Chico, CA/Butte County
$PM_{2.5}$ Second Maintenance Plan

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The Butte County Air Quality Management District appreciates the assistance and contributions from staff with the California Air Resources Board and the U.S. EPA Region 9 office.

Table of Contents

Tables

Figures

1. Executive Summary

In December 2009 most of Butte County was designated by the United States Environmental Protection Agency (U.S. EPA) as nonattainment for the 2006 24-hour fine particulate matter ($PM_{2.5}$) National Ambient Air Quality Standard (NAAQS). Under state and federal law, the Butte County Air Quality Management District (BCAQMD or District) is the local air quality agency responsible for meeting and maintaining compliance with federal air quality standards. The California Air Resources Board (CARB) is tasked with submitting State Implementation Plans (SIPs) to U.S. EPA that demonstrate how nonattainment areas will attain the NAAQS. U.S. EPA took final action effective October 2013 to determine that the Chico nonattainment area in Butte County, California had attained the 2006 24-hour $PM_{2.5}$ NAAQS.

To be reclassified as an attainment area, the Clean Air Act (CAA) section 175A requires attainment and maintenance of the standard for 20 years, demonstrated in two consecutive 10-year maintenance periods. In December 2017, CARB submitted the "Chico, CA/Butte County $PM_{2.5}$ Nonattainment Area Redesignation Request and Maintenance Plan" to U.S. EPA. U.S. EPA took final action effective August 10, 2018 approving the redesignation request and the first 10-year $PM_{2.5}$ Maintenance Plan for the planning area. CAA Section 175A(b) requires the second maintenance plan to be submitted 8 years after redesignation to attainment. This document, Chico CA/Butte County $PM_{2.5}$ Second Maintenance Plan (Second Maintenance Plan), prepared in accordance with Section 175(A) of the CAA, demonstrates how the Planning Area will continue to maintain the NAAQS throughout the second 10-year Maintenance period.

2. Introduction and Background

a. Area Setting

Butte County, California is located in the northeastern portion of the Sacramento Valley Air Basin (Figure 1). The U.S. EPA has designated a portion of Butte County as the Chico, CA/Butte County (partial) $PM_{2.5}$ Planning Area (Planning Area). The $PM_{2.5}$ monitoring site is located in the Planning Area at the eastern edge of the valley floor, on East Avenue in Chico, California, and is assigned an Air Quality System (AQS) number 060070008.

The U.S. EPA defines the Planning Area (Figure *2*) as that portion of Butte County which lies west of the line described as follows: (Mount Diablo Base and Meridian) Beginning at the intersection of the Butte-Yuba county line and the township line common to T18N R6E and T19N R6E, west to the township line common to T18N R6E and T19N R6E, then north along the range line common to R5E and R6E, then west along the township line common to T21N and T20N, then north along the range line common to R4E and R5E, then west along the township line common to T24N and T23N to the Butte-Tehama County boundary.

The Sacramento Valley is bound on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. These mountain ranges reach heights in excess of 6000 feet above mean sea level (MSL), with individual peaks rising higher. This provides a substantial physical barrier to both locally created pollution and the pollution that has been transported northward on prevailing winds from the metropolitan areas to the south. Although a significant portion of the Planning Area is at elevations higher than 1,000 feet above MSL, the vast majority of its populace lives and works below that elevation. The valley is often subjected to inversion layers that, coupled with geographic barriers, create a high potential for poor air quality conditions.

Figure 1. Sacramento Valley Air Basin

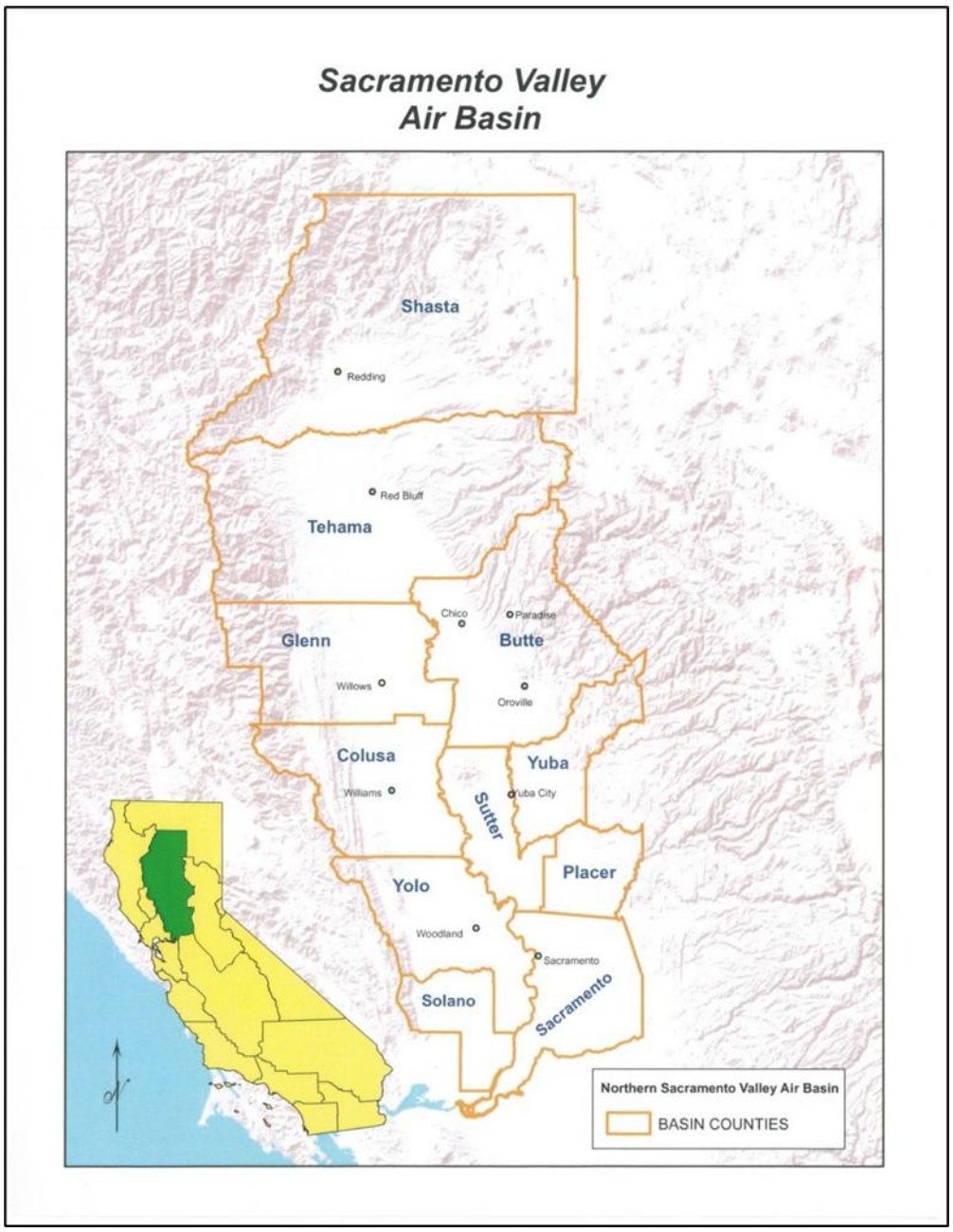
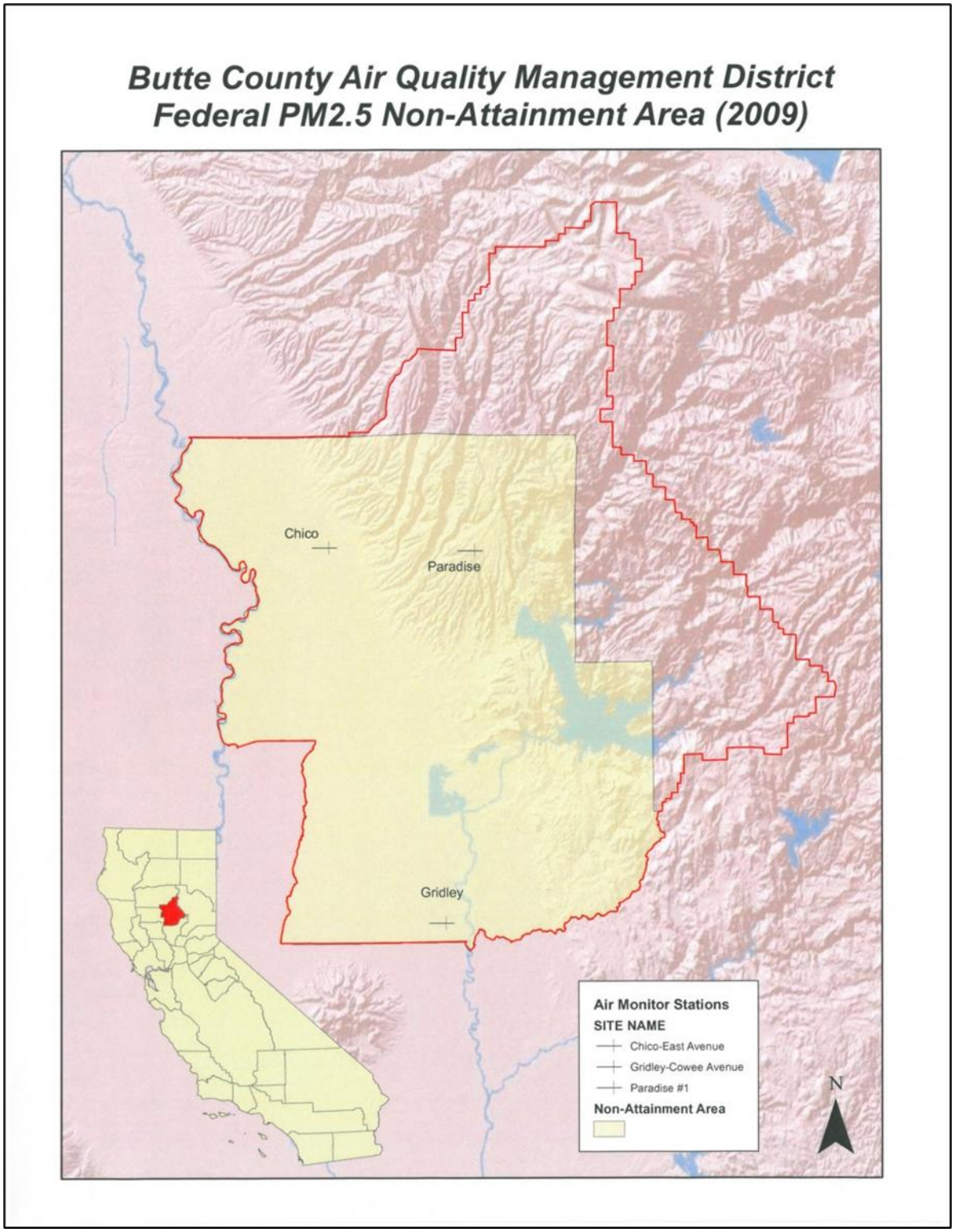


