

# **Annual Network Plan**

**Covering Monitoring Operations in  
25 California Air Districts**

**June 2018**



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## Abbreviations used in this document

|                   |  |
|-------------------|--|
| ANP               | Annual Network Plan  |
| APCD              | Air Pollution Control District                                   |
| AQMD              | Air Quality Management District                                  |
| AQS               | Air Quality System   |
| ARD               | Air Resources District   |
| ARM               | Approved Regional Method   |
| AQDA              | Air Quality Data Action  |
| CAN               | Corrective Action Notification                                   |
| CARB              | California Air Resources Board                                   |
| CASTNET           | Clean Air Status and Trends Network                              |
| CBSA              | Core-Based Statistical Area                                      |
| CFR               | Code of Federal Regulations                                      |
| CO                | Carbon monoxide  |
| CSN               | Chemical Speciation Network                                      |
| DV                | Design Value   |
| FEM               | Federal Equivalent Method  |
| FRM               | Federal Reference Method   |
| IMPROVE           | Interagency Monitoring of Protected Visual Environments          |
| MATES             | Multiple Air Toxics Exposure                                     |
| MLD               | Monitoring and Laboratory Division                               |
| NAAQS             | National Ambient Air Quality Standard                            |
| NCore             | National Core multipollutant network monitoring Station          |
| NIST              | National Institute of Standards and Technology                   |
| NO <sub>2</sub>   | Nitrogen dioxide   |
| NPS               | National Park Service  |
| OMB               | Office of Management and Budget                                  |
| PAMS              | Photochemical Assessment Monitoring Site                         |
| PM <sub>10</sub>  | Particulate Matter with an aerodynamic diameter ≤10 micrometers  |
| PM <sub>2.5</sub> | Particulate Matter with an aerodynamic diameter ≤2.5 micrometers |
| PQAO              | Primary Quality Assurance Organization                           |
| PWEI              | Population Weighted Emissions Index                              |
| QAS               | Quality Assurance Section`                                       |
| QMB               | Quality Management Branch  |
| QMS               | Quality Management Section                                       |
| SLAMS             | State and Local Air Monitoring Site                              |
| SO <sub>2</sub>   | Sulfur dioxide   |
| SPM               | Special Purpose Monitor  |
| STN               | Speciated Trends Network   |
| TPY               | Tons per Year  |

|          |                                      |
|----------|--------------------------------------|
| TSA      | Technical System Audit               |
| U.S. EPA | U.S. Environmental Protection Agency |
| VOC      | Volatile Organic Compound            |

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## **Executive Summary**

The Annual Network Plan covers detailed information about criteria pollutant monitoring sites and instruments operating in California. Accurately measuring air quality is the foundation of California's efforts to reduce air pollution. For more than 50 years California has maintained one of the most extensive air monitoring networks in the world, collecting data on a wide range of pollutants. The information gathered from these networks makes it possible to track progress in cleaning the air and identify the most effective actions needed to meet health-based air quality standards.

The California Air Resources Board (CARB) and California's thirty-five local air districts, 25 of which are covered in this plan, have been measuring ambient air quality using a variety of stationary monitoring networks supplemented by mobile platforms including cars, aircraft, and ships. From the very beginning, California's air monitoring program has been a partnership between government agencies at the federal, state, and local level, along with universities and more recently with engaged community members and industry representatives.

California's different air monitoring networks are designed to meet a range of regulatory requirements, such as compliance with the federal Clean Air Act, as well as to help address research and public health priorities. Over time, the types of pollutants being monitored and the extent of the air monitoring networks have varied as a function of new legislative mandates, community concerns, as well as our success in improving air quality in many parts of California. Air monitoring data outreach such as the Air Quality and Meteorological Information System (AQMIS), Air Quality Index, and AirNow program allow people and companies to take precautions by avoiding the outdoors or minimizing activities that contribute to air pollution when levels are unhealthy.

This executive summary briefly describes the main types of monitoring that are conducted in California.

## **Criteria Pollutant Monitoring**

The majority of California's air monitoring resources, reflected in the current statewide network of approximately 250 monitoring stations, have been dedicated to measuring ambient concentrations of criteria pollutants, which are ground-level ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb).

As detailed in the Annual Network Plan, for each of these criteria pollutants, the Code of Federal Regulation (CFR) specifies a list of acceptable instruments and methods, the frequency at which samples are to be collected, and how many instruments must be duplicated at the same location for each region. The CFR also details standards to be used for locating air monitoring sites (such as population, local traffic counts, local emission sources, etc.), number of sites located in each region, and the appropriate

scale (e.g., neighborhood, urban, and regional) for the spatial objective of the particular pollutant.

Data from these monitoring networks are used for determining the attainment status for national and State ambient air quality standards, supporting public information services, forecasting expected high pollution events, and supporting the development of emissions reduction programs. Monitoring data must complete a review and validation process by the agency collecting the data before the data is deemed final for regulatory purposes. Because this type of monitoring often requires significant infrastructure and resources, these methods have limitations for widespread deployment as part of community air monitoring efforts.

### **Additional Types of Air Monitoring Not Covered in the Annual Network Plan**

**Toxic Air Contaminants Monitoring:** Beginning in the 1980s, with the recognition of the health risks posed by a wide range of chemicals, California and the local air districts deployed a network of approximately 35 air toxics monitoring stations. Each of these stations take regular air samples of 67 toxic compounds which are then analyzed using specialized equipment. A few examples are volatile organic compounds, carbonyl compounds, toxic metals, and hexavalent chromium.

Most air toxics monitoring methods involve collecting air samples in the field and returning them to the laboratory for subsequent analysis. One significant limitation is that data from these methods may take weeks, or in some cases months, after sampling to become available as these sophisticated methods often require labor-intensive analytical procedures. Air toxic monitoring data are used to identify sources contributing to air toxic pollution and trends in the concentration of air toxics over time. Data can be used to support regulatory and enforcement actions when collected in a scientifically defensible manner.

**Greenhouse Gas Emission Monitoring:** With the passage of the California Global Warming Solutions Act of 2006 (AB 32), the CARB collaborated with federal agencies and universities to deploy a network of 15 tall towers and other stations to measure greenhouse gasses (GHG), study regional GHG emissions trends throughout the state, and evaluate regional and statewide emissions inventories.

Evaluating regional and statewide GHG emissions requires highly accurate and precise measurements of ambient greenhouse gases. The GHG network currently uses state-of-the-art, trace-level air monitoring instrumentation to measure trace levels of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and black carbon (BC). This data is collected in real time, 24 hours per day on a minute by minute basis. In conjunction with the ground-based network, airborne and spaceborne remote sensing measurements are conducted to screen large spatial regions for methane hotspots. Finally, mobile ground-based monitoring platforms are used to identify methane leaks at facilities and in communities.



**Remote Sensing:** Remote sensing instrumentation measures reflected or emitted radiation to collect information about air pollutant concentrations and meteorological conditions. Remote sensing instruments can be deployed on ground-based (mobile and stationary), airborne (i.e., aircraft, balloons), and spaceborne (i.e., satellites, spacecraft) platforms. Fence-line remote sensing applications can monitor emissions from facilities and roadway deployments can measure emissions from vehicles. When deployed on aircraft or satellites, remote sensing systems can survey large spatial areas and identify the general location of concentrated air pollution.

**Community-Scale Air Monitoring:** Recognizing the need to understand air quality at the neighborhood level, CARB and the local air districts have periodically undertaken community-focused air monitoring studies, such as the South Coast Air Quality Management District's Multiple Air Toxics Exposure Study (MATES) and the Bay Area Air Quality Management District's Community Air Risk Evaluation (CARE). Other activities include air monitoring for air quality emergencies, monitoring pesticides during application or PM due to wildfire smoke. With the advent of low-cost air sensors in the last decade, many community groups and individuals are now also measuring air quality and deploying their own grassroots monitoring networks. As a result, there are now more than 500 community-focused air monitors deployed in a wide range of California neighborhoods by community members, universities, private entities, and government agencies.

Continued usage of fence-line monitoring, advancements in air sensors, and additional mobile monitoring studies are important pieces to local air monitoring programs. Community-level air monitoring programs are expected to continue expanding in California with the recent adoption of Assembly Bill 617 (AB 617). California's focus on community-level monitoring and planning combined with improvements in air monitoring technologies will allow California to set the standard for what constitutes successful community air monitoring for decades to come. Monitoring methods commonly used for community air monitoring include:

- *Fence-line Monitoring:* Fence-line monitoring is a monitoring strategy in which air quality is measured at the perimeter of a known emissions source. Air districts may require fence-line monitoring at stationary sources that emit air pollutants. Depending on the air pollutant that is expected to be emitted, fence-line monitoring can utilize a wide variety of measurement tools such as air sensors, passive samplers, remote sensing systems, and real-time instrumentation. This type of monitoring may be used to help determine where and when leaks are occurring, the rate emissions are leaving the source, and what chemicals are present. AB 617 includes new requirements for enhanced fence-line and community monitoring in the vicinity of major stationary sources such as refineries.
- *Air Sensors:* Air quality sensors measure air pollutants on a real-time or near real-time basis and are generally low in cost, highly portable, and can require less power and siting infrastructure than other air monitoring methods. Currently,

no low-cost (i.e., \$2,000 or less) sensors meet federal reference or federal equivalent method requirements and many have not been robustly evaluated to determine the accuracy of their measurements. However, sensor technology is rapidly developing and performance is expected to improve over time. Sensors have the potential to provide hyper-local air quality data as part of coordinated, well-designed, community-led air monitoring efforts. The resulting data may be of sufficient quality to help understand spatial variability, identify areas with relatively higher pollutant concentrations for further investigation with more robust techniques, complement existing air monitoring networks, and evaluate personal exposure to air pollution.

- *Mobile Monitoring:* Mobile monitoring platforms collect environmental data while in motion, for example in a car or van. Instrumentation is utilized that can quickly measure air pollutant concentrations and provide instantaneous snapshots of air pollutant concentrations at a specific location and time. Mobile platforms can deploy a variety of instrumentation ranging from sensors, research-grade instrumentation, and remote sensing devices. Mobile platforms have the ability to measure real-time air pollutant concentrations at fine spatial gradients which can be used to identify persistent elevated pollutant concentrations and indicate potential contributing sources. These mobile monitoring platforms provide a valuable means of identifying areas that may need additional measurements and future deployment of fixed monitoring networks.

## **Conclusion**

Collectively, the complementary suite of monitoring networks and tools operated in California creates one of the most wide-ranging air monitoring programs in the world. These monitoring networks and studies provide critical information for identifying and mitigating California's most significant air quality challenges. This Annual Network Plan documents the regulatory ambient air quality monitors as required by Federal regulations and compiles important analysis of a vital portion of California's monitoring network.

## **Section 1: Introduction**

Federal regulations require state and local agencies that conduct ambient air monitoring for regulatory purposes to submit an Annual Network Plan (ANP) to the U.S. Environmental Protection Agency (U.S. EPA). ANPs are required to include detailed information about sites and instruments operating in the ambient air monitoring network. This ANP meets the federal regulatory requirements set forth in 40 CFR 58.10 and Appendices A through E.

The California Air Resources Board (CARB) Primary Quality Assurance Organization (PQAO) is comprised of 32 of the 35 air districts in California. The districts in the CARB PQAO may elect to prepare their own ANP or have their information included in the CARB ANP. The 2018 CARB ANP covers the monitoring networks of 25 districts within the CARB PQAO. Seven districts in the CARB PQAO will prepare their own ANPs and submit them directly to the U.S. EPA. Three other districts in California, the Bay Area Air Quality Management District (AQMD), San Diego County Air Pollution Control District (APCD), and South Coast AQMD represent their own PQAOs and are responsible for preparing their own ANPs and submitting them directly to U.S. EPA.

The 2018 ANP details the operations of the monitoring networks in 2017 and describes the changes that are planned to occur within the next 18 months. Consistent with direction from U.S. EPA, this ANP describes monitors operated by local districts, CARB, and other agencies such as the National Park Service (NPS), within the jurisdictions of the districts covered by this report. As required by federal regulations, this ANP includes detailed information about monitors using Federal Reference Methods (FRM), Federal Equivalent Methods (FEM), or Approved Regional Methods (ARM) that are included in the State and Local Air Monitoring (SLAMS) network, National Core (NCore) multipollutant monitoring station, Chemical Speciation Network (CSN), Special Purpose Monitor (SPM) stations, and Photochemical Assessment Monitoring Stations (PAMS).

### Areas Covered in this Network Plan

The geographic boundaries of the 25 air districts covered in this ANP as well as the districts preparing their own ANPs are identified in Table 1 and Figure 1. Monitoring sites operated by districts that are not covered by this ANP are included when necessary to demonstrate fulfillment of federal monitoring requirements.

### Public Inspection and Comment Period

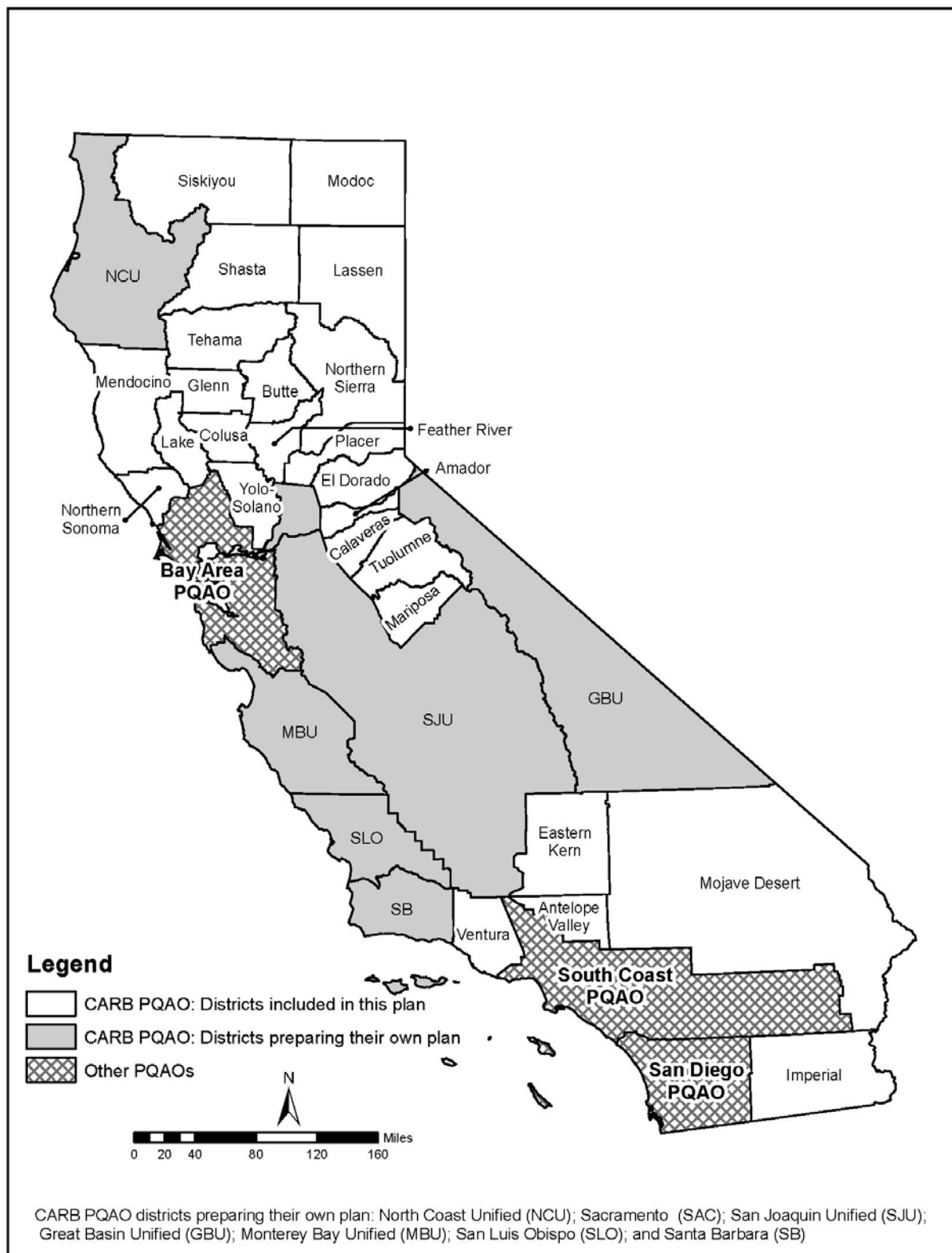
The CARB ANP was available for a 30 day public inspection and comment period prior to its submittal to the U.S. EPA. If public comments are received, CARB will provide a response to the comments when the plan is submitted to the U.S. EPA. The final version of the CARB ANP is available for download from <http://www.arb.ca.gov/aqd/amnr/amnr.htm>.

**Table 1: Districts in the CARB Primary Quality Assurance Organization**

| Districts Included in the CARB ANP  | Districts Drafting Their Own ANP  |
|---|---|
| Amador County APCD<br>Antelope Valley AQMD<br>Butte County AQMD<br>Calaveras County APCD<br>Colusa County APCD<br>Eastern Kern APCD<br>El Dorado County AQMD<br>Feather River AQMD<br>Glenn County APCD<br>Imperial County APCD<br>Lake County AQMD<br>Lassen County APCD*<br>Mariposa County APCD<br>Mendocino County AQMD<br>Modoc County APCD*<br>Mojave Desert AQMD<br>Northern Sierra AQMD<br>Northern Sonoma County APCD<br>Placer County APCD<br>Shasta County AQMD<br>Siskiyou County APCD<br>Tehama County APCD<br>Tuolumne County APCD<br>Ventura County APCD<br>Yolo-Solano AQMD | Great Basin Unified APCD<br>Monterey Bay ARD<br>North Coast Unified AQMD<br>Sacramento Metropolitan AQMD<br>San Joaquin Valley APCD<br>San Luis Obispo County APCD<br>Santa Barbara County APCD |

\* Lassen County APCD and Modoc County APCD are covered by this ANP; however, no ambient air quality monitors are currently sited in these districts.

