Serving Island, San Juan, Skagit and Whatcom Counties

Statement of Basis – Proposed 019R3

Sierra Pacific Industries Burlington Division

Mount Vernon, WA

May 12, 2026

PERMIT INFORMATION

SIERRA PACIFIC INDUSTRIES

14353 McFarland Road, Mount Vernon, WA 98273

Responsible Corporate Official

David S. North
Division Manager
Sierra Pacific Industries
Burlington Division
14353 McFarland Road
Mount Vernon, WA 98273
(360) 424-7619 ext. 1403

Corporate Inspection Contact

Tyler Moriarty
Division Manager
Sierra Pacific Industries
Burlington Division
14353 McFarland Road
Mount Vernon, WA 98273
(360) 424-7619 ext. 1434

Northwest Clean Air Agency

1600 South Second Street
Mount Vernon, Washington 98273-5202
(360) 428-1617

Prepared by

Robyn Nabstedt, EIT
Environmental Engineer
(360) 419-6844

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1 INTRODUCTION

Sierra Pacific Industries (SPI) owns and operates a dimensional lumber manufacturing facility in Skagit County, Washington. This facility is referred to as "SPI" or "the facility," in this document.

The SPI facility is a designated major source subject to the Air Operating Permit (AOP) program because of its potential to emit (PTE) both criteria pollutants and Hazardous Air Pollutants (HAP). It has the potential to emit more than 100 tons per year (tpy) of nitrogen oxides (NO_X), carbon monoxide (CO), and volatile organic compounds (VOC), more than 10 tons per year of hydrogen chloride (HCl) and acetaldehyde, and more than 25 tons per year of total HAP. These air pollutants are defined as regulated air pollutants in Chapter 173-401 of the Washington Administrative Code (WAC).

The purpose of this Statement of Basis is to set forth the legal and factual basis for the SPI AOP conditions and to provide background information to facilitate review of the permit by interested parties. This Statement of Basis is not a legally enforceable document.

1.1 Permit Changes in the Third Renewal

The Northwest Clean Air Agency (NWCAA) received an application for the third renewal of the SPI AOP on April 1, 2025. Changes specific to each permit section are listed below.

1.1.1 AOP Section 1 Emission Unit Descriptions

Emission unit descriptions in Table 1-1 were updated with applicable orders, monitoring equipment, and equipment capacities.

1.1.2 AOP Section 2 Standard Terms and Conditions

Section 2 was updated with current citation dates and NWCAA standard language, which includes modified applicable regulations.

1.1.3 AOP Section 3 Standard Terms and Conditions for NSPS and NESHAP

Section 3 was updated with current NWCAA standard language consistent with the National Emission Standards for Hazardous Air Pollutants (NESHAP) and New Source Performance Standards (NSPS) that apply to the SPI operations. New and modified applicable regulations and updated citation dates are included.

1.1.4 AOP Section 4 and 5 Generally and Specifically Applicable Requirements

The Generally Applicable Requirements of Section 4 were reviewed and updated. Section 4 primarily lists NWCAA and WAC regulations, which often lack specific methods for compliance determination and require that additional monitoring, recordkeeping and recording provisions be added to the AOP for the purpose of compliance determination. This aspect of AOP monitoring, also known as gap-filling and sufficiency monitoring, is discussed further in Section 7.5 of this document.

Section 5 has been modified by updating the federal regulations that apply to SPI, most notably 40 CFR 63 Subpart DDDDD emissions standards for filterable particulate matter (PM), total selected metals (TSM), hydrogen chloride (HCl), and mercury for Emission Unit (EU)-1, the Cogeneration Unit.

Conditions for EU-6, the Natural Gas Package Boiler, were updated to include requirements from Order of Approval to Construct (OAC) 1089b, issued in 2021. This includes the reintroduction of periodic testing for NOx and CO and the removal of the annual capacity factor limit. This boiler is no longer considered a limited-use boiler under NESHAP DDDDD and is now subject to more frequent (annual) tune-ups. The AOP conditions have been updated to reflect the change in operation of this boiler.

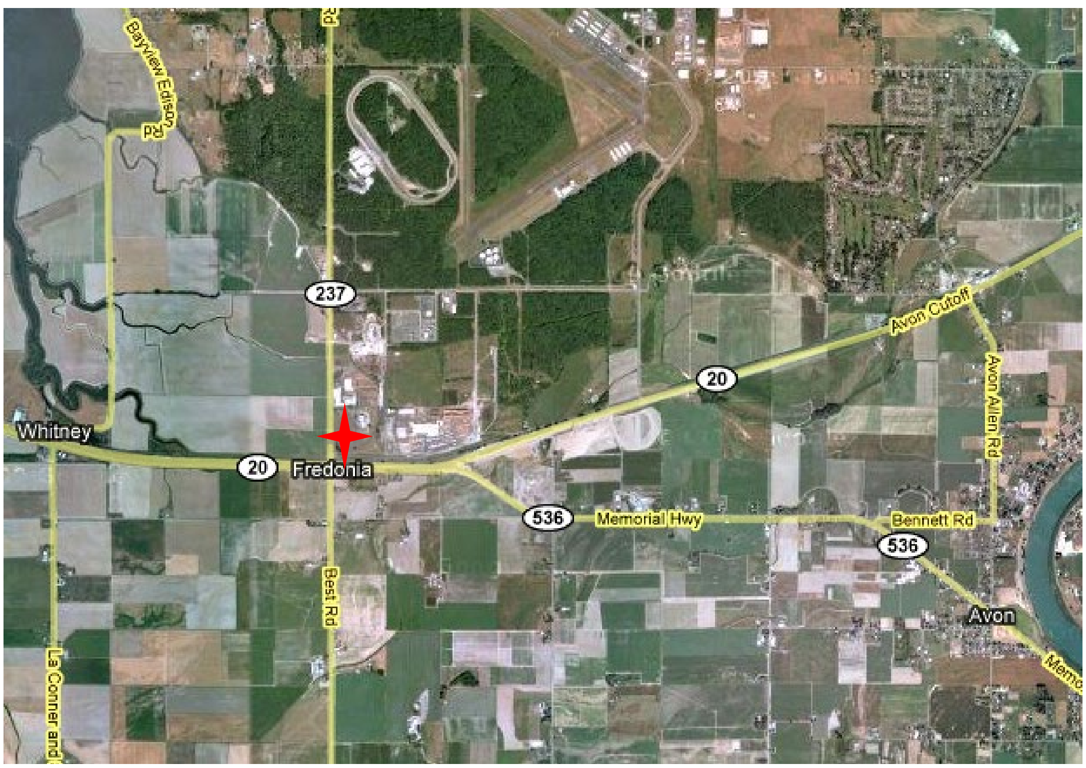
2 FACILITY DESCRIPTION AND EMISSION UNITS

The SPI facility can produce approximately 400 million board feet (MMbf)[1] of kiln-dried dimensional lumber per year. A wood-fired boiler/cogeneration unit produces steam for heating on-site lumber drying kilns and for powering a steam turbine capable of generating up to 28 Megawatts (MW) of electricity. Electricity generated is used on-site to power the saw mill and excess electricity is sold to the Puget Sound Energy distribution system. The facility was constructed beginning in late 2005 with initial startup in December 2006.

Section 1 of the AOP includes a summary of emission units, including their monitoring systems, control devices, and applicable orders and other permit actions. Generally, plant-wide emission requirements from NWCAA and Washington Department of Ecology (Ecology) regulations are included in Sections 2 and 4 of the AOP while requirements for units that have specific permitting or regulatory requirements are contained in Section 5 of the AOP. Section 3 lists portions of federal regulations applicable site-wide.

2.1 Location

The SPI lumber mill and cogeneration plant is located in Skagit County, at 14353 McFarland Road near Mount Vernon, Washington 98273. Figure 2-1shows the location of the facility. Figure 2-2is a drawing of the general layout of the process area of the facility.



[1] A **board-foot** is a specialized unit of volume for measuring lumber; it is the volume of a one foot length of a board one foot wide and one inch thick. One board-foot equals 1 ft × 1 ft × 1 in or 0.002360 m^3.

Board-feet are used for rough lumber (before drying and planing) with no adjustments. For planed lumber, board-feet refer to the nominal thickness and width of lumber, calculated in principle on its size before drying and planing. Actual length is used.

Figure 2-1 SPI Location

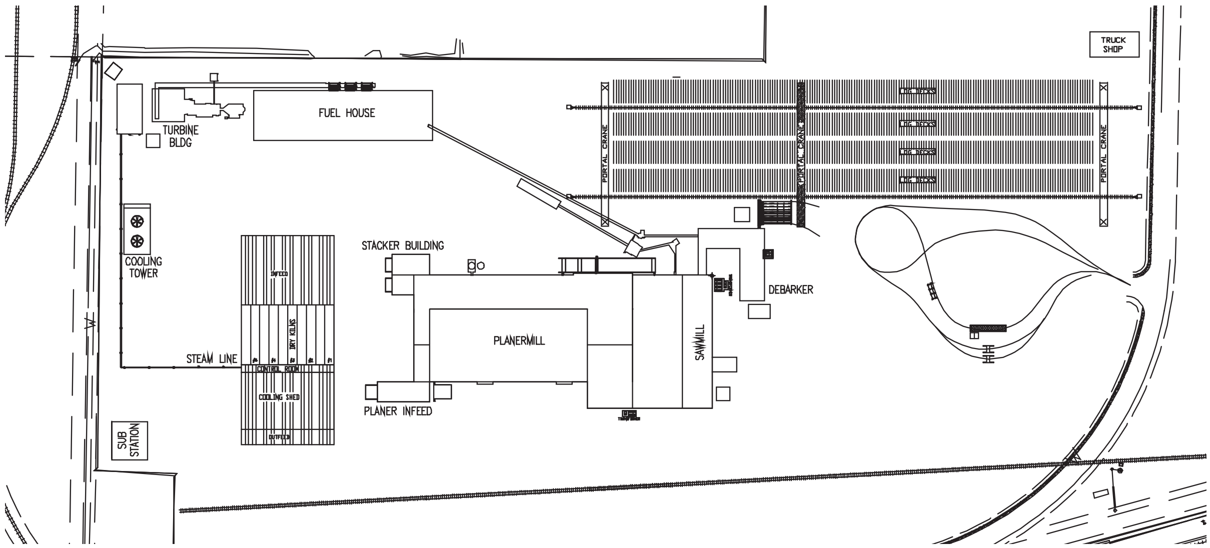


Figure 2-2 SPI Facility Layout

2.2 Operating Schedule

At the time of the permit renewal, SPI operates two 12-hour shifts (Monday 0500 through Saturday 0400) at the saw mill and planer. Maintenance on the milling equipment is done as needed between shifts and on weekends. The kilns are operated 24 hours per day, seven days per week.

The cogeneration plant operates 24 hours per day, seven days per week, with a scheduled minor maintenance shutdown approximately every 6 to 12 months. The facility underwent the first major overhaul on the cogeneration plant in May 2009 after approximately two years and six months of operation. These major overhauls are scheduled every seven to nine years of operation. The last major overhaul shutdown took place in 2020. The last maintenance shutdown took place in September 2025.

2.3 Process Description

Figure 2-3 presents the general process flow diagram of operations at the facility.

Logs are delivered to the site by truck arriving through the northern facility gate. The facility processes Western hemlock and Douglas fir. Other species of logs received at the facility are generally set aside to be sold or sent to a different facility. A majority of the log trucks are offloaded by an electric-powered portal crane that stacks the logs in organized log decks as shown in Figure 2-4. The balance are offloaded by log loaders (Caterpillar 988 or similar), which put the logs within reach of the portal crane.