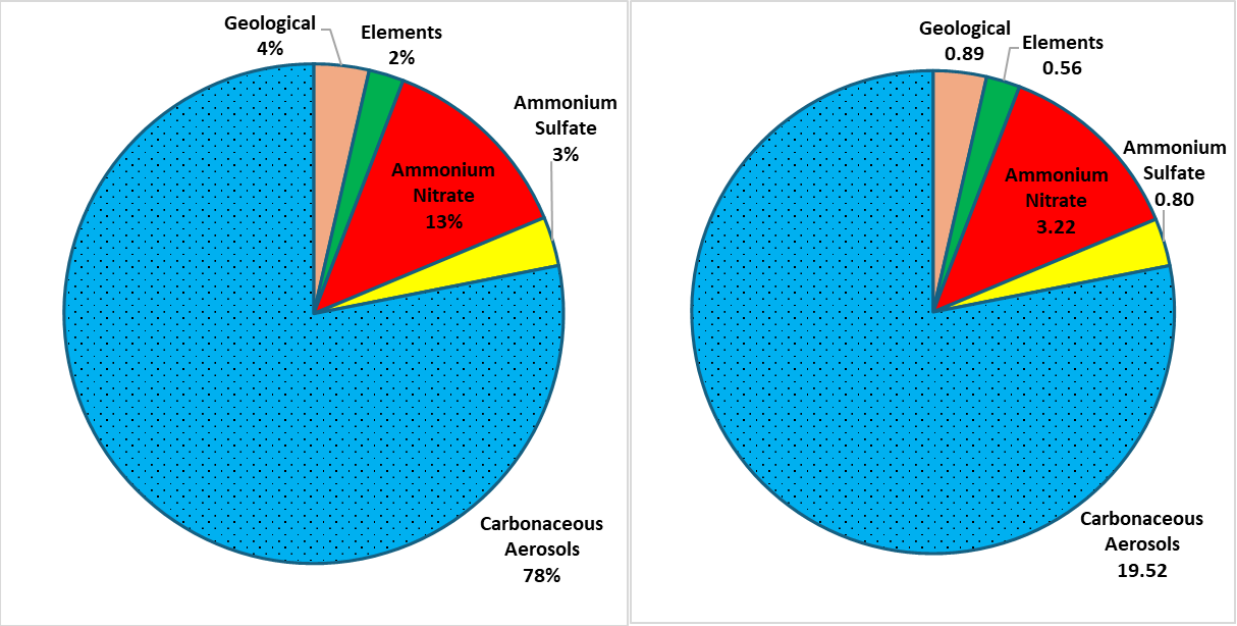
Figure 2. Planning Area



In Butte County, elevated $PM_{2.5}$ levels occur primarily during the winter months due to a combination of meteorological conditions, terrain, and seasonal emission patterns. Wintertime

weather patterns, such as temperature inversions, light winds, and shallow mixing heights, trap pollutants close to the ground, limiting dispersion. At the same time, emissions from residential wood heating increase substantially during cold weather, adding large amounts of fine particulate matter to the air. As a result, most exceedances of the $PM_{2.5}$ standard occur during the winter. Carbonaceous aerosols, which include organic matter and elemental carbon, overwhelmingly drive $PM_{2.5}$ on high pollution days, making up almost 80% of the total $PM_{2.5}$. They are driven by emissions from combustion sources such as residential wood burning, vehicle emissions, and other incomplete combustion processes. Agricultural and residential open burning are also contributing factors All other components are comparatively small contributors, with the next highest component, nitrate, contributing about 10% of the mass (Figure *3*). While the sources of ammonium nitrate are regional, sources of carbonaceous aerosols are more localized.

Figure 3. 2022-2024 $PM_{2.5}$ Mass and Percent Contribution on 10% of Days with Highest $PM_{2.5}$ Concentrations.



Butte County currently has three (3) monitoring sites operated by the California Air Resources Board that measure $PM_{2.5}$, located in Chico, Gridley, and Paradise. However, only the Chico site has a federal equivalent method monitor (FEM) that can be used for attainment demonstration purposes. The Chico site collected federal reference method (FRM) data from 1998 to 2019 until the FRM monitor was replaced with an FEM monitor on July 1, 2019. The Chico site also has a $PM_{2.5}$ speciation monitor that identifies the chemical composition of the $PM_{2.5}$. The $PM_{2.5}$ speciation monitor was considered for relocation in the 2025 Annual Monitoring Network Plan however it is still currently in operation at the Chico site.

b. Regulatory History

Pursuant to the CAA, the U.S. EPA sets primary air quality standards to protect public health, including protection of sensitive populations such as asthmatics, children, and the elderly, and

secondary standards to protect public welfare, including the protection against decreased visibility and damage to crops, animals, vegetation, and buildings. Achieving the federal standards protects public health, reduces the region's health care costs, and improves the quality of life for residents. This section describes U.S. EPA's process for setting health-based standards and designating areas based on those standards, the history of the $PM_{2.5}$ standard and the area designations, and the CAA requirements for areas based on those designations.

National Ambient Air Quality Standards

The Clean Air Act was adopted in 1970. The legislation authorized the development of comprehensive federal and state regulations to limit emissions from stationary and mobile sources. The CAA was amended in 1977 and again in 1990. The CAA and amendments require the U.S. EPA adopt National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. U.S. EPA formally designates areas as "nonattainment" (not meeting the standard), "unclassifiable/attainment" (meeting the standard or expected to be meeting the standard despite a lack of monitoring data), or "unclassifiable" (insufficient data to classify).

Once nonattainment designations take effect, state and local governments develop implementation plans outlining how areas will attain and maintain the standards by reducing air pollutant emissions contributing to fine particle concentrations. The CAA requires U.S. EPA to conduct a periodic review of the standards and the science upon which the standards are based.

Overview of Particulate Matter NAAQS

Particulate matter is one of the six criteria pollutants. U.S. EPA first issued standards for particulate matter in 1971 and subsequently revised the standards in 1987, 1997, 2006, and 2012. The 2006 revision addressed two categories of particle pollution: *fine particles* ($PM_{2.5}$), which have an aerodynamic diameter of 2.5 micrometers or smaller, and *inhalable coarse particles* (PM_{10}) which have a nominal aerodynamic diameter of less than 10 micrometers.

The U.S. EPA established the separate annual and 24--hour standards for $PM_{2.5}$ in 1997 (62 FR 38652). The annual standard was set at 15.0 micrograms per cubic meter ($\mu g/m^3$). The 24-hour standard was set at 65 $\mu g/m^3$, based on a 3-year average of the 98^{th} percentile of 24-hour $PM_{2.5}$ concentrations.

In 2006, U.S. EPA lowered the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and retained the annual $PM_{2.5}$ standard at 15.0 $\mu g/m^3$. The revised $PM_{2.5}$ standards were published on October 17, 2006 (71 FR 61144) and became effective on December 18, 2006.

In 2012, U.S. EPA lowered the annual $PM_{2.5}$ standard from 15.0 $\mu g/m^3$ to 12.0 $\mu g/m^3$ and retained the 24-hour $PM_{2.5}$ standard at 35 $\mu g/m^3$. The revised $PM_{2.5}$ standards were published on January 15, 2013 (78 FR 3085) and became effective on March 18, 2013.

In 2024, U.S. EPA lowered the annual $PM_{2.5}$ standard from 12.0 $\mu g/m^3$ to 9.0 $\mu g/m^3$ and retained the 24-hour $PM_{2.5}$ standard at 35 $\mu g/m^3$. The revised $PM_{2.5}$ standards were published on March 6, 2024 (89 FR 16202) and became effective on May 6, 2024.

Designations
On November 13, 2009 (74 FR 58688), U.S. EPA promulgated air quality designations for all areas in the U.S. for the 2006 $PM_{2.5}$ NAAQS, effective December 14, 2009. Based on 2005-2007 monitoring data, the Planning Area was designated nonattainment for the 24-hour $PM_{2.5}$ NAAQS .

U.S. EPA issued a final determination effective October 10, 2013 finding that the Planning Area had attained the 2006 24-hour $PM_{2.5}$ National Ambient Air Quality Standard (78 FR 55225). This determination was based upon complete, quality-assured, and certified ambient air monitoring data showing that this area has monitored attainment of the 2006 24-hour $PM_{2.5}$ NAAQS based on the 2010–2012 monitoring period. Further, U.S. EPA took final action effective June 9, 2017 that the Planning Area met the 2006 24-hour $PM_{2.5}$ standard as required by December 31, 2015 (82 FR 21711). To qualify for redesignation, an area must demonstrate attainment and continued maintenance of the standard for a 20-year period, supported by two consecutive 10-year maintenance plans. U.S. EPA approved the Planning Area's Redesignation Request and first 10-year maintenance plan as a SIP revision effective August 10, 2018 (83 FR 32064). The second maintenance plan is due on August 10, 2026, eight years after approval of the first plan.

To meet Clean Air Act requirements, the District, with the support from CARB, has prepared the Second Maintenance Plan to demonstrate continued attainment and maintenance of the 35 $\mu g/m^3$ 24-hour $PM_{2.5}$ NAAQS through the second 10-year maintenance period through ending in 2038.