### Figure 1: California Primary Quality Assurance Organizations



## Section 2: Monitoring Network Overview

California's ambient air monitoring network includes over 250 sites and more than 700 monitors, making it one of the most extensive in the world. Many regions in California are characterized by complex terrain, variable meteorological conditions, and diverse emission sources. A large monitoring network is critical for assessing the State's progress in meeting clean air objectives, understanding spatial and temporal variation in air pollutants, and evaluating pollutant exposure. Monitors are operated by CARB, local air districts, and other entities including the NPS, private contractors, and tribal authorities. Tribal monitors are not included in this report.

Ambient concentration data are collected for a wide variety of pollutants including ozone, particulate matter with a diameter of 2.5 microns or less (PM<sub>2.5</sub>), particulate matter with a diameter of 10 microns or less (PM<sub>10</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb), which are the federal criteria pollutants. Meteorological parameters, volatile organic compounds (VOC), and a host of toxic air contaminants are also monitored at a number of sites. While toxics, VOCs, and meteorological monitoring play an integral role in California's air quality programs, the focus of this ANP, as specified by federal requirements, is on sites that conduct monitoring of the federal criteria pollutants, as well as PAMS data, within the jurisdiction of districts covered by this ANP.

Although most sites monitor for multiple pollutants, not all pollutants are monitored at every site because the data needs vary by locale. One fundamental purpose of monitoring is to distinguish between areas where pollutant levels violate the ambient air quality standards and areas that meet ambient air quality standards. Areas in violation of a standard usually have increasingly stringent mandates to reduce the sources of pollution that result in the exceedances. Based in part on monitoring data, air quality agencies develop strategies, programs, and regulations to achieve needed emission reductions. Data from the ambient monitoring network are then used to assess the efficacy of those strategies, programs, and regulations.

The pollutants and the number of monitors at each monitoring site in the area covered by this ANP are shown in Table 2; additional site and monitor-level details are provided in Appendix A.

**Table 2: Pollutants Monitored in the Districts Covered by this ANP**

| District        | Site (AQS Number)                               | CO | NO <sub>2</sub> | Ozone | SO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> | CARB Operated |
|-----------------|---|----|-----------------|-------|-----------------|------------------|-------------------|---------------|
| Amador          | Jackson-Clinton (06-005-0002)                   |    |                 | 1     |                 |                  |                   | Yes           |
| Antelope Valley | Lancaster-Division (06-037-9033)                | 1  | 1               | 1     |                 | 1                | 1                 |               |
| Butte           | Chico-East (06-007-0008)                        | 1  | 1               | 1     |                 | 1                | 2                 | Yes           |
|                 | Gridley (06-007-4001)                           |    |                 |       |                 |                  | 1                 | Yes           |
|                 | Paradise-Airport (06-007-0007)                  |    |                 | 1     |                 |                  |                   | Yes           |
|                 | Paradise-Theater (06-007-2002)                  |    |                 |       |                 |                  | 1                 | Yes           |
| Calaveras       | San Andreas (06-009-0001)                       |    |                 | 1     |                 | 1                | 1                 | Yes           |
| Colusa          | Colusa-Sunrise Blvd (06-011-1002)               |    |                 | 1     |                 | 2                | 2                 | Yes           |
| Eastern Kern    | Canebrake (06-029-0017)                         |    |                 |       |                 | 1                |                   |               |
|                 | Mojave (06-029-0011)                            |    |                 | 1     |                 | 1                | 1                 | Yes           |
|                 | Ridgecrest-California (06-029-0015)             |    |                 |       |                 | 1                | 1                 |               |
| El Dorado       | Cool (06-017-0020)                              |    |                 | 1     |                 |                  |                   | Yes           |
|                 | Echo Summit (06-017-0012)                       |    |                 | 1     |                 |                  |                   | Yes           |
|                 | Placerville (06-017-0010)                       |    |                 | 1     |                 |                  |                   | Yes           |
|                 | South Lake Tahoe (06-017-0011)                  |    |                 |       |                 | 1                |                   | Yes           |
| Feather River   | Sutter Buttes (06-101-0004) <sup>1</sup>        |    |                 | 1     |                 |                  |                   | Yes           |
|                 | Yuba City (06-101-0003)                         |    | 1               | 1     |                 | 1                | 2                 | Yes           |
| Glenn           | Willows-Colusa (06-021-0003)                    |    |                 | 1     |                 | 1                | 1                 | Yes           |
| Imperial        | Brawley-Main (06-025-0007)                      |    |                 |       |                 | 2                | 1                 |               |
|                 | Calexico-Ethel (06-025-0005)                    | 1  | 1               | 1     | 1               | 2                | 3                 | Yes           |
|                 | El Centro-9th (06-025-1003) <sup>2</sup>        | 1  | 1               | 1     |                 | 1                | 1                 |               |
|                 | Niland-English (06-025-4004)                    |    |                 | 1     |                 | 2                |                   |               |
|                 | Westmorland (06-025-4003)                       |    |                 | 1     |                 | 1                |                   |               |
| Lake            | Anderson Spring (06-033-3010)                   |    |                 |       |                 | 1                |                   |               |
|                 | Glenbrook (06-033-3011)                         |    |                 |       |                 | 1                |                   |               |
|                 | Lakeport-S.Main (06-033-3002) <sup>3</sup>      |    |                 | 1     |                 | 1                | 1                 |               |
| Mariposa        | Jerseydale (06-043-0006)                        |    |                 | 1     |                 |                  |                   | Yes           |
|                 | Yosemite Village (06-043-1001)                  |    |                 |       |                 | 1                | 1                 | Yes           |
|                 | Yosemite NP-Turtleback (06-043-0003)            |    |                 | 1     |                 |                  |                   |               |
| Mendocino       | Fort Bragg-300 Dana (06-045-0010)               |    |                 |       |                 | 1                |                   |               |
|                 | Ukiah-Gobbi (06-045-0008)                       |    |                 | 1     |                 |                  |                   |               |
|                 | Ukiah-Library (06-045-0006)                     |    |                 |       |                 |                  | 1                 |               |
|                 | Willits-Justice Center (06-045-2002)            |    |                 |       |                 |                  | 1                 |               |
| Mojave Desert   | Barstow (06-071-0001)                           | 1  | 1               | 1     |                 | 1                |                   |               |
|                 | Blythe-Murphy (06-065-9003)                     |    |                 | 1     |                 |                  |                   | Yes           |
|                 | Hesperia-Olive (06-071-4001)                    |    |                 | 1     |                 | 1                |                   |               |
|                 | Joshua Tree-Black Rock (06-071-9002)            |    |                 | 1     |                 |                  |                   |               |
|                 | Joshua Tree-Pinto Wells (06-065-1004)           |    |                 | 1     |                 |                  |                   |               |
|                 | Lucerne Valley (06-071-0013)                    |    |                 |       |                 | 1                |                   |               |
|                 | Mojave NP (06-071-1001)                         |    |                 | 1     |                 |                  |                   |               |
|                 | Phelan (06-071-0012)                            |    |                 | 1     |                 |                  |                   |               |
|                 | Trona-Athol/Telescope (06-071-1234)             |    | 1               | 1     | 1               | 1                |                   |               |
| Northern Sierra | Victorville-Park (06-071-0306)                  | 1  | 1               | 1     | 1               | 2                | 2                 |               |
|                 | Chester (06-063-1007)                           |    |                 |       |                 |                  | 1                 |               |
|                 | Grass Valley (06-057-0005)                      |    |                 | 1     |                 |                  | 2                 |               |
|                 | Portola (06-063-1010)                           |    |                 |       |                 |                  | 3                 |               |
|                 | Quincy-N Church (06-063-1006)                   |    |                 |       |                 |                  | 2                 |               |
|                 | Truckee-Fire Station (06-057-1001)              |    |                 |       |                 |                  | 2                 |               |
| Northern Sonoma | White Cloud Mountain (06-057-0007) <sup>4</sup> |    |                 | 1     |                 |                  |                   | Yes           |
|                 | Cloverdale (06-097-0001)                        |    |                 |       |                 | 1                |                   |               |
|                 | Guerneville-Church (06-097-3002)                |    |                 |       |                 | 1                |                   |               |
|                 | Healdsburg-Matheson (06-097-0002)               |    |                 |       |                 | 1                |                   |               |
|                 | Healdsburg-Airport (06-097-1003)                |    |                 | 1     |                 |                  |                   |               |
| Placer          | Auburn-Atwood (06-061-0003)                     |    |                 | 1     |                 |                  | 1                 |               |
|                 | Colfax-City Hall (06-061-0004)                  |    |                 | 1     |                 |                  | 1                 |               |
|                 | Lincoln-1st (06-061-2002)                       |    |                 | 1     |                 |                  | 1                 |               |
|                 | Roseville-N Sunrise (06-061-0006)               |    | 1               | 1     |                 | 1                | 3                 | Yes           |
|                 | Tahoe City-Fairway (06-061-1004)                |    |                 | 1     |                 |                  | 1                 |               |

**Table 2 continued**

| District    | Site   | CO | NO <sub>2</sub> | Ozone | SO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> | CARB Operated |
|-------------|--|----|-----------------|-------|-----------------|------------------|-------------------|---------------|
| Shasta      | Anderson-North (06-089-0007)                   |    |                 | 1     |                 | 1                |                   |               |
|             | Lassen Volcanic NP (06-089-3003)               |    |                 | 1     |                 |                  |                   |               |
|             | Redding-Health Dept (06-089-0004)              |    |                 | 1     |                 | 1                | 1                 |               |
|             | Shasta Lake-Lake (06-089-0009)                 |    |                 | 1     |                 |                  |                   |               |
|             | Shasta Lake-La Mesa (06-089-0008)              |    |                 |       |                 | 1                |                   |               |
| Siskiyou    | Yreka (06-093-2001) <sup>5</sup>               |    |                 | 1     |                 | 1                | 2                 |               |
| Tehama      | Red Bluff-Walnut (06-103-0007)                 |    |                 | 1     |                 | 1                | 1                 |               |
|             | Tuscan Butte (06-103-0004)                     |    |                 | 1     |                 |                  |                   | Yes           |
| Tuolumne    | Sonora-Barretta (06-109-0005)                  |    |                 | 1     |                 |                  |                   | Yes           |
| Ventura     | El Rio-Rio Mesa School (06-111-3001)           |    | 1               | 1     |                 | 1                | 1                 |               |
|             | Ojai-East Ojai (06-111-1004)                   |    |                 | 1     |                 |                  | 1                 |               |
|             | Piru-Pacific (06-111-0009)                     |    |                 | 1     |                 |                  | 1                 |               |
|             | Simi Valley-Cochran (06-111-2002)              |    | 1               | 1     |                 | 1                | 2                 |               |
|             | Thousand Oaks (06-111-0007)                    |    |                 | 1     |                 |                  | 1                 |               |
| Yolo-Solano | Davis-UCD Campus (06-113-0004)                 |    | 1               | 1     |                 |                  | 1                 | Yes           |
|             | Vacaville-Merchant (06-095-3001)               |    |                 |       |                 | 1                |                   |               |
|             | Vacaville-Ulatis (06-095-3003)                 |    |                 | 1     |                 |                  |                   |               |
|             | West Sacramento-15 <sup>th</sup> (06-113-2001) |    |                 |       |                 | 1                |                   |               |
|             | Woodland-Gibson (06-113-1003)                  |    |                 | 1     |                 | 1                | 1                 |               |

<sup>1</sup> 2017 data from May 18 to October 31 for Sutter Buttes has been invalidated due to poor quality assurance results.

<sup>2</sup> CO monitor shutdown on 7/12/2017.

<sup>3</sup> Lakeport-Lakeport Blvd (06-033-3001) closed on 7/1/2017, new site at Lakeport-S. Main Street started on 7/1/2017.

<sup>4</sup> White Cloud Mountain did not operate in 2017.

<sup>5</sup> 2017 data from February 23 to September 20 for Yreka has been invalidated due to poor quality assurance results.

Note: CARB operating sites are delineated with grey shading.



### Section 3: Site and Monitoring Information

U.S. EPA requires the federal site type, federal monitoring objective, and federal monitor type to be included in ANPs. These elements are described in the following sections and identified at the monitor-level in the detailed site reports in Appendix A.

#### Federal Site Type

Monitoring sites must be capable of informing air quality program managers about peak air pollution levels, typical levels in populated areas, air pollution transported into and out of a city or region, and air pollution levels near specific sources. For these reasons, U.S. EPA requires that each monitor at a site be designated, at a minimum, with one of the following site types established in the Air Quality System (AQS) database:

- Extreme Downwind
- Highest Concentration
- Maximum Ozone Concentration
- Maximum Precursor Emissions Impact
- Population Exposure
- Source Oriented
- Upwind Background
- General/Background
- Regional Transport
- Welfare Related Impacts
- Quality Assurance
- Other

U.S. EPA requires that a monitor be designated with an appropriate site type so that the data collected can be used to support a specific federal monitoring objective. The site type designations are at the monitor level rather than the site level because U.S. EPA has determined that a single site type may not be adequate to describe all of the monitors at a particular site.

Federal regulations note that the spatial scale of representativeness of a monitor should be consistent with the stated site type. The spatial scale of representativeness is a measure of the physical dimensions of the air mass through which pollutant concentrations are expected to be relatively homogeneous. The scales of representativeness that are most relevant to ambient air monitoring are defined as follows:

- *Microscale*: Measured concentrations are expected to be similar for an area ranging from several meters up to about 100 meters.
- *Middle scale*: Measured concentrations are expected to be similar for areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometer.

- *Neighborhood scale*: Measured concentrations are expected to be similar within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers range.
- *Urban scale*: Measured concentrations are expected to be similar within an area of city-like dimensions, on the order of 4 to 50 kilometers.
- *Regional scale*: Measured concentrations are expected to be similar within a rural area of reasonably homogeneous geography without large sources, and extend from tens to hundreds of kilometers.
- *National and global scales*: These measurement scales represent concentrations characterizing the nation and the globe as a whole

The spatial scale of representativeness that is generally most appropriate for each of the most common federal site types are shown in Table 3, which is based on Table D-1 in Appendix D of 40 CFR 58. The types of monitoring sites and the spatial scales designated in the area covered by this ANP are listed in Table 4 and included in the detailed site reports in Appendix A. The site type is listed first following the spatial scale. Note that a monitor may have more than one site type.