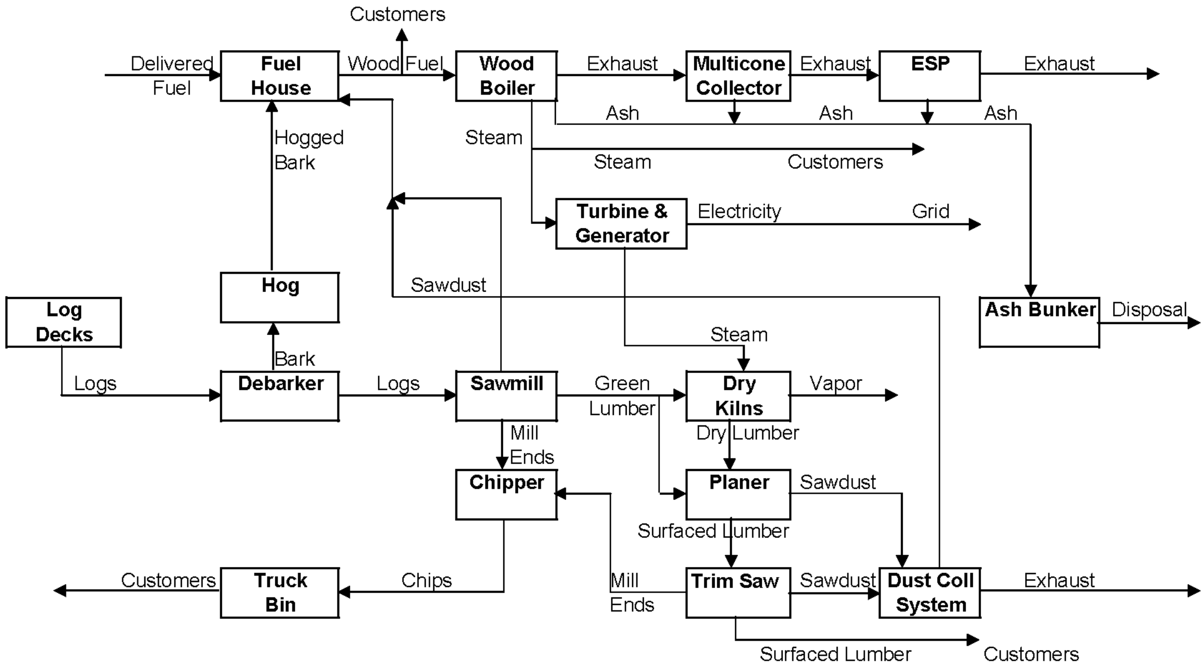


Figure 2-3 General Process Flow Diagram

Figure 2-4 Log Storage and Crane

The portal crane selects logs for feed to the saw mill through the debarker machine. The debarker removes the bark from the log. The log is then sent to the saw mill, while the bark is conveyed to a large wood chipper known as a “hog.” The hog reduces and homogenizes the size of the individual pieces of bark and normally sends it to the cogeneration facility fuel house. SPI segregates bark from logs that have been transported over salt water to be shipped off site for landscaping, keeping it out of the fuel for the boiler.

2.3.1 Saw Mill and Planer Operation

Debarked logs are cut to appropriate lengths and sawed into lumber in the saw mill as illustrated in Figure 2-5.

Figure 2-5 Sawline equipment

Log pieces that are too small to be sawed into lumber are sent to a chipper and the resulting chips are carried by covered conveyor to a chip bin. Trucks periodically remove chips and carry them to off-site customers.

Saw dust from the mill is collected under the saw deck and transferred to the fuel house by covered conveyor.

Un-dried, or "green," lumber from the saw mill may be graded, stacked, and moved by forklift to a train or truck to be removed from the facility as green product. Green lumber may also be stacked with spacers and sent to the kilns to be dried. Lumber sorting is shown in Figure 2-6.

Lumber dried in the kilns is allowed to cool in a covered area adjacent to the kilns called the cooling shed. The cool dry lumber is moved by forklift from the cooling shed to the planer mill, where the lumber is planed, graded, stacked, wrapped for shipment offsite. Product is shipped offsite primarily by rail car, but trucks may also be used.

Figure 2-6 Lumber Sorting Line

The planer, shown in Figure 2-7, processes kiln-dried lumber which generates fine, light dust. SPI uses a high efficiency cyclone to collect dust directly from the interior of the planer mill by vacuum which then places the dust onto the fuel house conveyors. Dust pick-up points are located at the planer and the trimmer saw. A baghouse is installed on the cyclone exhaust to control particulate matter emissions. The planer mill baghouse is identified as EU-3.

Most of the 48,440 acfm[2] operating capacity of this system is devoted to the planer, but approximately 10,000 acfm is dedicated to the trimmer saw. The baghouse exhaust has a permit limit of 0.005 grain per standard cubic foot (gr/scf)[3] of air exhausted. At the design capacity of the baghouse (50,440 acfm at 70 ºF, equivalent to 50,250 scfm at 68 ºF) and 0.005 gr/scf, the dust collection system has the potential to emit 9.4 TPY of PM_{10}. The potential annual emission rate for the dust collection system is based on continuous operation (24 hours per day, 8,760 hours per year). However, since startup, SPI has operated the mill in shifts on a non-continuous basis that results in fewer hours of operation and lower annual emissions.

[2] acfm = actual cubic feet per minute (ambient conditions)

[3] Standard conditions are 20 °C (68 °F) and 1.00 atmosphere (29.92 inches of mercury).

Note that the baghouse exhaust stack was initially constructed, and is currently configured to discharge vertically downward as shown in Figure 2-8.

Figure 2-7 Enclosed Planer Operation

Figure 2-8 Sawdust baghouse and conveyors

2.3.2 Dry Kilns

SPI operates six double-track dry kilns to treat lumber produced by the saw mill (up to 400 MMbf/yr)[4]. The kilns are identified as EU-4. One of the kilns is shown in Figure 2-9with a closer view in Figure 2-10. The kilns may run on a continuous basis throughout the year, if necessary, to meet production needs. The amount, dimension, and type of wood that is kiln-dried changes throughout the year based on market demand.

Wood is stacked with spacers to allow air and heat to penetrate the stack more uniformly. Steam is circulated in the kiln wall piping while fans and plenums in the roof structure circulate air in the chamber. The steam demand, fan, and plenum systems are controlled by a computer system with kiln temperature readings as feedback.

Figure 2-9 Dry Kiln at Cycle End

Figure 2-10 Dry Kilns Ready to be Loaded

Figure 2-11 shows two views of the kilns. On the left, stacked lumber inside the kiln is

[4] MMbf = million board feet

shown, with a view up to the steam tubes surrounding the kiln. On the right is a view the upper portion of a kiln, where fans are used to circulate air inside the kilns when it is in operation.

Figure 2-11 Kiln Internal Equipment

Wood passing through the kilns is either western hemlock or Douglas fir. During the drying process, wood releases VOC which pass to the atmosphere through the kiln vents. Some of these compounds (semivolatile chemicals) can condense to form particulate matter, and others have been listed by the EPA as HAP. Western hemlock and Douglas fir release methanol, acetaldehyde, and formaldehyde as the largest portion of drying emissions.

Emissions from the kilns are controlled by species throughput limitations and maintaining kiln temperatures below 200°F. No control equipment is installed on the kiln vents.

Emission factors for calculating emissions from the kilns have been included in Prevention of Significant Deterioration (PSD) permit 05-04, Amendment 3. See Section 6 of this document for more discussion. The dry kilns are also regulated by NWCAA OAC 938c, issued in 2013.

2.3.3 Anti-mold Spray System

Lumber may be treated with anti-stain/anti-mold and brightener chemicals. The spray chamber is a continuous spray box that lumber (dried as well as green) is fed through. The lumber is treated with two water-borne coatings, one that protects against sapstain, mold, mildew, decay, and bacteria during storage and transit, and another that brightens the lumber to improve its appearance. The spray chamber is located near the planer mill.

The spray chamber exhausts to the atmosphere at a maximum flow rate of 1,000 acfm. The exhaust passes through a mist eliminator, and the condensed fluid from the mist eliminator is recycled back into the spray system. No additional control equipment is installed on the spray chamber exhaust. The spray chamber is identified as EU-5.

The potential VOC emissions from the spray chamber are estimated to be approximately nine tons per year assuming all VOC in the chemicals is emitted. The spray chamber emissions are addressed by NWCAA OAC 938c, issued in 2013.

2.3.4 Cogeneration Plant

Steam for the kilns is generated by the boiler in the cogeneration facility. The cogeneration plant consists of a wood-fired, water-wall boiler, a steam turbine, and a generator. The boiler burns wood residuals (bark, sawdust, and chipped material) generated in the saw mill and planer to produce high-pressure steam for the steam turbine. In the event of saw mill shutdown, the facility also accepts wood residuals from offsite to fuel the boiler. The material is delivered by truck, dumped in the area in front of the fuel house, and mixed into the sawdust in the fuel house by front loader. A NWCAA permit requires inspection and rejection of fuel containing anything other than biomass.

Fuel is received in a three-sided fuel house, as shown in Figure 2-12, either from overhead conveyors from the saw mill or from trucks unloaded in front of the fuel house. Fuel is stacked for storage in the fuel house and pushed into the chain feeder area by front loader. Fuel is fed to boiler by a drag chain onto enclosed conveyors; as a result, fugitive dust emissions are calculated up to the drag chain. The boiler burns approximately 380,000 tons of wood residuals annually, all of which are received through the fuel house.

Figure 2-12 Fuel House

The McBurney vibrating grate spreader-stoker type boiler has a design heat input of 430 million British thermal units per hour (MMBtu/hr) and a design steam generation rate of 250,000 pounds per hour (lb/hr). The boiler is equipped with two natural gas burners, each rated at 62.5 MMBtu/hr, for start up and flame stabilization. The boiler incorporates a selective non-catalytic reduction (SNCR) system to reduce NO_X emissions using urea injection. Boiler exhaust is treated through a multiclone followed by an electrostatic precipitator (ESP) to control particulate matter emissions. Ash collected from the multiclone and ESP is shipped offsite to be used as a soil amendment. The ash loading system is enclosed to prevent fugitive emissions. The process flow in the cogeneration plant is shown in Figure 2-13.

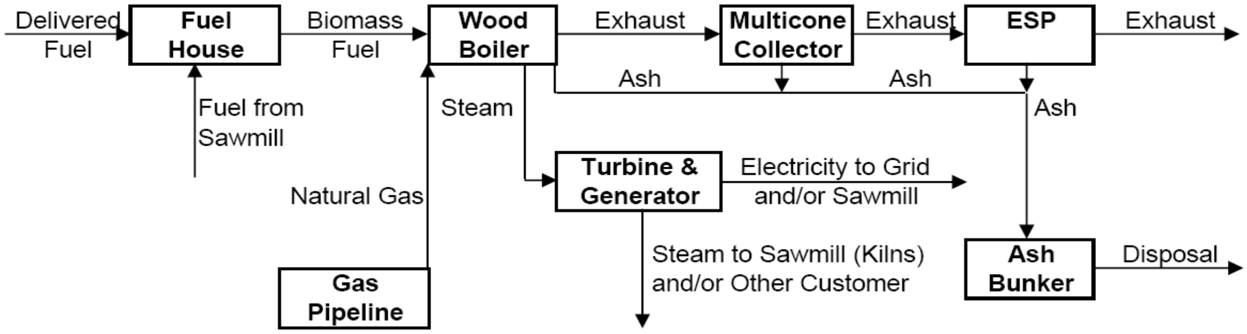


Figure 2-13 Cogeneration Plant Flow Diagram

The boiler emits NO_X, CO, $PM_{2.5}$, PM_{10}, and PM, SO_2, and VOC, as well as several HAP. The boiler exhaust is identified as EU-1. Figure 2-14 shows the boiler house and ESP.

Figure 2-14 Boiler House and ESP

The steam turbine generator can generate up to 28 MW of electricity. A portion of the produced power is used on-site; the remaining power is sold to a public utility. Low-pressure steam is collected from the steam turbine through a controlled extraction and used to heat the dry kilns.

The steam turbine and generator do not emit air pollutants. The boiler criteria pollutant emissions are based on the permit limits established in the most recent PSD permit (PSD 05-04 Amendment 3) applicable to the facility. Potential HAP emissions were derived from factors for the biomass-fired boiler. Factors were derived from AP-42 Section 1.6, where the EPA combined all source test data to calculate the AP-42 emission factors regardless of boiler type or control technology. Where more specific information was available, emission factors that were based on a subset of the source tests (biomass-fired boilers controlled by ESPs). The HCl emission factor was based on SPI's proposed HCl emission limit of 0.02 lb/MMBtu. HCl is emitted from burning "salty hog", wood that was previously soaked in salt water. The ammonia emission rate was based on an anticipated maximum exhaust ammonia concentration of 50 parts per million (ppm), a consequence of operating an SNCR system to reduce boiler NO_X emissions.