3. Evaluation of the First Maintenance Period

The Planning Area continued to meet the NAAQS through the first 10-year maintenance period when not impacted by smoke from wildfires. Three months after U.S. EPA's approval of the first 10-year maintenance plan, Butte County was impacted by the Camp Fire - the deadliest and most destructive wildfire in California history. Prior to the Camp Fire in 2018 the Planning Area was also impacted by smoke from the Mendocino Complex Fire. The year 2020 brought smoke impacts from the August Complex Fire, currently the largest wildfire complex in California history, as well as the destructive North Complex fire. The Dixie Fire in 2021 started in Butte County and spread into neighboring counties, becoming the largest single wildfire in California history. 2024's Park Fire brought more destruction to Butte County communities however wind conditions limited the smoke impacts within the Planning Area.

Figure 4 and Table 1 show the resulting impacts to the Planning Area's design value. Per the contingency plan in the first 10-year Maintenance Plan, the District evaluated exceedances of the NAAQS and determined that each exceedance of the standard was due to wildfire smoke impacts. When days flagged for wildfire smoke impacts were removed, the modified design value remained below the standard for each year evaluated. The individual days exceeding the 24-hr $PM_{2.5}$ standard due to wildfire smoke impacts between 2018 and 2022 are included in **Attachment A**.

Figure 4. $PM_{2.5}$ 24-hr 98th Percentiles & Design Value Trends

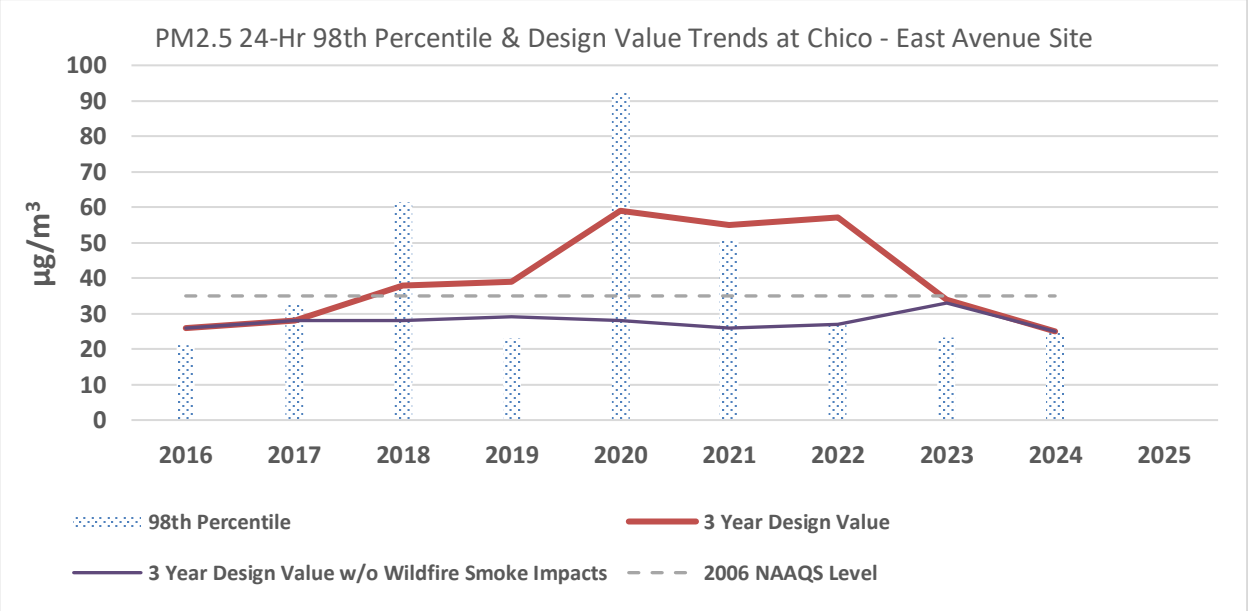


Table 1. 98th Percentiles and 24-hr Design Values with and without Wildfire Smoke Impacts (WSI)

Year	98th Percentile (µg/m³)		DV (µg/m³)	
	All Data	No WSI	All Data	No WSI
2015	29.5	29.5	29	29
2016	21.2	21.2	26	26
2017	32.6	32.6	28	28
2018	61.4	29.0	38	28
2019	23.0	23.0	39	28
2020	92.3	27.6	59	27
2021	50.6	26.1	55	26
2022	27.3	26.5	57	27
2023	23.3	23.3	34	25
2024	24.9	24.9	25	25

The District prepared Exceptional Event Initial Notification submittals for the 2016-2018, 2018-2020, 2019-2021, and 2020-2022 24-hr $PM_{2.5}$ design values which CARB transmitted to U.S. EPA. For each submittal, U.S. EPA determined that data from these wildfire smoke events did not have regulatory significance under the Exceptional Events Rule and therefore placed the submittals on hold. Table *2* provides a summary of the District's actions when the contingency plan was triggered during the fires 10-year period (i.e., when the 24-hour $PM_{2.5}$ design value exceeded the standard). Although the District had 60 days from the date of data certification

(May 1) to evaluate exceedances, these reviews were completed each April using preliminary data.

Table 2. Summary of Actions Taken When Contingency Plan Triggered

Date(s)	Actions
12/13/2018 & 4/25/2019	Reports to District Governing Board identifying days in 2018 exceeding the 24-hr $PM_{2.5}$ standard due to wildfire smoke impacts from the Carr, Mendocino Complex, and Camp Fires.
10/19/2019	CARB submittal of Exceptional Event Initial Notification Information Forms for the 2016-2018 design value to U.S. EPA.
2/27/2020	District Governing Board reaffirms through Resolution 2020-03 that the 2016-2018 design value exceeded the standard due to wildfire smoke impacts and that additional measures were not necessary to ensure attainment.
09/24/2020 & 3/25/2021	Reports to District Governing Board identifying days in 2020 exceeding the 24-hr $PM_{2.5}$ standard due to wildfire smoke impacts from the August Complex and North Complex Fires.
3/24/2021	CARB submittal of Exceptional Event Initial Notification Information Forms for the 2018-2020 design value to U.S. EPA.
3/25/2021	District Governing Board reaffirms through Resolution 2021-09 that the 2018-2020 design value exceeded the standard due to wildfire smoke impacts and that additional measures were not necessary to ensure attainment.
9/23/2021 & 3/24/2022	Reports to District Governing Board identifying days in 2021 exceeding the 24-hr $PM_{2.5}$ standard due to wildfire smoke impacts from the Dixie, Monument, and Caldor Fires.
3/24/2022	District Governing Board reaffirms through Resolution 2022-09 that the 2019-2021 design value exceeded the standard due to wildfire smoke impacts and that additional measures were not necessary to ensure attainment.
6/17/2022	CARB submittal of Exceptional Event Initial Notification Information Forms for the 2019-2021 design value to U.S. EPA.
10/27/2022 & 3/23/2023	Reports to District Governing Board identifying days in 2022 exceeding the 24-hr $PM_{2.5}$ standard due to wildfire smoke impacts from Mosquito Fire.
8/23/2023	CARB submittal of Exceptional Event Initial Notification Information Forms for the 2020-2022 design value to U.S. EPA.

In April 2022, U.S. EPA identified the Planning Area as being subject to the mitigation plan requirements of the Exceptional Events Rule. The District developed the Mitigation Plan to Reduce the Impacts of Wildfire Smoke in Butte County, California in December 2023. U.S. EPA determined that the mitigation plan was complete in February 2024.

As shown in Figure 4 above and Table 3 below, $PM_{2.5}$ concentrations in 2020 and 2021 were substantially affected by wildfire smoke, resulting in anomalously high 98th percentile concentrations and correspondingly elevated 24-hour design values. Due to these wildfire driven impacts, 2020, 2021, and 2022 design value periods are not appropriate for modeling applications. Accordingly, 2023 is designated as the Base Year for the emissions inventory and serves as the foundation for the modeling platform for this Second Maintenance Plan. Because 2023 is the central year of the three-year period used to calculate the 2024 $PM_{2.5}$ design value, 2024 is selected as the Reference Year for projecting future design values. The monitoring data

for 2022 through 2024 are complete, with the lowest quarterly data capture at 88%, well above the minimum 75% requirement for design value calculations.

Table 3. Summary of 98th Percentiles & Design Value (micrograms per cubic meter)

98th Percentile (µg/m³)					**24-hr Design Value (µg/m³)**				
2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
92.3*	50.6*	27.3	23.3	24.9	59*	55*	57*	34	25

*Data impacted by wildfires

Although there were significant wildfire smoke impacts during first 10-year maintenance period, air quality trends over the past three years demonstrate that the Planning Area is maintaining the standard going into the second 10-year maintenance period.

4. Second 10-Year $PM_{2.5}$ Maintenance Plan

a. Attainment Inventory

CARB, with supporting data reported by BCAQMD, maintains sufficient emissions inventories to identify the level of emissions in the Planning Area needed to maintain attainment with the NAAQS. For the Second Maintenance Plan, an emissions inventory (**Attachment B)** was developed for the 2023 base year, with forecasts extending through the 2038 horizon year (Attachment B). The most recent triennial National Emissions Inventory (NEI) year, 2023, was selected as the base year because it aligns with the middle year of the 2024 attainment-year design value period. Two interim milestone years, 2028 and 2035, were included to help track progress toward maintaining the standard. Because past $PM_{2.5}$ exceedances(excluding wildfire smoke impacted days) occurred primarily during the winter months, the emissions forecasts focused on wintertime emissions. This approach remains consistent with the first 10-year Maintenance Plan. The maintenance demonstration includes emissions from mobile (on- and off-road) sources, stationary point sources, stationary aggregated sources, areawide sources, and natural sources. It covers direct $PM_{2.5}$ emissions (filterable and condensable) and $PM_{2.5}$ precursors including oxides of nitrogen (NOx), sulfur oxides (SOx), volatile organic compounds (VOC), and ammonia (NH3). **Attachment C** provides a detailed discussion of emissions inventory source categories and methodologies used..

Primary PM emissions include both filterable and condensable components. The $PM_{2.5}$ NAAQS final implementation rule [1] requires SIP emissions inventories to report filterable $PM_{2.5}$, condensable $PM_{2.5}$, and total primary $PM_{2.5}$ separately. The distinction between condensable and filterable particulate matter is further summarized in **Attachment D** While mobile sources emit both filterable and condensable PM, the Air Emissions Reporting Requirements (AERR) do not require states to report these components separately for mobile categories. Therefore, the condensable and filterable $PM_{2.5}$ emissions presented in Attachment D reflect only stationary point and area source categories that generate condensable emissions.

