Regional Haze Round 2 Five Year Progress Report

2018 - 2022

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DEQ Department of Environmental Quality

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Executive summary

Regional haze is air pollution that reduces visibility in scenic areas. The haze that affects visibility in Oregon comes from motor vehicles, power plants, industrial and manufacturing processes, forestry, agricultural (including dairies) and open burning, as well as natural sources such as wildfire and windblown dust.

To address the problem of regional haze, the Environmental Protection Agency adopted the Regional Haze Rule in 1999. This rule requires states to adopt regional haze plans to incrementally improve visibility in all Class I areas over the next 60 years. In 1977, Congress designated certain national parks and wilderness areas as "Class I areas," where visibility was identified as an important value deserving protection. Oregon has 12 Class I areas that include Crater Lake National Park and 11 wilderness areas.

Visibility impairment is measured by a network of monitors that capture pollution and calculate the light scatter effect of each pollutant such as carbon, sulfur and ammonia. More pollutants mean more absorption and scattering of light, which reduce the clarity and color of what we see. The visibility improvement goal aims to restore “natural” visibility to these areas, meaning that they are free from human-caused pollution.

This report evaluates ongoing efforts towards the “reasonable progress goals” established for the first five years of the 2018-2028 implementation period of Oregon’s regional haze plan. The Clean Air Act requires periodic progress reports for the EPA that summarize changes in monitoring and emissions data, and evaluate how the State Implementation Plan is progressing toward its goals.

Federal strategies to reduce emissions from diesel and gasoline powered vehicles and equipment will also help improve visibility by reducing levels of impairing pollutants like SO_2 and NO_x. The North American Emission Control Area will similarly reduce emission of these pollutants from ocean going ships that travel to Oregon, as well as vessels that travel upriver to inland ports.

Although these haze control strategies are in varying stages of implementation in Oregon, improvements in visibility are already evident in the monitoring data. Current haze indexes for Oregon’s Class I areas indicate

that Oregon is on track to meeting the “reasonable progress goals” established in the second planning period (2018-2028) of the Regional Haze Program. By collecting additional years of visibility data and emissions inventory trends, Oregon will be able to assess how emissions from various source sectors relate to and impact these trends.

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1. Acronyms

Acronym	Complete Phrase
CAA	Clean Air Act
CAPD	Clean Air and Power Division
CEMS	Continuous emission monitoring system
CFR	Code of Federal Regulations
CRP	Community Response Plans
DEQ	Department of Environmental Quality
EPA	United States Environmental Protection Agency
EU	Emissions unit
FFA	Four-factor analysis
FLM	Federal Land Manager
FR	Federal Register
IMPROVE	Interagency Monitoring of Protected Visual Environments
LRAPA	Lane Regional Air Protection Agency
MAO	Mutual agreement and final order
MID	Most Impaired Days
MMBtu	Million British thermal units
MOVES	Motor Vehicle Emission Simulator
NAAQS	National Ambient Air Quality Standard
NEC	Not elsewhere classified
NEI	National Emissions Inventory
NH_3	Ammonia
NOx	Nitrogen oxides
OCVRP	Oregon Clean Vehicle Rebate Program
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
PM	Particulate matter
PM_{10}	Particulate matter < 10 microns
$PM_{2.5}$	Particulate matter < 2.5 microns
PPA	Power Purchase Agreement
PPM	Parts per million
PSELs	Plant Site Emission Limits
RATA	Relative accuracy test audit
RICE	Reciprocating internal combustion engine
RHR	Regional Haze Rule
RPG	Reasonable Progress Goal
SAFO	Stipulated agreement and final order
SCR	Selective catalytic reduction
SIP	State Implementation plan
SMP	Smoke Management Plan
SNCR	Selective non-catalytic reduction
SSRA	Smoke Sensitive Receptor Areas
tpy	Tons per year
TRAACS	Tracking, Reporting, and Administration of Air Contaminant Sources
URP	Uniform rate of progress
WRAP	Western Regional Air Partnership

2. Acknowledgements

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3. Introduction

This report has been prepared to meet the requirements of the Federal Regional Haze Rule, 40 CFR 51.308(g) for submitting the five-year progress report.

The Regional Haze Rule requires states to address visibility protection for regional haze in Class I Areas. In Oregon there are 12 mandatory federal Class I areas, including Crater Lake National Park and 11 wilderness areas. These areas are listed in Table 3.4.

3.1 Requirements for periodic reports

The RHR requires periodic reports every five years after the initial regional haze SIP has been submitted. Periodic reports must evaluate progress towards the reasonable progress goals for each Class I area located within the state, as well as those located outside the state which may be affected by emissions from within the state. This report satisfies the second five-year progress report requirement in the Regional Haze Program. The minimum elements required in each periodic report are listed in 40 CFR 51.308(g) and 40 CFR 51.308(h). This report is organized according to those elements.

Five-year progress reports must include:

1. The status of implementation of control measures included in the original regional haze SIP (Section 4.1).
2. A summary of emission reductions achieved through the implementation of control measures (Section 4.2).
3. An assessment of visibility conditions (Section 6).
4. An analysis of the changes in emissions of visibility-impairing pollutants (Section 7).
5. A review of the state's visibility monitoring strategy (Section 9).
6. An assessment of significant changes in anthropogenic emissions that may have limited or impeded progress in improving visibility (Section 7).
7. An assessment of whether the current SIP elements and strategies are sufficient to meet reasonable progress goals (Section 9).

While the state submits its progress report, the state must also determine the adequacy of the existing implementation plan. This five-year review provides a progress report on control measures that were identified in the 2018-2028 Regional Haze State Implementation Plan for Oregon. The 2018-2028 SIP emphasized controlling the contributions of point sources, using a four-factor analysis. The four-factor analysis involved assessing potential emission controls technologies for facilities against four statutory factors:

1. The cost of control,

2. Time necessary to install controls
3. Energy and non-air quality impacts, and
4. Remaining useful life.

To assess progress, this report relies on emissions information from the 2017 and 2020 National Emissions Inventory, and visibility data from the five-year period from 2018-2022.

In discussing the status of control strategies, EPA guidance suggests that "[t]he report should focus on a targeted evaluation of important control measures that achieve reductions in visibility impairing pollutant species."

The 2018-2028 SIP identifies the relative contribution of each visibility impairing pollutant from anthropogenic and natural emission sources. Oregon datasets suggested that sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) emissions are predominately from anthropogenic sources, such as point, mobile and area sources. Oregon's long-term strategy for the second planning period focused on these pollutants in part due to the important role of Best Available Retrofit Technology[1] for the first planning period, but also due to the controllable nature of these emissions. This report, therefore, focuses on the status of efforts to date to control SO_2 and NO_2 emissions, as well as PM_{10} emissions from specific facilities that are required to complete actions such as reduction of plant site emission limits or other actions to reduce emissions of SO_2 and NOx. Controlling SO_2, NO_2 and PM_{10} emissions has a co-benefit of reducing visibility impairment from these pollutants as well as reducing the adverse impact of deposition of these pollutants on ecosystems.

Section 308 (i) prescribes requirements for state and Federal Land Managers' coordination, including the opportunity for FLMs to consult with the state on visibility impairment, reasonable progress goals and control strategies for Class I areas in the state. Subparagraph (4) requires a plan for continued consultation by the state with FLMs. In the 2018-2028 SIP, Oregon committed to continuing consultation with FLMs on the implementation of the visibility protection program, including development and review of implementation plan revisions and five-year progress reports, and the implementation of other programs having the potential to contribute to impairment of visibility in any mandatory federal Class I area within the state.

3.2 Clean Air Act requirements for addressing Regional Haze

In 1977, Congress amended the CAA, establishing a national goal to protect visibility in Class I federal areas – national parks and wilderness areas greater than 6,000 or 5,000 acres, respectively. The amendments called for the "prevention of any future, and the remedying of

any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution."

In 1979, the EPA, in consultation with the Secretary of Interior, promulgated a list of 156 mandatory Class I areas in which visibility was determined to be an important factor. In Oregon there are 12 Class I areas.

On July 1, 1999, EPA issued the Regional Haze Rule, establishing a comprehensive visibility protection program for Class I federal areas. The intent of the RHR is to improve visibility over the long term in the 156 Class I areas. It requires each affected state to develop and adopt an implementation plan that will improve the haziest days and protect the clearest days at each mandatory Class I area in the state, with a goal of returning to natural visibility conditions by the year 2064. Each plan must provide a comprehensive analysis of natural and anthropogenic sources of haze in each Class I area in the state and contain strategies to control anthropogenic emissions that contribute to haze. The plan must also address the transport of haze across state boundaries. The 2018-2028 SIP, prepared by Oregon DEQ, was submitted to EPA in 2022.

The visibility data included in this progress report is from the Regional Haze Technical Support System developed by the Western Air Regional Partnership WRAP, a regional planning organization serving western states. The WRAP Technical Support System is a data hub for regional haze related visibility data and modeling.

The Regional Haze Technical Support System was prepared to provide the technical basis for use by the western states to develop the first of their individual reasonable progress reports for the 116 federal Class I areas located in the western states. Data from the TSS allow for regional, state, and Class I area-specific basis to characterize the difference between 2000-2004 baseline conditions and current conditions, which is represented by the most recent successive five-year average, that is, the 2018-2022 period. The Regional Haze Technical Support System characterizes changes in visibility impairment using aerosol measurements from the Interagency Monitoring of Protected Visual Environments network. It analyzes the differences between emissions inventory years represented by the baseline and current progress periods.

3.3 Oregon IMPROVE monitoring network

In the mid-1980's, the Interagency Monitoring of Protected Visual Environments program was established to measure visibility impairment in mandatory Class I federal areas throughout the United States. The monitoring sites are operated and maintained through a formal cooperative relationship between the EPA, National Park Service, U.S. Fish and Wildlife Service, Bureau of Land Management, and U.S. Forest Service. In 1991, several additional organizations joined the effort: National Association of Clean Air Agencies, Western States Air Resources Council, Mid-Atlantic Regional Air Management Association, and Northeast States for Coordinated Air Use Management.

The objectives of the IMPROVE program include establishing the current visibility and aerosol conditions in mandatory Class I federal areas; identifying the chemical species and emission sources responsible for existing human-made visibility impairment; documenting long-term trends for assessing progress towards the national visibility goals; and supporting the requirements of the Regional Haze Rule by providing regional haze monitoring representing all visibility-protected federal Class I areas where practical.

In Oregon there are six IMPROVE monitors that are used to represent conditions at the Class I areas listed in Table 3.4. Three are in the Oregon Cascades, two in Eastern Oregon, and one in the Coast Range. Since there are 12 Class I areas in Oregon, some monitors serve multiple Class I areas. While it is desirable to have one monitor per Class I area, in some cases one monitor can be "representative" of haze conditions in nearby Class I areas.

The Columbia River Gorge National Scenic Area, which is not a Class I area, previously had two IMPROVE monitors, shown in Table 3.4. The monitor at the western end of the Gorge was discontinued in 2011.

3.4 The Regional Haze Technical Support System

The main purpose of the Regional Haze Technical Support System is to provide summary analytical results and methods documentation for the technical requirements of the Regional Haze Rule, and to support the preparation, completion, evaluation, and implementation of the regional haze implementation plans to improve visibility in Class I areas. The TSS delivers regional technical analyses, summarizing datasets that identify sources and areas contributing to haze in the Western Regional Air Partnership region.

Secondly, the TSS serves as a central hub for accessing, visualizing, analyzing, and retrieving technical data and regional analyses from WRAP forums and workgroups to support regional haze planning in the West. The TSS summarizes results and consolidates information about air quality monitoring, meteorological and receptor modeling data analyses, emissions inventories and models, and gridded air quality/visibility regional modeling simulations. These data are integrated for application to air quality planning purposes by prioritizing and refining key information and results into explanatory tools.

Table 1.4. Current Oregon IMPROVE monitoring network sites and Class I or scenic areas represented by data from each monitor.

AQS Monitor ID	IMPROVE Monitor ID	Class I or Scenic Area Represented	Sponsor	Elevation	Start Date
41-005-0102	MOHO1	Mt. Hood Wilderness	USFS	5022 ft	3/7/2000
41-039-0070	THSI1	Mt. Jefferson Wilderness	USFS	2903 ft	7/24/1993
		Mt. Washington Wilderness			
		Three Sisters Wilderness			
41-035-8001	CRLA1	Crater Lake National Park	NPS	6548 ft	3/2/1988
		Diamond Peak Wilderness			
		Mountain Lakes Wilderness			
		Gearhart Mountain Wilderness			
41-033-0010	KALM1	Kalmiopsis Wilderness	USFS	262 ft	3/7/2000
41-061-0010	STAR1	Strawberry Mountain Wilderness	USFS	4130 ft	3/7/2000
		Eagle Cap Wilderness			
41-063-0002	HECA1	Hells Canyon Wilderness Area	USFS	2148 ft	8/1/2000
53-039-0003	CORI1	Columbia River Gorge National Scenic Area	USFS	584 ft	6/26/1993

Note: USFS denotes the United States Forest Service.

4. Regional haze facility controls

4.1 Required facility controls

During the second round of regional haze planning, DEQ required 31 facilities for which the emissions in tons/year divided by the distance to an affected Class I area in kilometers (also referred to as Q/) exceeded 5.00 to go through a four-factor analysis. The four-factor analysis process derives from 40 CFR 51.308(f)(2)(i) where the 2017 Regional Haze Rule lays out the factors that states must consider in establishing reasonable progress goals. The four-factors are: cost of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected sources.

DEQ presented an option for facilities for which actual emissions were below the Q/d threshold; if those sources agreed to lower plant site emission limits such that Q/d was less than five, those facilities could “screen out” and DEQ would not require further analysis from those facilities. DEQ worked with the remaining facilities that did not screen out of further analysis as they proceeded through the FFA process. DEQ, in consultation with EPA and other states, developed criteria by which to assess the cost effectiveness of pollution controls. DEQ

considered the results of the initial cost effectiveness analysis and additional information facilities submitted. In addition, DEQ employed a weight of evidence approach to better understand regional model results. More information about the facility screening process is detailed in the Regional Haze State Implementation plan for 2018-2028.

40 CFR 51.308(g)(1) requires "A description of the status of implementation of all measures included in the implementation plan for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside the state." Section 4 summarizes the emissions control strategies and the status of implementing those controls at each facility evaluated in Oregon's 2018-2028 SIP. The stipulated agreement and final orders can be found on DEQ's website.

These emission control requirements and their original implementation plan are described in detail in section 3.7.5 of Oregon's 2018-2028 SIP and Oregon's Regional Haze Supplement. The current implementation status is described for each facility below in sections 4.1. In addition, Table 4.1 summarizes facilities with control requirements from Oregon's Regional Haze SIP 2018-2028 and includes the permit number and the corresponding SAFO where applicable.

Many SAFO agreements include Plant Site Emission Limits, which are defined by OAR-340-200-0020 (116); PSELs are annual limits for a given pollutant that are measured on a rolling basis each 12- month period. For a given year, there are twelve rolling 12-month data points that the facility is required to track to show compliance. Additionally, facilities are required to submit notification of exceedance with PSELs to Oregon DEQ. In the case that an exceedance was self-reported by the facility or discovered by DEQ, it is documented in this report.

In this report, instead of reporting all twelve rolling 12-month averages for each source subject to a SAFO with PSEL reductions, DEQ selected a representative 12-month period for each source. The other 12-month rolling averages are available to DEQ, and EPA, upon request.

At the time this report was compiled, it was Oregon DEQ's assessment that, during the period DEQ reviewed**,** the facilities listed in this report complied with Regional Haze Rule requirements incorporated into SAFO and permit limits with one exception. Portland General Electric Beaver/Port Westward Plants reported exceedances of SAFO PM_{10} PSEL for nine 12-month periods and an exceedance of SAFO NOx PSEL for one 12-month period. This resulted in enforcement case AQ-TV-HQ-2024-042 and civil penalty fines totaling $145,200 for PGE. This case is detailed below in section 4.1.7.

Table 4.1. Oregon DEQ list of facilities with controls from Regional Haze 2018-2028 State Implementation plan.

Report Section	Permit Name	Permit #	SAFO or MAO #
4.1.1	Owens-Brockway	26-1876-TV-01	26-1876
4.1.2	Georgia Pacific – Wauna Mill	04-0004-TV-01	04-0004-A1
4.1.3	Northwest Pipeline LLC – Oregon City Compressor Station	03-2729-TV-01	03-2729-A1
4.1.4	EVRAZ Inc. NA	26-1865-TV-01	26-1865
4.1.5	Willamette Falls Paper Company	03-2145-TV-01	03-2145
4.1.6	City of St. Helens (paper mill) (Formerly Cascades Tissue Group: A Division of Cascades Holding US Inc.)	05-1849-TV-02	05-1849
4.1.7	PGE Beaver Plant/Port Westward Plant	05-2520-TV-01	05-2520*
4.1.8	Boise Cascade Wood Products, LLC – Elgin Complex	31-0006-TV-01	31-0006
4.1.9	Gas Transmission Northwest LLC – Compressor Station 12	09-0084-TV-01	09-0084
4.1.10	Gas Transmission Northwest LLC – Compressor Station 13	18-0096-TV-01	18-0096**
4.1.11	Gilchrist Forest Products	18-0005-TV-01	-
4.1.12	Northwest Pipeline LLC – Baker Compressor Station	01-0038-TV-01	01-0038-A1
4.1.13	JELD-WEN	18-0006-TV-01	-
4.1.14	Cascade Pacific Pulp, LLC – Halsey Pulp Mill	22-3501-TV-01	22-3501-A2
4.1.15	Georgia Pacific – Toledo LLC	21-0005-TV-01	21-0005-A1
4.1.16	Boise Cascade Wood Products, LLC – Medford	15-0004-TV-01	15-0004
4.1.17	Biomass One, L.P.	15-0159-TV-01	15-0159
4.1.18	Roseburg Forest Products - Dillard	10-0025-TV-01	10-0025
4.1.19	International Paper – Springfield	208850	208850

*MAO represents Case No. AQ-TV-HQ-2024-042.
** SAFO represents OAH Case No. 2021-ABC-04835 and DEQ Case No. AQ/RH-HQ-2021-140.

4.1.1 Owens Brockway

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Owens-Brockway was required to not operate Furnace A upon execution of the SAFO. The SAFO was signed Aug. 8, 2021 and Furnace A was permanently shut down on July 27, 2021, having last operating in 2020.Owens-Brockway was required to meet the PSELs listed below in table 4.1.1A.

Table 4.1.1A. PSELs and actual emission for the Owens-Brockway facility.

From Jan. 1, 2022		
Pollutant	**PSELs (tons/year)**	**2022 Actual Emissions (tons/year)**
PM_{10}	55	31.4
NOx	137	132.27
SO_2	108	73.26

There were additional PSELs stated in the SAFO that are not applicable until July 31, 2025. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Owens-Brockway followed SAFO requirements.

4.1.1 Georgia-Wauna Mill

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Georgia Pacific – Wauna Mill was required to meet the PSELs listed below in table 4.3.1.

Table 4.1.2A. PSELs and actual emissions for the Georgia Pacific – Wauna Mill.

From Aug. 1, 2022		
Pollutant	**PSELs (tons/year)**	**2023 Actual Emissions (tons/year)**
PM_{10}	1,077	688
NOx	2,019	1,088.8
SO_2	913	484.4

There were additional PSELs stated in the SAFO that are not applicable until Dec. 31, 2024 and July 31, 2026.

As stated in the SAFO, Georgia Pacific – Wauna Mill was required to replace Paper Machine 5, Yankee Burner, with a low NOx burner with an emissions rate no greater than 0.03 lb/MMBtu by Dec. 31, 2024. The permit for construction of the burner replacement was issued on Sep. 21, 2023. The permittee submitted an additional permit application for a significant modification on Jan. 29, 2024 to include the updated burners. Construction on the burner began on Aug. 26, 2024. As required by the Title V permit modification, a stack test must be completed within one year of project start-up and GP Wauna anticipates this will be completed in Q1 2025.

As stated in the SAFO, Georgia Pacific – Wauna Mill was required to have a NOx emissions limit of no more than 0.06 lb/MMBtu for the TAD1 and TAD2 burners on Paper Machines 6 and 7. The permittee tested Paper Machine 6 on Apr. 12, 2022 and Paper Machine 7 on May 11, 2022. The emissions rate for each point source is summarized below in Table 4.1.2B.

Table 4.1.2B. NO_X measured emissions for burners at the Georgia Pacific – Wauna Mill.

Emission Device	Measured Value (lb/MMBtu)	Limit (lb/MMBtu)
TAD1, Paper Machine 6	0.03	0.06
TAD2, Paper Machine 6	0.04	0.06
TAD1, Paper Machine 7	0.06	0.06
TAD2, Paper Machine 7	0.03	0.06

Georgia Pacific – Wauna Mill used EPA Test Method 7E to conduct these emissions tests. The permittee submitted the test reports for Paper Machine 6 on June 14, 2022 and for Paper Machine 7 on July 11, 2022. DEQ reviewed the reports and requested that the test reports be resubmitted due to calculation errors. Georgia Pacific resubmitted the test reports on July 13, 2022 and Aug. 18, 2022, addressing DEQ's feedback. DEQ accepted the test report for Paper Machine 6 on July 20, 2022 and for Paper Machine 7 on Aug. 29, 2022. The permittee was required to show compliance with the NOx emission limit on burners TAD1 and TAD2 on Paper Machines 6 and 7 by Dec. 5, 2023. DEQ determined that test methods conducted and the data provided in these two test reports were sufficient to evaluate the reported emissions and that the NOx emissions were found to be in compliance with SAFO emission limits.

As stated in the SAFO, Georgia Pacific was required to meet with DEQ by Dec. 31, 2022 to discuss technical details of installing a low NOx burner, flue gas recirculation, and CEMS installation on Power Boiler-33. The permittee and DEQ met on Dec. 13, 2022 where a permit application schedule was agreed to. The construction permit for the burner replacement and the flue gas recirculation installation was issued on Sep 21, 2023.

There were additional requirements stated in the SAFO including the installation of low NOx burners, flue gas recirculation, and CEMS which are not required to be completed until July 31, 2026.

4.1.3 Northwest Pipeline, LLC Oregon City Compressor Station

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Northwest Pipeline, LLC, Oregon City Compressor Station was required to replace two reciprocating internal combustion engines (RICE) that comprise EU1 with new emissions units. The replacement is required to meet an emissions limit of 219 tons/year and to meet the requirements of the New Source Performance Standard in place at the time of permit application submittal. The permittee has until July 31, 2031, to install the two new RICE. At the time of compiling this report, DEQ had not received an application for construction. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Northwest Pipeline, LLC, Oregon City Compressor Station followed SAFO requirements.

4.1.4 EVRAZ Inc. NA

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, EVRAZ Inc. NA was required to install low NOx burners. These low NOx burners are required to be installed on the pre-heat portions of the EU-10 Reheat Furnace with a designed NOx emission factor of 170 pounds per million cubic feet of natural gas by Dec. 31, 2024. An application for burner replacement construction was received on Feb. 28, 2023 and was issued by DEQ on March 29, 2023. EVRAZ sent a letter to DEQ on Oct. 22, 2024, which stated that the facility was not able to install the burner replacement as anticipated. EVRAZ explained that NOx burners were found to be incompatible with the existing refractory, despite consulting a qualified engineering firm.

EVRAZ requested an extension until May 31, 2025, to install the low NOx burners. DEQ is working with EVRAZ to identify an appropriate extension date for installation of the low NOx burners and any other additional requirements.

There were additional requirements stated in the SAFO including conducting an initial NOx source test on EU-10 Reheat Furnace to verify the NOx emissions factor, and this is not required to be completed until Dec. 31, 2025. Additionally, the permittee is required to submit a source test report and propose a new NOx emission factor for EU-10 within 90 days of completing the source test, and this is not required to be completed until the source test is completed. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that EVRAZ Inc. NA followed SAFO requirements.

4.1.5 Willamette Falls Paper Company

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Willamette Falls Paper Company is required to meet the PSELs listed below in table 4.1.5A.

Table 4.1.5A. PSELs and actual emissions for the Willamette Falls Paper Company.

From Aug. 1, 2022		
Pollutant	**PSELs (tons/year)**	**2022 Actual Emissions (tons/year)**
PM_{10}	20	4
NOx	240	208
SO_2	5	3

As stated in the SAFO, Willamette Falls Paper Company is required to only combust natural gas in Boilers 1, 2, and 3, except it may use ultra-low sulfur diesel for no more than 48 hours per year. The permittee met this agreement and has not burned ultra-low sulfur diesel since this SAFO was executed on Aug. 9, 2021. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Willamette Falls Paper Company followed SAFO requirements.

4.1.6 City of St. Helens (paper mill)

Cascades Tissue Group: A Division of Cascades Holding US Inc. ceased operation of its paper mill as of Nov. 15, 2023. The paper mill was then purchased by the City of St. Helens and the permit was officially transferred on Jan. 31, 2024.

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, the City of St. Helen's paper mill, known formerly as Cascades Tissue Group: A Division of Cascades Holding US Inc., was required to meet the PSELs listed below in table 4.1.6A.

Table 4.1.6A. PSELs and actual emissions for the paper mill owned by the City of St. Helens.

From Aug. 1, 2022		
Pollutant	**PSELs (tons/year)**	**2022 Actual Emissions (tons/year)**
PM_{10}	14	1.95
NOx	103	81.01
SO_2	39	1.14

The paper mill's status is "temporary closure" in Oregon's Tracking, Reporting, and Administration of Air Contaminant Sources (TRAACS) system. The City of St. Helens communicated to DEQ that it intends to have the site operational by fourth quarter 2025. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that City of St. Helens (paper mill) has followed SAFO requirements.