2.3.5 Cooling Tower

The facility's cooling tower condenses steam from the turbine before it is returned to the boiler feedwater supply. The cooling tower is equipped with drift eliminators to reduce water loss associated with aerosol drift. The drift eliminators achieve a drift of 0.0005 percent or less, according to design specifications. Assuming this drift rate, a maximum water flow rate of 25,000 gallons per minute (gpm), and a conservative total dissolved solids (TDS) value of 725 milligrams per liter (mg/l), the PM_{10} emission rate from the cooling towers was calculated to be approximately one ton per year. The cooling tower is identified as EU-2. The cooling tower emissions are addressed in NWCAA OAC 938c, issued in 2013.

2.3.6 Natural gas-fired package boiler

An Apache 2,200 brake horsepower (bhp) Scotch Marine boiler rated at 95 MMBtu/hr and equipped with low-NOX burners and flue gas recirculation was initially permitted on June 21, 2011. The main boiler/cogeneration plant generally undergoes maintenance for about 5-15 days per year. The purpose of the Apache boiler is to maintain kiln operation, providing steam, during the main boiler down-time.

The Apache boiler is permitted by NWCAA OAC 1089b, issued on August 31, 2021 to burn only natural gas. The most recent permit modification removed a condition limiting annual capacity to 10 percent or less, meaning the boiler no longer qualifies as a limited-use boiler[5] under 40 CFR 63 Subpart DDDDD. Because the boiler burns only natural gas, it is not subject to any emission standards under Subpart DDDDD, but it does require an annual tune-up.

2.3.7 Facility Roadways and Storage Areas

Particulate matter is generated facility-wide from storage areas and roadways. The majority of the plant manufacturing area is paved. The facility sprays water on roadways by water truck and operates a sweep truck regularly to maintain the paved surfaces free of wood dust and dirt.

[5] Limited-use boiler any boiler that burns any amount of solid, liquid, or gaseous fuels and has a federally enforceable average annual capacity factor of no more than 10 percent. Annual capacity factor means the ratio between the actual heat input to a boiler from the fuels burned during a calendar year and the potential heat input to the boiler had it been operated for 8,760 hours during a year at the maximum steady state design heat input capacity.

3 FACILITY EMISSIONS AND ENFORCEMENT HISTORY

The SPI facility is subject to the Title V program because its potential annual NO_X, CO, VOC, the single HAPs (HCl) and acetaldehyde, and total HAP emissions exceed the applicability thresholds.

Table 3-1 contains the potential to emit (PTE) from point sources at the SPI Mount Vernon facility as reported by SPI in its initial AOP application received by NWCAA on December 31, 2007, and amended to include the potential emissions of the package boiler that was first permitted on June 21, 2011. The boiler emissions are post-control. In the table below, "--" denotes a PTE of 0 for the given pollutant and EU.

Table 3-1 Potential to Emit - Criteria Pollutants

Pollutant	Boiler tpy	Cooling Tower tpy	Planer Mill tpy	Dry Kilns tpy	Anti-mold Spray tpy	Fugitive Emissions tpy	Package Boiler tpy	Plant-wide tpy
NO_X	245	--	--	--	--	--	166	411
CO	659	--	--	--	--	--	30.8	690
SO_2	47	--	--	--	--	--	3.0	50
PM/PM_{10}	37.7	0.9	9.4	5.9	--	2.2	3.1	59
$PM_{2.5}$	37.7	0.9	9.4	5.9	--	--	3.1	57
VOC	35.8	--	--	120	9.00	--	2.2	167
H_2SO_4	3.8	--	--	--	--	--	--	3.8

SPI is also major for HAP. It has the potential to emit about 16 tons of acetaldehyde, 3.3 tons of formaldehyde, 8.4 tons of methanol, and 37.7 tons of hydrochloric acid.

3.1 Actual Emissions

SPI is required to submit emissions annually by April 15 for the preceding calendar year. Table 3-2 contains the emissions of criteria and other major pollutants reported by SPI from 2020 to 2024, which is the latest year emissions have been reported as of the time of writing this document. Table 3-3 contains the emissions of HAPs from the same reporting period. The actual mass of emissions reported includes emissions from normal operation as well as upsets.

Table 3-2 Actual Criteria Air Pollutant Emissions

Criteria Air Pollutant	2020 tpy	2021 tpy	2022 tpy	2023 tpy	2024 tpy
PM	63	70	69	64	71
PM_{10}	25	33	35	28	33
$PM_{2.5}$	13	21	23	17	21
SO_2	0.8	1	2	2	0.04
NO_X	119	160	115	171	152
VOC	59	61	54	58	67
CO	194	225	198	232	259

Criteria Air Pollutant	2020 tpy	2021 tpy	2022 tpy	2023 tpy	2024 tpy
NH_3	3	4	6	19	19

Table 3-3 Actual Hazardous Air Pollutant Emissions

Toxic Air Pollutant	2020 lb/yr	2021 lb/yr	2022 lb/yr	2023 lb/yr	2024 lb/yr
Acetaldehyde	18,777	19,739	19,261	19,865	20,004
Acrolein	309	348	320	358	351
Formaldehyde	4,201	5,571	4,137	6,007	5,839
Methanol	11,636	12,193	12,671	12,671	11,886
Phenol	741	771	666	719	841

3.2 Enforcement History

SPI received three Notices of Violation (NOV) from the NWCAA between January 2020 and December 2025. A summary of these NOVs is presented below.

Table 3-4 NOV history, January 2020 - December 2025

Date Issued	Date Occurred	NOV	Description	Penalty
3/23/2021	9/30/2020-2/21/2021	4461	Sierra Pacific Industries reported 11 upset and excess emissions events on the following dates: September 30, October 28, November 1, 4, and 16, December 22 and 30, 2020, January 7, 9, and 15, and February 21, 2021. Moreover on November 14, 2020 SPI reported a shutdown due to a mechanical failure. Four of the incidents were caused by burning fuel with a high moisture content, and eight of the incidents resulted from preventable operational or mechanical failures. The frequency of boiler upsets with excess emissions resulting from reasonably preventable conditions is indicative of insufficient operation and maintenance practices and resources consistent with good air pollution control practices. Citations: NWCAA 322.3, NWCAA 342.1	$6,250
10/4/2022	2022	4619	Failure to submit the following required reports timely: 1. The first half 2022 First half Semiannual Boiler MACT report, due on 7/30/2022, has not been submitted as of 9/28/2022 either via CEDRI or hardcopy to NWCAA. NWCAA notified SPI via email on 8/31/2022. (TV term) 2. The first half 2022 semiannual compliance certification report, due on 7/30/2022 has not been submitted as of 9/28/2022. NWCAA notified SPI email on 9/26/2022. (TV term) 3. The second quarter of 2022 air emission report, due on 7/30/2022, was delivered on 8/04/2022. (TV term) SPI has asserted that company was the victim of a data hijack, and that the company did not pay ransom, so they lost data, causing them to be late on reports. Citations: WAC 173-401-615(3), 40 CFR 63.9(k), 40 CFR 63.7550	$3,000

2/21/2023	6/19/2022	4637	Operation of the wood-fired boiler resulting in 30.7 tons excess carbon monoxide (CO) emissions released during the period 6/19/2022 through 7/11/2022 (based on emissions in excess of the 0.35 lb CO/MMBtu limit). The facility also exceeded the rolling 30-day CO limit from 7/4/2022 through 7/31/2022. The wood fired boiler started up on 06/19/2022 when the steam turbine malfunctioned. The facility continued running the wood fired boiler to produce steam for the kilns (but without producing electricity). On 07/11/2022, the facility found the CEMS was registering the boiler in startup mode, with no alarms, in excess of emission limits. The facility then shut down the boiler on 7/12/2022. The facility reported the root cause as the data acquisition handling software (DAHS) was incorrectly programmed. Citations: NWCAA 322.2, 40 CFR 63.7500(a)(1)	$63,000

3.3 Stack Tests

SPI performed the following stack tests from January 2020 to December 2025.

Table 3-5 Stack Test History

Test Date	Pollutant	Emission Unit	Result
10/27/2020	CO, HCl, Hg, NH_3, NOx, PM, PM_{10}, SO_2, VOC	McBurney Wood Fired Boiler	Pass
8/19/2021	PM_{10}	McBurney Wood Fired Boiler	Pass
10/21/2021	NH_3, PM_{10}, SO_2, VE, VOC	McBurney Wood Fired Boiler	Pass
10/21/2021	PM_{10}	Planer	Pass
5/6/2022	CO, NOx	Apache Boiler	Pass
10/27/22	NH3, PM10, VE	McBurney Wood Fired Boiler	Pass
10/6/2023	HCl, Hg, NH_3, PM, PM_{10}, SO_2, VOC	McBurney Wood Fired Boiler	Pass
10/6/2023	CO, NOx	Apache Boiler	Pass
10/5/2024	NH3, PM10, VE	McBurney Wood Fired Boiler	Pass
10/30/2024	PM_{10}	Planer	Pass
10/31/2024	CO, NOx	Apache Boiler	Pass
10/15/2025	NH_3, SO_2, VE, VOC	McBurney Wood Fired Boiler	Under Review
10/16/2025	PM_{10}	Planer	Under Review
10/21/2025	CO, NOx	Apache Boiler	Under Review

As shown above, the facility passed all stack tests from January 2020 to October 2025, and preliminary review indicates passing stack tests performed from October 2025 to December 2025. As discussed in detail in Section 7.5, NWCAA used this and other information to determine whether existing monitoring was sufficient.

4 FEDERAL REQUIREMENTS

The facility owns and operates equipment regulated under federal regulations.

4.1 New Source Performance Standards

EPA has established NSPS for new, modified, or reconstructed facilities and source categories in 40 CFR Part 60.

4.1.1 Subpart A – General Provisions

If a NSPS in 40 CFR Part 60 applies to a facility, Subpart A also applies. If a requirement is applicable when triggered by some action, it was not included in the permit. Similarly, if a part of Subpart A did not have concrete requirements for the facility (i.e., if it solely addressed applicability or definitions), it was not included. If the requirement was something in the past, or addressed something that a regulatory agency must do, it was not included. The fact that these parts were not included in the permit does not exempt the facility from the requirements if they are triggered by any future actions.

The Subpart A requirements appear in Section 3 of the AOP.

4.1.2 Subpart Db - Standards Of Performance for Industrial-Commercial-Institutional Steam Generating Units (Greater than 100 MMBtu/hr)

40 CFR 60 Subpart Db addresses emissions from boilers constructed after June 19, 1984 having a heat input of greater than 100 million British thermal units per hour (MMBtu/hr). Subpart Db applies to the cogeneration boiler because the rated heat input of that unit is 430 MMBtu/hr and the unit commenced constructed in 2005.

Subpart Db limits PM emissions to 0.085 lb/MMBtu. At the proposed maximum firing rate, this limit translates into an emission rate of 36.6 lb PM/hr. Subpart Db also requires exhaust opacity to be 20 percent or less (six-minute average), except for one six-minute period per hour, which cannot exceed 27 percent opacity. SPI is required by Subpart Db to monitor opacity with a continuous opacity monitoring system (COMS). These limits do not apply during startup, shutdown, or during a malfunction. The Ecology PSD permit (PSD 05-04 Amendment 3) has a more stringent cogeneration boiler exhaust PM emission limit and NWCAA permit (OAC 938c) has a more stringent cogeneration boiler exhaust opacity limit than corresponding NSPS requirements.

The cogeneration unit burns natural gas during startup and to maintain flame stabilization. Subpart Db imposes SO_2 and NO_X limits on boilers that fire fossil fuels under certain conditions. The SO_2 limits do not apply to boilers that combust natural gas. The NO_X limits in Subpart Db do not apply to boilers that have a federally enforceable requirement that limits annual fossil fuel capacity factor to less than ten percent. SPI maintains on-site records of the quantities and times that natural gas is fired in the cogeneration boiler to ensure that gas provides less than ten percent of the annual fuel input. The AOP imposes a 0.10 annual fuel factor for natural gas exempting the facility from the NO_X limits in the regulation for the cogeneration boiler.

