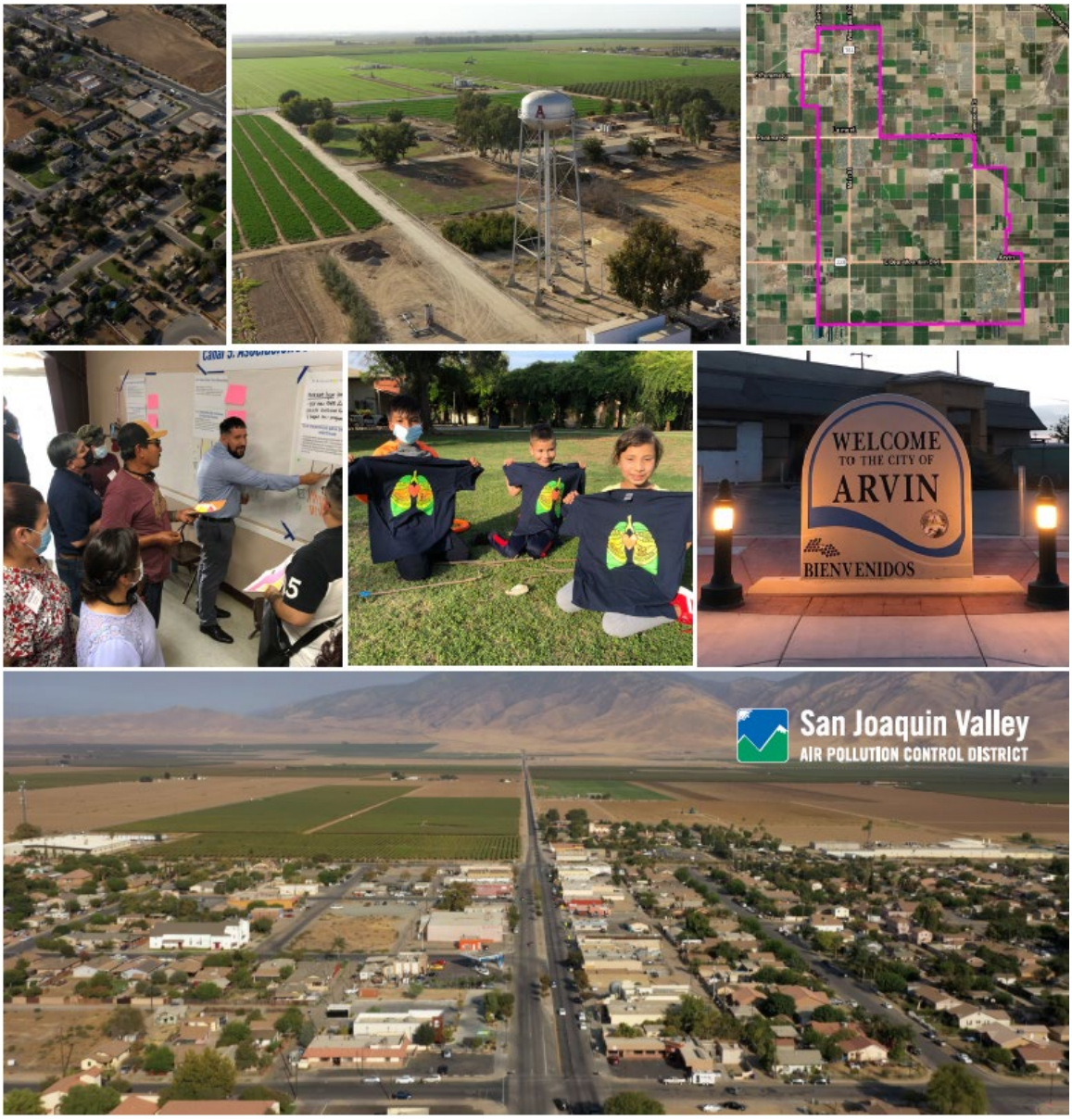
San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

Arvin-Lamont Community Air Monitoring Report

2023 2nd Quarter (April 2023 – June 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 PM2.5 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:

- Throughout the quarter, between dispersive troughs, high pressure caused moderate air quality due to PM2.5 across the community.
- Mid to late May and June was dominated by alternating weak high and low pressure systems. During the second quarter of 2023, there were no days over the federal 24-hour PM2.5 standard of 35 µg/m^3.
- 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

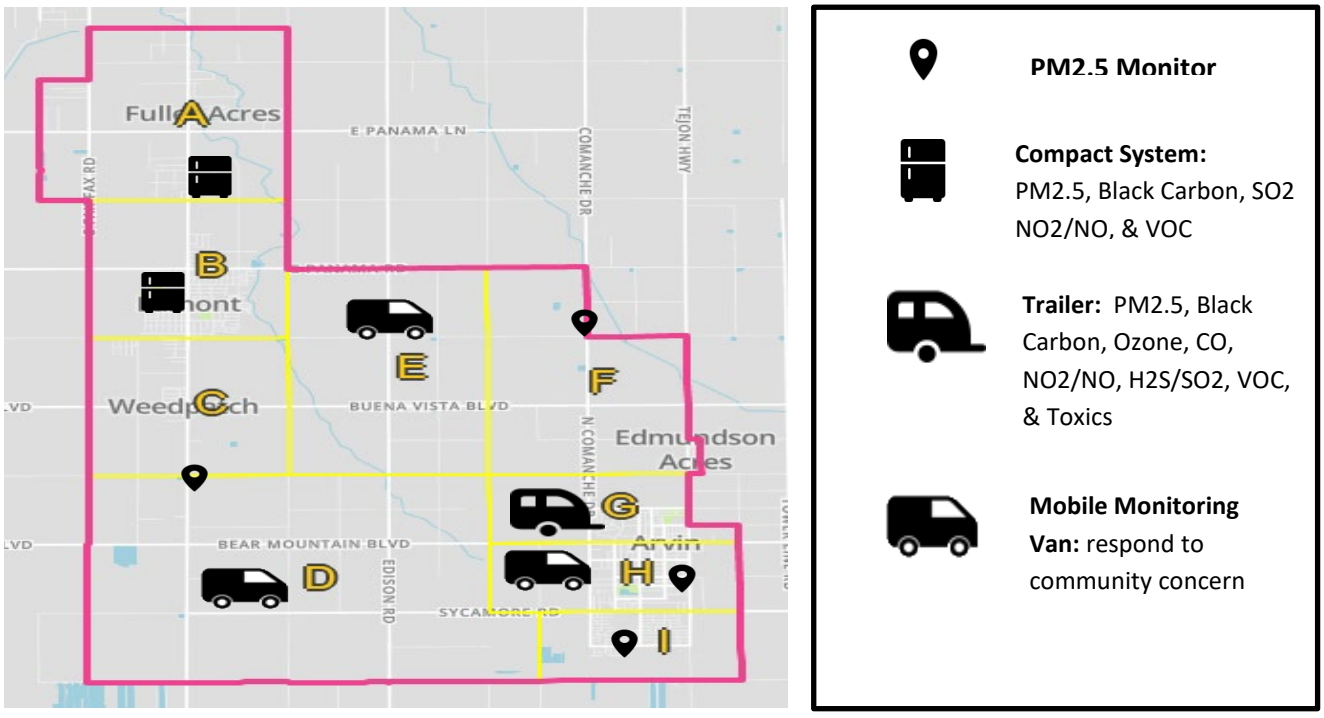

Table 1 Status of Arvin-Lamont Community Air Monitoring Network

Zone	Location	Installed	Notes
A	Mountain View Middle School	X	Except for black carbon, fully 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 $PM_{2.5}$ 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 $PM_{2.5}$ 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. 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)[1].

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

During this period, the District collected 23 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, 2-propanol, 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.