4.1.7 PGE Beaver Plant/Port Westward Plant

PGE Beaver Plant/Port Westward Plant entered into a SAFO on Aug. 10, 2021 that outlined federally enforceable reductions in PSELs. This facility self-reported an exceedance of SAFO PM10 PSEL for nine consecutive 12-month periods from Aug. 1, 2022 – March 31, 2024 and SAFO NOx PSEL for one 12-month period from Feb. 1, 2023 – Jan. 31, 2024. As a result, enforcement case AQ-TV-HQ-2024-042 was initiated and civil penalty fines totaling $145,200 were issued.

PGE and Oregon DEQ entered a mutual agreement and final order on April 19, 2024. As outlined in the MAO, PGE was required to install low-NOx burners on turbines Unit 1, 2, 3, 4, 5, and 6 at the Beaver Plant. Installation on Unit 6 was completed on Dec. 13, 2022, and on Unit 4 on July 15, 2023. At the time that this report was compiled, installation on Unit 1 was in progress and upgrades on Unit 2, 3, and 5 were not complete.

Additionally, PGE was required to limit ammonia slip, as per their permit, from the Port Westward Plant turbine (PWEU1) to no more than 8 ppm volume, dry based on a three-hour average as measured by a source test. On Aug. 15-16, 2023, PGE conducted a source test of PWEU1 and the three-hour ammonia concentration was measured as 8.6 ppm volume, dry,

exceeding the limit rounded to 9 ppm volume, dry based. DEQ reviewed this test report and on Jan. 24, 2024, DEQ determined that the test methods conducted, data provided, and calculations performed were sufficient for evaluating ammonia emissions at PWEU1. PGE was issued a civil penalty fine for the exceedance in ammonia slip. In a later source test on Oct. 26, 2023, DEQ determined that PGE reestablished compliance with this permit limit as the three-hour ammonia concentration was measured as 8.0 ppm volume, dry based which is within the limit of 8 ppm volume

Additionally, the MAO for this facility stipulated interim emission limits for the combined emissions of PM10, NOx, and SO2 until July 31, 2027 as shown in table 4.1.7A.

Table 4.1.7A. Combined emissions for the PGE Beaver/Port Westward Plant.

Time Period	PM_{10} + NOx + SO_2 (tons)
May 1, 2023 – July 31, 2025	1,382
Sep 1, 2024 – July 31, 2026	1,024
Sep 1, 2025 – July 31, 2027	574

Furthermore, the MAO required that PGE submit a schedule for SCR catalyst replacement on Port Westward Plant turbine (PWEU1) to DEQ by May 1, 2024. To satisfy Section II, Condition 3 of MAO CASE NO. AQ-TV-HQ-2024-042, PGE reported on April 26, 2024 that the expected arrival date of the catalyst was in May 2024. DEQ accepted PGE's schedule for catalyst replacement on May 8, 2024. PGE submitted a maintenance request for startup to DEQ on June 7, 2024 which was approved by DEQ on June 10, 2024. PGE reported startup of the turbine with the new catalyst to DEQ on June 17, 2024 and submitted an Exceptional Event on June 18, 2024.

The MAO for PGE also outlined restrictions to the number of non-upgraded turbines allowed to be in operation at the same time as shown in table 4.1.7B.

Table 4.1.7B. Non-upgraded turbines for Portland General Electric Beaver/Port Westward Plant.

Time Period	Number of non-upgraded turbine units
Nov. 1, 2024 – March 31, 2025	3
April 1, 2025 – March 31, 2026	2
April 1, 2026 – July 31, 2026	1
Aug. 1, 2026 and onward	0

Additionally, the MAO required that PGE no longer accept deliveries of fuel oil for use on Units 1-6 at the Beaver Plant. Additionally, the MAO requires that PGE not use fuel oil to run turbine Units 1-6 after March 31, 2026.

PGE's MAO stipulated specific data reports that are required to be submitted with PGE's annual compliance reports for calendar years 2024-2027. These reports include rolling 12-calendar

month emissions of PM_{10}, NO_x, and SO_2, a description of any violations of the turbine restrictions outlined in table 4.8.2, and a certification that no fuel oil was delivered for use in turbine Units 1-6 at the Beaver plant. For the 2026 annual report, it is required that PGE include a certification that no fuel oil was used in any of the turbine Units 1-6 after March 31, 2026 at the Beaver plant.

The MAO includes stipulated penalties for violations of the interim limits, violations of a fuel oil restriction included in the MAO, and reporting violations.

Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that PGE Beaverton/Port Westward Plant has followed MAO requirements.

4.1.8 Boise Cascade Wood Products, LLC – Elgin Complex

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Boise Cascade Wood Products, LLC – Elgin Complex was required to reduce PSELs for SO_2 to 17.1 tons/year. This requirement is reflected in their permit modification dated May 23, 2022. Boise Cascade Wood Products, LLC – Elgin Complex was required to meet the PSELs listed below in tables 4.1.8A and 4.1.8B.

Table 4.1.8A. PSELs and actual SO_2 emissions for Boise Cascade Wood Products, LLC – Elgin Complex.

Pollutant	PSELs (tons/year)	2022 Actual Emissions (tons/year)
SO_2	17.1	9.1

Table 4.1.8B. PSELs and actual SO2 emissions for Boise Cascade Wood Products, LLC – Elgin Complex.

Pollutant	PSELs (tons/year)	2023 Actual Emissions (tons/year)
SO_2	17.1	9.7

Additionally, Boise Cascade was required to install a CEMS on Boiler 1 and 2 for NOx within three months of when the SAFO was signed on Aug. 12, 2021. This requirement was completed as the CEMS was installed on Sep 30, 2022; though this was not within three months of the execution of the SAFO. The CEMS was installed following EPA Procedure 1, Performance Specification 2 and specifications in DEQ's Continuous Monitoring Manual. A Relative Accuracy Test Audit was performed on March 28, 2023 and again on March 6, 2024. The permittee submitted CEMS test results from March 28, 2023 to Oregon DEQ for certification on April 28, 2023. At the time this report was compiled, Oregon DEQ had not completed its certified review of these test reports.

Boise Cascade was also required to begin a combustion improvement project by July 31, 2023 with the goal of reducing NOx emissions from Boiler 1 and 2 by at least 15%. Boise Cascade notified DEQ in April of 2023 that they planned to install high-temperature cameras in the fireboxes of Boilers 1 and 2 at Elgin during the first week of May 2023 as part of a NOx reduction project; installation was then completed on-time. However, this project did not result in the quantity of emissions reductions required by the SAFO, so Boise Cascade began a series of other projects designed to further reduce NOx emissions; these improvements continued up to December 2024, and DEQ will be evaluating the results thereafter.

There were additional requirements stated in the SAFO. One was a requirement to submit 12 months of CEMS data to DEQ to demonstrate the NOx emission reductions achieved by the combustion improvement project and another is to propose a new NOx limit based on this data, but these are not due until Dec. 31, 2025. In the case that the combustion improvement project does not meet the goal of reducing boiler NOx emissions by at least 15%, the SAFO requirement was to reduce PSEL for combined PM_{10}, NOx, and SO_2 to a level that will achieve a Q/d commensurate with a 15% boiler NOx reduction. The emission limit and the PSELs requirements stated in the SAFO is not required to be met until March 31, 2026. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Boise Cascade Wood Products, LLC – Elgin Complex has followed SAFO requirements.

4.1.9 Gas Transmission Northwest LLC – Compressor Station 12

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Gas Transmission Northwest LLC - Compressor Station 12 was required to meet the PSELs listed below in table 4.10.1.

Table 4.1.9A. PSELs and actual emissions for Gas Transmission Northwest LLC – Compressor Station 12.

From Aug. 1, 2022		
Pollutant	**PSELs (tons/year)**	**2022 Actual Emissions (tons/year)**
PM_{10}	12.7	5.33
NOx	317.1	85.7
SO_2	30.4	2.87

Table 4.1.9B. PSELs and actual emission for Gas Transmission Northwest LLC – Compressor Station 12

From Aug. 1, 2023		
Pollutant	**PSELs (tons/year)**	**2023 Actual Emissions (tons/year)**
PM_{10}	11.4	6.7
NOx	257.2	94.36
SO_2	21.7	3.46

There were additional PSELs stated in the SAFO that are not applicable until Aug. 1, 2024 and Aug. 1, 2025. Based on the information available to DEQ at the time this report was compiled,

DEQ's assessment was that Gas Transmission Northwest LLC - Compressor Station 12 was following SAFO requirements.

4.1.10 Gas Transmission Northwest LLC – Compressor Station 13

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Gas Transmission Northwest LLC - Compressor Station 13 was required to install a SCR and CEMS or replace Turbines 13C and 13D. Gas Transmission Northwest LLC – Compressor Station 13 sent Oregon DEQ a letter dated March 23, 2023 stating its intent to replace Turbines 13C and 13D instead of complying with requirements to construct a SCR and CEMS.

At the time of compiling this report, the permit has not yet been modified to incorporate these changes. This replacement is required by no later than July 31, 2031.
The permittee is required to meet with Oregon DEQ by Jan. 1, 2025 to discuss the replacement project and the permit application schedule.

There were additional requirements stated in the SAFO related to this replacement project. The SAFO required that the new technology must meet most recent permitting requirements for new emission units, including NSPS but this will not be required until the deadline established in the meeting with Oregon DEQ discussing permit application schedule. The SAFO required that the permittee would complete the replacement project and begin operating using the new technology by July 31, 2031. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Gas Transmission Northwest LLC - Compressor Station 13 has followed SAFO requirements.

4.1.11 Gilchrist Forest Products

At the time that Regional Haze applicability was being reviewed, Interfor, the parent company of Gilchrist Forest Products, a sawmill, agreed to install an ESP on boilers B-1 and B-2. The ESP requirement for these boilers was incorporated into the permit, but a SAFO was not issued.
In Sep 2020, Nieman Enterprises purchased the sawmill from Interfor. Neiman Enterprises stood behind the initial commitment that Interfor made to install an ESP on the boilers. A notice of completion of construction of the ESP, serving both boilers, was received by Oregon DEQ on May 27, 2022. A permit modification was issued July 25, 2023 including PSELs listed in table 4.1.11A.

Table 4.1.11A. PSELs and actual emissions for Gilchrist Forest Products for 2023.

Pollutant	PSELs (tons/year)	2023 Actual Emissions (tons/year)
PM_{10}	77	14.2
NOx	99	48.7
SO_2	6	2.8

Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Gilchrist Forest Products has followed SAFO requirements.

4.1.12 Northwest Pipeline LLC – Baker Compressor Station

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Northwest Pipeline LLC – Baker Compressor Station was required to meet the PSELs listed below in tables 4.13.1 and 4.13.2. A Title V renewal permit with these PSELs incorporated was issued on Sep 25, 2023.

Table 4.1.12A. PSELS and actual emissions for Northwest Pipeline LLC – Baker Compressor Station.

From Aug. 1, 2022 – July 31, 2023		
Pollutant	**PSELs (tons/year)**	**Aug. 2022 Actual Emissions,12 month rolling average (tons/year)**
PM_{10}	5	1.2
NOx	473	167.7
SO_2	2	0.2

Table 4.1.12B. PSELs and actual emissions for Northwest Pipeline LLC – Baker Compressor Station.

From Aug. 1, 2023 – July 31, 2024		
Pollutant	**PSELs (tons/year)**	**2023 Actual Emissions (tons/year)**
PM_{10}	5	1.1
NOx	404	29.8
SO_2	2	0.13

There were additional PSELs stated in the SAFO that are not applicable until Aug. 1, 2024, Aug. 1, 2025, and Aug. 1, 2026. Instead of meeting the PSELs, Northwest Pipeline LLC may request in writing by July 31, 2026, to replace EU1 and EU2. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Northwest Pipeline LLC – Baker Compressor Station has followed SAFO requirements.

4.1.13 JELD-WEN

At the time the Regional Haze 2018-2028 SIP was completed, the JELD-WEN permit modification was not yet complete. Oregon DEQ issued a permit modification on Aug. 11, 2022 with updated PSELs of 30 tons/year for PM10, 70 tons/year for NOx, and 5 tons/year of SO2. The facility's new Q/d was calculated to be 4.98.

Table 4.1.13A. PSELs and actual emissions for JELD-WEN.

From Aug. 1, 2022 – July 31, 2023		
Pollutant	**PSELs (tons/year)**	**2022 Actual Emissions (tons/year)**
PM_{10}	30	9.4
NOx	70	20.4
SO_2	5	1.0

Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that JELD-WEN has followed Regional Haze 2018-2028 SIP and permit requirements.

4.1.14 Cascade Pacific Pulp, LLC – Halsey Pulp Mill

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Cascade Pacific Pulp, LLC – Halsey Pulp Mill was required to not combust fuel oil #6 by June 30, 2024. The permittee has met this requirement and has not combusted fuel oil #6 since 2019. Cascade Pacific Pulp, LLC – Halsey Pulp Mill and DEQ agreed to amendment 2 to this SAFO which requires that Power Boiler #2 be replaced with a unit that will have an emission limit of 0.036 lbs. of NOx/MMBtu as a 30 day rolling average. The permittee is required to meet with DEQ by Jan. 1, 2028 to discuss a permit application schedule for this modification. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Cascade Pacific Pulp, LLC – Halsey Pulp Mill has followed SAFO requirements.

4.1.15 Georgia Pacific – Toledo LLC

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Georgia Pacific – Toledo LLC was required to determine whether they would commit to completing a NOx reduction project, or whether they would replace three boilers: EU-11, EU-13, and EU-18, by July 31, 2022. The permittee sent DEQ a permit application on July 26, 2022 detailing their decision to replace the boilers. The permittee met with DEQ on May 24, 2022 where technical details and a permit approval schedule was outlined.

The permittee has outlined their intent to replace boilers EU-11, EU-13, and EU-18 by July 31, 2031. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Georgia Pacific – Toledo LLC has followed SAFO requirements.

4.1.16 Boise Cascade Wood Products, LLC – Medford

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Boise Cascade Wood Products, LLC – Medford was required to meet the PSELs listed in the tables below.

Table 4.1.16A. Combined PSELs and actual emissions for Boise Cascade Wood Products, LLC – Medford.

From Aug. 1, 2021 – July 31, 2023		
Pollutant	**PSELs (tons/year)**	**2021 Actual Emissions (tons/year)**
PM_{10} + NOx + SO_2	396	211.6

Table 4.1.16B. Combined PSELs and actual emissions for Boise Cascade Wood Products, LLC – Medford.

From Aug. 1, 2021 – July 31, 2023		
Pollutant	**PSELs (tons/year)**	**2022 Actual Emissions (tons/year)**
PM_{10} + NOx + SO_2	396	193.4

Table 4.1.16C. Combined PSELs and actual emissions for Boise Cascade Wood Products, LLC – Medford.

From Aug. 1, 2023 – July 31, 2024		
Pollutant	**PSELs (tons/year)**	**2023 Actual Emissions (tons/year)**
PM_{10} + NOx + SO_2	381	206

The permittee requested a minor permit modification on July 19, 2022, which outlines how the facility will achieve reductions to meet the PSELs of 381 tons/year for PM_{10}, NOx, and SO_2 for Aug. 1, 2023 – July 31, 2024. DEQ accepted this permit modification on Nov. 3, 2022.

There were additional PSELs stated in the SAFO that are not applicable until Aug. 1, 2024, Aug. 1, 2025, and Aug. 1, 2026. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Boise Cascade Wood Products, LLC - Medford has followed SAFO requirements.

4.1.17 Biomass One, L.P.

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, Biomass One, L.P. was required to install CEMS to North and South Boilers by July 31, 2022. Biomass One, completed installation and associated testing on July 26 – 27, 2022. The permittee was required to submit data by Dec. 31, 2022 and it submitted CEMS data on Sep26, 2022 which has not yet been certified by DEQ.

Additionally, the permittee was required to design a NOx optimization plan. The permittee submitted a draft plan on Dec. 28, 2022. DEQ requested revisions and a revised plan was submitted Feb. 8, 2023, which was accepted by DEQ.

The plan outlined an experimental design to determine the relationship between NOx emissions

and various operational parameters. First, Biomass One established a baseline NOx emission factor using their current best management practices. Next, Biomass One determined an experimental NOx emission factor under reduced primary air boiler operation while maintaining excess oxygen in the boiler. And finally, they determined a NOx emission factor when secondary air flow is significantly reduced. The results of these three experiments were expected Aug. 18, 2023. Biomass One sent a letter to DEQ dated July 28, 2023 requesting a 3 month extension which DEQ granted. Biomass One submitted a report on the NOx optimization project which was received by DEQ on Dec. 5, 2023.

The results of the NOx optimization project demonstrated that “none of the configurations demonstrated a repeatable, statistically significant relationship between identified operating parameters and NOx generation (Biomass One, November 2023).” The experiment used a sample size of “nearly 35,000 data points (Biomass One, November 2023).” With the completion of this NOx optimization plan, there were no further actions required by the permittee.

The permittee is required to provide notice to DEQ within 14 days of finalizing a power purchase Agreement. The current agreement expires Dec. 31, 2026.

If a new power purchase Agreement is completed, then within 180 days of notifying DEQ of the new PPA, Biomass One is required to submit an application for NOx reduction technology. This NOx reduction technology is required to include an SCR on the North and South boilers. If installation of an SCR is technically infeasible or presents other unacceptable impacts, the permittee will propose the best available, technically feasible, and achievable NOx reduction option for DEQ’s approval. Biomass One L.P. would be required to complete implementation of the agreed upon NOx reduction technology within 18 months of DEQ’s notice of approval.

Based on the information available to DEQ at the time this report was compiled, DEQ’s assessment was that Biomass One, L.P. has followed SAFO requirements.

4.1.18 Roseburg Forest Products – Dillard

As part of Oregon’s Regional Haze 2018-2028 SIP and as outlined in the SAFO, Roseburg Forest Products – Dillard was required to install CEMS to measure emissions of NOx from Boilers 1, 2, and 6 by July 31, 2022. The CEMS was installed, and a Relative Accuracy Test Audit was completed Sep 14-20, 2022. The permittee was required to submit data by Dec. 31, 2022 and it submitted CEMS data on Dec. 27, 2022. At the time this report was compiled, Oregon DEQ has not yet certified the test report.

The permittee was required to notify DEQ whether they would comply with emissions limits on the boilers or install a SNCR before Jan.31, 2024. The permittee submitted a letter to DEQ on Jan. 20, 2024 noting that their intent to pursue boiler optimization to meet emission limits. Separately from SAFO requirements, the permittee submitted a notice of approval to construct a SNCR for Boilers 1, 2, and 6 in a letter dated May 2, 2024. The permittee submitted the permit application on April 26, 2024 which was accepted by DEQ on May 2, 2024.

Additionally, Roseburg Forest Products – Dillard was required to meet emissions limits as summarized below in Table 4.1.18A. Roseburg Forest Products reported that there was one day in April 2024 when Boiler 6 had a 7-day rolling average NOx limit as 0.29 lb/MMBtu, but the average emissions from all three boilers was less than 0.28 lb/MMBtu which satisfies SAFO limits. A permit modification was completed on July 23, 2022 to incorporate SAFO emission limits for Boilers 1, 2, and 6.

Table 4.1.18A. NO_X limits for Roseburg Forest Products – Dillard.

Boiler	7-day rolling average (lb NO_X/MMBtu)
1	0.30
2	0.30
6	0.28

There were additional NOx emission limits for Boilers 1, 2, and 6 stated in the SAFO that are not applicable until June 30, 2025. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that Roseburg Forest Products - Dillard has followed SAFO requirements.

4.1.19 International Paper – Springfield

As part of Oregon's Regional Haze 2018-2028 SIP and as outlined in the SAFO, International Paper – Springfield was required to meet the PSELs listed below for the Power Boiler, Package Boiler, Lime Kilns, and Recovery Furnace. These PSELs were established in the permit renewal issued on Jan. 23, 2024.

The permittee agreed to combust only natural gas in the Power and Package Boilers, Black Liquor Solids and natural gas in the Recovery Furnace, and natural gas, product turpentine, and product methanol in the Lime Kilns; all with the exception to combust ultra-low sulfur diesel for no more than 48 hours per year during natural gas curtailments. These fuel limitations were established in the permit renewal issued Jan. 23, 2024.

Table 4.1.19A. PSELs and actual emissions for International Paper – Springfield.

On and after July 31, 2022		
Pollutant	**PSELs (tons/year)**	**2023 Actual Emissions (tons/year)**
PM_{10}	177	149
NOx	962	526
SO_2	237	44

The permittee was required to install CEMS and measure the emissions of NOx from the Power Boiler. The CEMS was installed on Dec. 28, 2022 and the RATA was completed March 1, 2023. The Power Boiler NOx CEMS RATA was certified by LRAPA on May 8, 2023, ahead of the due date of May 31, 2023.

The permittee has begun a project to reduce NOx emissions from the Power Boiler to comply with the 7-day rolling average limit of 0.25 lbs. NOx/MMBtu that will begin Jan. 31, 2025. The permittee, in a communication dated April 5, 2024, reported the average Power Boiler NOx 7-day rolling average for June 2023 - March 2024, as 0.19 lbs. NOx/MMBtu. As this is an informal communication and the requirement won't begin until Jan. 31, 2025, LRAPA did not certify or formally accept this report.

There were additional NOx PSELs for the Power Boiler stated in the SAFO that are not applicable until Dec. 31, 2025. Based on the information available to DEQ at the time this report was compiled, DEQ's assessment was that International Paper Company Springfield Mill has followed SAFO requirements.

4.2 Emissions reductions from Regional Haze State Implementation plan strategies

The RHR paragraph in 40 CFR 51.308(g)(2) requires "A summary of the emissions reductions achieved throughout the state through the implementation of the measures described in paragraph (g)(1) of this section." Therefore Table 4.2 below of this section of the progress report, gives a description of some of the emissions reductions measures described above in Section 4.

Eleven out of 31 facilities that were required to do a four-factor analysis had new regional haze enforceable limits that were implemented in 2022 and thereafter for the Regional Haze 2018-2028 plan. Table 4.2B below provides combined NOX, PM_{10}, and SO_2 actual emissions including emission changes from 2017 to 2023. These emission changes are mostly due to the new limits established in the facilities permits. The reduction in limits forces these facilities to simultaneously reduce actual emissions to prevent exceedance of these new permit limits. Most control technologies that are required of facilities in Regional Haze round two were not scheduled for installation until 2024 - 2025 and therefore, changes in facility controls do not account for emission changes observed by most facilities in this report. Assessment of future facility reports will provide a better understanding of how the controls required as part of the Regional Haze program impacted facility emissions.

Overall, emissions have decreased for these facilities after the second plan up until now. The most significant increase in emissions, of 861 tons per year, was by PGE's Beaver Plant/Port Westward 1 located in Clatskanie Oregon. As a result, enforcement case AQ-TV-HQ-2024-042 was initiated and civil penalty fines totaling $145,200 were issued. PGE and Oregon DEQ entered a mutual agreement and final order on April 19, 2024.

Oregon DEQ also identified the Clearwater Paper Corporation, PPD and CPD as a facility from which emissions could impact the Class I area at the Hells Canyon Wilderness. Idaho DEQ identified the Clearwater Paper Corp. as having effective existing controls for their Regional Haze program in their 2024 Regional Haze Supplement, which was recently approved by EPA. Idaho reported in the Regional Haze Supplement that Clearwater Paper Corp. had several new

permit conditions in 2023 in relation to construction of a No. 4 recovery furnace that will presumably impact haze pre-cursor emissions. New permit conditions were issued on Sept. 28, 2023, including: new No.4 recovery furnace NOx emissions limits, and No. 4 recovery furnace BLS firing rate limit as well as 2.5 No.4 recovery furnace BLS Firing Rate monitoring 3.10 No.4 monitoring and recordkeeping. DEQ will communicate with Idaho DEQ staff to get further updates on the status of this facility and others in adjacent states that may impact Class I areas in Oregon.

Table 4.2A. Relevant emission reduction measures for facilities required to reduce PSELs or other actions in the 2018-2028 Regional Haze State Implementation plan. Note: N/A denotes not applicable because reductions have not been required until future dates listed in this table.

Facility ID	Facility Name, City, County	SAFO Agreement			
		RH Progress Report Section	Emission Reduction Measure	Starting Date	New NO_X, PM_{10}, SO_2 Combined PSELs (tons/year)
01-0038	NW Pipeline LLC-Baker Compressor Station, Baker City, Baker	4.13	PSEL Reduction	8/1/2022	411
03-2145	Willamette Falls Paper Company, West Linn, Clackamas	4.6	PSEL Reduction	1/1/2022	265
04-0004	Georgia Pacific-Wauna Mill, Clatskanie, Clatsop	4.3	PSEL Reduction	1/1/2022	4009
05-1849	City of St Helens formerly A Division of Cascades Holding US Inc., Saint Helens, Columbia	4.7	PSEL Reduction	8/1/2022	156
05-2520	PGE Beaver Plant/Port Westward I Plant, Clatskanie, Columbia	4.8	PSEL Reduction	1/1/2022	1,382
10-0025	Roseburg Forest Products, Dillard, Douglas	4.19	Install CEMs and comply with boiler NOx limits	6/30/2025	N/A

Facility ID	Facility Name, City, County	SAFO Agreement			
		RH Progress Report Section	Emission Reduction Measure	Starting Date	New NO_X, PM_{10}, SO_2 Combined PSELs (tons/year)
15-0004	Boise Cascade Wood Products, Medford, Jackson	4.17	PSEL Reduction	8/1/2022	381
15-0159	Biomass One, L.P., White City, Jackson	4.18	N/A	N/A	N/A
18-0005	Interfor, Gilchrist, Klamath	4.12	PSEL Reduction	7/25/2023	182
18-0006	dba JELD-WEN, Klamath Falls, Klamath	4.14	PSEL Reduction	1/1/2022	105
208850	International Paper, Springfield, Lane	4.2	PSEL Reduction for boilers, kilns, and recovery furnace only	7/31/2022	1376
21-0005	Georgia-Pacific, Toledo, Lincoln	4.16	Boiler replacement	7/31/2031	N/A
22-3501	Halsey Pulp Mill, Halsey, Linn	4.15	Halt combustion of fuel oil #6 by 6/6/2024; meet with DEQ by 1/1/2028 to discuss power boiler replacement.	6/6/2024; 1/1/2028	N/A
26-1865	EVRAZ Inc., Portland, Multnomah	4.5	Low NOx burners required to be installed by 12/31/2024	12/31/2024	N/A
26-1876	Owens-Brockway Glass Container Inc., Portland, Multnomah	4.2	Removed Furnace A	7/7/2021	300
31-0006	Boise Cascade Wood Products, Elgin, Union	4.9	SO_2 only PSEL Reduction	5/23/2022	17.1

Table 4.2B. 2017 to 2023 emission changes for facilities required to reduce PSELs or other actions in the 2018-2028 SIP.