**Table 3: Site Type and Recommended Spatial Scale**

| Appropriate Site Type   | Appropriate Spatial Scales  |
|-------------------------|---|
| Highest concentration   | Micro, middle, neighborhood (sometimes urban or regional for secondarily formed pollutants) |
| Population exposure     | Neighborhood, urban   |
| Source oriented         | Micro, middle, neighborhood   |
| General background      | Urban, regional   |
| Regional transport      | Urban, regional   |
| Welfare-related impacts | Urban, regional   |

**Table 4: Site Type and Spatial Scale in the Districts Covered by this ANP**

| District        | Site                    | CO     | NO <sub>2</sub> | Ozone         | SO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> |
|-----------------|-------------------------|--------|-----------------|---------------|-----------------|------------------|-------------------|
| Amador          | Jackson-Clinton         |        |                 | pop/ n        |                 |                  |                   |
| Antelope Valley | Lancaster-Division      | pop/ m | pop/ m          | pop/ m        |                 | pop/ n           | pop/ n            |
| Butte           | Chico-East              | pop/ n | pop/ n          | pop/ n        |                 | pop/ n           | high/ n           |
|                 | Gridley                 |        |                 |               |                 |                  | pop/ n            |
|                 | Paradise-Airport        |        |                 | high/ r       |                 |                  |                   |
|                 | Paradise-Theater        |        |                 |               |                 |                  | gen/ n            |
| Calaveras       | San Andreas             |        |                 | high/ n       |                 | gen/ n           | gen/ n            |
| Colusa          | Colusa-Sunrise Blvd     |        |                 | gen/ r        |                 | high, pop/ n     | pop/ n            |
| Eastern Kern    | Canebrake               |        |                 |               |                 | gen,pop/ u       |                   |
|                 | Mojave                  |        |                 | high/ r       |                 | high/ n          | high/ n           |
|                 | Ridgecrest-California   |        |                 |               |                 | high/ n          | pop/ n            |
|                 | Cool                    |        |                 | high/ r       |                 |                  |                   |
| El Dorado       | Echo Summit             |        |                 | trans/ r      |                 |                  |                   |
|                 | Placerville             |        |                 | high/ r       |                 |                  |                   |
|                 | South Lake Tahoe        |        |                 |               |                 | pop/ m           |                   |
|                 | Sutter Buttes           |        |                 | high,trans/ r |                 |                  |                   |
| Feather River   | Yuba City               |        | pop/ n          | high/ n       |                 | pop/ n           | pop/ n            |
| Glenn           | Willows-Colusa          |        |                 | pop/ n        |                 | pop/ n           | pop/ n            |
| Imperial        | Brawley-Main            |        |                 |               |                 | pop/ n           | pop/ n            |
|                 | Calexico-Ethel          | pop/ n | pop/ n          | gen/ n        | pop/ n          | high/ n          | pop/ n            |
|                 | El Centro-9th           | pop/ n | pop/ n          | high/ n       |                 | pop/ n           | pop/ n            |
|                 | Niland-English          |        |                 | pop/ n        |                 | pop/ n           |                   |
|                 | Westmorland             |        |                 | pop/ r        |                 | pop/ m           |                   |
|                 | Anderson Spring         |        |                 |               |                 | pop/ u           |                   |
| Lake            | Glenbrook               |        |                 |               |                 | pop/ u           |                   |
|                 | Lakeport-S.Main         |        |                 | pop/ u        |                 | gen/ n           | pop/ n            |
| Mariposa        | Jerseydale              |        |                 | high/ r       |                 |                  |                   |
|                 | Yosemite Village        |        |                 |               |                 | pop/ m           | pop/ m            |
|                 | Yosemite NP-Turtleback  |        |                 | gen/ r        |                 |                  |                   |
| Mendocino       | Fort Bragg-300 Dana     |        |                 |               |                 | gen/ n           |                   |
|                 | Ukiah-Gobbi             |        |                 | pop/ n        |                 |                  |                   |
|                 | Ukiah-Library           |        |                 |               |                 |                  | pop/ n            |
|                 | Willits-Justice Center  |        |                 |               |                 |                  | pop/ n            |
| Mojave Desert   | Barstow                 | pop/ m | pop/ m          | pop/ m        |                 | pop/ n           |                   |
|                 | Blythe-Murphy           |        |                 | gen/ n        |                 |                  |                   |
|                 | Hesperia-Olive          |        |                 | pop/ n        |                 | gen,pop/ n       |                   |
|                 | Joshua Tree-Black Rock  |        |                 | high/ r       |                 |                  |                   |
|                 | Joshua Tree-Pinto Wells |        |                 | gen/ r        |                 |                  |                   |
|                 | Lucerne Valley          |        |                 |               |                 | pop/ n           |                   |
|                 | Mojave NP               |        |                 | gen/ r        |                 |                  |                   |
|                 | Phelan                  |        |                 | pop/ n        |                 |                  |                   |
|                 | Trona-Athol/Telescope   |        | source/ n       | pop/ n        | source/ n       | high,source/ n   |                   |
| Northern Sierra | Victorville-Park        | pop/ n | pop/ n          | pop/ n        | pop/ n          | pop/ n           | trans,pop/ n      |
|                 | Chester                 |        |                 |               |                 |                  | pop/ n            |
|                 | Grass Valley            |        |                 | pop/ n        |                 |                  | pop/ n            |
|                 | Portola                 |        |                 |               |                 |                  | pop/ n            |
|                 | Quincy-N Church         |        |                 |               |                 |                  | pop/ n            |
|                 | Truckee-Fire Station    |        |                 |               |                 |                  | pop/ n            |
| Northern Sonoma | White Cloud Mountain    |        |                 | gen/ r        |                 |                  |                   |
|                 | Cloverdale              |        |                 |               |                 | pop/ n           |                   |
|                 | Guerneville-Church      |        |                 |               |                 | pop/ n           |                   |
|                 | Healdsburg-Matheson     |        |                 |               |                 | pop/ n           |                   |
|                 | Healdsburg-Airport      |        |                 | gen/ u        |                 |                  |                   |
| Placer          | Auburn-Atwood           |        |                 | pop/ n        |                 |                  | pop/ n            |
|                 | Colfax-City Hall        |        |                 | pop/ n        |                 |                  | pop/ n            |
|                 | Lincoln-1st             |        |                 | pop/ n        |                 |                  | pop/ n            |
|                 | Roseville-N Sunrise     |        | pop/ n          | high/ n       |                 | high/ n          | pop/ n            |
|                 | Tahoe City-Fairway      |        |                 | gen/ u        |                 |                  | gen/ u            |

**Table 4 continued**

| District    | Site                             | CO | NO <sub>2</sub> | Ozone             | SO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> |
|-------------|----------------------------------|----|-----------------|-------------------|-----------------|------------------|-------------------|
| Shasta      | Anderson-North                   |    |                 | pop/ n            |                 | high/ n          |                   |
|             | Lassen Volcanic NP               |    |                 | gen/ r            |                 |                  |                   |
|             | Redding-Health Dept              |    |                 | pop,high/ n       |                 | high/ n          | pop/ n            |
|             | Shasta Lake-Lake                 |    |                 | pop/ n            |                 |                  |                   |
|             | Shasta Lake-La Mesa              |    |                 |                   |                 | pop/ n           |                   |
| Siskiyou    | Yreka                            |    |                 | high,trans,pop/ n |                 | high/ n          | pop/ n            |
| Tehama      | Red Bluff-Walnut                 |    |                 | pop/ n            |                 | high/ n          | gen/ n            |
|             | Tuscan Butte                     |    |                 | high/ r           |                 |                  |                   |
| Tuolumne    | Sonora-Barretta                  |    |                 | high/ n           |                 |                  |                   |
| Ventura     | El Rio-Rio Mesa School           |    | pop/ u          | pop/ u            |                 | pop/ n           | pop/ n            |
|             | Ojai-East Ojai                   |    |                 | pop/ u            |                 |                  | pop/ n            |
|             | Piru-Pacific                     |    |                 | pop/ n            |                 |                  | pop/ n            |
|             | Simi Valley-Cochran              |    | high/ u         | high/ u           |                 | high/ n          | high/ n           |
|             | Thousand Oaks                    |    |                 | pop/ u            |                 |                  | pop/ n            |
| Yolo-Solano | Davis-UCD Campus                 |    | pop/ n          | pop/ n            |                 |                  | pop/ n            |
|             | Vacaville-Merchant               |    |                 |                   |                 | pop/ n           |                   |
|             | Vacaville-Ulatis                 |    |                 | high, pop/ n      |                 |                  |                   |
|             | West Sacramento-15 <sup>th</sup> |    |                 |                   |                 | pop/ n           |                   |
|             | Woodland-Gibson                  |    |                 | pop/ n            |                 | pop/ n           | pop/ n            |

**Site Types:**

gen- general background  
high- highest concentration  
pop- population exposure  
trans- regional transport  
source- source oriented

**Spatial Scales:**

m- middle scale  
n- neighborhood scale  
u- urban scale  
r- regional scale

## Federal Monitoring Objective

The federal monitoring objectives are defined in Appendix D of 40 CFR 58. Federal monitoring regulations require that each monitor measuring a criteria pollutant is sited to meet at least one monitoring objective. The three federal monitoring objectives are:

- To provide air quality data to the public in a timely manner;
- To support compliance with national ambient air quality standards; and
- To support air quality research studies.

Many air quality agencies operate monitors with multiple objectives in mind. For example, monitoring is conducted to provide both air quality data to the public as well as to support compliance with national ambient air quality standards. There are a number of monitoring purposes besides the federal monitoring objectives that are directly related to the needs of state and local agencies. Some of the most common state and local monitoring purposes include determination of agricultural and residential burn periods, geyser air monitoring, and state designations. These are outside of the scope of the ANP.

## Federal Monitor Type

The federal monitor type refers to the agency operating the monitor or the specific purpose for which the monitor is operated. There are seven federal monitor types:

- SLAMS
- SPM
- Industrial
- Non-EPA federal
- Tribal
- EPA
- Other \*

Most monitors established and operated by state and local air agencies are identified as SLAMS. SLAMS monitors meet specific siting and quality assurance criteria defined in federal regulations. Some monitors are identified as SPMs, and are operated by state and local monitoring agencies to fulfill very specific or short-term monitoring goals. SPMs are required to meet 40 CFR Part 58 Appendix A requirements, and 40 CFR Part 58 Appendix E requirements are optional. Many SPMs operated in California by state and local agencies do fulfill these requirements. SPMs that operate for more than two years can be used by U.S. EPA to determine compliance with federal standards.

In this ANP all the monitors identified as non-EPA federal monitors are operated by the NPS. Industrial monitors and EPA monitors are not operated in the area covered by this ANP. Tribal monitors are operated on tribal lands by tribal entities and are outside of the scope of this ANP. Table 5 shows the types of monitors, their monitoring objectives and the network affiliations. Some monitors are operated under specific types of monitoring network programs. Example of the network affiliations are PAMS, NCore, Near-road and CSN. The full list can be found at <https://aqs.epa.gov/aqsweb/documents/codetables/networks.html>.

**Table 5: Monitor Type, Monitoring Objective and Network Affiliation**

| District        | Site                  | Monitoring Objective           | Monitor Type* | Network Affiliation** |
|-----------------|-----------------------|--------------------------------|---------------|-----------------------|
| Amador          | Jackson-Clinton       | NAAQS Comparison               | SLAMS         |                       |
| Antelope Valley | Lancaster-Division    | NAAQS Comparison, Public Info. | SLAMS         |                       |
| Butte           | Chico-East            | NAAQS Comparison, Public Info. | SLAMS         | CSN Supplemental      |
|                 | Gridley               | Public Info.                   | SLAMS         |                       |
|                 | Paradise-Airport      | NAAQS Comparison               | SLAMS         |                       |
|                 | Paradise-Theater      | Public Info.                   | SLAMS         |                       |
|                 | San Andreas           | NAAQS Comparison, Public Info. | SLAMS         |                       |
| Calaveras       | San Andreas           | NAAQS Comparison, Public Info. | SLAMS         |                       |
| Colusa          | Colusa-Sunrise Blvd   | NAAQS Comparison               | SLAMS         |                       |
| Eastern Kern    | Canebrake             | NAAQS Comparison               | SLAMS         |                       |
|                 | Mojave                | NAAQS Comparison               | SLAMS         |                       |
|                 | Ridgecrest-California | NAAQS Comparison               | SLAMS         |                       |
| El Dorado       | Cool                  | NAAQS Comparison               | SLAMS         |                       |
|                 | Echo Summit           | NAAQS Comparison               | SLAMS         |                       |
|                 | Placerville           | NAAQS Comparison               | SLAMS         |                       |
|                 | South Lake Tahoe      | NAAQS Comparison               | SLAMS         |                       |
| Feather River   | Sutter Buttes         | NAAQS Comparison               | SLAMS         |                       |
|                 | Yuba City             | NAAQS Comparison, Public Info. | SLAMS         |                       |
| Glenn           | Willows-Colusa        | NAAQS Comparison, Public Info. | SLAMS         |                       |
| Imperial        | Brawley-Main          | NAAQS Comparison               | SLAMS         |                       |
|                 | Calexico-Ethel        | NAAQS Comparison, Public Info. | SLAMS         | CSN Supplemental      |
|                 | El Centro-9th         | NAAQS Comparison               | SLAMS         |                       |
|                 | Niland-English        | NAAQS Comparison               | SLAMS         |                       |
|                 | Westmorland           | NAAQS Comparison               | SLAMS         |                       |

**Table 5 continued**

| District        | Site                    | Monitoring Objective           | Monitor Type*   | Network Affiliation** |
|-----------------|-------------------------|--------------------------------|-----------------|-----------------------|
| Lake            | Anderson Spring         | Public Info.                   | SLAMS           |                       |
|                 | Glenbrook               | Public Info.                   | SLAMS           |                       |
|                 | Lakeport-S.Main         | NAAQS Comparison               | SLAMS           |                       |
| Mariposa        | Jerseydale              | NAAQS Comparison               | SPM             |                       |
|                 | Yosemite Village        | NAAQS Comparison, Public Info. | SLAMS           |                       |
|                 | Yosemite NP-Turtleback  | NAAQS Comparison               | non-EPA Federal | CASTNET               |
| Mendocino       | Fort Bragg-300 Dana     | NAAQS Comparison               | SLAMS           |                       |
|                 | Ukiah-Gobbi             | NAAQS Comparison               | SLAMS           |                       |
|                 | Ukiah-Library           | NAAQS Comparison               | SLAMS           |                       |
|                 | Willits-Justice Center  | NAAQS Comparison               | SLAMS           |                       |
| Mojave Desert   | Barstow                 | NAAQS Comparison               | SLAMS           |                       |
|                 | Blythe-Murphy           | NAAQS Comparison, Public Info. | SLAMS           |                       |
|                 | Hesperia-Olive          | NAAQS Comparison               | SLAMS           |                       |
|                 | Joshua Tree-Black Rock  | NAAQS Comparison               | non-EPA Federal | CASTNET               |
|                 | Joshua Tree-Pinto Wells | Public Info.                   | non-EPA Federal |                       |
|                 | Lucerne Valley          | NAAQS Comparison               | SLAMS           |                       |
|                 | Mojave NP               | Public Info.                   | non-EPA Federal |                       |
|                 | Phelan                  | NAAQS Comparison               | SLAMS           |                       |
|                 | Trona-Athol/Telescope   | NAAQS Comparison               | SLAMS           |                       |
|                 | Victorville-Park        | NAAQS Comparison               | SLAMS           |                       |
| Northern Sierra | Chester                 | NAAQS Comparison               | SLAMS           |                       |
|                 | Grass Valley            | NAAQS Comparison               | SLAMS           |                       |
|                 | Portola                 | NAAQS Comparison               | SLAMS           | CSN Supplemental      |
|                 | Quincy-N Church         | NAAQS Comparison               | SLAMS           |                       |
|                 | Truckee-Fire Station    | NAAQS Comparison               | SLAMS           |                       |
|                 | White Cloud Mountain    | NAAQS Comparison               | SLAMS           |                       |
| Northern Sonoma | Cloverdale              | NAAQS Comparison               | SLAMS           |                       |
|                 | Guerneville-Church      | NAAQS Comparison               | SLAMS           |                       |
|                 | Healdsburg-Matheson     | NAAQS Comparison               | SLAMS           |                       |
|                 | Healdsburg-Airport      | NAAQS Comparison               | SLAMS           |                       |
| Placer          | Auburn-Atwood           | NAAQS Comparison               | SLAMS           |                       |
|                 | Colfax-City Hall        | NAAQS Comparison, Public Info. | SLAMS           |                       |
|                 | Lincoln-1st             | NAAQS Comparison, Public Info. | SLAMS           |                       |
|                 | Roseville-N Sunrise     | NAAQS Comparison, Public Info. | SLAMS           |                       |
|                 | Tahoe City-Fairway      | NAAQS Comparison, Public Info. | SLAMS           |                       |
| Shasta          | Anderson-North          | NAAQS Comparison               | SLAMS           |                       |
|                 | Lassen Volcanic NP      | NAAQS Comparison, Research     | non-EPA Federal | CASTNET               |
|                 | Redding-Health Dept     | NAAQS Comparison               | SLAMS           |                       |
|                 | Shasta Lake-Lake        | NAAQS Comparison               | SLAMS           |                       |
|                 | Shasta Lake-La Mesa     | NAAQS Comparison               | SLAMS           |                       |
| Siskiyou        | Yreka                   | NAAQS Comparison               | SPM             |                       |
| Tehama          | Red Bluff-Walnut        | NAAQS Comparison               | SLAMS           |                       |
|                 | Tuscan Butte            | NAAQS Comparison               | SPM             |                       |
| Tuolumne        | Sonora-Barretta         | NAAQS Comparison               | SLAMS           |                       |
| Ventura         | El Rio-Rio Mesa School  | NAAQS Comparison               | SLAMS           | PAMS                  |
|                 | Ojai-East Ojai          | NAAQS Comparison               | SLAMS           |                       |
|                 | Piru-Pacific            | NAAQS Comparison               | SLAMS           |                       |
|                 | Simi Valley-Cochran     | NAAQS Comparison, Public Info. | SLAMS           | PAMS                  |
|                 | Thousand Oaks           | NAAQS Comparison               | SLAMS           |                       |
| Yolo-Solano     | Davis-UCD Campus        | NAAQS Comparison, Public Info. | SLAMS           |                       |
|                 | Vacaville-Merchant      | NAAQS Comparison               | SLAMS           |                       |
|                 | Vacaville-Ulatis        | NAAQS Comparison               | SLAMS           |                       |
|                 | West Sacramento-15th    | NAAQS Comparison               | SLAMS           |                       |
|                 | Woodland-Gibson         | NAAQS Comparison               | SLAMS           |                       |

\* There are no other network types such as CSN STN, IMPROVE, NATTS, NCore, or Near-road in the area covered by this ANP and are required to be identified by the appropriate network affiliation.

## Section 4: Additional Information about the Monitors

### Required Monitor Information

U.S. EPA regulations (40 CFR Part 58.10) require that the annual monitoring network plan lists specific additional information that characterizes the nature and location of the monitors. U.S. EPA Region 9 identified all of the information that is required on each site/monitor basis. The full list of required information is included in Table 6. This detailed information for each site can be found in the detailed site tables in Appendix A of this ANP.

