**224**	1,511	4.1	**200**	50,099	**222**				
112	0	ALA	SAN LEANDRO, JCT. RTE. 61	28,500	**246**	2,921	10.3	**159**	54,789	**216**				
112	0.602	ALA	JCT. RTE. 880	39,000	**218**	1,911	4.9	**185**	56,199	**211**				
112	1.782	ALA	SAN LEANDRO, JCT. RTE. 185	22,200	**273**	533	2.4	**274**	26,997	**281**				
109	1.87	SM	MENLO PARK, JCT. RTE. 84	20,300	**282**	524	2.6	**276**	25,016	**287**				
101	1.869	SM	JCT. RTE. 114	188,000	**53**	7,952	4.2	**69**	259,568	**51**				
101	3.16	SCL	JCT. RTE. 25 EAST	73,000	**182**	6,351	8.7	**91**	130,159	**154**				
101	3.16	SCL	JCT. RTE. 25 EAST	49,000	**203**	8,154	16.6	**66**	122,386	**165**				
101	6.08	SCL	GILROY, JCT. RTE. 152 EAST	88,000	**167**	7,040	8.0	**83**	151,360	**140**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
101	17.82	SCL	MORGAN HILL, COCHRAN ROAD	131,000	**125**	9,891	7.6	**42**	220,019	**88**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
101	35.759	SCL	SAN JOSE, JCT. RTE. 130 EAST	191,000	**49**	9,531	5.0	**47**	276,779	**44**				
101	35.759	SCL	SAN JOSE, JCT. RTE. 130 EAST	154,000	**90**	10,210	6.6	**41**	245,890	**64**				
101	37.726	SCL	SAN JOSE, OAKLAND ROAD	175,000	**66**	9,503	5.4	**48**	260,527	**50**				
101	38.3	SCL	SAN JOSE, JCT. RTE. 880	130,000	**127**	6,500	5.0	**90**	188,500	**117**				
101	43.85	SCL	SUNNYVALE, LAWRENCE EXPRESSWAY	159,000	**80**	6,726	4.2	**87**	219,534	**89**				
101	46.134	SCL	SUNNYVALE, JCT. RTE. 237	155,000	**88**	5,906	3.8	**101**	208,154	**100**				
101	46.134	SCL	SUNNYVALE, JCT. RTE. 237	135,000	**122**	5,211	3.9	**117**	181,899	**124**				
101	48.103	SCL	MOUNTAIN VIEW, JCT. RTE. 85 SOUTH	200,000	**42**	9,000	4.5	**53**	281,000	**43**				
101	48.103	SCL	MOUNTAIN VIEW, JCT. RTE. 85 SOUTH	154,000	**91**	7,053	4.6	**82**	217,477	**92**				
92	0	SM	HALF MOON BAY, JCT. RTE. 1	17,600	**291**	649	3.7	**258**	23,441	**290**				
92	5.191	SM	JCT. RTE. 35 SOUTH	24,300	**262**	1,312	5.4	**206**	36,108	**248**				
92	5.191	SM	JCT. RTE. 35 SOUTH	22,800	**266**	841	3.7	**239**	30,369	**270**				
92	6.392	ALA	HAYWARD, JCT. RTE. 880	100,000	**159**	7,000	7.0	**84**	163,000	**135**				
92	6.392	ALA	HAYWARD, JCT. RTE. 880	56,000	**197**	1,176	2.1	**213**	66,584	**202**				
92	8.219	ALA	HAYWARD, JCT. RTES. 185/238	40,000	**216**	584	1.5	**265**	45,256	**231**				
92	11.208	SM	JCT. RTE. 82	86,000	**170**	1,978	2.3	**182**	103,802	**181**				
92	12.143	SM	SAN MATEO, JCT. RTE. 101	139,000	**111**	6,255	4.5	**95**	195,295	**109**				
92	12.143	SM	SAN MATEO, JCT. RTE. 101	104,000	**152**	2,496	2.4	**171**	126,464	**157**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
92	14.443	SM	SAN MATEO/HAYWARD BRIDGE	86,000	**171**	5,590	6.5	**106**	136,310	**149**				
87	0	SCL	SAN JOSE, JCT. RTE 85	83,000	**174**	266	0.3	**307**	85,394	**189**				
87	2.826	SCL	CURTNER AVENUE	120,000	**136**	2,040	1.7	**180**	138,360	**146**				
87	3.563	SCL	ALMADEN EXPRESSWAY	136,000	**120**	3,482	2.6	**140**	167,338	**133**				
87	5.156	SCL	SAN JOSE, JCT. RTE. 280	155,000	**87**	3,705	2.4	**138**	188,345	**118**				
87	5.156	SCL	SAN JOSE, JCT. RTE. 280	93,000	**162**	3,441	3.7	**142**	123,969	**164**				
87	9.22	SCL	JCT. RTE. 101	67,000	**185**	2,010	3.0	**181**	85,090	**190**				
85	0	SCL	SAN JOSE, JCT. RTE. 101	42,500	**213**	548	1.3	**270**	47,432	**228**				
85	5.22	SCL	JCT. RTE. 87	132,000	**124**	700	0.5	**252**	138,300	**147**				
85	5.22	SCL	JCT. RTE. 87	115,000	**145**	541	0.5	**272**	119,869	**170**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
85	10.498	SCL	JCT. RTE. 17	108,000	**149**	270	0.3	**306**	110,430	**174**				
85	10.498	SCL	JCT. RTE. 17	103,000	**155**	567	0.6	**267**	108,103	**176**				
85	17.699	SCL	CUPERTINO, STEVENS CREEK BOULEVARD	122,000	**133**	695	0.6	**254**	128,255	**156**				
85	18.448	SCL	SUNNYVALE, JCT. RTE. 280	113,000	**146**	3,447	3.1	**141**	144,023	**142**				
85	21.749	SCL	MOUNTAIN VIEW, JCT. RTE. 82	116,000	**143**	2,622	2.3	**165**	139,598	**145**				
85	22.163	SCL	JCT. RTE. 237	109,000	**147**	3,008	2.8	**150**	136,072	**150**				
85	22.163	SCL	JCT. RTE. 237	89,000	**165**	1,700	1.9	**190**	104,300	**180**				
85	22.629	SCL	MOUNTAIN VIEW, EVELYN AVENUE	88,000	**166**	1,681	1.9	**191**	103,129	**182**				
85	23.867	SCL	MOUNTAIN VIEW, JCT. RTE. 101	81,000	**176**	1,620	2.0	**194**	95,580	**184**				
84	0	SM	SAN GREGORIO, JCT. RTE. 1	1,350	**325**	59	4.4	**322**	1,881	**325**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
84	4.884	ALA	NEWARK BOULEVARD	66,000	**188**	1,848	2.8	**187**	82,632	**193**				
84	6.01	ALA	NORTH JCT. RTE. 880	66,000	**187**	2,970	4.5	**156**	92,730	**186**				
84	6.923	ALA	SOUTH JCT RTE 880	29,500	**242**	1,033	3.5	**226**	38,797	**243**				
84	10.82	ALA	FREMONT, JCT. RTE. 238	22,400	**269**	515	2.3	**278**	27,035	**280**				
84	10.83	ALA	FREMONT, JCT. RTE. 238	15,200	**300**	365	2.4	**295**	18,485	**304**				
84	14.95	SM	WOODSIDE, JCT. RTE. 35	4,250	**316**	100	2.4	**318**	5,150	**318**				
84	14.95	SM	WOODSIDE, JCT. RTE. 35	3,200	**317**	80	2.5	**319**	3,920	**319**				
84	17.987	ALA	JCT. RTE. 680	25,500	**259**	408	1.6	**292**	29,172	**276**				
84	17.987	ALA	JCT. RTE. 680	7,100	**311**	163	2.3	**315**	8,567	**312**				
84	21.537	SM	WOODSIDE, JCT. RTE. 280	15,800	**298**	458	2.9	**284**	19,922	**298**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
84	24.704	SM	REDWOOD CITY, JCT. RTE. 82	38,000	**220**	1,102	2.9	**219**	47,918	**226**				
84	25.721	SM	MENLO PARK, JCT. RTE. 101	43,500	**212**	1,279	2.9	**208**	55,011	**215**				
84	25.81	SM	MENLO PARK, JCT. RTE. 101	26,000	**256**	754	2.9	**249**	32,786	**262**				
84	27.659	SM	JCT. RTE. 114	26,000	**257**	884	3.4	**235**	33,956	**257**				
84	28.194	SM	JCT. RTE. 109	48,000	**205**	2,165	4.5	**177**	67,485	**201**				
84	28.714	ALA	LIVERMORE, WEST JCT RTE 580	21,800	**274**	604	2.8	**262**	27,236	**279**				
82	0	SCL	SAN JOSE, JCT. RTE. 101	55,000	**199**	1,650	3.0	**192**	69,850	**200**				
82	3.435	SM	JCT. RTE. 84	47,500	**206**	1,563	3.3	**197**	61,567	**208**				
82	3.435	SM	JCT. RTE. 84	36,500	**222**	836	2.3	**240**	44,024	**233**				
82	5.15	SM	REDWOOD CITY/SAN CARLOS CITY LIMITS	26,000	**255**	699	2.7	**253**	32,291	**264**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
82	6.06	SCL	SAN JOSE, ALMA AVENUE	22,700	**268**	851	3.8	**238**	30,359	**271**				
82	6.9	SCL	SAN JOSE, JCT. RTE. 280	15,600	**299**	577	3.7	**266**	20,793	**296**				
82	7.717	SCL	SAN JOSE, JCT. RTE. 87	14,800	**301**	488	3.3	**282**	19,192	**300**				
82	9.904	SCL	SAN JOSE, JCT. RTE. 880	28,500	**249**	909	3.2	**232**	36,681	**246**				
82	9.904	SCL	SAN JOSE, JCT. RTE. 880	27,000	**252**	994	3.7	**228**	35,946	**249**				
82	10.343	SCL	SAN JOSE/SANTA CLARA CITY LIMITS	23,800	**263**	952	4.0	**231**	32,368	**263**				
82	10.554	SM	SAN MATEO, JCT. RTE. 92	49,000	**202**	676	1.4	**256**	55,084	**214**				
82	10.554	SM	SAN MATEO, JCT. RTE. 92	39,500	**217**	521	1.3	**277**	44,189	**232**				
82	11.141	SCL	SANTA CLARA, BENTON ROAD	18,700	**289**	1,201	6.4	**211**	29,509	**274**				
82	16.844	SM	MILLBRAE, CENTER STREET	21,100	**278**	612	2.9	**260**	26,608	**283**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
82	17.035	SCL	MATHILDA AVENUE	31,500	**237**	759	2.4	**248**	38,331	**244**				
82	17.99	SM	SAN BRUNO, TAYLOR/SAN MATEO AVENUE	29,000	**244**	452	1.6	**286**	33,068	**260**				
82	18.6	SM	SAN BRUNO, SAN BRUNO AVENUE	36,000	**227**	706	2.0	**251**	42,354	**238**				
82	18.841	SCL	MOUNTAIN VIEW, JCT. RTE. 85	48,500	**204**	1,077	2.2	**222**	58,193	**210**				
82	18.841	SCL	MOUNTAIN VIEW, JCT. RTE. 85	44,000	**211**	1,175	2.7	**214**	54,575	**217**				
82	18.963	SM	SAN BRUNO, JCT. RTE. 380	36,000	**228**	526	1.5	**275**	40,734	**241**				
82	19.134	SCL	MOUNTAIN VIEW, JCT. RTE. 237 EAST	45,000	**208**	1,157	2.6	**215**	55,413	**213**				
82	21.91	SM	SOUTH SAN FRANCISCO, HICKEY BOULEVARD	25,000	**260**	495	2.0	**281**	29,455	**275**				
82	25.45	SCL	PALO ALTO,	37,500	**221**	1,181	3.2	**212**	48,129	**225**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
			EMBARCADERO ROAD											
82	26.37	SCL	SANTA CLARA/SAN MATEO COUNTY LINE	30,000	**241**	1,368	4.6	**203**	42,312	**239**				
80	2.04	CC	RICHMOND, JCT. RTE. 123 SOUTH	191,000	**47**	6,112	3.2	**98**	246,008	**62**				
80	2.04	CC	RICHMOND, JCT. RTE. 123 SOUTH	167,000	**71**	5,344	3.2	**111**	215,096	**95**				
80	2.802	ALA	OAKLAND, JCT. RTE. 580 EAST	145,000	**102**	2,567	1.8	**166**	168,103	**132**				
80	2.961	CC	RICHMOND, SAN PABLO AVENUE	194,000	**46**	6,887	3.6	**85**	255,983	**53**				
80	2.961	CC	RICHMOND, SAN PABLO AVENUE	188,000	**52**	6,091	3.2	**99**	242,819	**68**				
80	5.983	CC	RICHMOND, HILLTOP DRIVE	183,000	**56**	7,320	4.0	**77**	248,880	**61**				
80	7.597	CC	PINOLE, APPIAN WAY	190,000	**50**	8,303	4.4	**62**	264,727	**48**				
80	7.597	CC	PINOLE, APPIAN WAY	177,000	**63**	7,399	4.2	**76**	243,591	**67**				
80	10.059	CC	HERCULES, JCT. RTE. 4 EAST	171,000	**69**	7,866	4.6	**71**	241,794	**69**				
80	10.059	CC	HERCULES, JCT. RTE. 4 EAST	116,000	**142**	6,206	5.4	**96**	171,854	**130**				
80	14.139	CC	CARQUINEZ BRIDGE	108,000	**148**	5,400	5.0	**110**	156,600	**137**				
77	0.098	ALA	OAKLAND, JCT. RTE. 880	21,600	**275**	546	2.5	**271**	26,514	**284**				
77	0.365	ALA	OAKLAND, EAST 12TH STREET	15,900	**297**	281	1.8	**305**	18,429	**305**				
77	0.452	ALA	OAKLAND, EAST 14TH STREET	15,900	**296**	345	2.2	**298**	19,005	**302**				
61	14.8	ALA	SAN LEANDRO, JCT. RTE. 112 EAST	21,400	**276**	1,134	5.3	**216**	31,606	**266**				
61	16.07	ALA	OAKLAND, AIRPORT/HEGENBERGER ROADS	20,700	**280**	789	3.8	**246**	27,801	**277**				
61	16.07	ALA	OAKLAND, AIRPORT/HEGENBERGER ROADS	20,200	**283**	828	4.1	**242**	27,652	**278**				

Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
61	18.52	ALA	ALAMEDA, ISLAND DRIVE	38,000	**219**	954	2.5	**230**	46,586	**229**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
61	21.967	ALA	JCT. RTE. 260 NORTH	16,700	**294**	224	1.3	**313**	18,716	**303**				
35	0.053	SCL	JCT. RTE. 17	720	**329**	56	7.8	**323**	1,224	**326**				
35	10.518	SM	WOODSIDE, JCT. RTE. 84	1,750	**324**	80	4.6	**320**	2,470	**323**				
35	14.1	SCL	JCT. RTE. 9	920	**326**	16	1.7	**329**	1,064	**328**				
35	14.1	SCL	JCT. RTE. 9	920	**327**	15	1.6	**330**	1,055	**329**				
35	21.72	SM	JCT. RTE. 92	3,050	**318**	266	8.7	**308**	5,444	**316**				
35	23.037	SM	JCT. RTE. 280	14,300	**302**	139	1.0	**316**	15,551	**309**				
35	23.037	SM	JCT. RTE. 280	3,050	**319**	40	1.3	**324**	3,410	**320**				
35	23.037	SM	JCT. RTE. 92	2,050	**323**	27	1.3	**327**	2,293	**324**				
35	28.687	SM	DALY CITY, JCT. RTE. 1	30,500	**238**	317	1.0	**301**	33,353	**259**				
35	28.687	SM	DALY CITY, JCT. RTE. 1	30,000	**240**	330	1.1	**299**	32,970	**261**				
35	30.834	SM	JOHN DALY BOULEVARD	28,000	**250**	308	1.1	**302**	30,772	**268**				
35	30.834	SM	JOHN DALY BOULEVARD	22,700	**267**	232	1.0	**312**	24,788	**288**				
25	2.528	SCL	GILROY, JCT RTE 101	22,400	**270**	1,458	6.5	**202**	35,522	**251**				
24	1.847	ALA	OAKLAND, JCT. RTES. 580 AND 980	152,000	**93**	3,770	2.5	**137**	185,930	**121**				
24	2.319	CC	CAMINO PABLO	163,000	**75**	4,075	2.5	**135**	199,675	**102**				
24	5.117	ALA	OAKLAND, JCT. RTE. 13	147,000	**99**	4,101	2.8	**132**	183,909	**123**				
24	5.117	ALA	OAKLAND, JCT. RTE. 13	148,000	**98**	2,975	2.0	**155**	174,775	**129**				
24	5.887	ALA	OAKLAND, CALDECOTT TUNNEL	155,000	**86**	3,503	2.3	**139**	186,527	**120**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
24	7.656	CC	LAFAYETTE, PLEASANT HILL ROAD	179,000	**58**	6,265	3.5	**94**	235,385	**76**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
24	7.656	CC	LAFAYETTE, PLEASANT HILL ROAD	178,000	**61**	4,450	2.5	**126**	218,050	**91**				
17	0.108	SCL	JCT. RTE. 35 NORTHWEST	52,000	**200**	1,602	3.1	**195**	66,418	**203**				
17	0.108	SCL	JCT. RTE. 35 NORTHWEST	52,000	**201**	1,570	3.0	**196**	66,130	**204**				
17	4.06	SCL	BEAR CREEK ROAD	56,000	**198**	1,898	3.4	**186**	73,082	**199**				
17	7.073	SCL	LOS GATOS, JCT. RTE. 9 WEST	84,000	**173**	4,645	5.5	**122**	125,805	**159**				
13	4.262	ALA	OAKLAND, JCT. RTE. 580	46,500	**207**	535	1.2	**273**	51,315	**220**				
13	7.397	ALA	OAKLAND, PARK BOULEVARD	57,000	**194**	827	1.5	**243**	64,443	**205**				
13	7.397	ALA	OAKLAND, PARK BOULEVARD	57,000	**195**	604	1.1	**261**	62,436	**207**				
13	9.621	ALA	OAKLAND, JCT. RTE. 24	70,000	**184**	1,260	1.8	**209**	81,340	**196**				
13	9.621	ALA	OAKLAND, JCT. RTE. 24	19,600	**286**	172	0.9	**314**	21,148	**294**				
13	13.178	ALA	JCT. RTE. 123	34,000	**229**	653	1.9	**257**	39,877	**242**				
13	13.178	ALA	JCT. RTE. 123	26,000	**253**	562	2.2	**268**	31,058	**267**				
13	13.931	ALA	BERKELEY, JCT. RTE. 80	36,000	**226**	1,530	4.3	**199**	49,770	**224**				
9	0	SCL	JCT. RTE. 35	2,700	**321**	16	0.6	**328**	2,844	**321**				
9	7.4	SCL	SARATOGA, JCT. RTE. 85 NORTH	13,800	**304**	356	2.6	**296**	17,004	**307**				
9	7.4	SCL	SARATOGA, JCT. RTE. 85 NORTH	12,400	**305**	430	3.5	**290**	16,270	**308**				
9	11.448	SCL	LOS GATOS, JCT. RTE. 17	34,000	**230**	1,102	3.2	**220**	43,918	**234**				
4	0	CC	HERCULES, JCT. RTE. 80	41,000	**214**	2,554	6.2	**168**	63,986	**206**				
4	12.667	CC	JCT. RTE. 680	85,000	**172**	4,097	4.8	**134**	121,873	**168**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
4	12.667	CC	JCT. RTE. 680	81,000	**175**	4,123	5.1	**131**	118,107	**172**				
4	14.668	CC	CONCORD, JCT. RTE. 242	90,000	**163**	5,634	6.3	**104**	140,706	**144**				
4	14.668	CC	CONCORD, JCT. RTE. 242	78,000	**177**	5,273	6.8	**115**	125,457	**160**				
4	18.83	CC	PORT CHICAGO HIGHWAY EAST	144,000	**105**	7,445	5.2	**75**	211,005	**99**				
4	18.83	CC	PORT CHICAGO HIGHWAY EAST	130,000	**126**	7,176	5.5	**80**	194,584	**111**				
4	20.102	CC	BAILEY ROAD	128,000	**128**	5,888	4.6	**102**	180,992	**125**				
4	31.13	CC	JCT. RTE. 160	20,700	**279**	1,112	5.4	**218**	30,708	**269**				
4	44.367	CC	BYRON HIGHWAY	19,500	**287**	3,005	15.4	**151**	46,545	**230**				
4	44.367	CC	BYRON HIGHWAY	18,700	**288**	2,710	14.5	**161**	43,090	**235**				
4	46.46	CC	DISCOVERY BAY BOULEVARD	8,100	**309**	1,119	13.8	**217**	18,171	**306**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
1	18.189	SM	JCT. RTE. 84 EAST	5,700	**314**	439	7.7	**289**	9,651	**311**				
1	18.189	SM	JCT. RTE. 84 EAST	5,700	**315**	288	5.1	**303**	8,292	**314**				
1	26.432	SM	MIRAMONTES POINT ROAD	7,700	**310**	386	5.0	**293**	11,174	**310**				
1	29.036	SM	HALF MOON BAY, JCT. RTE. 92 EAST	28,500	**247**	752	2.6	**250**	35,268	**253**				
1	29.036	SM	HALF MOON BAY, JCT. RTE. 92 EAST	27,000	**251**	859	3.2	**237**	34,731	**255**				
1	35.334	SM	VALLEMAR/ETHELDOR E STREETS	13,900	**303**	1,056	7.6	**225**	23,404	**291**				
1	40.959	SM	PACIFICA, LINDA MAR BOULEVARD	28,500	**248**	770	2.7	**247**	35,430	**252**				
1	43.464	SM	PACIFICA, SHARP PARK ROAD INTERCHANGE	44,500	**210**	894	2.0	**233**	52,546	**219**				
1	46.722	SM	DALY CITY, JCT. RTE. 35	64,000	**190**	1,082	1.7	**221**	73,738	**198**				

Route	Postmile	County	Description	Total AADT	**AADT Rank**	Total # Trucks	Total Truck %	**Truck Rank**	FE-AADT*	**FE-AADT Rank**	*Ahead AADT (red = different value than "Total AADT") for top 40 AADT, Truck, and FE-AADT.*	*FE-AADT using "Ahead AADT"*	***FE-AADT using "Ahead AADT" Rank***	*Notes*
1	46.722	SM	DALY CITY, JCT. RTE. 35	40,500	**215**	802	2.0	**244**	47,718	**227**	*Not calculated – segments not in the Top 40 for AADT, Total # trucks, or FE-AADT*			
1	47.802	SM	SOUTH JCT. RTE. 280	71,000	**183**	440	0.6	**288**	74,960	**197**				
1	48.359	SM	NORTH JCT. RTE. 280	95,000	**161**	1,302	1.4	**207**	106,718	**178**				

First Proposed Near-Road Monitoring Site: San Francisco-Oakland-Fremont CBSA

The Air District is proposing a monitoring location east of Interstate 80 (I-80) west of Aquatic Park in Berkeley within 25 meters of the nearest traffic lane. According to the Bay Area Metropolitan Traffic Commission this freeway segment is the most congested of all segments in the Bay Area. This part of freeway is quite flat with little slope between the freeway and the adjoining property both to the west (the Bay) and to the east (Aquatic Park). It also has one of the highest AADTs in the Bay Area and the highest Fleet Equivalent AADT (FE-AADT) on I-80 in the Bay Area. Because the freeway runs south to north in this area with westerly prevailing winds, and because of the absence of significant upwind sources, a monitoring site just east of the I-80 appears to be one of the few locations available where a clear pollutant signal coming predominantly from roadway emissions can be captured and is therefore ideal for near-road monitoring.

The proposed site is along the 5th highest FE-AADT road segment in the Bay Area. There are four road segments with higher FE-AADT than the proposed site and they are all along Interstate 880 (I-880), as shown in Table 27. The Air District is also proposing near-road monitoring along I-880. EPA guidelines for selecting monitoring sites require consideration of monitoring not just along the highest FE-AADT segments, but also along different freeways and geographic locations if possible. Therefore, the Air District is proposing one site within one of the top four segments (along I-880) and another site along the fifth highest segment (along I-80).

