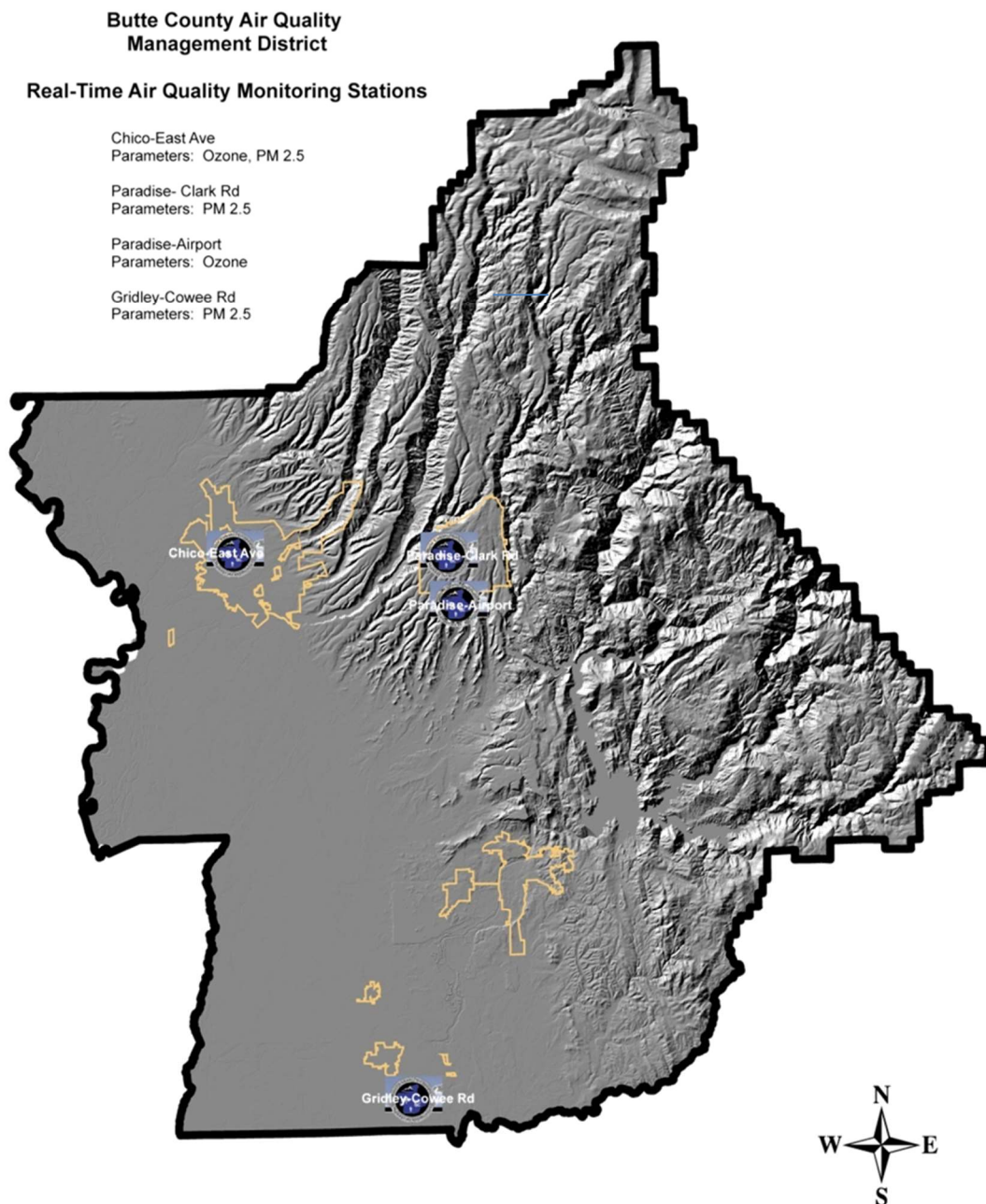


# BUTTE COUNTY AIR QUALITY MANAGEMENT DISTRICT

## Air Quality Summary for 2024 and 2024 – 2025 Check Before You Light Program Summary

The following is a summary of Butte County’s air quality for 2024 and a summary of the 2024-2025 Check Before You Light Program. This document gives the reader an overview of the two (2) criteria pollutants of greatest concern - ozone (O<sub>3</sub>) and particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>). The data was obtained from the official air monitoring sites located within Butte County. PM<sub>2.5</sub> is monitored in Chico, South Butte County southeast of Gridley, and Paradise. Ozone is monitored in Chico and Paradise. PM<sub>10</sub> is only monitored in Chico. Official air monitoring in Butte County is conducted by the California Air Resource Board (CARB).



The **Ambient Air Quality Standards** establish the concentration at which a pollutant is known to cause adverse health effects to sensitive groups within the population, such as children and the elderly. Both the California and federal governments have adopted health-based standards for the *criteria pollutants*, which for this report include Ozone and PM<sub>2.5</sub>. In general, the air quality standards are expressed as a measure of the amount of pollutant per unit of air. For example, the ozone standards are expressed as parts per million (ppm) and the particulate matter standards are expressed as micrograms of particulate matter per cubic meter of air (ug/m3).

**Ozone**

Ozone is a colorless gas with a pungent odor. It is the chief component of urban smog. The name “smog” was created from the words smoke and fog. Ozone is not directly emitted as a pollutant but is formed in the atmosphere when reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>) precursor emissions react in the presence of sunlight. Meteorology and terrain play major roles in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and cloudless skies provide for the optimum conditions. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often impacts a widespread area. The largest contribution of ozone-forming pollution that is transported to Butte County comes from vehicle emissions in urban areas to the south. Wildfires can also create emissions that increase ozone concentrations. Ozone concentrations tends to peak where the subsidence inversion above the Sacramento Valley meets the foothills of the Sierra Nevada mountains. This is the reason ozone concentrations at the Paradise monitoring station are historically higher than the Chico monitoring station.