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	27.0	21,367	9.4	3,052
Acetaldehyde	Wood combustion in fireplaces and woodstoves, coffee roasting, burning of tobacco, vehicle exhaust fumes, and coal refining and waste processing	6.6	261	1.2	78

V. Appendix of Pollutant Species and Comparative Analysis

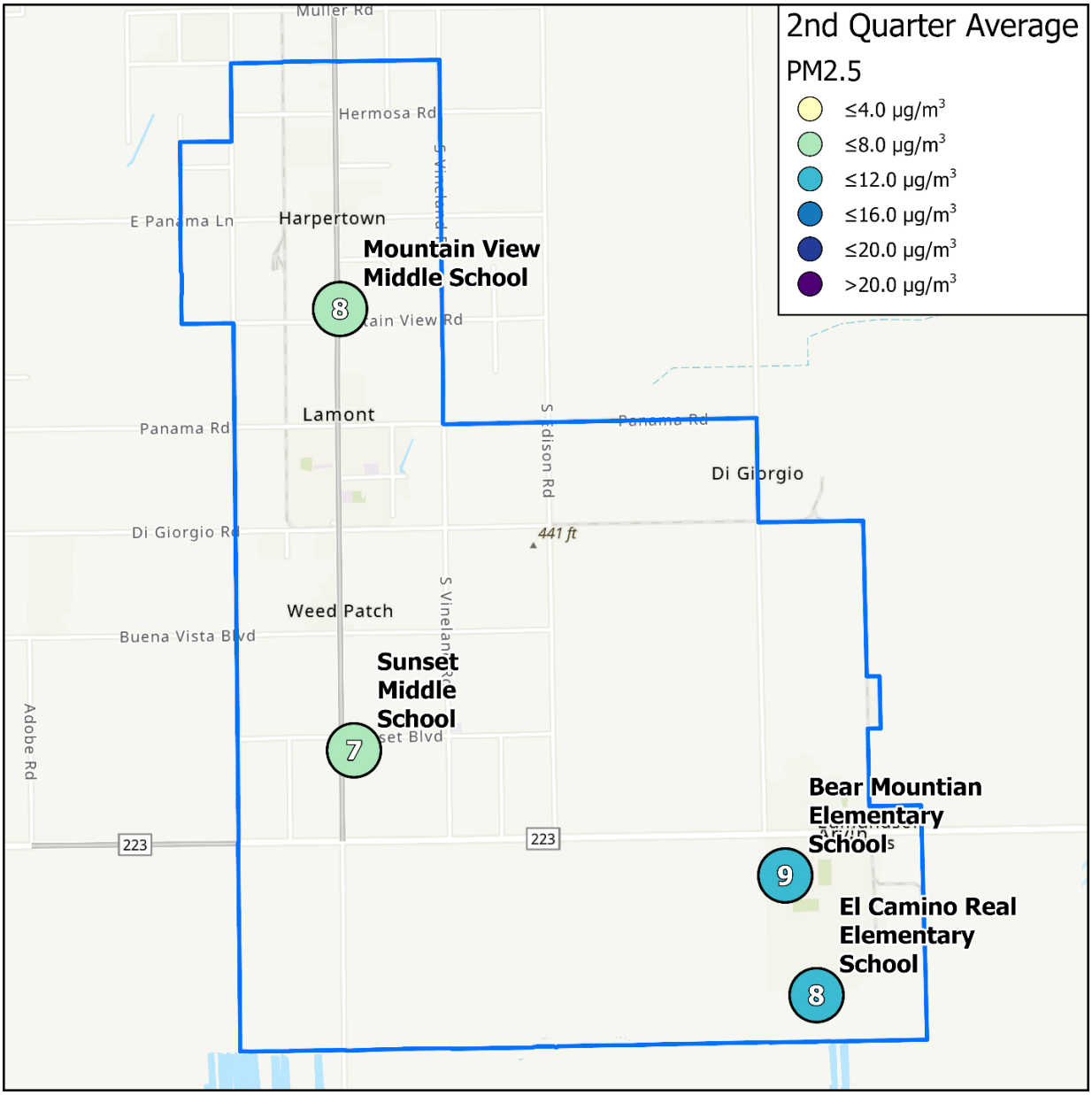
Comparative Analysis of Measured Pollutants

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 Q2	7.8	8.7	8.2	7.6	7.3

Figure 2 Spatial Comparison of PM2.5 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).

The second quarter of 2023 experienced patterns of alternating weak disturbances and marginal stability. April was characterized by alternating troughs which brought good dispersion conditions across the region followed by short periods of ridging until another trough dug through the region. During the month of May, multiple systems brought increased winds and dispersive conditions for the majority of the month. Throughout the quarter, between dispersive troughs, high pressure caused moderate air quality due to PM2.5 across the community.