4.1.3 Subpart Dc – Standards of Performance for Industrial-Commerical-Institutional Steam Generating Units (10-100 MMBtu/hr)

40 CFR 60 Subpart Dc addresses emissions from boilers constructed after June 9, 1989 having a heat input rate greater than 10 MMBtu/hr but less than 100 MMBtu/hr. Subpart Dc applies to the natural gas-fired Apache package boiler because the unit has a heat input rate of 95 MMBtu/hr and was constructed in 2011.

The main boiler/cogeneration plant is scheduled to undergo maintenance for about 5-15 days per year. The Apache boiler is permitted by NWCAA OAC 1089b to burn only natural gas..

4.2 National Emissions Standards for Hazardous Air Pollutants (NESHAP)

EPA has established NESHAP under 40 CFR 63 to regulate HAP emissions from major sources of HAP. This regulatory program defines a "major source" as any facility that has a PTE of more than 10 tons per year of a single HAP or more than 25 tons per year of all HAP combined. The highest single HAP potential to emit at the facility is HCl at 37.7 tons per year. Overall, the facility has a combined PTE of 58.6 tons per year for all HAP. As a result of the annual facility-wide HCl emissions exceeding 10 tons per year, and total HAP emission rate exceeding 25 tons per year, the facility is a major source with respect to the NESHAP program.

4.2.1 Subpart A – General Requirements

If a Standard in 40 CFR Part 63 applies to a facility, portions of Subpart A also apply. If a requirement is applicable when triggered by some action, it was not included in the permit. Similarly, if a part of Subpart A did not have concrete requirements for the facility (i.e., if it solely addressed applicability or definitions), it was not included. If the requirement was something in the past, or addressed something that a regulatory agency must do, it was not included. The fact that these parts were not included in the permit does not exempt the facility from the requirements if they are triggered by any future actions.

Subpart A requirements for notifications are included in Section 3 of the AOP. These sections are triggered by the applicability of other Subparts to the facility.

4.2.2 Subpart DDDD – Plywood and Composite Wood Products

As a major source of HAPs, the facility is subject to applicable promulgated Maximum Achievable Control Technology (MACT) standards. 40 CFR Part 63 Subpart DDDD applies to the dry kilns. Construction of the dry kilns commenced in December 2005. Therefore, these units are considered new sources under 40 CFR 63 Subpart DDDD. The only applicable requirement (40 CFR §63.2252) to the kilns is the initial notification requirement in 40 CFR §63.9(b). Pursuant to 40 CFR §63.9(b)(iii), the initial combined NOC and PSD permit application served as the initial notification for the lumber dry kilns. Therefore, the facility has met this requirement and there are no additional compliance provisions applicable to the facility under this regulation included in the AOP.

4.2.3 Subpart DDDDD – Industrial, Commercial and Institutional Boilers and Process Heaters

40 CFR Part 63 Subpart DDDDD, often referred to as the "Boiler MACT," is intended to regulate industrial, commercial, or institutional boilers or process heaters that are located at a major source of hazardous air pollutants. SPI owns and operates two boilers that are subject to the boiler MACT.

The Apache 95 MMBtu/hr boiler, EU-6, is fired on natural gas and qualifies as an existing unit designed to burn Gas 1 fuels. EU-6 must comply with the work practice standards in 40 CFR 63 Subpart DDDDD Table 3, Line 3, which requires an annual tune-up.

The biomass-fired boiler qualifies as an "existing" "large solid fuel unit" with oxygen trim under the boiler MACT. According to §63.7499, the biomass-fired boiler at SPI qualifies under paragraph (i): Stokers/sloped grate/other units designed to burn wet biomass/bio-based solid. The rule, which includes a variety of emission standards, work practice standards, monitoring, testing, and recordkeeping requirements for such units, has been included in the AOP. The rule allows a facility to comply with some of the standards using either performance testing or by performing fuel analysis. SPI has requested that both methods be included in the AOP to allow for operational flexibility.

The biomass-fired boiler was required to install a COMS under NWCAA OAC 938c. Table 4 of the boiler MACT specifies operating limits for boilers. Line 4 of this table applies to the biomass-fired boiler at SPI. This line is further split into two options, 4a and 4b. A source must meet one of the two options. SPI will meet option 4a that stipulates a limit of 10% opacity, daily block average. Since SPI is equipped with a COMS, the COMS will be used for showing compliance with the 10% opacity daily block average limit.

4.3 PSD and Major New Source Review

EPA established the Prevention of Significant Deterioration program to ensure that new or expanded sources do not cause a significant deterioration in the air quality of areas that currently meet applicable air quality standards. SPI submitted a PSD permit application for the facility in 2005 because the facility's potential CO emissions exceeded the 250 ton per year PSD applicability threshold for non-designated sources. The facility's initial PSD permit was issued on December 12, 2005 (PSD 05-04). PSD 05-04 Amendment 1 was issued on August 6, 2009. PSD 05-04 Amendment 2 was issued on October 28, 2013. PSD 05-04 Amendment 3 was issued on April 23, 2024. These amendments are discussed further in Section 6 of this document.

4.4 Title IV Acid Rain Provisions

Title IV of the federal Clean Air Act regulates SO_2 and NO_X emissions from fossil fuel-fired electrical generation facilities. 40 CFR §72.6 identifies criteria used to determine whether a facility is subject to the Acid Rain Program. §72.6(b)(4)(ii) states that a biomass-fired cogeneration unit is not subject to the program if it sells no more than one third of its potential annual electrical output capacity or if it sells less than 219,000 megawatt (electric)-hours (MWe-hrs) of electricity annually. A cogeneration unit meeting either of these criteria is not subject to the Acid Rain Program.

The biomass-fired boiler at the facility meets the definition of a "cogeneration unit" in 40 CFR §72.2 because at least a portion of the steam generated by the boiler is delivered first to the steam turbine and then to the adjacent lumber manufacturing facility as steam for heating. Thus, the steam is "used twice." Additionally, SPI is capable of selling up to 219,000 MWe-hrs of power annually, which is more than one-third of the boiler's annual potential electrical output capacity (219,000 MWe-hrs calculated as described in Appendix D to Part 72). However, the boiler is not an affected source because SPI does not sell more than 219,000 MWe-hrs of electricity annually. The facility maintains records of the amount of electricity generated and sold. The electricity sale records are used to confirm the facility sells less than 219,000 MWe-hrs of power annually. Due to the boiler's cogeneration status and electrical sales, this boiler is not considered an affected source.

4.5 Compliance Assurance Monitoring

EPA established the Compliance Assurance Monitoring (CAM) program to regulate emission sources that employ a control device to maintain compliance with an enforceable emission limit or standard. 40 CFR §64.2 establishes applicability criteria for the CAM program:

- The unit is located at a major source,
- The unit is subject to an emission limit, other than an emission limit from a NSPS or NESHAP that was proposed after November 15, 1990,
- The unit uses a control device to achieve compliance with that limit,
- The unit has potential pre-control emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source, and,
- The unit is not otherwise exempt.

For units to which all applicability criteria above apply, one further criterion is evaluated to determine whether a CAM Plan is needed: if a unit is equipped with a continuous emissions monitor (i.e., CEM or COM) and monitoring for compliance with a limit is done using the continuous emissions monitor, then a CAM plan is not required for that unit for that specific limit or standard.

With the exception of the biomass-fired boiler and the planer mill dust collection system, none of the facility's emission sources employ pollution control equipment. The cooling tower is equipped with a mist eliminator; however, the primary purpose of the mist eliminator is not to control emissions. All cooling towers employ mist eliminators as process equipment to minimize water loss during operation.

CAM summary for Emission Units at SPI:

Emission Unit	Add-on Control Device Present?	Is unit subject to emission limit or standard for which the unit has a control device?	If control is present, what pollutant does it control?	Are pre-control emissions greater than 100% of major source?	Is unit equipped with a continuous monitor for the pollutant for which it exceeds 100% of major source?	Is a CAM Plan Required?
Cogeneration Facility (biomass-fired boiler)	Yes – ESP, multiclone, & SCR	Yes: PM & Opacity Yes: NOx	ESP - PM & Opacity SCR - NOx	Yes for PM, Opacity, and NOx	Yes, CEMS for NOx Yes, COMS used for some, but not all, opacity limits	**NOx: NO** – CEM used to show compliance for all applicable limits **PM & Opacity: YES** for some limits not monitored continuously (see Section 9)
Planer Mill	Yes – Baghouse	Yes: PM & Opacity	PM & Opacity	Yes for PM	No	**PM & Opacity: YES** (See Section 10)
Cooling Towers	No controls	No controls	No controls	No controls	No	No
Dry Kilns	No controls	No controls	No controls	No controls	No	No
Anti-mold spray chamber	No controls	No controls	No controls	No controls	No	No
Natural Gas package boiler	No controls	No controls	No controls	No controls	No	No

4.5.1 Wood-fired (Biomass) Boiler

The boiler is equipped with a multiclone and ESP for particulate control and an SNCR system for NO_X control. For PM, opacity, and NOx, the biomass-fired boiler is subject to emission limits stemming from a PSD, 40 CFR 60 Subpart Db, 40 CFR 63 Subpart DDDDD, NWCAA OAC permits, the WAC, and the NWCAA Regulation. As discussed above, the boiler uses control devices to achieve compliance with its opacity, PM_{10} and NO_X limits.

The pre-control emissions of PM_{10} and NOx are evaluated as follows:

- The technical support document for PSD 05-04, which SPI received for the biomass boiler, states that post-control potential emissions of NOx are 188 tpy. Pre-control emissions of NOx can only be larger and were not evaluated since post control emissions were above 100 tpy.
- The technical support document for PSD 05-04 states that the post-control potential emissions of PM_{10} are 54 tpy. Assuming that the ESP and multiclones have a 90 percent control efficiency for PM_{10}, the pre-control potential PM_{10} emissions are greater than 540 tons per year.

4.5.1.1 NOx Emissions Limits Monitored Using CEMS

Although the boiler has pre-control emissions of NOx that are more than 100 tpy, a CAM plan is not required if continuous monitoring using a CEM is required to show compliance with those standards. The facility's PSD permit 05-04 requires that SPI install a NO_X CEMS on the boiler and requires the use of that CEMS to demonstrate compliance with the NOx limits stemming from the PSD. Therefore, as established in 40 CFR §64.3(d)(1), the NOx CEMS satisfies the requirements of Part 64 and therefore a CAM plan for NO_X is not required.

4.5.1.2 NOx Emission Limits Not Monitored Using CEMS

The biomass boiler is not subject to any NOx emission limits other than those in SPI's PSD 05-04 permit.

4.5.1.3 Opacity Emissions Limits Using COMS

Because the boiler's pre-control PM_{10} emissions are greater than 100 tpy, the boiler is also subject to CAM review for opacity. The boiler is equipped with a continuous opacity monitoring system (COMS), which was required by NWCAA OAC 938c. The COM is the compliance method for the following OAC 938c and federal NSPS requirements:

1. OAC 938c Condition 3a: 20 percent opacity for a period or periods aggregating more than three minutes in one hour
2. OAC 938c Condition 3b: 5 percent opacity, one hour average and 10 percent opacity, during soot blowing
3. 40 CFR 60 Subpart Db: 20 percent opacity (6 minute average) except for one six-minute average per hour of not more than 27 percent opacity

A CAM Plan is not required for these requirements because the COMS satisfies the requirements for continuous monitoring.