**Table 6: Required Detailed Monitoring Site Information**

| Site Name   |
|---|
| Local site name   |
| AQS ID  |
| GPS coordinates (decimal degrees)   |
| Street Address  |
| County  |
| Distance to roadways (meters)   |
| Traffic count (AADT, year)  |
| Groundcover (e.g. paved, vegetative, dirt, sand, gravel)  |
| Representative statistical area name (i.e. MSA, CBSA, other)  |
| Pollutant, POC  |
| Primary / QA Collocated / Other   |
| Parameter code  |
| Basic monitoring objective(s)   |
| Site type(s)  |
| Monitor type  |
| Network affiliation(s), if applicable   |
| Instrument manufacturer and model   |
| Method code   |
| FRM/FEM/ARM/other   |
| Collecting Agency   |
| Analytical Lab (i.e. weigh lab, toxics lab, other)  |
| Reporting Agency  |
| Spatial scale (e.g. micro, neighborhood)  |
| Monitoring start date   |
| Current sampling frequency  |
| Required sampling frequency   |
| Sampling season   |
| Probe height (meters)   |
| Distance from supporting structure (meters)   |
| Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby (meters).     |
| Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby (meters). |
| Distance from tree drip-lines (meters)  |
| Distance to furnace or incinerator flue (meters)  |
| Distance between monitors fulfilling a QA collocation requirement (meters).   |
| Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)  |
| Probe material for reactive gases NO/NO <sub>2</sub> /NO <sub>y</sub> , SO <sub>2</sub> , O <sub>3</sub> ; PAMS: VOCs, Carbonyls    |

**Table 6 continued**

|  |
|--|
| Residence time for reactive gases NO/NO <sub>2</sub> /NO <sub>y</sub> , SO <sub>2</sub> , O <sub>3</sub> ; PAMS: VOCs, Carbonyls (seconds) |
| Will there be changes within the next 18 months? (Y/N)   |
| Is it suitable for comparison against the annual PM <sub>2.5</sub> ? (Y/N)   |
| Frequency of flow rate verification for manual PM samplers, including Pb samplers  |
| Frequency of flow rate verification for automated PM analyzers   |
| Frequency of one-point QC check for gaseous instruments  |
| Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters   |
| Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors   |

### Information on the continuous PM<sub>2.5</sub> non-FEM monitors

The federal regulations require that monitors are Federal Equivalent Method (FRM), Federal Equivalent Method (FEM), or Approved Regional Method (ARM) and meet certain siting criteria in order for the data to be used for NAAQS comparison. While all continuous PM<sub>10</sub> monitors discussed in this report are FEM monitors, there are some continuous PM<sub>2.5</sub> monitors that are non-FEMs. Table 7 lists the continuous PM<sub>2.5</sub> non-FEM monitoring sites covered in this ANP. The continuous PM<sub>2.5</sub> data reported from these non-FEM monitors are excluded from NAAQS comparison. However, these non-FEM monitors are California Approved Samplers (CAS) and the data are used for State designation and/or in AirNow for Air Quality Index reporting.

**Table 7: Monitoring Site Operating Continuous PM<sub>2.5</sub> Non-FEM monitors**

| District        | Site                                   |
|-----------------|--|
| Butte           | Chico-East Avenue (06-007-0008)        |
|                 | Gridley (06-007-4001)                  |
|                 | Paradise-Theater (06-007-2002)         |
| Colusa          | Colusa-Sunrise Blvd (06-011-1002)      |
| Feather River   | Yuba City (06-101-0003)                |
| Glenn           | Willows-Colusa (06-021-0003)           |
| Imperial        | Calexico (06-025-0005)                 |
| Mariposa        | Yosemite Village (06-043-1001)         |
| Northern Sierra | Chester (06-063-1007)                  |
|                 | Grass Valley (06-057-0005)             |
|                 | Portola (06-063-1010)                  |
|                 | Quincy-N Church Street (06-063-1006)   |
|                 | Truckee-Fire Station (06-057-1001)     |
| Placer          | Colfax-City Hall (06-061-0004)         |
|                 | Lincoln-1st Street (06-061-2002)       |
|                 | Roseville-N Sunrise Ave (06-061-0006)  |
|                 | Tahoe City-Fairway Drive (06-061-1004) |
| Yolo-Solano     | Davis-UCD Campus (06-113-0004)         |



## Core-Based Statistical Areas

Appendix A of this ANP also lists the location of each monitor, including the Core-Based Statistical Area (CBSA) in which each monitor is located. CBSAs are defined by the United States Office of Management and Budget (OMB) and provide a consistent set of geographical areas for federal agencies to use in collecting, tabulating, and publishing statistical data. Two types of areas are included as CBSAs: Metropolitan Statistical Areas and Micropolitan Statistical Areas, which differ by population threshold. A Metropolitan Statistical Area has an urban core with a population of 50,000 or more, whereas a Micropolitan Statistical Area has an urban core with a population of at least 10,000, but less than 50,000. Several counties in California are sparsely populated and do not meet the classification requirements for incorporation into a CBSA (Figure 2).

U.S. EPA specifies the number of monitors required for each pollutant based on the CBSA. Table 8 contains a comprehensive list of CBSAs and associated air districts for California. Several of the 25 air districts covered by this ANP are located in CBSAs that also include air districts that are preparing their own ANPs. Information regarding monitors operated by districts outside of those covered by this ANP will be included in this plan when necessary to demonstrate fulfillment of federal monitoring requirements.

For CBSAs that include multiple districts, fulfillment of minimum monitoring requirements is dependent upon coordination between air monitoring staff, particularly when changes to the monitoring network are considered. The Roles and Responsibilities documents developed by CARB specify that districts and CARB must communicate with each other when changes to the network are being considered. When proposed changes are communicated between districts and CARB, staff from both agencies will work closely to evaluate impacts on minimum monitoring requirements and develop pathways that ensure federal requirements are met. The Roles and Responsibilities documents are available on the CARB website at [http://www.arb.ca.gov/aqgm/qa/pqao/repository/rr\\_docs.htm](http://www.arb.ca.gov/aqgm/qa/pqao/repository/rr_docs.htm).

### Figure 2: Core-Based Statistical Areas in California



U.S. DEPARTMENT OF COMMERCE Economics and Statistics Administration U.S. Census Bureau

**Table 8: Core-Based Statistical Areas in California**

| <b>CBSA Name*</b>                         | <b>County</b>  | <b>Included in the CARB ANP?</b>        | <b>Included in other ANP?</b> |
|---|--|---|-------------------------------|
| Bakersfield                               | Kern   | Yes; Eastern Kern                       | San Joaquin Valley            |
| Chico                                     | Butte  | Yes                                     | - -                           |
| Clearlake                                 | Lake   | Yes                                     | - -                           |
| Crescent City                             | Del Norte  | No                                      | North Coast Unified           |
| El Centro                                 | Imperial   | Yes                                     | - -                           |
| Eureka-Arcata-Fortuna                     | Humboldt   | No                                      | North Coast Unified           |
| Fresno                                    | Fresno   | No                                      | San Joaquin Valley            |
| Hanford-Corcoran                          | Kings  | No                                      | San Joaquin Valley            |
| Los Angeles-Long Beach-Anaheim            | Los Angeles; Orange                                    | Yes; Antelope Valley                    | South Coast                   |
| Madera                                    | Madera   | No                                      | San Joaquin Valley            |
| Merced                                    | Merced   | No                                      | San Joaquin Valley            |
| Modesto                                   | Stanislaus   | No                                      | San Joaquin Valley            |
| Napa                                      | Napa   | No                                      | Bay Area                      |
| Oxnard-Thousand Oaks-Ventura              | Ventura  | Yes                                     | - -                           |
| Red Bluff                                 | Tehama   | Yes                                     | - -                           |
| Redding                                   | Shasta   | Yes                                     | - -                           |
| Riverside-San Bernardino-Ontario          | Riverside; San Bernardino                              | Yes, Mojave Desert                      | South Coast                   |
| Sacramento-Roseville-Arden Arcade         | El Dorado; Placer; Sacramento; Yolo                    | Yes; Placer, Yolo-Solano, and El Dorado | Sacramento Metropolitan       |
| Salinas                                   | Monterey   | No                                      | Monterey Bay                  |
| San Diego-Carlsbad                        | San Diego  | No                                      | San Diego County              |
| San Francisco-Oakland-Hayward             | Alameda; Contra Costa; Marin; San Francisco; San Mateo | No                                      | Bay Area                      |
| San Jose-Sunnyvale-Santa Clara            | San Benito; Santa Clara                                | No                                      | Bay Area                      |
| San Luis Obispo-Paso Robles-Arroyo Grande | San Luis Obispo  | No                                      | San Luis Obispo County        |
| Santa Cruz-Watsonville                    | Santa Cruz   | No                                      | Monterey Bay                  |
| Santa Maria-Santa Barbara                 | Santa Barbara  | No                                      | Santa Barbara County          |
| Santa Rosa                                | Sonoma   | Yes; Northern Sonoma                    | Bay Area                      |
| Sonora                                    | Tuolumne   | Yes                                     | - -                           |
| Stockton-Lodi                             | San Joaquin  | No                                      | San Joaquin Valley            |
| Susanville                                | Lassen   | Yes                                     | - -                           |
| Truckee-Grass Valley                      | Nevada   | Yes                                     | - -                           |
| Ukiah                                     | Mendocino  | Yes                                     | - -                           |
| Vallejo-Fairfield                         | Solano   | Yes; Yolo-Solano                        | Bay Area                      |
| Visalia-Porterville                       | Tulare   | No                                      | San Joaquin Valley            |
| Yuba City                                 | Sutter; Yuba   | Yes                                     | - -                           |

\* Micropolitan Statistical Areas are delineated with grey shading; Metropolitan Statistical Areas are not shaded.

## Section 5: Federal Minimum Monitoring Requirements

For criteria pollutants, U.S. EPA has established minimum monitoring requirements that are specified in federal regulations (Appendix D of Title 40, Part 58 of the CFR). Generally, requirements are based on the population from the most recent census data, the severity of the air quality problem, as specified by the design value, or emissions.

This ANP uses 2010 Census populations to determine official minimum monitoring requirements. Upon direction from U.S. EPA, this ANP also includes the most recent available population census estimates (July 1, 2017) to estimate any changes to these requirements.

### Section 5A: Ozone

#### Minimum Number of Ozone Monitoring Sites

The criteria for minimum monitoring requirements for ozone are shown in Table 9. The requirements are based on the population of the MSA and the magnitude of the design value (i.e. if the design value is greater or equal to 85% or less than 85% of the ozone standard). There are no minimum monitoring requirements outside of metropolitan statistical areas (i.e. areas with without an urban core or less than 50,000 people). NCore and SLAMS monitors can be used to meet minimum monitoring requirements for ozone. In the absence of a valid design value, requirements for “less than 85% of any ozone NAAQS” apply.

**Table 9: Minimum Ozone Monitoring Requirements for SLAMS**

| Metropolitan Statistical Area population | Most recent 3-year design value concentrations<br>≥85% of any Ozone NAAQS | Most recent 3-year design value concentrations<br><85% of any Ozone NAAQS |
|--|---|---|
| >10 million                              | 4   | 2   |
| 4 - 10 million                           | 3   | 1   |
| 350,000 - <4 million                     | 2   | 1   |
| 50,000 - <350,000                        | 1   | 0   |

Within each Metropolitan Statistical Area, at least one site should be sited to capture maximum ozone concentrations and the site type should be identified as “Highest Concentration”. As shown in Table 10, the 11 metropolitan statistical areas covered by this ANP met the minimum ozone monitoring requirements for ozone in 2017. Sites from districts not covered by this ANP are also listed to provide a complete picture of all the sites contributing towards the minimum monitoring requirements in each Metropolitan Statistical Area. Note that percentages are relative to the 0.070 ppm ozone standard and high concentration sites are denoted with bold text.

SPMs and non-EPA Federal ozone monitors are operated in some areas covered by this ANP, but cannot be counted towards the minimum monitoring requirements. Information about these monitors is provided in Appendix A of this ANP.

**Table 10: CBSAs with Minimum Ozone Monitoring Requirements**

| Metropolitan Statistical Area  | 2010 Census Population (2016 Population Estimate*) | 2015-2017 Design Value (% of NAAQS) DV Site              | Required # of Sites | SLAMS Sites Operating in 2017 (District where site is located)<br><i>High Concentration Sites Denoted by Bold Text</i>   |
|--------------------------------|--|--|---------------------|--|
| Bakersfield                    | 839,361 (893,119)                                  | 0.090 ppm (129%)<br><i>Bakersfield-Municipal Airport</i> | 2                   | <b>Arvin-Di Giorgio (San Joaquin Valley)</b><br>Bakersfield-5558 California Avenue (San Joaquin Valley)<br><b>Bakersfield-Municipal Airport (San Joaquin Valley)</b><br><b>Edison (San Joaquin Valley)</b><br>Maricopa-Stanislaus Street (San Joaquin Valley)<br><b>Mojave-923 Poole Street (Eastern Kern)</b><br>Oildale-3311 Manor Street (San Joaquin Valley)<br>Shafter-Walker Street (San Joaquin Valley)   |
| Chico                          | 220,000 (229,294)                                  | 0.076 ppm (109%)<br><i>Paradise</i>                      | 1                   | Chico-East Avenue (Butte County)<br><b>Paradise-4405 Airport Road (Butte County)</b>   |
| El Centro                      | 174,528 (182,830)                                  | 0.077 ppm (110%)<br><i>Calexico</i>                      | 1                   | Calexico-Ethel Street (Imperial)<br><b>El Centro-9th Street (Imperial)</b><br>Niland-English Road (Imperial)<br>Westmorland (Imperial)   |
| Los Angeles-Long Beach-Anaheim | 12,828,837 (13,353,907)                            | 0.101 ppm (144%)<br><i>Glendora</i>                      | 4                   | Lancaster-43301 Division Street (Antelope Valley)<br>Anaheim-Pampas Lane (South Coast)<br>Azusa (South Coast)<br>Burbank (South Coast)<br>Compton-700 North Bullis Road (South Coast)<br>Costa Mesa-Mesa Verde Drive (South Coast)<br><b>Glendora-Laurel (South Coast)</b><br>La Habra (South Coast)<br>Long Beach-2425 Webster Street (South Coast)<br>Los Angeles-LAX (South Coast)<br>Los Angeles-North Main Street (South Coast)<br>Mission Viejo-26081 Via Pera (South Coast)<br>Pasadena-S Wilson Avenue (South Coast)<br>Pico Rivera-4144 San Gabriel (South Coast)<br>Pomona (South Coast)<br>Reseda (South Coast)<br><b>Santa Clarita (South Coast)</b><br>West Los Angeles-VA Hospital (South Coast) |
| Oxnard-Thousand Oaks-Ventura   | 823,318 (854,223)                                  | 0.077 ppm (110%)<br><i>Simi Valley</i>                   | 2                   | El Rio-Rio Mesa School #2 (Ventura)<br>Thousand Oaks-Moorpark Road (Ventura)<br>Ojai-Ojai Avenue (Ventura)<br>Piru-3301 Pacific Avenue (Ventura)<br><b>Simi Valley-Cochran Street (Ventura)</b>  |
| Redding                        | 177,223 (179,921)                                  | 0.074 ppm (106%)<br><i>Redding</i>                       | 1                   | Anderson-North Street (Shasta County)<br><b>Redding-Health Dept Roof (Shasta County)</b><br>Shasta Lake-13791 Lake Blvd (Shasta County)  |

**Table 10 Continued**

| <b>Metropolitan Statistical Area</b> | <b>2010 Census Population (2016 Population Estimate*)</b> | <b>2015-2017 Design Value (% of NAAQS) DV Site</b> | <b>Required # of Sites</b> | <b>SLAMS Sites Operating in 2017 (District where site is located)</b><br><i>High Concentration Sites Denoted by Bold Text</i>   |
|--------------------------------------|---|--|----------------------------|---|
| Riverside-San Bernardino-Ontario     | 4,224,851<br>(4,580,670)                                  | 0.112 ppm<br>(160%)<br><i>Crestline</i>            | 3                          | Barstow (Mojave Desert)<br>Blythe-445 West Murphy Street (Mojave Desert)<br>Hesperia-Olive Street (Mojave Desert)<br>Phelan (Mojave Desert)<br>Trona-Athol and Telegraph (Mojave Desert)<br>Victorville-14306 Park Avenue (Mojave Desert)<br>Banning Airport (South Coast)<br><b>Crestline (South Coast)</b><br>Fontana-Arrow Highway (South Coast)<br>Indio-Jackson Street (South Coast)<br>Lake Elsinore-W Flint Street (South Coast)<br>Mira Loma-Van Buren (South Coast)<br>Palm Springs-Fire Station (South Coast)<br>Perris (South Coast)<br>Redlands-Dearborn (South Coast)<br>Riverside-Rubidoux (South Coast)<br><b>San Bernardino-4th Street (South Coast)</b><br>Upland (South Coast)<br>Winchester-33700 Borel Road (South Coast) |
| Sacramento-Roseville-Arden Arcade    | 2,149,127<br>(2,324,884)                                  | 0.084<br>(120%)<br><i>Auburn</i>                   | 2                          | <b>Cool-Highway 193 (El Dorado County)</b><br>Echo Summit (El Dorado County)<br><b>Placerville-Gold Nugget Way (El Dorado County)</b><br><b>Auburn-11645 Atwood Road (Placer County)</b><br>Colfax-City Hall (Placer County)<br>Lincoln-1445 1st Street (Placer County)<br><b>Roseville-N Sunrise Blvd (Placer County)</b><br>Tahoe City-221 Fairway Drive (Placer County)<br>Elk Grove (Sacramento)<br><b>Folsom (Sacramento)</b><br>North Highlands (Sacramento)<br>Sacramento-Del Paso Manor (Sacramento)<br>Sacramento-Goldenland (Sacramento)<br>Sacramento-T St (Sacramento)<br>Sloughhouse (Sacramento)<br>Davis-UCD Campus (Yolo-Solano)<br>Woodland-Gibson Road (Yolo-Solano)  |
| Santa Rosa                           | 483,878<br>(504,217)                                      | 0.056 ppm<br>(80%)<br><i>Healdsburg-Muni</i>       | 1                          | Sebastopol (Bay Area)<br><b>Healdsburg-Municipal Airport (Northern Sonoma)</b>  |
| Vallejo-Fairfield                    | 413,344<br>(445,458)                                      | 0.067 ppm<br>(96%)<br><i>Vacaville-Ulatis</i>      | 2                          | Fairfield-Chadbourne Road (Bay Area)<br>Vallejo-304 Tuolumne Street (Bay Area)<br><b>Vacaville-Ulatis Drive (Yolo-Solano)</b>   |
| Yuba City                            | 166,892<br>(173,679)                                      | 0.077 ppm<br>(110%)<br><i>Sutter Buttes</i>        | 1                          | <b>Sutter Buttes-S Butte (Feather River)</b><br><b>Yuba City-Almond Street (Feather River)</b>  |

\* Source: U.S. Census Bureau. Retrieved from [https://factfinder.census.gov/faces/nav/jsf/pages/download\\_center.xhtml](https://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml)

## Seasonal Ozone Monitoring

The ozone monitoring season is year-round in California; however, monitoring at the six sites shown in Table 11 have operated on a seasonal basis since they were established. A seasonal waiver for ozone monitoring in 2017 at these sites was granted by U.S. EPA. The ozone monitoring season was April through October, the period in which peak ozone is expected or when sites are physically accessible. A copy of the waiver request for 2018 is provided in Appendix B. The waiver must be updated each year.