Ozone impacts lung function by irritating and damaging the respiratory system. In addition, ozone causes damage to vegetation, buildings, rubber, and some plastics. Recognizing the health impacts of daylong exposure, the United States Environmental Protection Agency (U.S. EPA) promulgated an 8-hour ozone standard in 1997 as a successor to the 1-hour standard, which was established in 1979. EPA revised the 8-hour federal standard in 2008 and again in 2015. CARB approved an 8-hour ozone state standard on April 28, 2005, which became effective in early 2006. Table 1 shows the State and National Ozone Standards effective in 2024.

<b>TABLE 1 AMBIENT AIR QUALITY STANDARDS - OZONE</b>	
<b>State Ozone Standard:</b> 0.09 ppm for 1 hour, not to be exceeded. 0.07 ppm for 8 hours, not to be exceeded.	<b>National Ozone Standards:</b> --- 0.070 ppm for 8 hours, not to be exceeded. Based on the fourth highest concentration averaged over three years.* * Federal 8-hour ozone standard revised October 2015.

Butte County was officially designated marginal nonattainment for the 2015 federal ozone standard in 2018 by the U. S. EPA. U.S. EPA took final action in October 2022 to determine that Butte County met the 2015 federal ozone standard by the required attainment deadline. CARB designated Butte County as nonattainment-transitional for the California Ambient Air Quality Standard for ozone in January 2024.

Table 2 shows the ozone air quality summary for 2024 and Figures 1 & 2 (attached) graphically show the maximum 8-hour measurements for each day in Chico and Paradise. CARB installed a new ozone monitor in Paradise on Clark Road in 2023 to replace the ozone monitor located at the Paradise Airport. Based on preliminary data, monitors in Chico and Paradise did not exceed the 2015 federal 8-hour ozone standard in 2024. This is the third year in a row that monitors in Butte County did not exceed federal 8-hour ozone

standards. The Chico-East Avenue ozone monitor did experience one exceedance of the State 1-hour ozone standard during impacts from the Park Fire.