The proposed Berkeley monitoring site will provide useful pollutant data from the highest FE-AADT road segment along I-80 in the Bay Area. The site will also provide information about population exposure to pollution in the nearby Aquatic Park, a recreational area within the city of Berkeley and the frequently used bicycle bridge that passes directly over the freeway. Table 29 below is a matrix of siting details of the proposed site in Berkeley.

Figure 15 shows the general location of the proposed monitoring site and Figure 16 is a close-up view of the site. Figure 17 is a wind rose diagram showing the prevailing winds at the Oakland sewage treatment plant meteorological site in 2012. The meteorological site is 2-3 miles south of the proposed near-road monitoring site along I-80 in Berkeley.

In the San Francisco-Oakland-Fremont CBSA the Air District is required to operate two near-road monitoring sites. The Air District lists the Berkeley site as the "first" near-road site in this document. However, this does not mean it is the highest priority site or that it will become operational first. There are still many milestones to be reached at both sites such as: EPA Region 9 approval of the sites, lease agreements, installation of new PG&E infrastructure for electrical power, and construction and electrical permit approvals by the City of Berkeley.

The Air District, with Region 9 approval, plans to monitor NO_2, CO, and $PM_{2.5}$ at this location. The Air District will also monitor Ultrafine Particulate (UFP) and toxics if resources allow.

Table 29. Siting Matrix for the Near-Road Monitoring Site in Berkeley.

Site/Segment Parameters	Description of Parameter	Candidate
		#1 FE-AADT Site on the 80 Corridor (2-4 AADT in the Bay Area)
Location	*Describe if the entry is for a specific point along a road segment or if the entry is representative of a whole road segment. If the entry is for a point, provide a moniker and the latitude and longitude. If for a road segment, identify where the segment boundaries occur (e.g. intersection, mile marker, political boundary, etc.).*	Road Segment; Rt 80 EMERVILLE, POWELL STREET - postmile 3.786 Proposed site is immediately south of the Berkeley Animal Shelter at the I-80 Bike Bridge, Berkeley Animal Shelter address is 1 Bolivar, Berkeley CA 94710
Road segment name	*Provide given road name and common name (if applicable).*	Interstate 80 between 80/580 interchange and Ashby Ave.
Road type	*Type of road (controlled access highway, limited access freeway, arterial, etc.).*	Controlled access highway
Road segment end points	*Denote the location of the road segment end points, including any given names, common names, and the latitude and longitude of each individual end point.*	Interstate 80 between 80/580 interchange and Ashby Ave.
AADT	*Provide AADT, source of data, and vintage (year).*	265,000 (Caltrans, 2010, Provided by EPA Region 9)
HD counts	*As available, provide HD counts, source of data, and vintage (year).*	12,694 (Caltrans, 2010, Provided by EPA Region 9)
FE-AADT	*As available, provide FE-AADT, noting HDm value used. If not the national default value, provide the source of data used to calculate the site-specific value.*	**379,246** (Caltrans, 2010, Provided by EPA, Region 9) HDm = 10 (national average)
Congestion information	*Denote value and type (e.g. LOS, or AADT by lane), data source, and vintage (year).*	Ranked #1 Most Congested Freeway Stretch in the Bay Area (MTC - http://www.mtc.ca.gov/news/transactions/ta01-0205/top_ten.htm)

Site/Segment Parameters	Description of Parameter	Candidate
Roadway design	*Denote design type or types present (flat, elevated-fill, cut, etc.). If not flat, identify whether the configuration is a vertical or sloped boundary. Include the height and degree of slope if applicable.*	Flat
Terrain	*Denote the nature of the terrain (plain, peak, hillside, valley, etc.) immediately around the road and also any larger scale terrain features of note.*	Flat road with bay to the west
Meteorology	*If the entry is for a point, denote the predominate winds and whether the point is relatively upwind or downwind. If the entry is for a whole segment, denote the orientation of the segment to the predominant winds.*	Prevailing winds in this area are northwesterly. Roughly perpendicular to freeway.
Population exposure	*Denote any assessment of population exposure and/or likeness to other road segments throughout the CBSA.*	Non-unique road segment with industry within 150 - 600 meters and dense housing communities within approximately 1 KM to the E.
Safety features	*Denote any safety features present and the height, width, and length.*	Safe access available on City of Berkeley Aquatic Park access road - permission granted by City of Berkeley Parks
Infrastructure	*Denote existing infrastructure (light poles, billboards, etc.) and potential site proximity (distance).*	Power available through the City of Berkeley
Interchanges	*Denote the presence of any interchanges within or at the end points of the target road segment and potential site proximity (distance), including traffic information if available (AADT, HD counts, etc.).*	Proposed site is approx 2.0 KM SW of 580, 80 interchange
Surrounding land use	*Denote surrounding land use (residential, commercial, etc.). Also note proximity to other large roads, areas of higher relative road density, and/or locations within or near central business districts or urban*	City of Berkeley, with SF Bay to the west and industry and housing to the east. This area is a highly congested freeway with the 580/80 interchange to the south and the Bay Bridge toll plaza approximately 4.6 KM to the southwest

Site/Segment Parameters	Description of Parameter	Candidate
	downtown areas.	
Nearby sources	*If applicable, note nearby NO_X sources (type, tonnage, etc.) and potential site proximity (distance).*	All sources are typically downwind of the freeway with San Francisco Bay directly upwind
Current road construction	*Denote any visible or known road construction at the candidate site location or along the target road segment.*	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#alameda
Future road construction	*If known, denote transportation agency plans for any future road construction (including time frame for completion).*	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#alameda
Frontage roads	*Denote the presence of frontage roads, and whether those roads are included as part of the target road segment.*	Frontage road to the west and not included in traffic counts.
Available space – site footprint	*Denote any limitations in the space available for a multi-pollutant monitoring station.*	Lease area would be defined by the City of Berkeley - No limitation expected
Property type	*Is it right-of-way (ROW) or private property?*	Public property - City of Berkeley Parkland
Property owner	*Who manages or owns the property under evaluation?*	City of Berkeley
Likelihood of access	*Note the level of confidence and any uncertainties regarding the acquisition of access to a particular property.*	Requires approval of the city council - the mayor supports the project
Other details/local knowledge	*List any other pertinent details that may have bearing on why a particular candidate site may or may not be selected. This can include information that reflects a state or local agencies' own knowledge of the area or roads under consideration.*	This location is congested in both directions for large portions of the day. It is an ideal location for model evaluation since the SF Bay is usually upwind of the site, there are no impacts from other sources the majority of the time

Figure 15. Proposed near-road air monitoring site in Berkeley along Interstate 80.

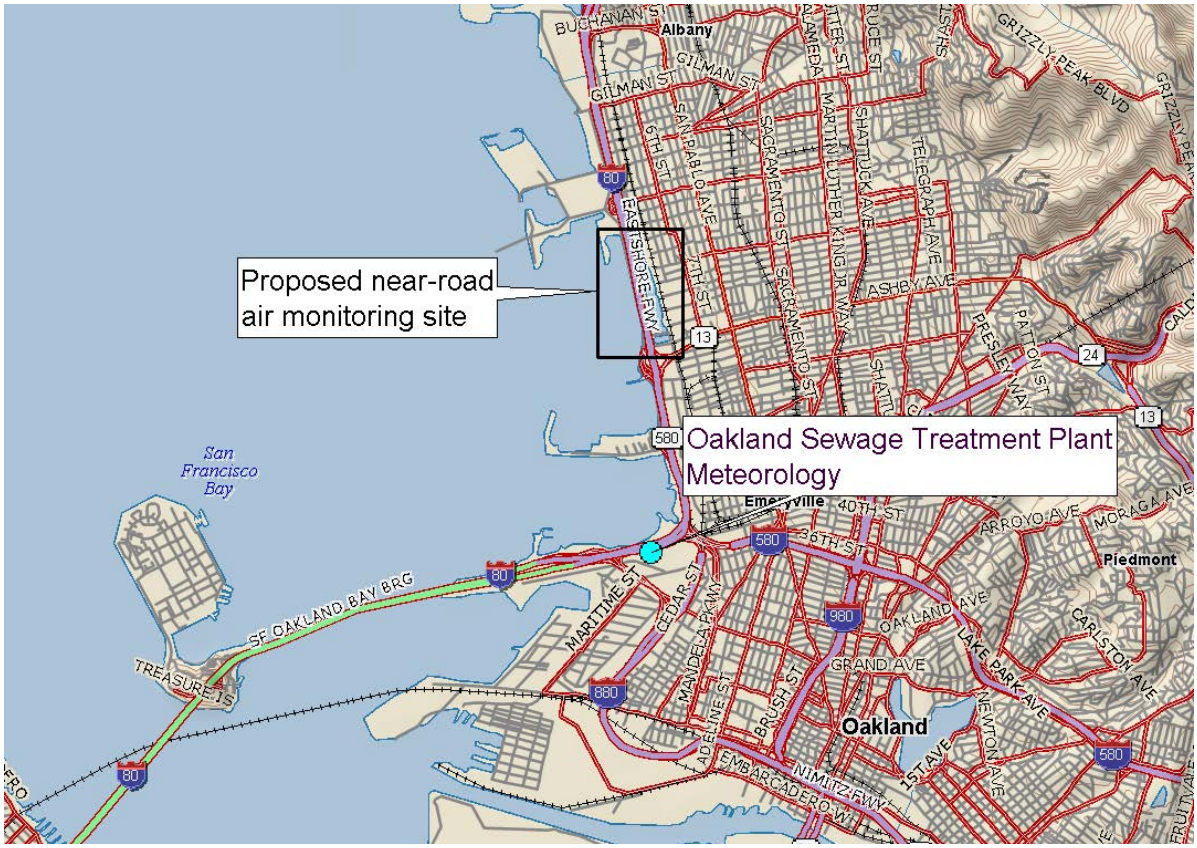


Figure 16. Close up view of proposed near-road air monitoring site in Berkeley.

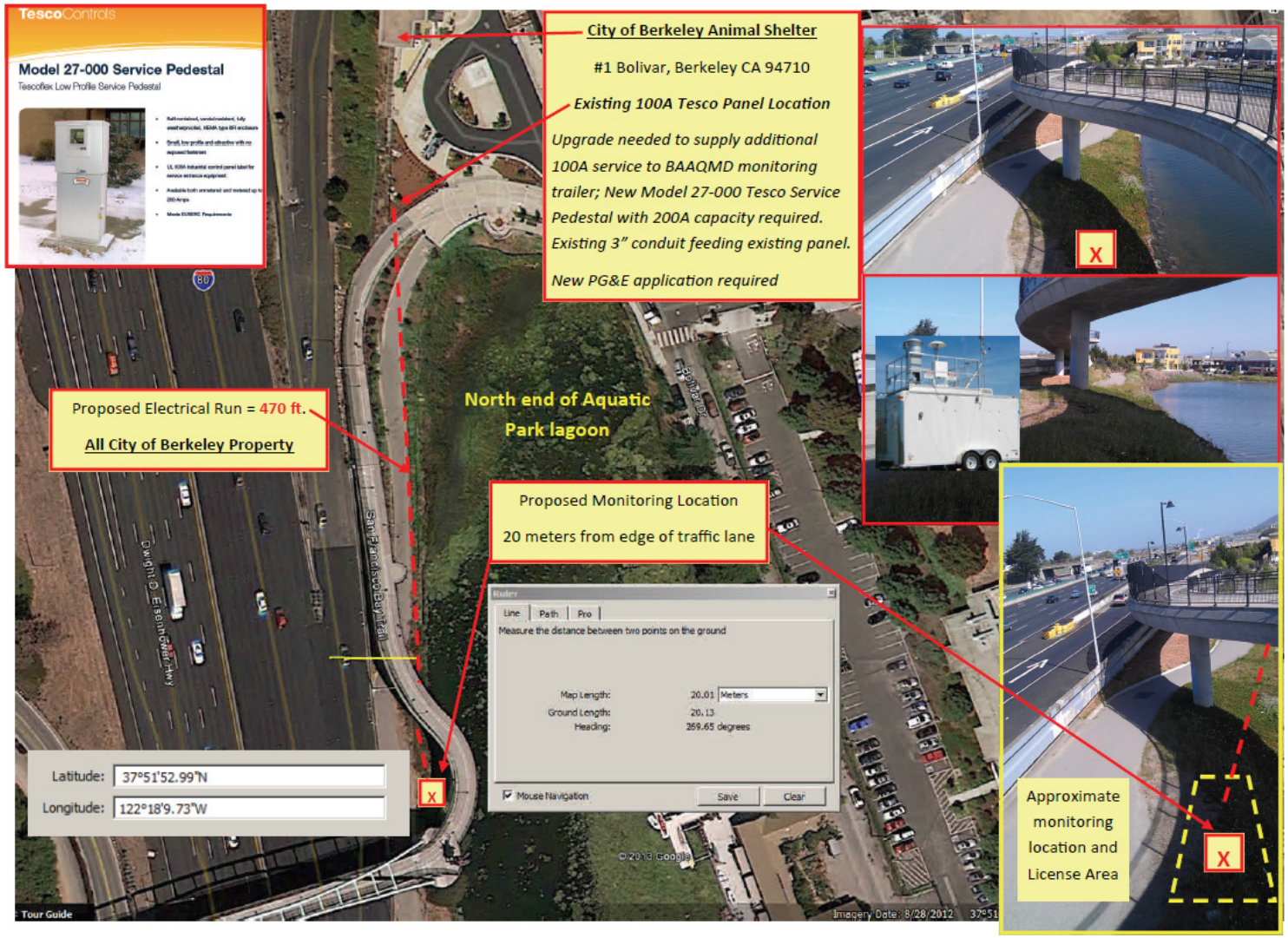
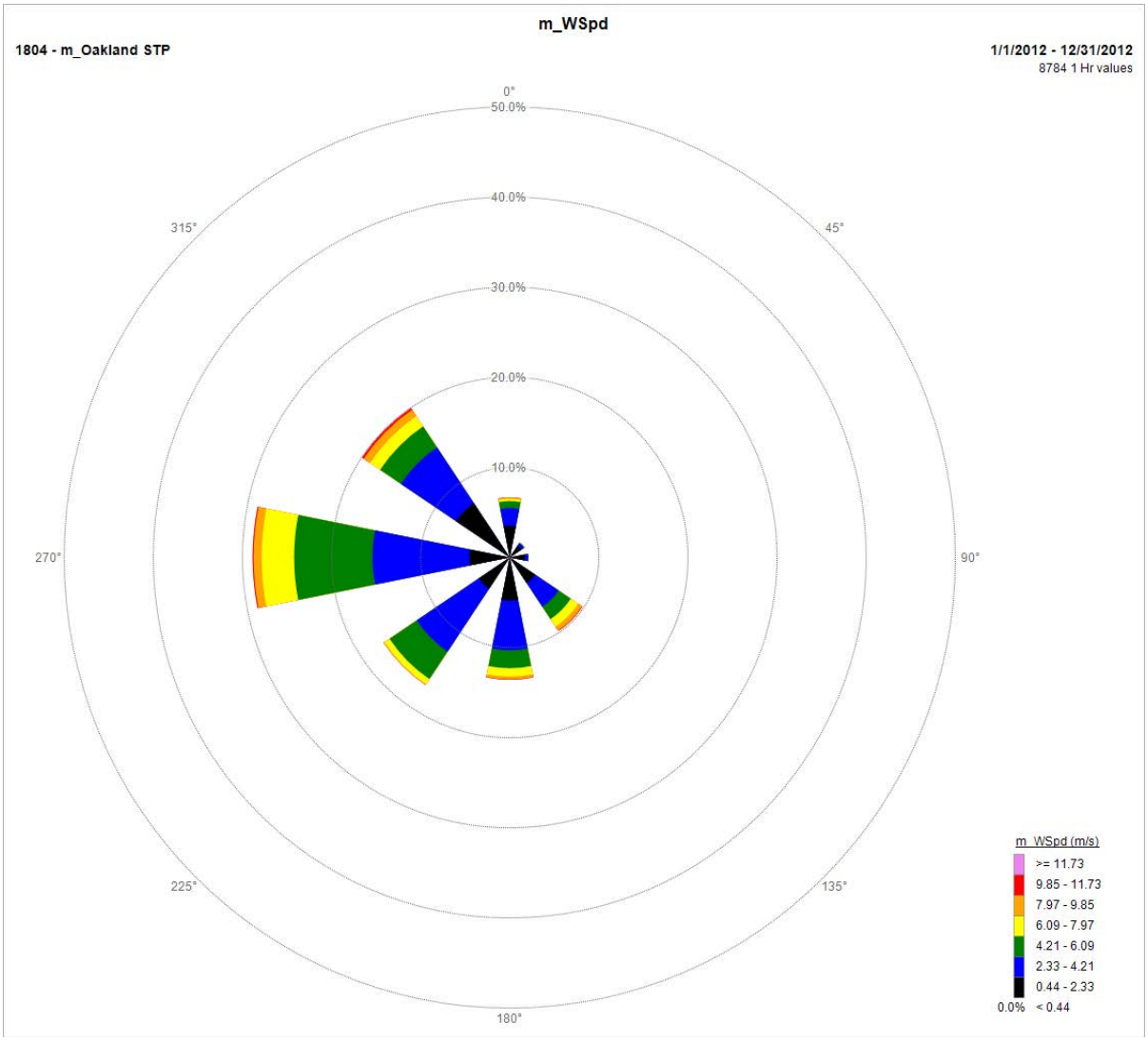


Figure 17. Wind rose for 2012 at the Oakland sewage treatment plant.



Berkeley, Aquatic Park Near-road (AQS ID pending)

Pollutant, POC	**NO, 1 / NO2, 1**	**CO, 1**	**PM2.5, 3**
Parameter code	42601 / 42602	42101	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Source Oriented	Source Oriented	Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS
Sampling method	TECO 42i	TECO 48i	Met One FEM BAM 1020
Method code	074	054	170
FRM/FEM/ARM/other	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Micro	Micro	Micro
Monitor start date - proposed	01/01/2014 [1]	01/01/2014 [1]	01/01/2014 [1]
Sampling frequency - proposed	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A
Sampling season - proposed	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters) - proposed	2-7 per EPA requirement	2-7 per EPA requirement	2-7 per EPA requirement
Distance from supporting structure (meters)	>1 per EPA requirement	>1 per EPA requirement	>1 per EPA requirement
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	>10 per EPA requirement	>10 per EPA requirement	>10 per EPA requirement
Distance to furnace or incinerator flue (meters)	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (meters)	≥ 270 per EPA requirement	≥ 270 per EPA requirement	≥ 270 per EPA requirement
Probe material for reactive gases	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	< 20 per EPA requirement	< 20 per EPA requirement	N/A
Will there be changes within the next 18 months?	Y – when it starts to operate	Y – when it starts to operate	Y – when it starts to operate
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A
Last Annual Performance Evaluation gaseous parameters	None – not operating yet	None – not operating yet	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	None – not operating yet

1. Without EPA Region 9 approval of sites by August 1, 2013 the monitors will probably not be operating by Jan 1, 2014.

Second Proposed Near-Road Monitoring Site in the San Francisco-Oakland-Fremont CBSA

A second near-road monitoring site is required in the San Francisco-Oakland-Fremont CBSA to be operational by January 1, 2015. The Air District is proposing a site in Oakland on the Laney College campus, located on the east (downwind) side of Interstate 880 (I-880) within 30 meters of the nearest traffic lane. The Air District intends to have this site operational by January 1, 2014, a year ahead of the EPA required deadline for a second near-road site in the CBSA. This stretch of freeway is flat and has the 2nd highest FE-AADT of all road segments in the Bay Area. Near the monitoring site, the freeway is four lanes. The site is just south of the Oak Street single lane off-ramp.

The reason the Air District is not proposing monitoring along the 1st highest FE-AADT segment which is in Oakland at the intersection of I-880 and State Route 77 is because that area has train tracks on the downwind side with no access permitted from the land owner (Union Pacific easement) to cross their train tracks, primarily for safety reasons. North of the highest FE-AADT location, multiple private property owners were contacted but they were considering selling their property (and did not want complications), or they were not interested in discussing lease terms, or they were not willing to sign a lease. Additionally, the location was not ideal per EPA Region 9 due to obstructions to air flow from the roadway. The Air District made many efforts to secure a location along this segment, including a listing on Craigslist:

CL > SF bay area > east bay > housing > office & commercial >

Reply your anonymous craigslist address will appear here Posted: 2013-01-25, 1:47PM PST

- $650 / 600ft² - Outdoor Air Quality Monitoring Site Needed - Within 50 meters of 880 (alameda)

LONG TERM LEASE FOR NEAR ROAD MONITORING SITE - BAAQMD INFORMATION

The Bay Area Air Quality District (BAAQMD) and EPA have identified the EASTERN (downwind) side of interstate 880 from approximately the junction of interstates 880/980 to the High Street over crossing as a location of high value for air monitoring in the San Jose/Santa Clara metropolitan area.
The Air District is seeking a suitable location with a long-term lease to locate a pre-fabricated shelter (approximately 10 ft. wide by 20 ft. long by approximately 9 ft. high) to house and secure all monitoring equipment. Build out of the proposed location including power, communications and fencing would be arranged and paid for by the Air District. BAAQMD would work with the property owner providing leased space to minimize visual and other impacts and would negotiate compensation for continued use of the location. District employees would need to access and service the monitoring instrumentation on a weekly basis.
BAAQMD operates instrumentation in cooperation with other Bay Area governmental and private organizations and would be glad to provide references. We have developed methodologies to ensure that our operations impact a host facility as little as possible. In addition, we strive to answer all questions and/or concerns as quickly as possible to maintain our working relationships.

BACKGROUND INFORMATION

In 2010, the EPA strengthened the health-based National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide (NO2). NO2 concentrations as well as other vehicle related pollutants in many urban areas are likely to be highest around major roads. Pollutants, such as carbon monoxide, particulate matter, and volatile organic compounds associated with vehicle traffic may also be incorporated at Near Road sites to help determine health risk associated with high traffic roadways.
Monitoring must take place within a MAXIMUM of 50 meters from the freeway, and most preferably within 20 meters. The EPA stipulates which road segments will meet the near roadway requirements and includes air monitoring siting criteria to ensure that sites accurately represent the desired location, including distance from trees, which can react with certain pollutants, and objects which may disrupt air flow, such as buildings and sound walls. There are also practical considerations to locating monitoring sites, such as availability of electricity, and safe access for District field personnel.

The proposed site is located in a parking area at Laney College. The roadway and proposed monitoring site are at the same elevation, as is recommended in EPA siting guidelines. The two sites proposed in this CBSA can be differentiated in several ways:

- Fleet mix data shows nearly double the percentage of trucks along the segment near Laney College than along the segment in Berkeley
- The two sites are on different freeway designations (Interstate 880 verses 80)
- The immediate area (within ½ mile) near the Berkeley site can be characterized as having more public recreation and housing use while the Laney College site has more commercial and industrial use

The two sites are similar in that both have very high FE-AADT values (both in the top 5) and both are near locations where it is reasonable to assume significant populations would be exposed to freeway emissions (the Berkeley site is near Aquatic Park and a bicycle bridge and the Lanely site is near a college campus).

Because there are two near-road sites required in this CBSA, the Air District is pursuing lease agreements and PG&E electrical installation contracts for both sites simultaneously. Although we list this location as the "second" proposed site, it has just as high a priority as the "first" site. The Air District intends to have both sites operational by January 1, 2014 if possible.

Table 30 below is a matrix of siting details of the proposed site in Oakland. Figure 18 shows the general location of the proposed monitoring site and Figure 19 is a close-up view of the site. Figure 20 is a wind rose diagram showing the prevailing winds at the Oakland sewage treatment plant meteorological site in 2012. The meteorological site is 3 miles northwest of the proposed near-road monitoring site along Interstate 880 in Oakland.

The Air District, with Region 9 approval, plans to monitor NO_2, CO, and $PM_{2.5}$ at this location. The Air District will also monitor Ultrafine Particulate (UFP) and toxics if resources allow.

Table 30. Siting Matrix for the Near-Road Monitoring Site at Laney College in Oakland.