**Table 11: Seasonal Ozone Monitoring Sites**

| AQS Site ID | Site Name                         | District         | Start Year |
|-------------|-----------------------------------|------------------|------------|
| 060170012   | Echo Summit <sup>1</sup>          | El Dorado County | 2000       |
| 060170020   | Cool                              | El Dorado County | 1996       |
| 060430006   | Jerseydale                        | Mariposa County  | 1995       |
| 060570007   | White Cloud Mountain <sup>2</sup> | Northern Sierra  | 1995       |
| 061010004   | Sutter Butte <sup>3</sup>         | Feather River    | 1993       |
| 061030004   | Tuscan Buttes <sup>4</sup>        | Tehama County    | 1995       |

<sup>1</sup> Echo Summit did not operate in April.

<sup>2</sup> White Cloud Mountain did not operate in 2017 due to shelter issues.

<sup>3</sup> 2017 data from May 18 to October 31 for Sutter Buttes has been invalidated due to poor quality assurance results.

<sup>4</sup> 2017 data from April 6 to June 20 for Tuscan Buttes has been invalidated due to poor quality assurance results.

## **Section 5B: Nitrogen Dioxide (NO<sub>2</sub>)**

### Minimum Number of NO<sub>2</sub> Monitoring Sites

Federal regulations specify three types of NO<sub>2</sub> minimum monitoring requirements:

- area-wide;
- minimum near-road NO<sub>2</sub> monitoring, and;
- monitoring in communities with susceptible populations.

Area-wide monitoring must be conducted in CBSAs with populations of one million or more. For these areas, a minimum of one monitor is required and should be sited to capture the highest concentrations at a neighborhood or larger spatial scale. PAMS sites can be used to meet area-wide minimum monitoring requirements if they meet siting criteria.

The CBSAs in California that meet the population thresholds for required area-wide NO<sub>2</sub> monitoring are the Los Angeles-Long Beach-Anaheim, Riverside-San Bernardino-Ontario, Sacramento-Roseville-Arden Arcade, San Diego-Carlsbad, San Francisco-Oakland-Hayward and San Jose-Sunnyvale-Santa Clara. The areas of expected highest concentration in these CBSAs are not within the jurisdictions of the districts covered by this ANP. As such, area-wide NO<sub>2</sub> monitoring for these CBSAs is addressed in the ANPs prepared by the South Coast AQMD, Sacramento Metropolitan AQMD, San Diego County APCD, and Bay Area AQMD. Although not required, NO<sub>2</sub> monitors are operated in several districts covered by this ANP. Information about these monitors can be found in Appendix A of this ANP.

Near-road NO<sub>2</sub> monitoring requirements are based on population of the CBSA and Annual Average Daily Traffic (AADT) counts on road segments within the CBSA. One monitor is required in CBSAs with a population of one million or more persons. A second monitor is required in CBSAs with a population greater than or equal to 2.5 million or CBSA's with populations greater than or equal to 1 million and roadway AADT greater than or equal to 250,000 on one or more road segments. Near-road monitors should be sited to capture maximum one hour concentrations at a micro spatial scale. The near-road requirements are being implemented in phases, over the course of several years. For informational purposes, all of the CBSAs in California that are required by current federal regulations to conduct near-road NO<sub>2</sub> monitoring are shown in Table 12.

The near-road areas with road segments with the highest AADT for the Bakersfield, Los Angeles-Long Beach-Anaheim, Riverside-San Bernardino-Ontario, and Sacramento-Roseville-Arden Arcade CBSAs are not within the jurisdiction of the districts covered by this ANP. Near-road NO<sub>2</sub> monitoring for these CBSAs in the CARB PQAO is addressed in the ANPs prepared by the San Joaquin Valley APCD and the Sacramento Metropolitan AQMD. Information about near-road NO<sub>2</sub> monitoring for the



other PQAOs in California can also be found in the ANPs prepared by the San Diego County APCD, South Coast AQMD and the Bay Area AQMD.

**Table 12: CBSAs with Near-Road NO<sub>2</sub> Monitoring Requirements**

| <b>CBSA</b>                         | <b>Population 2010 Census (2016 Population Estimate)</b> | <b>Area-wide Monitoring</b> | <b>Maximum AADT (2016)*</b> | <b>Required Near-road Sites</b> | <b>Near-road Sites Operating in 2017 (District where sites are located)</b> |
|-------------------------------------|--|-----------------------------|-----------------------------|---------------------------------|---|
| Bakersfield**                       | 839,361<br>(893,119)                                     | No                          | 154,000                     | 1                               | - - (San Joaquin Valley)  |
| Fresno                              | 930,450<br>(989,255)                                     | No                          | 167,000                     | 1                               | Fresno-2482 Foundry Park (San Joaquin Valley)                               |
| Los Angeles-Long Beach-Anaheim      | 12,828,837<br>(13,353,907)                               | Yes                         | 461,000                     | 2                               | Anaheim-Route 5 (South Coast)<br>Long Beach-Route 710 (South Coast)         |
| Riverside-San Bernardino-Ontario    | 4,224,851<br>(4,580,670)                                 | Yes                         | 278,000                     | 2                               | Ontario-Etiwanda (South Coast)<br>Ontario-Route 60 (South Coast)            |
| Sacramento-Roseville-Arden Arcade** | 2,149,127<br>(2,324,884)                                 | Yes                         | 260,000                     | 2                               | Sacramento-Bercut Drive (Sacramento)<br>- -                                 |
| San Diego-Carlsbad**                | 3,095,313<br>(3,337,685)                                 | Yes                         | 305,000                     | 2                               | Rancho Carmel Dr. (San Diego)<br>- - (San Diego)                            |
| San Francisco-Oakland-Hayward       | 4,335,391<br>(4,727,357)                                 | Yes                         | 277,000                     | 2                               | Laney College (Bay Area)<br>Berkeley-Aquatic Park (Bay Area)                |
| San Jose-Sunnyvale-Santa Clara**    | 1,836,911<br>(1,998,463)                                 | Yes                         | 270,000                     | 2                               | San Jose-Knox Ave (Bay Area)<br>- -   |

\* Traffic data are courtesy of California Department of Transportation <http://www.dot.ca.gov/trafficops/census/>.

\*\* Near-road sites were in the planning/construction stages and not yet operating in 2017.

Federal regulations also require area-wide NO<sub>2</sub> monitoring in select areas with susceptible and vulnerable populations. The locations of these areas in California were determined by the U.S. EPA Regional Administrator and are shown in Table 13 along with the responsible monitoring agency. More information on this monitoring can be found in the ANPs prepared by the Bay Area AQMD, the San Diego County APCD, the San Joaquin Valley APCD and the South Coast AQMD.

**Table 13: NO<sub>2</sub> Regional Administrator Required Monitoring Site**

| District           | Site (AQS ID)                    |
|--------------------|----------------------------------|
| San Diego          | San Diego-Beardsley (060731010)  |
| Bay Area           | Oakland West (060010011)         |
| San Joaquin Valley | Parlier (060194001)              |
| San Joaquin Valley | Bakersfield-Muni (060292012)*    |
| South Coast        | Long Beach North (060374002)     |
| South Coast        | Los Angeles-Main St. (060371103) |
| South Coast        | San Bernardino (060719004)       |

\* San Joaquin Valley and CARB share monitoring responsibilities in the San Joaquin Valley. U.S EPA originally identified Arvin as the required NO<sub>2</sub> monitoring site for susceptible and vulnerable populations. However, Arvin does not have NO<sub>2</sub> monitoring while Bakersfield Muni does. Therefore, the San Joaquin District and CARB have worked with Region 9 and are in the process of transitioning the required monitoring site from Arvin to Bakersfield-Muni. The San Joaquin ANP discusses this proposed change, which requires U.S EPA approval.

## Section 5C: Carbon Monoxide (CO)

### Minimum Number of CO Monitoring Sites

The only federal requirement for CO monitoring is for near-road CO monitoring. In CBSAs with a population of one million or more, one CO monitor is required to operate collocated with one near-road NO<sub>2</sub> monitor. If a CBSA has more than one near-road NO<sub>2</sub> monitoring site, a CO monitor is only required at one near-road site in the CBSA. The CO monitor was required to be operational by January 1, 2015 in CBSAs with a population more than 2.5 million, and by January 1, 2017 for all other CBSAs.

**Table 14: CBSAs with CO Minimum Monitoring Requirements**

| CBSA                                  | Population<br>2010 Census<br>(2016 Population Estimate) | Required #<br>of Near-road<br>Sites | Near-road Sites Operating in<br>2017                         |
|---------------------------------------|---|-------------------------------------|--|
| Los Angeles-Long Beach-<br>Anaheim    | 12,828,837<br>(13,353,907)                              | 1                                   | Anaheim-Route 5 (South Coast)                                |
| San Francisco-Oakland-<br>Hayward     | 4,335,391<br>(4,727,357)                                | 1                                   | Laney College (Bay Area)<br>Berkeley-Aquatic Park (Bay Area) |
| Riverside-San<br>Bernardino-Ontario   | 4,224,851<br>(4,580,670)                                | 1                                   | Ontario-Etiwanda (South Coast)                               |
| San Diego-Carlsbad                    | 3,095,313<br>(3,337,685)                                | 1                                   | Rancho Carmel Dr. (San Diego)                                |
| Sacramento-Roseville-<br>Arden Arcade | 2,149,127<br>(2,324,884)                                | 1                                   | Sacramento-Bercut Drive<br>(Sacramento)                      |
| San Jose-Sunnyvale-<br>Santa Clara    | 1,836,911<br>(1,998,463)                                | 1                                   | San Jose-Knox Ave (Bay Area)                                 |

As shown in Table 14, three CBSAs that include a district covered by this ANP meet the population threshold and have minimum monitoring requirements for CO; however, the near-road areas with road segments with the highest AADT for the Los Angeles-Long Beach-Anaheim, Riverside-San Bernardino-Ontario, and Sacramento-Roseville-Arden Arcade, CBSAs are not within the areas covered by this ANP. Subsequently, near-road monitoring for these CBSAs is addressed in the ANPs prepared by the South Coast AQMD, Bay Area AQMD, and the Sacramento Metropolitan AQMD. Several districts covered by this ANP conduct area-wide CO monitoring. CO concentrations at area-wide monitors are well below the standard, and California has long attained federal and State CO standards. Information about these monitors is provided in Appendix A.

Regional Administrators may require additional CO monitoring in other areas where data or other indicators suggest that concentrations may approach or exceed the NAAQS.

## Section 5D: Sulfur Dioxide (SO<sub>2</sub>)

### Minimum Number of SO<sub>2</sub> Monitoring Sites

Monitoring regulations for SO<sub>2</sub> are based on the population weighted emissions index (PWEI) in a CBSA. The PWEI considers population and aggregated county-level emissions data and is calculated using the equation:

$$CBSA\ PWEI = \frac{CBSA\ Population \times \sum_{County} Emission}{1,000,000}$$

One monitor is required in CBSAs with PWEIs equal to or greater than 5,000 but less than 100,000; two monitors are required in CBSAs with PWEIs equal to greater than 100,000 but less than one million; and three monitors are required in CBSAs with PWEI values of one million or more. As shown in Table 15, two CBSAs that contain a district covered by this plan meet the PWEI threshold and have minimum monitoring requirements for SO<sub>2</sub>. Site types identified as population exposure, high concentration, source oriented, general background, or regional transport can satisfy minimum monitoring requirements. SO<sub>2</sub> monitors at NCore sites shall be counted toward minimum monitoring requirements.

The most recent data available to calculate PWEI were the 2010 U.S. census data and emissions data from the 2015 CARB Emission Inventory.

**Table 15: CBSAs with Minimum Monitoring Requirements for SO<sub>2</sub>**

| CBSA                             | District covered by this ANP | Other District ANPs covering this CBSA | County SO <sub>2</sub> (TPY) (2015 Data) | Population 2010 Census (2016 Population Estimate) | PWEI            | Required Sites | SLAMS Sites Operating in 2017  |
|----------------------------------|------------------------------|--|--|---|-----------------|----------------|--|
| Los Angeles-Long Beach-Anaheim   | Antelope Valley AQMD         | South Coast AQMD                       | Los Angeles: 5,256                       | 12,828,837 (13,353,907)                           | 73,522 (76,531) | 1              | Costa Mesa (South Coast)<br>Fontana (South Coast)<br>Long Beach (South Coast)<br>Los Angeles-Main Street (South Coast)<br>Los Angeles-Hastings (South Coast) |
|                                  |                              |  | Orange: 475                              |   |                 |                |  |
| Riverside-San Bernardino-Ontario | Mojave Desert AQMD           | South Coast AQMD                       | Riverside: 329                           | 4,224,851 (4,580,670)                             | 8,023 (8,699)   | 1              | Rubidoux (South Coast)<br>Trona (Mojave Desert)<br>Victorville (Mojave Desert)   |
|                                  |                              |  | San Bernardino: 1,570                    |   |                 |                |  |

All districts covered by this ANP met the minimum monitoring requirements for SO<sub>2</sub> in 2017. In December 2017, U.S EPA designated all areas of California as unclassifiable/attainment for the federal SO<sub>2</sub> standard.

## **Section 5E: Lead (Pb)**

### Minimum Number of Pb Monitoring Sites

Monitoring is required near Pb sources which are expected or have been shown to contribute to a maximum Pb concentration in excess of the federal standard. Specifically, monitoring is required at airports which emits more than 1.0 tons per year or non-airport sources which emit 0.50 tons per year or more of Pb. None of the areas covered by this ANP exceed the threshold for source monitoring.

Pb monitoring at NCore site was previously required but no longer required. However, agencies that operate NCore site are required to obtain approval to terminate an existing Pb monitor. CARB had received approval for discontinuation of PB monitoring at the Fresno-Garland NCore site in April 2017. The approval letter for this site is included in Appendix D.

## Section 5F: PM<sub>10</sub>

### Minimum Number of PM<sub>10</sub> Monitoring Sites

Monitoring requirements for PM<sub>10</sub> are based on population and air quality conditions in each metropolitan statistical area. The criteria for determining the minimum number of monitoring sites is listed in Table 16. The number of sites is given as a range rather than an absolute number because the goal of establishing a network of monitoring sites is to characterize national and regional air quality trends and geographic patterns, which can vary in complexity from place to place.

**Table 16: Minimum Monitoring Requirements for PM<sub>10</sub> Monitoring Sites**

| Population          | High Concentration<br>(Exceeds NAAQS by<br>≥20%) | Medium Concentration<br>(≥80% of NAAQS) | Low Concentration<br>(<80% of NAAQS) |
|---------------------|--|---|--------------------------------------|
| > 1 million         | 6 – 10 sites                                     | 4 – 8 sites                             | 2 – 4 sites                          |
| 500,000 - 1 million | 4 – 8 sites                                      | 2 – 4 sites                             | 1 – 2 sites                          |
| 250,000 - 500,000   | 3 – 4 sites                                      | 1 – 2 sites                             | 0 – 1 sites                          |
| 100,000 - 250,000   | 1 – 2 sites                                      | 0 – 1 sites                             | 0 sites                              |

The number of required monitoring sites in CBSAs with populations ≥ 100,000 are shown in Table 17. Only sites designated as SLAMS may be counted to meet PM<sub>10</sub> minimum monitoring requirements. In contrast to the information presented on the gaseous monitoring network, sites outside of the scope of this ANP are only included in Table 17 if needed to meet minimum monitoring requirements because of the complex nature of PM monitoring.

Eleven Metropolitan Statistical Areas include at least a portion of the areas covered by this ANP. The Los Angeles-Long Beach-Anaheim Metropolitan Statistical Area includes the Antelope Valley AQMD; however, most of the area is under the jurisdiction of the South Coast AQMD. Monitoring sites operated by South Coast AQMD are necessary to meet minimum monitoring requirements for PM<sub>10</sub> and include sites located in areas where high concentrations are expected. The sole monitoring site run by Antelope Valley AQMD is not needed to meet minimum monitoring requirements for this area but serves to complement the network of monitors operated by South Coast.