Facility ID	Facility Name, City, County	Combined NO_X, PM_{10}, SO_2 actual emissions (tons/year)			
		2017	2020	2023	2017-2023 Emission Change
01-0038	NW Pipeline, LLC- Baker Compressor Station, Baker City, Baker	162	92	45	-117
03-2145	Willamette Falls Paper Company, West Linn, Clackamas	204	86	180	-24
04-0004	Georgia Pacific- Wauna Mill, Clatskanie, Clatsop	2353	2406	2323	-30
05-1849	City of St Helens formerly A Division of Cascades Holding US Inc., Saint Helens, Columbia	265	65	55	-210
05-2520	Beaver Plant/Port Westward I Plant, Clatskanie, Columbia	431	475	1293	861[2]
10-0025	Roseburg Forest Products, Dillard, Douglas	1560	1518	702	-858
15-0004	Boise Cascade Wood Products, Medford, Jackson	254	188	206	-48
15-0159	Biomass One, L.P., White City, Jackson	269	383	310	41
18-0005	Interfor, Gilchrist, Klamath	188	89	96	-92
18-0006	dba JELD-WEN, Klamath Falls, Klamath	45	44	67	22
208850[1]	International Paper, Springfield, Lane	973	719	---	-254
21-0005	Georgia-Pacific, Toledo, Lincoln	1151	1050	869	-282
22-3501	Halsey Pulp Mill, Halsey, Linn	712	733	528	-184
26-1865	EVRAZ Inc., Portland, Multnomah	261	205	224	-37
26-1876	Owens-Brockway Glass Container Inc., Portland, Multnomah	598	258	130	-468
31-0006	Boise Cascade Wood Products, Elgin, Union	182	129	138	-45
Grand Total		9607	8439	7164	-1724

Note: [1] at the time this report was compiled, Oregon DEQ did not have access to the LRAPA 2023 data from the National Emissions Inventory to obtain data for International Paper; [2] the Beaver Plant #05-2520 was issued a violation and penalty fine of $145,000 for exceeding plant site emission limits in April of 2024.

5. Programs that impact regional haze precursors in Oregon

Summary

The following sections describe updates to ongoing programs and regulations in Oregon that directly protect visibility or can be expected to improve visibility in Oregon Class I areas, by reducing emissions in general. This summary does not attempt to estimate the expected improvements in visibility, as many of the benefits are secondary to the primary air pollution objective of these programs/rules. Consequently, the expected improvements in visibility would be difficult to quantify, due to the technical complexity and limitations in current assessment methods.

5.1 Employee commute options

DEQ established a mandatory Employee Commute Options program within the Portland Air Quality Maintenance Area, which applies to employers with more than 100 employees at a work site. Approximately 700 work sites in the Portland metro area participate in the ECO program. The ECO Program aims to cut mobile emissions by encouraging employers to offer commute options that reduce single-occupancy vehicle trips to worksites by 10%. Employers participating in the program conduct a baseline survey for each site, develop trip reduction plans and report to DEQ. Follow-up surveys are reported every two years to measure progress toward meeting the commute trip reduction target. By comparing the data from successive surveys, employers can track changes in employee commuting patterns and assess the effectiveness of trip reduction strategies. DEQ estimates ~37% of daily greenhouse gas emissions are from passenger cars commuting during peak hours on weekdays.

Employer-based commute option programs bring multiple benefits to air quality, workers and employers. DEQ's calculations show that commute options like using transit, biking and telecommuting can prevent up to tens of thousands of tons of greenhouse gasses, smog forming pollutants, and toxic air contaminants from entering the air each year. An estimated 338,736,265 vehicle miles traveled were reduced by this program from 2018-2022.

5.2 Diesel emissions mitigation grants

DEQ allocated approximately $8 million each year during 2021 and 2022. The Diesel Emissions Mitigation Grants program used these funds to reduce over 200 tons of diesel emissions, install diesel exhaust control technology, upgrade to new, cleaner diesel equipment, and to support the purchase of dozens of new medium and heavy-duty zero emissions electric vehicles operating in Oregon. The program has invested in communities throughout the state including in Southern Oregon, central Willamette Valley, and the Portland metro area.

The Diesel Emissions Mitigation Grants program will continue to allocate approximately $8 million per year for at least three more funding cycles through 2025, when DEQ expects all the available funds to be allocated to air quality projects. Oregon has until 2027 to use available funds, or they risk being sent back to the trustee.

5.3 Clean Fuels Program

The Clean Fuels Program seeks to reduce greenhouse gas emissions from Oregon's transportation fuels. The Clean Fuels Program accomplishes this by identifying the carbon intensity, or level of carbon emissions, for each type of available fuel and then setting the level of carbon intensity of transportation fuels used in Oregon. DEQ requires fuel providers to show that the volume and type of fuel they supply for use in Oregon meets the carbon intensity level for that year. DEQ gradually lowers the amount of carbon intensity in fuel allowed each year to meet the annual reduction goal. DEQ is on-track to achieve a 10% reduction in greenhouse gas emissions from Oregon's transportation fuels by 2025. Key regional haze highlights since the program's 2016 launch include cleaner biofuel production, increased biofuel deliveries to Oregon, and reduced tailpipe pollution through biofuel and electric transitions, improving public health.

5.4 VOCs in consumer products and architectural and industrial maintenance coatings

DEQ is conducting a rulemaking to instate new required limits on the content of volatile organic compounds of consumer products and architectural coatings. This rulemaking is designed to limit the emissions of one category of ozone pre-cursors from this emission source category. This rulemaking will likely follow one of two potential regulatory models: 1) rules for the California Air Resources Board districts applying to consumer products and architectural coatings, or 2) model rules developed by the Ozone Transport Commission for consumer products and architectural and industrial maintenance coatings. The estimated emissions reductions for VOCs associated with this rulemaking in Oregon are 2,206-4,844 tons of VOCs per year. The rulemaking process for this new regulation is expected to conclude by the end of 2025.

5.5 Reducing VOC emissions at gasoline dispensing facilities

Oregon's Environmental Quality Commission adopted new rules for gasoline dispensing facilities and vapor recovery equipment at those facilities that will reduce emissions of VOCs and hazardous air pollutants. The rules require many facilities to decommission Stage II incompatible equipment to minimize vapor loss associated with Stage II vapor recovery equipment that is incompatible with the onboard refueling vapor recovery systems in modern gasoline powered vehicles. In addition, these rules put in new requirements for tanks that are replaced or newly installed and requires gasoline dispensing facilities with throughput higher

than one million gallons per year to have Stage I Enhanced Vapor Recovery technology and enhanced conventional nozzles by 2030. This rule is estimated to reduce VOC emissions by more than 844 tons per year (see page 44 of the public notice available on DEQ's rulemaking website for the Gasoline Dispensing Facility rule updates).

5.6 Oregon Clean Vehicle Rebate Program

To accelerate the transition from gasoline cars to electric vehicles, the Oregon Legislature created the Oregon Clean Vehicle Rebate Program. This program provides rebates to maximize incentives for Oregonians to purchase or lease battery electric or plug-in hybrid electric vehicles. The rebate program was designed to encourage higher adoption of electric vehicles, reduce air pollution and advance progress toward the state's greenhouse gas reduction goals. The OCVRP offers two different types of rebates: a standard rebate available to all Oregon residents that purchase or lease a new eligible vehicle and an enhanced Charge Ahead Rebate to make zero emissions vehicles more accessible for those with low or moderate incomes.

Since the program's inception in 2018, the program has issued 30,416 rebates to Oregon residents, businesses, agencies and organizations, with about 16% of those rebates going to low- and moderate-income applicants. In summer 2023, the Oregon Clean Vehicle Rebate Program worked with Atlas Public Policy to analyze the program's impact on greenhouse gas emissions, air pollutants, and resulting community health impacts. The analysis found that rebated vehicles resulted in a net reduction of CO_2 emissions of nearly 875,000 tons. It also showed that transitioning to more electric vehicles reduced select air pollutants, including a net decrease of 158 tons of NOx and 17 tons of $PM_{2.5}$. Additionally, the analysis estimated that the in-state health impacts due to the rebate program were $1.5-3.4 million.

5.7 The Clean Air Construction Program

The Clean Air Construction Program is a collaboration among the City of Portland, Port of Portland, Multnomah County, Washington County, TriMet, Portland Community College and Metro ("Clean Air Construction Agencies") to reduce diesel emissions in participating agencies' construction projects in the Portland metro region. This is accomplished by implementing a standard set of idle reduction and diesel equipment requirements on job sites and implementing a regional program to verify compliance.

The Clean Air Construction Program began in 2020 with idling requirements, and then phased in diesel engine requirements in 2022. As of January 1, 2024, no diesel engines on non-road equipment that are lower than Tier 4 are allowed on applicable construction projects funded by Clean Air Construction Program agencies, unless they are retrofit. While not yet quantified based on program data, this program is expected to reduce particulate matter in the Portland metro region.

5.8 Emissions standards for light- and heavy-duty vehicles

In 2021, DEQ's Environmental Quality Commission adopted medium- and heavy-duty diesel engine standards that were previously adopted in California. Oregon is one of the Section 177 states that has opted in to California's vehicle and truck emission standards. This rulemaking adopted by reference a few of California's rules including: 1) the Advanced Clean Trucks rule, which requires manufacturers of medium- and heavy- duty vehicles to sell a certain percentage of zero emission vehicles beginning with the 2025 vehicle model year, 2) the Heavy Duty Low NOx Omnibus rules which require heavy duty vehicle manufacturers to comply with tougher NOx emission standards, overhaul engine testing procedures and further extend engine warranties to ensure NOx emissions are reduced, and 3) updates to the low emission vehicle program rules to ensure they are identical to California's current light duty vehicle emission standards.

DEQ passed another rule in 2022, which requires auto manufacturers to produce and deliver increasing percentages of new zero emission light-duty vehicles for consumers. By 2035, all new passenger cars, SUVs, and light-duty pickup trucks must either be battery electric or plug-in hybrid electric vehicles. As Oregon makes the transition, new gasoline vehicles will still be allowed for sale through 2034.

Oregon also adopted the Low Emission Vehicle program, which requires new light-duty vehicles to meet reduce emissions of criteria pollutants such as carbon monoxide, volatile organic compounds, and oxides of nitrogen and air toxics.

5.9 Diesel Emissions Identification Program

DEQ launched the Diesel Emissions Identification Program on April 1, 2024. The program provides emission control labels to voluntary participants for nonroad construction equipment and on-road concrete mixer trucks and dump trucks. These labels can be used to assist in tracking compliance with clean construction standards that are required for certain public works contracts. Participation in the program also provides an opportunity to any contractor or subcontractor in the state to show their commitment to cleaner construction practices.

Outreach efforts are currently underway to connect with government partners and interested parties to spread awareness of the program to construction fleet owners and operators in the state.

6. Visibility progress

Per RHR paragraph in 40 CFR 51.308(g)(3), states with Class I areas must assess the visibility conditions and changes described in items one through three below, expressed in terms of five-year averages of the annual haze index values, in deciview, for the 20% most impaired and clearest days. The applicable period to assess current conditions is the most recent five-year

period preceding the required date of the progress report for which data are available six months preceding the required date of the progress report. Based on this criterion, the most recent five-year period for this progress report submittal is 2018-2022.

1. Current visibility conditions.
2. The difference between current conditions and baseline conditions.
3. The change in visibility impairment over the period since the period addressed in the most recent plan required under 40 CFR 51.308(f).

To satisfy items 1 and 2, current conditions, baseline conditions, and the difference between the two are shown in Tables 6-1 and 6-2 for the 20% most impaired and the 20% clearest days respectively. For item 3, Tables 6-1 and 6-2 also show current conditions and present the conditions that were last reported in the State Implementation plan for Oregon for the second regional haze planning period. All the haze indexes presented below are based on data that was measured and analyzed as part of the Interagency Monitoring of Protected Visual Environments program and accessed through the Regional Haze Technical Support System.

Tables 6-1 and 6-2 also indicate current five-year haze indexes for all of Oregon's Class I areas are lower than those from the time of baseline, meaning that visibility has improved since the time of baseline for both the 20% most impaired and the 20% clearest days. Furthermore, Tables 6-1and 6-2 show that current five-year haze indexes at all of Oregon's Class I areas are lower than those from the second planning period regional haze SIPs, meaning that there have been similar improvements in visibility since the time of the second planning period regional haze SIPs. Finally, Tables 6-1 and 6-2 show that current five-year haze indexes are below the modeled 2028 reasonable progress goals at Oregon's Class I areas.

Table 6-1. Baseline and current conditions in deciview (Dv) for Oregon's Class I Areas, for the 20% most impaired days.

IMPROVE Monitor	Oregon Class I Areas	2000-2004 Baseline (Dv)	Last Reported (2014-2018) (Dv)	Current Visibility (2018 – 2022) (Dv)	Diff	2028 RP Goal (Dv)	2064 Natural Conditions (Dv)
CRLA1	Crater Lake NP. Diamond Peak W Gearhart Mountain W Mountain Lakes W	9.4	8	7.8	-1.6	7.8	5.2
HECA1	Hells Canyon W	16.5	12.3	11.5	-5.0	11.5	6.6
KALM1	Kalmiopsis W	13.3	12	11.4	-1.9	11.4	7.8
MOHO1	Mount Hood W	12.1	9.3	9.4	-2.7	9.4	6.6
STAR1	Eagle Cap W Strawberry Mountain W	14.5	11.2	10.8	-3.7	10.8	6.6
THSI1	Mount Jefferson W Mount Washington W Three Sisters W	12.8	11.3	10.8	-2.0	10.8	7.3

Note: "NP" denotes National Park areas and "W" denotes Wilderness area. "Diff" denotes the difference in current visibility and baseline values (current - minus baseline); for Diff, negative values suggest improvement in visibility conditions since time of baseline. "RP" denotes reasonable progress goal for deciview, based on models from the TSS; all data were obtained from the Regional Haze Technical Support System.

Table 6-2. Baseline and current conditions in deciview (Dv) for Oregon's Class I Areas, for the 20% clearest days.

IMPROVE Monitor	Oregon Class I Area/s	2000-2004 Baseline (Dv)	Last Reported (2014-2018) (Dv)	Current Visibility (2018 – 2022) (Dv)	Diff	2028 RPG (Dv)	2064 Natural Conditions (Dv)
CRLA1	Crater Lake NP Diamond Peak W Gearhart Mountain W Mountain Lakes W	1.7	1	1.4	-0.3	0.98	0.1
HECA1	Hells Canyon W	5.5	4.0	3.9	-1.6	3.8	2.5
KALM1	Kalmiopsis W	6.3	5.9	5.9	-0.4	5.8	3.7
MOHO1	Mount Hood W	2.2	1.4	1.4	-0.8	1.3	0.9
STAR1	Eagle Cap W Strawberry Mountain W	4.5	2.8	2.8	-1.7	2.6	1.5
THSI1	Mount Jefferson W Mount Washington W Three Sisters W	3.0	2.6	2.7	-0.3	2.5	1.9

Note: "NP" denotes National Park areas and "W" denotes Wilderness area. "Diff" denotes the difference in current visibility and baseline values (current - minus baseline); for Diff, negative values suggest improvement in visibility conditions since time of baseline. RPG denotes reasonable progress goal for deciview, based on models from the TSS; all data were obtained from the Regional Haze Technical Support System.

The following figures 6A-6F illustrate the Uniform Rate of Progress glidepath as defined by EPA, compared to IMPROVE measurements for the period 2000-2022. The URP glidepath is constructed (in deciview) for the 20% most impaired days or clearest days using observations from the IMPROVE monitoring site representing a Class I area. IMPROVE annual average values are presented as points. IMPROVE five-year average values are presented as solid lines covering the periods 2000-2004, 2008-2012, and 2014-2018. The URP glidepath starts with the IMPROVE most impaired days for the 2000-2004 five-year period and draws a straight line to estimated natural conditions in 2064. In the second regional haze planning period, 2064 natural conditions estimates are based on the 15-year average of natural conditions on most impaired days or clearest days in each year 2000-2014. For clearest days, the goal is no degradation of visibility from the 2000-2004 five-year period, therefore glidepath for clearest days is a straight line from the 2000-2004 baseline. Both most impaired days and clearest days are illustrated in the same chart.

Figure 6A. Modeled 2028 RPGs and current conditions for the IMPROVE CRLA 1 monitor representing conditions for Crater Lake National Park Diamond Peak Wilderness, Mountain Lakes Wilderness and Gearhart Mountain Wilderness.

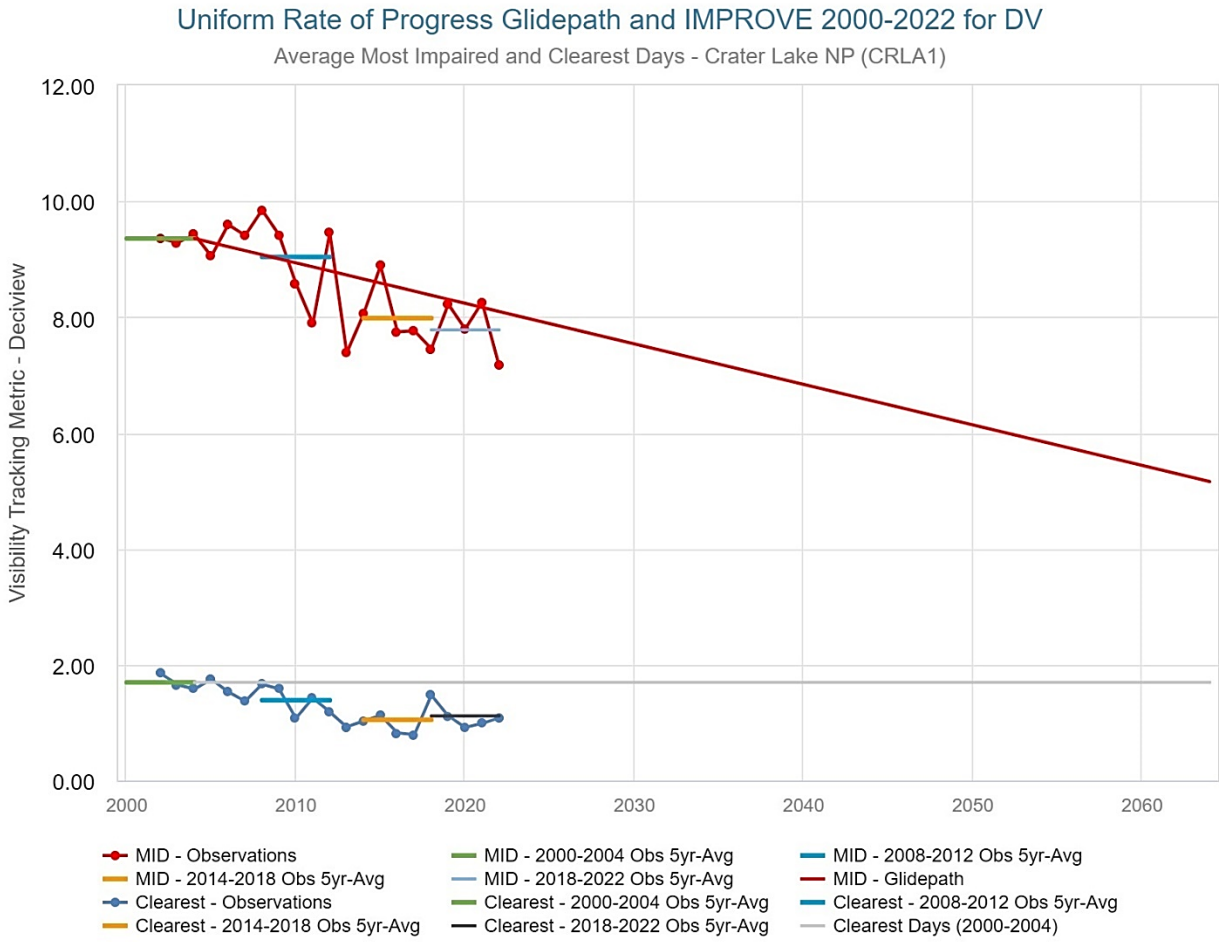


Figure 6B. Modeled 2028 RPGs and current conditions for the IMPROVE MOHO1 monitor representing visibility conditions for Mount Hood Wilderness.

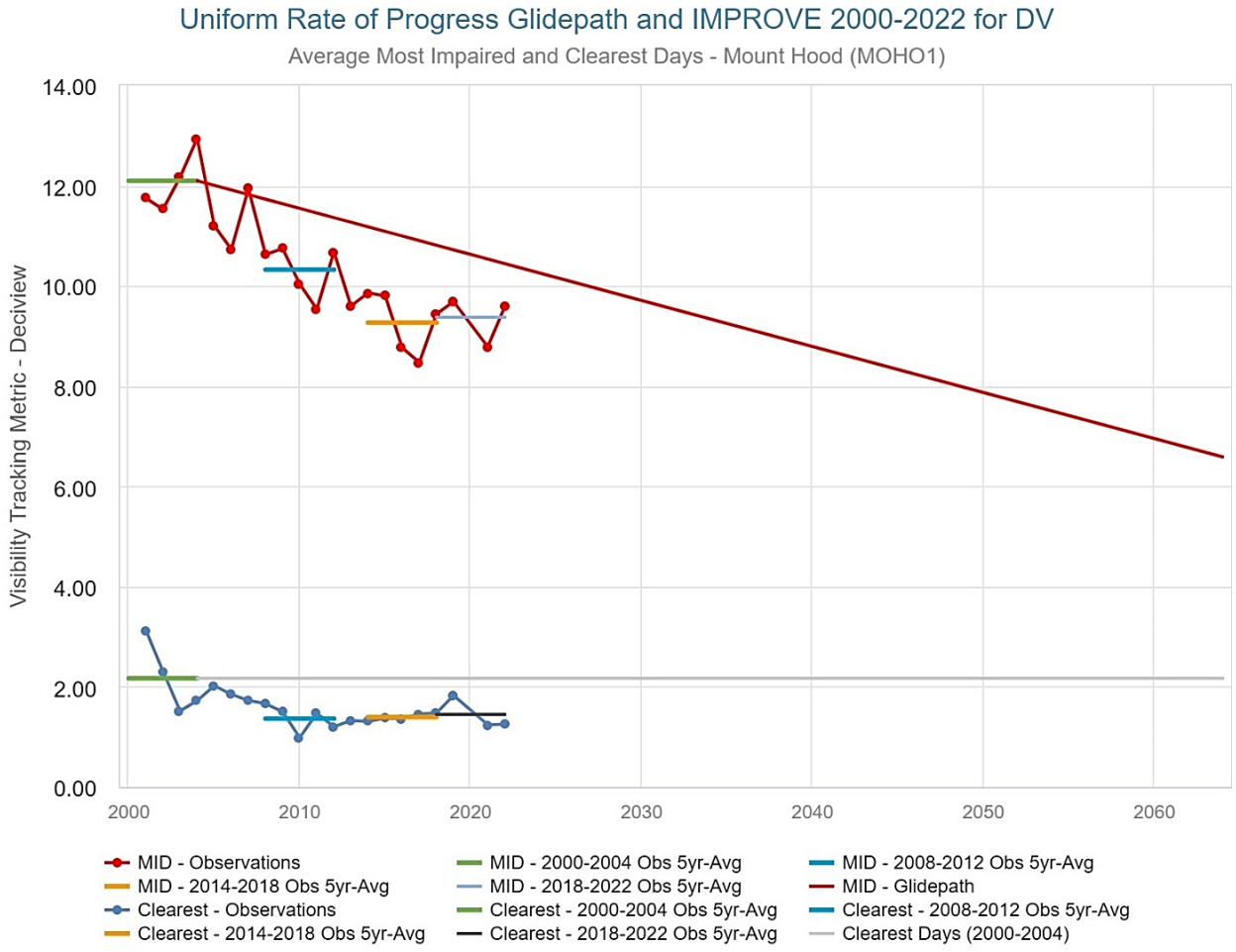


Figure 6C. Modeled 2028 RPGs and current conditions for the IMPROVE HECA1 monitor representing visibility conditions for Hells Canyon Wilderness.