[1] 40 CFR 51.1008(a)(1)(iv)

BCAQMD issues Emission Reduction Credits (ERCs) for emission reductions achieved through equipment shutdown or voluntary control. These ERCs may then be used as offsets to compensate for an increase in emissions from a new or modified major source regulated by BCAQMD. To conservatively account for the possibility that banked ERCs may be used during the maintenance period, the balance of the ERC bank was added to the horizon year emission forecasts. Additionally, the current BCAQMD ERC bank contains credits for PM_{10} but not for $PM_{2.5}$. As a conservative approach, the bank of PM_{10} credits was added to the $PM_{2.5}$ emissions forecast even though $PM_{2.5}$ is only a fraction of PM_{10}.

Figure 5 presents total emissions (tons per day), including the ERC bank, for five pollutant groups, $PM_{2.5}$, NOx, SOx, ROG, and ammonia, in the base year, the 2028 and 2035 milestone years, and the 2038 horizon year. The chart illustrates how each pollutant category is expected to change over time and provides a comprehensive view of overall emissions trends across the maintenance period. Figure 6 highlights the projected rate of change for these pollutants, excluding the ERC bank. Among the major pollutants, NOx shows the most substantial decline, decreasing by roughly 33% over the analysis period. The remaining pollutants exhibit more moderate reductions, ranging from about 3% to 13%, reflecting slower but steady progress toward lower emission levels.

Figure 5. Total Emissions (Including ERC Bank) Over Maintenance Period

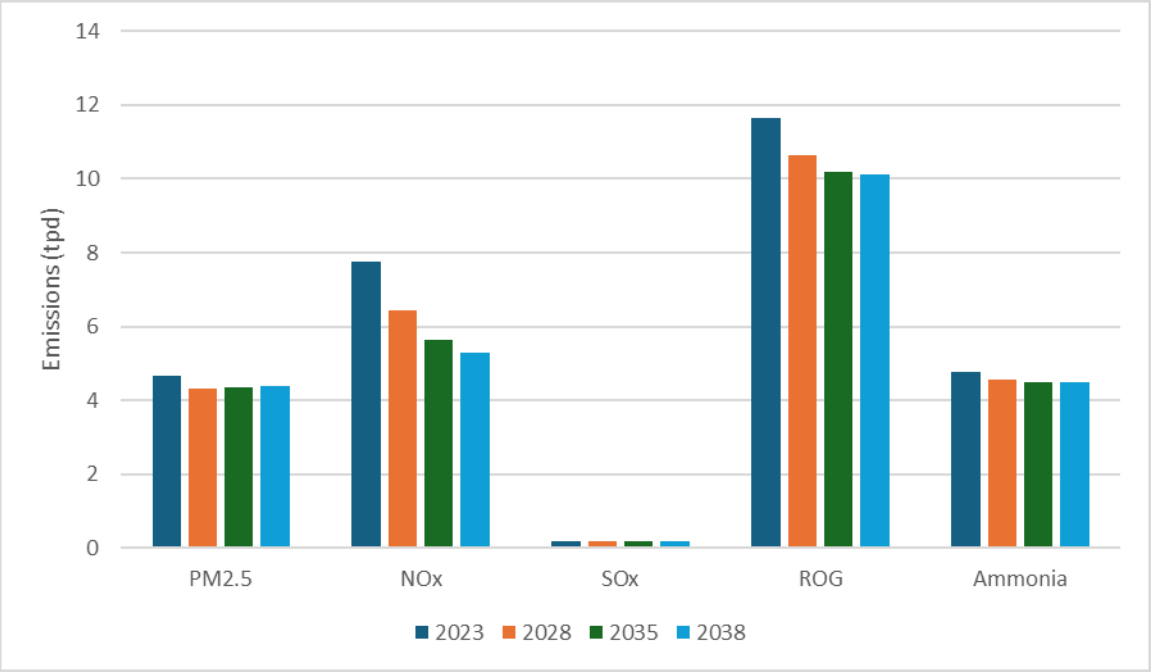
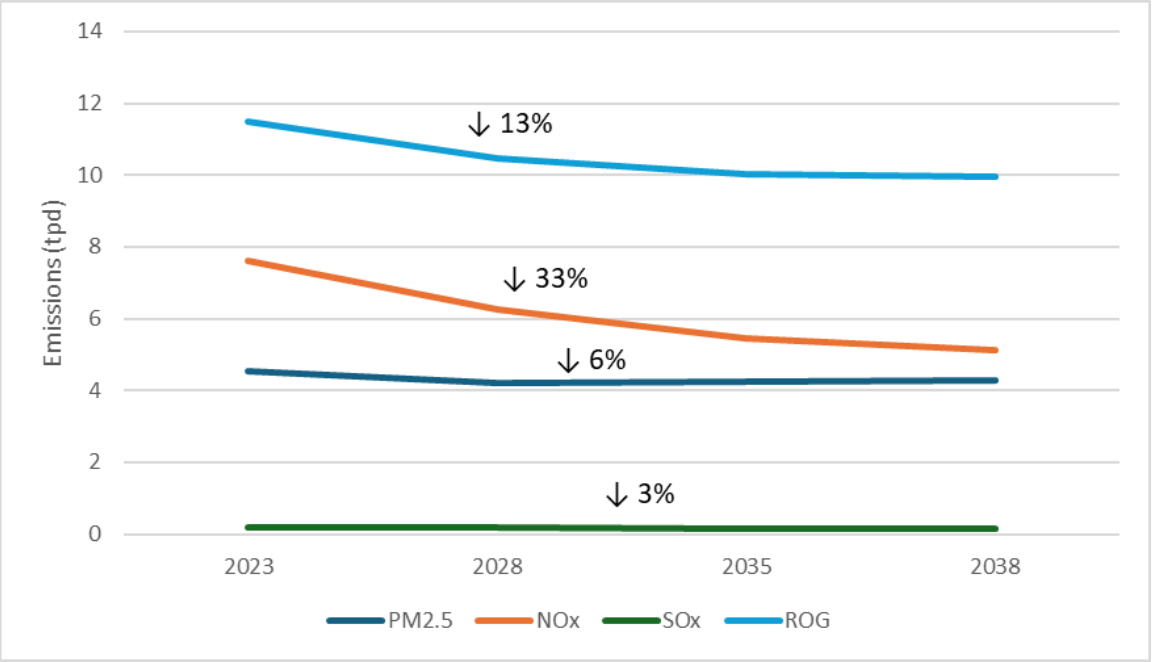


Figure 6. Trends in Projected Emissions Over the Maintenance Period



b. Maintenance Demonstration

Section 175A(a) of the Clean Air Act requires states to demonstrate that an area will maintain the NAAQS for at least 10 years after redesignation. States may show continued maintenance either by demonstrating that future emissions of the pollutant and its precursors will not exceed attainment-year levels or by using air quality modeling to show that future source configurations and emission rates will not result in a violation of the NAAQS.

For this Plan, a rollback model was selected as the primary tool to demonstrate continued attainment of the 2006 24-hour $PM_{2.5}$ standard through 2038 for the Planning Area. This chapter presents projected future $PM_{2.5}$ concentrations and demonstrates that the area will continue to maintain the 2006 24-hour standard through the 2038 horizon year.

The purpose of the maintenance demonstration is to demonstrate that the Planning Area is projected to remain in attainment with the NAAQS throughout the entire 10-year second maintenance period. CARB, with emissions inventory information provided by BCAQMD, developed an inventory for the base year of 2023 and forecast emissions through the horizon year of 2038. Because the finding was made that $PM_{2.5}$ exceedances in the Planning Area primarily occurred during the winter months, wintertime emissions were considered in the emission forecasts. The maintenance demonstration includes emissions of direct $PM_{2.5}$ and the precursors SOx and NOx. Only anthropogenic emissions are included in the rollback model. Emissions from natural sources are excluded from the maintenance demonstration.

The Woodstove Change-out Program also provides a small emission benefit for the base future years on directly emitted $PM_{2.5}$ (**Attachment E)**. These emission benefits were deducted from the emission inventory for the rollback model calculation.

The method chosen to demonstrate maintenance of the $PM_{2.5}$ 24-hr NAAQS is a rollback proportional model. The rollback model assumes that there is a direct correlation between emissions of a pollutant and measured concentrations of that pollutant in the same air shed, and that changes in emissions will result in corresponding changes in concentrations. This correlation is then used to predict future concentrations based on future emissions.

The rollback model has two main parts: concentrations and emissions. Ambient monitoring data from speciation samplers located at the Chico monitoring site were used to assess the chemical composition of $PM_{2.5}$. Two samplers and multiple filter media are used to determine chemical speciation profiles. A Speciation Air Sampling System (SASS) sampler is used to collect $PM_{2.5}$ constituents including ions (sulfate, nitrate, sodium, potassium, and ammonium, etc.) and numerous trace elements. A University Research Glassware 3000N (URG) sampler is used for collecting elemental and organic carbon data. Both speciation samplers (SASS and URG) operate on a 1-in-6 day sampling schedule. $PM_{2.5}$ gravimetric mass and elements are measured by X-ray fluorescence (XRF) on Teflon-membrane filters. Ions were measured by ion chromatography on nylon-membrane filters. Organic and Elemental Carbon (OC and EC respectively) were measured by a Thermal Optical Analyzer on quartz-fiber filters. The data were analyzed by CARB's Monitoring and Laboratory Division and reported to U.S. EPA's Air Quality Systems (AQS) database. Currently applied measurement technology does not quantify all measured components, so the sum of the measured species was always less than the full measured mass. PM mass reconstruction applied multipliers to measured species to estimate unmeasured components.