The monitors operated in districts covered by this ANP are adequate to meet minimum monitoring requirements in the remaining ten Metropolitan Statistical Areas; however, there are additional monitors operated in these areas that are in jurisdictions outside of the scope of this ANP. Information about these monitors can be found in the ANPs prepared by the South Coast AQMD, San Joaquin Valley APCD, and the Sacramento Metropolitan AQMD.

**Table 17: CBSAs with Minimum Monitoring Requirements for PM<sub>10</sub>**

| Metropolitan Statistical Area     | 2010 Census Population (2017 Population Estimate) | 2017 Max Concentration (% of NAAQS)<br>Max Concentration Site (District where site is located) | Required Sites | SLAMS Sites Operating in 2017 (District where site is located)   |
|-----------------------------------|---|--|----------------|--|
| Bakersfield                       | 839,361 (893,119)                                 | 205 ug/m <sup>3</sup> (137%)<br><i>Oildale (San Joaquin)</i>                                   | 4-8            | Canebrake (Eastern Kern)<br>Mojave (Eastern Kern)<br>Ridgecrest (Eastern Kern)<br>Oildale (San Joaquin)  |
| Chico                             | 220,000 (229,294)                                 | 101 ug/m <sup>3</sup> (67%)*<br><i>Chico-East Ave (Butte County)</i>                           | 0              | Chico-East Ave (Butte County)  |
| El Centro                         | 174,528 (182,830)                                 | 449 ug/m <sup>3</sup> (299%)<br><i>Brawley (Imperial County)</i>                               | 1-2            | Brawley (Imperial County)<br>Calexico-Ethel St (Imperial County)<br>El Centro (Imperial County)<br>Niland (Imperial County)<br>Westmorland (Imperial County)   |
| Los Angeles-Long Beach-Anaheim    | 12,828,837 (13,353,907)                           | 140 ug/m <sup>3</sup> (93%)<br><i>Glendora-Laural (South Coast)</i>                            | 4-8            | Lancaster (Antelope Valley)<br>Anaheim-Pampas Ln (South Coast)<br>Azusa (South Coast)<br>Glendora-Laurel (South Coast)<br>Long Beach-PCH (South Coast)<br>Long Beach-Webster (South Coast)<br>Los Angeles-N Main St (South Coast)<br>Los Angeles-LAX (South Coast)<br>Mission Viejo (South Coast)<br>Santa Clarita (South Coast) |
| Oxnard-Thousand Oaks-Ventura      | 823,318 (854,223)                                 | 287 ug/m <sup>3</sup> (191%)*<br><i>El Rio (Ventura County)</i>                                | 2-4 (4-8)**    | Simi Valley (Ventura County)<br>El Rio (Ventura County)  |
| Redding                           | 177,223 (179,921)                                 | 115 ug/m <sup>3</sup> (77%)*<br><i>Anderson (Shasta County)</i>                                | 0              | Redding (Shasta County)<br>Anderson (Shasta County)<br>Shasta Lake (Shasta County)   |
| Riverside-San Bernardino-Ontario  | 4,224,851 (4,580,670)                             | 477 ug/m <sup>3</sup> (318%)<br><i>Mecca (South Coast)</i>                                     | 6-10           | Barstow (Mojave Desert)<br>Lucerne Valley (Mojave Desert)<br>Victorville (Mojave Desert)<br>Trona (Mojave Desert)<br>Hesperia (Mojave Desert)<br>Crestline (South Coast)<br>Indio-Jackson St (South Coast)<br>Mecca (South Coast)  |
| Sacramento-Roseville-Arden Arcade | 2,149,127 (2,324,884)                             | 149 ug/m <sup>3</sup> (99%)*<br><i>Sacramento-T St (Sacramento)</i>                            | 4-8            | So. Lake Tahoe (El Dorado County)<br>Roseville-N Sunrise (Placer County)<br>North Highlands (Sacramento)<br>Del Paso (Sacramento)<br>Sacramento-T St (Sacramento)<br>Sacramento-Goldenland (Sacramento)<br>Sacramento-Branch (Sacramento)<br>Woodland-Gibson Rd (Yolo-Solano)<br>West Sacramento (Yolo-Solano)                   |
| Santa Rosa                        | 483,878 (504,217)                                 | 164 ug/m <sup>3</sup> (109%)*<br><i>Cloverdale (Northern Sonoma)</i>                           | 1-2 (2-4)**    | Cloverdale (Northern Sonoma)<br>Healdsburg (Northern Sonoma)<br>Guerneville (Northern Sonoma)  |
| Vallejo-Fairfield                 | 413,344 (445,458)                                 | 237 ug/m <sup>3</sup> (158%)*<br><i>Vacaville-Merchant St (Yolo-Solano)</i>                    | 0-1 (3-4)**    | Vacaville-Merchant St (Yolo-Solano)  |
| Yuba City                         | 166,892 (173,679)                                 | 144 ug/m <sup>3</sup> (96%)*<br><i>Yuba City-Almond St (Feather River)</i>                     | 0-1            | Yuba City-Almond St (Feather River)  |

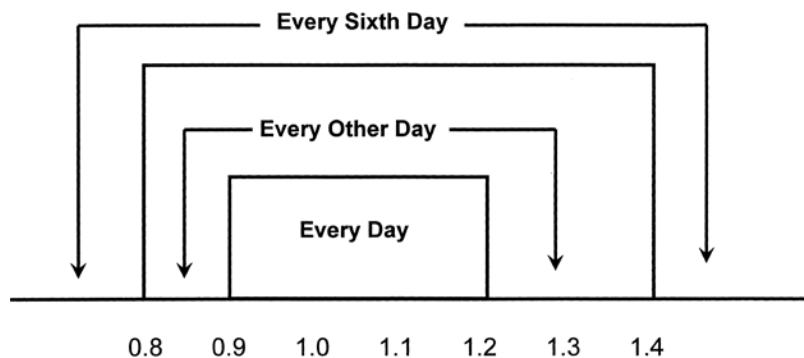
\* Many sites were impacted by wildfire smoke in late 2017. Some of these impacts will be addressed under the Exceptional Event Rule (81 FR 68216) while others did not lead to exceedances of the standard but impacted the minimum monitoring requirements.

\*\*Sites in these MSAs have consistently recorded PM<sub>10</sub> concentrations below the NAAQS, with an average concentration for the last decade ranging from 25% to 50% of the standard. Existing monitoring meets the needs of the local air districts and the communities; CARB is committed to working with EPA and the local air districts to ensure that monitoring levels continue to protect public health and safety.

### PM<sub>10</sub> Sampling Frequency Requirements for Primary FRM Monitors

Federal regulations establish procedures for determining an appropriate sampling frequency for PM<sub>10</sub> monitors. All 24-hour samples must be taken from midnight to midnight, local standard time, to ensure consistency among measurements nationwide. Figure 3, reproduced from Figure 1 in 40 CFR 58.12e, shows the required sampling frequency based upon the ratio of the design value to the standard.

**Figure 3: Required Sampling Frequency for manual PM<sub>10</sub> monitors**



The calculated required sampling frequencies for all FRM PM<sub>10</sub> monitors in the districts covered by this ANP are shown in Table 18. Note that exceptional events are included in the concentrations shown.



**Table 18: Required Sampling Frequency for PM<sub>10</sub> FRM Monitors**

| Site Name             | District     | AQS ID      | 2017 Max Concentration | Ratio of Max Concentration to Standard | Required Sampling Frequency | Current Sampling Frequency |
|-----------------------|--------------|-------------|------------------------|--|-----------------------------|----------------------------|
| Ridgecrest            | Eastern Kern | 060290015-1 | 48                     | 0.31                                   | 1:6                         | 1:6                        |
| Canebrake             | Eastern Kern | 060290017-1 | 45                     | 0.29                                   | 1:6                         | 1:6                        |
| Anderson Springs*     | Lake         | 060333010-1 | 127                    | 0.82                                   | 1:6                         | 1:2                        |
| Glenbrook             | Lake         | 060333011-1 | 89                     | 0.58                                   | 1:6                         | 1:6                        |
| Lakeport (Lakeport)** | Lake         | 060333001-2 | 14                     | 0.09                                   | 1:6                         | 1:6                        |
| Lakeport (S.Main)**   | Lake         | 060333002-1 | 120                    | 0.78                                   | 1:6                         | 1:6                        |
| Anderson              | Shasta       | 060890007-1 | 116                    | 0.75                                   | 1:6                         | 1:6                        |
| Redding               | Shasta       | 060890004-2 | 89                     | 0.58                                   | 1:6                         | 1:6                        |
| Shasta Lake           | Shasta       | 060890008-1 | 88                     | 0.57                                   | 1:6                         | 1:6                        |
| Red Bluff             | Tehama       | 061030007-1 | 101                    | 0.66                                   | 1:6                         | 1:6                        |
| Vacaville             | Yolo-Solano  | 060953001-2 | 238                    | 1.55                                   | 1:6                         | 1:6                        |
| West Sacramento       | Yolo-Solano  | 061132001-1 | 78                     | 0.51                                   | 1:6                         | 1:6                        |
| Woodland*             | Yolo-Solano  | 061131003-1 | 129                    | 0.84                                   | 1:6                         | 1:2                        |

\* Wildfires in October 2017 impacted several sites, with two (Anderson Springs and Woodland) moving into a higher sampling frequency category. These sites are still below the standard, so the impacted concentrations do not qualify for an exceptional event demonstration. CARB is working with the affected districts to evaluate sampling frequency at these sites.

The Lakeport site moved from Lakeport Blvd (06-033-3001) to S. Main (06-033-3002) on 7/1/17.

## Section 5G: PM<sub>2.5</sub>

### Minimum Number of PM<sub>2.5</sub> Monitoring Sites

The minimum number of monitoring sites that are required for the PM<sub>2.5</sub> network is based on population and air quality within each metropolitan statistical area, as shown in Table 19. Each Metropolitan Statistical Area is required to have at least one monitoring site situated to measure maximum concentrations at a neighborhood or larger scale.

**Table 19: Minimum Monitoring Requirements for PM<sub>2.5</sub>**

| Population          | DV ≥ 85% of any PM <sub>2.5</sub> NAAQS | DV < 85% of any PM <sub>2.5</sub> NAAQS |
|---------------------|---|---|
| > 1 million         | 3 sites                                 | 2 sites                                 |
| 500,000 - 1 million | 2 sites                                 | 1 site                                  |
| 50,000 - <500,000   | 1 site                                  | 0 sites                                 |

Only SLAMS sites situated to measure concentrations that are representative of area-wide PM<sub>2.5</sub> concentrations should be used to meet minimum monitoring requirements. NCore and PAMS sites can count towards meeting minimum monitoring requirements if the site(s) are representative of area-wide PM<sub>2.5</sub> concentrations. In contrast to the information presented on the gaseous monitoring network, sites outside of the scope of this ANP were only included in Table 20 if needed to meet minimum monitoring requirements because of the complex nature of PM monitoring.

### PM<sub>2.5</sub> Near-Road Monitoring

Federal regulations require that at least one PM<sub>2.5</sub> monitor is collocated at a near-road NO<sub>2</sub> monitoring site in CBSAs with a million or more people. No near-road sites are located in the areas covered by this ANP. Information about near-road sites can be found in the ANPs prepared by the Bay Area AQMD, Sacramento Metropolitan AQMD and South Coast AQMD.

### PM<sub>2.5</sub> Continuous Monitoring

Federal regulations require that at least half of the minimum number of required monitors operated in each Metropolitan Statistical Area should be continuous monitors. In each Metropolitan Statistical Area, at least one continuous monitor should be collocated with a required FRM/FEM/ARM monitor unless one of the required monitors is a continuous monitor. Sites outside of the scope of this ANP were only included in Table 21 if needed to meet minimum monitoring requirements.

**Table 20: CBSAs with Minimum Monitoring Requirements for PM<sub>2.5</sub>**

| Metropolitan Statistical Area     | 2010 Census Population (2017 Population Estimate) | 2017 Design Value (% of NAAQS)<br>Design Value Site<br>(District where site is located)   |   | Required Sites | SLAMS Sites Operating in 2017<br>(District where site is located)<br>Highest Concentration Sites Denoted by Bold Text                     |
|-----------------------------------|---|---|---|----------------|---|
|                                   |   | 24-hour   | Annual  |                |   |
| Bakersfield                       | 839,361<br>(893,119)                              | 59 ug/m <sup>3</sup> (169%)<br><i>Bakersfield-California</i><br><i>(San Joaquin)</i><br><i>Bakersfield-Planiz</i><br><i>(San Joaquin)</i> | 17.3 ug/m <sup>3</sup> (144%)<br><i>Bakersfield-Planiz</i><br><i>(San Joaquin)</i>    | 2              | <b>Mojave (Eastern Kern)</b><br>Ridgecrest (Eastern Kern)   |
| Chico                             | 220,000<br>(229,294)                              | 28 ug/m <sup>3</sup> (80%)<br><i>Chico-East Ave</i><br><i>(Butte County)</i>  | 8.6 ug/m <sup>3</sup> (72%)<br><i>Chico-East Ave</i><br><i>(Butte County)</i>         | 0              | Chico-East Ave (Butte)  |
| El Centro                         | 174,528<br>(182,830)                              | 31 ug/m <sup>3</sup> (89%)<br><i>Calexico-Ethel St</i><br><i>(Imperial County)</i>  | 12.0 ug/m <sup>3</sup> (100%)<br><i>Calexico-Ethel St</i><br><i>(Imperial County)</i> | 1              | Brawley (Imperial)<br>Calexico-Ethel St (Imperial)<br>El Centro (Imperial)  |
| Los Angeles-Long Beach-Anaheim    | 12,828,837<br>(13,353,907)                        | 39 ug/m <sup>3</sup> (111%)<br><i>Compton-N Bullis</i><br><i>(South Coast)</i>  | 12.6 ug/m <sup>3</sup> (105%)<br><i>Long Beach-Rte 710</i><br><i>(South Coast)</i>    | 3              | Lancaster (Antelope Valley)<br>Compton-N Bullis (South Coast)<br>Long Beach-Rte 710 (South Coast)   |
| Oxnard-Thousand Oaks-Ventura      | 823,318<br>(854,223)                              | 39 ug/m <sup>3</sup> (111%)<br><i>Ojai (Ventura County)</i>   | 9.7 ug/m <sup>3</sup> (81%)<br><i>Ojai</i><br><i>(Ventura County)</i>                 | 2              | Thousand Oaks (Ventura)<br><b>Piru (Ventura)</b><br>Ojai (Ventura)<br><b>Simi Valley (Ventura)</b><br>El Rio (Ventura)                    |
| Redding                           | 177,223<br>(179,921)                              | 21 ug/m <sup>3</sup> (60%)<br><i>Redding</i><br><i>(Shasta County)</i>  | 6.8 ug/m <sup>3</sup> (57%)<br><i>Redding</i><br><i>(Shasta County)</i>               | 0              | Redding-Health Dept (Shasta)  |
| Riverside-San Bernardino-Ontario  | 4,224,851<br>(4,580,670)                          | 39 ug/m <sup>3</sup> (111%)<br><i>Mira Loma</i><br><i>(South Coast)</i>   | 14.6 ug/m <sup>3</sup> (122%)<br><i>Ontario</i><br><i>(South Coast)</i>               | 3              | Victorville (Mojave Desert)<br>Mira Loma (South Coast)<br>Ontario (South Coast)   |
| Sacramento-Roseville-Arden Arcade | 2,149,127<br>(2,324,884)                          | 34 ug/m <sup>3</sup> (97%)<br><i>Del Paso</i><br><i>(Sacramento)</i>  | 9.6 ug/m <sup>3</sup> (80%)<br><i>Del Paso</i><br><i>(Sacramento)</i>                 | 3              | Auburn-Atwood St (Placer County)<br>Roseville-N Sunrise Blvd (Placer)<br><b>Del Paso-Avalon Dr (Sacramento)</b><br>Woodland (Yolo-Solano) |
| Santa Rosa                        | 483,878<br>(504,217)                              | 21 ug/m <sup>3</sup> (60%)<br><i>Sebastopol-Morris</i><br><i>(Bay Area)</i>   | 6.6 ug/m <sup>3</sup> (55%)<br><i>Sebastopol-Morris</i><br><i>(Bay Area)</i>          | 1              | Sebastopol-Morris St (Bay Area)   |
| Vallejo-Fairfield                 | 413,344<br>(445,458)                              | 30 ug/m <sup>3</sup> (86%)<br><i>Vallejo</i><br><i>(Bay Area)</i>   | 9.6 ug/m <sup>3</sup> (80%)<br><i>Vallejo</i><br><i>(Bay Area)</i>                    | 1              | <b>Vallejo-Tuolumne St (Bay Area)</b>   |
| Yuba City                         | 166,892<br>(173,679)                              | 28 ug/m <sup>3</sup> (80%)<br><i>Yuba City</i><br><i>(Feather River)</i>  | 9.0 ug/m <sup>3</sup> (75%)<br><i>Yuba City</i><br><i>(Feather River)</i>             | 0              | Yuba City-Almond St (Feather River)   |

**Table 21: CBSAs with Minimum Monitoring Requirements for Continuous PM<sub>2.5</sub>**

| <b>Metropolitan Statistical Area</b> | <b>Minimum # of Required Sites</b> | <b>Required Continuous Monitors</b> | <b>Sites with Continuous Monitors Operating in 2017<br/>(District where site is located)</b>   |
|--------------------------------------|------------------------------------|-------------------------------------|--|
| Bakersfield                          | 2                                  | 1                                   | Mojave (Eastern Kern)  |
| Chico                                | 0                                  | 0                                   | Chico-East Ave (Butte)   |
| El Centro                            | 1                                  | 1                                   | Calexico (Imperial)  |
| Los Angeles-Long Beach-Anaheim       | 3                                  | 2                                   | Lancaster (Antelope Valley)<br>Glendora-Laurel (South Coast)<br>Long Beach-South (South Coast)<br>Los Angeles-N Main St (South Coast)<br>Reseda (South Coast)<br>Santa Clarita (South Coast)   |
| Oxnard-Thousand Oaks-Ventura         | 2                                  | 1                                   | El Rio (Ventura)<br>Ojai (Ventura)<br>Piru (Ventura)<br>Simi Valley (Ventura)<br>Thousand Oaks (Ventura)   |
| Redding                              | 0                                  | 0                                   | --   |
| Riverside-San Bernardino-Ontario     | 3                                  | 2                                   | Victorville (Mojave Desert)<br>Banning (South Coast)<br>Crestline (South Coast)<br>Lake Elsinore (South Coast)<br>Mira Loma (South Coast)<br>Rubidoux (South Coast)<br>Temecula (South Coast)<br>Upland (South Coast)  |
| Sacramento-Roseville-Arden Arcade    | 3                                  | 2                                   | Auburn-Atwood St (Placer)<br>Colfax (Placer)<br>Lincoln (Placer)<br>Roseville-N Sunrise (Placer)<br>Tahoe City (Placer)<br>Del Paso-Avalon Dr (Sacramento)<br>Elk Grove (Sacramento)<br>Folsom-Natoma St (Sacramento)<br>Sacramento-T St (Sacramento)<br>Sloughhouse (Sacramento)<br>Davis (Yolo-Solano) |
| Santa Rosa                           | 1                                  | 1                                   | Sebastopol-Morris St (Bay Area)  |
| Vallejo-Fairfield                    | 1                                  | 1                                   | Vallejo-Tuolumne St (Bay Area)   |
| Yuba City                            | 0                                  | 0                                   | Yuba City (Feather River)  |

## PM<sub>2.5</sub> Sampling Frequency Requirements for Primary FRM Monitors

Sampling frequency for manual FRM PM<sub>2.5</sub> monitoring can vary by site. Determination of the required sampling frequency for PM<sub>2.5</sub> monitors is based upon the site level design value and a number of different factors identified in federal regulations and summarized in Table 22. Sites located in areas with more severe air quality conditions generally are required to collect measurements more frequently than other sites.