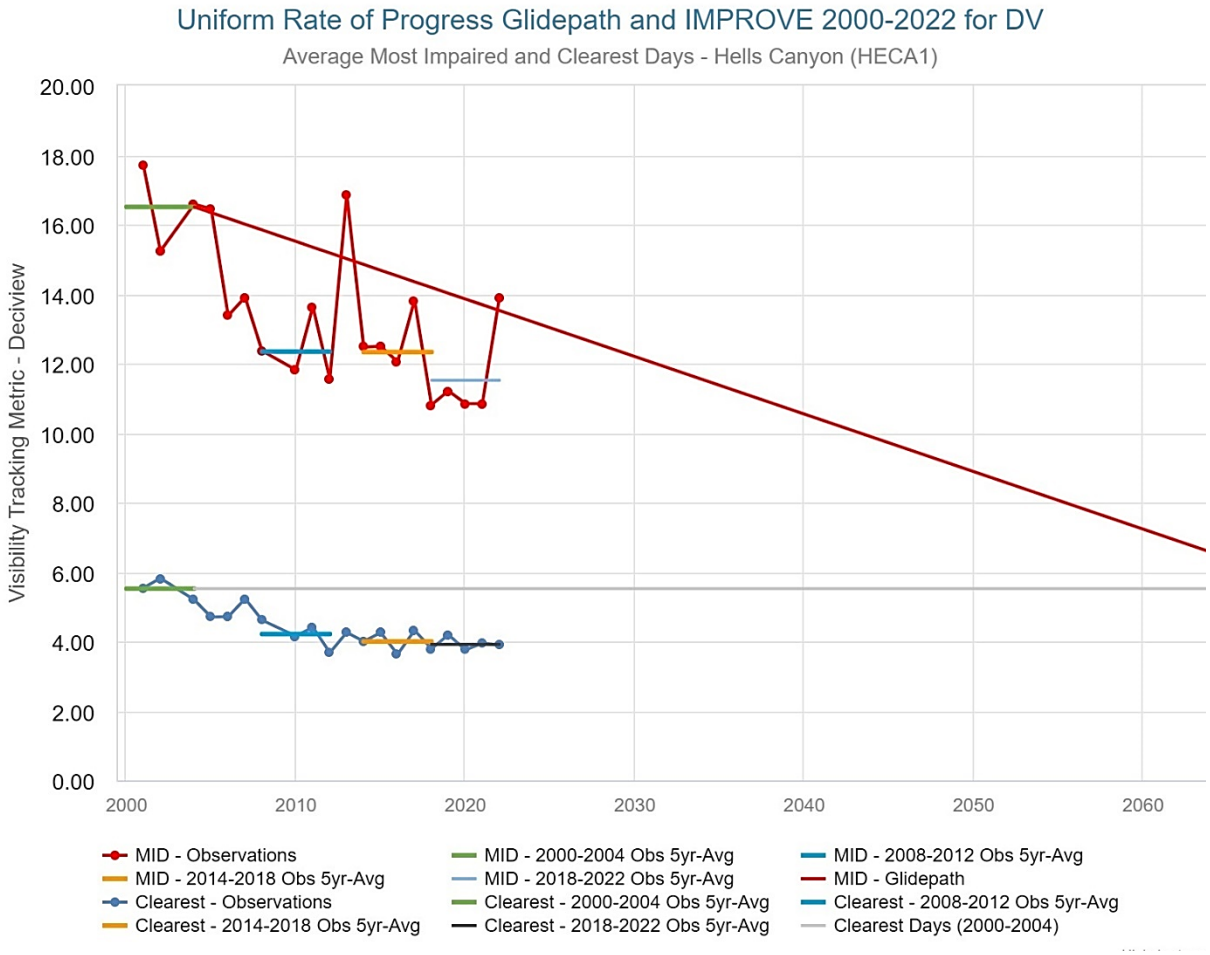


Figure 6D. Modeled 2028 RPGs and Current Conditions for the IMPROVE STAR1 monitor representing conditions for Eagle Cap Wilderness and Strawberry Mountain Wilderness.

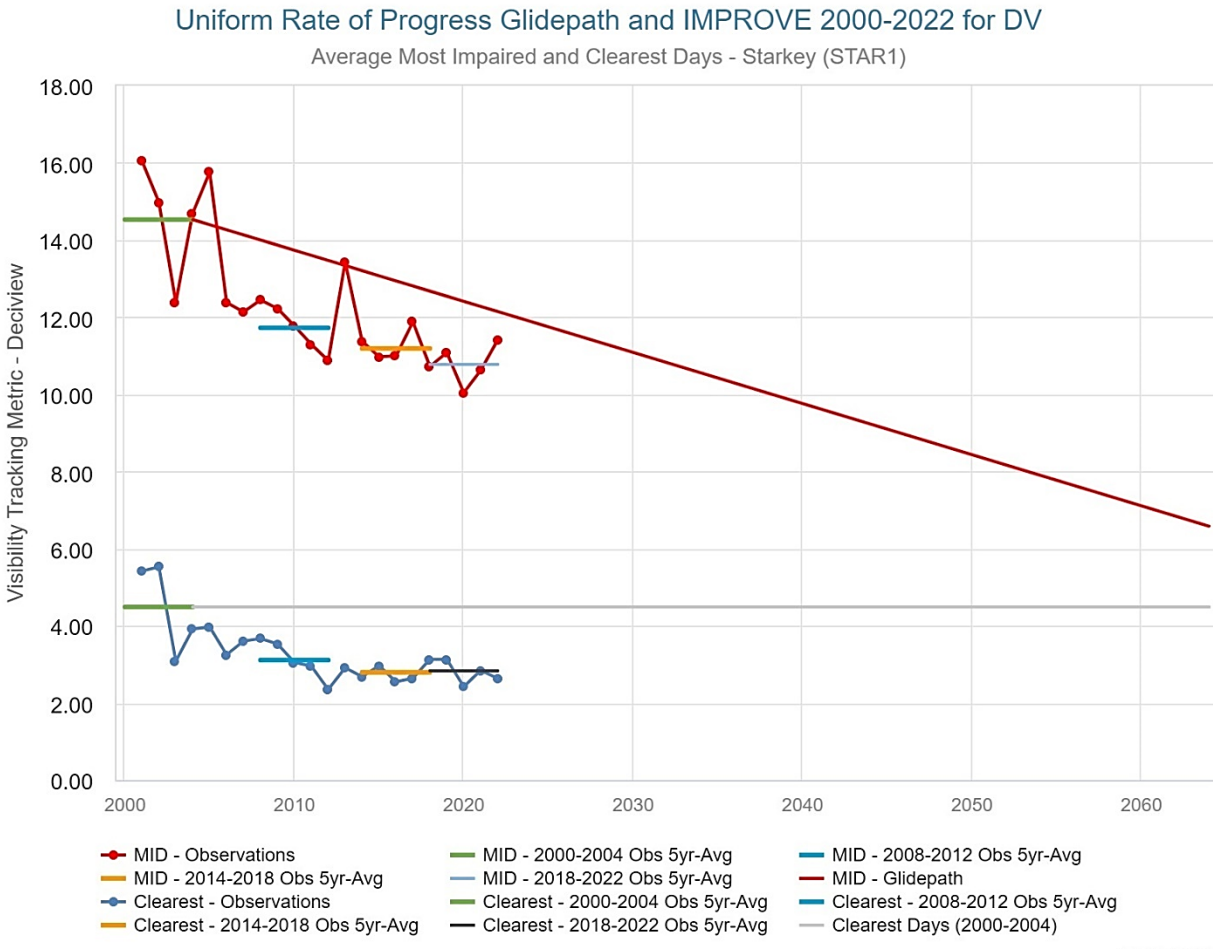


Figure 6E. Modeled 2028 RPGs and Current Conditions for the IMPROVE KALM1 monitor representing conditions Kalmiopsis Wilderness.

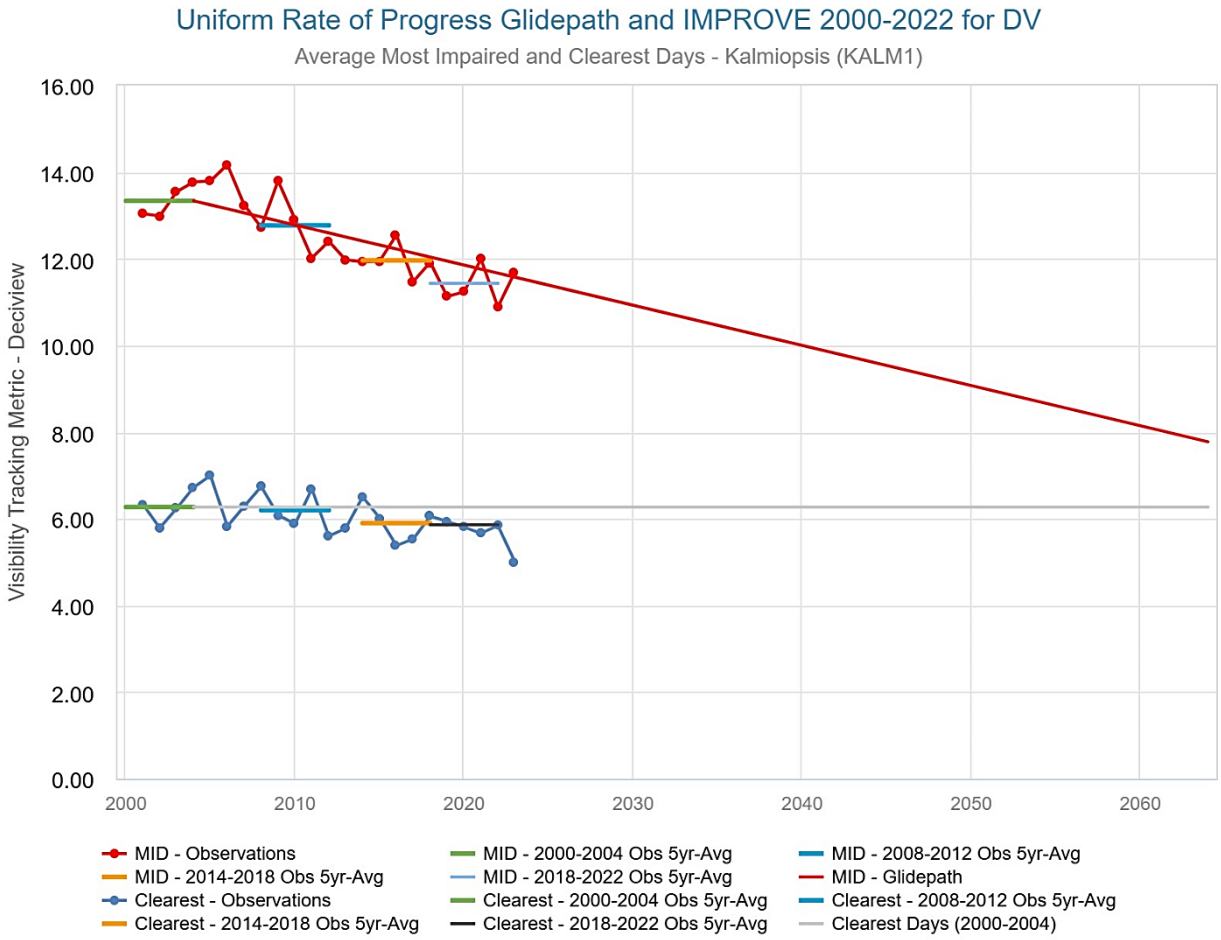
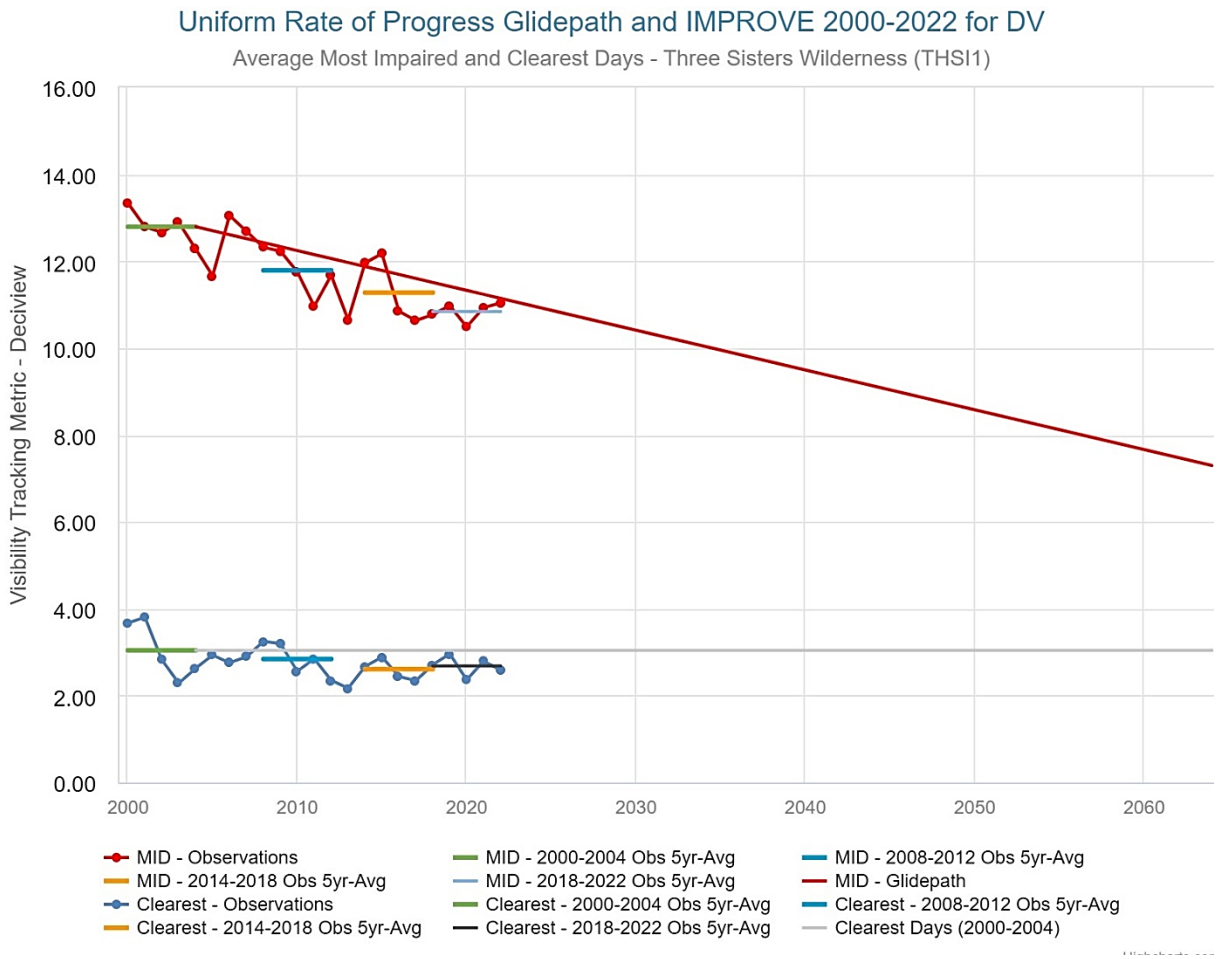


Figure 6F. Modeled 2028 RPGs and current conditions for the IMPROVE THSI1 monitor representing conditions for Mount Jefferson Wilderness Mount Washington Wilderness and the Three Sisters Wilderness.



In addition to the visibility improvements in Oregon's Class I areas, visibility has improved at the Class I areas that are nearby Oregon listed in Tables 6-3 and 6-4.

As part of a broader approach to understanding haze in Oregon, and impacts on Class I areas, DEQ also reviewed visibility trends in the Columbia Gorge. The Columbia River Gorge monitor for which data is presented in this report from 2000-2023 is located near Wishram, Washington (CORI1), and another monitor near Washougal, WA (COGO1) that was discontinued earlier, for which data is presented from 2002-2009. Overall, the longitudinal trends in deciview at the Columbia River Gorge monitor suggest modest but consistent improvement in visibility on both the most impaired days and clearest days (Figures 6G and 6H) between 2000 and 2023.

Figure 6G. Deciview on most impaired and clearest days as measured at the CORI1 monitor in the Columbia River Gorge.

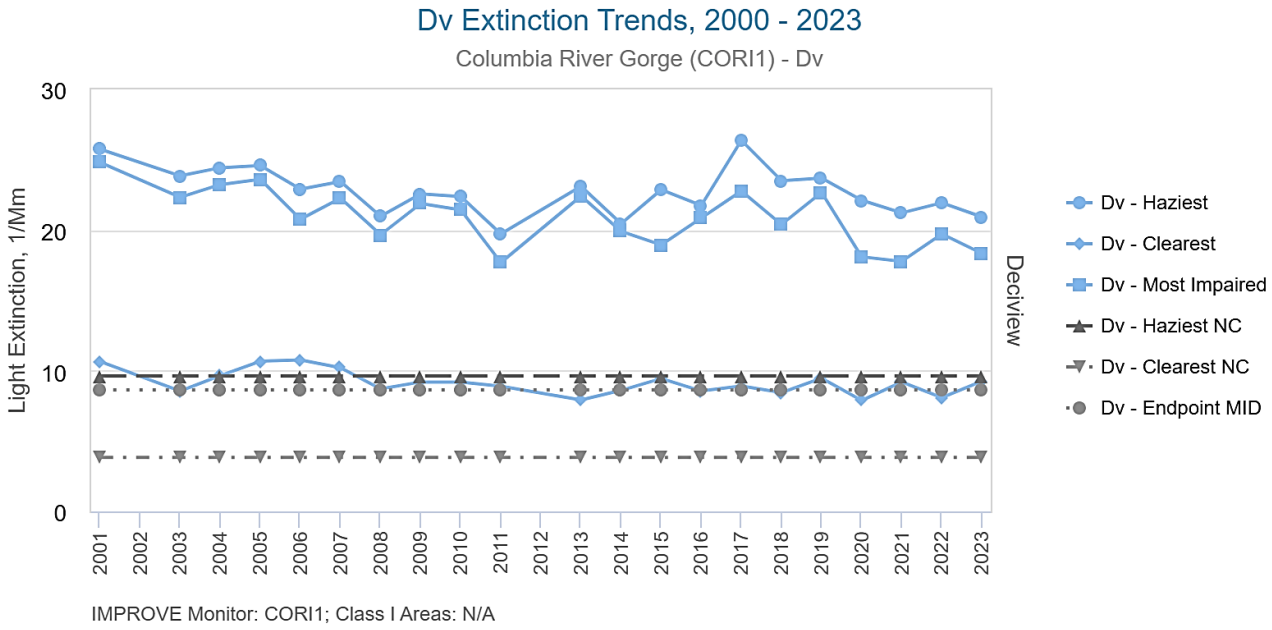


Figure 6H. Deciview on the most impaired days and clearest days (with trendlines) as measured at the CORI1 monitor in the Columbia River Gorge.

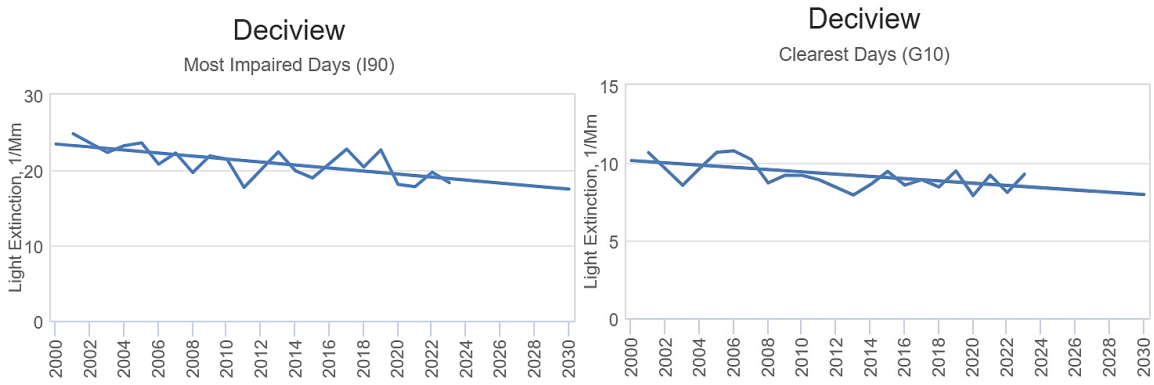


Figure 6I. Deciview on most impaired and clearest days as measured at the COGO1 monitor in the Columbia River Gorge.

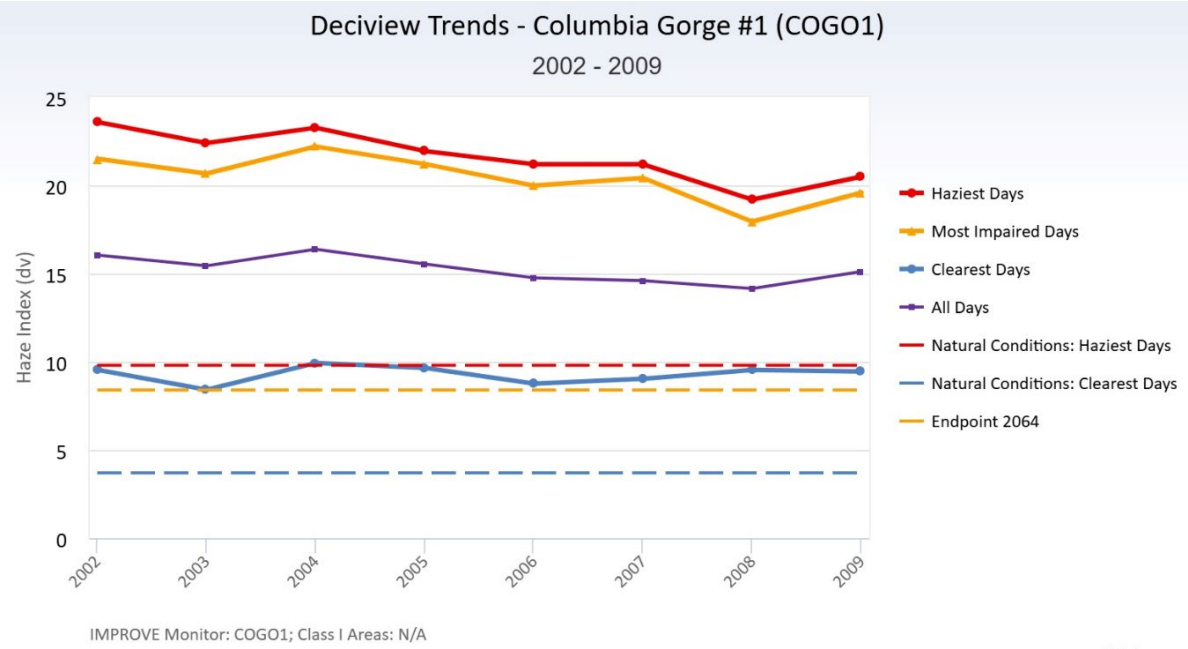


Figure 6J. Deciview on most impaired days as measured at the GOGO1 monitor in the Columbia River Gorge, with trendline.

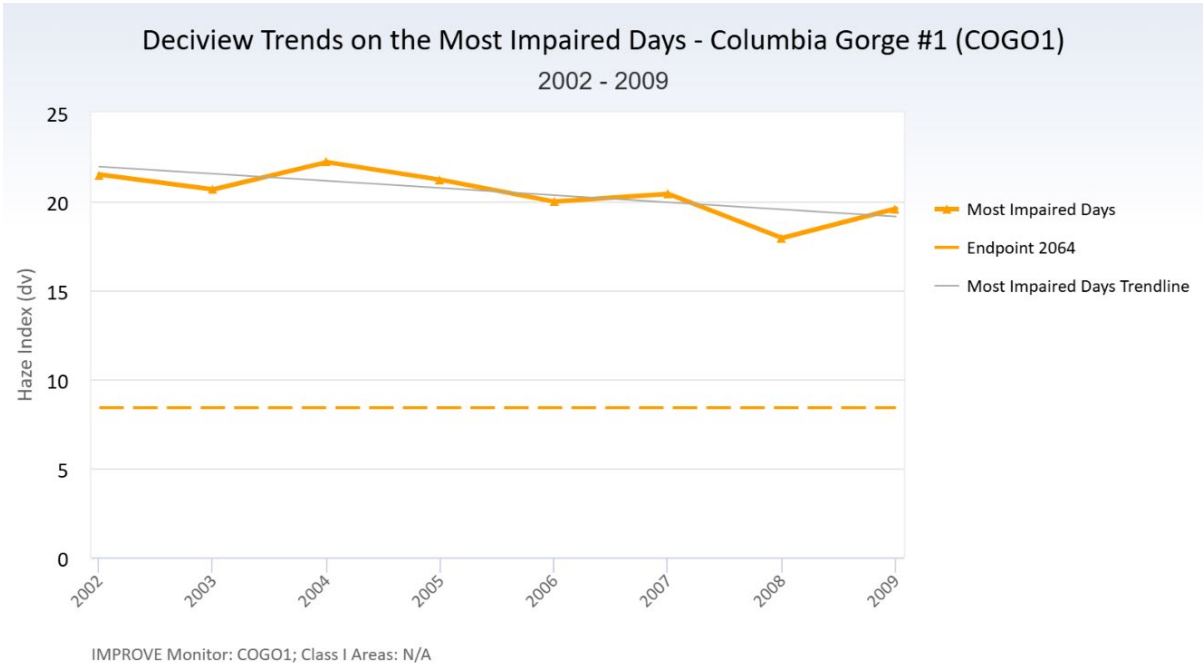
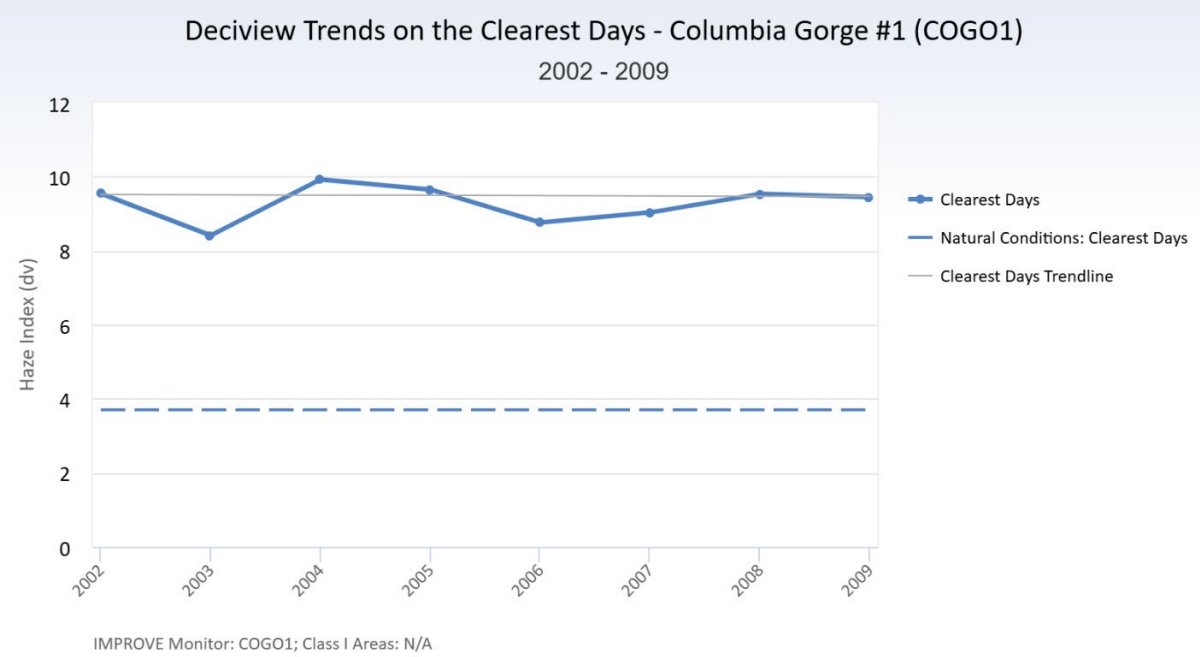


Figure 6K. Deciview on most impaired days as measured at the GOGO1 monitor in the Columbia River Gorge, with trendline.