4.5.1.4 Other Opacity Emissions Limits

Because the boiler's pre-control PM_{10} emissions are greater than 100 tpy, the boiler is subject to CAM review for opacity. The following additional opacity limits apply. These limits are evaluated separately from the limits identified in Section 5.5.1.3 because, unlike the limits in Section 5.5.1.3, the COM is not sufficient to demonstrate compliance as compliance must be demonstrated outside of the boiler stack:

1. NWCAA 451.1: less than 20 percent opacity for any period aggregating more than three minutes in any 60 minute period
2. WAC 173-400-040(1): less than 20 percent opacity for any period aggregating more than three minutes in any 60 minute period
3. OAC 938c Condition 3c: less than 10 percent opacity for any period aggregating more than three minutes in any 60 minute period

NWCAA determined that a CAM Plan was needed for the above requirements. SPI submitted a PM CAM plan for the biomass boiler with their first Title V renewal application as stated in 40 CFR §64.5(b). This CAM plan is applicable to both PM and opacity. SPI proposed a CAM plan based on both COM readings and ESP voltage measurements. The provisions of the CAM plan have been included in AOP terms reference the above mentioned opacity limits. The plan is shown in Section 10 of this document.

Note that in addition to complying with the CAM plan, the monthly visible emission checks required by AOP term 4.12 serve to further demonstrate compliance with the visible emission limits and validate the CAM plan monitoring parameters.

4.5.1.5 <u>PM Emissions Limits</u>

The biomass boiler is not equipped with a particulate matter continuous monitor. The following particulate matter emission limits and standards apply:

1. PSD 05-04: 0.02 lb PM_{10}/MMBtu 24-hour average, based on the heat input value of the fuel
2. PSD 05-04: 37.7 tons PM_{10} in any consecutive 12-month period
3. NWCAA Regulation and WAC: 0.10 grain/dscf (0.23 g/dry m^3) (corrected to seven percent oxygen)
4. NWCAA Regulation and WAC: 0.05 grain/dscf (0.11 g/dry m^3) (corrected to seven percent oxygen) when burning gaseous fuel

SPI has submitted a PM CAM plan for the biomass boiler with their first Title V renewal application as stated in 40 CFR §64.5(b). SPI has proposed a CAM plan based on opacity and voltage measurements. The provisions of the CAM plan have been included in AOP terms which reference the above mentioned PM limits. The plan is shown in Section 10 of this document.

Note that in addition to complying with the CAM plan, the monthly visible emission checks required by AOP term 4.12 and the annual PM testing requirements in AOP term 5.1.14 serve to further demonstrate compliance with the PM emission limits and validate the CAM plan monitoring parameters.

4.5.1.6 <u>Large Pollutant Specific Emission Units</u>

According to 40 CFR §64.5(a), a large pollutant-specific emissions unit (PSEU) is one with the potential to emit (taking into account control devices) the applicable regulated air pollutant in an amount equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

Based on this definition, the biomass boiler is not a large PSEU for PM: the post-control emissions are under 100 tons per year, since the ESP is limited to 0.02 lb/MMBtu, with an annual potential emission of 39.4 tpy of PM.

As discussed above, because the biomass boiler has a post-control limit of more than 100 tpy of NOx, it would be a large PSEU for that pollutant under CAM. However, since all NOx limits for the biomass boiler are required to demonstrate compliance using a CEMS, no CAM plan is required.

4.5.2 Planer Mill

The planer mill dust collection system employs a baghouse for particulate control. The planer mill dust collection system is subject to a PM_{10} emission limit (0.005 gr/dscf, and not more than 9.4 tons of PM_{10} per year, from PSD 05-04 Amendment 3) and a baghouse control device achieves compliance with its PM_{10} limit. The baghouse is also subject to opacity limits (generally applicable opacity limits in Section 4 of the AOP). According to Chapter 1 of EPA's CAM Technical Guidance Document[6], pre-control device emissions can be estimated using post-control potential to emit and the estimated control device efficiency. The baghouse controlling the planer mill is subject to an annual PM_{10} limit of 9.4 tons per year. Assuming conservatively that the baghouse has greater than 99 percent control efficiency for PM_{10}, the pre-control potential PM_{10} emissions are greater than 930 tons per year. As a result, the baghouse controlling emissions from the planer mill is subject to CAM.

Visible emissions from baghouse are directly related to sawdust particulate matter emissions; when a baghouse is functioning properly, no visible emissions will be observed. Since the baghouse controls PM emissions to below the major source threshold, 40 CFR §64.3(b)(4)(iii) requires data collection at least once per 24-hour period. The SPI AOP was modified during the previous renewal to include the CAM Plan, which consists of daily observation of emissions from the baghouses and daily readings of the pressure drop across the baghouses. This monitoring, annual testing already required, plus monitoring records were found to be appropriate based on guidance provided by EPA in a Frequently Asked Questions Concerning the CAM Rule (October 2004) guidance document[7]. In this document, EPA stated that daily observation for any visible emissions from a baghouse stack satisfies the monitoring requirement of CAM for PM emissions.

As mentioned above, the maximum PM emission rate of the planer mill baghouse is 9.4 tpy. The potential controlled PM_{10} emissions from the planer mill baghouse are less than 100 tpy, and therefore the unit is not classified as a large PSEU.

SPI has proposed a CAM plan based on pressure drop monitoring across the bags of the baghouse. The CAM provisions are included in AOP Terms 4.13 and 5.3.1. The CAM plan is shown in Section 11 of this document.

4.6 Other Federal New Source Review Programs

The entire jurisdiction of NWCAA is designated as in attainment for all criteria pollutants. No other federal new source review programs for new or modified sources of air pollution in a nonattainment area are applicable.

[6] http://www.epa.gov/ttnchie1/mkb/documents/TSD_1.pdf, accessed on 1/12/2021

[7] www.epa.gov/ttn/emc/cam/camfaq1r1004.pdf, accessed on 1/12/2021

5 PSD AND OAC PERMITS

SPI has been issued a series of permits by Ecology and NWCAA. Section 5.1 discusses historical orders, while Section 5.2 discusses currently applicable orders.

5.1 Obsolete Orders

This section describes OACs and permits that are expired or superseded in order to provide the facility history of changes impacting emissions.

5.1.1 OAC 938 and PSD 05-04

SPI submitted a combined Notice of Construction (NOC) application and a PSD permit application for the facility to NWCAA and Ecology on August 22, 2005. OAC 938 and the permit PSD 05-04 were issued in parallel on December 12, 2005. Construction of the SPI facility began December 2005 and the facility commenced operations on December 30, 2006 under these permit actions.

OAC 938 limited throughput of the kilns to 150 million board feet of lumber over any consecutive 12-month period. The purpose of the requirement was to limit formaldehyde emissions to less than 195 lb/year, which is the point at which modeling indicated that the "acceptable source impact level (ASIL)" for the pollutant formaldehyde was reached. The 195 lb/year amount and the resulting 150 MMbf/year limit were based on the worst case of the two allowed wood species – Hemlock. Under this scenario, SPI could dry up to 100 percent hemlock and remain under the formaldehyde ASIL.PSD permit 05-04 limited VOC and PM_{10} emissions from the kilns as requested by SPI, in order to facilitate issuance of the PSD permit. These emission caps kept the facility below the thresholds requiring significant modeling work.

5.1.2 PSD 05-04 Amendment 1

PSD 05-04 was superseded by Amendment 1 issued and effective August 6, 2009.

Throughout 2007 and 2008, SPI found that more of the total production required drying because the market for green (not dried) lumber was declining (as stated in the OAC 938a modification application). Therefore, the facility needed to dry most, if not all, of the mill production in order to remain competitive. Additionally, according to SPI, production improvements implemented by the facility resulted in an actual mill capacity of 400 MMbf/yr. The actual capacity of the kilns is also now known to be up to 400 MMbf/yr as-built.

In the PSD modification application and the associated minor permit modification (OAC 938b) application, SPI requested that the kiln throughput limit be lifted to 400 MMbf/yr with resulting criteria, toxic air pollutant (TAP), and hazardous air pollutant (HAP) emission increases. SPI proposed that kiln throughput be limited by emissions not by production rate directly in order to provide flexibility for the species dried in the kilns.

The PSD permit addresses the criteria pollutant emission limits and OAC 938b addresses the toxic air pollutant limits that changed during this permit revision.

Because the proposed project was a PSD circumvention case avoiding full modeling requirements, PSD guidance document, Tyler memo 7/5/85 page 10 requires that the project be treated as a new source for purposes of modeling. SPI utilized Environ consultants to fulfill the modeling requirements and provide a full ambient impact analysis. WA DOE and EPA conducted the reviews for all the modeling results.

The ambient impact results showed that full throughput at the kiln had to be limited in conjunction with extending the facility fence line to the west of the kilns in order to manage

$PM_{2.5}$ increment consumption. The PSD 05-04 Amendment 1 terms includes terms to address the new property boundary and limiting the kiln throughput to meet the modeling results. The PSD 05-04 Amendment 1 permit also includes ambient $PM_{2.5}$ monitoring in the area of proposed impact within the facility boundary.

The application requested that the PSD NO_X limit be lifted from 188 tpy to 245 tpy to offset the formation of secondary visible emissions resulting from the reaction of fuel salts with injected urea. This increase is seen as dropping the long term 0.10 lb NO_X /MMBtu leaving only the short-term 0.13 lb NO_X /MMBtu limit in place.

5.1.3 PSD 05-04 Amendment 2

PSD 05-04 Amendment 2 was issued on , and superseded PSD 05-04 A1.

SPI applied to Ecology to change their PSD permit, asking to revise the averaging period of their CO limit from 0.35 pounds per million British thermal units (lb/MMBtu) emission limit from one hour to a 30-day rolling of the facility's biomass boiler.

SPI argued that since their boiler burns wet biomass, and the fuel does not instantaneously combust as it would in a natural gas boiler, the boiler grate can carry a significant amount of fuel, even up to ½ hour worth of fuel under some conditions. Also, SPI argued, it takes 20 minutes for fuel to travel from the fuel house through the fuel delivery system and into the furnace. Fuel is put on the grate for a current need, but when that need changes, it can take between ½ hour to nearly an hour for the boiler to level the fuel back to the current demand and achieve the result of a full fuel change if we are changing fuel source. This could result in excess CO emissions when the limit is based on a one hour averaging period. Therefore, SPI concluded, a one hour averaging time is inconsistent with the boiler design parameters.

Ecology considered the request and agreed that a one hour averaging period does not provide sufficient time for a biomass boiler to be operated properly. Using historical CEMS data from SPI, as well as other permits written around the same time as the original PSD 05-04 (2005), Ecology proposed a limit of 0.28 lb/MMBtu, 24-hour average.

5.1.4 OAC 938a

OAC 938a was issued on January 17, 2008, superseding and replacing OAC 938.

On December 18, 2007, SPI applied to change the kiln throughput limitations of OAC 938. Throughout 2007 SPI found that the facility was drying less hemlock than anticipated, and needed to dry more Douglas fir lumber to respond to market demands. SPI requested changes in their permit to raise allowable kiln throughput to 180 MMbf on a calendar year basis and the addition of a formaldehyde limit of 195 pounds over any consecutive 12-month period. The modified permit allowed more flexibility, requiring SPI to track throughput of each allowable wood species and to calculate formaldehyde emissions on a monthly basis.

During the time interval between issuance of OAC 938 and 938a, new emission factors had been developed for formaldehyde from dry kilns. It was found that emissions of formaldehyde increased if the kiln operated at temperatures in excess of 200°F. The permit findings identified kiln temperatures controlled below 200°F to be BACT for VOC and TBACT.

5.1.5 OAC 938b

OAC 938b was issued on February 23, 2009, superseding and replacing OAC 938a.

In conjunction with the PSD 05-04 Amendment, SPI requested associated and additional changes to the NWCAA OAC. SPI requested that the COMS-measured opacity limit on the cogeneration unit be increased from five percent to 10 percent to accommodate soot blowing. In interviews with the facility operators, soot blowing at the boiler was being deferred from the recommended rates to meet the opacity limits in place. OAC 938b provided a term that allows for scheduled soot blowing twice per day, easing the opacity limit during that hour to the requested 10 percent limit. This change does not impact the BACT determination for visible emissions for the boiler – most other wood-fired boilers have provisions for soot blowing included in the permits.

Emissions of acetaldehyde, acrolein, and formaldehyde at full capacity in the kilns resulted in ambient levels exceeding the ASILs, therefore, Tier 2 review was required for those compounds. The tier 2 review was conducted by Ecology and the technical support document is included in the background documentation for OAC 938b.