To reconstruct $PM_{2.5}$ mass concentrations using chemical composition data, assumptions about the molecular form of the species must be made. Table 1 presents assumptions used in this report. Sulfate and nitrate are assumed to be neutralized to ammonium sulfate [$(NH4)_2SO_4$] and ammonium nitrate (NH_4NO_3) with the NH_4+ fraction accounted for by applying stoichiometric multipliers as specified in Table 1. Geological material is estimated following the formula utilized by the IMPROVE Program. Elements are estimated by summing the remaining elements by XRF, excluding sulfur and geological elements. Carbonaceous aerosols are back-calculated from $PM_{2.5}$ mass as the concentration that would result in reconstructed mass being exactly equal to gravimetric $PM_{2.5}$ mass. Estimates of carbonaceous aerosols are validated by comparing to the sum of the measured elemental carbon (EC) and organic matter, which was estimated as organic carbon times 1.4.

Table 4: Form of $PM_{2.5}$ Chemical Species Assumed in this Report

Component	Formula
Ammonium Nitrate	1.29 x Nitrate
Ammonium Sulfate	1.38 x Sulfate
Geological/Dust	2.2 x Aluminum + 2.49 x Silicon + 1.63 x Calcium + 2.42 x Iron +1.94 x Titanium
Elements	Sum of remaining elemental species (excluding S, Al, Si, Ca, Fe, and Ti)
Carbonaceous Aerosol	Measured $PM_{2.5}$ Mass - (Ammonium Nitrate + Ammonium Sulfate + Geological + Elements)

$PM_{2.5}$ concentrations used in the rollback model represent average concentrations on the top 10% of days between 2022 and 2024 (Table 5 and Table 10). To remain consistent with the winter emission inventory used in this maintenance plan to project future year design values, only winter days (November to April) were selected. Occasional high $PM_{2.5}$ days during the summer season, which were likely caused by wildfire events, were excluded from the rollback analysis.

Typically, about 60 daily speciation samples are scheduled each year at the Chico monitoring station. For both 2022 and 2024, 58 daily samples were available, and the six samples with the highest $PM_{2.5}$ mass were selected and averaged to represent a typical annual high-day composition for the respective year. Since only 25 samples were collected in 2023, three highest samples were selected to represent this year.

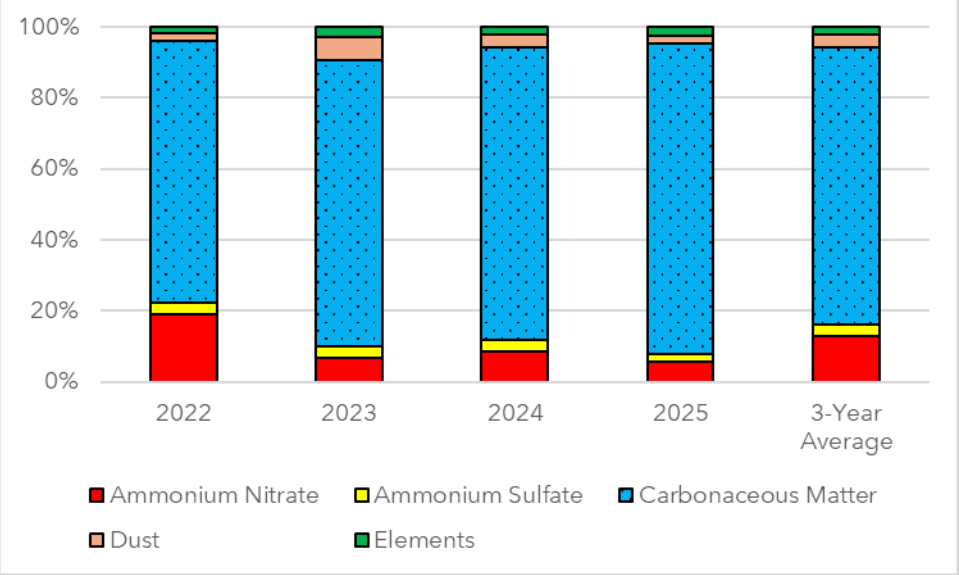
2025 speciation data from the Chico station were also included to assist the rollback model. The annual average concentrations of all the speciation data mentioned above are presented in Table 5. Details of each day can be found in the supporting information at the end of this write-up. (Table 10).

Table 5: Annual and Three-year Average of Highest 10% Days in 2022-2025 (µg/m³)

Year	Ammonium Nitrate	Ammonium Sulfate	Carbonaceous Matter	Dust	Elements	$PM_{2.5}$
2022	4.17	0.72	16.05	0.47	0.44	21.85
2023	0.78	0.35	9.22	0.74	0.33	11.43
2024	1.34	0.49	12.79	0.53	0.37	15.52
2025	1.06	0.43	16.63	0.41	0.47	19.00
3-Year Average (2022-2024)	2.10	0.52	12.69	0.58	0.38	16.27
3-Year Average Scaled to 2024 Design Value	**3.22**	**0.80**	**19.50**	**0.89**	**0.58**	**25**

The highest 10% days from 2023 appear to have significantly lower concentrations than other listed years, mainly from the lower levels of carbonaceous matter. However, from the perspective of percentage contribution to the total $PM_{2.5}$, 2023-2025 were all very similar, while 2022 was the outlier with much higher ammonium nitrate contribution (
Figure 7). Given that all the speciation data will be scaled to the 2024 $PM_{2.5}$ 24-hour design value (25 µg/m³), it is thus determined that the impact of limited data from 2023 is insignificant to this model.

Figure 7: $PM_{2.5}$ Speciation Percentage Contribution to Annual Highest 10% Days in 2022-2025



The rollback model assumes that atmospheric pollutant concentrations in excess of background represent $PM_{2.5}$ mass subject to controls (mass available for rolling) and are proportional to emissions. The mass available for rolling is estimated by subtracting background concentration from the mass assigned to each source. For example, the mass of ammonium nitrate available

for rolling is calculated by subtracting the background concentrations of ammonium nitrate. Background concentrations are concentrations that would occur in the airshed in the absence of local anthropogenic emissions and represent local natural emissions and transported pollutants.

To determine the background $PM_{2.5}$ concentrations, two locations in the IMPROVE network were examined: Lassen National Park (AQS ID: 060893003) and Bliss State Park (AQS ID: 060179000), which is on the western side of Lake Tahoe. Although Lassen National Park is the preferred location due to its proximity to Chico, speciation data were unavailable there in early January of 2022, which included several of the highest $PM_{2.5}$ days at Chico. In addition, data from Lassen National Park in November 2023 showed signs of wildfire influence, making those observations unsuitable for background estimate. Data from Bliss State Park were mostly free of these issues. Thus, speciation data from Bliss State Park were selected for estimating background concentrations.

The 24-hour background concentrations were calculated by averaging $PM_{2.5}$ speciation data collected at the Bliss State Park site on the days corresponding to the highest 10% $PM_{2.5}$ concentrations at Chico. In 2022 and 2024, three of the identified high $PM_{2.5}$ days at Chico did not have matching sampling days at Bliss. Because the effect on the overall average was minimal, no replacement days were selected for those years. However, in 2023, none of the top 3% high-$PM_{2.5}$ days at Chico had corresponding data from Bliss. To ensure representativeness for that year, the closest subsequent sampling days were used as replacement. The resulting annual and three-year average 24-hour background concentrations are listed in Table 6. Details of each day can be found in the supporting information at the end of this section. (Table 11) The background concentrations were very low compared to Chico levels and were very consistent across three years.

Table 6: Speciated Concentrations for Annual and Three-year average Background Concentrations in 2022-2024 from Bliss State Park (μg/m³)

Year	Ammonium Nitrate	Ammonium Sulfate	Carbonaceous Matter	Dust	Elements	$PM_{2.5}$
2022	0.03	0.14	0.66	0.05	0.01	0.90
2023	0.06	0.19	0.36	0.27	0.03	0.90
2024	0.03	0.13	0.71	0.08	0.02	0.98
3-Year Average	0.04	0.15	0.58	0.14	0.02	0.93

On the emission side, directly emitted $PM_{2.5}$ dust ($PM_{2.5}$ Dust) was separated from all other sources of directly emitted $PM_{2.5}$ ($PM_{2.5}$ Non-Dust), so that changes in dust emissions could be projected on concentrations of fugitive dust and changes in emissions from all other sources of directly emitted $PM_{2.5}$ could be projected on concentrations of carbonaceous aerosols and elements. The emission categories that were counted as $PM_{2.5}$ Dust include Farming

Operations, Construction and Demolition, Paved Road Dust, Unpaved Road Dust, and Fugitive Windblown Dust.

The first step in calculating the maintenance year $PM_{2.5}$ design values was to estimate the anticipated increase or decrease in emissions from each source between 2023 (the base year) and 2038 (the maintenance year). The same percentage of increase or decrease in emissions from each source was then applied to the $PM_{2.5}$ mass available for rolling. The future year contributions of each component were calculated by applying the percent change to the mass available for rolling and then adding background concentrations back, as shown in the equation below:

$$\begin{aligned} &Future\ Year\ Concentration \\ &\quad = Concentration\ Available\ for\ Rolling \times (1 + Percent\ Change\ from\ Base\ Year) \\ &\quad + Background\ Concentration \end{aligned}$$

The maintenance year design value was determined by summing maintenance year contributions for all the components, as illustrated in
Table 8. As is demonstrated, through the significant decrease in NOx and non-dust $PM_{2.5}$ emissions, the 2038 $PM_{2.5}$ 24-hour design value in Chico is projected to be 23 µg/m³, which is 2 µg/m³ lower than the 2024 level.

To further solidify the maintenance demonstration, an alternative rollback approach is presented in Table *9*. This approach uses the same assumptions and initial year conditions as the default rollback model presented in Table 8, with the exception of the treatment of secondary PM precursors (NOx and SOx). Because the response of ammonium nitrate and ammonium sulfate concentrations to changes in precursor emissions is uncertain, a proportional rollback may not accurately reflect future changes in these secondary PM components. To ensure a conservative outcome, the alternative approach holds 2038 NOx and SOx emissions at their 2023 levels. Under this conservative scenario, the Chico area continues to demonstrate maintenance, with the 2038 $PM_{2.5}$ 24-hour design value declining to 24 µg/m³, well below the NAAQS.
Together, the default and alternative rollback analyses demonstrate that the Chico, CA/Butte County Planning Area will continue to maintain the 24-hour $PM_{2.5}$ National Ambient Air Quality Standard through 2038. Both approaches, one reflecting projected emission reductions and one using a fully conservative assumption that holds $PM_{2.5}$precursor emissions constant at 2023 levels, show design values well below the 35 µg/m³ standard in the maintenance year. These results provide a robust and credible demonstration of continued attainment through 2038, even under a conservative assessment of PM2.5 precursor behavior.

