



# San Joaquin Valley

AIR POLLUTION CONTROL DISTRICT

## Arvin-Lamont Community Air Monitoring Report 2023 4<sup>th</sup> Quarter (October 2023 – December 2023)



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## I. Background

Assembly Bill (AB) 617, signed into law in July 2017, has resulted in a statewide effort to reduce air pollution and improve public health in communities that experience disproportionate burdens from exposure to air pollutants statewide through new community-focused and community-driven actions. AB 617 provides mechanisms and resources to implement community-specific air quality monitoring networks, develop and implement emission reduction programs; improve availability of data and other technical information; and invest substantial funding in the community through voluntary incentive funding measures. The City of Arvin and nearby Lamont are part of a small, rural community in Southeast Kern County, and have long been recognized as one of the most air quality impacted areas of the Valley. A number of heavily trafficked highways pass nearby, including Hwy 184 and Hwy 223, contributing to overall emissions in the community. The community is also surrounded by agricultural operations, industrial sources, and emissions traveling downwind from the City of Bakersfield to the northwest.

District staff provided assistance to the Community Steering Committee (CSC) members by helping them to develop their recommended air monitoring priorities. The District worked with CSC members as they reviewed and evaluated a variety of different resources, including maps of stationary sources, area sources, mobile sources, prevailing wind direction data, and sensitive receptor locations relative to sources of air pollution within the community. The CSC adopted their official recommendation in July 2021, including the deployment of various air monitoring platforms within the community as a part of the [Arvin-Lamont Community Air Monitoring Plan \(CAMP\)](#).

The District has invested an extensive amount of work into implementing the CAMP, including researching, developing, configuring, deploying, trouble-shooting, and maintaining new state-of-the-art high precision air monitoring equipment. This also includes the use of the mobile air monitoring van to take measurements in a variety of locations of interest and to respond to community concerns. The District has also contracted with analytical laboratories to conduct the needed analysis to speciate the VOC and PM<sub>2.5</sub> samples being taken in the community. In addition, the District has worked closely with organizations to negotiate leases to authorize the deployment of the equipment on site.

### **Access to Data from Arvin-Lamont Community Air Monitoring Network**

In addition to these quarterly reports, the District is continuing its efforts to enhance the availability of air monitoring data and information to ensure that the community is fully apprised of the ongoing air monitoring efforts and are receiving the latest air quality information. This includes continued regular updates to the Community Steering Committee (CSC) and bilingual weekly updates and real-time air quality information in Arvin-Lamont, which are both available on the [Arvin-Lamont Air Monitoring webpage](#). In addition, raw hourly data from the Arvin-Lamont community air monitoring network are also being sent to CARB and are now available on CARB's statewide [AQView data portal](#).

## II. Summary of Findings for the Quarter

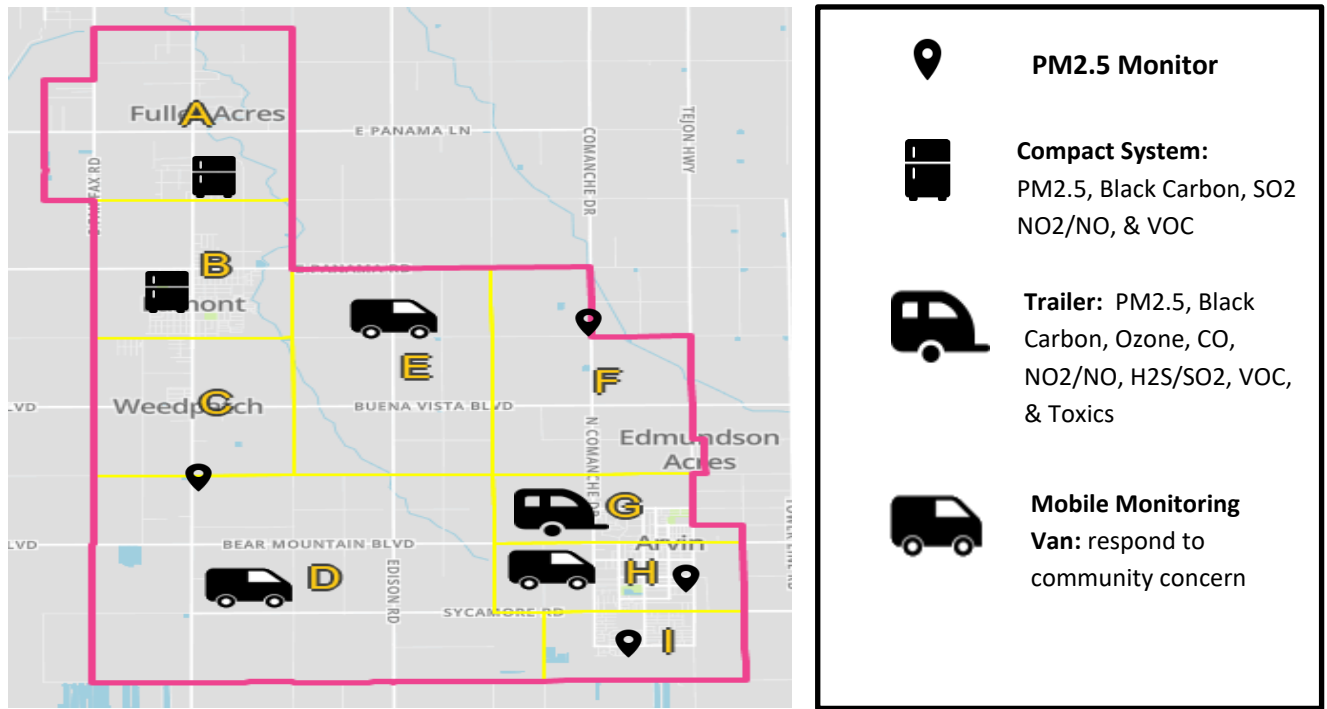
Through the continued implementation of the Arvin-Lamont CAMP during this period, the following was observed among the pollutants monitored:

- October air quality was influenced by high pressure systems that caused poor dispersion resulting in smoke from wildfires in the Sierra Nevada to be confined at the surface.
- November was dominated by alternating high and low pressure patterns over the region that caused alternating days in the Good to Moderate Air Quality Index (AQI) categories. The Residential Wood Burning Curtailment season began on the first of the month.
- High pressure patterns over the region prevailed in December. Stable conditions and poor dispersion caused air quality to deteriorate into the Moderate to Unhealthy for Sensitive Groups AQI categories.
- During this period, acetaldehyde, methanol, ethanol, isopropanol, and acetone were the primary VOCs detected. Overall, during this monitoring period the concentrations of VOCs detected in the samples taken were well below health based thresholds.
- Further analysis including Heat Maps and Charts is included below.

## III. Status of Community Air Monitoring Network

Consistent with the community recommended air monitoring network design, the District is now implementing the community air monitoring plan for Arvin-Lamont. The following map and table detail the network design for the Arvin-Lamont CAMP, as well as the status of implementing each specified air monitoring site.

**Figure 1 Design of Arvin-Lamont Community Air Monitoring Network**



**Table 1 Status of Arvin-Lamont Community Air Monitoring Network**

Zone	Location	Installed	Notes
A	Mountain View Middle School	X	All monitoring, <u>except for black carbon</u> , implemented as of June 2, 2022.
B	Alicante Elementary		Performed a site walk with Lamont Elementary School District on monitor placement. Awaiting air monitoring equipment.
C	Sunset Middle School	X	Real-time PM2.5 installed
D	Various Locations		District will work with CSC to begin air monitoring in this area with van
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F	Near Di Giorgio Rd. & Comanche Dr.		Looking for a site that will host the monitor.
G	Arvin Community Services District		Lease agreement signed on May 1, 2023; working with contractor to build electrical infrastructure
H	Bear Mountain Elementary, Various Locations with Van	X	Real-time PM2.5 installed at Bear Mountain Elementary; District will work with CSC to begin air monitoring in this area with van
I	El Camino Real Elementary	X	Real-time PM2.5 installed

The District continues to work on implementing the Arvin-Lamont CAMP, as well as making changes as needed based on CSC member comments and other logistical reasons.

#### IV. Mobile Air Monitoring Van Activities

During this period, no mobile air monitoring van activities occurred.

## V. Summary of VOC Speciation Analysis

To build a better understanding of the various constituents that compose the overall Volatile Organic Compound (VOC) concentrations in the Arvin-Lamont community, in April 2022 the District began VOC speciation sampling near Arvin High School. The collected samples were sent to a third-party laboratory for analysis to determine the contribution of various species of VOCs in the air sampled in the community.

Details on the types of species measured through this analysis, and potential activities, are below.