The Regional Haze Rule in 40 CFR 51.208(g)(1) requires that progress reports include "a description of the status of implementation of all measures included in the implementation plan for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside the State". In order to assess whether the Class I areas outside the state also exhibited improved visibility over time, DEQ includes Tables 6-3 and 6-4. These tables present visibility data for Class I areas that have been identified as potentially impacted by emissions of haze-forming pollutants from Oregon. Tables 6-3 and 6-4 demonstrate the visibility improvements are occurring at the Class I areas in adjacent states; DEQ will be coordinating with neighboring states to determine if additional SIP strategies are needed to address sources of haze forming pollutants across state borders.

Table 6-3. Baseline and current conditions (Dv) for the Most impaired Days for affected Class I areas in adjacent states.

IMPROVE Monitor	Class I area	2000-2004 Baseline (Dv)	Last Reported (2014-2018) (Dv)	Current Visibility (2018 – 2022) (Dv)	Diff
TRIN1	Marble Mountain W, CA	11.9	10.4	10.6	-1.3
REDW1	Redwood NP, CA	13.7	12.6	12.1	-1.6
LABE1	Lava Beds NM/Schonchin W, CA	11.3	9.7	9.2	-2.1
MORA1	Mount Rainier NP, WA	16.5	12.7	12.5	-4.0
WHPA	Mount Adams W, WA	10.5	8.0	8.0	-2.5
SAWT	Sawtooth W, ID	10.1	8.4	8.9	-1.2
JARB1	Jarbridge W, NV	8.7	8	8.3	-0.4

Note: NP denotes National Park, NM denotes National Monument and W denotes Wilderness area. Diff denotes the difference in current visibility and baseline values (current - minus baseline); for Diff, negative values suggest improvement in visibility conditions since time of baseline. RPG denotes reasonable progress goal for deciview, based on models from the TSS; all data were obtained from the Regional Haze Technical Support System.

Table 6-4. Baseline and current conditions in deciview (Dv) for the 20% Clearest Days for affected Class I areas in adjacent states.

IMPROVE Monitor	Class I area	2000-2004 Baseline (Dv)	Last Reported (2014-2018) (Dv)	Current Visibility (2018 – 2022) (Dv)	Diff
TRIN1	Marble Mountain W, CA	3.4	3.1	2.6	-0.8
REDW1	Redwood NP, CA	6.1	5.3	5.5	-0.6
LABE1	Lava Beds NM/Schonchin W, CA	3.2	2.5	2.7	-0.5
MORA1	Mount Rainier NP, WA	5.5	3.9	4.0	-1.5
WHPA	Mount Adams W, WA	1.7	1.0	1.0	-0.7
SAWT	Sawtooth W, ID	4	2.6	2.6	-1.4
JARB1	Jarbridge W, NV	2.6	1.8	1.9	-0.7

Note: NP denotes National Park, NM denotes National Monument and W denotes Wilderness area. Diff denotes the difference in current visibility and baseline values (current - minus baseline); for Diff, negative values suggest improvement in visibility conditions since time of baseline. RPG denotes reasonable progress goal for deciview, based on models from the TSS; all data were obtained from the Regional Haze Technical Support System.

7. Emissions progress

The Regional Haze rule requires analysis tracking the change in emissions of pollutants contributing to visibility impairment from all sources in the state for the progress report. The emissions changes should be identified by source type or activity. The emissions analysis should cover the time frame since the previous regional haze SIP planning period.

Inventory data resources

40 CFR 51.308(g)(4) has two distinct requirements that revolve around two separate sets of emissions inventory data as described below:

i. **Emissions from all sources and activities:** the primary source of these data is the National Emissions Inventory, which is compiled and released on an annual and triennial basis by the EPA. The NEI is made up of emissions from nonpoint, nonroad, on-road, and point sources. EPA runs their own estimation tools (including Wagon Wheel and Motor Vehicle Emission Simulator model) to develop nonpoint and mobile source emissions nationwide. Although EPA prefers to develop their own estimates with their tools or models, they do not discourage state, local, or tribal air agencies from submitting their own estimates via approved methods or tools. Activity input data is either submitted by state, local, or tribal air agencies or they can accept EPA defaults to run nonpoint and mobile source emission estimation tools. Large point source emission estimates are required to be calculated and submitted by state, local, or tribal air agencies for the NEI.

   For the 40 CFR 51.308(g)(4) requirement, the analysis must extend at least through the most recent NEI year for which data is available six months prior to the required date of the progress report. The beginning year of the emissions tracking analysis for this report is 2017 used in the second planning period SIP and ends with 2020 NEI. Information and data for the NEI can be found at National Emissions Inventory.

ii. **Emissions from sources that report to a centralized EPA database:** there are many individual emissions sources that are required to report their emissions directly to EPA because of their participation in an air quality program such as Cross-State Air Pollution Rule, the Acid Rain Program, and the Regional Greenhouse Gas Initiative, among others. Most of the sources that report in this manner are large stationary point sources such as electric generating units and large industrial facilities. EPA requires facilities that have electric generating units greater than 25 MW and burns fossil fuels to report NO_X and SO_2 continuous emissions monitoring data directly to the Clean Air and Power Division. This data is readily available at Clean Air Markets Program Data website. For purposes of 40 CFR 51.308(g)(4), the analysis must extend through the most recent year available six months prior to the required date of the progress report which is 2023 for this report.

Breakdown of emissions sources and activities

The source of these data is EPA's NEI and CAPD systems. The most recent NEI available six months prior to the due date of the second planning period progress reports (i.e., this submittal) is the 2020 NEI. The figures below compare emissions estimates from the 2020 NEI with those from the 2017 NEI, which was the most recently available NEI at the time of the second planning period regional haze SIP. Further, 2017-2023 facility EGU (25 MW or greater) continuous emissions monitoring data reported to CAPD will be broken out from the NEI data for analysis. Emissions estimates are provided for Oregon as well as the other WESTAR states. The state-specific charts are broken down into the following emission source categories:

- Point sources represent large stationary sources of emissions located at a discrete geographic point. Examples include power plants, manufacturing facilities (e.g., wood products, etc.), and large commercial/institutional facilities such as schools. Point sources in Oregon typically hold a federal or state air permit and report their emissions to DEQ, LRAPA, and/or EPA directly. For NOx and SO_2, facilities required to report CEMs data to CAPD are broken out for analysis across 2017 to 2023 in Section 7.7 of this report. While facilities that are not required to report continuous emissions monitoring data to CAPD are captured by the NEI data.
- Nonpoint sources, also called area sources, are those that are too widespread or numerous to be accounted for individually. There are many nonpoint sectors, but a handful of examples include residential fuel combustion, consumer solvent use, commercial cooking, and agricultural tilling. Prescribed fires, wildfires, and biogenic emission sectors were initially captured under their own separate category known as the Events category. However, starting in 2020 EPA rolled these sectors into the Nonpoint category and eliminated the Events category. For this analysis DEQ also rolled these sectors into the nonpoint category for the 2017 NEI as well to normalize the comparison between 2014, 2017, and 2020 EI data.
- Nonroad sources are equipment and vehicles that do not primarily travel on roadways. Examples include construction equipment, recreational vehicles, and lawn & garden equipment.
- On-road sources are vehicles that primarily travel on roadways such as cars, trucks, buses, and motorcycles.

Regional haze pollutants inventoried

The subsections below detail the change in emissions since the time of the second planning period regional haze SIPs for all emissions sources and CAPD emissions sources respectively. The following visibility impairing pollutants are covered in the summaries:

- ammonia (NH_3),
- nitrogen oxides (NOx),
- particulate matter < 10 microns (PM_{10}),
- particulate matter < 2.5 microns ($PM_{2.5}$),
- sulfur dioxide (SO_2), and
- volatile organic compounds (VOCs).

7.1 Changes to NEI data that impact emissions estimates

Emission changes from triennial-to-triennial NEI years can be attributed to both physical changes in the magnitude of emissions from certain sources, as well as changes to accounting methodology that impact emissions estimates.

Changes to estimation methods, tools, and reporting requirements

These changes appear mostly on paper because of updates to EPA estimation methodologies, models or tools, or NEI reporting requirements. There are four notable causes for emission changes from 2017 to 2020:

1. issues with unpaved road dust estimation methodology,
2. issues with data input activity collected for residential wood combustion,
3. new reporting for certain sectors and pollutants, and
4. improvements to the MOVES model.

During and after the preparation of baseline emissions inventory for the second plan DEQ and WRAP found issues with certain sectors estimation methodologies and tools. One of these sectors is unpaved road dust which grossly overestimated emissions because of certain variables (e.g., default silt loading factor) used in the mathematical formula that do not adequately represent conditions within the Pacific Northwest. 2017 unpaved road dust emissions were adjusted by DEQ and WRAP to more adequately represent actual emissions in the second plan. However, EPA still relies on outdated data variables to estimate unpaved road dust emissions for the NEI. This change in estimation methodology did not get updated for subsequent NEIs, including 2020, thereby continuing the over estimation of emissions for this sector in Oregon.

For this report, DEQ re-ran unpaved road dust emissions in the Wagon Wheel tool for 2020 adjusting the silt loading factor from 7.2 to 3.9. The loading factor 7.2 is more indicative of dry conditions found in Arizona. DEQ substituted the silt loading factor with Washington's factor of 3.9 which is more representative for the Pacific Northwest. DEQ updated those emissions accordingly for this report. DEQ and EPA's Nonpoint Methods Advisory Committee are currently evaluating this permanent change for unpaved road dust for the 2023 NEI and beyond.

Another sector with issues is residential wood combustion. Oregon DEQ staff evaluated the data collection and estimation methods used to develop emissions for this sector. This evaluation came after the 2017 NEI was released, and the second plan was put into place. DEQ found that residential wood combustion emissions were underestimated in past NEIs due to inadequate data collection for residential heating activity. DEQ is now conducting statewide triennial surveys to collect better activity data for the NEIs. This activity data was submitted to EPA starting with 2020 NEI and used in the Wagon Wheel tool to more accurately estimate emissions for Oregon. However, this finding has increased emissions on paper since the 2017 NEI but has aligned these emission estimates to more realistic residential wood combustion activities across the state.

Further discussion is needed for emission impacts from 2017 to 2020 for certain categories and/or sectors or pollutants not reported in previous NEIs by state, local, and tribal air agencies or EPA. Inconsistencies in reporting occurred for the point source category for ammonia from 2014 to 2020 where emissions were not reported by Oregon for all facilities. While the nonpoint "Industrial Boilers, internal combustion engines – biomass" sector resulted in significant increases in emissions from 2014 to 2020 across all regional haze visibility pollutants which was not because of physical changes in activity but because they were never reported before by EPA. Emissions for this sector were not reported in 2014 and 2017 by EPA but reported in 2020.

Finally, emission model improvements can explain emission changes for several regional haze pollutants from 2017 to 2020 as well. EPA has made significant improvements to the MOVES model used to estimate 2020 mobile emissions which appear to lower emissions across the state for criteria pollutants. They also updated agricultural estimation methodologies and folded that into the Wagon Wheel estimation tool which has impacted emissions specifically for ammonia and VOC pollutants. Overall, changes to data collection and estimation methods and models and reporting requirements resulted in significant changes to emissions from 2017 to 2020 for these categories and sectors.

Change in reporting for non-major emissions sources from nonpoint to point source category

Beginning in 2020, DEQ began reporting 278 state permitted facilities to the NEI along with 100 TV facilities. Approximately 378 facilities in total were reported since DEQ is now collecting air toxic data from these facilities in addition to criteria emissions data on NEI triennial years. DEQ is now reporting criteria and hazardous air pollutant emissions to the NEI. DEQ's primary goal for collecting air toxic data from facilities is to more accurately represent emissions in EPA's AirToxScreen program and utilize the emissions data for DEQ's Air Toxics Inventory and Clean Air Oregon program. Because state permitted facilities emissions in the past were captured under the nonpoint category as area sources these emissions inadvertently increased emissions for the point source category. This also requires backing out those pollutant emissions from nonpoint source classification codes to prevent double counting and is called point reconciliation. Unfortunately, point reconciliation only occurred for fuel combustion and solvent usage but no other source classification codes that might be counted under nonpoint category as well. This is considered an accounting change in emissions for this report.

Physical emission changes

Real physical changes to pollutant levels are generally associated with increases or decreases in emission activities across the state. This may be attributed to implementation of state and federal regulatory programs, the economy, or physical conditions that can impact NEI emissions. One area where physical changes to activity has successfully brought about decreases to emission levels is by implementing more aggressive state and federal regulations and programs. For example, Oregon's Clean Vehicles Rebate, Clean Fuels, and Low Emission Vehicle programs and other federal control programs for diesel and gasoline vehicles have been implemented for mobile sources. This has resulted in physical changes in on-road emissions by removing older, more polluting vehicles off the streets while newer, cleaner vehicles are phased in.

In addition, enforceable permit limits for certain facilities under the point source category can also bring about physical changes in emissions. These emission changes are mostly due to the new limits established in the facilities permits. The reduction in limits forces these facilities to simultaneously reduce actual emissions to prevent exceedance of these new permit limits. Oregon facilities typically renew their permits every five years.

New regional haze enforceable limits were established in 2022 and thereafter for 11 out of 31 Oregon facilities for the second plan. Some facilities from the second plan are also required to install control technologies but are not scheduled for implementation until 2024 and 2025. However, for the NEI data evaluation neither cause is an explanation for emission changes in sections 7.1 - 7.9 of this report because the years evaluated for individual pollutants is 2014 to 2020. However, Section 4.2 compares emissions for these facilities for 2017 to 2023. These enforceable regional haze permit limits established in 2022 are captured as emission changes for these facilities from the second plan (2017) to 2023. Overall, emissions have decreased for most of these facilities after the second plan up until now.

However, physical changes in emissions activity can be brought on by fluctuations in the economy or to manage environmental issues that can also impact emission levels. For example, when the economy is good it can result in increases in production activity or fuel usage or when bad decrease emission activities for many stationary point sources. From 2017 to 2020 changes in activity may also be indicative of the COVID pandemic where less vehicles were on the road or businesses were restricted from operating due to statewide lockdown. Another instance is when certain activities used to manage environmental conditions such as using prescribed fires to mitigate wildfires impacts can affect emission levels. 2020 NEI emissions year was a high wildfire activity season for Oregon resulting in significant increases in emissions that broke out across the state. Though, the emissions comparison below mostly covers anthropogenic emission sources prescribed fire activity (human caused) has increased over the years to manage future wildfires resulting in increased emissions.

These explanations for emissions changes described above are carried forward to the next sections evaluation of the individual regional haze pollutants.

7.2 Statewide pollutant emissions

Oregon statewide emissions from 2014 to 2020 are provided in Figure 7.2-1 below. This figure includes all anthropogenic, human caused, emission sources anthropogenic and non-anthropogenic including biogenic and wildfire emission sources. While Figure 7.2-2 breaks out total anthropogenic emissions only for further analysis.

Figure 7.2-1. 2014 to 2020 Oregon statewide total visibility pollutant emissions in tons per year (tpy) including non-anthropogenic emissions sources.

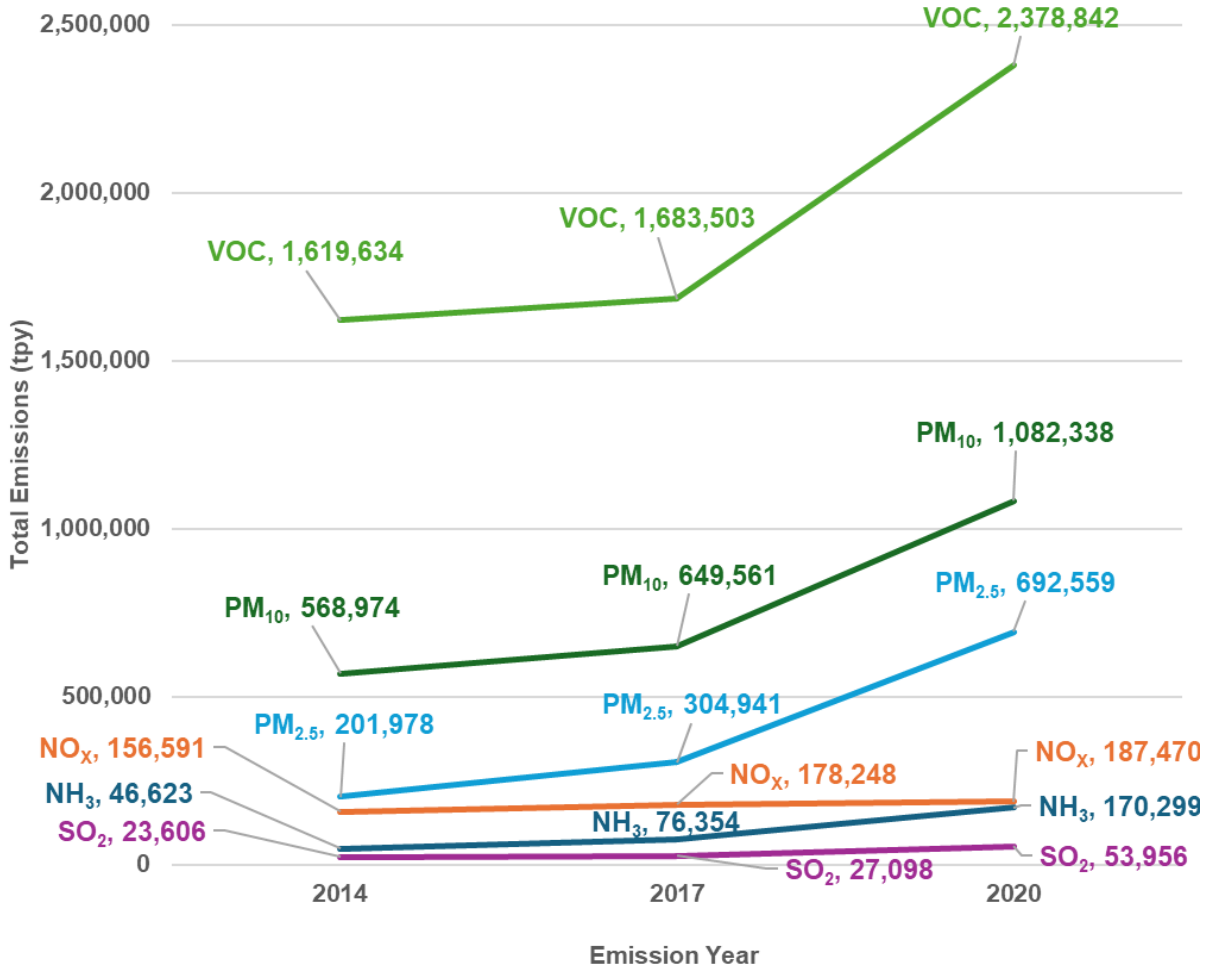
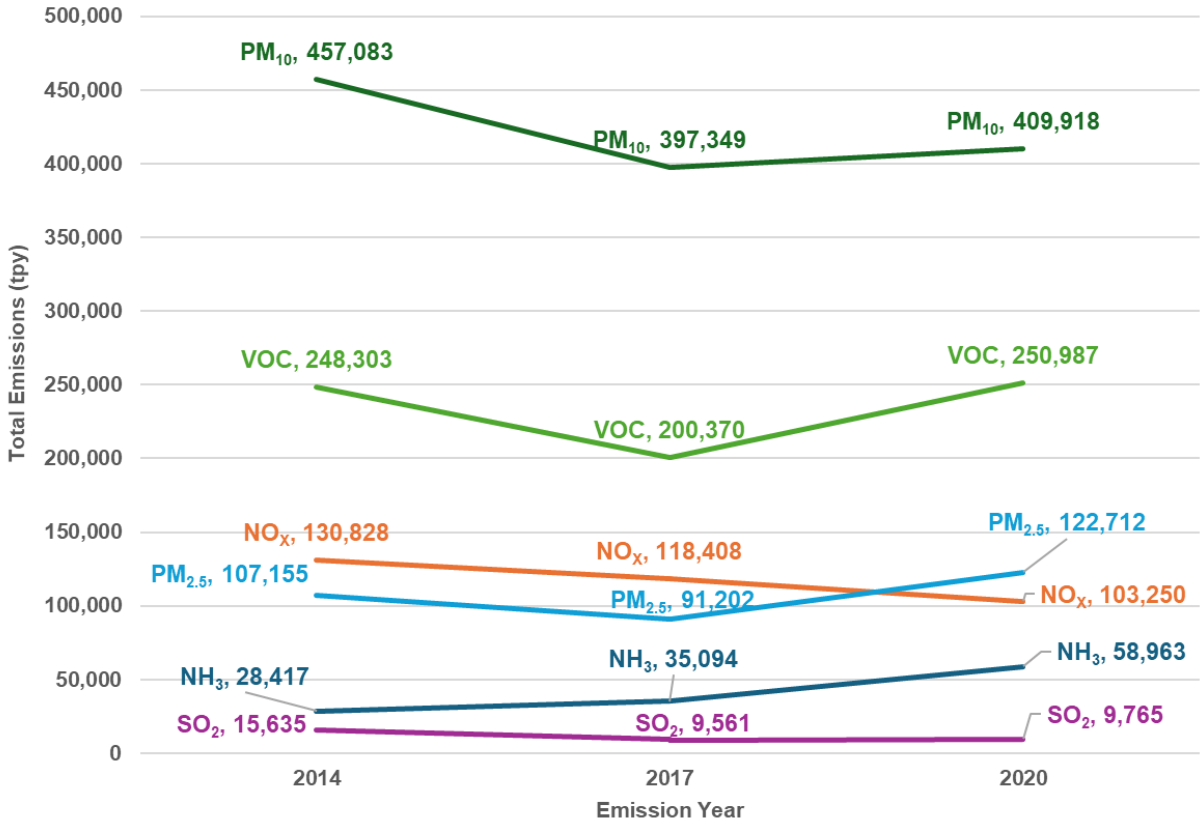


Figure 7.2-2. 2014 to 2020 Oregon statewide anthropogenic pollutant emissions in tons per year (tpy) excluding non-anthropogenic emissions sources.



7.3 Emissions of NH_3

Oregon ammonia emissions by category are shown in Figure 7.3 below for 2014 to 2020. Ammonia emissions from nonpoint and point emission sources have increased since the second plan while mobile source emissions have steadily decreased from 2014 to 2020. Changes in ammonia emissions for mobile sources from 2017 to 2020 are likely due to improvements made to the MOVES model and decreased vehicular activity due to COVID.

Table 7.3-1 demonstrates a further breakdown of nonpoint sectors contributing to increased ammonia emissions and includes emission changes from the second plan (2017 to 2020). The nonpoint sectors contributing significantly to these increases are agricultural sources (e.g., fertilizer application, livestock waste, field burning), prescribed fires, and waste disposal. The triennial year-to-year variability in NEI emissions is primarily due to changes to agricultural and combustion estimation methods and reporting. For prescribed fires and waste disposal sectors variability in emissions are likely physical changes in activity from 2017 to 2020. For further explanations regarding possible causes for changes to emissions levels see Section 7.1 above.

Oregon DEQ will further examine the impact of the agricultural sector on haze forming pollutant emissions, particularly ammonia, once the EPA's National Air Emissions Monitoring Study is finalized and as part of planning efforts for the next phase of state implementation planning (for

2028-2038). DEQ will also work to better understand if areas in Oregon experience ammonia limitation and are therefore particularly sensitive to ammonia deposition that could be enhanced by livestock operations. Finally, DEQ plans to collaborate with other states and WRAP to support necessary analyses or modeling that will help to characterize aspects of the ammonia cycle.

Figure 7.3. 2014 to 2020 ammonia emissions by category for Oregon in tons per year (tpy).