Site/Segment Parameters	Description of Parameter	Candidate
		#1 FE-ADDT site in the Bay Area (as sent to Region 9). Update: #2 FE-AADT (amended 5/23/13)
Location	*Describe if the entry is for a specific point along a road segment or if the entry is representative of a whole road segment. If the entry is for a point, provide a moniker and the latitude and longitude. If for a road segment, identify where the segment boundaries occur (e.g. intersection, mile marker, political boundary, etc.).*	Road Segment; Rt 880 MADISON STREET - postmile 39.091 - Proposed location at the Laney College Parking lot located at Fallon Street and E 8th Street in Oakland

Site/Segment Parameters	Description of Parameter	Candidate
Road segment name	*Provide given road name and common name (if applicable).*	Interstate 880 (Nimitz Freeway)
Road type	*Type of road (controlled access highway, limited access freeway, arterial, etc.).*	Controlled access highway
Road segment end points	*Denote the location of the road segment end points, including any given names, common names, and the latitude and longitude of each individual end point.*	Rt 880 between Madison Street and SR-77
AADT	*Provide AADT, source of data, and vintage (year).*	216,000 (Caltrans, 2010, Provide by EPA Region 9)
HD counts	*As available, provide HD counts, source of data, and vintage (year).*	23,112 (Caltrans, 2010, Provided by EPA Region 9)
FE-AADT	*As available, provide FE-AADT, noting HDm value used. If not the national default value, provide the source of data used to calculate the site-specific value.*	**402,008** (Caltrans, 2010, Provided by EPA Region 9) HDm = 10 (national average)
Congestion information	*Denote value and type (e.g. LOS, or AADT by lane), data source, and vintage (year).*	Ranked #2 Most Congested Freeway Stretch along the 880 Corridor (MTC - http://www.mtc.ca.gov/news/transactions/ta01-0205/top_ten.htm)
Roadway design	*Denote design type or types present (flat, elevated-fill, cut, etc.). If not flat, identify whether the configuration is a vertical or sloped boundary. Include the height and degree of slope if applicable.*	Roadway design immediately upwind of monitor location is flat. Elevated freeway section nearby with brief periods of at grade elevation.
Terrain	*Denote the nature of the terrain (plain, peak, hillside, valley, etc.) immediately around the road and also any larger scale terrain features of note.*	Mostly elevated freeway with brief slopes to at grade elevations.
Meteorology	*If the entry is for a point, denote the predominate winds and whether the point is relatively upwind or downwind. If the entry is for a whole segment, denote the orientation of the segment to the predominant*	Prevailing winds in this area are westerly. Roughly perpendicular to freeway.

Site/Segment Parameters	Description of Parameter	Candidate
	winds.	
Population exposure	*Denote any assessment of population exposure and/or likeness to other road segments throughout the CBSA.*	Non-unique road segment has a junior college campus directly to the east surrounded by dense housing communities within approximately 1 KM, with light industrial and warehousing within 0.5 KM to the W.
Safety features	*Denote any safety features present and the height, width, and length.*	None
Infrastructure	*Denote existing infrastructure (light poles, billboards, etc.) and potential site proximity (distance).*	PG&E power available - confirmed with PG&E 3_2013
Interchanges	*Denote the presence of any interchanges within or at the end points of the target road segment and potential site proximity (distance), including traffic information if available (AADT, HD counts, etc.).*	Proposed site is approx 1.6 KM SW of 880, 24 interchange and approximately 4.5 KM northwest of SR77-880 interchange
Surrounding land use	*Denote surrounding land use (residential, commercial, etc.). Also note proximity to other large roads, areas of higher relative road density, and/or locations within or near central business districts or urban downtown areas.*	City of Oakland, proposed site is directly west of Laney Junior College and surrounding land use is mixed commercial and residential.
Nearby sources	*If applicable, note nearby NO_X sources (type, tonnage, etc.) and potential site proximity (distance).*	This area is dominated by vehicle sources
Current road construction	*Denote any visible or known road construction at the candidate site location or along the target road segment.*	Continuing projects scheduled over eight years at http://www.i880corridor.com/. Laney College plans to develop the proposed site in 5 to 10 years, but hopes to work with the District to maintain monitoring at the proposed site

Site/Segment Parameters	Description of Parameter	Candidate
Future road construction	*If known, denote transportation agency plans for any future road construction (including time frame for completion).*	Continuing projects scheduled over eight years at http://www.i880corridor.com/. Laney College plans to develop the proposed site in 5 to 10 years, but hopes to work with the District to maintain monitoring at the proposed site
Frontage roads	*Denote the presence of frontage roads, and whether those roads are included as part of the target road segment.*	No frontage road present.
Available space – site footprint	*Denote any limitations in the space available for a multi-pollutant monitoring station.*	Working with Laney College to secure adequate space
Property type	*Is it right-of-way (ROW) or private property?*	Public property through Laney College
Property owner	*Who manages or owns the property under evaluation?*	Laney College
Likelihood of access	*Note the level of confidence and any uncertainties regarding the acquisition of access to a particular property.*	Securing the site likely for the next 5 to 10 years, but difficult to determine after that
Other details/local knowledge	*List any other pertinent details that may have bearing on why a particular candidate site may or may not be selected. This can include information that reflects a state or local agencies' own knowledge of the area or roads under consideration.*	Highest FE-AADT site in the Bay Area. This proposed site is the last possible site along this corridor that is publicly owned

Figure 18. Proposed near-road air monitoring site at Laney College in Oakland.

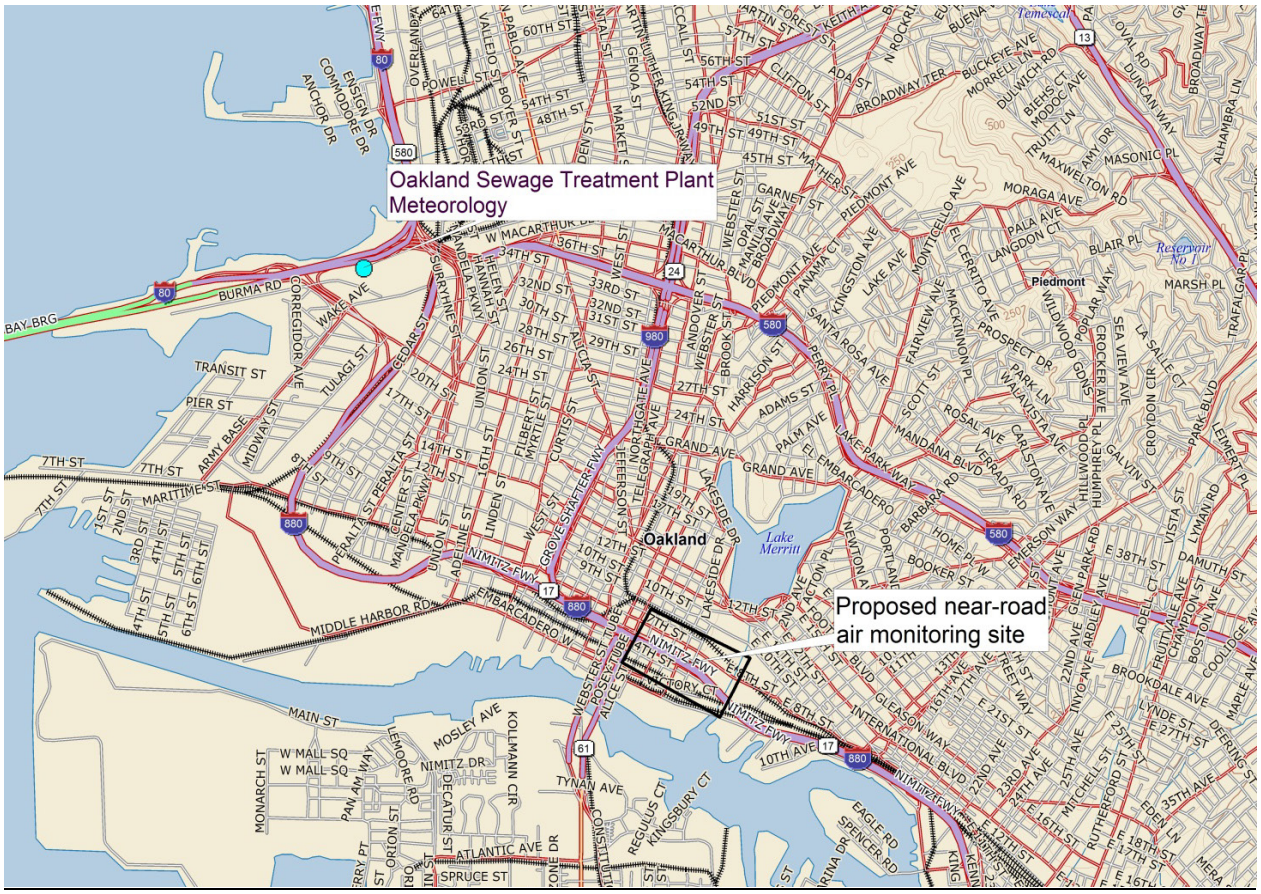
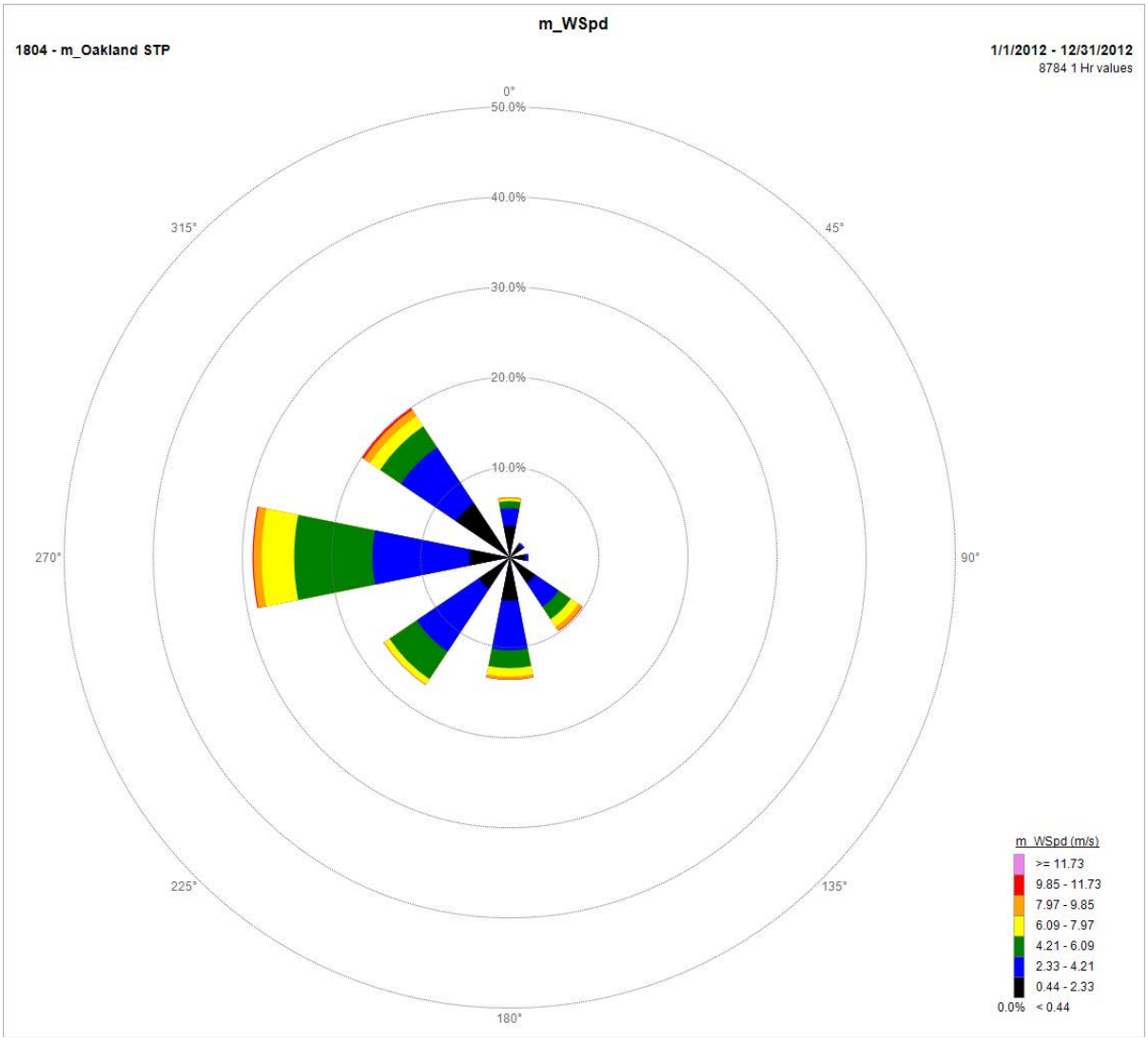


Figure 19. Close up view of proposed near-road air monitoring site at Laney College in Oakland.

Figure 20. Wind rose for 2012 at the Oakland sewage treatment plant.



Oakland, Laney College Near-road (AQS ID pending)

Pollutant, POC	**NO, 1 / NO2, 1**	**CO, 1**	**PM2.5, 3**
Parameter code	42601 / 42602	42101	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Source Oriented	Source Oriented	Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS
Sampling method	TECO 42i	TECO 48i	Met One FEM BAM 1020
Method code	074	054	170
FRM/FEM/ARM/other	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Micro	Micro	Micro
Monitor start date - proposed	01/01/2014 [1]	01/01/2014 [1]	01/01/2014 [1]
Sampling frequency - proposed	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A
Sampling season - proposed	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters) - proposed	2-7 per EPA requirement	2-7 per EPA requirement	2-7 per EPA requirement
Distance from supporting structure (meters)	>1 per EPA requirement	>1 per EPA requirement	>1 per EPA requirement
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	>10 per EPA requirement	>10 per EPA requirement	>10 per EPA requirement
Distance to furnace or incinerator flue (meters)	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (meters)	≥ 270 per EPA requirement	≥ 270 per EPA requirement	≥ 270 per EPA requirement
Probe material for reactive gases	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	< 20 per EPA requirement	< 20 per EPA requirement	N/A
Will there be changes within the next 18 months?	Y – when it starts to operate	Y – when it starts to operate	Y – when it starts to operate
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A
Last Annual Performance Evaluation gaseous parameters	None – not operating yet	None – not operating yet	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	None – not operating yet

1. Without EPA Region 9 approval of sites by August 1, 2013 the monitors will probably not be operating by Jan 1, 2014.

Proposed Near-Road Monitoring Site in in the San Jose-Sunnyvale-Santa Clara CBSA

The Air District is proposing a monitoring location in San Jose within 35 meters of the nearest traffic lane. The proposed site is south of the intersection of Interstates 280 and 680, and US Highway 101 with significant housing and population within a few miles.

The road segment with the highest FE-AADT in Santa Clara County was at Interstate 280 (I-280) and McLaughlin Avenue but this segment was not selected because the freeway along this segment is elevated (not within EPA siting guidelines). The Air District proposed site is only about 0.4 miles east of this segment, with a similar FE-AADT (309,757 verses 294,140) but is at the same level as the freeway thereby making it a better choice. Similarly, the 2nd ranked segment was at I-280 and King Road but, again, the freeway was elevated. This segment is just 0.4 miles east of the proposed monitoring site.

The Air District also considered near-road monitoring along the 3rd ranked segment in this CBSA which is to the north of the Interstate 880 (I-880) and California Highway 237 (the 880/237 Interchange). However, the east side of the freeway within the cloverleaf (open vegetative or dirt areas within the boundary of the roads) would be subject to Caltrans Air Space Lease limitations. The Air District decided against pursuing monitoring on this parcel because Caltrans could require our instruments be shut down and moved at any time. Other areas to the east of I-880 have open land (a wide shoulder) with a large sound wall but there is no safety barrier to protect Air District staff from oncoming traffic and inattentive drivers. In short, the area was deemed unsafe because staff would have to exit and re-enter the freeway along the shoulder and then conduct multi-weekly calibration of the instruments while exposed to traffic. On the opposite side of the freeway the Air District considered siting on the McCarthy Ranch commercial development area. However, similar risks to staff existed and the potential monitoring location was not downwind of the freeway.

Given that the 1st and 2nd ranked segments were in the vicinity of the major cloverleaf 280/680 interchange, and significant safety concerns existed along the 3rd ranked segment, the Air District pursued a monitoring location along the 4th highest segment which was actually closer to the cloverleaf itself than the 1st and 2nd ranked segments and appeared to be in a much safer location. Air District staff surveyed the area and eventually found Caltrans property that seemed to fit most of the siting criteria (flat level terrain, no obstructions from trees, buildings or sound walls), except that the prevailing winds were not perpendicular to the freeway. This aspect in siting is discussed below.

The prevailing winds show two maximum: one from the northwest and one from the southeast – both are parallel to the proposed road segment to be monitored. Although the Air District would desire a location downwind of the monitored road segment, EPA guidance does not require it. In fact, on page 6513 of the Federal Register (Vol. 75, No. 26) published on February 9, 2010, EPA wrote, “We solicited comment on, but did not propose, having near-road sites located on the predominantly downwind side of the target roadways.”

Naturally, the Air District would desire monitoring downwind of target road-segment but we further note that the targeted road segment is within a major freeway intersection, somewhat of a cloverleaf, with three of the four highest maximum FE-AADT values within ½ mile of

the site and major freeway emissions coming from all directions. Therefore, the Air District concluded that siting downwind of the target segment was a minor consideration and was outweighed by other positive siting factors, including the flatness of the terrain near the site.

Table 31 below is a matrix of siting details of the proposed site in San Jose. Figure 21, Figure 22, and Figure 23, show the location of the proposed Knox Avenue site at various scales. Figure 25 is a wind rose diagram showing the prevailing winds at the San Jose Airport meteorological site in 2012. The meteorological site is 2-3 miles northwest of the proposed near-road monitoring site in San Jose. The prevailing winds overlaid with the site location are shown in Figure 24.

The Air District, with Region 9 approval, plans to monitor NO_2, CO, and $PM_{2.5}$ at this location. The Air District will also monitor Ultrafine Particulate (UFP) and toxics if resources allow.

Table 31. Siting Matrix for the Near-Road Monitoring Site in San Jose.

Site/Segment Parameters	Description of Parameter	Candidate #1	Candidate #2	Candidate #3	Candidate #4
					PROPOSED BAAQMD SITE; San Jose-Sunnyvale-Santa Clara CBSA
Location	*Describe if the entry is for a specific point along a road segment or if the entry is representative of a whole road segment. If the entry is for a point, provide a moniker and the latitude and longitude. If for a road segment, identify where the segment boundaries occur (e.g. intersection, mile marker, political boundary, etc.).*	Road Segment; Rt 280 MCLAUGHLIN AVENUE - postmile 0.366	Road Segment; Rt 680 SAN JOSE, KING ROAD - post mile 0.385	Road Segment; Rt 880 JCT. RTE. 237 - post mile 8.422	Point: - **1007 Knox Ave. San Jose** This location is representative of contiguous road segments from post mile 34.87 Junction Route 280W at I-101 to post mile 35.759 SAN JOSE, JCT. RTE. 130 EAST. Located on a Caltrans property construction yard located on the east side of RTE 101. 37°20'17.43"N 121°50'59.42"W This site is at the junction of the first two candidate sites.
Road segment name	*Provide given road name and common name (if applicable).*	MCLAUGHLIN AVENUE	SAN JOSE, KING ROAD	JCT. RTE. 237	SAN JOSE, JCT. RTE. 280 WEST, JCT. RTE.
Road type	*Type of road (controlled access highway, limited access freeway, arterial, etc.).*	Controlled access highway	Controlled access highway	Controlled access highway	Controlled access highway
Road segment end points	*Denote the location of the road segment end points, including any given names, common names, and the latitude and longitude of each individual end point.*	SR-87 / Guadalupe Parkway and Rt 101	Rt-680 / King Rd to US 101	SR-237 / Milpisal Alviso Road / Calaveras Blvd	South end point = I-280/I-680 North/Sacramento/SF/Downtown San (**Exit 385 B** - 37°19'48.09"N, 121°50'32.19"W): North end point = SAN JOSE, JCT. RTE. 130 EAST (**Exit 386 A** - 37°20'50.22"N, 121°51'32.84"W)
AADT	*Provide AADT, source of data, and vintage (year).*	238,000 (Caltrans, 2010)	218,000 (Caltrans, 2010)	200,000 (Caltrans, 2010)	**191,000** (Caltrans, 2010)

Site/Segment Parameters	Description of Parameter	Candidate #1	Candidate #2	Candidate #3	Candidate #4
HD counts	*As available, provide HD counts, source of data, and vintage (year).*	7,973 (Caltrans, 2010)	9,592 (Caltrans, 2010)	11,400 (Caltrans, 2010)	**11,460** (Caltrans, 2010)
FE-AADT	*As available, provide FE-AADT, noting HDm value used. If not the national default value, provide the source of data used to calculate the site-specific value.*	**309,757** (Caltrans, 2010) HDm = 10 (national average)	**304,328** (Caltrans, 2010) HDm = 10 (national average)	**302,600** (Caltrans, 2010) HDm = 10 (national average)	**294,140** (Caltrans, 2010) HDm = 10 (national average)
Congestion information	*Denote value and type (e.g. LOS, or AADT by lane), data source, and vintage (year).*	LOS D: PM, 280 West Bound from 101 to McLaughlin LOS F: AM, 280 West Bound from 101 to McLaughlin LOS C: AM, 280 East Bound McLaughlin to 101 LOS D: PM 280 East Bound McLaughlin to 101 (LOS ratings SCVTA fwy2010_Table) provided by Casey Emoto, <Casey.Emoto@vta.org> 408-321-5564	(LOS ratings SCVTA fwy2010_Table) provided by Casey Emoto, <Casey.Emoto@vta.org> 408-321-5564	(LOS ratings SCVTA fwy2010_Table) provided by Casey Emoto, <Casey.Emoto@vta.org> 408-321-5564	LOS D: PM, North Bound from Tully to Story road **LOS F: AM North Bound Story to 280 LOS F: PM South Bound 280 to Story Rd** LOS C: AM South Bound Story to Tully road (LOS ratings SCVTA fwy2010_Table) provided by Casey Emoto, <Casey.Emoto@vta.org> 408-321-5564
Roadway design	*Denote design type or types present (flat, elevated-fill, cut, etc.). If not flat, identify whether the configuration is a vertical or sloped boundary. Include the height and degree of slope if applicable.*	Flat	Flat	Flat	Flat

Site/Segment Parameters	Description of Parameter	Candidate #1	Candidate #2	Candidate #3	Candidate #4
Terrain	*Denote the nature of the terrain (plain, peak, hillside, valley, etc.) immediately around the road and also any larger scale terrain features of note.*	Gentle at road grade within a larger valley.	Gentle at road grade within a larger valley.	Gentle at road grade within a larger valley.	Gentle at road grade within a larger valley.
Meteorology	*If the entry is for a point, denote the predominate winds and whether the point is relatively upwind or downwind. If the entry is for a whole segment, denote the orientation of the segment to the predominant winds.*	Prevailing winds in this area are northwesterly. Roughly parallel to freeway.	Prevailing winds in this area are northwesterly. Roughly parallel to freeway.	Prevailing winds in this area are northwesterly. Roughly perpendicular to freeway.	Prevailing winds in this area are northwesterly. Roughly crosswind to freeway.
Population exposure	*Denote any assessment of population exposure and/or likeness to other road segments throughout the CBSA.*	Non-unique road segment surrounded by dense housing communities within approximately 0.5 KM to the N and W, with commercial development within 0.5 KM to the S and E.	Non-unique road segment surrounded by dense housing communities within approximately 0.5 KM	Non-unique road segment surrounded by commercial development within approximately 0.5 KM	Non-unique road segment surrounded by dense housing communities within approximately 0.5 KM to the N, NW, NE, E and SE, with commercial development within 0.5 KM to the W.
Safety features	*Denote any safety features present and the height, width, and length.*	None - no site available	None - no site available	None - no site available	None - site located approx 30 meters from traffic lane
Infrastructure	*Denote existing infrastructure (light poles, billboards, etc.) and potential site proximity (distance).*	None - no site available	None - no site available	None - no site available	This property is a Caltrans Yard and Offices. Utilities are available.
Interchanges	*Denote the presence of any interchanges within or at the end points of the target road segment and potential site proximity (distance), including traffic information if available (AADT, HD counts, etc.).*	Road segment is approx 0.6 KM SW of 280, 680, 101 interchange	Road segment is approx 1 KM NE of 280, 680, 101 interchange	Road segment located at the interchange of 880 and 237	Monitoring site located approximately 800 meters east of highest FE-AADT road segment (MCLAUGHLIN AVENUE SJ - 309,757) and 1000 meters west of 2nd highest FE-AADT segment (SAN JOSE, KING ROAD - 304,328).