Table 7: 2023 and 2038 Speciated Emission Inventory Used for the Rollback Model (tons per day)

	NOx	**SOx**	**Dust**	**Non-Dust** $PM_{2.5}$
2023				
CEPAM	7.601	0.181	0.706	3.843
ERC	0.164	0.008	N/A	0.107
Woodstove Change-out Benefit (Deduction)				0.033
2023 Total	7.765	0.189	0.706	3.917
2038				
CEPAM	5.129	0.176	0.720	3.567
ERC	0.164	0.008	N/A	0.107
Woodstove Change-out Benefit (Deduction)				0.054
2038 Total	5.293	0.184	0.720	3.620
Percentage Emission Change (2038 from 2023)				
	-31.8%	**-2.6%**	**1.9%**	**-7.6%**

Table 8: 2038 Maintenance Demonstration Using Proportional Rollback Model

Emissions	$PM_{2.5}$ Components	2024 DV (µg/m³)	Background (µg/m³)	Available for Rolling (µg/m³)	Emission Change (%)	2038 DV (µg/m³)
Secondary $PM_{2.5}$						
NOx	Ammonium Nitrate	3.22	0.04	3.18	-31.8%	2.21
SOx	Ammonium Sulfate	0.80	0.15	0.65	-2.6%	0.78
Primary $PM_{2.5}$						
Dust	Fugitive Dust	0.89	0.14	0.76	1.9%	0.91
Non-Dust $PM_{2.5}$	Carbonaceous Aerosols+Elements	20.09	0.61	19.48	-7.6%	18.60
DV Calculations (µg/m³)		**25**	**0.93**	**24.08**		**22.51**
Rounded 2038 DV (µg/m³)						**23**
Decrease in DV (µg/m³)						**2**

Table 9: 2038 Maintenance Demonstration Using Proportional Rollback Model with 2023 NOx and SOx Emissions Held Constant Through 2038 (Alternative Version)

Emissions	$PM_{2.5}$ Components	2024 DV (µg/m³)	Background (µg/m³)	Available for Rolling (µg/m³)	Emission Change (%)	2038 DV (µg/m³)
Secondary $PM_{2.5}$						
NOx	Ammonium Nitrate	3.22	0.04	3.18	0%	3.22
SOx	Ammonium Sulfate	0.80	0.15	0.65	0%	0.80
Primary $PM_{2.5}$						
Dust	Fugitive Dust	0.89	0.14	0.76	1.9%	0.91
Non-Dust $PM_{2.5}$	Carbonaceous Aerosols+Elements	20.08	0.60	19.49	-7.6%	18.60
DV Calculations (µg/m³)		**25**	**0.93**	**24.08**		**23.54**
Rounded 2038 DV (µg/m³)						**24**
Decrease in DV (µg/m³)						**1**

Supporting Information

Table 10: List of Top 10% $PM_{2.5}$ Concentration Days from 2022-2025 at Chico Monitoring Station and Speciation Details (µg/m³).[2]

Date	$PM_{2.5}$	Ammonium Nitrate	Ammonium Sulfate	Dust	Carbonaceous (Back-calculated)	Elements
1/11/2022	16.4	0.97	0.36	0.59	14.06	0.42
1/17/2022	20.8	1.19	0.39	0.60	18.21	0.41
11/27/2022	16.6	1.03	0.40	0.58	14.22	0.36
12/13/2022	17.8	0.67	0.30	0.55	15.77	0.50
12/19/2022	20.9	7.48	1.01	0.20	11.88	0.33
12/25/2022	38.6	13.67	1.88	0.27	22.18	0.60
1/24/2023	11.5	0.97	0.30	0.65	9.26	0.32
2/19/2023	10.9	0.61	0.36	0.58	9.02	0.34
11/3/2023	11.9	0.77	0.40	1.01	9.38	0.34
1/7/2024	11.4	0.61	0.25	0.17	10.08	0.29
1/15/2024	12.8	0.92	0.44	0.37	10.76	0.32
2/12/2024	12.4	0.98	0.32	0.46	10.38	0.26
11/10/2024	17	1.78	0.79	1.35	12.62	0.46
12/2/2024	28.8	2.76	0.79	0.59	24.09	0.57
12/8/2024	10.7	1.01	0.35	0.26	8.81	0.28
1/1/2025	19.7	1.65	0.69	0.41	16.01	0.94
1/19/2025	27.2	1.86	0.66	0.38	23.73	0.57
2/6/2025	13.2	0.67	0.22	0.36	11.69	0.26
2/18/2025	12.8	0.58	0.25	0.28	11.46	0.23
12/3/2025	14.7	1.07	0.44	0.53	12.29	0.37
12/28/2025	26.4	0.55	0.32	0.48	24.58	0.46

[2] 2025 data was preliminary at the time when this write-up was drafted and was not included in the rollback model.

Table 11: List of Coincide days at Bliss State Park Monitoring Site that Match Chico Top 10% $PM_{2.5}$ Concentration Days and Speciation Details (µg/m³).

Bliss Date	$PM_{2.5}$	Ammonium Nitrate	Ammonium Sulfate	Dust	Carbonaceous (Back-calculated)	Elements
1/11/2022	0.8	0.04	0.09	0.07	0.59	0.01
1/17/2022	1.1	0.04	0.10	0.06	0.88	0.03
12/13/2022	0.2	0.02	0.03	0.01	0.14	0.00
12/19/2022	1.1	0.03	0.36	0.10	0.60	0.01
12/25/2022	1.3	0.04	0.13	0.03	1.10	0.01
2/2/2023	0.9	0.05	0.14	0.23	0.45	0.04
2/20/2023	1.3	0.10	0.27	0.51	0.37	0.05
11/5/2023	0.5	0.02	0.15	0.06	0.26	0.00
1/7/2024	0.2	0.01	0.04	0.02	0.11	0.02
2/12/2024	1.4	0.05	0.17	0.24	0.90	0.04
12/2/2024	1.5	0.04	0.21	0.06	1.18	0.01
12/8/2024	0.8	0.01	0.11	0.03	0.64	0.01

c. Monitoring Network

The existing $PM_{2.5}$ monitoring network in the Chico-Butte County attainment/maintenance area includes a $PM_{2.5}$ FEM monitor located at 984 East Avenue in Chico, CA operating on a continuous daily schedule. The District is committed to working with CARB in the continued operation of the Chico-East Avenue monitoring station and maintaining compliance with federal law on Ambient Air Quality Surveillance (40 CFR Part 58).

d. Verification of Continued Attainment

CARB is responsible for monitoring $PM_{2.5}$ in the Chico-Butte County Planning Area. CARB also oversees the quality assurance of $PM_{2.5}$ data and submits annual monitoring network plans to the US EPA on behalf of the District. CARB commits to maintaining an appropriate $PM_{2.5}$ monitoring network through the maintenance period, with any potential changes to be developed in collaboration with the U.S. EPA and subject to stakeholder review. To verify continued attainment of the $PM_{2.5}$ standard, CARB will continue to conduct $PM_{2.5}$ monitoring and expeditiously review data as it becomes available. The District will track the progress of the maintenance plan through the acquisition of ambient and source emission data. All permitted stationary sources within the District are required to submit annual thorough data that the District uses to compile the emissions inventory. The District will commit to reviewing the emissions inventory for unexpected growth in primary $PM_{2.5}$ or NOx that may jeopardize the maintenance of the 2006 $PM_{2.5}$ NAAQS.

The District develops a comprehensive stationary source emission inventory every three years to submit to CARB under 40 CFR Part 51, Subpart A.

e. Transportation Conformity

This chapter provides the regulatory basis and technical justification for determining whether on-road emissions of nitrogen oxides (NOx) and directly emitted particulate matter ($PM_{2.5}$) are significant contributors to the 24-hour $PM_{2.5}$ design value for the Planning Area, consistent with the requirements of 40 CFR Part 93. Based on the analysis presented below, both NOx and directly emitted $PM_{2.5}$ from motor vehicles are determined to be insignificant for regional emissions analysis under transportation conformity.

Under Section *40 CFR 93.109(f)* of the conformity, an area is not required to conduct a regional emissions analysis under 93.118 or 93.119 if the maintenance plan demonstrates that regional motor vehicle emissions of a pollutant or precursor are an insignificant contributor to the air quality problem for the applicable NAAQS. To make such a determination, the SIP or a maintenance plan must demonstrate that it is unreasonable to expect motor vehicle emissions growth sufficient to cause a future violation of the standard. The rule identifies four criteria that must be considered when evaluating insignificance for a given pollutant or precursor:

- The contribution of on-road emissions to the total SIP inventory
- The current state of air quality in the region
- The absence of any on-road control measures in the plan that are required to attain or maintain the NAAQS and,
- Historical and future projections of on-road emissions of that pollutant/precursor

A finding of insignificance applies only to the regional emissions analysis requirements; all other elements of transportation conformity, including interagency consultation, hot-spot analysis, fiscal constraints, and project-level conformity, continue to apply. Transportation conformity also remains applicable for any other NAAQS for which the area is designated nonattainment or maintenance.

This maintenance plan concludes that regional NOx emissions and direct $PM_{2.5}$ are insignificant contributors to $PM_{2.5}$ air quality in Butte County. The following sections summarize air quality conditions in the region and apply the insignificance criteria listed above to on-road NOx and direct $PM_{2.5}$ emissions within the Planning Area.