T-BACT was employed to mitigate the impact of the emissions in this case. "T-BACT" is best available control technology for toxic air pollutants. The kilns in question were using T-BACT at the time of the original application, which is no add-on controls, plus the additional limitation of not exceeding an average operating temperature of 200 °F.

OAC 938b imposed facility-wide limits of acetaldehyde, acrolein, and formaldehyde reflective of the Tier 2 modeling analysis. The WAC 173-460 tier 2 approval by Ecology was included as part of the OAC upon issuance of the permit.

SPI submitted an ammonia emissions monitoring plan to the NWCAA in 2007. The plan noted that testing demonstrated that at the highest input of urea, the facility does not exceed the 50 ppmdv[8] limit imposed by the permit. Therefore, the facility proposed to demonstrate compliance with the ammonia slip limit annually through source testing. The AOP reflects that there is no additional monitoring for ammonia slip beyond the annual testing and that any modification triggers an update of the plan. OAC 938b includes language that places operation and maintenance (O&M) requirements on the urea injection system.

5.1.6 OAC 1089

OAC 1089 was issued on June 21, 2011, and installation and operation of a 95 MMBtu/hr natural gas-fired package boiler in order to maintain kiln operation during the wood-fired boiler down-time.

The wood-fired boiler scheduled maintenance time is 5-15 days per year and is under contract with Puget Sound Energy for power production for all remaining days of the year. SPI requested an operating limit of 876 hours per year to accommodate both scheduled maintenance and unforeseen boiler downtime.

OAC 1089 was issued on 6/21/2011, and was superseded by OAC 1089a on 11/14/2014.

5.1.7 OAC 1089a

OAC 1089 was superseded by OAC 1089a issued and effective November 14, 2014.

On October 27, 2014, SPI applied to NWCAA to amend the language in Condition 1 of OAC 1089 that keeps the natural gas-fired package boiler as "limited use" boiler as defined in 40 CFR 63 Subpart DDDDD.

OAC 1089 limited the boiler to 876 hours of operation per calendar year. The language was

[8] "ppm" means parts per million. Sometimes this is written as "ppmvd" meaning ppm on a volumetric, dry, basis, to distinguish ppm on a weight basis. Stack gas is usually sampled through a probe placed somewhere in the middle of the stack cross-section. The moisture is removed from the gas stream as part of the sampling process. The stack gas sample is analyzed for the pollutant in question, with the lab results being calculated as cubic feet (or meters) of pollutant per million cubic feet (or meters) of dry stack gas.

changed to reflect what 40 CFR 63 Subpart DDDDD allows: that limited use boilers are those that do not exceed 10% of the annual capacity factor.

The annual capacity factor is defined as the ratio between the actual heat input to a boiler or process heater from the fuels burned during a calendar year and the potential heat input to the boiler or process heater had it been operated for 8,760 hours during a year at the maximum steady state design heat input capacity.

The conditions pertaining to NOx and CO limits, as well as the testing provisions, also were deleted. The original permit called only for an initial test, which had been done on 05.10.2012. Results were 1.08 lb NOx/hour (limit of 1.7 lb/hr) and 0.08 ppmv CO (limit of 50 ppmv).

5.2 Effective Orders and Permits

The following Orders of Approval to Construct (OAC) and Regulatory Orders for specific equipment are currently valid at the facility and included in the AOP.

5.2.1 PSD 05-04 Amendment 3

PSD 05-04 Amendment 3 was issued April 23, 2024 superseding and replacing PSD 05-04 Amendment 2.

SPI applied to Ecology to change their PSD permit, asking to revise the averaging period of their CO limit from 0.35 pounds per million British thermal units (lb/MMBtu) emission limit from one hour to a 30-day rolling of the facility's biomass boiler.

Using historical CEMS data from SPI, as well as other permits written around the same time as the original PSD 05-04 (2005), Ecology agreed to change the limit to 0.28 lb/MMBtu, 24-hour average.

5.2.2 OAC 938c

OAC 938b was superseded by OAC 938c issued and effective May 8, 2013.

On February 14, 2013, SPI submitted an application proposing to utilize "urban wood waste" fuel ("alternative fuel") for up to 50% of the wood-fired boiler's fuel demand. Specifically, SPI proposed to remove the words "from wood products industries" from condition 8 of OAC 938b to allow no more than 50% of fuel combusted in the existing biomass-fired cogeneration boiler to be purchased from fuel suppliers other than those in the wood products industry.

5.2.3 OAC 1089b

In June of 2021, SPI requested an amendment to OAC 1089a to remove the annual capacity factor limiting operation of the natural gas-fired Apache package boiler. The boiler became subject to the annual tune-up requirements of 40 CFR 63 Subpart DDDDD, rather than the 'limited use boiler' tune-up frequency of once every five years. This renewal incorporates the removal of the annual capacity factor from OAC 1089b and the subsequent change in operation of the boiler into the AOP.

6 COMPLETED REQUIREMENTS

These requirements are applicable, but they are “one-time” in nature, in that they only have to be complied with once, usually in the startup phase of a project. Once this type of requirement has been fulfilled, it is placed in this Completed Requirements Section.

6.1 40 CFR 60 Subpart Db, §60.40b (6/13/07, unless otherwise noted)

The cogeneration facility is subject to Subparts A and Db of the NSPS. Subpart A contains a number of notification requirements that are considered to be one-time. Once these notification requirements have been fulfilled they can be moved to this section. SPI submitted the notification of commencement of construction in their application for OAC 938 on August 22, 2005. They submitted notification via email that the cogeneration facility had commenced operation, stating that operations had commenced on December 30, 2006. They submitted the notification and test protocol for the initial source testing and relative accuracy test audit (RATA) of the continuous emission monitoring system (CEMS) on December 21, 2007.

6.2 40 CFR 63 Subpart DDDD, §63.2252 (2/16/06)

For process units not subject to the compliance options or work practice requirements specified in §63.2240 (including, but not limited to, lumber kilns), the source is not required to comply with the compliance options, work practice requirements, performance testing, monitoring, SSM plans, and recordkeeping or reporting requirements of Subpart DDDD, or any other requirements in subpart A of 40 CFR 63, except for the initial notification requirements in §63.9(b). SPI submitted the initial notification in their application for OAC 938 on August 22, 2005. They submitted notification via email that the dry kilns had commenced operation, stating that operations had commenced on December 30, 2006.

6.3 40 CFR 63 Subpart DDDDD §63.7545(b)

According to §63.7545(b), SPI must have submitted to an initial notification not later than 120 days after 1/31/2013. SPI has submitted the initial notification to EPA Region X with a letter dated 5/30/2013.

6.4 40 CFR 63 Subpart DDDDD Table 3 Line 4

According to 40 CFR 63 Subpart DDDDD, Table 3, Line 4, an existing boiler located at a major source facility must have a one-time energy assessment performed by a qualified assessor according to the provisions listed in Table 4. The report was finished on July 31, 2015.

6.5 40 CFR 63 Subpart DDDDD §63.7510

According to §63.7510, as part of the initial compliance demonstration, SPI must have performed initial compliance tests for HCl, Hg, and PM according to §63.7520 and Table 5, a CEM performance evaluation for CO according to §63.7525(a) and a COM performance evaluation for opacity according to §63.7525(c), as well as the initial boiler tune-up. These tests and performance evaluations were completed on 6/11/2015.

6.6 PSD 05-04 Amendment 3

Section A, General Conditions: General standard conditions from PSD 05-04 Amendment 2 were moved into Section A, General Conditions in PSD 05-04 Amendment 3. These conditions are substantially equivalent to conditions found in Section 2 of the AOP (Standard Terms and Conditions) and are not included in the AOP.

Condition 1: Requirements specified in the following approval conditions for SPI to notify or report to or acquire approval or agreement from "Ecology and the Northwest Clean Air Agency" may be satisfied by providing such notification, reporting, or approval request to the NWCAA if the approval conditions of this PSD permit have been incorporated in SPI's Title V permit (40 CFR Part 70). Therefore, there are no ongoing compliance provisions in this term to incorporate into the AOP.

Condition 2: requires that SPI shall obtain and maintain exclusive control over property described as "That portion of New Lot 2 of that certain Boundary Line Adjustment as shown on Record of Survey recorded under Auditor's file number 200905290102, records of Skagit County, Washington.

The requirement to obtain control over the property is implicit and is not included in the term as it appears in the AOP. And for simplicity, the requirement to maintain this area describes the boundary in general terms as including the area east of the rail spur and the northwest corner of the Fredonia Grange lot. In the event of a dispute in this description, the underlying requirement holds precedence and the survey information will be compared.

Control of the property was confirmed by SPI in correspondence, approved by NWCAA and Ecology on November 18, 2009.

6.7 OAC 938c

Condition 11 required SPI to submit a notification of the date they received first alternative fuel, and the date they first burned that fuel in their boiler. According to an email from Curt Adcock of SPI to Erica Shuhler of NWCAA received on 6/18/2013, alternative fuel was first received by SPI on June 12, 2013 and it was burned in the boiler on June 19, 2013.

7 GENERAL PERMIT ADMINISTRATION AND ASSUMPTIONS

7.1 Permit Content

Applicable requirements that were satisfied by a single past action on the part of the source are not included in the AOP. An example of this would be performance testing to demonstrate compliance with applicable emission limitations as a requirement of initial startup (see Section 6). Also, regulations that require action by a regulatory agency, but not of the regulated source are not included as applicable permit conditions.

7.2 Federal Enforceability

Federally enforceable requirements are terms and conditions required under the Federal Clean Air Act (FCAA) or under any of its applicable requirements. Local and state regulations may become federally enforceable by formal approval and incorporation into the State Implementation Plan (SIP). Federally enforceable requirements are enforceable by the EPA and citizens. All applicable requirements in the permit including standard terms and conditions, generally applicable requirements, and specifically applicable requirements are federally enforceable unless they are identified in the permit as enforceable only by the state. Two different versions (identified by the date) of the same regulatory citation may apply to the source if the date NWCAA adopted the regulation lags behind changes made to the Washington Administrative Code (WAC) or federal regulations. The citation for each applicable requirement in the permit includes a date, which is the effective date in the case of a WAC, or the approval date for NWCAA Regulation sections, or the Federal Register publication date for federal regulations.

7.3 Future Requirements

Applicable requirements promulgated with future effective compliance dates may be included as applicable requirements in the permit. Some requirements that are not applicable until triggered by an action, such as the requirement to file an application prior to constructing a new source, are addressed within the standard terms and conditions section of the permit.

There are presently no pending applications to construct or modify SPI in such a way as to trigger New Source Review. SPI has certified in the permit renewal application that the facility will meet any future applicable requirements on a timely basis.

7.4 Compliance Options

SPI did not request emissions trading provisions or specify more than one operating scenario in the air operating permit application; therefore, the permit does not address these options as allowed under WAC 173-401-650. This permit does not condense overlapping applicable requirements (streamlining) nor does it provide any alternative emission limitations.

7.5 Gap Filling and Sufficiency Monitoring

Title V of the Federal Clean Air Act is the basis for the EPA's 40 CFR 70, which is the basis for the State of Washington air operating permit regulation, Chapter 173-401 WAC. Title V requires that all air pollution regulations applicable to the source be called out in the AOP for that source. Title V also requires that each applicable regulation be accompanied by a federally enforceable means of "reasonably assuring continuous compliance." Title V, 40 CFR 70, and WAC 173-401-615 all contain a "gap-filling" provision that enables NWCAA to add monitoring where no monitoring is present[9]. 40 CFR Part 70.6(c)(1) and WAC 173-401-630(1) contain authority to address situations where monitoring exists, but is deemed to be insufficient. NWCAA relied upon these authorities to add monitoring where needed to the AOP.

The majority of cases where monitoring needed to be added were older regulations and permits that contain no monitoring. For example, NWCAA used its gap-filling authority to add monitoring for the 20 percent visible emission standard, NWCAA 451.1. In any term where gap-filling has taken place, the regulatory citation for that term will contain will contain the words "directly enforceable" and the introductory paragraphs for the AOP table include the reference to the citation of the gap-filling requirement.