The current and required sampling frequency for PM<sub>2.5</sub> FRM monitors located in districts covered by this ANP are shown in Table 23 and also in Appendix A. Exceptional events are included in the determination of the design values shown here.

**Table 22: Criteria for Minimum Sampling Frequency for FRM PM<sub>2.5</sub> Monitoring**

| 1:6 may be approved by<br>Regional Administrator  | 1:3  | 1:1   |
|---|--|---|
| Collocated with continuous<br>FRM/FEM/ARM monitor   | Not collocated with continuous<br>FRM/FEM/ARM monitor                                | Not collocated with continuous<br>FRM/FEM/ARM monitor           |
| <b>AND</b>  | <b>OR</b>  | <b>AND</b>  |
| Annual DV is <90% of NAAQS and<br>not the highest in the area                               | Annual DV is $\pm 10\%$ of NAAQS and highest<br>in the area                          | 24 hour DV is $\pm 5\%$ of NAAQS and the<br>highest in the area |
| <b>AND</b>  | <b>OR</b>  | <b>AND</b>  |
| 24 hour DV is <90% of NAAQS and<br>not the highest in the area                              | 24 hour DV is $\pm 10\%$ of NAAQS and<br>highest in the area                         | Annual DV is below annual NAAQS                                 |
| <b>AND</b>  | <b>OR</b>  |   |
| 24 hour NAAQS has not been<br>exceeded one or more times in each<br>of the past three years | 24 hour NAAQS has been exceeded one or<br>more times in each of the past three years |   |
|   | <b>OR</b>  |   |
|   | NCore Site   |   |
|   | <b>OR</b>  |   |
|   | Required regional background site  |   |
|   | <b>OR</b>  |   |
|   | Required regional transport site   |   |

**Table 23: Required PM<sub>2.5</sub> Sampling Frequency for FRM monitors**

| Site Name                 | AQS Site ID    | District           | 2017<br>24-hr<br>DV | 2017<br>Annual<br>DV | Required<br>Sampling<br>Frequency | Current<br>Sampling<br>Frequency |
|---------------------------|----------------|--------------------|---------------------|----------------------|-----------------------------------|----------------------------------|
| Chico-East                | 060070008      | Butte              | 28                  | 8.6                  | 1:3                               | 1:1                              |
| Colusa <sup>1</sup>       | 060111002      | Colusa             | 24                  | 7.6                  | 1:6                               | 1:6                              |
| Calexico                  | 060250005      | Imperial           | 31                  | 12.0                 | 1:1                               | 1:1                              |
| Brawley                   | 060250007      | Imperial           | 24                  | 9.1                  | 1:3                               | 1:3                              |
| El Centro                 | 060251003      | Imperial           | 20                  | 8.1                  | 1:3                               | 1:3                              |
| Ridgecrest <sup>2</sup>   | 060290015      | Eastern Kern       | 17*                 | 5.1*                 | 1:3                               | 1:6                              |
| Lakeport <sup>1</sup>     | 060333001/3002 | Lake               | 19**                | 4.3**                | 1:6                               | 1:6                              |
| Grass Valley <sup>3</sup> | 060570005      | Northern<br>Sierra | 18                  | 4.8                  | 1:1                               | 1:6                              |
| Truckee                   | 060571001      | Northern<br>Sierra | 19*                 | 6.0*                 | 1:3                               | 1:3                              |
| Roseville <sup>1</sup>    | 060610006      | Placer             | 19                  | 7.4                  | 1:6                               | 1:6                              |
| Quincy                    | 060631006      | Northern<br>Sierra | 39                  | 10                   | 1:1                               | 1:1                              |
| Portola                   | 060631010      | Northern<br>Sierra | 50*                 | 15.1*                | 1:3                               | 1:3                              |
| Redding <sup>1</sup>      | 060890004      | Shasta             | 21                  | 6.8                  | 1:6                               | 1:6                              |
| Yreka <sup>4</sup>        | 060932001      | Siskiyou           | 34*                 | 7.8*                 | 1:1                               | 1:6                              |
| Yuba City                 | 061010003      | Feather River      | 28                  | 9                    | 1:3                               | 1:1                              |
| Woodland <sup>1</sup>     | 061131003      | Yolo-Solano        | 25                  | 7.5                  | 1: 6                              | 1:6                              |

\* Design values based on incomplete data.

\*\*Design values are combined for Lakeport-Lakeport and Lakeport-S Main

<sup>1</sup>Colusa, Lakeport, Redding, Roseville, and Woodland were granted waivers to allow 1:6 sampling (Letter from G.Yoshimura, EPA to R.Ramalingam on December 14, 2017). An updated waiver request for these sites is included in Appendix B of this ANP.

<sup>2</sup>Ridgecrest is in the process of relocating to a new site and switching from an FRM to an FEM BAM monitor; the new FEM BAM PM<sub>2.5</sub> monitor began reporting to AQS in November 2017.

<sup>3</sup>An FEM BAM was installed at the Grass Valley site on December 6, 2017.

<sup>4</sup>The Siskiyou County APCD is currently conducting parallel monitoring prior to replacing the existing FRM monitor at Yreka with an FEM BAM. The new monitor will be in operation after analysis is complete.

### Suitability for comparison to the annual PM<sub>2.5</sub> standard

The CFR states that for PM<sub>2.5</sub> FRM or FEM monitors used in area-wide monitoring and that meet siting criteria, the reported data are comparable to the annual PM<sub>2.5</sub> standard. For a PM<sub>2.5</sub> monitor to be considered area-wide, the concentration values measured by the monitor should be representative of concentrations expected over an area with dimensions of a few kilometers. The PM<sub>2.5</sub> FRM and FEM monitors included in this report are sited per the definition of area-wide monitoring in the CFR and meet applicable requirements; therefore, the FRM and FEM data are suitable for comparison to the PM<sub>2.5</sub> NAAQS.

## Requirements for PM<sub>2.5</sub> Background and Transport Sites

Within each state, federal regulations require at least one site measuring concentrations representative of regional background and at least one site representative of regional transport. The regulatory language referenced in 40 CFR 58 Appendix C 2.9 indicates that IMPROVE samplers used for regional background/regional transport requirements can be considered SLAMS.<sup>1</sup> Federal regulations require that monitors required to characterize regional background and transport have a minimum sampling frequency of one in every three days (1:3). The monitors sited to meet these requirements are listed below.

**Table 24: Regional Background and Transport Sites for PM<sub>2.5</sub>**

| Regional Background Sites (Monitor Type/AQS ID)  | Regional Transport Sites (Monitor Type/AQS ID) |
|--|--|
| Northern: Point Reyes National Seashore (EPA/060410002)<br>Southern: San Rafael Wilderness (EPA/060839000) | Vallejo (SLAMS/060950004)                      |

All districts covered by this ANP meet the requirements for PM<sub>2.5</sub> minimum monitoring, near-road monitoring, and continuous monitoring. CARB is working with local air districts to reassess the current sampling schedules and assist in applying for additional funding to comply with sampling frequency requirements and associated continuous collocation requirements.

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<sup>1</sup> January 13, 2017 email communication from A.Meburst, EPA, to R.Fine/G.Sweigert/T.Najita/W.Tasat citing 40 CFR 58 Appendix C 2.9.

## Section 6: Other Federal Monitoring Requirements

### Chemical Speciation Network (CSN)

Federal regulations also require that states continue to conduct speciated particulate measurements at CSN sites. These measurements are intended to support development of SIPs and research activities. Some districts in California conduct additional speciated particulate measurements to fulfill specific local objectives. Table 25 lists the California sites in the National Speciation Trends Network (STN) and State speciation network.

**Table 25: PM<sub>2.5</sub> CSN Sites in California**

| Site Name                  | AQS ID    | District           | National STN Site | State Speciation Site |
|----------------------------|-----------|--------------------|-------------------|-----------------------|
| Anaheim-Pampas             | 060590007 | South Coast        |                   | x                     |
| Bakersfield-California Ave | 060290014 | San Joaquin Valley | x                 |                       |
| Calexico-Ethel St          | 060250005 | Imperial County    |                   | x                     |
| Chico-East Ave             | 060070008 | Butte County       |                   | x                     |
| El Cajon-Lexington         | 060731022 | San Diego          | x                 |                       |
| Fontana-Arrow              | 060712002 | South Coast        |                   | x                     |
| Fresno-Garland             | 060190011 | San Joaquin Valley | x                 |                       |
| Livermore-Rincon           | 060010007 | Bay Area           |                   | x                     |
| Los Angeles-North Main St  | 060371103 | South Coast        | x                 |                       |
| Modesto-14th               | 060990005 | San Joaquin Valley |                   | x                     |
| Oakland-West               | 060010011 | Bay Area           |                   | x                     |
| Portola                    | 060631010 | Northern Sierra    |                   | x                     |
| Rubidoux                   | 060658001 | South Coast        | x                 |                       |
| Sacramento-Del Paso Manor  | 060670006 | Sacramento         | x                 |                       |
| Sacramento-T Street        | 060670010 | Sacramento         |                   | x                     |
| San Jose-Jackson           | 060850005 | Bay Area           | x                 |                       |
| Vallejo-Tuolumne           | 060950004 | Bay Area           |                   | x                     |
| Visalia-Church St          | 061072002 | San Joaquin Valley |                   | x                     |

### PM Monitor Spacing

Federal regulations require that high volume monitors, defined as monitors that have a sample flow rate > 200 liters per minute, are more than 2 meters away from all other PM samplers. Further, low volume monitors, those with a sample flow rate < 200 liters per minute, are required to be more than 1 meter away from all other PM monitors.



The PM monitors in the districts covered by this ANP meet spacing requirements.  
National Core multipollutant Network (NCore) Monitoring

Sites in the NCore Monitoring Network measure multiple pollutants to support a wide range of air quality management objectives. NCore sites are intended to be long-term sites that will generate datasets useful for trend analyses and model evaluation. The NCore Monitoring Network includes rural and metropolitan sites. As shown in Table 26, seven NCore sites are located in California; however, none of the sites are located in the districts covered by this ANP. More information about specific sites can be found in the ANPs submitted by districts in which the sites are located.

**Table 26: NCore Sites in California**

| Site                            | AQS ID    | District           | Site Type |
|---------------------------------|-----------|--------------------|-----------|
| El Cajon-Lexington Elementary   | 060731022 | San Diego          | Urban     |
| Fresno-Garland                  | 060190011 | San Joaquin Valley | Urban     |
| Los Angeles-N Main St.          | 060371103 | South Coast        | Urban     |
| Riverside-Rubidoux              | 060658001 | South Coast        | Urban     |
| Sacramento-Del Paso Manor       | 060670006 | Sacramento         | Urban     |
| San Jose-Jackson                | 060850005 | Bay Area           | Urban     |
| White Mountain Research Station | 060270002 | Great Basin        | Rural     |

Photochemical Assessment Monitoring Station (PAMS)

Ozone nonattainment areas classified as serious, severe, or extreme were required to establish PAMS site(s) which provide enhanced monitoring of ozone, NO<sub>x</sub>, VOCs, and meteorological parameters. The enhanced monitoring is intended to provide comprehensive data to evaluate the nature of ozone pollution and craft effective planning strategies to improve air quality in effected areas.

In California, the Sacramento Metropolitan AQMD, San Diego County APCD, San Joaquin Valley APCD, South Coast AQMD, and Ventura County APCD have established PAMS sites. Ventura County is the only district covered by this ANP that conducts monitoring as part of the PAMS program. In recent years, the PAMS program has been re-engineered and, as discussed in last year's ANP, the extent of Ventura County's continued participation in the PAMS program is not clear. However, in 2017, Ventura County's PAMS monitoring included measurements of more than 50 target VOCs at the Simi Valley and El Rio sites; and measurement of upper air meteorological parameters at the Simi Valley upper air site.

### Special Purpose Monitors (SPM)

In 2017, only one SPM monitor was operating in the area covered by this ANP. One PM<sub>2.5</sub> non-FEM monitor was started on 7/1/2016 at Yreka (Siskiyou) and the district is in the process of switching uploading monitor information to AQS. This SPM monitor meets 40 CFR Part 58 Appendix A and E siting requirements.

The SPM ozone monitors at Jerseydale (Mariposa County) and Tuscan Butte (Tehama County) had operated for more than 2 years and now serve as SLAMS monitors.

## Section 7: Federal Quality Assurance Requirements

### CARB PQA Collocation Requirements

Appendix A of 40 CFR 58 includes requirements for collocation of samplers to ensure that measurements of PM<sub>2.5</sub>, PM<sub>10</sub>, and Pb are of comparable quality throughout monitoring networks located in each PQA.

### PM<sub>2.5</sub> Collocation Status

Federal regulations require that 15 percent of the FEM and FRM monitors in the network of primary PM<sub>2.5</sub> monitors must have a collocated monitor. Collocated FRM monitors must have the same method of measurement. For each site with collocated PM<sub>2.5</sub> FEM monitors, half of the collocated monitors must have the same method of measurement and half must be FRM monitors. If there are an odd number of required collocated monitors then the additional monitor must be an FRM monitor.

**Table 27: Collocation Requirements for PM<sub>2.5</sub> Monitoring Methods**

| Method Type            | Method Description         | # of Primary Monitors | # of Required Collocated Monitors | Sites with Collocated Monitors - Method Type (District)  |
|------------------------|----------------------------|-----------------------|-----------------------------------|--|
| 118 (FRM) <sup>1</sup> | R&P Model 2025 with WINS   | 1                     |                                   | See footnote   |
| 143 (FRM) <sup>2</sup> | R&P Model 2000 with VSCC   | 8                     | 1                                 | Roseville-N Sunrise – 143/143 (Placer)   |
| 145 (FRM)              | R&P Model 2025 with VSCC   | 22                    | 3                                 | Bakersfield-California – 145/145 (San Joaquin Valley)<br>Calexico-Ethel – 145/145 (Imperial)<br>Fresno-Garland – 145/145 (San Joaquin Valley)<br>Portola – 145/145 (Northern Sierra)<br>Sacramento-Del Paso – 145/145 (Sacramento)   |
| 170 (FEM) <sup>3</sup> | Met One BAM 1020 with VSCC | 41                    | 6                                 | Folsom – 170/170 (Sacramento)<br>Madera – 170/145 (San Joaquin Valley) <sup>4</sup><br>Modesto – 170/143 (San Joaquin Valley)<br>Salinas – 170/117 (Monterey Bay)<br>Simi Valley – 170/170 (Ventura)<br>Stockton – 170/170 (San Joaquin Valley)<br>Victorville – 170/170 (Mojave Desert) |
| 181 (FEM) <sup>5</sup> | Thermo TEOM 1400           | 2                     | 1                                 | Keeler – 181/145 (Great Basin)   |
| 204 (FEM)              | Teledyne BAM 602           | 5                     | 1                                 | Madera – 204/145 (San Joaquin Valley) <sup>4</sup>   |
| 238 (FEM)              | Teledyne TEOM T640X        | 1                     | 1                                 | Bishop – 238/145 (Great Basin)   |

<sup>1</sup>The 118 monitor at Ridgecrest will be closing as soon as parallel monitoring with the new 170 monitor at the Ward St site is completed.