### **VOC Speciation Analysis**

VOCs are carbon chained compounds that vaporize in ambient conditions. Among these compounds are BTEX, 1,3-butadiene, PAH, aldehydes, naphthalene, and diethanolamine. These compounds are typically emitted from products such as paints, inks, organic solvents, petroleum products as well as vehicle exhaust. The health effects of these compounds vary but, long term exposure can have lasting adverse health effects. A more detailed list of possible VOCs and their health effects is provided by the California Office of Environmental Health Hazard Assessment (OEHHA)<sup>1</sup>.

During this period, the District collected 14 air samples for laboratory analysis. The VOC laboratory analysis is capable of isolating concentrations of 83 VOC species; however, during this period, most VOCs were not detected in the atmosphere.

Acetaldehyde, methanol, ethanol, isopropanol, and acetone were the primary VOCs detected. Of these five, only acetaldehyde and methanol have an associated Reference Exposure Level (REL), a health risk metric established by the Office of Environmental Health Hazard Assessment (OEHHA). Below is a summary of the potential sources and a comparison of the peak concentration with the associated OEHHA REL. Green colored values represent pollutant concentrations that are below the applicable REL, while orange colored values represent elevated values or values above the applicable REL. All shaded values in the table below are colored green and no concerning concentrations of VOCs were detected in the samples taken.

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<sup>1</sup> <https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary>

**Table 2 Summary of VOC Speciation Analysis**

Pollutant	Potential Sources of Emission	Short Term Impact		Long Term Impact	
		Max Measured [24-hour] (ppb)	OEHHA Acute REL [1-hour] (ppb)	Average Measured [Annual] (ppb)	OEHHA Chronic REL [Annual] (ppb)
Methanol	Automobile exhaust, solvent use, and naturally from vegetation and microbes	350.0	21,367	26.0	3,052
Acetaldehyde	Wood combustion in fireplaces and woodstoves, coffee roasting, burning of tobacco, vehicle exhaust fumes, and coal refining and waste processing	42.0	261	4.7	78

## VI. Appendix of Pollutant Species and Comparative Analysis

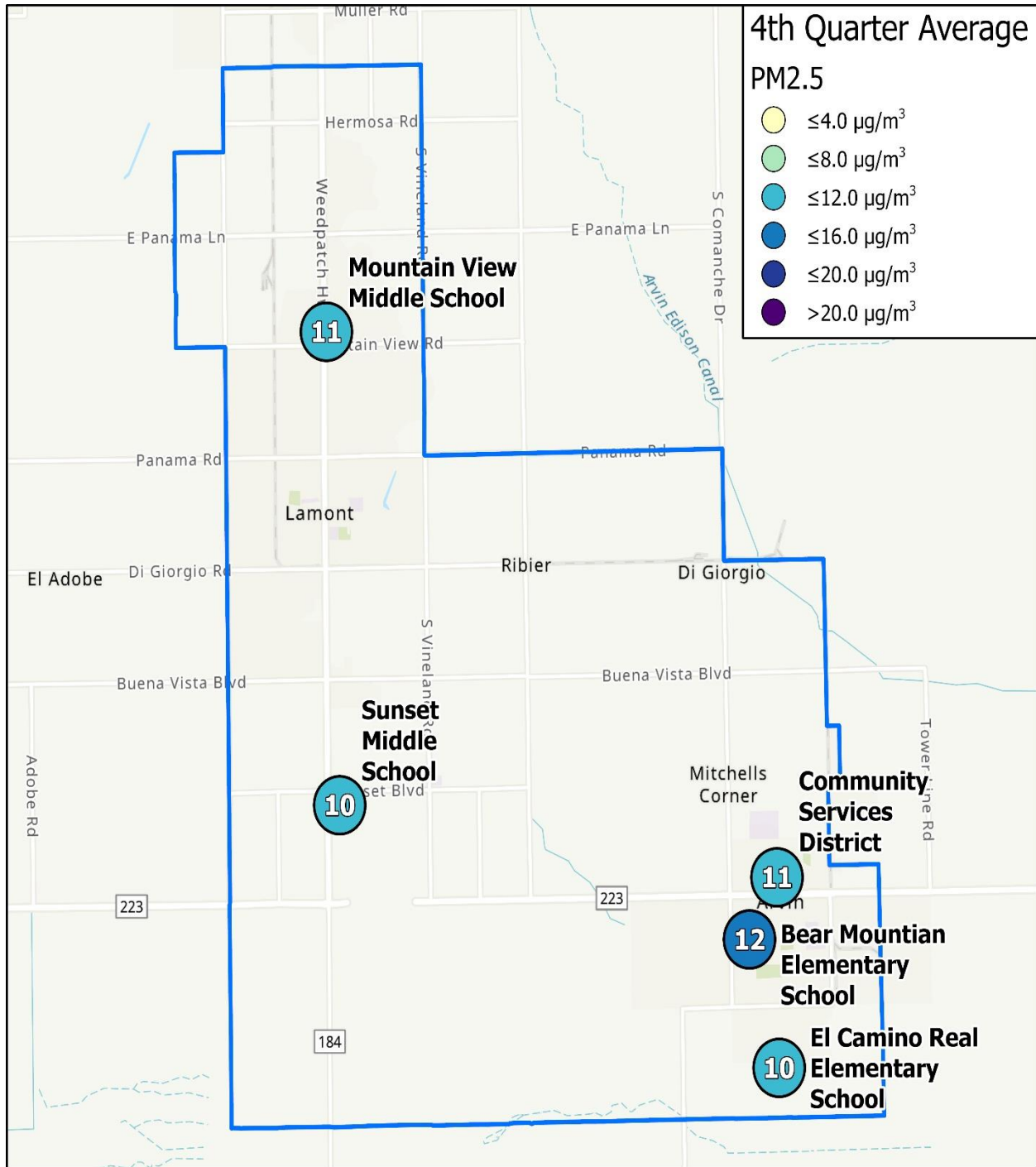
### Comparative Analysis of Measured Pollutants