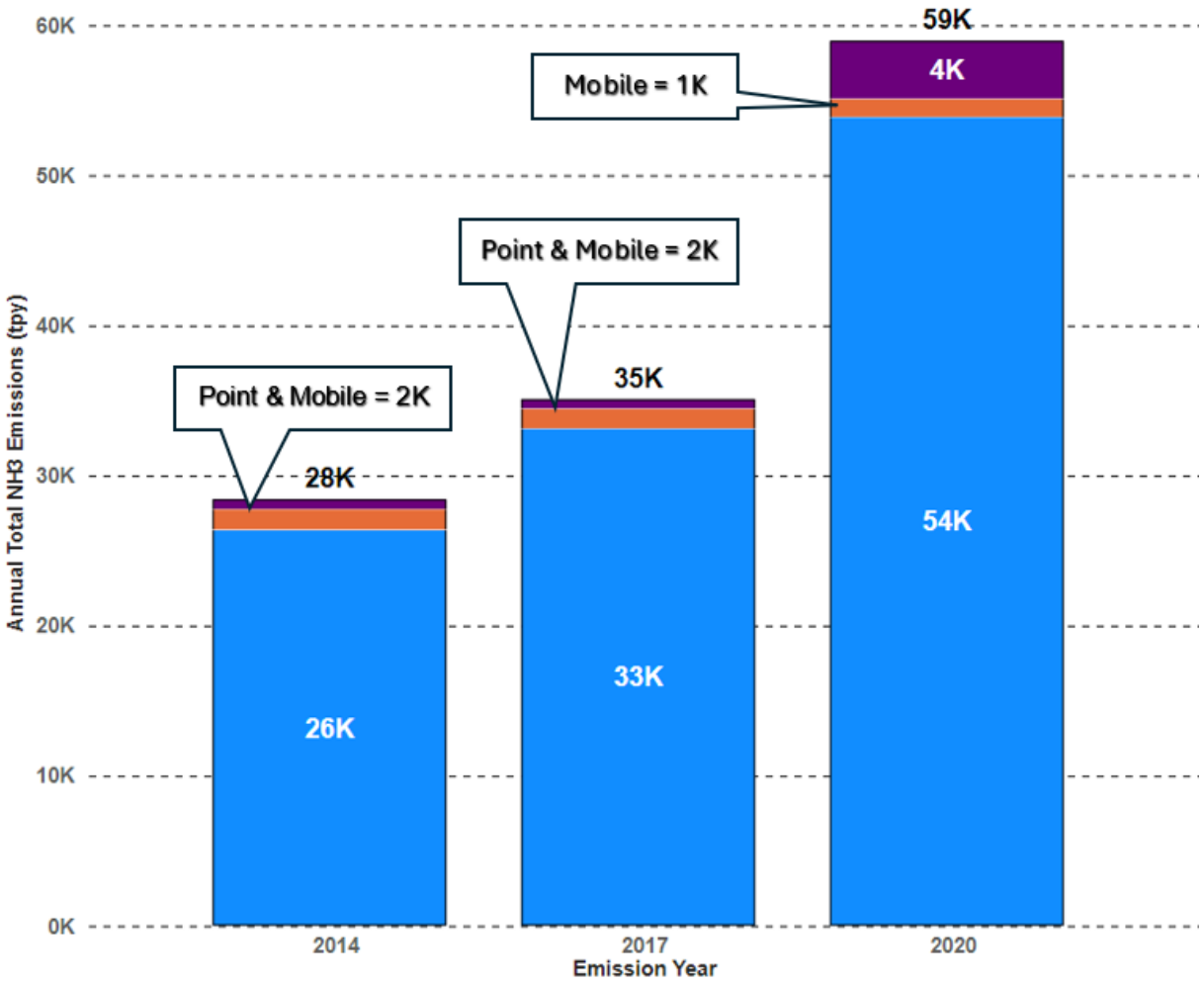


Table 7.3-1. 2014 to 2020 ammonia (NH_3) emissions by nonpoint sectors for Oregon in tons per year (tpy).

Anthropogenic Nonpoint Sectors	NH_3 Emissions (tpy)			2017-2020 Emission Change
	2014	2017	2020	
Agriculture - Livestock Waste	11,353	12,396	22,736	10,340
Prescribed Fires	7,872	5,138	9,080	3,942
Agriculture - Fertilizer Application	5,207	13,716	16,670	2,954
Waste Disposal	112	118	1,895	1,777
Agricultural Field Burning	957	683	1,934	1,251
Residential Wood Combustion	345	494	967	473
Industrial Boilers, ICEs - Biomass	0	0	88	88
Other Sectors < 10 tpy each	24	24	21	-3
Residential Heating - Natural Gas	412	478	455	-24
Industrial Boilers, ICEs - Natural Gas	71	63	22	-41
Grand Total	**26,352**	**33,111**	**53,868**	**20,757**

Table 7.3-2 shows 2014 to 2020 point source emissions broken down by sector or industry type and includes emission changes from the second plan 2017 to 2020. Chemical manufacturing stands out as the most significant increase in emissions because these types of facilities were not reported before 2020. In addition, a combination of other point source sectors caused emission increases from 2017 to 2020 as well. Most of these sectors had no emissions estimated for 2014 and 2017 either which is likely due to changes in reporting requirements for 2020. Finally, DEQ started reporting smaller facilities with state air operating permits as point sources in 2020; therefore, increasing emissions for this category. For further explanations regarding causes for emissions level changes see Section 7.1 above.

Table 7.3-2. 2014 to 2020 ammonia emissions by point sectors for Oregon in tons per year (tpy).

Anthropogenic Point Sectors	NH_3 Emissions (tpy)			2017-2020 Emission Change
	2014	2017	2020	
Chemical Manufacturing	0	0	2,772	2772
Electric Generation - Natural Gas	57	44	426	382
Industrial Boilers, ICEs - Natural Gas	0	0	129	129
Waste Disposal	0	0	128	128
Comm/Institutional - Natural Gas	0	0	82	82
Pulp & Paper	164	175	201	26
Other Point Sectors < 10 tpy each	6	5	26	21
Industrial Boilers, ICEs - Biomass	0	0	14	14
Electric Generation - Coal	28	1	0	-1
Industrial Processes - NEC	403	411	93	-317
Grand Total	**658**	**634**	**3,870**	**3,236**

7.4 Emissions of NO_X

Figure 7.4 shows 2014 to 2020 NOx emissions by category for Oregon. Point and mobile category emissions have declined from the second plan year (2017) to 2020 while nonpoint emissions have increased. Analysis of facilities that report CEMS data to CAPD are covered under Section 7.9.

NO_X emissions declined for the mobile source categories due to improvements in the MOVES model and decreased activity for both on-road and point sources from 2017 to 2020 which may be associated with the COVID-19 pandemic and effects on overall transportation patterns. Table 7.4 shows 2014 to 2020 NO_X emissions for nonpoint sectors and includes emission changes from 2017 to 2020 in Oregon.

Industrial wood combustion and prescribed fires are the most significant contributors to NO_X emission increases from 2017 to 2020. The increase in industrial wood combustion emissions is due to reporting changes rather than a real physical change in emissions activity from 2017 to 2020. This is because emissions were not estimated for 2014 and 2017 for this sector. For prescribed fires sector variability in emissions are likely due to physical changes in activity from 2017 to 2020. For further explanations regarding potential changes to emissions see Section 7.1 above.

Figure 7.4. 2014 to 2020 NOx emissions by category for Oregon in tons per year (tpy).

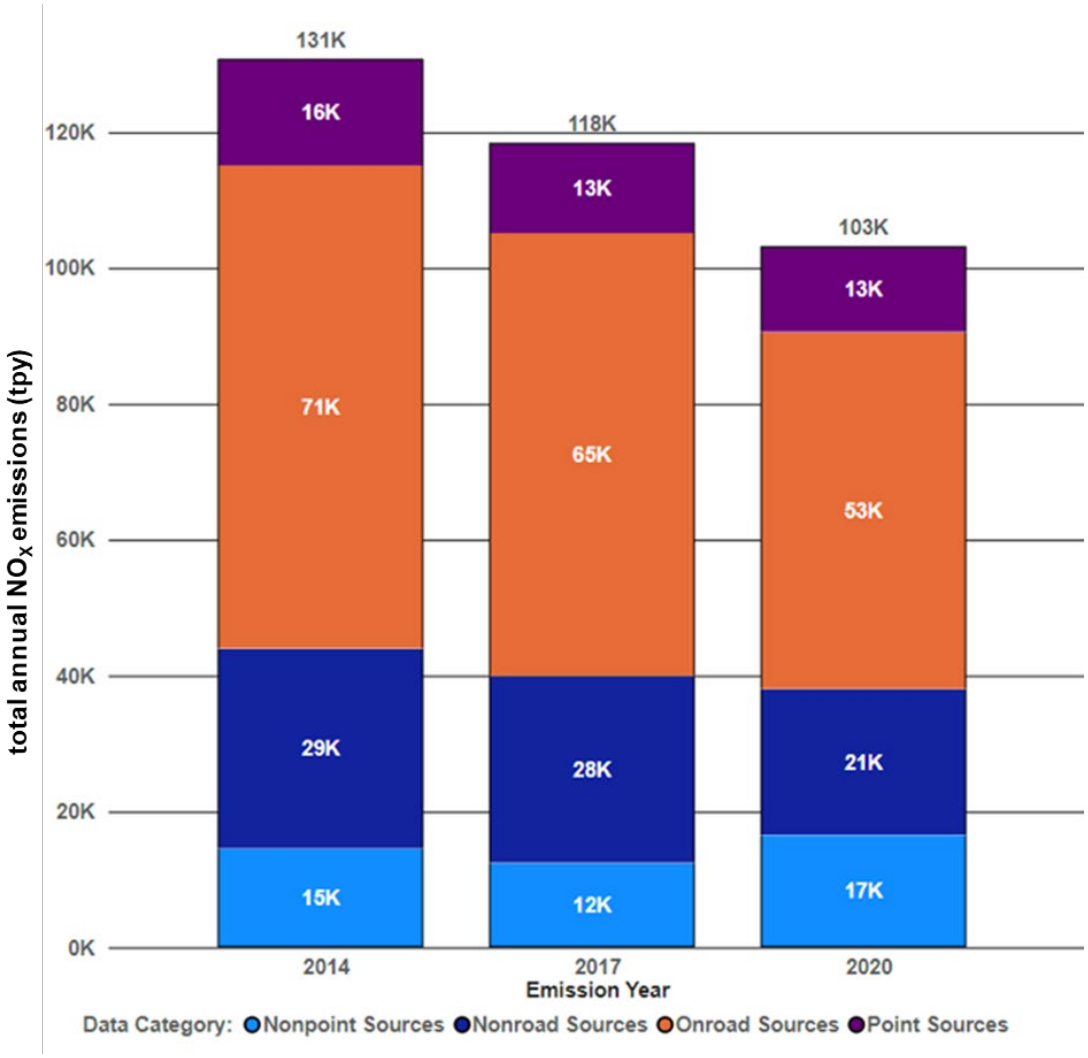


Table 7.4. 2014 to 2020 NO_X emissions by nonpoint sectors for Oregon in tons per year (tpy).

Anthropogenic Nonpoint Sectors	NO_X Emissions (tpy)			2017-2020 Emission Change
	2014	2017	2020	
Industrial Boilers, ICEs - Biomass	0	0	2,756	2,756
Prescribed Fires	4,907	3,238	5,181	1,944
Residential Wood Combustion	668	926	1,573	647
Agricultural Field Burning	296	188	609	421
Comm/Institutional Combustion- Other	84	84	249	165
Waste Disposal	1,196	710	829	120
Comm/Institutional Combustion- Biomass	129	115	177	62
Residential Heating - Other	178	138	190	52
Miscellaneous Non-Industrial NEC	82	27	28	1
Nonpoint Sectors < 10 tpy each	33	14	10	-4
Residential Heating - Oil	121	132	94	-38
Industrial Boilers, ICEs - Other	125	125	73	-53
Comm/Institutional Combustion - Oil	114	113	56	-57
Comm/Institutional Combustion - Natural Gas	1,376	1,357	1,292	-66
Residential Heating - Natural Gas	1,936	2,249	2,138	-111
Industrial Boilers, ICEs - Oil	611	608	404	-204
Industrial Boilers, ICEs - Coal	449	449	190	-258
Industrial Boilers, ICEs - Natural Gas	2,223	1,959	690	-1,269
Grand Total	**14,527**	**12,431**	**16,538**	**4,107**

7.5 Emissions of PM_{10}

Emissions PM_{10} for 2014 to 2020 Oregon by category are shown in Figure 7.5. Overall, PM_{10} emissions have decreased since the second planning period began in 2018, with exception to the nonpoint category. Changes in particulate emissions for mobile sources from 2017 to 2020 are likely due to improvements made to the MOVES model and decreased vehicular activity due to COVID.

Table 7.5 provides 2014 to 2020 PM_{10} emissions broken down by nonpoint sector and changes in emissions from the second plan (2017) to 2020. The most significant sector contributing to PM_{10} emission increases is prescribed fires. This is attributed to increases in fire activity and not due to changes in estimation methodologies and reporting.

Several other nonpoint sectors are also causing increases to PM_{10} emissions from 2017 to 2020 such as agricultural field burning, commercial cooking, construction dust, industrial and residential wood combustion, mining processes, and waste disposal throughout the state. Some of these changes are due to real physical increases in emissions activity for these sectors while industrial and residential wood combustion is likely due to reporting and accounting issues. Emissions for industrial wood combustion were not reported in 2014 and 2017 by EPA but

reported in 2020 across all regional haze pollutants. While residential wood combustion changes are attributed to changes in data collection and estimation methods. See Section 7.1 above for further explanation for why emissions levels changed.

Figure 7.5. 2014 to 2020 PM_{10} emissions by category for Oregon in tons per year (tpy).

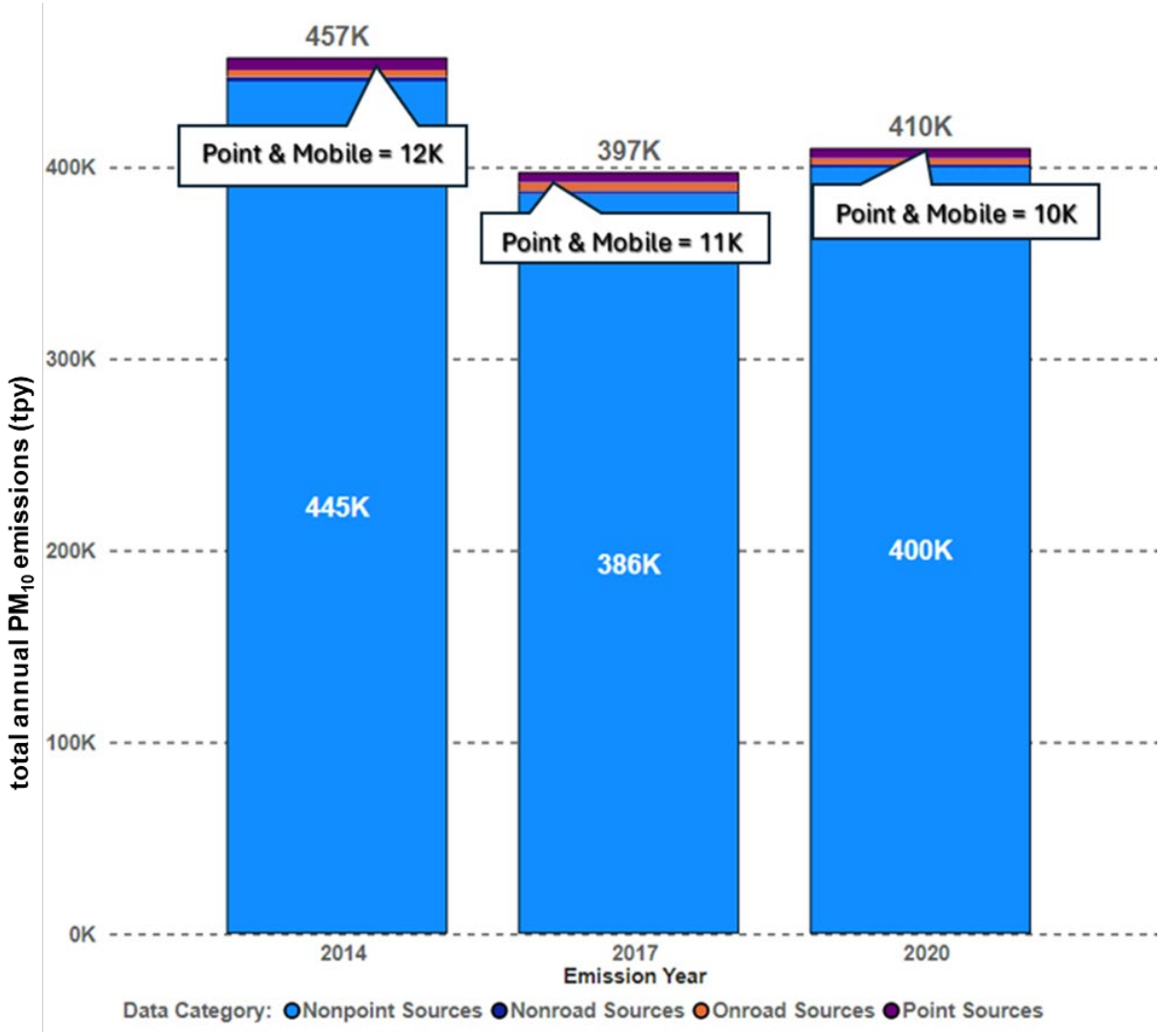


Table 7.5. 2014 to 2020 PM_{10} emissions by nonpoint sectors for Oregon in tons per year (tpy).

Anthropogenic Nonpoint Sectors	PM_{10} Emissions (tpy)			2017-2020 Emission Change
	2014	2017	2020	
Prescribed Fires	47,509	31,034	54,420	23,386
Industrial Boilers, ICEs - Biomass	0	0	6,476	6,476
Construction Dust	14,724	13,129	19,393	6,264
Paved Road Dust	7,012	9,138	15,053	5,915
Residential Wood Combustion	6,351	9,407	14,640	5,233
Agricultural Field Burning	1,974	1,021	3,201	2,179
Commercial Cooking	339	2,278	3,783	1,505
Industrial Processes - Mining	2,431	2,431	3,443	1,012
Waste Disposal	4,385	3,690	4,281	590
Comm/Institutional Combustion - Biomass	304	270	415	145
Miscellaneous Non-Industrial NEC	216	212	215	3
Nonpoint Sectors < 50 tpy each	128	129	72	-57
Agriculture - Crops & Livestock Dust	59,373	49,629	49,428	-201
Industrial Boilers, ICEs - Coal	532	532	226	-306
Unpaved Road Dust	299,270	262,776	224,677	-38,099
Grand Total	**444,546**	**385,676**	**399,722**	**14,046**

7.6 Emissions of $PM_{2.5}$

Figure 7.6 shows 2014 to 2020 $PM_{2.5}$ emissions by category for Oregon. The emission patterns and trends for $PM_{2.5}$ are largely similar to those described above for PM_{10}. As with PM_{10}, $PM_{2.5}$ emissions are dominated by the nonpoint category but only increased by 2 tons from 2017 to 2020 for point sources and on the decline for mobile sources. Changes in particulate emissions for mobile sources from 2017 to 2020 are likely due to improvements made to the MOVES model and decrease in vehicular activity due to COVID.

Table 7.6 shows 2014 to 2020 $PM_{2.5}$ emissions and includes emission changes from the second plan (2017) to 2020 for nonpoint sectors in Oregon. Again, $PM_{2.5}$ nonpoint sectors contributing to emissions increases mirror closely with PM_{10} sectors. The top nonpoint sectors significantly contributing to $PM_{2.5}$ emission increases from 2017 to 2020 are prescribed fires, industrial and residential wood combustion, agricultural field burning, paved road dust, and commercial cooking. While the other nonpoint sectors contribute half the emissions of those sectors mentioned above but nonetheless still have a significant impact on $PM_{2.5}$ emissions throughout the state.

Some of these changes in emissions observed are due to real physical increases in emissions activity while others are changes in reporting requirements or estimation methods and tools. See section 7.1 for further explanation on the issues found with reporting and/or estimation methods for industrial and residential wood combustion. All other sectors had no changes in

emissions estimation methodologies or tools, so those changes are likely real physical changes in emissions activity from 2017 to 2020.

Figure 7.6: 2014 to 2020 $PM_{2.5}$ emissions by category for Oregon in tons per year (tpy).

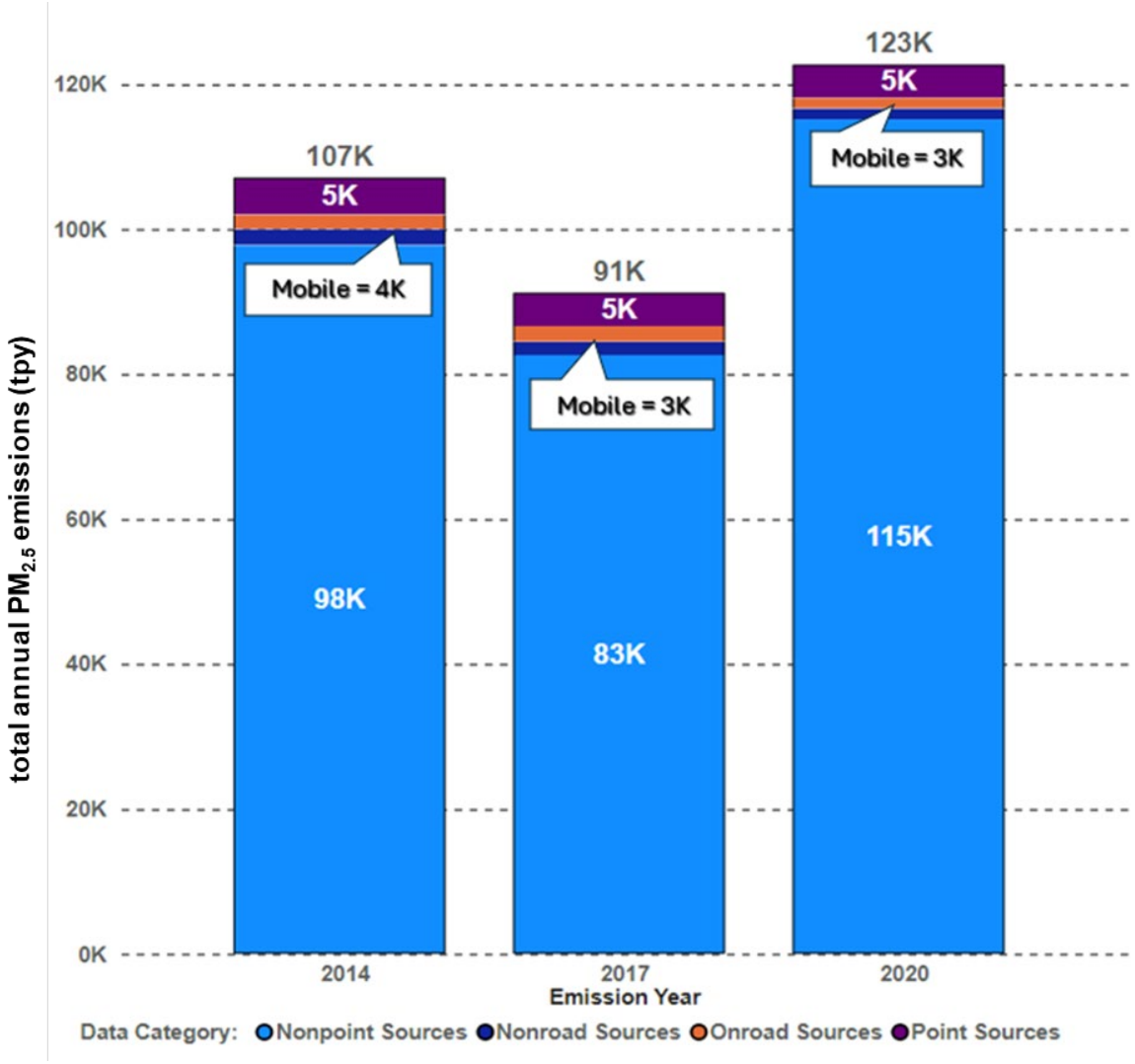


Table 7.6. 2014 to 2020 $PM_{2.5}$ emissions by nonpoint sectors for Oregon in tons per year (tpy).

Anthropogenic Nonpoint Sectors	$PM_{2.5}$ Emissions (tons/year)			2017-2020 Emission Change
	2014	2017	2020	
Prescribed Fires	40,262	26,300	46,119	19,819
Industrial Boilers, Engines - Biomass	0	0	5,599	5,599
Residential Wood Combustion	6,350	9,406	14,640	5,234
Agricultural Field Burning	1,437	720	2,304	1,584
Paved Road Dust	1,714	2,284	3,763	1,479
Commercial Cooking	260	2,116	3,514	1,398
Construction Dust	1,472	1,313	1,939	626
Waste Disposal	3,551	3,355	3,897	542
Industrial Processes - Mining	304	304	430	127
Comm/Institutional Combustion - Biomass	263	234	359	125
Miscellaneous Non-Industrial NEC	173	169	172	2
Agriculture - Crops & Livestock Dust	11,968	10,022	9,980	-41
Nonpoint Sectors < 50 tpy each	206	206	106	-101
Unpaved Road Dust	29,839	26,196	22,333	-3,863
Grand Total	**97,797**	**82,625**	**115,156**	**32,530**

7.7 Emissions of SO_2

2014 to 2020 SO_2 emissions by category for Oregon are shown in Figure 7.7. Overall SO_2 emissions have gone down for point and mobile categories and increased from 2017 to 2020 for the nonpoint category. Changes in sulfur dioxide emissions for mobile and point sources from 2017 to 2020 are likely due to improvements made to the MOVES model and decrease in physical activity due to COVID. Analysis of facilities that report CEMS data to CAPD are covered under Section 7.9.

Table 7.7 provides emissions for 2014 to 2020 for the nonpoint sectors and includes emission changes for each sector from the second plan (2017) to 2020. The nonpoint sectors contributing significantly to SO_2 increases from 2017 to 2020 are prescribed fires and industrial wood combustion. Prescribed fire emission increases are real physical changes in emissions activity from 2017 to 2020. While industrial wood combustion emission increases are due to a change in reporting requirements in 2020 since EPA reported nothing in 2014 and 2017 for this sector. All other nonpoint sectors contributing to SO_2 emissions statewide are likely physical changes in emissions activity. See Section 7.1 for further explanations on changes in reporting and estimation methods.

Figure 7.7. 2014 to 2020 SO_2 emissions by category for Oregon in tons per year (tpy).