Site/Segment Parameters	Description of Parameter	Candidate #1	Candidate #2	Candidate #3	Candidate #4
Surrounding land use	*Denote surrounding land use (residential, commercial, etc.). Also note proximity to other large roads, areas of higher relative road density, and/or locations within or near central business districts or urban downtown areas.*	Northern Santa Clara Valley, surrounding land use is mixed commercial and residential. The area is an interchange of major freeways (101, 680 and 280), and has a large airport to the west-northwest.	Northern Santa Clara Valley, surrounding land use is mixed commercial and residential. The area is an interchange of major freeways (101, 680 and 280), and has a large airport to the west-northwest.	Northern Santa Clara Valley, surrounding land use is mixed commercial and residential. The area is an interchange of major freeways (237 and 880).	Northern Santa Clara Valley, surrounding land use is mixed commercial and residential. The area is an interchange of major freeways (101, 680 and 280), and has a large airport just to the west-northwest.
Nearby sources	*If applicable, note nearby NO_X sources (type, tonnage, etc.) and potential site proximity (distance).*	Vehicle sources dominate in this area. Road segment located approximately 0.8 KM west of 3rd highest FE-AADT road segment (SAN JOSE, JCT. RTE. 280 WEST, JCT. RTE.-294,140) and 2 KM west of 2nd highest FE-AADT segment (SAN JOSE, KING ROAD - 304,328).	Vehicle sources dominate in this area. Road segment located approximately 1 KM east of 3rd highest FE-AADT road segment (SAN JOSE, JCT. RTE. 280 WEST, JCT. RTE.-294,140) and KM east of highest FE-AADT (MCLAUGHLIN AVENUE SJ - 309,757)	Vehicle sources dominate in this area	Vehicle sources dominate in this area. Monitoring site located approximately 800 meters east of highest FE-AADT road segment (MCLAUGHLIN AVENUE SJ - 309,757) and 1000 meters west of 2nd highest FE-AADT segment (SAN JOSE, KING ROAD - 304,328).

Site/Segment Parameters	Description of Parameter	Candidate #1	Candidate #2	Candidate #3	Candidate #4
Current road construction	*Denote any visible or known road construction at the candidate site location or along the target road segment.*	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#santaclara	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#santaclara	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#santaclara	**Project Location - South of Monitoring Site:** Santa Clara County on U.S. 101 from Story Road to Tully Road overcrossing in San Jose. **Project Scope:** Construction one Additional lane on southbound U.S. 101 from Story Road and modify the interchange at Tully Road to a partial cloverleaf, and replace the existing Tully Road overcrossing. **Schedule:** The project is expected to start in November 2010. The project is scheduled to finish in winter 2012. http://www.dot.ca.gov/dist4/projects_list.htm#santaclara
Future road construction	*If known, denote transportation agency plans for any future road construction (including time frame for completion).*	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#santaclara	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#santaclara	None noted at http://www.dot.ca.gov/dist4/projects_list.htm#santaclara	No major construction anticipated for next 10 years.
Frontage roads	*Denote the presence of frontage roads, and whether those roads are included as part of the target road segment.*	No frontage road present.	No frontage road present.	No frontage road present.	No frontage road present.
Available space – site footprint	*Denote any limitations in the space available for a multipollutant monitoring station.*	None - no site available	None - no site available	None - no site available	Preliminary agreement for 10' x 20' shelter location on property has been reached with Caltrans. Adequate space is available
Property type	*Is it right-of-way (ROW) or private property?*	None - no site available	None - no site available	None - no site available	Caltrans Maintenance area/Office
Property owner	*Who manages or owns the property under evaluation?*	None - no site available	None - no site available	None - no site available	Caltrans

Site/Segment Parameters	Description of Parameter	Candidate #1	Candidate #2	Candidate #3	Candidate #4
Likelihood of access	*Note the level of confidence and any uncertainties regarding the acquisition of access to a particular property.*	None - no site available	None - no site available	None - no site available	Owner willing to establish property access agreement.
Other details/local knowledge	*List any other pertinent details that may have bearing on why a particular candidate site may or may not be selected. This can include information that reflects a state or local agencies' own knowledge of the area or roads under consideration.*	None - no site available	None - no site available	None - no site available	Monitoring site located east of highest FE-AADT road segment (MCLAUGHLIN AVENUE SJ - 309,757) and west of 2nd highest FE-AADT segment (SAN JOSE, KING ROAD - 304,328).

Figure 21. Proposed near-road air monitoring site in San Jose near the intersection of Interstate 280/680 and Highway 101.

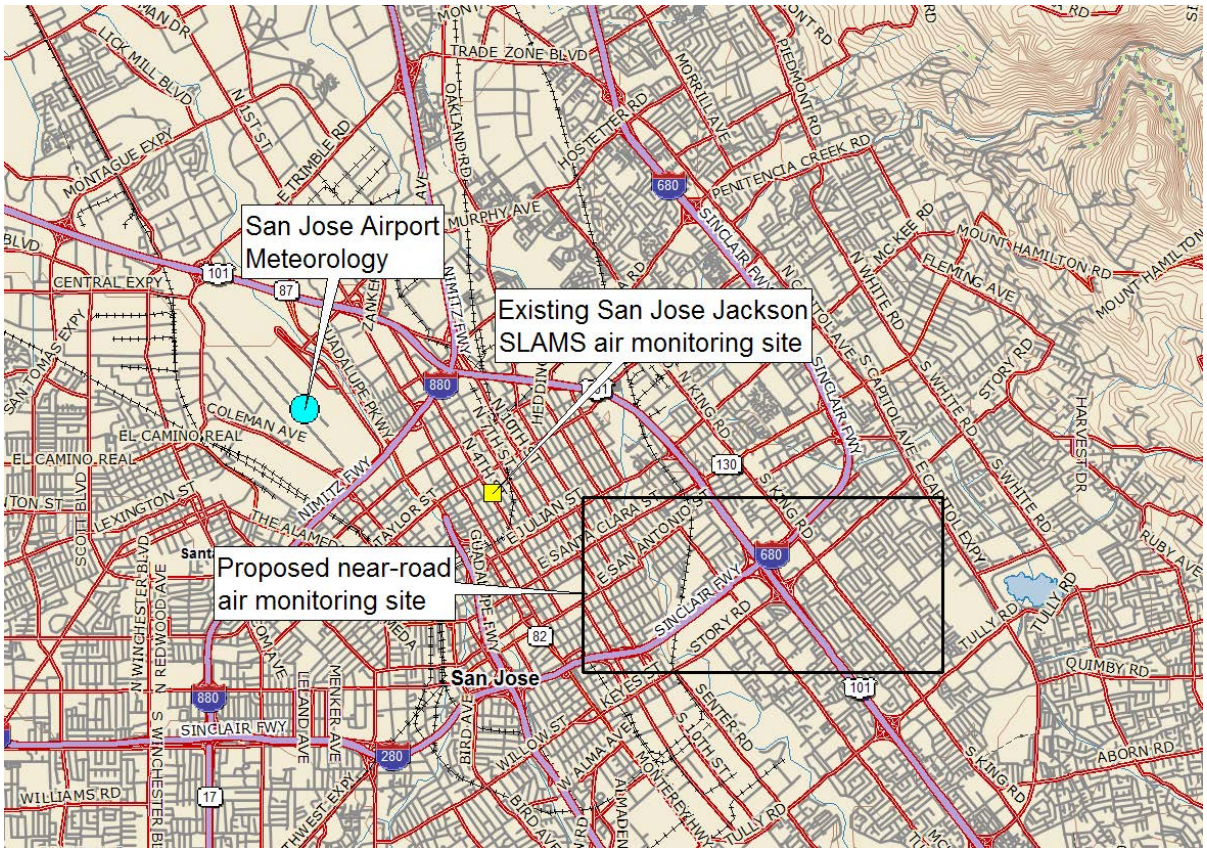


Figure 22. Neighborhood view of proposed near-road air monitoring site in San Jose near the intersection of Interstate 280/680 and Highway 101

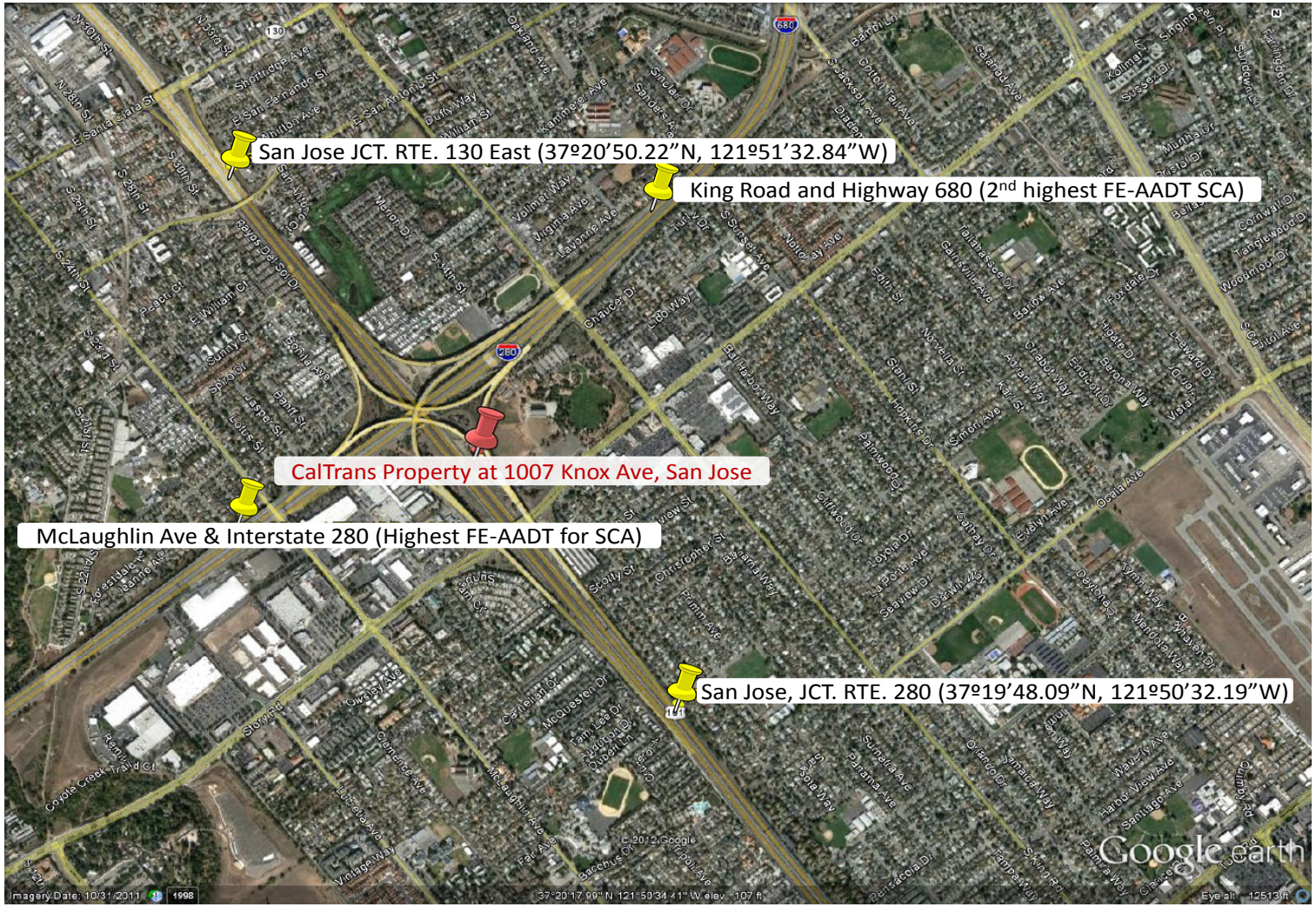


Figure 23. Close up view of proposed near-road air monitoring site in San Jose near the intersection of Interstate 280/680 and Highway 101 (as sent to Region 9)

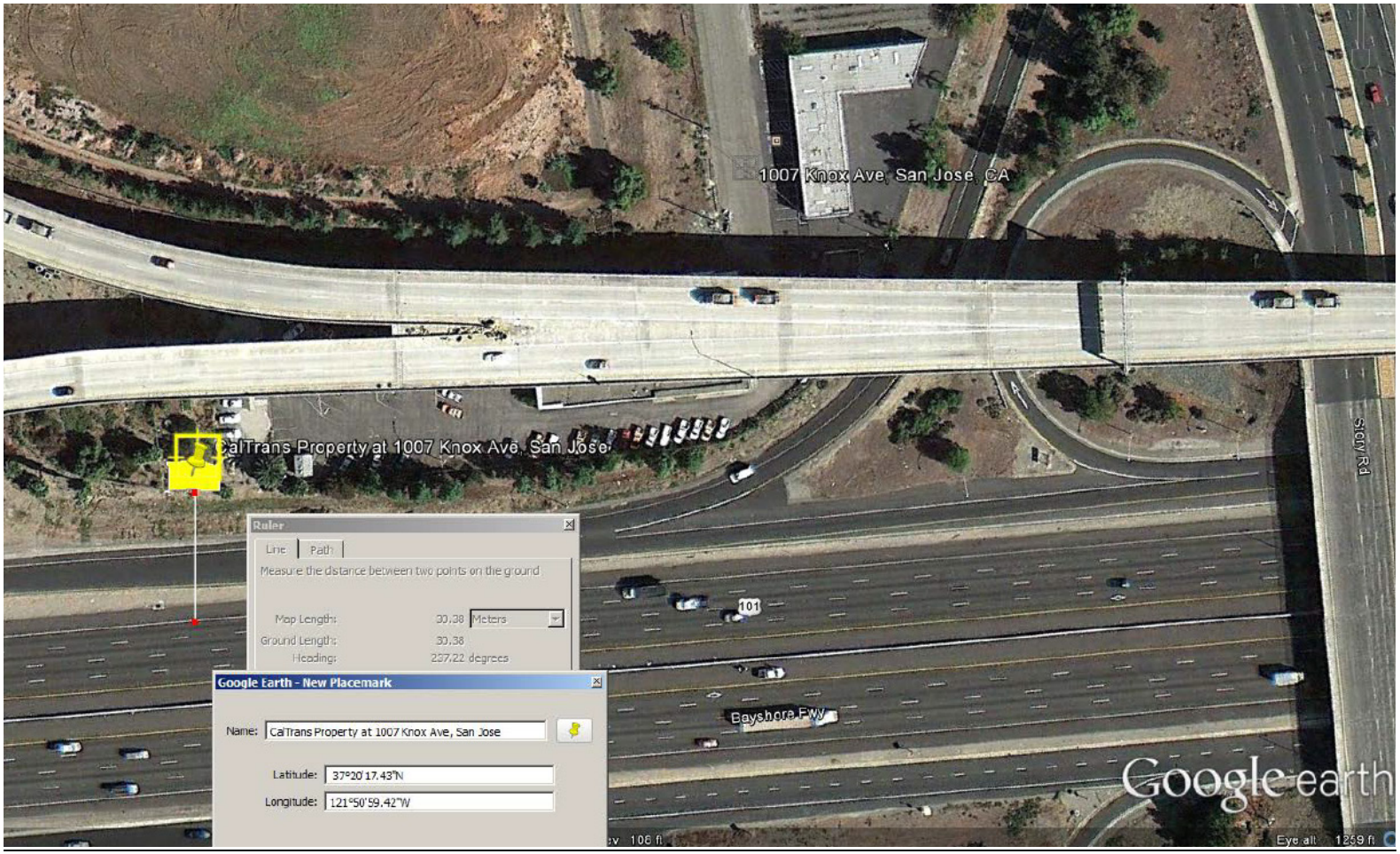
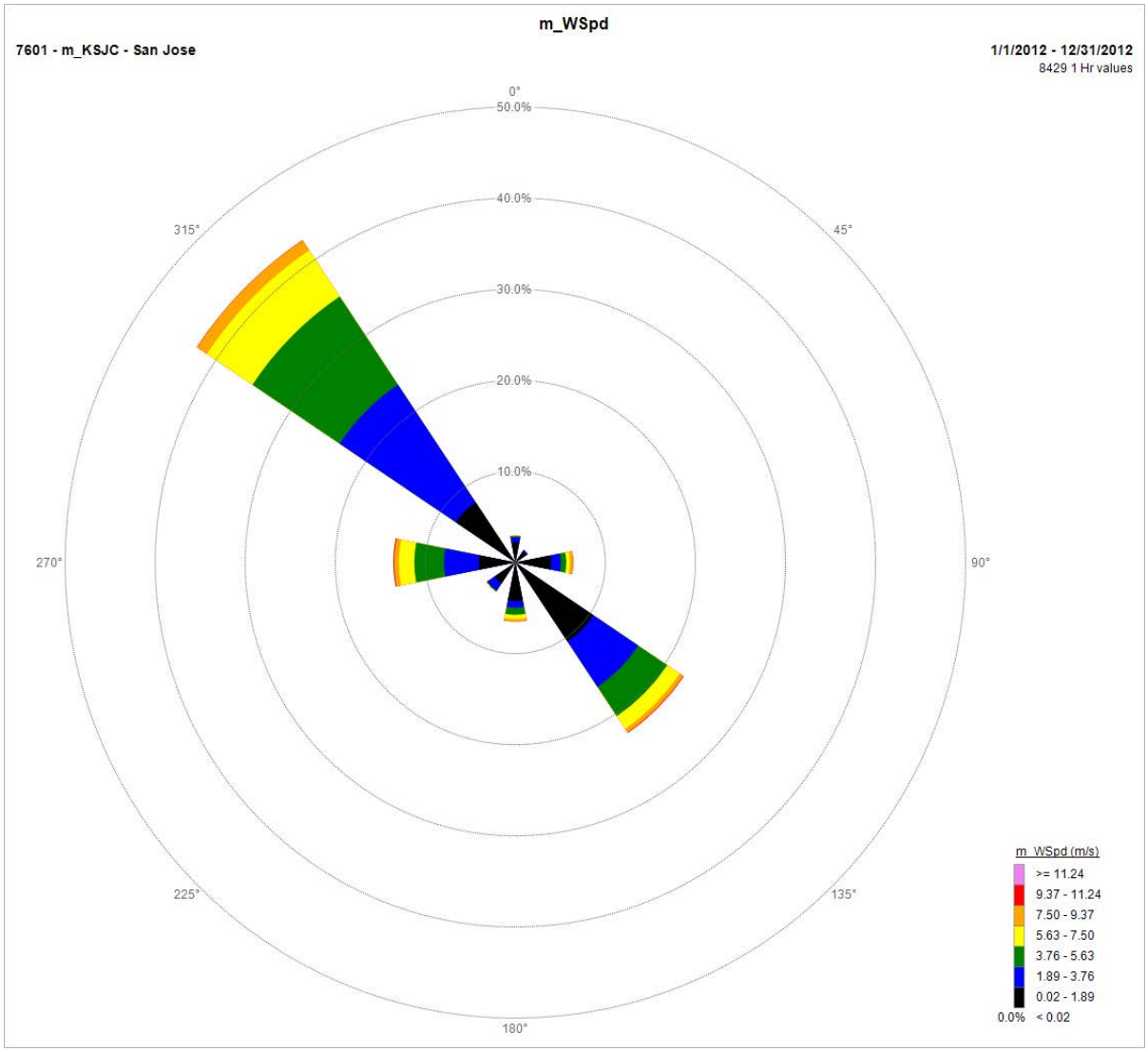


Figure 24. Site and Wind rose (supplemental, not sent to Region 9) showing prevailing winds superimposed on site location showing prevailing winds are parallel to the freeway near the proposed monitoring site.

Figure 25. Wind rose for 2012 at the San Jose Airport.



San Jose, Knox Avenue Near-road (AQS ID pending)

Pollutant, POC	**NO, 1 / NO2, 1**	**CO, 1**	**PM2.5, 3**
Parameter code	42601 / 42602	42101	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Source Oriented	Source Oriented	Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS
Sampling method	TECO 42i	TECO 48i	Met One FEM BAM 1020
Method code	074	054	170
FRM/FEM/ARM/other	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Micro	Micro	Micro
Monitor start date - proposed	01/01/2014 [1]	01/01/2014 [1]	01/01/2014 [1]
Sampling frequency - proposed	Continuous	Continuous	Continuous
Calculated sampling frequency	N/A	N/A	N/A
Sampling season - proposed	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters) - proposed	2-7 per EPA requirement	2-7 per EPA requirement	2-7 per EPA requirement
Distance from supporting structure (meters)	>1 per EPA requirement	>1 per EPA requirement	>1 per EPA requirement
Distance from obstructions on roof (meters)	None	None	None
Distance from obstructions not on roof (meters)	None	None	None
Distance from trees (meters)	>10 per EPA requirement	>10 per EPA requirement	>10 per EPA requirement
Distance to furnace or incinerator flue (meters)	None	None	None
Distance between collocated monitors (meters)	N/A	N/A	N/A
Unrestricted airflow (meters)	≥ 270 per EPA requirement	≥ 270 per EPA requirement	≥ 270 per EPA requirement
Probe material for reactive gases	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	< 20 per EPA requirement	< 20 per EPA requirement	N/A
Will there be changes within the next 18 months?	Y – when it starts to operate	Y – when it starts to operate	Y – when it starts to operate
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A
Last Annual Performance Evaluation gaseous parameters	None – not operating yet	None – not operating yet	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	None – not operating yet

1. Without EPA Region 9 approval of sites by August 1, 2013 the monitors will probably not be operating by Jan 1, 2014.

Final Approval Request and Summary of the three proposed sites

Collectively the three proposed sites for near-road air monitoring will meet the minimum monitoring requirements in 40 CFR Part 58. Additionally, the Air District plans to monitor Ultrafine Particles (UFP) and, depending on funding and staff resource availability, toxics monitoring at the three near-road monitoring sites.

The Air District requested approval of the three near-road air monitoring sites by EPA Region 9. The Air District reaffirms its request for approval of all three sites for near-road monitoring sites at this time, for NO_2, CO, and $PM_{2.5}$.

EPA Region 9 approval letter and attached checklist for near-road monitoring sites.

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

MAY 14 2013

Mr. Eric Stevenson
Director of Technical Services
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

Dear Mr. Stevenson:

The U.S. Environmental Protection Agency (EPA) received the Bay Area Air Quality Management District's (BAAQMD) letter dated April 23, 2013, containing information about BAAQMD's proposed near-roadway nitrogen dioxide (NO_2) monitoring sites and requesting approval or specific guidance on what is needed for approval. We have reviewed the matrix, as well as the windroses and maps showing the proposed locations for the following three sites: 1) the Laney College site near Fallon Street and East 8th Street, Oakland, as one NO_2 near-roadway site within the San Francisco-Oakland-Fremont Core Based Statistical Area (CBSA), 2) the I-80 Bike Bridge site near 1 Bolivar, Berkeley, as a second site within the San Francisco-Oakland-Fremont CBSA, and 3) the CalTrans Property site near 1007 Knox Avenue, San Jose, for the San Jose-Sunnyvale-Santa Clara CBSA's NO_2 near-roadway site. Assuming that the finalized sites are accurately characterized by the information provided in the letter's attachments and meet all of the applicable 40 CFR Part 58 criteria, including the requirements for public review and comment, we expect that we will be able to approve these three sites as BAAQMD's NO_2 near-roadway sites.

Prior to final submittal to EPA, a plan describing the near-roadway site selections must be made available to the public for comment. The final submittal to EPA should forward any comments received and responses to the comments. We encourage BAAQMD to include additional narrative when developing a document for the public, such as a summary of BAAQMD's extensive efforts to find these specific locations. Typical annual network plan information such as monitoring operation schedule, monitoring objective, and spatial scale of representativeness would also provide a more complete picture to the public. For your reference, we are attaching preliminary draft review checklists for each of your proposed near-roadway sites. These further articulate the elements that may be included in a plan for public review and EPA approval. We have also included guidance (Table 4-2 and paragraph 13.2) from EPA's *Near-road NO_2 Monitoring Technical Assistance Document* (TAD), EPA-454/B-12-002, June 2012.