The following spatial comparison map depicts the quarterly PM2.5 average and location for each site within the community. Good air quality is represented in the map by the light yellow, light green, and light blue colors. Moderate air quality and above is represented by darker blues and purples based on how high the quarterly average PM2.5 is for each site. Bakersfield-California is shown in Table 3 as a reference to a regulatory air monitoring site. It is not shown in Figure 2 due to the distance from the Arvin-Lamont community.

**Table 3 PM2.5 Quarterly Averages**

Quarter	Bakersfield-California	Bear Mountain Elementary School	El Camino Real Elementary School	Mountain View Middle School	Sunset Middle School
2023 Q4	16.3	12.4	10.3	11.4	10.3

**Figure 2 Spatial Comparison of PM<sub>2.5</sub> Quarterly Averages**



### Pollutant Concentration Heat Maps

The following Heat Maps provide a comparative analysis of various pollutants being measured at the air monitoring sites as a part of the community air monitoring network. The color scales for each table are based on the Air Quality Index (AQI) or the associated Reference Exposure Level (REL).

In the fourth quarter of 2023, October experienced multiple storms that transported through the region and brought dispersive conditions throughout the Valley, resulting in the majority of the month in the Good AQI category. During the last couple of weeks of October, high pressure started to build over the region and remained present over the region providing increased stability, increased temperature, stronger temperature inversions, and deteriorating dispersion conditions. This high pressure system, coupled with smoke from wildfires burning in the Sierra Nevada and contributed to elevated PM2.5 concentrations resulting in multiple days in the Moderate AQI category at multiple sites within the community.

In November, high pressure continued to produce stable conditions with deteriorating air quality for the majority of the month. Reduced mixing depths during the afternoons and cooler seasonal temperatures, allowed for stable conditions and temperature inversions further deteriorated air quality throughout the Valley. Residual smoke from the wildfires in the Sierra Nevada also remained trapped at the surface at the beginning of the November, under high pressure conditions. As a result, multiple days in November were in the Moderate AQI category due to PM2.5. Intermittent storms and low pressure systems did bring some relief and provided multiple days in the Good AQI category.

In December, high pressure continued to produce stable conditions with deteriorating air quality for the majority of the month, with poor to marginal dispersion present across the community for the majority of the month due to high pressure and shallow mixing depths. In the second week of December, high pressure began to steadily build over the region bringing declining dispersion conditions to the Valley. Conditions remained stable throughout the week with elevated PM2.5 concentrations under a less dispersive atmosphere leading to air quality in the Moderate to Unhealthy for Sensitive Groups AQI category. During the remaining portion of December, high pressure began to build over the region again resulting in strengthening stability and deteriorating dispersion, resulting in particulate matter concentrations increased leading air quality in the Moderate AQI category.