<b>TABLE 2</b> <b>BUTTE COUNTY OZONE AIR QUALITY DATA SUMMARY 2024</b> <i>(data is still preliminary as of April 2025)</i>		
	<b>Chico</b>	<b>Paradise (Airport)</b>
<b>Max. 1-Hour Ozone Measurement Date</b>	0.093ppm 8/2/2024	0.069 ppm (tie) 6/21/2024 8/29/2024
<b>Days Above State Std. (0.09ppm)</b>	<b>1</b>	<b>0</b>
<b>Max. 8-Hour Ozone Measurement</b>	0.070 ppm 8/2/2024	0.066 ppm 08/29/2024
<b>4<sup>th</sup> Highest 8-Hour Ozone Measurement (used for calculating Design Value)</b>	0.067 ppm	0.064 ppm
<b>Days Above State Std. (0.07ppm) – rounding differs from Fed. Std.)</b>	<b>0</b>	<b>0</b>
<b>Days Above 2015 Fed. Std. (0.07ppm)</b>	<b>0</b>	<b>0</b>

**Particulate Matter (PM<sub>2.5</sub>)**

Particulate Matter (PM<sub>2.5</sub>) refers to particles with an aerodynamic diameter of 2.5 microns or smaller. For comparison, the average diameter of a human hair is about 70 microns. PM<sub>2.5</sub> is a mixture of substances that can include elements such as carbon, lead, and nickel; compounds such as nitrates, organic compounds, and sulfates; and complex mixtures such as diesel exhaust and soil. These substances occur in the form of solid particles or as liquid droplets. Some particles are emitted directly into the atmosphere. Other particles, referred to as secondary particles, result from gases that are transformed into particles through physical and chemical processes in the atmosphere. Emissions are dominated by contributions from area-wide sources, primarily fugitive dust from construction and demolition, residential fuel combustion (woodstoves and fireplaces), and open burning.

Particulate matter can be directly emitted into the air (primary PM) or, similar to ozone, it can be formed in the atmosphere (secondary PM) from the reaction of gaseous precursors such as NO<sub>x</sub>, sulfur oxides (SO<sub>x</sub>), ROG, and ammonia. On an annual average basis, directly emitted PM<sub>2.5</sub> emissions contribute approximately 70 percent of the ambient PM<sub>2.5</sub> in the Sacramento Valley Air Basin.

The fine particles pose an increased health risk because they can deposit deep in the lung and contain substances that are particularly harmful to human health; therefore, this report will look at PM<sub>2.5</sub> data and trends. Table 3 shows the State and National PM<sub>2.5</sub> standards effective in 2024. In early 2024, US EPA updated the annual PM<sub>2.5</sub> standard from 12 µg/m<sup>3</sup> to 9 µg/m<sup>3</sup> which is being re-evaluated with the current administration.

<b>TABLE 3</b> <b>AMBIENT AIR QUALITY STANDARDS – PM<sub>2.5</sub></b>	
<b>State PM<sub>2.5</sub> Standards:</b> 12 µg/m <sup>3</sup> annual arithmetic mean not to be exceeded.	<b>National PM<sub>2.5</sub> Standards:</b> 35 µg/m <sup>3</sup> for 24 hours, not to be exceeded, based on the 98 <sup>th</sup> percentile concentration averaged over three years and 9 µg/m <sup>3</sup> annual arithmetic mean averaged over 3 years.

Butte County has continued to meet the federal PM<sub>2.5</sub> standard since 2013 when the U. S. EPA officially recognized that Butte County’s monitoring data showed attainment of the standard. The U. S. EPA approved a PM<sub>2.5</sub> Redesignation Request and Maintenance Plan effective August 2018. CARB designated Butte County as attainment for the California Ambient Air Quality Standard for PM<sub>2.5</sub> in January 2024.