Thank you for your work on the near-roadway NO_2 network. For over a year, BAAQMD has made extensive efforts to find the most suitable sites. We appreciate your diligence and perseverance in finding the best possible, implementable site.

If you have any questions regarding this letter or the enclosed comments, please feel free to contact me at (415) 972-3851 or Gwen Yoshimura of my staff at (415) 947-4134.

Sincerely,

Matthew Lakin, Manager
Air Quality Analysis Office

Enclosures:

A. R9 Near-road NO_2 Plan review checklist – Laney College
B. R9 Near-road NO_2 Plan review checklist – I-80 Bike Bridge
C. R9 Near-road NO_2 Plan review checklist – San Jose Caltrans Yard

cc: Glen Colwell, BAAQMD

Attachment A
R9 Near-road NO_2 Plan review checklist-
May 1, 2013 preliminary review of information received April 30, 2013

Agency: BAAQMD
Site(s): Laney College

This checklist is intended to clarify those elements that EPA will be looking for during the review of proposed near-road NO_2 sites. Please note that this checklist summarizes near-road NO_2 site requirements of 40 CFR Part 58, but does not substitute for those requirements, nor do its contents provide a binding determination of compliance with those requirements. The checklist is subject to revision in the future and we welcome comments on its contents and structure.

COMPLETENESS CHECK: Based on 40 CFR 58 requirements.

Network Plan requirements (40 CFR 58.10)-				
Near-road NO2 plan requirement	**Citation**	**Info submitted?[1] If yes, page #s.**	**Requirement met?[2]**	**Notes**
A plan (submitted by July 1, 2013) for establishing near-road NO2 monitoring site(s)	40 CFR 58.10(a)(5)	Yes	Insufficient	Plan should include checklist items below, as applicable, and go through public comment.
Evidence of public comment on proposed site(s), no changes subsequent to proposal, and submittal of any received comments	40 CFR 58.10(a)(2)	No	Insufficient	Please complete prior to final submittal.
Anticipated operation start date	40 CFR 58.10(a)(5)	No	Insufficient	Please include this information in the final submittal.
AQS site identification number	40 CFR 58.10(b)(1)	No	Insufficient	Please include this information in the final submittal if available.
Location (street address & geographical coordinates)	40 CFR 58.10(b)(2)	Yes	Yes	
Sampling and analysis method (method code)	40 CFR 58.10(b)(3)	No	Insufficient	Please include this information in the final submittal.
Operation Schedule (Season & sampling frequency)	40 CFR 58.10(b)(4)	No	Insufficient	Please include this information in the final submittal.
Any proposal to remove or move the monitor within a period of 18 months following plan submittal	40 CFR 58.10(b)(5)	Yes	Yes	
Monitoring objective & spatial scale of representativeness	40 CFR 58.10(b)(6)	No	Insufficient	Please include this information in the final submittal.
CBSA represented by the monitor	40 CFR 58.10(b)(8)	Yes	Yes	

[1] Response options: N/A (Not Applicable), Yes, No, Incomplete, Incorrect. The responses "Incomplete" and "Incorrect" assume that some information has been provided.
[2] Response options: N/A (Not Applicable) – [reason], Yes, No, Insufficient to Judge. Assumes information submitted is correct.

Network Design criteria requirements (40 CFR 58, Appendix D, 4.3.2)				
CBSA population & year	40 CFR 58, App.D 4.3.2(a)	No	insufficient	Although this information was not submitted in the matrix, this information is included in Bay Area AQMD's annual network plan.
Maximum AADT counts & year for the CBSA(s)	40 CFR 58, App.D 4.3.2(a)	Yes	Yes	
Correct # of required near-road NO2 monitors for the CBSA(s)	40 CFR 58, App.D 4.3.2(a)	Yes	Yes	
Were all road segments within the CBSA ranked by AADT?	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend including statement clarifying all road segments were ranked.
Discussion of how fleet mix is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Discussion of how roadway design is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend including narrative in plan discussing the desirability of roadway design near where the monitor will be placed.
Discussion of how congestion is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Most congested in Bay Area
Discussion of how terrain is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend including narrative in plan discussing the desirability of terrain near where the monitor will be placed.
Discussion of how meteorology is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
After above factors considered, if multiple candidate sites where max concentrations expected: Discussion of how population exposure is considered?	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Where the site proposed is the 2nd in the CBSA: Discussion of differing factors compared to first site (i.e. fleet mix; congestion; terrain; geographic area within CBSA; or different route, interstate, or freeway designation).	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend including narrative in plan expanding on different factors considered compared to other site in CBSA.

Siting criteria requirements (40 CFR 58, Appendix E)-				
Distance from target road segment as near as practicable (TAD recommendation is within 20 meters) & no more than 50 meters?	40 CFR 58, App.E 6.4(a)	No	Insufficient	Please include this information in the final submittal.
Vertical inlet placement between 2-7 meters?	40 CFR 58, App.E 2	No	Insufficient	Please include this information in the final submittal.
Probe distance from supporting structures is at least 1 meter away vertically and horizontally?	40 CFR 58, App.E 2	No	Insufficient	Please include this information in the final submittal.
Is air flow unobstructed between the probe and the outside nearest edge of the targeted road segment?	40 CFR 58, App.E 6.4(a)	No	Insufficient	Please include this information in the final submittal.

SUPPORTING/ADDITIONAL INFORMATION: Based on Near-road NO2 monitoring TAD and experience.

Check	Included (y/n)	Notes
FE-AADT rank of road segment selected?	Y	#2 rank
If top FE-AADT segment not selected, is justification provided for higher ranks not selected?	N	Recommend including narrative in plan expanding on why top FE-AADT segment not selected.
If similar top FE-AADT sites, was most congested segment selected?	Y	#2 most congested 880 segment selected.
Is candidate site selected downwind of target road segment?	Y	
Are wind roses included to show predominant wind patterns?	Y	
Are physical attributes (roadway design, roadside structures, or terrain) desirable? (see Table 4-2 of Near-road NO_2 TAD included below)	Y	Recommend including narrative in plan expanding on desirability of physical attributes.
If applicable, was population exposure considered as an additional factor?	Y	
Will this be a multi-pollutant site? If so, list additional parameters planned.	N	Recommend clarifying other pollutants that may be installed at site.
Is proposed site in a "unique" location? (See Near-road NO_2 TAD section 13.2 included below)	Y	Not unique location

Table 4-2. Summary of physical considerations for candidate near-road sites.

Physical Site Component	Impact on Site Selection	Desirable Attributes	Least Desirable Attributes	Potential Information Sources
Roadway design or configuration	Feasibility of monitor placements; affects pollutant transport and dispersion.	At-grade or nearly at-grade with immediate surrounding terrain.	Deep cut-sections/significantly below grade; significantly above grade (fill or bridge); above grade (bridge).	Field reconnaissance; satellite imagery
Roadside Structures	Feasibility of monitor placement; affects pollutant transport and dispersion.	present other than low (<2 m in height) vegetation or safety features such as guardrails.	Presence of sound walls, mature (high and thick) vegetation, obstructive buildings.	Field reconnaissance; satellite imagery
Terrain	Affects pollutant dispersion, local atmospheric stability.	Flat or gentle terrain, within a valley, or along a road grade.	Along mountain ridges or peaks, hillsides, or other naturally windswept areas.	Field reconnaissance; digital elevation models and vegetation files; satellite imagery.
Meteorology	Affects pollutant transport and dispersion.	Relative downwind locations; winds from road to monitor.	Strongly predominant upwind positions.	Local data; National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS); EPA's Air Quality System (AQS).

13.2 Unique Locations and Background Source Influences

In the evaluation process, state and local air agencies may encounter situations where certain road segments of interest have characteristics that make the location a unique near-road location that has elevated pollutant concentrations. In such cases, the pollutant concentrations are not representative of other near-road locations across the CBSA. The unique characteristics of these locations could be due to the close proximity of a substantial stationary source, non-road mobile sources, or roadway design features (such as tunnel entrances and exits or toll plazas). In situations where a state or local air agency has a choice between road segments that otherwise have similar potential for peak NO2 concentrations, the air agencies should place a higher weight on sites that are most influenced by typical roadway activity rather than those that are heavily influenced by unique sources or features. This approach increases the probability that the chosen site can represent a larger population exposure within and across CBSAs.

The EPA recognizes that state and local air agencies will likely have a good understanding of whether candidate near-road NO2 monitoring sites have unique characteristics that do or do not represent the CBSA that those sites are within. The EPA encourages state and local air agencies to use their local knowledge in site selection and to engage the EPA Regional staff for assistance in evaluating such a situation as necessary.

Attachment B
R9 Near-road NO_2 Plan review checklist
May 1, 2013 preliminary review of information received April 30, 2013

Agency: BAAQMD
Site(s): I-80 Bike Bridge

This checklist is intended to clarify those elements that EPA will be looking for during the review of proposed near-road NO_2 sites. Please note that this checklist summarizes near-road NO_2 site requirements of 40 CFR Part 58, but does not substitute for those requirements, nor do its contents provide a binding determination of compliance with those requirements. The checklist is subject to revision in the future and we welcome comments on its contents and structure.

COMPLETENESS CHECK: Based on 40 CFR 58 requirements.

Network Plan requirements (40 CFR 58.10)- Near-road NO2 plan requirement	Citation	Info submitted?[3] If yes, page #s.	Requirement met?[4]	Notes
A plan (submitted by July 1, 2013) for establishing near-road NO2 monitoring site(s)	40 CFR 58.10(a)(5)	Yes	Insufficient	Plan should include checklist items below, as applicable, and go through public comment.
Evidence of public comment on proposed site(s), no changes subsequent to proposal, and submittal of any received comments	40 CFR 58.10(a)(2)	No	Insufficient	Please complete prior to final submittal.
Anticipated operation start date	40 CFR 58.10(a)(5)	No	Insufficient	Please include this information in the final submittal.
AQS site identification number	40 CFR 58.10(b)(1)	No	Insufficient	Please include this information in the final submittal if available.
Location (street address & geographical coordinates)	40 CFR 58.10(b)(2)	Yes	Yes	
Sampling and analysis method (method code)	40 CFR 58.10(b)(3)	No	Insufficient	Please include this information in the final submittal.
Operation Schedule (Season & sampling frequency)	40 CFR 58.10(b)(4)	No	Insufficient	Please include this information in the final submittal.
Any proposal to remove or move the monitor within a period of 18 months following plan submittal	40 CFR 58.10(b)(5)	Yes	Yes	
Monitoring objective & spatial scale of representativeness	40 CFR 58.10(b)(6)	No	Insufficient	Please include this information in the final submittal.
CBSA represented by the monitor	40 CFR 58.10(b)(8)	Yes	Yes	

[3] Response options: N/A (Not Applicable), Yes, No, Incomplete, Incorrect. The responses "Incomplete" and "Incorrect" assume that some information has been provided.
[4] Response options: N/A (Not Applicable) – [reason], Yes, No, Insufficient to Judge. Assumes information submitted is correct.

Network Design criteria requirements (40 CFR 58, Appendix D, 4.3.2)-				
CBSA population & year	40 CFR 58, App.D 4.3.2(a)	No	insufficient	Although this information was not submitted in the matrix, this information is included in Bay Area AQMD's annual network plan.
Maximum AADT counts & year for the CBSA(s)	40 CFR 58, App.D 4.3.2(a)	Yes	Yes	
Correct # of required near-road NO2 monitors for the CBSA(s)	40 CFR 58, App.D 4.3.2(a)	Yes	Yes	
Were all road segments within the CBSA ranked by AADT?	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend including statement clarifying all road segments were ranked.
Discussion of how fleet mix is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Discussion of how roadway design is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Discussion of how congestion is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	(Most congested in Bay Area)
Discussion of how terrain is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Discussion of how meteorology is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
After above factors considered, if multiple candidate sites where max concentrations expected: Discussion of how population exposure is considered?	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend clarifying if people engage in recreational activities near this site, and how the monitoring data might relate to potential exposure.
Where the site proposed is the 2nd in the CBSA: Discussion of differing factors compared to first site (i.e. fleet mix; congestion; terrain; geographic area within CBSA; or different route, interstate, or freeway designation).	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend including narrative in plan expanding on different factors considered compared to other site in CBSA.

Siting criteria requirements (40 CFR 58, Appendix E)-				
Distance from target road segment as near as practicable (TAD recommendation is within 20 meters) & no more than 50 meters?	40 CFR 58, App.E 6.4(a)	No	Insufficient	Please include this information in the final submittal.
Vertical inlet placement between 2-7 meters?	40 CFR 58, App.E 2	No	Insufficient	Please include this information in the final submittal.
Probe distance from supporting structures is at least 1 meter away vertically and horizontally?	40 CFR 58, App.E 2	No	Insufficient	Please include this information in the final submittal.
Is air flow unobstructed between the probe and the outside nearest edge of the targeted road segment?	40 CFR 58, App.E 6.4(a)	No	Insufficient	Please include this information in the final submittal.

SUPPORTING/ADDITIONAL INFORMATION: Based on Near-road NO2 monitoring TAD and experience.

Check	Included (y/n)	Notes
FE-AADT rank of road segment selected?	Y	Top segment along 80, within top 5 in CBSA.
If top FE-AADT segment not selected, is justification provided for higher ranks not selected?	Y	This is top ranking congested segment. Higher ranking FE-AADT along 880 planned as another site in CBSA. Recommend including more narrative in plan expanding on this.
If similar top FE-AADT sites, was most congested segment selected?	Y	
Is candidate site selected downwind of target road segment?	Y	
Are wind roses included to show predominant wind patterns?	Y	
Are physical attributes (roadway design, roadside structures, or terrain) desirable? (see Table 4-2 of Near-road NO_2 TAD included below)	Y	Recommend including narrative in plan expanding on desirability of physical attributes.
If applicable, was population exposure considered as an additional factor?	Y	
Will this be a multi-pollutant site? If so, list additional parameters planned.	N	Recommend clarifying other pollutants that may be installed at site.
Is proposed site in a "unique" location? (See Near-road NO_2 TAD section 13.2 included below)	Y	Not unique location

Table 4-2. Summary of physical considerations for candidate near-road sites.

Physical Site Component	Impact on Site Selection	Desirable Attributes	Least Desirable Attributes	Potential Information Sources
Roadway design or configuration	Feasibility of monitor placements; affects pollutant transport and dispersion.	At-grade or nearly at-grade with immediate surrounding terrain.	Deep cut-sections/significantly below grade; significantly above grade (fill or bridge); above grade (bridge).	Field reconnaissance; satellite imagery
Roadside Structures	Feasibility of monitor placement; affects pollutant transport and dispersion.	present other than low (<2 m in height) vegetation or safety features such as guardrails.	Presence of sound walls, mature (high and thick) vegetation, obstructive buildings.	Field reconnaissance; satellite imagery
Terrain	Affects pollutant dispersion, local atmospheric stability.	Flat or gentle terrain, within a valley, or along a road grade.	Along mountain ridges or peaks, hillsides, or other naturally windswept areas.	Field reconnaissance; digital elevation models and vegetation files; satellite imagery.
Meteorology	Affects pollutant transport and dispersion.	Relative downwind locations; winds from road to monitor.	Strongly predominant upwind positions.	Local data;.National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS); EPA's Air Quality System (AQS).

13.2 Unique Locations and Background Source Influences

In the evaluation process, state and local air agencies may encounter situations where certain road segments of interest have characteristics that make the location a unique near-road location that has elevated pollutant concentrations. In such cases, the pollutant concentrations are not representative of other near-road locations across the CBSA. The unique characteristics of these locations could be due to the close proximity of a substantial stationary source, non-road mobile sources, or roadway design features (such as tunnel entrances and exits or toll plazas). In situations where a state or local air agency has a choice between road segments that otherwise have similar potential for peak NO2 concentrations, the air agencies should place a higher weight on sites that are most influenced by typical roadway activity rather than those that are heavily influenced by unique sources or features. This approach increases the probability that the chosen site can represent a larger population exposure within and across CBSAs.

The EPA recognizes that state and local air agencies will likely have a good understanding of whether candidate near-road NO2 monitoring sites have unique characteristics that do or do not represent the CBSA that those sites are within. The EPA encourages state and local air agencies to use their local knowledge in site selection and to engage the EPA Regional staff for assistance in evaluating such a situation as necessary.

Attachment C
R9 Near-road NO_2 Plan review checklist-
May 1, 2013 preliminary review of information received April 30, 2013

Agency: BAAQMD
Site(s): San Jose Caltrans Yard

This checklist is intended to clarify those elements that EPA will be looking for during the review of proposed near-road NO_2 sites. Please note that this checklist summarizes near-road NO_2 site requirements of 40 CFR Part 58, but does not substitute for those requirements, nor do its contents provide a binding determination of compliance with those requirements. The checklist is subject to revision in the future and we welcome comments on its contents and structure.

COMPLETENESS CHECK: Based on 40 CFR 58 requirements.

Network Plan requirements (40 CFR 58.10)-				
Near-road NO2 plan requirement	**Citation**	**Info submitted?[5] If yes, page #s.**	**Requirement met?[6]**	**Notes**
A plan (submitted by July 1, 2013) for establishing near-road NO2 monitoring site(s)	40 CFR 58.10(a)(5)	Yes	Insufficient	Plan should include checklist items below, as applicable, and go through public comment.
Evidence of public comment on proposed site(s), no changes subsequent to proposal, and submittal of any received comments	40 CFR 58.10(a)(2)	No	Insufficient	Please complete prior to final submittal.
Anticipated operation start date	40 CFR 58.10(a)(5)	No	Insufficient	Please include this information in the final submittal.
AQS site identification number	40 CFR 58.10(b)(1)	No	Insufficient	Please include this information in the final submittal if available.
Location (street address & geographical coordinates)	40 CFR 58.10(b)(2)	Yes	Yes	
Sampling and analysis method (method code)	40 CFR 58.10(b)(3)	No	Insufficient	Please include this information in the final submittal.
Operation Schedule (Season & sampling frequency)	40 CFR 58.10(b)(4)	No	Insufficient	Please include this information in the final submittal.
Any proposal to remove or move the monitor within a period of 18 months following plan submittal	40 CFR 58.10(b)(5)	Yes	Yes	
Monitoring objective & spatial scale of representativeness	40 CFR 58.10(b)(6)	No	Insufficient	Please include this information in the final submittal.

[5] Response options: N/A (Not Applicable), Yes, No, Incomplete, Incorrect. The responses "Incomplete" and "Incorrect" assume that some information has been provided.
[6] Response options: N/A (Not Applicable) – [reason], Yes, No, Insufficient to Judge. Assumes information submitted is correct.

CBSA represented by the monitor	40 CFR 58.10(b)(8)	Yes	Yes	

Network Design criteria requirements (40 CFR 58, Appendix D, 4.3.2)-				
CBSA population & year	40 CFR 58, App.D 4.3.2(a)	No	insufficient	Although this information was not submitted in the matrix, this information is included in Bay Area AQMD's annual network plan.
Maximum AADT counts & year for the CBSA(s)	40 CFR 58, App.D 4.3.2(a)	Yes	Yes	
Correct # of required near-road NO2 monitors for the CBSA(s)	40 CFR 58, App.D 4.3.2(a)	Yes	Yes	
Were all road segments within the CBSA ranked by AADT?	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Recommend including statement clarifying all road segments were ranked.
Discussion of how fleet mix is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Discussion of how roadway design is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	Please state if an update on "Current Road Construction" is available.
Discussion of how congestion is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Discussion of how terrain is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Discussion of how meteorology is considered	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
After above factors considered, if multiple candidate sites where max concentrations expected: Discussion of how population exposure is considered?	40 CFR 58, App.D 4.3.2(a)(1)	Yes	Yes	
Where the site proposed is the 2nd in the CBSA: Discussion of differing factors compared to first site (i.e. fleet mix; congestion; terrain; geographic area within CBSA; or different route, interstate, or freeway designation).	40 CFR 58, App.D 4.3.2(a)(1)	N/A	N/A- only one site in CBSA currently required	

Siting criteria requirements (40 CFR 58, Appendix E)-				
Distance from target road segment as near as practicable (TAD recommendation is within 20 meters) & no more than 50 meters?	40 CFR 58, App.E 6.4(a)	No	Insufficient	Please include this information in the final submittal.
Vertical inlet placement between 2-7 meters?	40 CFR 58, App.E 2	No	Insufficient	Please include this information in the final submittal.
Probe distance from supporting structures is at least 1 meter away vertically and horizontally?	40 CFR 58, App.E 2	No	Insufficient	Please include this information in the final submittal.
Is air flow unobstructed between the probe and the outside nearest edge of the targeted road segment?	40 CFR 58, App.E 6.4(a)	No	Insufficient	Please include this information in the final submittal.

SUPPORTING/ADDITIONAL INFORMATION: Based on Near-road NO2 monitoring TAD and experience.

Check	Included (y/n)	Notes
FE-AADT rank of road segment selected?	Y	#4 in CBSA
If top FE-AADT segment not selected, is justification provided for higher ranks not selected?	Insufficient	Recommend including narrative in plan expanding on how this site relates to the top three road segments, and why a different location near the top FE-AADT segments was not selected.
If similar top FE-AADT sites, was most congested segment selected?	Y	Segments with level F selected.
Is candidate site selected downwind of target road segment?	Y	Wind patterns appear to be parallel to target road--not most ideal. However, they do appear more perpendicular to 280/101 junction that runs just north. Recommend additional discussion.
Are wind roses included to show predominant wind patterns?	Y	
Are physical attributes (roadway design, roadside structures, or terrain) desirable? (see Table 4-2 of Near-road NO_2 TAD included below)	Y	Recommend including narrative in plan expanding on desirability of physical attributes.
If applicable, was population exposure considered as an additional factor?	Y	
Will this be a multi-pollutant site? If so, list additional parameters planned.	N	Recommend clarifying other pollutants that may be installed at site.
Is proposed site in a "unique" location? (See Near-road NO_2 TAD section 13.2 included below)	Y	Not unique location

Table 4-2. Summary of physical considerations for candidate near-road sites.

Physical Site Component	Impact on Site Selection	Desirable Attributes	Least Desirable Attributes	Potential Information Sources
Roadway design or configuration	Feasibility of monitor placements; affects pollutant transport and dispersion.	At-grade or nearly at-grade with immediate surrounding terrain.	Deep cut-sections/significantly below grade; significantly above grade (fill or bridge); above grade (bridge).	Field reconnaissance; satellite imagery
Roadside Structures	Feasibility of monitor placement; affects pollutant transport and dispersion.	present other than low (<2 m in height) vegetation or safety features such as guardrails.	Presence of sound walls, mature (high and thick) vegetation, obstructive buildings.	Field reconnaissance; satellite imagery
Terrain	Affects pollutant dispersion, local atmospheric stability.	Flat or gentle terrain, within a valley, or along a road grade.	Along mountain ridges or peaks, hillsides, or other naturally windswept areas.	Field reconnaissance; digital elevation models and vegetation files; satellite imagery.
Meteorology	Affects pollutant transport and dispersion.	Relative downwind locations; winds from road to monitor.	Strongly predominant upwind positions.	Local data; National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS); EPA's Air Quality System (AQS).

13.2 Unique Locations and Background Source Influences

In the evaluation process, state and local air agencies may encounter situations where certain road segments of interest have characteristics that make the location a unique near-road location that has elevated pollutant concentrations. In such cases, the pollutant concentrations are not representative of other near-road locations across the CBSA. The unique characteristics of these locations could be due to the close proximity of a substantial stationary source, non-road mobile sources, or roadway design features (such as tunnel entrances and exits or toll plazas). In situations where a state or local air agency has a choice between road segments that otherwise have similar potential for peak NO2 concentrations, the air agencies should place a higher weight on sites that are most influenced by typical roadway activity rather than those that are heavily influenced by unique sources or features. This approach increases the probability that the chosen site can represent a larger population exposure within and across CBSAs.

The EPA recognizes that state and local air agencies will likely have a good understanding of whether candidate near-road NO2 monitoring sites have unique characteristics that do or do not represent the CBSA that those sites are within. The EPA encourages state and local air agencies to use their local knowledge in site selection and to engage the EPA Regional staff for assistance in evaluating such a situation as necessary.