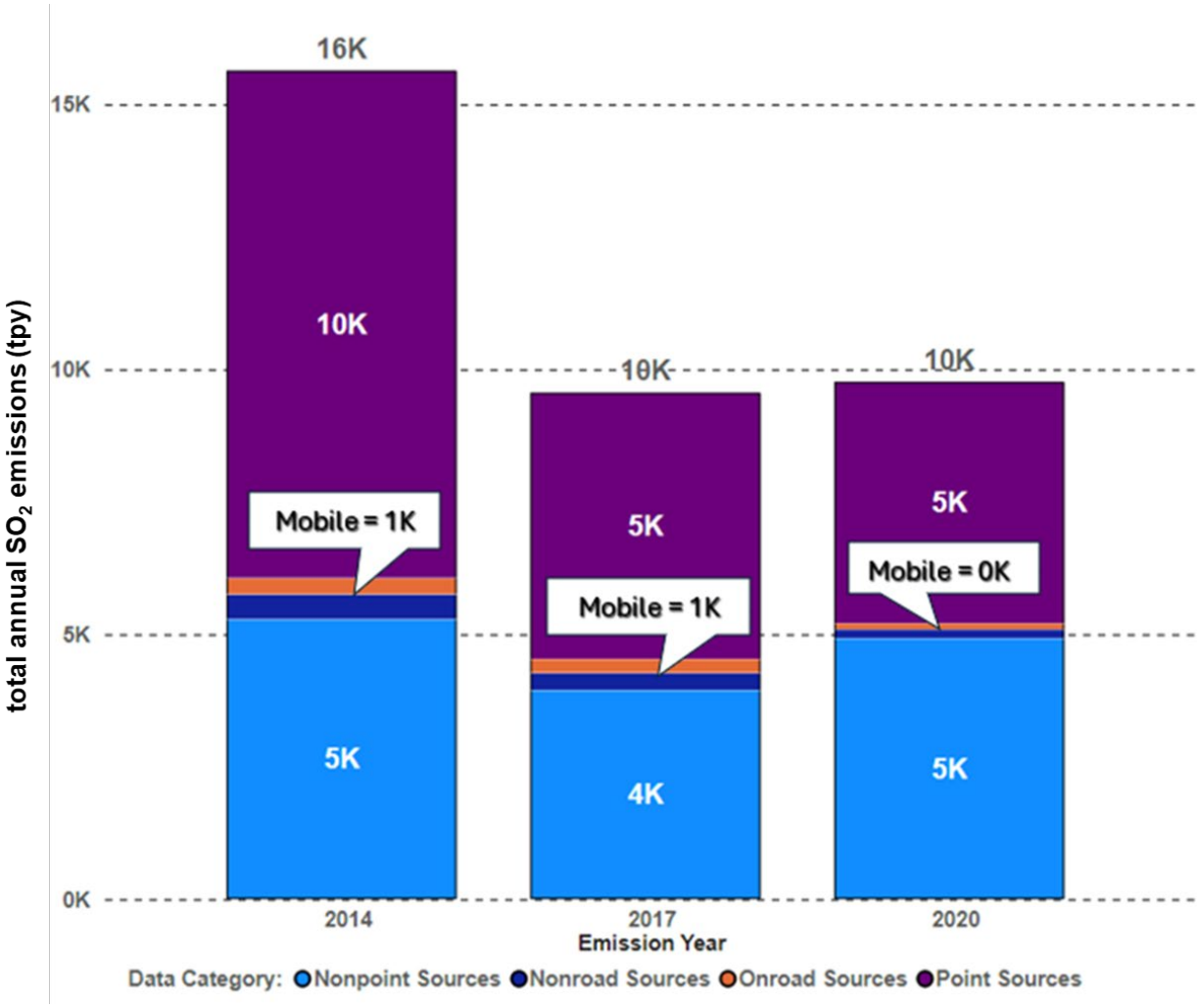


Table 7.7. 2014 to 2020 SO_2 emissions by nonpoint sectors for Oregon (tons per year).

Anthropogenic Nonpoint Sectors	SO_2 Emissions (tons/year)			2017-2020 Emission Change
	2014	2017	2020	
Prescribed Fires	3,110	2,041	3,443	1,403
Industrial Boilers, Engines - Biomass	0	0	313	313
Agricultural Field Burning	60	50	172	122
Residential Wood Combustion	108	208	299	91
Waste Disposal	353	235	287	52
Industrial Boilers, Engines - Coal	775	775	329	-446
Nonpoint Sectors < 30 tpy each	876	635	80	-555
Grand Total	**5,283**	**3,943**	**4,923**	**980**

7.8 Emissions of VOCs

Figure 7.8 shows 2014-2020 VOC emissions with emission changes from the second plan (2017) to 2020 by category for Oregon. VOC emissions have increased for point and nonpoint categories while mobile sources saw a decline from 2014 to 2020. Changes in VOC emissions for mobile sources from 2017 to 2020 are likely due to improvements made to the MOVES model and decrease in physical activity due to COVID.

Table 7.8-1 provides nonpoint sector emissions for 2014-2020 including emission changes for each sector from the second plan (2017) to 2020. Some of these changes are due to real physical increases in emissions activity while others are changes with the estimation methods and tools used by EPA.

The nonpoint sector that has seen the largest increase in VOC emissions is prescribed fires. While other sectors such as residential wood combustion, miscellaneous non-industrial not elsewhere classified sources, consumer and commercial solvent use, and agricultural field burning contribute much less than prescribed burning their contribution still needs to be noted. However, for all these nonpoint sectors listed above it appears these are physical changes to emissions activities from 2017 to 2020. The exception is residential wood combustion due to changes in data collection and estimation methods rather than real physical changes. See Section 7.1 for explanation regarding what and how DEQ changed the residential wood combustion data collection and estimation methods.

Finally, point sources also contribute to VOC emission increases throughout the state. Table 7.8-2 provides point sector breakdown by industry or activity type emissions for 2014-2020 including emission changes for each sector from the second plan (2017) to 2020.

The most significant contributors to VOC point emission increases are industrial processes – not elsewhere classified, industrial surface coating and solvent use, and chemical manufacturing sectors. The changes appear to be real physical changes in emissions activity for these sectors. However, DEQ started reporting smaller facilities with state air operating permits as point sources in 2020 therefore increasing emissions.

Figure 7.8. 2014 to 2020 VOC emissions for Oregon (tons per year).

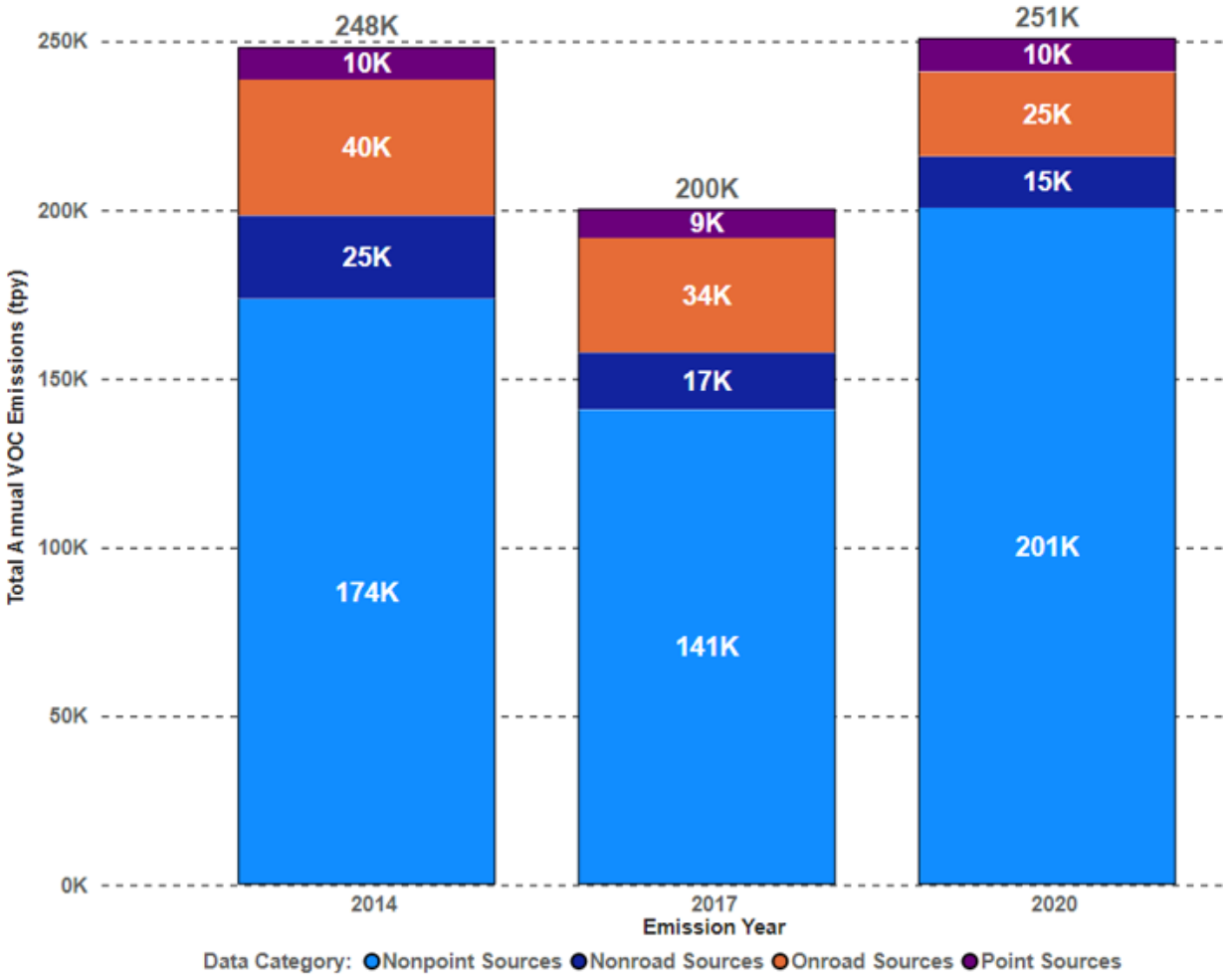


Table 7.8-1. 2014 to 2020 VOC emissions by nonpoint sectors for Oregon in tons per year (tpy).

Anthropogenic Nonpoint Sectors	VOC Emissions (tons/year)			2017-2020 Emission Change
	2014	2017	2020	
Prescribed Fires	113,166	73,858	130,524	56,666
Residential Wood Combustion	7,290	10,102	13,901	3,800
Miscellaneous Non-Industrial NEC	898	901	4,479	3,579
Consumer & Commercial Solvent Use	25,993	26,640	29,885	3,245
Agricultural Field Burning	705	746	2,821	2,075
Agriculture - Livestock Waste	732	992	1,819	827
Waste Disposal	3,232	2,450	2,774	324
Industrial Boilers, ICEs - Biomass	0	0	213	213
Commercial Cooking	223	318	518	200
Bulk Gasoline Terminals	0	610	613	3
Nonpoint Sectors < 20 tpy each	87	68	66	-2
Comm/Institutional Combustion - Natural Gas	76	75	71	-4
Residential Heating - Natural Gas	113	132	125	-6
Industrial Boilers, ICEs - Oil	34	34	27	-7
Industrial Processes - Storage and Transfer	274	500	446	-54
Industrial Boilers, ICEs - Natural Gas	122	108	38	-70
Gas Stations	3,601	4,071	3,328	-743
Industrial Surface Coating & Solvent Use	4,090	4,709	3,237	-1,472
Non-Industrial Surface Coating	4,596	4,596	2,990	-1,606
Degreasing	2,425	2,657	682	-1,974
Graphic Arts	5,955	7,267	2,062	-5,204
Grand Total	**173,613**	**140,831**	**200,621**	**59,790**

Table 7.8-2. 2014 to 2020 VOC emissions by point sectors for Oregon in tons per year (tpy).

Anthropogenic Point Sectors	VOC Emissions (tpy)			2017-2020 Emission Change
	2014	2017	2020	
Industrial Processes - NEC	804	529	1,374	845
Industrial Surface Coating & Solvent Use	647	507	806	299
Industrial Processes - Chemical Manufacturing	47	87	237	149
Industrial Processes - Storage and Transfer	731	794	893	99
Electric Generation - Natural Gas	159	150	224	74
Waste Disposal	286	286	342	56
Bulk Gasoline Terminals	282	239	281	43
Comm/Institutional Combustion - Other	0	6	34	28
Construction Dust	0	0	26	26
Point Sectors < = 20 tpy each	65	48	71	23
Oil & Gas Production	0	0	22	22
Industrial Boilers, ICEs - Biomass	334	247	250	3
Cement Manufacturing	19	20	23	3
Industrial Processes - Ferrous Metals	90	87	90	3
Comm/Institutional Combustion - Biomass	44	50	52	2
Electric Generation - Coal	56	31	30	-1
Electric Generation - Other	72	70	39	-31
Industrial Processes - Non-ferrous Metals	294	317	244	-72
Industrial Boilers, ICEs - Natural Gas	145	167	77	-90
Pulp & Paper	5,562	5,011	4,856	-155
Grand Total	**9,636**	**8,645**	**9,969**	**1,324**

7.9 Continuous emissions monitoring data from large permitted point sources reported to a centralized EPA database

Seven Oregon facilities with EGUs rated greater than 25 megawatts are required to report continuous emissions monitoring data to CAPD for EPA's Acid Rain Program. Table 7.9 below breaks out these electric generation facilities 2017-2023 CEMs data reported to EPA annually and includes emission changes for these facilities from the second plan (2017) to 2023. One notable change starting in 2020 was the planned permanent shut down of the coal boiler at PGE Boardman. This reduced both NO_X and SO_2 emissions considerably for this report. However, the CEMS data also indicates that there have not been significant reductions in NO_X or SO_2 emissions from 2017 to 2023 for the rest of the facilities except Port Westward Beaver Plant. Please see Section 4 for further explanation of emission changes for Port Westward. A lack of

change in emission levels for the rest of the facilities is likely due to regional haze controls are not scheduled for implementation until 2024.

Table 7.9. NOx and SO_2 CEMs Data for CAPD Sources in Oregon in tons per year (tpy).

Facility Name	DEQ Source #	Unit IDs	2017		2023		2017-2023 Emission Changes	
			SO_2	NOx	SO_2	NOx	SO_2	NO_X
			Short Tons					
Coyote Springs	25-0031	CTG1/CTG 2	6.0	143.0	8.7	187.1	2.7	44.1
Hermiston Power LLC	30-0118	1/2	4.1	108.0	6.7	157.6	2.6	49.6
Klamath Cogeneration Project	18-0003	CT1/CT2	5.1	130.3	6.3	60.8	1.2	-69.5
Hermiston Generating Company LLC	30-0113	CTG-1/CTG-2	6.5	173.2	8.7	218.3	2.2	45.1
Klamath Generation Peakers	---	GT1/GT2	0.2	8.3	0.6	17.1	0.3	8.8
Port Westward	05-2520	PWEU1	17.5	66.7	5.5	86.2	-12.0	19.4
Carty Generating Station	25-0016	CTEU1	5.0	54.5	7.0	69.4	2.0	14.9
		Grand Totals	44	684	43	796	-1	112

8. Assessment of changes impeding visibility progress

In the Regional Haze Rule, paragraph 40 CFR 51.308(g)(5), EPA requires an assessment of any significant changes in anthropogenic emissions within or outside the state since the period addressed in the most recent plan, in this case, the regional haze SIPs for the second planning period. This assessment includes whether those changes were anticipated in the most recent plan and how they have affected pollutant emissions and visibility.

In reviewing the impacts of these changes and differing reporting methodologies, DEQ's assessment is that the changes that obscure estimates of real emissions reductions discussed in section 7.1 have not impeded visibility progress. Table 8-1 provides statewide regional haze visibility pollutant emissions including emission changes from 2017 and 2020. All pollutant emissions saw an increase with exception to NO_X.

Table 8-1. Statewide regional haze visibility pollutant emissions.

Pollutants	Annual Emissions (tons per year)		
	2017	2020	Emission Changes
NH_3	35,094	58,963	23,869
NO_X	118,408	103,250	-15,158
PM_{10}	397,349	409,918	12,569
$PM_{2.5}$	91,202	122,712	31,510
SO_2	9,561	9,765	204
VOC	200,370	250,987	50,617

Table 8-2 repeats some of the information that was presented in Section 7 by individual visibility pollutant, and shows a breakdown of emissions by data category including emission changes between 2017 and 2020.

Table 8-2 indicates significant increases in emissions for nonpoint and point data categories. The most significant emission increases come from sectors within the nonpoint category across all visibility pollutants from 2017 to 2020. As discussed in Section 7 above, prescribed fires, agricultural livestock waste, and industrial and residential wood combustion sectors appear to lead the increases in emissions for NH_3, PM, and VOC. While the point source category demonstrates significant emission increases for NH_3 and VOC and a minor increase for $PM_{2.5}$.

Decreases overall occurred for all visibility pollutant emissions from 2017 to 2020 for the on-road and nonroad mobile source categories; some of these reductions can be attributed to a reduction in traffic during the COVID-19 pandemic and shut-downs experienced in Oregon. The most significant decreases occurred for NO_X and VOC for both the mobile source categories. In the point source category, NO_X, $PM_{10,}$ and SO_2 emissions decreases were demonstrated.

As described in Section 7.1, some variability in emissions estimates may be due to both changes in estimation methodologies and reporting requirements and physical changes in emissions activity or a combination thereof.

Table 8-2. 2017 and 2020 total emissions comparison by category for Oregon in tons per year.

Categories	2017	2020	Emission Change (tons/year)
Nonpoint Sources			
NH_3	33,111	53,868	20,757
NO_X	12,431	16,538	4,107
PM_{10}	385,676	399,722	14,046
$PM_{2.5}$	82,625	115,156	32,530
SO_2	3,943	4,923	980
VOC	140,831	200,621	59,790
Non-road Sources			
NH_3	36	34	-2
NO_X	27,515	21,498	-6,017
PM_{10}	1,960	1,602	-358
$PM_{2.5}$	1,848	1,507	-341
SO_2	327	171	-156
VOC	16,998	15,259	-1,739
On-road Sources			
NH_3	1,313	1,192	-122
NO_X	65,196	52,551	-12,645
PM_{10}	4,114	3,027	-1,087
$PM_{2.5}$	2,171	1,489	-682
SO_2	266	112	-153
VOC	33,896	25,138	-8,758
Point Sources			
NH_3	634	3,870	3,236
NO_X	13,265	12,663	-602
PM_{10}	5,599	5,568	-31
$PM_{2.5}$	4,558	4,560	2
SO_2	5,024	4,558	-466
VOC	8,645	9,969	1,324

9. Assessment of current strategy

The RHR 40 CFR 51.308(g)(6) requires an assessment of whether current plan elements and strategies are sufficient to enable the state, or states with Class I areas affected by emissions

from the state, to meet all established reasonable progress goals for the period covered by the most recent plan. Oregon affirms that the elements and strategies in its regional haze SIP for the second planning period are sufficient to meet the criteria of 40 CFR 51.308(g)(6). Oregon makes this affirmation based on the following assessment of the information and data presented in this progress report:

- Control requirements associated with Oregon's 2018-2028 Regional Haze SIP have resulted in an overall reduction in emissions for applicable facilities, except for PGE's Beaver/Port Westward Plant; see Table 4.2B. This reduction helps Oregon make reasonable progress at its own Class I areas that may be affected by Oregon's facility emissions (see Section 6). In addition, DEQ expects that there will be further emissions reductions from facility control measures by the end of the second planning period regional haze SIP as more facility control requirements go into effect; see Section 4.

- Current haze indexes for Oregon's Class I areas are lower than those for the time of the second planning period regional haze SIPs, and significantly lower than baseline, for the 20% most impaired and 20% clearest days (see Section 6). These trends are indicative that Oregon's Class I areas are on track to meet the reasonable progress goals established in the regional haze SIPs in the second planning period. Class I areas in adjacent states also demonstrate continued improvement in visibility.

- While current statewide emissions reductions strategies may be sufficient, more data is needed to understand the impact of emissions estimate changes and long-term emissions trends. Until more data is available, DEQ asserts that regional haze requirements for facilities and the impact of regulatory and non-regulatory programs to reduce mobile source emissions show efficacy in reducing statewide emissions, particularly because visibility indices have improved despite the apparent increases in emissions for many haze forming pollutants between 2017 and 2020. As discussed in Section 7, the apparent increases in pollutant emissions can be attributed to changes in estimation methods and reporting which impact estimates instead of real physical changes in emissions activity.

  Section 8, Table 8-1 above indicates increases in visibility pollutants except NO_X statewide from the 2017 to 2020. Table 8-2 shows nonpoint and point categories are causing increases in emissions for most visibility pollutants.

  These increases are attributed to the following: (See Section 7.1)
  a. Changes in estimation methodologies and reporting requirements for agricultural livestock and industrial and residential wood combustion.
  b. Physical changes in prescribed fire emissions activity.
  c. DEQ began reporting on 278 state permitted facilities, classified as non-major sources, to EPA in 2020. This shifted some emissions from the nonpoint category to point category thereby increasing point source emissions. See Section 7.1 for more information.
  d. Regional Haze enforceable limits were not implemented until 2022 for SAFO facilities. Also, many facility controls are not scheduled for installation until 2024 and 2025. These emission reductions measures will not show up in the current five-year period emissions analysis required for this progress report. However,

emissions were compared for facilities with Regional Haze SAFO requirements between 2017 and 2023 (See Section 4.2 of this report). Combined emissions totals (NO_X, PM_{10}, SO_2) have reduced by 1724 tons in part due to implementing the enforceable limits associated with the regional haze requirements in Oregon.

- Importantly, data suggest an overall decline for all visibility pollutant emissions from 2017 to 2020 for on-road and non-road mobile source categories in the emissions inventory (Table 8-2), though this likely reflects the effects of the COVID-19 pandemic. The most significant decreases occurred for NO_X and VOC emissions from mobile source categories. DEQ will continue to examine data and characterize the impact of non-facility programs, specifically implementation of mobile source regulatory programs, as described in Section 5 on reducing visibility pollutants in Oregon. Administrative changes to MOVES models between 2017 and 2020 likely account for the apparent reduction of NO_X and VOC emissions, which may not reflect real changes in emissions for those pollutants. More data from 2023 and beyond will help DEQ in future assessments emissions changes in these areas.

9.1 Need for federal action on haze precursors

In addition to the strategies implemented by Oregon, it is also important that EPA makes further progress on reducing sources of emissions that the state cannot otherwise control. The CAA limits states abilities to regulate emissions from some sources of air pollution, and EPA, as an entity of federal government, must work with international partners to reduce emissions from all sources beyond states' control. Continued reduction in emissions from these sectors is critical not just for Oregon's regional haze goals, but also for the success of all western states.

The Clean Air Act restricts states' ability to set emission standards on some sources of emissions and instead, places those authorities with the EPA. For example, EPA has the sole ability to set emission standards for nonroad engines. These sources of emissions contribute to regional haze forming pollutants in Class I areas in Oregon, so EPA has the responsibility to reduce these emissions. EPA must continue to set emissions standards for the light-, medium- and heavy-duty sectors, such as EPA's 2024 multi-pollutant emission standards. These standards are critical in driving the sector towards innovation and technology, as well as set more stringent emission standards for locomotives and nonroad engines.

Another source sector where emissions could be decreased through EPA's coordination is prescribed fires. In Oregon, prescribed fires represent a significant source of haze forming pollution, especially for particulate matter. The Smoke Management Plan in Oregon is crucial for minimizing emissions. DEQ cautions that there should be federal coordination on how to manage prescribed fire as emissions can cross state lines and impact regional air quality.

The EPA plays a critical role in conducting research that states use to design emission control strategies that take into account local considerations. DEQ urges EPA to continue and finish the work it has started to address emissions from the agricultural sector, like finalizing the National Air Emissions Monitoring Study on Animal Feeding Operations. EPA's lack of progress on this

issue has stalled progress in this sector and limited the ability of states to design programs to reduce emissions.

An increase in the frequency and scale of prescribed fire will be needed to reduce wildfire risk and reduce smoke emissions from a landscape with reduced wildfire fuel. EPA must build on the collaborative work of the land management, air quality and public health agencies in the Pacific Northwest to find solutions to minimize emissions and impacts from prescribed fire while increasing the pace and scale of understory burning. Without additional resources and creative collaboration, control strategies like Oregon's Smoke Management Plan will be challenged to meet these goals.

For many western states, transport of emissions from international sources is a significant contributor to visibility impairment in Class I areas. Negotiating international treaties to reduce emissions is a role held by EPA. Most of the increase in international transport is related to sulfate and nitrates suggesting increased use of fossil fuels. EPA must strengthen aircraft emission standards, ships and other marine vessel emission standards, and set climate targets that will rapidly phase out fossil fuel dependence in the US and internationally. Oregon's Regional Haze SIP is dependent on the federal government to successfully reduce the impact of international transport.

Oregon commits to track progress and report on sectors within EPA's purview in future Regional Haze plan updates.

10. Assessment of Oregon's Smoke Management Plan

Oregon's first Smoke Management Plan was written in 1969. The SMP is designed to meet the requirements of Oregon Administrative Rule 629-048, Smoke Management; Regional Haze Rule, 40 CFR 51.309(d)(6); and the policies of the EPA Interim Air Quality Policy on Wildland and Prescribed Fires. The SMP provides direction and operating procedures for all organizations involved in the management of prescribed fire. OAR 629-048 establishes by rule the procedures and the permitting process that land managers are required to follow to mitigate the impact of smoke on air quality and visibility in the state. The SMP and OAR 629-048 apply to Oregon Department of Forestry Forest Protection Districts as outlined in OAR 629-041-0500 through 629-041-0575 and as shown in Figure 10.1.

Figure 10.1. Geographic areas associated with the application of the Oregon Smoke Management Plan.