Table 4 shows the Chico, Paradise, and South Butte County PM<sub>2.5</sub> monitoring summary for 2024. The Chico air monitoring station includes a continuous PM<sub>2.5</sub> monitor known as a Beta Attenuation Monitor (BAM). This monitor has been approved as a federal equivalency method (FEM) monitor and therefore can be used for determining attainment with the federal PM<sub>2.5</sub> standards. Paradise and South Butte County monitor PM<sub>2.5</sub> using a non-FEM BAM. This data is useful for public reporting and understanding diurnal and episodic behavior of fine particles, background monitoring, and transport assessment. The Paradise-Theater monitoring location was closed by CARB in July 2023 and moved to the new Paradise-Clark Road location to be co-located with the ozone monitor.

TABLE 4 BUTTE COUNTY PM <sub>2.5</sub> AIR QUALITY DATA 2024 <i>(data is still preliminary as of April 2025)</i>			
	Chico (FEM)	Paradise (Non-FEM)	South Butte Co. (Non-FEM)
<b>Max 24-Hour PM<sub>2.5</sub> Measurement Date</b>	85.2 µg/m <sup>3</sup> 8/2/2024	132.8 µg/m <sup>3</sup> 7/31/2024	30.4 µg/m <sup>3</sup> 12/11/2024
<b>98<sup>th</sup> Percentile 24-Hour PM<sub>2.5</sub> Value (used for calculating Design Value)</b>	25.7 ug/m <sup>3</sup>	n/a	n/a
<b>Days Above Fed. Std. (35 ug/m<sup>3</sup>)</b>	<b>1</b>	<b>1</b>	<b>0</b>
<b>Annual Average</b>	6.87 ug/m <sup>3</sup>	n/a	n/a

Figures 3, 4, and 5 (attached) charts the 2024 PM<sub>2.5</sub> 24-hour average data for Chico, Paradise, and South Butte County, respectively. Both the Chico and Paradise monitoring locations measured one exceedance of the federal 24-hr PM<sub>2.5</sub> standard due to impacts from the Park Fire. Portions of Butte County also experienced short-term smoke impacts from the Thompson Fire near Oroville. Despite these impacts, the Chico monitoring location experienced the best annual PM<sub>2.5</sub> average since BAM measurements began in the year 2000.

**Particulate Matter (PM<sub>10</sub>)**

Particulate Matter (PM<sub>10</sub>) refers to particles with an aerodynamic diameter of ten (10) microns or smaller. This measurement of particulate matter captures PM<sub>2.5</sub> discussed above as well as coarser particulates that may still pose risks to human health at elevated concentrations. PM<sub>10</sub> includes larger particulates like dust from disturbed soil, rock crushing, traffic on dirt roads, or high wind events. Table 5 shows the State and National PM<sub>10</sub> standards.

TABLE 5 AMBIENT AIR QUALITY STANDARDS – PM <sub>10</sub>	
<b>State PM<sub>10</sub> Standards:</b> 20 µg/m <sup>3</sup> annual arithmetic mean not to be exceeded. 50 µg/m <sup>3</sup> for a 24-hour average not to be exceeded.	<b>National PM<sub>10</sub> Standard:</b> 150 µg/m <sup>3</sup> not to be exceeded more than once per year on average over 3 years.

The Chico monitoring location has the only permanent PM<sub>10</sub> monitor in Butte County. Table 6 shows the Chico PM<sub>10</sub> monitoring summary for 2024. The Chico air monitoring station includes a continuous PM<sub>10</sub>

BAM that has been approved as a federal equivalency method (FEM) monitor, and therefore can be used for determining attainment with the federal PM<sub>10</sub> standards.