Appendix E. Napa Ozone waiver to define monitor as Neighborhood Scale.

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

February 4, 2013

Matthew Lakin, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Dr. Lakin:

As you know, 40 CFR Part 58 requires that sampling for ozone, as well as other gaseous pollutants, must occur a minimum distance from roadways based on Average Daily Traffic (ADT) counts. In addition, the regulation requires that a minimum number of measurements occur in Core Based Statistical Areas (CBSAs) and be representative of defined spatial scales. These requirements minimize chemical reactions between compounds produced at the roadway and compounds being measured at sampling locations.

As discussed in our Annual Network Report, although the Bay Area Air Quality Management District's (Air District's) ozone measurements in Napa (AQS #06-055-0003-44201-1) do not meet the stated requirements for distance from major roadways as described in 40 CFR Part 58, we believe that the rationale for that requirement are still being met. The attached analysis provides data and makes the case that the measurement of ozone at Napa is not affected by oxides of nitrogen produced at the nearest roadway, and is representative of the spatial Neighborhood scale. As a result, measurements of ozone at this location meet the requirements for State and Local Air Monitoring Stations (SLAMS) ozone monitoring in the Napa CBSA. The Air District is requesting a waiver from the roadway distance requirement to qualify Napa as a representative Neighborhood scale SLAMS ozone monitoring site.

Please contact me if you have any questions or concerns about this request at (415) 749-4695. If you have any questions regarding the attached data or analysis, please contact Mark Stoelting, our Quality Assurance Officer, at (415) 749-4619.

Sincerely,

Eric D. Stevenson
Director of Technical Services

cc: G. Yoshimura
M. Kurpius

939 ELLIS STREET • SAN FRANCISCO CALIFORNIA 94109 • 415.771.6000 • *www.baaqmd.gov*

Napa Ozone Analysis for SLAMS Designation

Prepared by M. Stoelting, Quality Assurance Officer

Problem Context

The primary Bay Air Quality Management District (Air District) Air Monitoring station for the Napa, CA, Core Based Statistical Area (CBSA) is located at 2552 Jefferson St. in Napa. The station is located approximately 1.5 km northwest of downtown Napa and 0.5 km east of Hwy 29, a multi-lane freeway serving the southern part of the Napa Valley (60,000 ADT). The station has existed since March 1, 1972, and is located downwind of the population center during normal wind patterns when maximum pollutant concentrations are expected. Minimum ozone monitoring requirements specified in 40CFR Part 58 Appendix E require one State and Local Monitoring Stations (SLAMS) ozone monitor for the Napa CBSA which is currently located at the Napa station.

Ozone SLAMS monitors must meet Neighborhood scale siting criteria requiring sample collection at minimum distances from roadways (traffic count dependent). The minimum distances from roadways address concerns that vehicular NO_x emissions will scavenge (reduce) maximum ozone concentration measurements. The ozone probe inlet for the Napa station is 15 m east of the nearest traffic lane of Jefferson St., a major road with an Average Daily Traffic (ADT) count of 19,143 (2007). The minimum distance requirement for Napa Neighborhood scale specified in EPA Regulations is 30 m, thereby classifying Napa ozone (and NO_x) monitoring as Middle scale.

Though the Napa ozone monitor location does not strictly meet Neighborhood scale minimum distance requirements, the Air District contends that monitor placement still meets the requirements of Neighborhood scale monitoring and should be considered for SLAMS classification by the EPA Regional office. The supporting arguments are: 1) prevailing wind patterns during periods of high ozone indicate minimal impact on ozone concentrations by Jefferson St. traffic; 2) measurements of collocated NO_x concentrations are very low during high ozone, indicating minimal scavenging chemistry; and, 3) multi-year data indicates mobile NO emissions are continually decreasing as the vehicle fleet modernizes indicating that potential for impacts will continue to decrease over time.

Data Analysis

This narrative provides an analysis in support of Napa ozone SLAMS classification at a Neighborhood scale. Analysis began with suggestions provided by the Region 9 Air Quality Analysis Office:

- Utilizing the past three years of data, look at the four highest days per year (i.e., those days with 8-hr ozone concentrations that would figure into the DV calculation) - 12 days total - and provide diurnal ozone, NO, NO_2, NO_2/NO, wind speed, and wind direction.
- Find some days when the wind is blowing parallel to the road and some days when the wind is blowing perpendicular to the road - provide the same analyses as above.

- Provide some analysis of typical wind patterns during the day (e.g., wind rose for daytime).
- Provide design values for past 5 years.

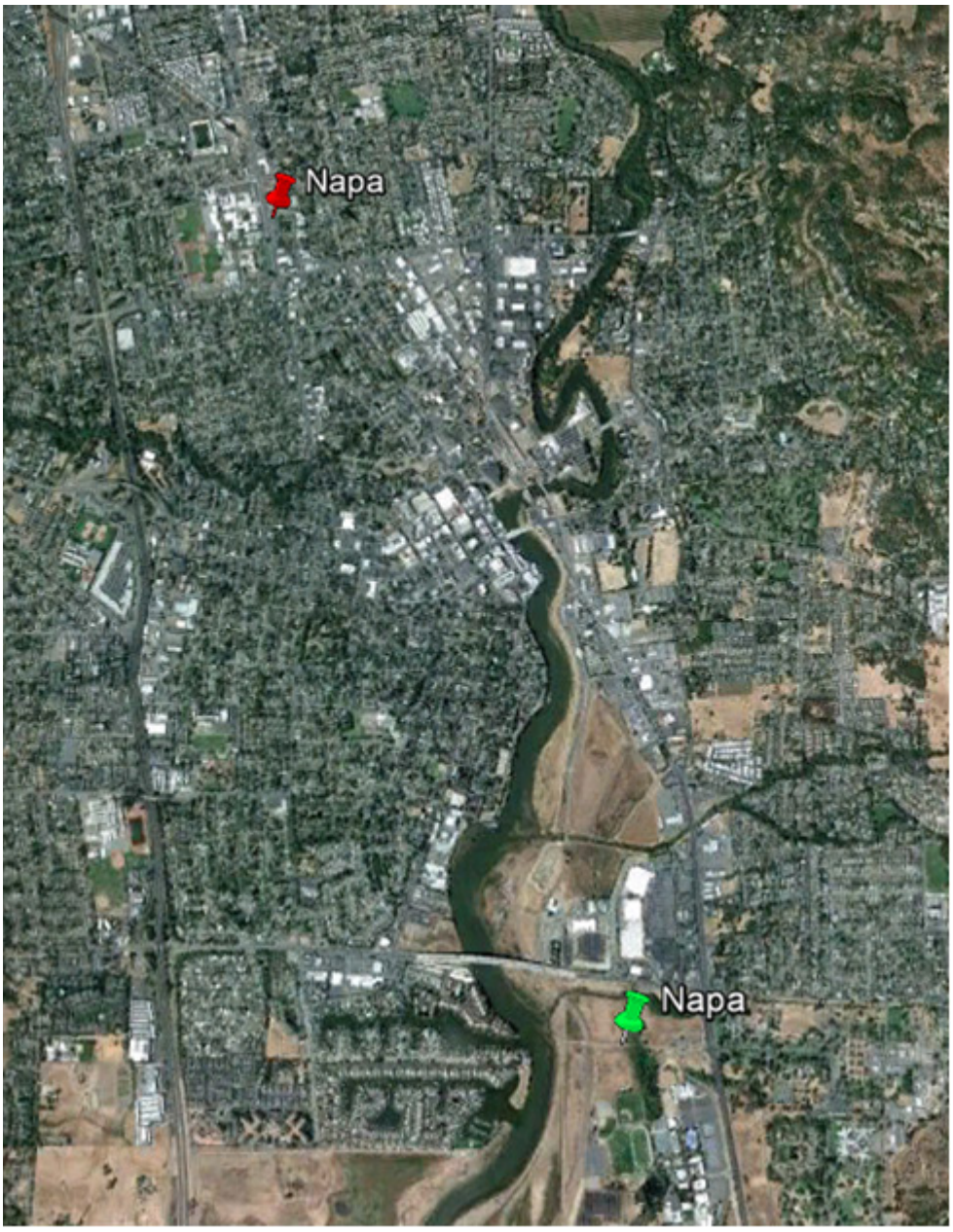
These efforts were augmented with additional NO_x analysis.

The periods of interest include times when 8-hr ozone concentrations have the potential to approach/exceed the National Ambient Air Quality Standards (NAAQS). The facts and constraints on this analysis are:

- Analysis focused on years 2010-12 (attainment determination period); May 1 to October 31, the 184 day period when all high ozone episodes occurred; and the 10 AM through 6 PM hours during which all maximum 8-hr daily values were measured (9 hrs./day, 4,968 hours total)
- Napa met data are available for 4,922 of the 4968 hours under analysis (99.1% completeness)
- The Jefferson St. compass orientation is 348°, so winds from 258° represents a direct crosswind from the street to the gaseous probe inlet
- Distance from the probe inlet to the edge of the nearest Jefferson St. traffic lane is 15 m
- Jefferson St. ADT count is 19,143 (2007)
- Jefferson St. is the predominant NO_x source in the neighborhood around the Napa monitoring station; the bulk of the Napa urban and industrial area lies to the south, typically upwind of the station during periods of elevated ozone concentrations
- To meet neighborhood scale monitoring criteria for ozone, probe must be 30 m from the edge of the nearest traffic lane, as grandfathered in for ozone sites approved before December 18, 2006 (40CFR Pt. 58 as amended); the Napa monitoring station was established on March 1, 1972
- The effective distance from Jefferson St. exceeds 30 m when winds are more than 60° from perpendicular ($\cos^{-1}(15/30) = 60°$); therefore winds in a 120° arc from 198° through 317° are 'crossing winds' of interest (see analysis below)
- 1,430 hours of crossing winds exist (28.7%) at ±60° from 258°
- Winds from 10 AM through 6 PM were examined to select only those days with 75% of the hours (>6 of 9) within the crossing winds arc; 85 days met this criteria, or about 28 days each year
- To select maximum impact, only days with average wind direction (WD) ±15° from 258° were chosen from this group, further reducing the sample to 11 days.
- To select parallel winds, hours within ±20° of 348° and 158° were selected; 843 hours (17.1%) met this parallel wind condition
- Winds from 10 AM through 6 PM were examined to select only those days with 100% of the hours within 20° parallel to Jefferson St.; 83 days met this criteria, or about 28 days each year
- to further refine representative parallel wind days, only days with average WD±7° from 348° Jefferson St axis were used, further reducing the sample to 11 days

Meteorological data used for the Napa analysis was measured at the Air District's Napa met site (green pin on the following map) located 4 Km at 156° from the Air Monitoring Station

(red pin on the following map). District meteorologists believe that the meteorological data is representative of regional conditions in the southern Napa Valley including the city of Napa and the Air Monitoring Station. This region of the valley is bounded on the east and west by ranges of low mountains that tend to channel valley air flow in a north/south direction.



Prevailing Wind Patterns

To establish prevailing, daytime wind patterns when ozone exceedances are most likely to occur, a wind rose was constructed using almost 5,000 hours of data from years 2010-12, May 1 to October 31, and from 10AM through 6PM (9 hours/day). The **Prevailing winds.pdf** wind rose shows a strong southerly wind pattern expected with afternoon, up-

valley winds driven by typical onshore coastal sea breezes. Air from the more heavily populated Bay Area moves north across the city of Napa before crossing the monitoring station northwest of downtown.

Highest ozone days

The four highest ozone days for each of the 2010-12 years were identified and diurnal data assembled as noted above in the Excel workbook file **max 8-hr ozone.xlsx**. A wind rose **HiO3 rose 2010-12.pdf** shows winds measured during these 12 events, 96 hours total (8 hours X 12 days). The orientation of Jefferson St. is 348° as indicated on the wind rose. The effective distance of the probe from Jefferson St., d_{eff}, varies as the inverse sine of the angle between Jefferson and the wind (Θ): $d_{eff} = 15 \text{ m} / \sin \Theta$. With direct crosswinds to Jefferson, sin(90)=1 and the effective distance to road is 15 m. At $\Theta = 30$ or 150° from Jefferson, $\sin \Theta = 0.5$ and the effective distance is 30 m, the SLAMS minimum. Allowing for Jefferson St. orientation, only winds within a 120° arc between 198° and 318° potentially impact ozone measurements below Neighborhood scale siting minimums.

During the 12 peak 8-hour ozone episodes, winds were within the 198° to 318° arc for 37 the 96 hours (see the **Peak O3 hrs** spreadsheet). The average NO and NO_2concentrations for all 96 hours were calculated at 1.5 and 8.2 ppb. During the 37 hours with winds within the impact arc, concentrations were 1.6 and 8.2 ppb, respectively. During the 59 non-impact hours, NO and NO_2 concentrations were 1.4 and 8.5 ppb.

Time series plots for the 12 peak ozone days are included in in the **max O3 graphs.pdf** file. Every plot shows that by late morning, NO levels are very low and NO_2remains at a stable concentration, typically about 10 ppb or less, for the remainder of the high ozone period.

Parallel and Crossing Winds to Jefferson St.

Using the selection process outlined above, 11 days were identified where winds consistently blew parallel to Jefferson St. during 10AM through 6PM. All wind was from the south, as expected, except for one day (May 2, 2012) with a late-afternoon, 180° shift. These days are identified with diurnal winds and pollutant data in the **Parallel wind days.xlsx** Excel workbook. The afternoon hours are tabulated in worksheet **Hrs 10-18** to calculate average NO, NO_2, and ozone.

Eleven crosswind days were identified where winds consistently blew across Jefferson St. toward the station during 10AM through 6PM when maximum ozone concentrations are expected. These days are identified with diurnal winds and pollutant data in the **Crosswind days.xlsx** Excel workbook. The afternoon hours are tabulated in worksheet **Hrs 10-18** to calculate average NO, NO_2, and ozone concentrations.

99 hours were evaluated in each direction, equivalent to the 96 hours evaluated during peak ozone days. Though the selection of days is based on ad hoc selection criteria, NO_x concentrations remain consistently low. In fact, they are lower when winds were blowing

across Jefferson St. toward the station and downwind largely from pristine, rural countryside.

NO Concentration Trends

To evaluate long term NO concentrations at Napa, a series of annual 'pollution roses' were constructed with NO concentration plotted as a function of wind direction from 10 AM through 6 PM during the May 1 through October 31 ozone season. File **NO roses.pdf** contains plots for 2012, 2011, 2010, and 2004. As expected, the wind pattern emulates the prevailing wind rose pattern presented above. However, all three principal lobes of the roses show a similar color distribution indicating NO concentrations are not dependent on wind direction (i.e. affected by Jefferson St. mobile emissions). More importantly, higher concentrations indicated by the hotter colors evident in the 2004 rose are consistently lower over time.

Napa Ozone Design Values

Design values for ozone were acquired using the AQS AMP480 Design Value Report. Values for the last five years are included in the attached AQS report **Design values.pdf** and summarized below:

Ozone Design Values Year	Napa DV (ppb)	Napa DV % of NAAQS (75 ppb)	District DV Max (ppb)	Max DV Site
2008	61	81	81	Livermore
2009	61	81	78	Livermore
2010	66	88	80	Livermore
2011	65	87	76	Livermore
2012*	63	84	73	Livermore & Bethel Island

*preliminary

Napa Design Values are less than 90% of the NAAQS and are consistently exceeded by other Design Values within the District.

Results Summary

The following is a summary of the average results for peak ozone events, and winds parallel and perpendicular to Jefferson St.:

	data records (max hours)	Avg WSpd (m/s)	Avg NO ppb	Avg NO2 ppb	Avg 1-hr O3 ppb
Max ozone (all)	96	3.3	1.5	8.4	max 8-hr events
High O3	37		1.6	8.2	

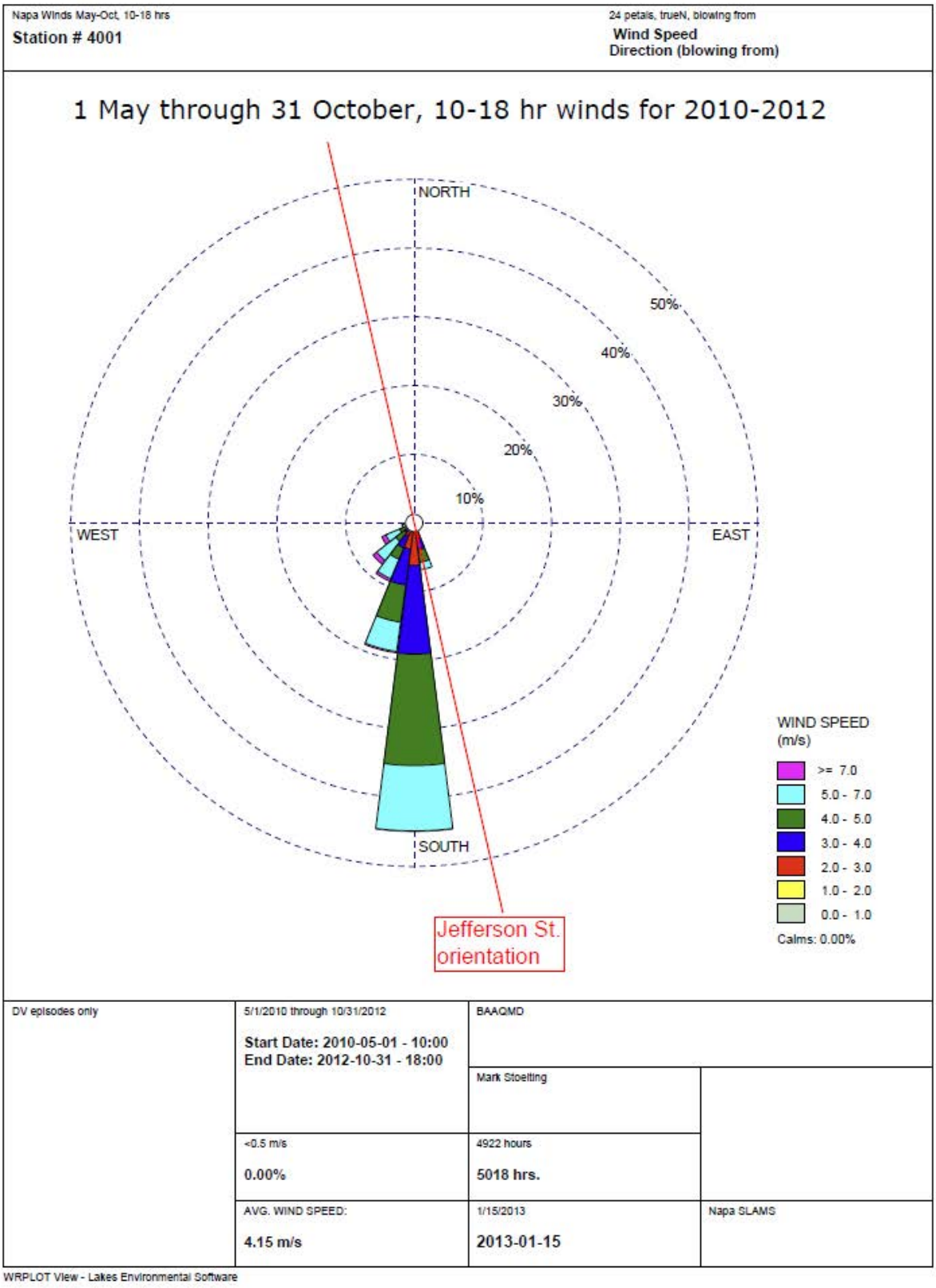
(impact)					
High O3 (no impact)	59		1.4	8.5	
Parallel winds	99	4.2	2.0	5.6	39.9
Cross winds	99	4.8	1.8	2.5	40.0

The average NO concentrations show that very little NO exists during the targeted hours regardless of the wind direction. All averages are 2 ppb or less, well below the 10 ppb minimum detection limit of the instrumentation. During high ozone events, NO_x concentrations are virtually identical between measurements impacted by Jefferson St, and those that were not. Winds blowing across Jefferson St. had *lower* average NO_x concentrations than those parallel. Annual decreases in measured NO concentrations indicate mobile fleet NO_x emission controls are having the desired result. The trend indicates continued concentration reductions will occur as the vehicular fleet modernizes (with reduced Jefferson St. impact).

The premise that Jefferson St. mobile sources are titrating high ozone concentrations is not supported by the low NO concentrations measured regardless of wind direction. Further supporting this argument are a series of annual NO pollution roses for May 1-October 31, hours 10 through 18. The roses during 2010 through 2012 show a monotonic NO reduction as the vehicular fleet modernizes with increasingly stringent NO_x emissions. These roses show significantly less NO than a similar rose constructed for 2004. NO_x impact from Jefferson St. will continue to decrease as mobile emissions are further reduced over time.

In summary, the Bay Area Air Quality Management District asserts that high ozone measurements in Napa are driven by transport from ozone precursor sources to the south, and enhanced by greater Napa area emissions. Wind patterns and concentration data presented here show that Jefferson St. NO_x emissions have minimal impact on high ozone values and that Neighborhood scale ozone measurements are collected at the current location. Bay Area requests a Region 9 waiver to qualify Napa as a SLAMS monitoring site to meet the minimum network monitoring requirements for ozone.

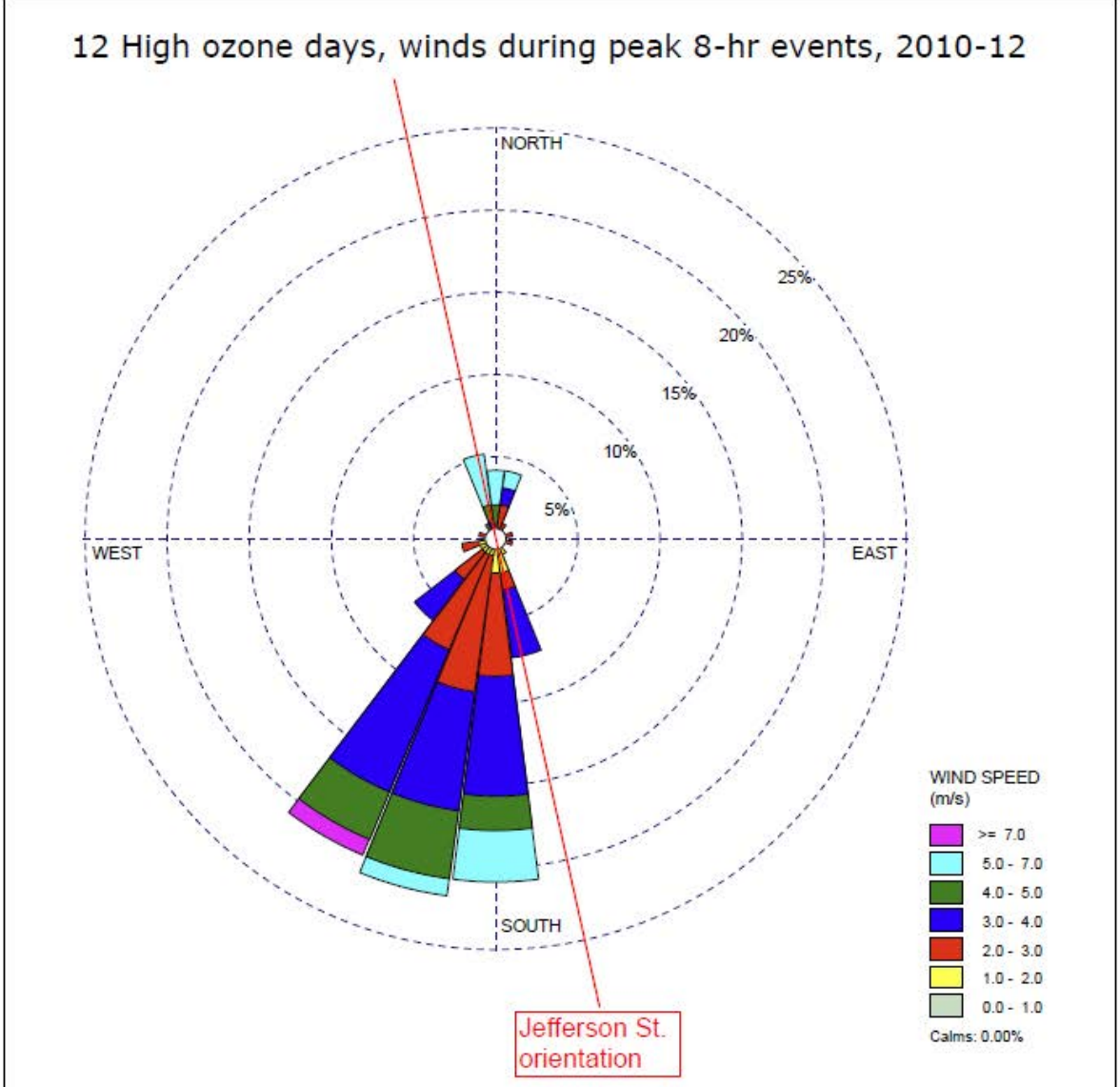
Prevailing winds.pdf



HiO3 Rose 2010-12.pdf

Napa Max 8 hr O3 Winds
Station # 4001

24 petals, trueN, blowing from
Wind Speed
Direction (blowing from)



DV episodes only	8/24/10 - 10/18/12 **Start Date: 2010-08-24 - 11:00** **End Date: 2012-10-18 - 17:00**	BAAQMD	
		Mark Stoelting	
	<0.5 m/s **0.00%**	96 hrs, 8x4 hrs/year **96 hrs.**	
	AVG. WIND SPEED: **3.34 m/s**	1/15/2013 **2013-01-15**	Napa SLAMS

WRPLOT View - Lakes Environmental Software

Peak O3 hrs spreadsheet from max 8-hr zone.xlsx Excel workbook.