<sup>2</sup>Lakeport-Lakeport (060333001) relocated to Lakeport-S.Main (060333002) on July 1, 2017; these sites are counted as one.

<sup>3</sup>Near the end of 2017, three 170 monitors (Hanford, Manteca, and Madera in San Joaquin Valley) converted to 204 monitors; the end-of-year total for primary 170 monitors is 38 with the number of required collocated monitors unchanged.

<sup>4</sup>The Madera collocated site for 170 monitors is now a collocated site for 204 monitors as of December 1, 2017.

<sup>5</sup>The Bishop (Great Basin) 181 monitor converted to 238 on October 10, 2017 and is now the collocation site for 238 monitors.

Federal regulations require that 80 percent of collocated PM<sub>2.5</sub> monitors are located at sites where the design values are within 20 percent of the federal PM<sub>2.5</sub> standards. However, California is a large state in which environmental conditions can cause significant variation in ambient PM<sub>2.5</sub> concentrations across spatial and temporal scales. Thus, CARB determined that limiting the focus of collocation efforts on meeting the 80 percent metric would result in collocated monitors being tightly clustered in a limited geographic range, which would not adequately represent the range of environmental conditions in the PQAQ that could potentially affect PM<sub>2.5</sub> measurements.

The current locations of collocated PM<sub>2.5</sub> samplers were collaboratively identified by CARB and local districts as representative of areas of expected high concentrations as well as areas with environmental conditions that could potentially affect measurements, which effectively addresses the quality control function of the collocated monitoring requirement.

### PM<sub>10</sub> Collocation Status

Federal regulations require that 15 percent of PM<sub>10</sub> sites using manual FRMs in a PQAQ have collocated monitors. Collocated monitors must use the same method of measurement as the primary FRM monitor.

Per U.S. EPA's guidance, the required number of collocation sites was determined by counting all of the PM<sub>10</sub> FRM monitors, regardless of method code.

**Table 28: Collocation Requirements for PM<sub>10</sub>**

| Number of Primary FRM monitors* | # of Required Collocated Monitors | Sites with Collocated Monitors - Method Types (District)  |
|---------------------------------|-----------------------------------|---|
| 28                              | 4                                 | Bakersfield-California – 063/063 (San Joaquin Valley)<br>Sacramento-Del Paso – 063/063 (Sacramento)<br>Keeler-Cerro – 127/127 (Great Basin)<br>Fresno-Drummond – 162/162 (San Joaquin Valley) |

\* This number reflects the number of monitors operating in the PQAQ in 2017

### Pb Collocation Status

There are two Pb monitors in the CARB PQAQ, located at the Fresno-Garland and Sacramento-Del Paso Manor sites. However, Pb collocation for NCore sites is addressed by U.S. EPA at the national level. Thus, CARB is not required to collocate for lead at the NCore sites.

## CARB Quality Management Branch (QMB)

The information in this section, along with the information available on CARB's Quality Assurance website, <http://www.arb.ca.gov/aqgm/qa/qa.htm>, provides an overview of CARB's QMB compliance status with the requirements of 40 CFR Part 58, Appendices A, C, and E. The compliance status overview is part of the annual network plan requirement.

### QMB Background

The Quality Assurance Section (QAS) and Quality Management Section (QMS) fulfill the QMB mission to ensure ambient air quality data meet or exceed the quality and program objectives of the end users. QAS and QMS perform various quality assurance activities to verify that the data collected comply with procedures and regulations set forth by U.S. EPA and can be considered good quality data and data-for-record.

The quality assurance activities are achieved through various audits which are independent from the ambient air monitoring program responsibilities. California's large network and unique ambient air monitoring challenges require a comprehensive state-of-the-art audit program. CARB's audit program meets the federal requirements for conducting annual performance evaluations and has been designated as equivalent to the National Performance Audit Program. Audits are conducted by using independent National Institute of Standards and Technology (NIST) traceable standards and must adhere to federally established acceptance criteria.

QAS is responsible for conducting performance audits of criteria and non-criteria pollutant analyzers, particulate matter samplers, meteorological equipment, and laboratory analyses utilized for generating ambient level measurements. QAS also performs site reviews as well as reports quality assessment and quality control results. QMS is responsible for ensuring that CARB meets its federally mandated PQAO responsibilities. QMS performs technical system audits (TSA) and provides quality assurance oversight of the PQAO districts.

### CARB Quality Assurance Activities

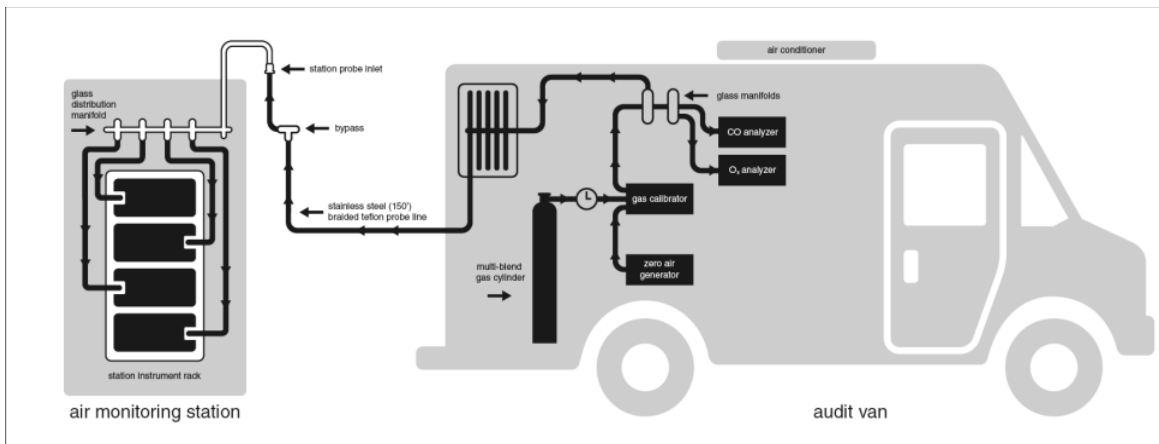
#### ***Monitoring Station Audits***

Annually, QAS conducts through-the-probe (TTP) audits for all continuous gaseous analyzers in the network. TTP audits of the gaseous analyzers, which monitor for carbon monoxide, nitrogen dioxide, hydrogen sulfide, sulfur dioxide, and ozone, are conducted in accordance with U.S. EPA requirements (Title 40, CFR, Part 58, Appendix A). These audits verify the accuracy of the gaseous analyzers and ensure the integrity of the entire sampling system. For most TTP audits, an audit van is transported by QAS to the ambient air monitoring station. Audit vans house the necessary instrumentation and equipment to allow the audit to be conducted at the same condition as the station instruments. TTP audits, depicted in Figure 4, are conducted by introducing NIST

traceable gases from the van into the station sampling probe inlet at various concentrations. QAS compares the results obtained from the station analyzer to the known values generated in the van.

TTP audit methodology can identify deficiencies caused by poor analyzer response, pollutant scavenging contaminants, and sampling system leaks. Deficiencies like these can cause the gaseous analyzers to fail an audit and possibly affect the quality of the ambient air data.

**Figure 4: Through-the-Probe Audit**



Biannually, QAS determines the accuracy of each particulate matter sampler in the network by comparison of the instrument's flow rate to either a certified orifice or a mass flow meter. These devices are certified against a NIST traceable flow device or calibrator. The audit device is connected in-line with the sampler's flow path and the flow rate is measured while the sampler is operating under normal sampling conditions. The true flow is calculated from the audit device's calibration curve. The sampler's flow is then compared to the true flow and a percent difference is determined for verifying compliance.

QAS also conducts annual audits of meteorological sensors using NIST traceable equipment. Accurate meteorological data are important for characterizing meteorological processes such as transport and diffusion, and to make air quality forecasts and burn-day decisions.

An integral part of a performance audit is conducting a siting evaluation. Stations that meet siting criteria at the time of initial setup may no longer conform due to updated regulations or changes in surrounding conditions and land use. Physical measurements and observations are noted on the site survey or accompanying documentation to determine compliance with 40 CFR Part 58, Appendix E requirements. Many of the siting issues result from the growth of vegetation-trees infringing on the minimum distance required from probes-inlets.

## ***Laboratory Performance and System Audits***

Laboratory mass analysis performance audits are conducted annually by QAS. These audits utilize NIST certified weights, hygrometers, and temperature sensors to verify the accuracy of the laboratory balance, relative humidity, and temperature sensors.

### ***Technical System Audit***

A Technical System Audit (TSA) is an on-site inspection and review of a monitoring organization's entire ambient air monitoring program. TSA procedures utilized by QMB auditors are located in U.S. EPA's Quality Assurance Handbook, Volume II. Each local agency within a PQAO must be audited on a six year schedule. The entire measurement system is reviewed which includes sample collection, sample analysis, and data processing. TSAs include a review of staff records, procedures, instrumentation, facilities, and documentation to assure compliance with all applicable requirements. Following evaluation of available information, a report is issued which includes a summary of the audit process, and a summary of findings and recommendations to correct any issues identified.

### ***Quality Assessment and Quality Control***

QAS ensures the quality of the data collected by the air monitoring stations operating in California through the analysis of precision data submitted to U.S. EPA's AQS database. Precision checks for gaseous-continuous samplers are required once every two weeks. These precision checks are conducted nightly at CARB and some district operated sites, and weekly or bi-weekly at other district sites. Precision checks for non-continuous, collocated particulate matter samplers are to be performed at least every 12 days. QAS staff analyzes the precision data in accordance with 40 CFR 58, Appendix A.

Air monitoring staffs perform a one-point flow rate verification at least once every month on the filter-based and automated PM analyzers. Air monitoring staffs review these data and take corrective action when the results exceed U.S. EPA's requirements. These flow rate verifications are used to assess bias of the automated instruments in accordance with 40 CFR Part 58, Appendix A, 3.2.3. These bias estimates are further verified by the semi-annual flow rate audits that are conducted five to seven months apart in each calendar year. In the course of auditing the PM<sub>2.5</sub> FRM and continuous samplers, the date of the last six months of flow rate and leak checks performed by the air monitoring staff are recorded.

### ***Identifying and Correcting Deficiencies***

During a performance audit, if a parameter fails to meet critical criteria (QA Handbook Volume II, Appendix D), an Air Quality Data Action (AQDA) request is issued to the facility operator. All AQDAs must be investigated by the operator and resolved to bring the parameter in question into compliance. The station operator completes the AQDA

by documenting the resolution, specifying the time period during which data were potentially affected, and recommending whether the data are to be released, corrected, or invalidated. QMB reviews the completed AQDA and discusses any concerns with the operator. A finalized copy of the AQDA is forwarded to the operator and CARB's Air Quality Analysis Section. Other issues identified as systematic or operational criteria that may impact or potentially impact data quality are documented through the issuance of a Corrective Action Notification (CAN).

### Audit Report Summary

Information about each air monitoring station audited by QMB is available at [http://www.arb.ca.gov/qaweb/sitelist\\_create.php](http://www.arb.ca.gov/qaweb/sitelist_create.php). This web page provides the map location, latitude and longitude coordinates, site photos, the pollutants monitored, along with a detailed site survey of the instrumentation and physical parameters for each site.

The 2017 calendar year audit dates for both the gaseous analyzers and PM monitors and residence time for each gas analyzer operating at the monitoring sites covered in this report are provided in the detailed site tables in Appendix A. Audit results are directly submitted to AQS quarterly per Appendix A of 40 CFR Part 58.

In addition, as required by 40 CFR Part 58.15, CARB submits a data certification letter along with the required AQS reports (AMP450NC and AMP600) to U.S.EPA annually. The most recent certification letter was sent to the U.S. EPA on June 2, 2017.



## Section 8: Proposed and Recently Implemented Monitoring Site Changes

CARB utilizes the annual network plan process to document and provide the public opportunities to comment on any proposed changes to the monitoring network. Any received comments are formally addressed via letters and are documented in the network plan. The network plan is submitted to the U.S. EPA annually for formal approval of all network modifications.

This section lists the proposed and recently implemented monitoring site changes that CARB is currently aware of in the areas covered by this ANP.

| District              | Site (AQS ID)                    | Comment  |
|-----------------------|----------------------------------|--|
| Butte County APCD     | Paradise (060072002)             | ARB replaced PM <sub>2.5</sub> non-FEM BAM1020 monitor with non-FEM BAM-1022 monitor in September 2017.  |
| Colusa County APCD    | Sunrise (060111002)              | ARB replaced non-FEM BAM1020 monitor with non-FEM BAM-1022 monitor in August 2017.   |
| Eastern Kern APCD     | Ridgecrest (060290015)           | District has requested approval from EPA to relocate the original site located at 100 W. California Avenue to a new site located near the corner of Sydnor Avenue and N. Primavera Street, approximately 4 miles northwest of the original site (A copy of the new location request is provided in Appendix D). As part of this move, the District will be replacing the PM <sub>10</sub> FRM and PM <sub>2.5</sub> FRM with FEM Met One 1020 BAM samplers. The existing site ceased operation on 3/15/2018. |
| El Dorado County AQMD | Placerville (060170010)          | CARB is no longer pursuing a relocation of current Placerville-Gold Nugget O3 monitor to Placerville Airport. The Airport site has been determined not to be a suitable monitoring location. CARB has extended the Placerville-Gold Nugget site lease until February 2020. Site relocation process has been renewed to find a potential replacement site for the current Placerville-Gold Nugget site.   |
| Imperial County APCD  | El Centro (060251003)            | CO monitor shutdown on 7/12/2017.  |
| Northern Sierra AQMD  | Grass Valley (060570005)         | The FEM BAM monitor was installed in mid-December 2017. This monitor will be permanent.  |
|                       | Loyalton (not yet available)     | The non-FEM BAM monitor was installed in early December of 2017. This is a SPM monitor. There are data issues with this site and site has not produced any data yet. Because of these issues, it is not clear if this will be a short-term or long-term site.  |
|                       | White Cloud Mountain (060570007) | Monitoring site is no longer available due to planned helitack expansion by site owner. CARB is proposing an alternate site on the same property and seeking U.S. EPA approval (see Appendix D.) CARB anticipates that this site will operate during the 2019 ozone season.  |
| Placer County APCD    | Lincoln (060612002)              | District is working to relocate the Lincoln-1st Street site due to the site demolition plan proposed by the site owner. The District has identified the new site location and is working on the contract with the City of Lincoln. The District anticipates to finish the Lincoln site relocation in fiscal year 18-19. The existing site ceased operation on 9/30/2017.   |
| Shasta County AQMD    | Lake Blvd. (06-089-0009)         | Districts plans to replace the Teledyne API 400 with a Teledyne T265 due to reaching the end of its useful life. Provided audits are passed in March of 2018, a new Teledyne T265 analyzer will become the official analyzer. The District has been operating the API 400 and T265 concurrently for several months.  |

| District             | Site (AQS ID)                | Comment   |
|----------------------|------------------------------|---|
| Siskiyou County APCD | Yreka (060932001)            | District is processing in its plan to switch PM <sub>2.5</sub> FRM to PM <sub>2.5</sub> FEM on July 1, 2018 and this change does not require formal U.S.EPA approval. |
| Tehama County APCD   | Red Bluff-Walnut (061030007) | The District will be replacing its Teledyne 400E with a Teledyne T400 with IZS. The change will occur in the beginning of the second quarter of 2018.                 |

CARB operates multiple sites in districts that are not covered by this ANP. Below are proposed and recently implemented changes to the CARB operated sites in Santa Barbara County. For changes in Sacramento and or/San Joaquin Valley, please see the individual district plans.

| District             | Site (AQS ID)           | Comment  |
|----------------------|-------------------------|--|
| Santa Barbara County | Armory (060830011)      | The CO and NOx were shut down in June 2017 and was approved by U.S. EPA. Continuous FEM PM10 and PM <sub>2.5</sub> operations have resumed.  |
|                      | Santa Maria (060831008) | CARB is continuing to pursue a request to shutdown of NO <sub>2</sub> and CO monitors. These monitors have met shutdown criteria outlined in 40CFR50.16. Reduction in staff dictates that resources could be better utilized at other CARB monitoring locations. CARB is working with the District regarding implementing these changes. |

## **Section 9: Network Information Resources**

While this report includes a great deal of information about the ambient air quality monitoring network, much more information, including summaries of the pollutant data from the monitors around the State is readily available on the web. This section lists a number of additional sources of such information. Also listed is contact information for the agencies responsible for the monitoring covered in this report.

CARB's Monitoring and Laboratory Division (MLD) maintains web pages with information about all the existing monitoring sites that routinely monitor and submit air quality data in California. The pages also include detailed local maps showing the location of the sites. This information can be found at <http://www.arb.ca.gov/aaqm/mldaqsb/amn.htm>. A more general MLD web page that provides links to other aspects of ambient monitoring is located at <http://www.arb.ca.gov/aaqm/aaqm.htm>.

Summaries of the official air quality data from sites around the State can be found at <http://www.arb.ca.gov/adam/welcome.html>. Summaries of the most recent preliminary data can be viewed at: <http://www.arb.ca.gov/aqmis2/aqmis2.php>. These last two sources of information are maintained by CARB staff of the Air Quality Planning and Science Division, as is the following more general web page that lists links to other aspects of the ambient air quality data program: <http://www.arb.ca.gov/html/ds.htm>.

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