There were also some limited cases where monitoring did exist but was found to be insufficient. NWCAA used its sufficiency monitoring authority (WAC 173-401-630(1)) to add monitoring in those cases. "Directly Enforceable – Sufficiency" is included in the AOP term when NWCAA used its authority supplement insufficient monitoring and the introductory paragraphs for the AOP table include reference to the citation for the sufficiency monitoring requirement.

The type and frequency of monitoring added under the authorities in WAC 173-401-615 and WAC 173-401-630(1) were set based on the following factors:

1. Historical Compliance – NWCAA reviewed the facility's past compliance with the underlying requirement. This information helped inform the decision about monitoring frequency and stringency.
2. Margin of Compliance – The margin of compliance is a measure of whether the facility can easily achieve compliance with a requirement, or whether they operate close to an exceedance. NWCAA considered the facility's margin of compliance for each underlying requirements in setting monitoring for that requirement.
3. Variability of Process and Emissions – Processes that vary their production rates and/or emissions over time (e.g., batch loading of grain silos, VOC emissions from lumber drying kilns) require different monitoring from steady-state processes. NWCAA considered process and emission variability in setting monitoring.
4. Environmental Impact of a Problem – Exceedances of some permit requirements have greater environmental consequences than others. For example, an upset that causes an exceedance at the biomass-fired cogeneration boiler could have a greater environmental impact than failing to use ultra-low sulfur diesel at an emergency

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[9] WAC 173-401-615(1) Monitoring. Each permit shall contain the following requirements with respect to monitoring:

(a) All emissions monitoring and analysis procedures or test methods required under the applicable requirements, including any procedures and methods promulgated pursuant to sections 504(b) or 114 (a)(3) of the FCAA;

(b) Where the applicable requirement does not require periodic testing or instrumental or noninstrumental monitoring (which may consist of recordkeeping designed to serve as monitoring), periodic monitoring sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit, as reported pursuant to subsection (3) of this section. Such monitoring requirements shall assure use of terms, test methods, units, averaging periods, and other statistical conventions consistent with the applicable requirement. Recordkeeping provisions may be sufficient to meet the requirements of this paragraph; and

(c) As necessary, requirements concerning the use, maintenance, and, where appropriate, installation of monitoring equipment or methods.

generator. NWCAA considered the environmental impact of a problem in setting monitoring.

5. Clarity and Complexity – The requirements that apply to AOP facilities are numerous, varied, and can be complex. The greater number, variety, and complexity of requirements, the harder it is for a facility to understand and comply. NWCAA's goal is to write clear, concise permits the facilities can understand. To help achieve this goal, when possible, NWCAA aligned additional monitoring with monitoring that the facility is already performing. This approach required careful thought. NWCAA reviewed the monitoring the facility is already performing to see if it was adequate to stand-in as monitoring for the permit term, and only used it if deemed adequate.

The following tables lists where NWCAA used its gap-filling or sufficiency monitoring authority.

Table 7-1 AOP Terms with Directly Enforceable Gapfill Provisions

AOP Term	Description	Monitoring
4.1	Required monitoring reports	Reporting periods identified
4.2	Operation and maintenance	Monitor, keep records and report
4.3-4.6, 4.22	Nuisance	Procedure followed when complaints are received
4.7-4.11	Fugitive PM	Procedure followed when complaints are received
4.12-4.16, 4.22	Visible emissions	Visible emissions monitoring
4.17-4.21	Sulfur dioxide	Burn biomass or natural gas only
5.1.6	Boiler startup	Recordkeeping to demonstrate startup has occurred
5.1.7	Boiler shutdown	Recordkeeping to demonstrate shutdown has occurred
5.1.18-5.1.19	Cogeneration unit regulatory status	Maintain records of electricity generation
5.5.1, 5.5.4	Anti-mold spray chamber	Recordkeeping and calculation of rolling 12 month VOC totals

Table 7-2 AOP Terms with Directly Enforceable Sufficiency Provisions

AOP Term	Description	Monitoring
5.1.2	Recordkeeping for rejected fuel loads	Ensuring the facility keeps records of rejected fuel loads onsite
5.3.1	Recordkeeping for planer baghouse	Keep records of lumber processed per month and calculate rolling 12 month total of PM10 emissions
5.4.4	Lumber drying kilns VOC limit	Clarifying VOC records include rolling 12 month totals

7.6 Inapplicable Requirements

WAC 173-401-640 requires the permitting authority to issue a determination regarding the applicability of requirements with which the source must comply. Table 6-1 of the AOP lists requirements that are deemed inapplicable to the facility. These inapplicable requirements must be listed in the AOP in order for the permit shield to apply. The basis for each determination of inapplicability is included in the table.

8 PERMIT ELEMENTS AND BASIS FOR TERMS AND CONDITIONS

8.1 Permit Organization

The permit is organized in the following sequence:

1. Permit Information
2. Attest
3. Table of Contents
4. Emission Unit Identification
5. Standard Terms and Conditions
6. Generally Applicable Requirements
7. Specific Requirements for Emissions Units
8. Inapplicable Requirements

8.2 Section 1 – Permit Information, Attest, and Emissions Unit Description Sections

The General Information section identifies the source, the responsible corporate official, and the NWCAA personnel responsible for permit preparation, review, and issuance. The Attest section provides authorization by NWCAA for the source to operate under the terms and conditions contained in the AOP. The Emissions Unit Identification section lists the significant emissions units, associated control equipment, fuel type, applicable orders and other permits, and installation dates. This section is a general overview of the facility. Detailed information about the plant can be found in the permit application and supporting files.

8.3 Section 2 – Standard Terms and Conditions

The Standard Terms and Conditions section of the permit specifies administrative requirements or prohibitions with no ongoing compliance monitoring requirements. The legal authority for the Standard Terms and Conditions are provided in the citations in Section 2 of the permit. The description of the regulation in each of these conditions (with the exception of those labeled "Directly enforceable") is sometimes a paraphrase of the actual regulatory requirement. Where there is a difference between the actual requirement and the paraphrased description, the cited regulatory requirement takes precedence. In an effort to make the section more readable, the terms and conditions have been grouped by function. In some cases, similar requirements at the state and local authority level have been grouped together.

Several permit conditions in Section 2 are labeled "Directly enforceable". These conditions are a clarification of the regulatory requirements, as the NWCAA interprets those requirements. They are legal requirements with which the permittee must comply and are directly enforceable through the permit.

A number of requirements that would not be applicable until triggered have also been included in this section. An example of one such requirement is the requirement for a source to submit an application for new source review.

8.4 Section 3 – Standard Terms and Conditions for NSPS and NESHAP

8.4.1 NSPS

The applicable requirements of Subpart A of 40 CFR 60 are in this Section. Subpart A contains requirements that apply whenever a specific New Source Performance Standard applies. NSPS Subpart Db applies to the cogeneration unit, so Subpart A applies to that unit as well.

8.4.2 NESHAP

The applicable requirements of Subpart A of 40 CFR 63 are in this Section. Subpart A contains requirements that apply whenever a specific NESHAP Standard applies. 40 CFR 63 Subpart DDDDD applies to the cogeneration unit and the package boiler, so Subpart A applies to those units as well.

8.5 Section 4 – Generally Applicable Requirements

The Section 4 - Generally Applicable Requirements section of the AOP identifies requirements that apply broadly to the facility. These requirements are generally not called out in NOC approvals. Instead, they are found as general air pollution rules such as the NWCAA Regulation or the WAC.

For example, regulations addressing general air pollution sources in Washington are contained in WAC 173-400. NWCAA has also established regulations that apply locally. Several general provisions already included in the existing PSD permit continue to apply to the Facility and are included in this Section:

WAC 173-400-040 General Standards for Maximum Emissions (adopted by the NWCAA under Section 401.1).

NWCAA Regulation Section 451 Emission of Air Contaminant – Visual Standard

WAC 173-400-050 and NWCAA Regulation Section 455 identify emission standards for combustion and incineration units, and limit particulate matter emissions. The requirements in 455.12 for "existing" sources that burn wood to produce steam don't apply to McBurney wood fired boiler, EU-1, at SPI as the boiler is not considered existing under the rule.

NWCAA Regulation Section 535 Odor Control Measures

NWCAA Regulation Section 550 Preventing Particulate Matter from Becoming Airborne

The first column of the Generally Applicable Requirements table in Section 4 includes the permit term, numbered 4.1, 4.2, etc. The second column is the legal citation and contains the enforceable requirement. If the requirement is not federally enforceable, it is specifically noted as "*State only*" along with the version date of the requirement. The third column is a paraphrase of the requirement, for descriptive purposes only, and is not intended to be a legal requirement. The last column contains the monitoring, recordkeeping and reporting (MR&R) requirements the source must perform to determine if it is maintaining on-going compliance with the corresponding requirement. Again, it is a paraphrase of the MR&R from the cited underlying requirement unless stated as "directly enforceable".

Many of the permit requirements do not need to be explained in this Statement of Basis because the legal and factual basis for the requirement is self-evident. Some of the terms, however, contain requirements that are not well defined or have MR&R for which the rationale is not readily apparent. For these, additional discussion is provided below.

8.5.1 Nuisance (odor) and Fugitive Emissions (Permit Terms 4.3 - 4.12, 4.24):

NWCAA Regulation 530 is a state only requirement that prohibits the discharge of air contaminants that are likely to be injurious to health, property or which unreasonably interfere with enjoyment of life and property. WAC 173-400-040(5) prohibits emissions detrimental to health and property. WAC 173-400-040(4) is a similar state requirement that requires "recognized good practice" to reduce odors to a reasonable minimum.

NWCAA Regulation 550 is a federally enforceable requirement that requires reasonably available control technology (RACT) for all fugitive dust emissions. WAC 173-400-040(3) addresses fugitive dust emissions for some activities and WAC 173-400-040(8) requires reasonable precautions or reasonably available control technology (RACT) to control fugitive emissions. Both of the Ecology regulations are federally enforceable. Recording of fugitive dust emissions is not necessarily a violation of the requirement, since the requirement does not prohibit fugitive dust emissions, but prohibits fugitive dust unless RACT is employed. RACT is employed for all sources of dust at this plant. Equipment controlled or vented directly through a stack is incapable of violating this standard while complying with the other requirements in the permit. WAC 173-400-040(2) is a state only regulation that prohibits emissions of particulate matter which becomes deposited upon the property of others in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

The monitoring method specifies monthly facility inspections to monitor for nuisance and fugitive emissions with SPI taking corrective action within 24 hours, if any nuisance or fugitive dust emissions are noted. In addition to the periodic inspections described above, SPI is also required to actively respond to citizen complaints. Records must be kept of periodic inspections, any complaints, problems found, and corrective actions taken.

Term 4.24 comes from Condition 1 of OAC 938c, and requires fugitive emissions to be controlled such that no visible emissions are detected at any point beyond the plant property line as measured by Reference Method 22.

8.5.2 Particulate Matter (Permit Terms 4.13 - 4.17):

The cogeneration facility and the sawmill baghouse exhaust stacks and the kilns are the only likely point sources of particulate matter emissions in the SPI facility. The MR&R requires SPI to periodically inspect the entire facility for visible emissions that would indicate PM emissions. If visible emissions are found, SPI is to take corrective action and to document the incident.

8.5.3 Sulfur Dioxide and Fuel bound Sulfur (Permit Terms 4.18 - 4.23)

8.5.3.1 Sulfur Dioxide, Stack Emissions (Permit Terms 4.18 - 4.21):

NWCAA Regulations 462 and 410 and WAC 173-400-040(6) have been grouped together under Permit Terms 4.16 through 4.18 since they are equivalent requirements (SO_2 emissions not to exceed 1,000 ppmvd) and have the same monitoring requirements.

The second paragraph of WAC 173-400-040(6), which is not in the NWCAA regulations and is not adopted into the SIP, allows for exceptions to this requirement if the source can demonstrate that there is no feasible method of reducing the SO_2 concentrations to 1,000 ppm. This requirement is not federally enforceable and is not an applicable requirement for sources regulated by the NWCAA.

The cogeneration unit burns only wood, which contains virtually no sulfur, burning natural gas only on startup and occasionally as required to maintain stable combustion. The following calculation shows that it is mathematically impossible for a unit to emit 1,000 ppm sulfur dioxide while burning natural gas.