<b>TABLE 6</b>	
<b>BUTTE COUNTY PM<sub>10</sub> AIR QUALITY DATA 2024</b>	
<i>(data is still preliminary as of April 2025)</i>	
	<b>Chico (FEM)</b>
<b>Max 24-Hour PM<sub>10</sub> Measurement</b>	112 µg/m <sup>3</sup>
<b>Date</b>	8/2/2024
<b>Days Above Fed. Std. (150 µg/m<sup>3</sup>)</b>	<b>0</b>
<b>Days Above State Std. (50 µg/m<sup>3</sup>)</b>	<b>10</b>
<b>Annual Average</b>	<b>19.78 µg/m<sup>3</sup></b>

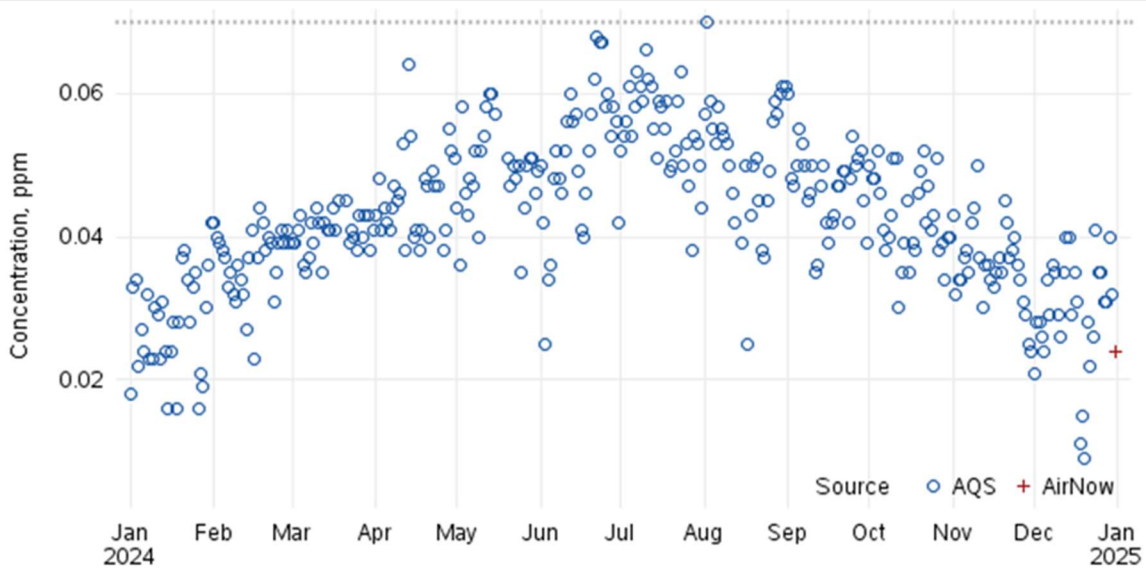
Smoke transported from wildfires and dust generated during harvest season are possible causes of the exceedances of the State PM<sub>10</sub> standard. The highest 24-hour PM<sub>10</sub> average measured coincided with the maximum 24-hour PM<sub>2.5</sub> average during the Park Fire impacts.

<b>2024-2025 Check Before You Light Program Season</b>
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The 2024-2025 Check Before You Light (CBYL) Program was effective November 1, 2024 through February 28, 2025. The CBYL Program requests that the public voluntarily refrain from using woodstoves and fireplaces when an area in Butte County is expected to exceed the federal 24-hr PM<sub>2.5</sub> health standard (35µg/m<sup>3</sup>). These conditions generally occur on cold winter nights with little air movement and strong inversions. The federal standard is also the threshold for the Air Quality Index (AQI) level of 101 which is considered Unhealthy for Sensitive Groups. People with respiratory or heart disease, the elderly and children are the groups most at risk. Advisories are issued for the following day based on air quality and meteorological data measured in Chico, Gridley, and Paradise. When advisories are issued for the Chico area a mandatory no-burn ordinance adopted by the Chico City Council restricts burning in non-EPA certified wood burning devices within the city limits.