WD during highest four Napa 8-hr O3 days for 2010-12 (96 hrs)

Winds during maximum ozone days

Date (LST)	WDir	WSpd	Jeff St impact?	effective dist to St	NO	NO2	NO2/NO
8/24/2010 11:00	217	2.4	yes	19.9	2.0	12.0	6.0
8/24/2010 12:00	223.4	2.8	yes	18.2	1.0	10.0	10.0
8/24/2010 13:00	213.5	3	yes	21.0	1.0	9.0	9.0
8/24/2010 14:00	218.4	3	yes	19.5	2.0	11.0	5.5
8/24/2010 15:00	212.2	2.9	yes	21.5	2.0	10.0	5.0
8/24/2010 16:00	203	2.7	yes	26.2	2.0	8.0	4.0
8/24/2010 17:00	177.8	2.2		30.0	1.0	10.0	10.0
8/24/2010 18:00	169.8	2.2		30.0	0.0	16.0	999
9/25/2010 10:00	228.5	1.4	yes	17.2	3.0	10.0	3.3
9/25/2010 11:00	239.9	1.8	yes	15.8	1.0	7.0	7.0
9/25/2010 12:00	253.3	1.9	yes	15.1	1.0	6.0	6.0
9/25/2010 13:00	226	3.8	yes	17.7	1.0	5.0	5.0
9/25/2010 14:00	216.8	3.5	yes	19.9	2.0	6.0	3.0
9/25/2010 15:00	220.5	3.2	yes	18.9	1.0	4.0	4.0
9/25/2010 16:00	211.4	2.9	yes	21.8	1.0	5.0	5.0
9/25/2010 17:00	195.4	2.7		30.0	2.0	6.0	3.0
9/27/2010 10:00	147.7	1.3		30.0	6.0	14.0	2.3
9/27/2010 11:00	207.3	2.4	yes	23.7	4.0	13.0	3.3
9/27/2010 12:00	201	3	yes	27.5	2.0	10.0	5.0
9/27/2010 13:00	214.3	3.2	yes	20.7	2.0	12.0	6.0
9/27/2010 14:00	206.9	3.1	yes	23.9	2.0	14.0	7.0
9/27/2010 15:00	203.6	3.2	yes	25.8	3.0	13.0	4.3
9/27/2010 16:00	194.8	2.6		30.0	2.0	13.0	6.5
9/27/2010 17:00	159.4	1.8		30.0	4.0	28.0	7.0
9/28/2010 11:00	211.6	1.8	yes	21.8	2.0	12.0	6.0
9/28/2010 12:00	199	2.6	yes	29.1	1.0	8.0	8.0
9/28/2010 13:00	191.8	3.5		30.0	1.0	8.0	8.0
9/28/2010 14:00	196.5	3		30.0	2.0	12.0	6.0
9/28/2010 15:00	182.9	2.3		30.0	2.0	11.0	5.5
9/28/2010 16:00	194.5	2.4		30.0	2.0	15.0	7.5
9/28/2010 17:00	168.4	3		30.0	2.0	19.0	9.5
9/28/2010 18:00	176.9	1.8		30.0	1.0	19.0	19.0
6/21/2011 10:00	184.4	3		30.0	2.6	8.9	3.4
6/21/2011 11:00	189.1	2.9		30.0	2.0	9.4	4.7
6/21/2011 12:00	184.3	3.3		30.0	1.6	8.1	5.1
6/21/2011 13:00	189.8	4		30.0	1.1	7.0	6.4
6/21/2011 14:00	183.7	4.8		30.0	1.2	7.7	6.4
6/21/2011 15:00	185.8	5.4		30.0	1.0	6.9	6.9
6/21/2011 16:00	177.7	5.8		30.0	1.6	7.2	4.5
6/21/2011 17:00	177.5	5.6		30.0	1.2	7.3	6.1
8/23/2011 11:00	187.1	2.7		30.0	2.4	7.8	3.3
8/23/2011 12:00	184.9	3.3		30.0	1.6	7.9	4.9
8/23/2011 13:00	193.4	3.9		30.0	1.5	7.5	5.0
8/23/2011 14:00	197.4	4.4		30.0	2.3	9.1	4.0
8/23/2011 15:00	201.8	4.3	yes	27.0	2.0	8.2	4.1
8/23/2011 16:00	203	4.1	yes	26.2	1.5	7.2	4.8
8/23/2011 17:00	186.8	3.4		30.0	1.3	8.2	6.3
8/23/2011 18:00	168.4	3.1		30.0	0.6	10.3	17.2

WD during highest four Napa 8-hr O3 days for 2010-12 (96 hrs)

Winds during maximum ozone days

Date (LST)	WDir	WSpd	Jeff St impact?	effective dist to St	NO	NO2	NO2/NO
9/19/2011 11:00	225.6	2.2	yes	17.8	1.4	7.5	5.4
9/19/2011 12:00	216.4	3.1	yes	20.1	1.4	8.5	6.1
9/19/2011 13:00	212.8	3.4	yes	21.3	1.3	9.4	7.2
9/19/2011 14:00	203.9	3.3	yes	25.6	2.2	9.6	4.4
9/19/2011 15:00	197.4	3.4		30.0	2.0	8.8	4.4
9/19/2011 16:00	187.2	3.3		30.0	1.7	10.4	6.1
9/19/2011 17:00	202.5	2.9		30.0	2.0	11.4	5.7
9/19/2011 18:00	167.5	3.4		30.0	0.7	10.0	14.3
9/28/2011 12:00	251.7	2.2	yes	15.1	1.6	7.4	4.6
9/28/2011 13:00	286	2.4	yes	17.0	1.7	6.8	4.0
9/28/2011 14:00	209.1	4.5	yes	22.8	1.1	6.5	5.9
9/28/2011 15:00	209.2	3.6	yes	22.8	1.7	8.2	4.8
9/28/2011 16:00	200.2	3	yes	28.1	1.4	7.6	5.4
9/28/2011 17:00	188.8	1.7		30.0	1.0	14.2	14.2
9/28/2011 18:00	159	1.8		30.0	0.5	21.3	42.6
9/28/2011 19:00	175.1	1.9		30.0	0.4	15.7	39.3
5/5/2012 11:00	357.9	4.9		30.0	1.2	3.4	2.8
5/5/2012 12:00	348.5	5.5		30.0	1.3	3.6	2.8
5/5/2012 13:00	343.7	5		30.0	0.8	3.1	3.9
5/5/2012 14:00	342.2	5.2		30.0	0.7	3.0	4.3
5/5/2012 15:00	333.8	4.6		30.0	0.7	2.8	4.0
5/5/2012 16:00	345.4	4.7		30.0	0.6	3.4	5.7
5/5/2012 17:00	355.3	4.9		30.0	0.4	3.0	7.5
5/5/2012 18:00	10	2.9		30.0	0.0	2.6	999
5/6/2012 10:00	13.9	5.3		30.0	1.0	2.5	2.5
5/6/2012 11:00	355.8	5.5		30.0	0.8	2.7	3.4
5/6/2012 12:00	355.9	5.3		30.0	0.6	2.0	3.3
5/6/2012 13:00	348.5	3.9		30.0	0.4	2.1	5.3
5/6/2012 14:00	16	3.2		30.0	0.3	2.0	6.7
5/6/2012 15:00	31.1	2.5		30.0	0.1	1.3	13.0
5/6/2012 16:00	21.8	2.4		30.0	0.0	1.0	999
5/6/2012 17:00	201.7	3.5	yes	27.0	0.1	2.0	20.0
9/30/2012 11:00	176.2	2.2		30.0	1.3	5.9	4.5
9/30/2012 12:00	190.9	2		30.0	1.2	5.6	4.7
9/30/2012 13:00	197.9	2.6		30.0	0.6	3.7	6.2
9/30/2012 14:00	179.3	3		30.0	1.5	5.5	3.7
9/30/2012 15:00	176.2	2.9		30.0	1.6	7.8	4.9
9/30/2012 16:00	185.2	3.1		30.0	0.7	7.6	10.9
9/30/2012 17:00	165.2	3.3		30.0	0.3	9.5	31.7
9/30/2012 18:00	180.5	2.5		30.0	0.4	13.4	33.5
10/18/2012 10:00	82.2	2.9		30.0	6.3	16.7	2.7
10/18/2012 11:00	105	2.3		30.0	1.0	5.1	5.1
10/18/2012 12:00	200.1	2.9	yes	28.2	1.1	5.1	4.6
10/18/2012 13:00	206	4.8	yes	24.4	1.2	5.6	4.7
10/18/2012 14:00	208.8	7.3	yes	23.0	1.3	6.0	4.6
10/18/2012 15:00	199.3	6.6	yes	28.9	1.3	5.8	4.5
10/18/2012 16:00	189.8	4.8		30.0	1.7	8.0	4.7
10/18/2012 17:00	180.3	4.4		30.0	1.3	7.6	5.8

Hrs 10-18 worksheet from Parallel wind days.xlsm Excel workbook.

Napa winds parallel to Jefferson St.

Hours 10-18 from selected days

Date (LST)	WDir	WSpd	NO	NO2	NO2/NO	O3
5/2/2012 10:00	338.6	4.4	2	3	2	54
5/2/2012 11:00	338.2	4.9	2	3	2	58
5/2/2012 12:00	338.9	6.3	2	3	2	64
5/2/2012 13:00	345.7	7.3	2	3	2	69
5/2/2012 14:00	351.3	5.8	1	3	3	70
5/2/2012 15:00	352.5	5.1	1	3	3	70
5/2/2012 16:00	186.1	3.5	1	3	3	68
5/2/2012 17:00	176.1	2.5	1	4	4	62
5/2/2012 18:00	156.8	2.3	1	5	5	47
6/29/2012 10:00	181.5	2.3	4	5	1	29
6/29/2012 11:00	176	2.4	3	5	2	35
6/29/2012 12:00	175.7	3.6	3	6	2	39
6/29/2012 13:00	172.9	4.1	3	6	2	40
6/29/2012 14:00	179.7	6.2	3	6	2	39
6/29/2012 15:00	156.3	6.3	3	6	2	37
6/29/2012 16:00	156	6.3	3	6	2	35
6/29/2012 17:00	162.3	6.8	2	6	3	33
6/29/2012 18:00	162.9	6.6	2	5	3	30
5/11/2012 10:00	175.2	2.5	2.5	8.3	3	41.7
5/11/2012 11:00	177.8	3.5	2.9	10.5	4	45.7
5/11/2012 12:00	180	4	3	11.5	4	49
5/11/2012 13:00	177.9	4.2	2.3	9.1	4	55.9
5/11/2012 14:00	185.4	4.8	2.1	8.8	4	58.1
5/11/2012 15:00	178.6	5	2	8.4	4	55.4
5/11/2012 16:00	175.4	4.8	2.4	8.5	4	47.7
5/11/2012 17:00	161.9	4.6	1.3	7.7	6	46.2
5/11/2012 18:00	157.1	5.1	0.6	8.5	14	43.4
7/7/2012 10:00	185.6	2.5	2.1	5.1	2	28.9
7/7/2012 11:00	183.4	3.1	1.4	5.7	4	36.6
7/7/2012 12:00	174	3.7	1.1	5.5	5	45.8
7/7/2012 13:00	178.9	4.3	0.8	5.4	7	53.7
7/7/2012 14:00	184.3	4.7	1	6.2	6	53.5
7/7/2012 15:00	173.7	4.9	0.9	5.2	6	49.2
7/7/2012 16:00	156.5	4.9	0.5	2.8	6	55.3
7/7/2012 17:00	168.7	4.7	0.9	3.8	4	45.6
7/7/2012 18:00	166.3	5.3	0.7	3.9	6	36.4
8/6/2012 10:00	157.2	1.8	3.1	3.7	1	21.4
8/6/2012 11:00	177.1	3.1	2.1	3.8	2	27.6
8/6/2012 12:00	184.4	3.8	1.5	4	3	34.6
8/6/2012 13:00	170	3.8	1.7	5.2	3	37.9
8/6/2012 14:00	171.6	4.6	1.2	4.4	4	42.2
8/6/2012 15:00	170.8	4.3	2.3	4.7	2	38.8
8/6/2012 16:00	177	4.5	2.7	3.8	1	33
8/6/2012 17:00	178.6	4.6	2.2	4.6	2	28.9

Napa winds parallel to Jefferson St.

Hours 10-18 from selected days

Date (LST)	WDir	WSpd	NO	NO2	NO2/NO	O3
8/6/2012 18:00	175.8	4.4	1.2	3.8	3	24
8/7/2012 10:00	171.2	3.1	4.4	6.3	1	21.4
8/7/2012 11:00	172.9	3.2	4.2	6.7	2	25.6
8/7/2012 12:00	179.4	4.1	2.8	6	2	31.9
8/7/2012 13:00	185.1	4.9	1.8	5	3	36.1
8/7/2012 14:00	172.8	5.6	2	4.5	2	35.5
8/7/2012 15:00	167.9	5.2	2.1	4.2	2	31.7
8/7/2012 16:00	165.5	5.6	2.4	3.5	1	31.3
8/7/2012 17:00	173.7	5.4	1.5	3.6	2	28.7
8/7/2012 18:00	166.7	5.7	1.1	3.6	3	26.3
8/16/2012 10:00	168.6	2.6	n/a	n/a		
8/16/2012 11:00	178.2	3.2	n/a	n/a		
8/16/2012 12:00	180.5	3.7	n/a	n/a		
8/16/2012 13:00	174.8	4.3	1.5	5.4	4	46.2
8/16/2012 14:00	177.6	4.5	1.9	6.3	3	45.4
8/16/2012 15:00	177.3	5.1	1.1	4.8	4	44.7
8/16/2012 16:00	168.4	5.2	1.5	5.1	3	39.5
8/16/2012 17:00	173.1	4.8	0.8	4.3	5	38.9
8/16/2012 18:00	164.6	4.6	0.6	4	7	33.1
9/7/2012 10:00	179.3	2.2	3.7	7.3	2	30.4
9/7/2012 11:00	167.7	3.1	1.7	4.5	3	38
9/7/2012 12:00	176	3.6	1.6	4.5	3	41.2
9/7/2012 13:00	174.1	3.7	1.7	5.6	3	43.9
9/7/2012 14:00	176.1	4.3	2.3	7.1	3	45.5
9/7/2012 15:00	173.5	5	2.3	7.1	3	45.5
9/7/2012 16:00	169	5.2	1.5	6.2	4	40.4
9/7/2012 17:00	169.4	5.2	1.6	7.3	5	34.6
9/7/2012 18:00	174.5	4.2	1.1	6.3	6	31.6
9/14/2012 10:00	176.5	3	3.7	4.7	1	27.2
9/14/2012 11:00	176.1	4	2	4.3	2	33.3
9/14/2012 12:00	179.3	3.7	3.1	6.1	2	34.6
9/14/2012 13:00	174.6	3.7	2.3	6.6	3	38.3
9/14/2012 14:00	179.5	4.3	2.1	6.3	3	41.6
9/14/2012 15:00	175.1	4.6	4.5	9.4	2	38.7
9/14/2012 16:00	166.3	5	4.1	6.9	2	36
9/14/2012 17:00	165.8	4.9	1.1	6.4	6	33.8
9/14/2012 18:00	162.3	4.2	0.9	7	8	30
9/15/2012 10:00	172.8	2.1	3.3	4.3	1	28
9/15/2012 11:00	173.7	2.3	2.5	3.8	2	30.8
9/15/2012 12:00	172.5	2.7	1.7	4.2	2	34.8
9/15/2012 13:00	172.3	3.1	1.5	4.9	3	39.3
9/15/2012 14:00	176.2	3.8	1.5	6.3	4	43.2
9/15/2012 15:00	175.4	3.5	1.5	6.4	4	43.2
9/15/2012 16:00	183.1	3.9	2	6	3	39.8

Napa winds parallel to Jefferson St.

	Hours 10-18 from selected days					
Date (LST)	WDir	WSpd	NO	NO2	NO2/NO	O3
9/15/2012 17:00	177	4.1	1.4	5.4	4	33.1
9/15/2012 18:00	159.2	4	1.2	6.2	5	28.1
9/20/2012 10:00	168.7	2.2	n/a	n/a		
9/20/2012 11:00	172.8	2.5	n/a	n/a		
9/20/2012 12:00	174	3.3	n/a	n/a		
9/20/2012 13:00	180.4	4.1	n/a	n/a		
9/20/2012 14:00	178.1	4.7	4.1	9.5	2	34.7
9/20/2012 15:00	172.2	4.5	2.9	7.3	3	35.6
9/20/2012 16:00	166	5	2.7	7.3	3	32.6
9/20/2012 17:00	167	4.4	1.8	7.3	4	29.2
9/20/2012 18:00	158.8	4.2	0.9	9	10	25.8
averages:		4.2	2.0	5.6		39.9

Hrs 10-18 worksheet from Crosswind days.xlsx Excel workbook.

Napa winds perpendicular to Jefferson St.

Hours 10-18 from selected days

Date (LST)	WDir	WSpd	NO	NO2	NO2/NO	O3
5/9/2010 10:00	247	4	2	2	1	42
5/9/2010 11:00	238.5	6	1	2	2	44
5/9/2010 12:00	256.3	5.4	2	2	1	41
5/9/2010 13:00	245.7	4.6	2	2	1	41
5/9/2010 14:00	248.4	5.3	2	3	2	40
5/9/2010 15:00	259.2	5.7	1	2	2	42
5/9/2010 16:00	254.6	4.7	1	2	2	43
5/9/2010 17:00	241.9	4.4	1	2	2	42
5/9/2010 18:00	243.1	4.3	1	2	2	40
5/10/2010 10:00	220	7	3	4	1	34
5/10/2010 11:00	215.3	6.4	4	5	1	38
5/10/2010 12:00	324.6	4.5	2	4	2	44
5/10/2010 13:00	195.8	2.9	3	4	1	43
5/10/2010 14:00	256.7	5.8	5	4	1	43
5/10/2010 15:00	274.9	6.3	3	2	1	43
5/10/2010 16:00	257.8	4.3	3	3	1	42
5/10/2010 17:00	292.7	3	3	3	1	42
5/10/2010 18:00	259.4	3.5	2	3	2	44
5/21/2010 10:00	275.1	4.6	3	3	1	39
5/21/2010 11:00	266.8	4.9	4	3	1	38
5/21/2010 12:00	249.5	6.3	3	3	1	39
5/21/2010 13:00	247.1	5.4	3	3	1	40
5/21/2010 14:00	254.8	6.4	4	3	1	40
5/21/2010 15:00	243	7.8	4	2	1	41
5/21/2010 16:00	242.7	7.1	3	4	1	40
5/21/2010 17:00	243.1	6.9	3	3	1	39
5/21/2010 18:00	241.5	5	2	3	2	39
5/23/2010 10:00	336.8	3.6	3	2	1	38
5/23/2010 11:00	303.4	3.2	2	2	1	39
5/23/2010 12:00	275.2	4.1	2	2	1	39
5/23/2010 13:00	260.8	5.7	2	2	1	38
5/23/2010 14:00	248.1	6.9	2	2	1	38
5/23/2010 15:00	244.5	7.6	1	2	2	39
5/23/2010 16:00	240	7.1	2	2	1	37
5/23/2010 17:00	235.3	6.4	2	2	1	36
5/23/2010 18:00	241.4	5.4	1	3	3	36
5/26/2011 10:00	283.9	2.3	1.6	3.9	2	42.8
5/26/2011 11:00	234.7	3.8	2.5	3.2	1	45.4
5/26/2011 12:00	240	4.6	1.4	2.5	2	45.7
5/26/2011 13:00	260	4.4	1.1	2.2	2	45.6
5/26/2011 14:00	239.5	5.9	2	2.8	1	43.1
5/26/2011 15:00	255.7	6.1	2	2.2	1	40.8
5/26/2011 16:00	258.8	4.9	1.6	2.4	2	39.7
5/26/2011 17:00	254.5	4.6	1.7	1.8	1	38.7

Napa winds perpendicular to Jefferson St.