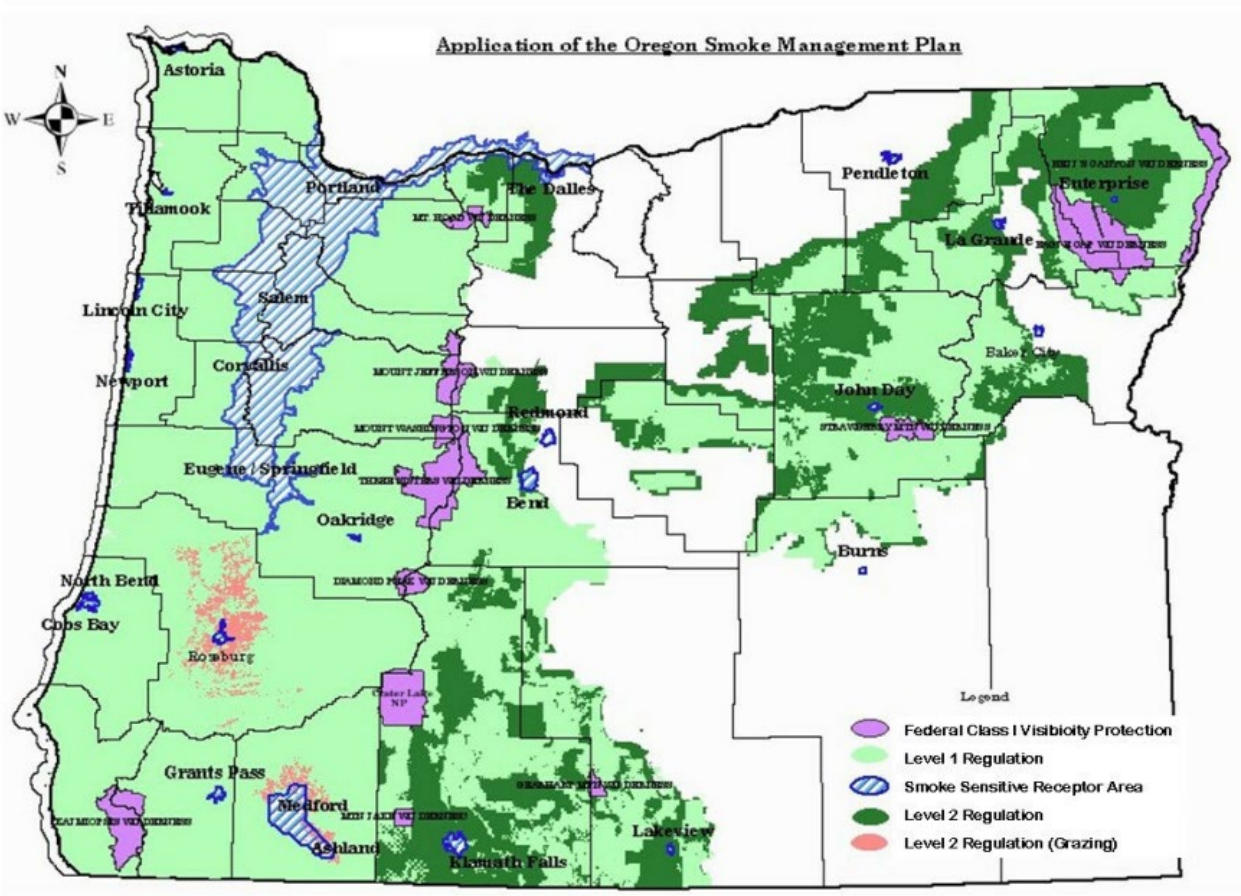


Table 10.1 provides a five-year summary of the number of acres and tons treated using both broadcast and pile prescribed burning in ODF protection boundaries in Oregon.

Table 10.1. Five-Year summary of acres and tons of biomass burned in prescribed fires in Oregon, as well as an estimate of associated tons of particulate matter emissions.

Year	Acres Burned	Tons Burned	Tons PM Emissions
2018	185,702	1,270,725	27,338
2019	200,629	1,245,128	27,625
2020	130,997	863,875	17,021
2021	143,653	996,496	22,091
2022	107,463	874,117	17,505

10.1 Area source emission reduction

Area source sectors include prescribed fire, open burning, residential wood combustion, agriculture and dairies, rail, airports and facilities and products that emit VOCs.

10.2 Smoke management and prescribed burning

Forestry prescribed burning occurs across the state and is controlled under a mandatory smoke management program operated by the Oregon Department of Forestry. Under state statute ORS 477.013, the ODF and DEQ are required to protect air quality through a Smoke Management Plan, which is included in the SIP. ODF smoke management rules are listed in OAR 629-048-0001 through 629-048-0500. The rules specify that the Smoke Management Plan is to be consistent with the Oregon Visibility Protection Plan (Section 5.2 of Oregon's SIP) and Oregon's Regional Haze SIP.

Since revisions to the Smoke Management rules in 2019, nine Smoke Sensitive Receptor Areas have developed Community Response Plans for prescribed fire smoke. Of those, three SSRA's were approved for a one-hour smoke intrusion exemption. This exemption allows smoke to enter the SSRA above the one-hour smoke intrusion threshold of 70 ug/m3. The federal 24-hour NAAQS must still be complied with and prescribed burns must be conducted in a manner to avoid excessive short-duration smoke events. Not all SSRA's qualify for a one-hour exemption based on the community's attainment status; communities in non-attainment are not able to apply per OAR 629-048-0180(3)(e). Communities with an approved exemption must submit an annual report outlining the methods used to communicate with the public, a log of dates and times the CRP was initiated, and a record of local meetings to discuss or update the CRP. An exemption may be revoked if there are repeated smoke intrusions that exceed the 24-hour average threshold or prescribed burning contributes to two or more NAAQS exceedances; or if the SSRA is within one exceedance of a NAAQS violation. The 2022 ODF Smoke Management Report recorded one smoke intrusion into an SSRA and 13 smoke incidents, where smoke from prescribed burns entered communities but remained below the intrusion threshold. The visibility protection provisions that were previously adopted (OAR 629-048-0130) remain in effect.

Two main objectives of the Smoke Management Plan are to minimize smoke emissions from prescribed burning and promote development of techniques that minimize or reduce emissions, such as utilization of forestland biomass. When prescribed burning is used, land managers are encouraged to employ the emission reduction techniques described in OAR 629-048-0210 to ensure the least emissions practicable. DEQ has hosted trainings along with ODF and the Natural Resources Conservation Service to educate landowners and entities that conduct prescribed burning on the options for alternatives to burning, including using an air curtain incinerator, chipping or masticating woody debris, and using lop and scatter techniques for slash. According to the National Cohesive Wildland Fire Management Strategy, non-burn fuel treatments involving mechanical, biological, or chemical methods offer many advantages in terms of greater control over the outcome and reduced risk of unintended consequences. The

disadvantage is usually higher economic cost, which in some cases can be offset by active economic markets for the byproducts of the treatment.

Pile burning accounts for the majority of forestry prescribed burning in Oregon. Prescribed burning is one important tool in forest management, with under-burning and broadcast burning used to reduce wildfire risk, restore habitat, and maintain forest health through reduction of understory fuels. DEQ is working to reduce emissions by promoting alternatives to pile burning. One of those alternatives is the use of air curtain incinerators. When used to dispose of clean woody debris an air curtain incinerator increases combustion efficiency especially when compared to outdoor pile burning. An air curtain incinerator operates by forcefully projecting a high velocity of air across an open combustion chamber in which clean wood is loaded. The “air curtain” that is created in this process traps unburned particles (smoke) under it where it is re-burned. Recent rule changes by EPA removed the Title V permit requirement for “other solid waste incineration” units that only burn clean wood waste. This rule change is only for the other waste solid incinerators and is not for the “commercial and industrial solid waste incineration.” In Oregon, most sources are commercial and industrial solid waste incinerators. In 2020, DEQ adopted rule amendments to allow issuance of general permits for air curtain incinerators (Administrative Order No. DEQ 7-2020). In light of EPA’s rule revisions, this permit will be updated to remove the requirement to transition to a Title V permit within one year of the source beginning to operate. Sources that produce emissions meeting the Title V threshold would still need a Title V permit, but a more typical air curtain incinerator operating on site to remove forest slash would likely not meet the Title V threshold and would continue to qualify for a general permit.

DEQ has convened a team of specialists to examine biomass utilization as an alternative to pile burning to reduce emissions, protect public health, and maintain visibility conditions. Starting in 2021, DEQ hosted a series of Biomass Utilization Working Group meetings which included representation from other state and regulatory agencies, industry experts, and biomass interested and affected parties. The Biomass Utilization Working Group includes subgroups for continued work with air curtain incinerators, a Biomass Permitting Guide subgroup, a Workforce Development subgroup, and a Biomass Incentives subgroup.

The goal of this working group is to:

- Understand the regulatory authority, process complexities, operational limitations and barriers related to biomass utilization;
- Understand associated environmental impacts that exist or have the potential to exist; and
- Identify needs and opportunities related to biomass utilization.

Accomplishments to date include the completion of an air curtain incinerator emissions test in 2023. This emissions test was conducted using Emerald Ash Borer infested ash wood and provided data on hazardous air pollutants, air toxics and total particulate matter emissions. The report is available on the DEQ Cleaner Air Oregon webpage. The data from the emissions test is being used by DEQ to inform the air curtain incinerator general permit. Additional emissions tests are being planned for 2025 – 2026 to assess emissions from pile burning forest debris.

These tests will provide further data for justification of alternatives to pile burning.

The Biomass Utilization Working Group has also completed a permitting guide that provides an overview of the permitting considerations for a new business. Sections include air quality, land quality, water quality, and an overview of potential requirements from other agencies including Department of Energy, ODF, Department of Transportation, and requirements when working with tribes on their lands. This Guide is posted on the DEQ Business Resources webpage under the permits section.

With many of Oregon's Class I visibility areas being located near active forestlands, DEQ believes that the promotion and utilization of ACIs and non-burn alternatives, including biomass utilization, has the potential to improve visibility in these areas.

10.3 Residential wood heating

Oregon's Heat Smart program reduces emissions from residential wood combustion by requiring uncertified stoves to be removed at the time of home sale. In addition, community grants authorized by the Oregon Legislature and administered by DEQ pay for wood stove changeouts to natural gas or electric-powered home heating devices in communities for which fine particulate matter pollution has been identified as a major source of wintertime air pollution. DEQ expects to continue to receive Legislative funding for woodsmoke reduction work in the coming years, although cannot count on a specific level of support.

10.4 Open burning

There are two main types of agricultural related burning that fall under open burning in Oregon, "agricultural open burning" and "field burning." Agricultural open burning means the open burning of any agricultural waste except as provided in OAR 340-264-0040(5). Field Burning means burning any grass seed or cereal grain crops, or associated residue, including steep terrain and species identified by the Director of Agriculture, or any "emergency" or "experimental" burning, as identified in OAR 603-077-0105(29). The majority of agricultural field burning in Oregon is associated with grass seed and cereal grain production. This burning is concentrated in specific locations during the summer months, with the majority in the Willamette Valley (about 15,000 acres) and smaller amounts in central and eastern Oregon in Jefferson and Union counties.

Field burning in the Willamette Valley is controlled under the Smoke Management Program operated by the Oregon Department of Agriculture (ORS 468A.590). ODA field burning rules are listed in OAR Chapter 603, Division 77, OAR 837 Division 110, and OAR Chapter 340, Division 264. The rules apply to areas lying between the crest of the Coastal Range and the crest of the Cascade Range (in the counties Multnomah, Washington, Clackamas, Marion, Polk, Yamhill, Linn, Benton and Lane). ODA's rules indicate that open field burning shall be regulated in a manner consistent with the Oregon Visibility Protection Plan.

Jefferson and Union County field burning is controlled through smoke management programs established by county ordinance and operated at that level. These county programs have requirements to avoid burning upwind of nearby Class I areas when smoke dispersion is poor and could impair visibility.

Oregon has prioritized the reduction of agricultural field burning while providing alternative methods of field sanitation and utilization of commercial residues to control, reduce, and prevent air pollution from field burning. Since the previous Regional Haze SIP revision, ODA's agricultural field burning program has decreased significantly, with maximum burnable acres reduced from 50,000 acres to 15,000 acres. Additionally, counties listed in ORS 468A.560 are no longer able to participate in propane flaming or stack burning. ODA encourages growers to utilize many different techniques which minimize emissions from field burning, including rapid ignition and ensuring field residues are dry and in good burning condition.

Agricultural open burning takes place across the state, except if prohibited by local jurisdictions. The amount of this burning is not well documented and DEQ has found little reliable information on daily burning activity in most areas of the state. DEQ tends to assume that emissions estimates of general outdoor burning include agricultural open burning. DEQ's Open Burning and Smoke Management staff have started a collaborative effort with ODF, ODA and the Oregon State Fire Marshal. This multi-agency group meets quarterly to assess each agency's current rules and regulatory gaps, create process documents, and develop shared messaging campaigns to promote alternatives to and best practices for burning. In addition, DEQ intends to update the Open Burning rules to clarify open burning in Oregon and to clarify how DEQ delegates responsibilities and enforcement to other agencies.

11. Review of visibility monitoring strategy

Oregon will continue to participate in the IMPROVE monitoring network to measure, characterize and report aerosol monitoring data for long-term reasonable progress tracking. DEQ commits a portion of Oregon's $PM_{2.5}$ EPA funding to support the IMPROVE network. DEQ deems the IMPROVE network representative of conditions in all of Oregon's Class I areas and would rely on the IMPROVE Steering Committee to advise states if conditions changed such that additional monitors were necessary. DEQ also deploys two visibility nephelometers at Government Camp (Mt Hood), and Crater Lake during the snow-free season (typically June through September), as well as a $PM_{2.5}$ monitor at Detroit Lake (Santiam Pass). DEQ and the nearby communities refer to the monitors for local information, particularly related to wildfire smoke.

Oregon's continued reliance on the IMPROVE network assumes the network's maintenance by Federal Land Management agencies and other Western Regional Air Partnership members . Oregon expects that operations and maintenance will continue to include data collection, analysis, quality assurance, and reporting. Oregon expects that FLMs will continue to make IMPROVE data available to the public through WRAP-supported web platforms such as the Technical Support System4 and Federal Land Manager Environmental Database.

12. Determination of adequacy

The Regional Haze Rule, paragraph 40 CFR 51.308(h) requires the state to take one of the following actions:

- The state may declare that no further revision of the existing plan is needed at this time. This is commonly referred to as a "negative declaration".
- If the plan is or may be inadequate to ensure reasonable progress due to emissions from another state, or states, which participated in a regional planning process, the state must notify EPA and the applicable state(s). The state must collaborate with the state(s) through the regional planning process to develop additional strategies for addressing the plan's deficiencies.
- If the plan is or may be inadequate to ensure reasonable progress due to emissions from another country, the state must notify the EPA and provide any available relevant information.
- If the plan is or may be inadequate to ensure reasonable progress due to emissions from within the state, then that state must revise its plan within one year to address the deficiencies.

Based on the information and data presented in this progress report, Oregon declares that no further revision of the existing State Implementation Plan is needed at this time.

13. Consultation with Federal Land Managers

Per RHR paragraph 40 CFR 51.308(i), opportunity for federal land management consultation on a progress report must be provided no less than 60 days prior to the public hearing or public comment opportunity on the progress report. The consultation must include the opportunity for Federal Land Managers to discuss their:

1. Assessment of visibility impairment in the Class I area.
2. Recommendations on the development and implementation of strategies to address visibility impairment.

On Oct. 23, 2024, DEQ sent the progress report to Federal Land Manger representatives at the U.S. Forest Service and National Park Service via electronic mail. At that time, DEQ also offered FLMs the opportunity to schedule a virtual or in-person meeting to discuss the progress report. The National Park Service representatives declined to provide comments due to other priorities during the review period. The Forest Service (USDA) provided comments back to DEQ on December 11, 2024.

Comments from the U.S. Forest Service focused on several major areas and can be reviewed in their entirety in Appendix 1 of this report.

1. Edits to ensure accuracy within the report, including editing for spelling errors and

inconsistency in deciview numbers listed in Tables 6-3 and 6-4 compared to numbers reviewed through the Federal Land Manager Environmental Database Query Wizard and from Air Quality Related Values (AQRV) - Express Tools.
2. Revisions to include several Class 1 areas outside the state and the Columbia River Gorge in section 6.
3. Revisions to clarify the effect of the pandemic on mobile source emissions in sections 7 and 9.
4. Revisions to clarify facility compliance with SAFOs.

14. Environmental justice considerations

14.1 Environmental justice

The 2017 Regional Haze Rule requires states to consider what beneficial effects controls for visibility improvement are likely to have on other factors, such as public health. Environmental advocacy groups have also raised the question of environmental justice benefits of Regional Haze Program reductions in pollutants to states.

To better understand the potential co-benefits of pollutant controls, DEQ undertook an environmental justice analysis of communities surrounding the facilities that DEQ's regional haze decisions will affect. EPA defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

Executive Order 12898 (1994) focused federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Executive Order established an Interagency Working Group on Environmental Justice. Additionally, the Executive Order directed federal agencies to develop strategies on how to identify and address the disproportionately adverse human health and environmental effects of programs, policies, and activities on minority and low-income populations.

14.2 Vulnerable populations

DEQ identified the demographic profiles of the communities immediately surrounding the facilities for which DEQ would potentially require control or actions in the 2018-2028 Regional Haze SIP. To accomplish this, DEQ used data provided in the 2019 version of EJSCREEN to calculate the following measures of potentially vulnerable communities for each census block group in the state; this version of EJSCREEN used the 2013-2017 five-year American Community Survey data for demographic indicators. The following indicators were incorporated into DEQ's calculation of a vulnerable population score.

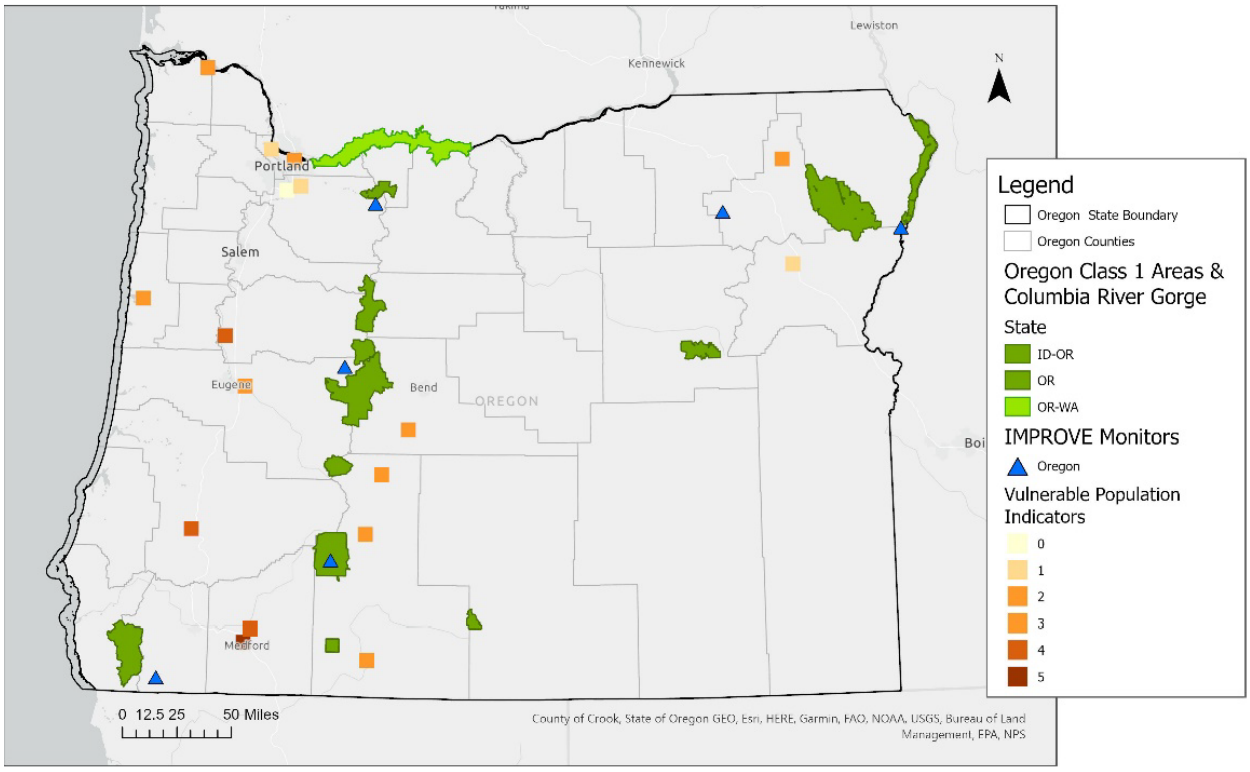
- Percent minority (percent population identifying as + percent of the population identified as Hispanic/Latino white).
- Percent low income (percent of population living in households making less than 200% of the federal income poverty level).
- Educational attainment (percent of the population over the age of 25 without a high school diploma).
- Linguistic isolation (percent of the population self-identified as speaking English “less than well”).
- Percent of population under 5.
- Percent of population over 64.

For each facility, DEQ tallied a “1” if the value of that indicator was above the statewide average, or a “0” if the value was below the statewide average.

Figure 14.2A shows the number of indicators for which the community within 2.5 miles of a facility was above the statewide average in 2017. The maximum was 6 and the minimum was 0. If a census block group was only partially contained within the 2.5 mile radius of the facility, then the value for that census block group was scaled to the proportion of the block group within the circle. Figure 14.2A illustrates the outcome of DEQ’s vulnerable populations analysis.

The analysis shows that most communities surrounding the affected Title V facilities are above the state average vulnerability score. Areas with the highest vulnerability scores were Medford, Roseburg and southeastern Linn County. Income indicators in these areas most influenced the vulnerability scores while percent minority indicators and linguistic isolation indicators most influence overall vulnerability scores in Portland and eastern Oregon counties.

Figure 14.2A. Vulnerable population indicators associated with Oregon's Class I areas and the Columbia River Gorge.



15. Public engagement and information dissemination

15.1 Public comment

This progress report was made available for public comment from Dec 27, 2024 to Jan 27, 2025.

Three comments were received by DEQ, including two full comment letters and one short email message. The substantive portions of those comments are detailed below.

Comments and DEQ's response to comments

The following comments were received from Steven D. McCoy with Friends of the Columbia River Gorge.

Comment: “The figures showing visibility trends in the National Scenic Area should be updated to include data from the COGO1 site. Although the COGO1 site was discontinued in 2011, its data is still useful in showing overall visibility trends in the National Scenic Area over time, and for that reason the COGO1 data was included in the Columbia River Gorge Air Study and Strategy (Sept. 2011). The COGO1 data should similarly be included in the Progress Report. After all, the Draft Progress Report contains data from the CORI1 site going as far back as 2001. The same should be done for the COGO1 site.”

DEQ Response: DEQ agrees with the commenter that the COGO1 site visibility data be included in this report. The TSS only made available data for the COGO1 monitor from 2002-2009, and the report has been amended to reflect the addition of several graphs for COGO1, which can be found on page 47-48 of the report.

Comment: ““The Draft Progress Report should be revised to acknowledge that the Management Plan for the Columbia River Gorge National Scenic Area, the Columbia River Gorge National Scenic Area act, state law, and the *Columbia River Gorge Air Study and Strategy* all require DEQ to protect and enhance air quality in the National Scenic Area… In addition to the requirements of federal and interstate law, DEQ is also required by state law to adhere to the adopted thresholds in the Strategy. ORS 196.155 (“All state agencies . . . are hereby directed and provided authority to carry out their respective functions and responsibilities in accordance with the compact executed under ORS 196.150 to 196.165 and the Columbia River Gorge National Scenic Area Act.”) This, along with the plain language of the National Scenic Area Act, means that DEQ must ensure continued improvement of air quality in the National Scenic Area over time. DEQ should document and disclose whether it is complying with its legal responsibilities.””

DEQ Response: DEQ appreciates the commenter addressing the aforementioned obligations. The focus of this particular report is to explain how DEQ is meeting the requirements of the Regional Haze Rule and following the strategies identified in the State Implementation Plan submitted to EPA by Oregon DEQ in 2021. DEQ asserts that the agency is protecting and enhancing air quality in the National Scenic Area. The Gorge Strategy noted that the Columbia River Gorge National Scenic Area would benefit from improvements planned at Mt. Hood and Mt. Adams Class 1 areas, and monitoring data demonstrates improving trends at representative IMPROVE monitors for those locations. Those data, along with the visibility data for the Columbia Gorge monitors, demonstrate improvements in visibility over time, which, taken together, demonstrate an enhancement in air quality in the Columbia River Gorge National Scenic Area. DEQ will pursue opportunities to address the obligations highlighted by the commenter through collaboration with Friends of Columbia Gorge, the Southwest Clean Air Agency, and with the Gorge Commission.

The following comment was received from Lilian Schemadovits-Norris with Roseburg Forest Products.

Comment: “Roseburg would like to clarify that in our letter submitted on Jan. 20,2024, we did notify the department that we would be complying with the 7-day rolling NOx average limits by using boiler optimization, and that has not changed. The SNCR construction project mentioned in the report was initiated outside the requirements of the SAFO. The SNCR is being

constructed as a proactive control measure in case there are increased NOx emissions in the future due to future projects, however Roseburg is not subject to any of the timelines within the SAFO regarding the SNCR. Roseburg maintains that it can meet the limits in Section II.4 by using boiler optimization after June 30, 2025. Roseburg recommends removing any reference of the SNCR related to the SAFO from the report. If the SNCR is to be mentioned, it is important to ensure that it is being installed as a proactive measure, but not as a way to comply with current or June 30,2025 NOx limits.

DEQ Response: DEQ appreciates Roseburg Forest Products' careful review of the stipulations reported on in this report. DEQ agrees with this assessment, and removed reference to the SNCR as a requirement. DEQ confirms that according to its' records, Roseburg Forest Products agreed to boiler optimization. The revised paragraph can be found on page 27 of this report.

The following comment was received from John Oluwaleye.

Comment: "I…Make positive respond to the Report".

DEQ Response: DEQ appreciates the commenter providing a positive response.

15.2 Information dissemination

All materials related to this SIP were posted on Oregon DEQ's public platforms. Oregon DEQ used several different resources to disseminate information to interested parties, including the DEQ webpage, and the GovDelivery system.

Public notices for the commenting period were issued on the Oregon DEQ public notice web page, and notifications were sent out through Oregon's GovDelivery system. Through GovDelivery, the public notice for this report was sent to approximately 19,082 recipients. Staff at DEQ also notified several Tribal representatives across the state of Oregon about the public comment period for this report.