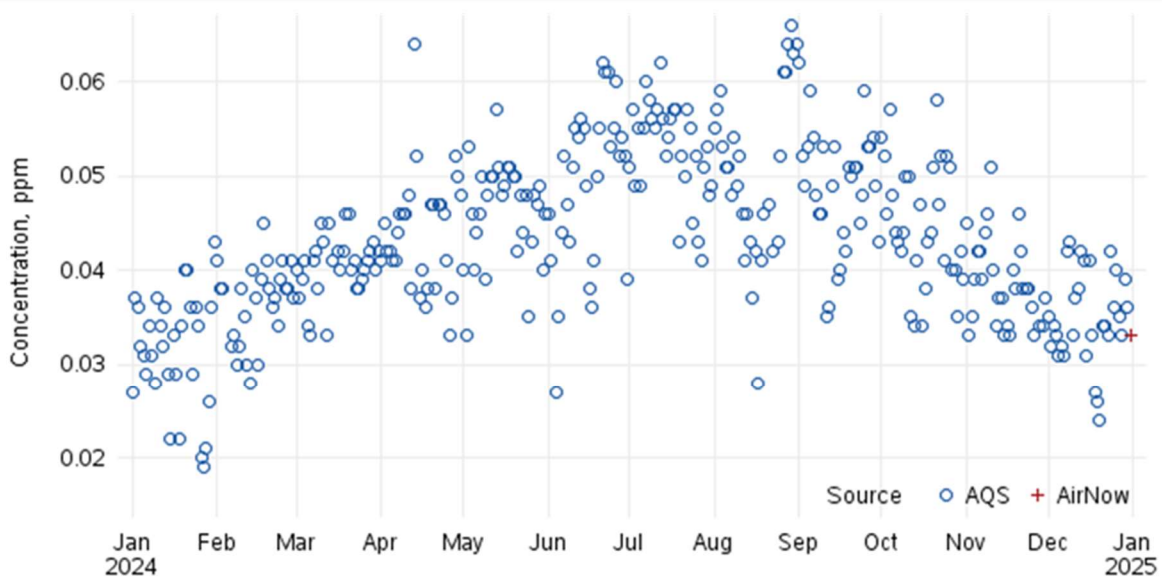
There were no advisories issued for the 2024-2025 CBYL season. There were also no exceedances of the federal 24-hr PM<sub>2.5</sub> standard at the Chico, Paradise, or South Butte County monitoring locations during the 2024-2025 CBYL season. This was the fourth season in a row with these conditions.

Figure 1 - 2024 Air Quality Summary: Daily Max 8-Hour Ozone Concentrations – Chico, CA (East Avenue)



Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>  
Generated: April 11, 2025

Figure 2 - 2024 Air Quality Summary: Daily Max 8-Hour Ozone Concentrations – Paradise, CA (Clark Road)



Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>  
Generated: April 11, 2025

Figure 3 - 2024 Air Quality Summary: 24-hour Average PM2.5 Measurements – Chico, CA (East Avenue)