Hours 10-18 from selected days

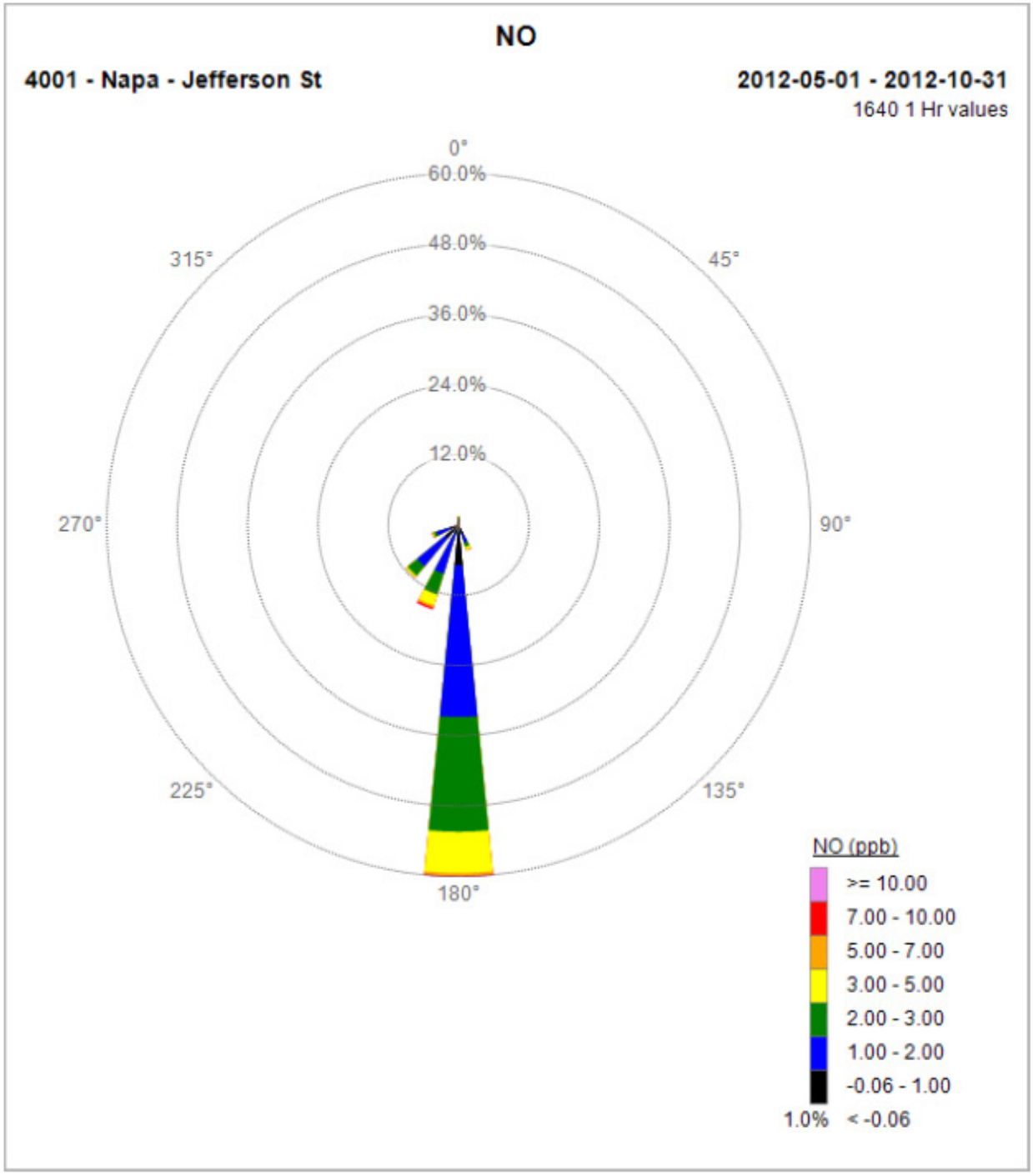
Date (LST)	WDir	WSpd	NO	NO2	NO2/NO	O3
5/26/2011 18:00	240.7	3.3	1.8	2.5	1	36.7
5/27/2011 10:00	224.8	3.7	n/a	n/a		
5/27/2011 11:00	251.7	3.8	n/a	n/a		
5/27/2011 12:00	237.3	4.9	n/a	n/a		
5/27/2011 13:00	231.9	5.7	1.3	1.5	1	44.5
5/27/2011 14:00	233.5	5.8	1.3	1.4	1	43.3
5/27/2011 15:00	243.5	5.7	1.4	1.4	1	42.6
5/27/2011 16:00	259.9	5.5	1.4	1.4	1	42.8
5/27/2011 17:00	249.2	5.4	1.6	1.3	1	43.5
5/27/2011 18:00	246.3	3.9	0.9	1.5	2	42
5/28/2011 10:00	221.9	5.3	1	1.6	2	44.2
5/28/2011 11:00	240.2	6.6	1.2	1.2	1	44.1
5/28/2011 12:00	239.1	5.4	1.1	1.3	1	44.5
5/28/2011 13:00	264.7	5.2	0.8	1.5	2	45
5/28/2011 14:00	265.4	4.1	1.4	1.5	1	40.4
5/28/2011 15:00	236	2.6	1.7	2.8	2	39.4
5/28/2011 16:00	326.1	1.2	0.7	2.5	4	36.2
5/28/2011 17:00	265.5	2.2	1.4	2.9	2	35.2
5/28/2011 18:00	230.2	3.5	0.6	1.6	3	37.4
9/11/2011 10:00	270.4	2.7	1	1.9	2	37.2
9/11/2011 11:00	276.4	2.9	0.9	1.9	2	38.7
9/11/2011 12:00	256.2	3.1	1.3	2.3	2	40.6
9/11/2011 13:00	253.5	3.5	1.1	2	2	42.4
9/11/2011 14:00	241.3	4.1	0.6	1.9	3	44
9/11/2011 15:00	231.3	4.5	0.8	2.2	3	44
9/11/2011 16:00	214.4	4.6	0.6	1.9	3	43.6
9/11/2011 17:00	220.7	3.8	0.5	2.9	6	43.6
9/11/2011 18:00	226.4	3.5	1.1	3.5	3	39.5
5/23/2012 10:00	191.3	1.9	1.3	4.7	4	41.9
5/23/2012 11:00	244.5	1.5	1.3	3.6	3	46
5/23/2012 12:00	264.2	3.3	1.1	2.2	2	48.4
5/23/2012 13:00	271.1	4.5	1.1	2.6	2	46.7
5/23/2012 14:00	247	6.6	1.5	4.2	3	45.1
5/23/2012 15:00	246.1	6.3	1.1	2.2	2	45.4
5/23/2012 16:00	245.7	5.5	1.1	2.2	2	42.5
5/23/2012 17:00	260.6	4.4	1	2.4	2	42.3
5/23/2012 18:00	285.3	3.9	0.7	2.2	3	40.6
6/4/2012 10:00	235.1	4.1	1.7	3.7	2	35.6
6/4/2012 11:00	232.1	4.6	2.5	3.7	1	36.4
6/4/2012 12:00	243.9	5.8	2.1	2.8	1	37.9
6/4/2012 13:00	250.4	6.3	1.2	2.1	2	38.4
6/4/2012 14:00	243.7	7.4	1.3	2.4	2	38.5
6/4/2012 15:00	244.7	7.4	1.3	2.4	2	38.5
6/4/2012 16:00	247.5	6.7	1.6	1.7	1	37.7

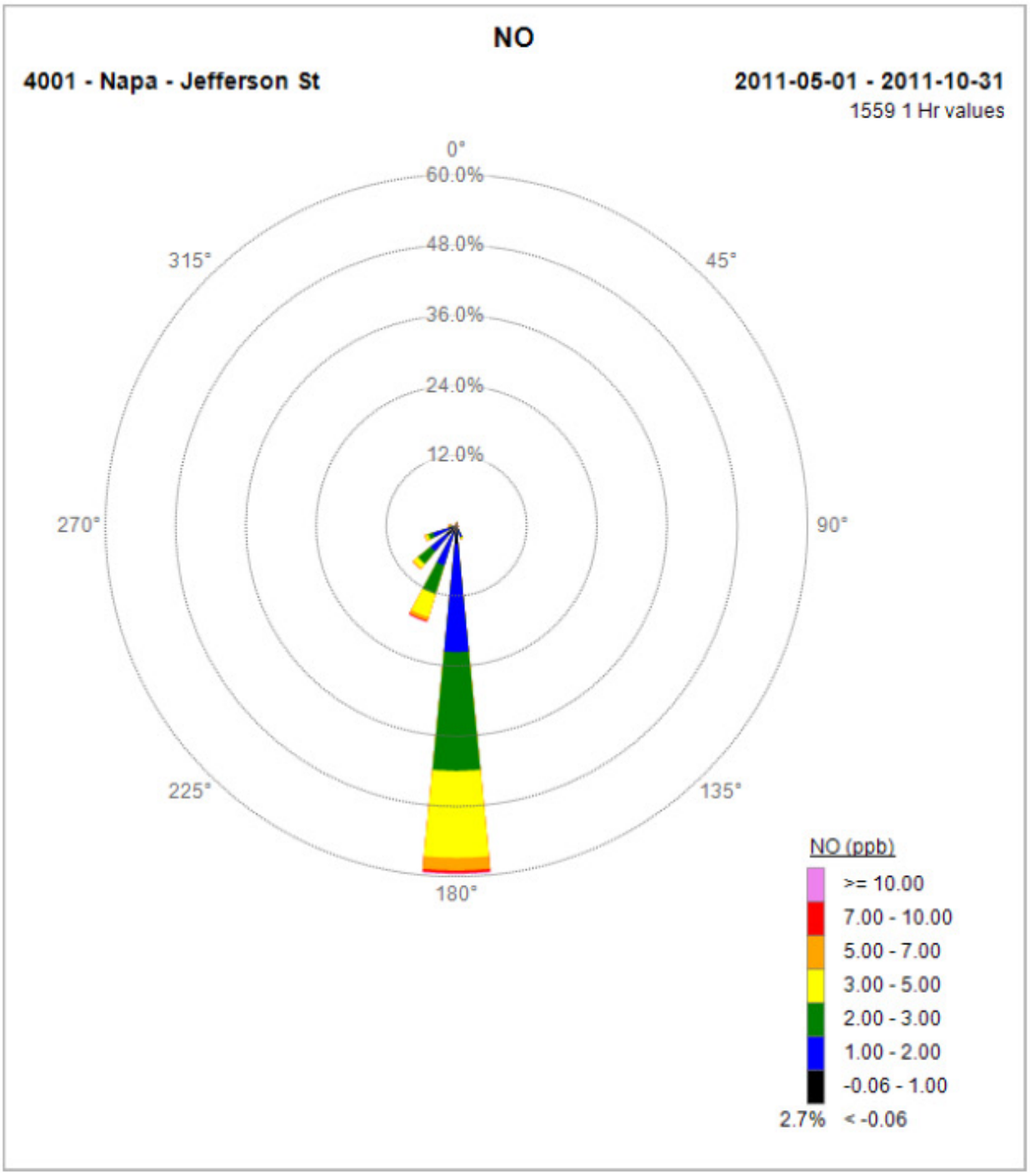
Napa winds perpendicular to Jefferson St.

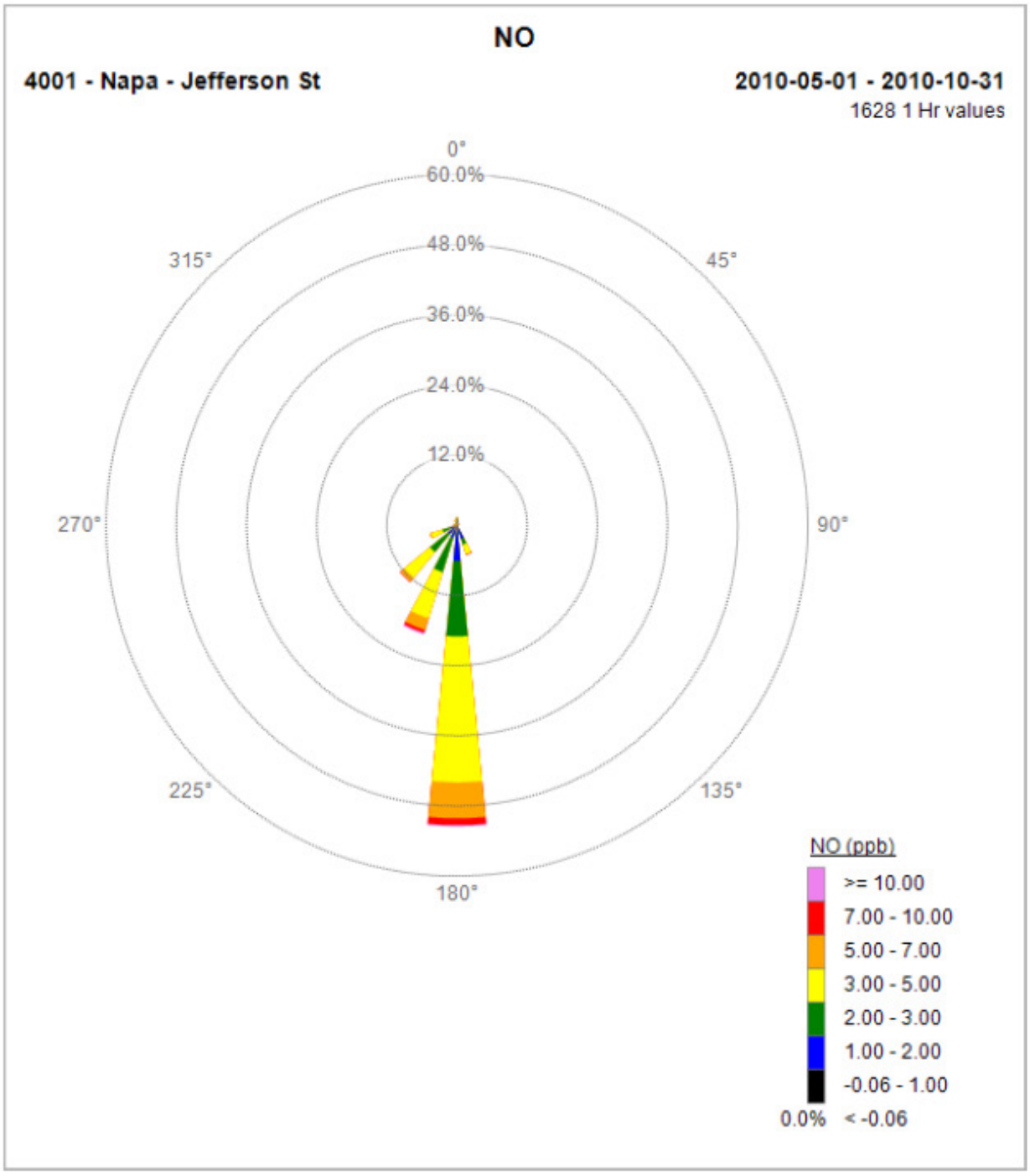
Hours 10-18 from selected days

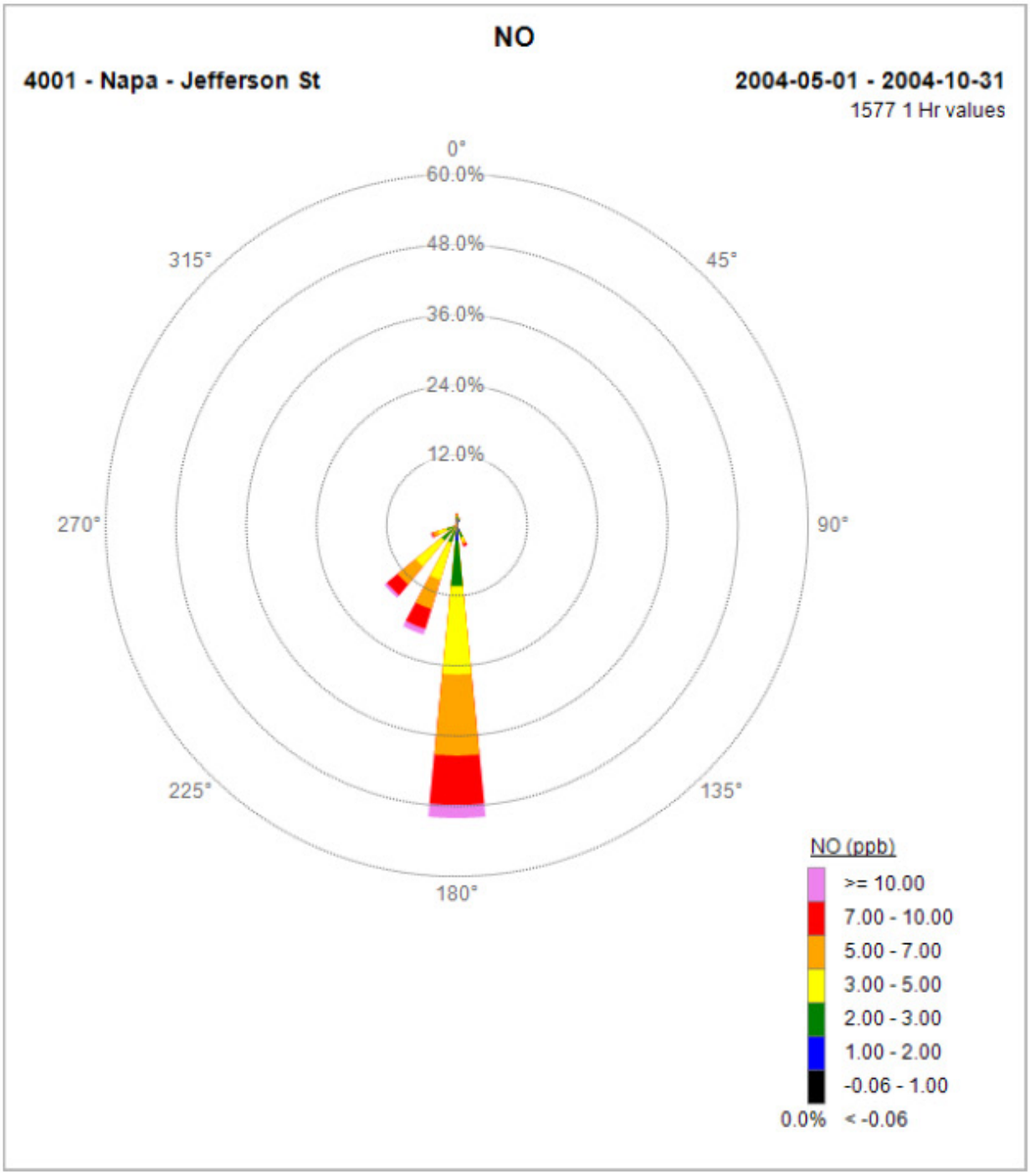
Date (LST)	WDir	WSpd	NO	NO2	NO2/NO	O3
6/4/2012 17:00	257.8	5.5	0.7	1.7	2	38.1
6/4/2012 18:00	259.2	4.7	0.9	1.5	2	37
10/5/2012 10:00	234.5	4.1	n/a	n/a		
10/5/2012 11:00	246.5	4.2	2.3	2.6	1	31
10/5/2012 12:00	265.9	3.9	2.4	2.9	1	31.2
10/5/2012 13:00	242.6	4.7	1.8	2.1	1	32.2
10/5/2012 14:00	250.5	5.1	2.2	2.4	1	31.2
10/5/2012 15:00	236.3	5.6	2.1	2.2	1	30.3
10/5/2012 16:00	245.9	4.8	2.7	2.7	1	29
10/5/2012 17:00	258.2	3.3	1.3	2.8	2	28.6
10/5/2012 18:00	203.4	2	2	4.7	2	25.7
		4.8	1.8	2.5		40.0

NO roses.pdf


NO
4001 - Napa - Jefferson St
2012-05-01 - 2012-10-31
1640 1 Hr values
0°
60.0%
48.0%
36.0%
24.0%
12.0%
45°
90°
135°
180°
225°
270°
315°
NO (ppb)
>= 10.00
7.00 - 10.00
5.00 - 7.00
3.00 - 5.00
2.00 - 3.00
1.00 - 2.00
-0.06 - 1.00
1.0%
< -0.06


NO
4001 - Napa - Jefferson St
2011-05-01 - 2011-10-31
1559 1 Hr values
0°
60.0%
48.0%
36.0%
24.0%
12.0%
45°
90°
135°
180°
225°
270°
315°
NO (ppb)
>= 10.00
7.00 - 10.00
5.00 - 7.00
3.00 - 5.00
2.00 - 3.00
1.00 - 2.00
-0.06 - 1.00
2.7% < -0.06


NO
4001 - Napa - Jefferson St
2010-05-01 - 2010-10-31
1628 1 Hr values
0°
60.0%
48.0%
36.0%
24.0%
12.0%
45°
90°
135°
180°
225°
270°
315°
NO (ppb)
>= 10.00
7.00 - 10.00
5.00 - 7.00
3.00 - 5.00
2.00 - 3.00
1.00 - 2.00
-0.06 - 1.00
0.0% < -0.06


NO
4001 - Napa - Jefferson St
2004-05-01 - 2004-10-31
1577 1 Hr values
0°
60.0%
48.0%
36.0%
24.0%
12.0%
45°
90°
135°
180°
225°
270°
315°
NO (ppb)
>= 10.00
7.00 - 10.00
5.00 - 7.00
3.00 - 5.00
2.00 - 3.00
1.00 - 2.00
-0.06 - 1.00
0.0%
< -0.06

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

APR 24 2013

Mr. Eric Stevenson
Director of Technical Services
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

Dear Mr. Stevenson:

We have reviewed your analysis in support of the Napa ozone monitor (AQS ID 06-055-0003) designation as neighborhood scale (February 8, 2013 email). Based on the information you provided, and further analysis by EPA, described below, EPA is granting a waiver from the Appendix E "spacing from roadways" siting requirement for the ozone monitor at Napa, per 40 CFR 58 Appendix E, section 10.

The Napa ozone monitor is currently the only ozone monitor in the Napa Metropolitan Statistical Area (MSA). According to Bay Area Air Quality Management District's (BAAQMD's) 2011 Air Monitoring Network Report, it is 15 meters from Jefferson Street. Jefferson Street is currently listed as having 19,143 vehicles per day, roadway average annual daily traffic (AADT) (2007). The Napa monitor meets siting requirements to be considered a neighborhood scale[1] monitor, with the exception of spacing from roadways. Appendix E, section 6, Table E-1, specifies minimum separation distances from roadways, based on the concern that ozone levels measured at the monitor may experience scrubbing effects, i.e. ozone levels may be decreased as a result of reaction with pollutants emitted from the nearby roadway, notably NO. For an AADT of 19,143, the Napa monitor is located too close to Jefferson Street according to Table E-1.

As outlined in 40 CFR part 58 Appendix E, Section 10.1.1, EPA may grant a siting waiver for an existing site if the site can be demonstrated to be as representative of the monitoring area as it would be if the siting criteria were being met. Based on the information provided by BAAQMD, EPA calculated a conservative estimate of the potential for ozone scrubbing as a result of

[1] As defined in 40 CFR part 58 Appendix D, Section 4.1(c)(1): *(1) Neighborhood scale —Measurements in this category represent conditions throughout some reasonably homogeneous urban sub-region, with dimensions of a few kilometers. Homogeneity refers to pollutant concentrations. Neighborhood scale data will provide valuable information for developing, testing, and revising concepts and models that describe urban/regional concentration patterns. These data will be useful to the understanding and definition of processes that take periods of hours to occur and hence involve considerable mixing and transport. Under stagnation conditions, a site located in the neighborhood scale may also experience peak concentration levels within a metropolitan area.*

roadway emissions. We conclude that there is not enough potential for scrubbing to indicate that Napa would otherwise experience concentrations above the 8-hour ozone NAAQS.

For the four highest 8-hour ozone days in 2010, 2011, and 2012, supplied in BAAQMD's spreadsheet "max 8-hr ozone," we conservatively assumed that when winds were blowing from the road to the monitor[2] all of the NO_2 measured at the Napa station represented scavenging of ozone in a straight one-to-one relationship (i.e. each molecule of NO_2 was formed by the reaction of one molecule of ozone with one molecule of NO from the roadway). This approach would be conservative, since some of the monitored NO_2 was likely to be either from transport into the area or emitted directly from sources on the roadway. Adding the 1-hour NO_2 values to the 1-hour ozone values thus provides a conservative estimate of what the ozone levels would have been without any roadway impact. As a result of this calculation, the 2010-2012 design value (DV) changed by 2 ppb, increasing Napa's 2012 DV from 63 ppb to 65 ppb. The twelve days used in this calculation are the highest 8-hour ozone days for each of the three years and are here used as a representative set of days. While a different collection of days may show different influences from the roadway given different meteorological or traffic conditions, it is unlikely that the same analysis using a different combination of days would yield a design value over the 75 ppb 8-hour ozone NAAQS.[3] Bay Area's wind roses also show that the predominant wind direction is from the south, and rarely blows from Jefferson Street to the monitor.

EPA concludes that the Napa ozone site accurately reflects a design value for the MSA that is below the 8-hour ozone NAAQS of 75 ppb, and that proximity to the roadway does not affect this representation of the MSA's ozone levels. With this Appendix E siting waiver approval, the Napa ozone site is found to be appropriately characterized as a neighborhood scale, SLAMS ozone monitor within the Napa MSA.

This waiver will need to be renewed with each annual network plan unless this site is reclassified as a smaller than neighborhood scale site. To renew the waiver, please include the most recent ozone design value for the Napa site in the annual network plan and state that BAAQMD is requesting a renewal of the Appendix E spacing from roadway siting waiver for the Napa ozone site, as originally granted in April 2013. Please also include this correspondence with your next annual network plan. EPA might not grant a renewal of the waiver should the design value come within 5 ppb of the standard (due to an increase of Napa's design value, or due to a revision of the ozone NAAQS), or should other situations arise that affect how the site is representing the MSA's ozone concentrations. The site may be judged to no longer be as representative of the monitoring area as it would be if the spacing from roadways siting criteria were being met.

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[2] Winds blowing from the road to the monitor were defined as in BAAQMD's materials, i.e. 198 through 317 degrees.

[3] EPA notes that numerical estimates of uncertainty of the impact on 8-hour ozone concentrations, and analysis of how variations in wind speed may affect ozone levels, were beyond the scope of this analysis. The analysis assumes that NO only affects the 8-hour ozone concentration for the ozone that is formed that same hour, and that it does not affect ozone concentrations outside of that hour through day-to-day carryover, transport or other mechanisms. EPA also performed the same calculation, but disregarding wind direction and simply adding each 1-hour NO2 value to each corresponding 1-hour O3 value for the four highest 8-hour ozone days in 2010, 2011, and 2012, with a resulting DV of 68 ppb, or a 5 ppb increase.

If you have any questions, please feel free to contact me at (415) 972-3851 or Gwen Yoshimura of my staff at (415)947-4134.

Sincerely,

Matthew Lakin, Manager
Air Quality Analysis Office
Air Division

cc: Glen Colwell, BAAQMD