On-Road Contributions to $PM_{2.5}$

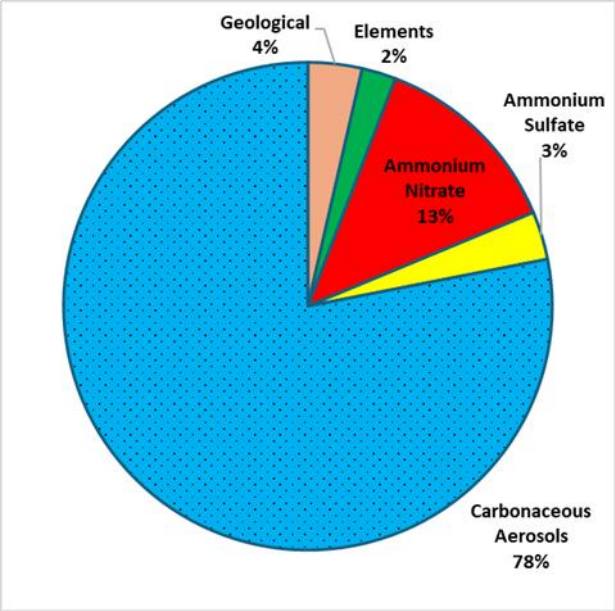
On-road mobile sources contribute to ambient $PM_{2.5}$ concentrations through NOx emissions, a precursor to ammonium nitrate formation, and through directly emitted $PM_{2.5}$ from exhaust, brake wear, and tire wear. Evaluation of these contributions is necessary to determine whether motor vehicle emissions may threaten continued attainment of the 24-hour $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS).

Current monitoring data, shown in Figure 8, indicate that ammonium nitrate represents a measurable portion of the 24-hour $PM_{2.5}$ design value. Based on the emissions inventory, on-road mobile sources account for approximately 33% of total NOx emissions and contribute an estimated 1.06 µg/m³, or about 4%, of the design value as ammonium

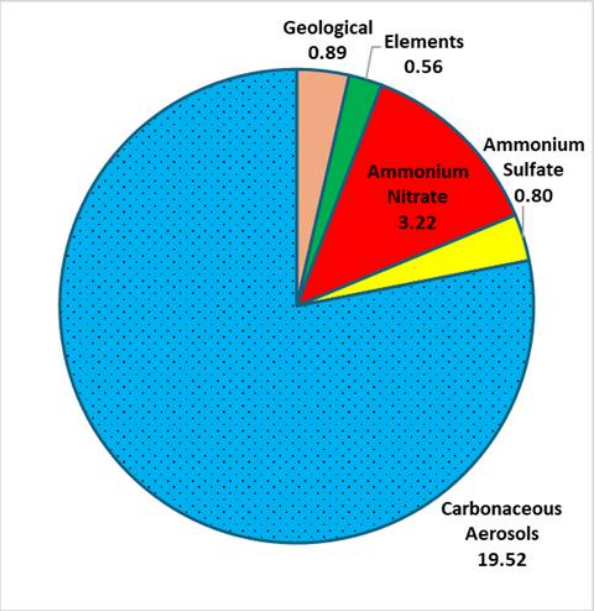
nitrate. On-road mobile sources account for approximately 2% of directly emitted non-dust $PM_{2.5}$, contributing an estimated 0.39 µg/m³, or 2% of the design value. This means on--road emissions make up only about 6% of the total design value.

Figure 8. $PM_{2.5}$ Composition on Top 10% of Days (2022-2024)

a) Percent Contribution



b) µg/m³ Contribution



Rollback Analysis for NOx and Directly Emitted $PM_{2.5}$

To evaluate whether on-road emissions could reasonably threaten continued attainment of the 24-hr $PM_{2.5}$ NAAQS, CARB conducted a series of rollback simulations designed to quantify the magnitude of on-road emission increases that would be required to produce a design value exceedance. These simulations are intentionally conservative and represent conditions well beyond any reasonably foreseeable future scenario.

In the first scenario (Table 12), on-road NOx and directly emitted $PM_{2.5}$ were increased by 500%, while emissions from all other source categories were held constant at projected levels. Even under this extreme increase, the resulting design value was 30 µg/m³, well below the 35 µg/m³ NAAQS.

A second scenario (Table 13) evaluated an even more extreme assumption, a 900% increase in on-road emissions relative to 2023 levels. Under this hypothetical condition, the resulting design value would rise to 36 µg/m³, exceeding the standard. However, such an increase is not reasonably foreseeable. Achieving it would require on-road NOx emissions to reach a level approximately 2.5 times greater than the entire Sacramento Valley's total 2023 NOx emissions, which is inconsistent with all historical data and projected emissions trends.

Table 12. Rollback Scenario with 500% Increase in On-road Emissions

Emissions Category	PM2.5 Component	2024 DV (ug/m3)	Background (ug/m3)	Available for Rolling (ug/m3)	Emissions			2038 DV (ug/m3)
					2023 (tpd)	2038 (tpd)	% Change	
Secondary PM2.5								
NOx On-Road	N/A	N/A	N/A	N/A	**2.565**	**15.390**	**500%**	N/A
NOx Other					5.200	4.165	-20%	
NOx Total	Ammonium Nitrate	3.22	0.04	3.18	7.77	19.56	152%	8.05
SOx	Ammonium Sulfate	0.80	0.15	0.65	0.19	0.18	-3%	0.78
Primary PM2.5								
Dust*	Fugitive Dust	0.89	0.14	0.76	0.71	0.72	2%	0.91
Non-Dust On-Road	N/A	N/A	N/A	N/A	**0.08**	**0.45**	**500%**	N/A
Non-Dust Other					3.84	3.56	-7%	
Non-Dust Total	Carbonaceous Aerosols + Elements	20.09	0.61	19.48	3.92	4.01	2%	20.57
Final DV		**25.00**	0.93	24.07				**30.32**
Final DV Rounded								**30.00**

* The “Dust” category includes emissions from farming activities, construction and demolition, paved and unpaved road dust, and fugitive windblown dust.

Table 13. Rollback Scenario with 900% Increase in On-road Emissions

Emissions Category	PM2.5 Component	2024 DV (ug/m3)	Background (ug/m3)	Available for Rolling (ug/m3)	Emissions			2038 DV (ug/m3)
					2023 (tpd)	2038 (tpd)	% Change	
Secondary PM2.5								
NOx On-Road	N/A	N/A	N/A	N/A	**2.565**	**25.650**	**900%**	N/A
NOx Other					5.200	4.165	-20%	
NOx Total	Ammonium Nitrate	3.22	0.04	3.18	7.77	29.82	284%	12.26
SOx	Ammonium Sulfate	0.80	0.15	0.65	0.19	0.18	-3%	0.78
Primary PM2.5								
Dust*	Fugitive Dust	0.89	0.14	0.76	0.71	0.72	2%	0.91
Non-Dust On-Road	N/A	N/A	N/A	N/A	**0.08**	**0.76**	**900%**	N/A
Non-Dust Other					3.84	3.56	-7%	
Non-Dust Total	Carbonaceous Aerosols + Elements	20.09	0.61	19.48	3.92	4.32	10%	22.08
Final DV		**25.00**	0.93	24.07				**36.03**
Final DV Rounded								**36.00**

* The “Dust” category includes emissions from farming activities, construction and demolition, paved and unpaved road dust, and fugitive windblown dust.

Projected Emissions Through 2038

In contrast to hypothetical rollback scenarios, projected emissions show a substantial decline in motor vehicle emissions and a corresponding reduction in contributions to the design values over the maintenance period. Between 2023 and 2038, on-road NOx emissions are expected to decrease by approximately 56%, and direct on-road $PM_{2.5}$ emissions by about 20% (Table 14). Assuming a proportional relationship between NOx emissions and ammonium nitrate formation, the ammonium nitrate contribution to the design value is projected to decrease to approximately 2.21 µg/m³ by 2038, with the on--road portion declining to approximately 0.47 µg/m³. Direct $PM_{2.5}$ on-road $PM_{2.5}$ is similarly projected to decline from 0.40 µg/m³ in 2023 to 0.32 µg/m³. Table 15summarizes these changes in on-road emissions and their contribution to the 24-hr design value.

Table 14. Rollback using 2023 and 2038 emissions.

Emissions Category	PM2.5 Component	2024 DV (ug/m3)	Background (ug/m3)	Available for Rolling (ug/m3)	Emissions			2038 DV (ug/m3)
					2023 (tpd)	2038 (tpd)	% Change	
Secondary PM2.5								
NOx On-Road	N/A	N/A	N/A	N/A	2.565	1.128	**-56%**	N/A
NOx Other					5.200	4.165	-20%	
NOx Total	Ammonium Nitrate	3.22	0.04	3.18	7.77	5.29	-32%	2.21
SOx	Ammonium Sulfate	0.80	0.15	0.65	0.19	0.18	-3%	0.78
Primary PM2.5								
Dust*	Fugitive Dust	0.89	0.14	0.76	0.71	0.72	2%	0.91
Non-Dust On-Road	N/A	N/A	N/A	N/A	0.08	0.06	**-20%**	N/A
Non-Dust Other					3.84	3.56	-7%	
Non-Dust Total	Carbonaceous Aerosols + Elements	20.09	0.61	19.48	3.92	3.62	-8%	18.61
Final DV		**25.00**	0.93	24.07				**22.51**
Final DV Rounded								**23.00**

* The “Dust” category includes emissions from farming activities, construction and demolition, paved and unpaved road dust, and fugitive windblown dust.

Table 15. Changes in On-Road Emissions and Contributions to the Design Value

Emission Category	2023 Emissions (tpd)	2038 Emissions (tpd)	2024 DV Contribution (µg/m³)	2038 DV Contribution (µg/m³)
NOx – On-Road	2.565	1.128	1.06	0.47
Direct $PM_{2.5}$ – On-Road	0.076	0.061	0.39	0.31
Total			1.45	0.78

On-road Control Measures are not Required to Maintain the $PM_{2.5}$ Standard

Under 40 CFR 93.109(f), an insignificance finding is appropriate when a SIP or maintenance plan does not rely on on-road motor vehicle controls to ensure attainment or continued maintenance of the standard.

Because photochemical modeling is not available for this area, we do not have a quantitative, future-year estimate of NOx-to-nitrate or SOx-to-sulfate conversion efficiency. To maintain a conservative approach, we evaluated a worst-case-scenario in which all NOx emissions (including on--road), all SOx emissions, and directly emitted on-road $PM_{2.5}$ are held constant at 2023 levels through 2038, rather than declining as

projected. As shown in Table 16, even under this deliberately conservative assumption, the 2038 design value still decreases to 24 µg/m³, well below the 35 µg/m³ NAAQS.