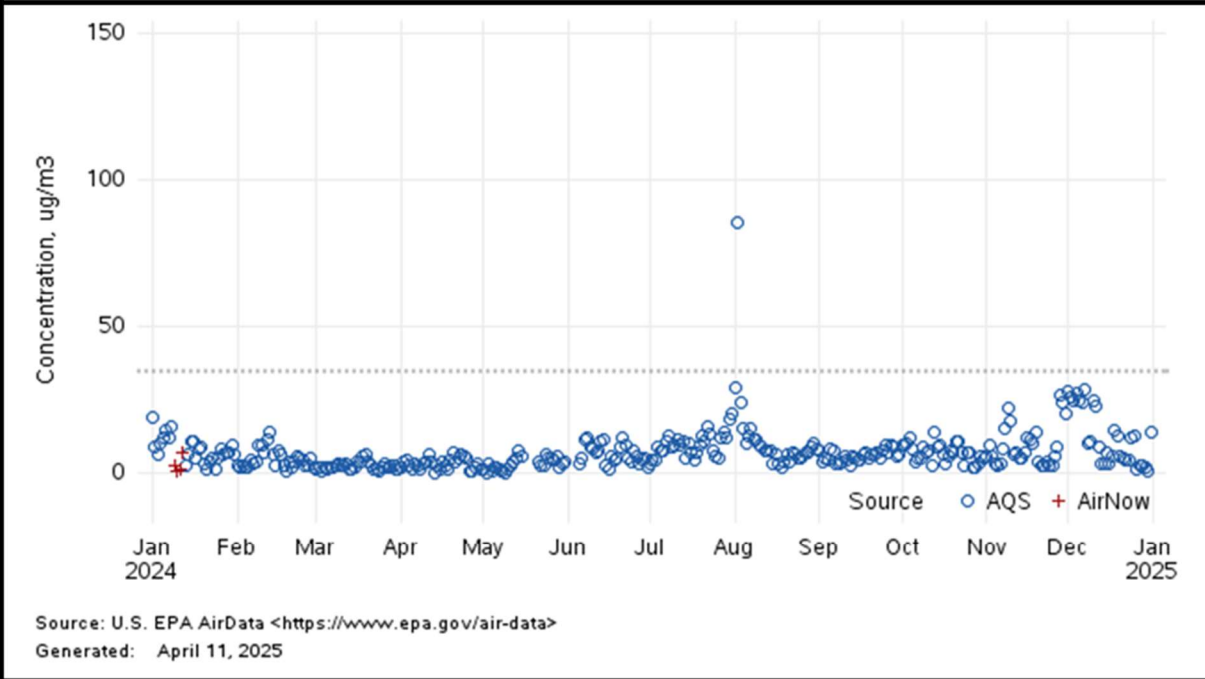


Figure 4 - 2024 Air Quality Summary: 24-hour Average PM2.5 Measurements – Paradise, CA (Clark Road)

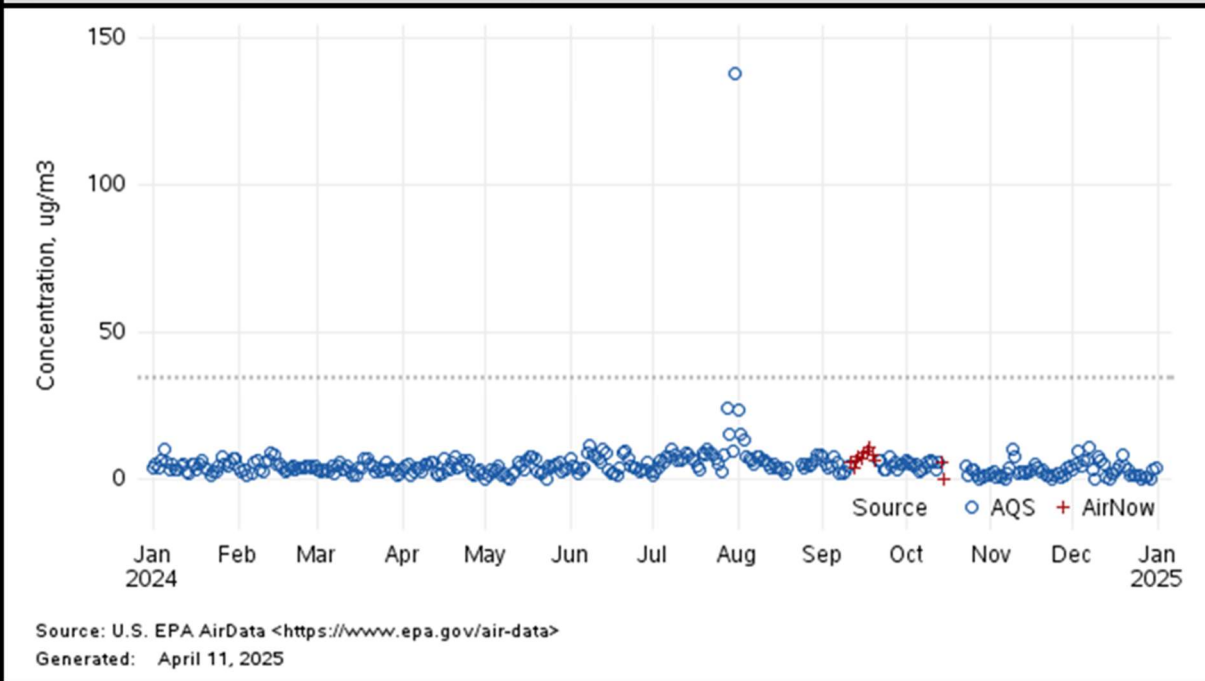


Figure 5 - 2024 Air Quality Summary: 24-hour Average PM2.5 Measurements – South Butte County (Cowee Avenue)

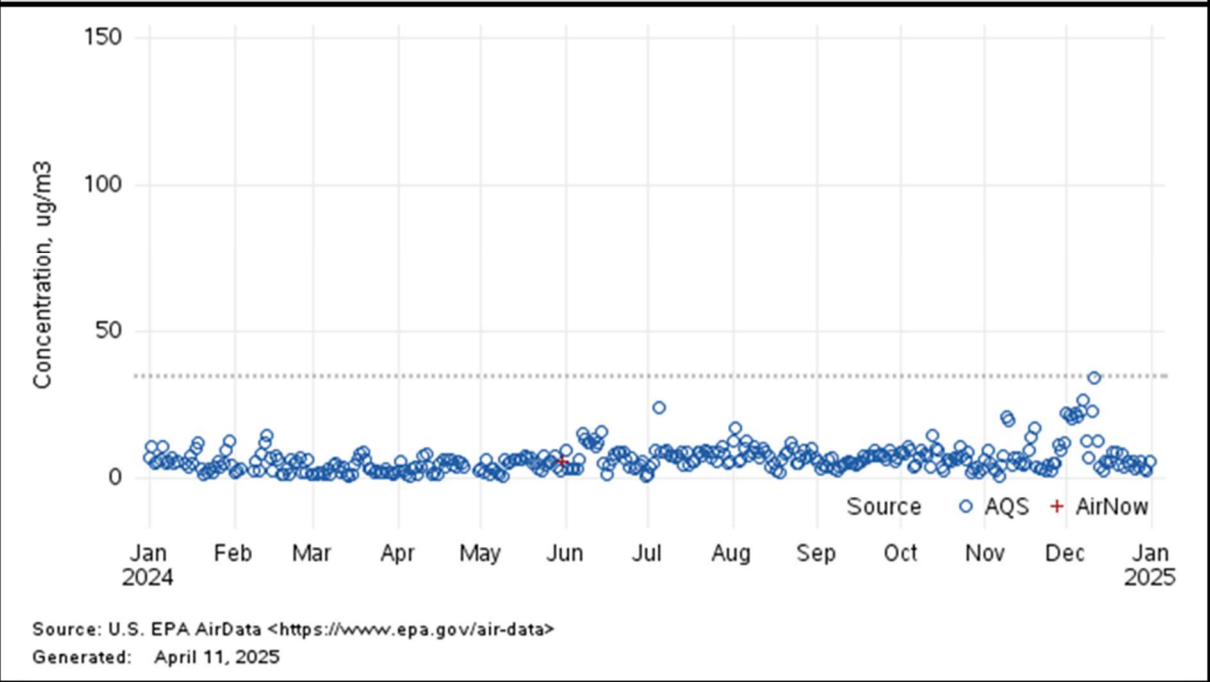


Figure 6 - 2024 Air Quality Summary: 24-hour Average PM10 Measurements – Chico, CA (East Avenue)