This analysis demonstrates that:
• No on-road emission controls are needed for maintenance, and
• On-road contributions are too small to be relevant for the maintenance demonstration.

Table 16. Rollback Scenario with 2023 NOx, SOx, and On-Road $PM_{2.5}$ Emissions Held Constant Through 2038

Emissions Category	PM2.5 Component	2024 DV (ug/m3)	Background (ug/m3)	Available for Rolling (ug/m3)	Emissions			2038 DV (ug/m3)
					2023 (tpd)	2038 (tpd)	% Change	
Secondary PM2.5								
NOx On-Road	N/A	N/A	N/A	N/A	2.565	2.565	**0%**	N/A
NOx Other					5.200	5.200	0%	
NOx Total	Ammonium Nitrate	3.22	0.04	3.18	7.77	7.77	0%	3.22
SOx	Ammonium Sulfate	0.80	0.15	0.65	0.19	0.19	0%	0.80
Primary PM2.5								
Dust*	Fugitive Dust	0.89	0.14	0.76	0.71	0.72	2%	0.91
Non-Dust On-Road	N/A	N/A	N/A	N/A	0.08	0.08	**0%**	N/A
Non-Dust Other					3.84	3.56	-7%	
Non-Dust Total	Carbonaceous Aerosols + Elements	20.09	0.61	19.48	3.92	3.64	-7%	18.69
Final DV		**25.00**	0.93	24.07				**23.62**
Final DV Rounded								**24.00**

Conclusion Regarding NOx and Direct $PM_{2.5}$ Significance

The evidence demonstrates that, based on the rollback modeling, the composition of the current design value, and projected emissions through the maintenance year, on-road NOx and directly emitted $PM_{2.5}$ are not significant contributors to the 24-hr $PM_{2.5}$ design value in Butte County. The $PM_{2.5}$ problem in the region is driven primarily by sources other than on--road mobile emissions, as on--road NOx accounts for only about 4% of the design value through ammonium nitrate formation and directly emitted on--road $PM_{2.5}$ contributes only about 2%. Even extreme, hypothetical increases in motor vehicle emissions would not produce concentrations high enough to threaten the NAAQS. Future year projections show substantial declines in on--road emissions, and a fully conservative scenario holding all precursor and direct $PM_{2.5}$ on-road emissions constant through 2038 still results in a design value well below the standard. This maintenance plan fully satisfied the criteria under 40 CFR 93.109(f) by demonstrating that on--road contributions are minimal, current air quality is well below the standard, the plan does not rely on on--road controls, future projections show declining on--road emissions, and no reasonable scenario exists in which on--road emissions could cause a future violation. Therefore,

transportation conformity budgets for on-road NOx and $PM_{2.5}$ are not required in this maintenance plan.

f. Contingency Plan

The CAA requires that a contingency plan be incorporated into the maintenance plan to assure that the District will promptly correct any violation of the standard which occurs during the maintenance period. BCAQMD will continue to use the 24-hour $PM_{2.5}$ design value (the 3-year average of the 98th percentile) at the Chico-East Avenue monitoring station as the contingency plan trigger threshold. Implementation of the contingency plan is triggered when the 24-hour $PM_{2.5}$ design value based on quality assured data submitted to the U.S. EPA's Air Quality System (AQS) exceeds 35 $\mu g/m^3$, the level of the NAAQS.

BCAQMD will annually assess whether the contingency plan has been triggered within 60 days of annual data certification or May 1st, whichever is sooner. Correspondence will be sent to CARB and U.S. EPA during this same timeframe with an assessment indicating whether the standard has been exceeded, and if so, whether the contingency measures are triggered or if potential exceptional events are suspected to be the cause of the exceedance. If the contingency plan is triggered, BCAQMD will begin implementing the contingency plan as described in Section 4.f.iii below.

i. Treatment of Exceedances Suspected to be Caused by an Exceptional Event

In some cases, exceedances leading to violations of the NAAQS could be caused by events such as wildfires that are not reasonably controllable or preventable, i.e., exceptional events. In consultation with CARB and U.S. EPA, BCAQMD can exclude such exceedances from the contingency plan trigger calculation. To avoid triggering the contingency plan unnecessarily, BCAQMD will follow the procedure described below to determine if an exceedance was likely caused by a possible exceptional event and can therefore be excluded from the contingency plan trigger calculation.

This procedure utilizes the Initial Notification of Exceptional Event "Initial Notification" (INI) process set forth in 40 CFR 50.14(c)(2) to identify exceedances BCAQMD wishes to exclude from the contingency plan trigger calculation. If BCAQMD wishes to exclude an exceedance from the contingency plan trigger calculation, BCAQMD will submit the INI form and supporting documentation to CARB within 60 days of annual data certification or May 1st, whichever is sooner. Prior to the INI form submittal, BCAQMD will submit a request to CARB to flag data in AQS and may confer with CARB and U.S. EPA regarding the appropriate supporting documentation to provide with the INI form.

INI forms will initially be submitted to CARB). CARB and/or U.S. EPA may require additional supporting documentation to allow for a sufficient evaluation. Additional supporting documentation can include, but is not limited to:

- A list of days potentially influenced by exceptional events;
- Identification of the event(s) responsible, including wildfire names and locations;
- Evidence of smoke transport to the monitors (e.g., upwind wind speed and direction, satellite imaging, remote sensing analyses, or HYSPLIT trajectories);
- Evidence of ground-level impact (daily PM concentrations and comparison to historical seasonal levels, including percent ranking);
- PM_{10} and/or $PM_{2.5}$ concentrations from regulatory and non-regulatory monitors in the area;
- Relevant news or media reports;
- Fire agency reports or Air Resource Advisor reports; and,
- Any additional supporting information identified through coordination with CARB and U.S. EPA.

CARB will review the INI and supporting documentation and submit it to U.S.EPA within 60 days of receiving it from BCAQMD. During this 60-day period, CARB may request supplemental documentation from BCAQMD. U.S. EPA will review the INI and supporting documentation and notify CARB and BCAQMD if it has determined one of the following:

- The exceedance was likely caused by an exceptional event and can be excluded from the contingency plan trigger calculation;
- U.S. EPA does not have sufficient information to evaluate the exceedance (BCAQMD and CARB can submit additional supplemental information within 30 days of notification of U.S. EPA's determination); or,
- The exceedance does not appear to have been caused by an exceptional event and should be included in the contingency plan trigger calculation.

If BCAQMD or CARB still believes the exceedance is due to an exceptional event and should not be included in the contingency plan trigger calculation, they may submit an exceptional event demonstration pursuant to 40 CFR 50.14(c)(3). U.S. EPA will review the exceptional event demonstration and either concur (exceedance is excluded from contingency plan trigger calculation) or not concur (exceedance is included in contingency plan trigger calculation).

ii. Contingency Plan Implementation

In the event that the contingency plan is triggered, BCAQMD will consult with interested parties, community organizations, and industry to identify voluntary and incentive based measures to reduce directly emitted $PM_{2.5}$ or precursors that can be implemented within nine months of the contingency plan being triggered (May 1st or the annual data certification, whichever is sooner). BCAQMD will make its analyses and summary of voluntary measures available to the public at a Governing Board meeting.

If voluntary and incentive based measures fail to result in attainment with the 24-hour $PM_{2.5}$ NAAQS 12 months after the contingency plan is triggered (the following year's design value), BCAQMD will complete sufficient analyses to begin consideration of necessary rules for ensuring attainment and maintenance of the 24-hour $PM_{2.5}$ NAAQS within 18 months of trigger date. If new rules are necessary, they will be proposed to the BCAQMD Governing Board for adoption and will provide for implementation within 24 months of the trigger date.

iii. Contingency Provisions

Actions that BCAQMD may consider include, but are not limited to, the measures found in Table 17. The measures chosen for consideration would depend on BCAQMD analysis as to the source of the exceedance.

Table 17. Potential Measures to be Considered if Contingency Plan is Triggered

Potential Voluntary and Incentive Measures
Consider issuing additional Check Before You Light advisories.
Expand outreach regarding burning in a fireplace or woodstove.
Provide additional incentives to change out older wood-burning devices.
Potential Rule Adoption Measures
Reasonable Available Control Technology (RACT) for existing stationary sources emitting $PM_{2.5}$ or $PM_{2.5}$ precursors.
Additional fugitive dust measures for construction activities and stationary sources.
Additional opacity restrictions.
Additional open burning restrictions for residential, agricultural, and prescribed burning.
Additional curtailment measures for residential wood-burning devices.

5. Environmental Impact

The District determined that pursuant to California Environmental Quality Act (CEQA) Guidelines § 15061(b)(2) and 15308, this Redesignation Request and Maintenance Plan is categorically exempt from CEQA as a Class 8 action taken by a regulatory agency to assure the maintenance, restoration, enhancement, and protection of the environment and application of the exemption is not barred by one of the exceptions set forth in CEQA Guidelines § 15300.2.

6. Conclusion

The Chico, CA/Butte County (partial) $PM_{2.5}$ Planning Area continues to maintain the 35 $\mu g/m^3$ 24-hr $PM_{2.5}$ NAAQS, as confirmed by recent air quality monitoring trends. This Second Maintenance Plan further demonstrates continued attainment and maintenance through 2038 by developing future year emissions inventories and projecting their associated contributions to $PM_{2.5}$ concentrations. Even under the most conservative scenario, one that assumes no reductions in precursor emissions, the area is projected to maintain the standard with a design value of 24 $\mu g/m^3$, well below the NAAQS.

Together, these analyses show that the Planning Area will continue to meet the standard for an additional ten years beyond the first maintenance period.

The Chico, CA/Butte County $PM_{2.5}$ Second Maintenance Plan meets all applicable requirements of Clean Air Act Section 175A . The Butte County Air Quality Management District requests that CARB submit this plan to U.S. EPA as a revision to the California State Implementation Plan.

Attachment A

Days Influenced by Wildfire Smoke 2018 - 2022

Attachment B

Emissions Inventory

Attachment C

Emissions Inventory: Supporting Documentation

Attachment D

Emissions Inventory: $PM_{2.5}$ Condensable Emissions

Attachment E

Emissions Reductions Achieved from the Wood Stove Change-out Program