According to *Perry's Chemical Engineer's Handbook*, each cubic foot of natural gas requires approximately 10 cubic feet of air for combustion, yielding approximately 11 cubic feet of combustion exhaust gases, consisting mostly of nitrogen, water vapor, and carbon dioxide. The sulfur in the natural gas will almost all be converted to sulfur dioxide, with each cubic foot of sulfur producing the same volume of sulfur dioxide. Since each cubic foot of natural gas contains 1.306×10^{-5} cubic foot of sulfur, each cubic foot of stack exhaust will contain approximately:

$$1.306\times10^{-5}\,\frac{ft^3\,S}{ft^3\,nat.gas}\times\frac{1\,ft^3\,SO_2}{1\,ft^3\,S}\times\frac{1\,ft^3\,nat.gas}{11\,ft^3\,stack\,exhaust}=1.188\times10^{-6}\,\frac{ft^3\,SO_2}{ft^3\,stack\,exhaust}$$

This is equivalent to 1.19 ppmvd SO_2. Note that this estimated value is about one-tenth of one percent of the 1,000 ppm SO_2 standard. Therefore, it is reasonable to assume that combustion units that are fired on natural gas cannot exceed the 1,000 ppm SO_2 limits in NWCAA Regulations 462 and 410 and WAC 173-400-040(6).

1. <u>Fuel Sulfur Content (Permit Term 4.22):</u>

Natural gas is used on a limited basis in the cogeneration unit. NWCAA 520 limits sulfur content of gaseous fuels to a maximum of 412 ppm sulfur, which is about 24 grains of sulfur per 100 standard cubic feet. Natural gas is supplied via pipeline by Cascade Natural Gas and typically contains less than 2 grains of sulfur per 100 standard cubic feet:

Note:

$$\frac{2\,gr.\ Sulfur}{100\,ft^3}\times\frac{1\,lb}{7000\,gr}\times\frac{1lb-mole}{32lb}\times\frac{385\,ft^3}{1lb-mole}\times10^6=34\,ppm$$

A "lb-mole" of a pure gas weighs the molecular weight of that gas in pounds and occupies 385 ft^3 at 32° F and 1 atmosphere pressure. A "lb-mole" of sulfur (S) weighs 32 lb and reacts with a lb-mole of oxygen (O_2) which also weighs 32 lb to form a lb-mole of sulfur dioxide, which weighs 64 lb. Therefore, 2 lb of SO_2 are emitted for every lb of sulfur in the fuel. Because one lb-mole of sulfur reacts to form one lb-mole of sulfur dioxide, each cubic foot of sulfur in the fuel results in one cubic foot of sulfur dioxide out the stack.

SPI demonstrates compliance with this requirement by burning natural gas, which is inherently low in sulfur, as required in Term 4.18. No oil is burned in any of the equipment at SPI.

8.6 <u>Section 5 – Specific Requirements for Emissions Units</u>

This section lists requirements that apply to the specific emission units, such as the cogeneration unit, the planer mill, dry kilns, etc. All of the general requirements from Sections 2 and 4 apply as well. Section 3 applies in the case of any emission unit that has an applicable NSPS or NESHAP. The format and organization of this section is the same as the table for the generally applicable requirements in Section 4.

9 CAM PLANS - ESP

COMPLIANCE ASSURANCE MONITORING PLAN
SIERRA PACIFIC INDUSTRIES, BURLINGTON DIVISION
ELECTROSTATIC PRECIPITATOR

I. Background

A. Emissions Unit

Description:	McBurney Biomass Fired, Water wall boiler with natural gas as secondary fuel.
Identification:	McBurney Boiler
NWCAA ID:	EU-1 Cogeneration Facility
Facility:	Sierra Pacific Industries – Burlington Division Mount Vernon, Washington

B. Applicable Regulation, Emissions Limit, and Monitoring Requirements

Regulation:	NWCAA AOP 019 OAC 938C PSD 05-04 Amendment 2 40 CFR Part 60 Subpart Db 40 CFR Part 63 – NESHAP, Major Sources
Emissions Limits:	
PM_{10}	0.02 lb/mmbtu (24-hour average) [PSD]
PM_{10}	37.7 tpy (any consecutive 12-month period) [PSD]
PM*	0.085 lb/mmbtu [40 CFR 60]
PM*	0.037 lb/mmbtu [40 CFR 63]
Current monitoring requirements:	Maintain and operate continuous opacity monitoring system (COMS) and perform annual performance stack testing.

C. Control Technology: Mechanical collector followed by a 4-Zone Electrostatic Precipitator

II. Monitoring Approach

The key elements of the monitoring approach, include the indicators to be monitored, indicator ranges, and performance criteria are presented in Table 1 and Table 2.

TABLE 1. OPACITY MONITORING APPROACH

I. Indicator	Opacity is used as an indicator of ESP performance.
Measurement Approach	A continuous opacity monitor (COM) provides continuous information to boiler operators to confirm proper operation of the ESP.
II. Indicator Range	Any of the following shall be considered an excursion of the ESP: • Exceeding 20% opacity for a period or periods aggregating more than 3 minutes in any 1 hour as measured by a COMS; • Exceeding 5% opacity (1-hour average) as measured by a continuous opacity monitoring system (COMS), except for periods of soot-blowing; • Exceeding 10% opacity (aggregated 3 minutes in any 1 hour) as measured by WA DOE Method 9A. • Exceeding 20% opacity for a period or periods aggregating more than 6 minutes in any 1 hour as monitored by Method 9. Note: Soot-blowing shall occur as a regularly scheduled event and shall not exceed 1 hour per 8-hour shift. Soot-blowing shall not cause the boiler stack to exceed 10% opacity (1-hour average) as measured by COMS. Deviations from the regular soot-blowing schedule that result in excess emissions shall trigger agency notification.
III. Performance Criteria A. Data Representativeness	More than 20 years of operating experience with a COM have demonstrated that opacity is an excellent indicator of ESP performance.
B. Verification of Operational Status	Hourly recording of T/R voltages and displays in boiler control room confirm operational status.
C. QA/QC Practices and Criteria	Confirm the meters read zero when the unit is not operating. The COM is checked quarterly and calibrated as appropriate.
D. Monitoring Frequency	Continuous monitoring by COM. Frequent visual observations of stack opacity by non-certified plant personnel.
Data Collection Procedures	COM observations are continuously recorded.
Averaging period	Varies based on permit requirements indicated above (3 min and 6 min).

TABLE 2. ESP MONITORING APPROACH

I. Indicator	Secondary voltage (to transformer/rectifier [T/R]) is measured for each field to ensure that proper conditions exist in each field for particulate matter collection.
Measurement Approach	The secondary voltage to each T/R is monitored hourly and recorded to confirm proper operation of the ESP. High and low voltage alarms for the operators are present in the control room.
II. Indicator Range	An excursion is defined as when the Kilovolts to two or more of the transformer rectifier (T/R) sets are **above 55kv** **<u>or</u>** **less than 10kv.** Excursions trigger an inspection, corrective action, and a reporting requirement.
III. Performance Criteria A. Data Representativeness	The voltages are measured using the instrumentation the manufacturer provided with the ESP. The maximum and minimum allowable T/R voltages are based on manufacturer recommended values. Shut-off alarm to the unit is set at 5kv to avoid unnecessary shut-down of the unit between 5 and the lower range of excursion.
B. Verification of Operational Status	Continuous recording of T/R voltages and displays in boiler control room confirm operational status.
C. QA/QC Practices and Criteria	Confirm the meters read zero when the unit is not operating. Follow O&M manual for ESP.
D. Monitoring Frequency	Continuous monitoring by alarm and hourly recording of T/R voltages.
Data Collection Procedures	Continuous monitoring by alarm and hourly recording of T/R voltages.

MONITORING APPROACH JUSTIFICATION

I. Background

The pollutant-specific emission unit is a 4-field ESP controlling a biomass-fired, water wall boiler. The boiler is rated at 250,000 pounds of steam per hour. The boiler subject to New Source Performance Standard (NSPS) Subpart Db. The boiler normally is operated at full capacity, and most emission tests have been performed at or near full load. The boiler is not a "large" CAM source (the post-control PM emissions are less than 100 tons per year) so continuous monitoring is not required. However, a Continuous Opacity Monitor (COM) was required as a condition of its operating permit and for compliance purposes with the NSPS Subpart Db.

A two-stage control system ensures compliance with permit limits for particulate matter (PM) mass emissions limits. Large particles are removed in a mechanical collector (a "multiclone" cyclone separator). This initial stage of particle control removes about 70 percent of the particulate matter mass emissions. These larger particles and char are typically re-injected into the boiler to improve fuel efficiency and to reduce ash generation. An induced draft fan pulls flue gas through the multiclone and into four-field ESP designed by PPC Industries. The maximum power consumption of the ESP is 204 kW. The combined PM control (multiclone and ESP) is estimated at 97.5% efficiency.

After passing through the ESP, boiler exhaust gases are emitted from an 82 foot tall, 8'-3" diameter stack. Stack sampling test ports and an opacity monitor are located about three quarters of the way up the stack.

The facility's Air Operating Permit identifies a variety of monitoring and record-keeping requirements. It also requires the development and use of an Operations and Maintenance Plan for both the multi-clone and the ESP.

II. Rationale for Selection of Performance Indicators

Although the performance of an ESP can be assured by providing sufficient power to each field, SPI has never conducted tests that reveal the minimum power requirements needed to ensure compliance with the mass emission limit. As noted below, recent source tests have demonstrated that the facility meets its PM emission limit and its opacity limit, but neither test evaluated mass emissions as a function of power input to the ESP. Indicators in the control room identify problems with the ESP electrical systems and with opacity excursions, but there is no absolute means of quantifying PM mass emissions in real time.

In an ESP, electric fields are established by applying a direct-current voltage across a pair of electrodes, a discharge electrode and a collection electrode. Particulate matter suspended in the gas stream is electrically charged by passing through the electric field around each discharge electrode (the negatively charged electrode). The negatively charged particles then migrate toward the positively charged collection electrodes. The particulate matter is separated from the gas stream by retention on the collection electrode. Particulate is removed from the collection plates by shaking or rapping the plates.

As a general rule, ESP performance improves as total power input increases. This relationship is true when particulate matter and gas stream properties (such as PM concentration, size distribution, resistivity, and gas flow rate) remain stable and all equipment components (such as rappers, plates, wires, hoppers, and transformer-rectifiers) operate satisfactorily. The secondary voltage decreases when a malfunction, such as grounded electrodes, occurs in the ESP. When the secondary voltage drops, less particulate is charged and collected. Monitoring the secondary voltage helps ensure that proper conditions exist in each field for particulate collection.

SPI believes that opacity is a better indicator of ESP performance and mass emissions than measuring ESP parameters. Problems that would be detected by anomalies in power input will also be manifested in the opacity observations. Monitoring the voltages to the T/R sets will help track ESP performance, while the control room alarms will help identify potential operational problems with the ESP fields.

III. Rationale for Selection of Indicator Ranges

An ESP excursion is defined as two or more of the ESP T/R sets have voltages that are outside the acceptable voltage range (above minimum acceptable voltage and below maximum acceptable voltage) as shown in Table 2. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All excursions will be documented and reported.

If the COM is not functioning, plant personnel will evaluate opacity visually once per shift. If there is a visible plume not attributable to water, plant personnel will consider that an excursion. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All opacity excursions will be documented and reported.

The opacity criterion was selected based upon the current permit limit for opacity.

10 CAM PLANS – BAGHOUSE

COMPLIANCE ASSURANCE MONITORING PLAN:
BAGHOUSE FOR PM CONTROL

I. Background

A. Emissions Unit

Description:	Planer Baghouse
Identification:	EU-3, Superior Systems Baghouse
Facility:	Sierra Pacific Industries – Burlington Division Mount Vernon, WA

B. Applicable Regulation, Emission Limit, and Pre-CAM Monitoring Requirements

Regulation:	NWCAA	AOP 019R1 OAC 938c
	PSD 05-04 Amendment 2, 40 CFR 60, App A	
Emission limits:	PM_{10}	0.005 gr/dscf (1-hr average)
	PM_{10}	9.4 tons (any consecutive 12-month period)
	Opacity	Cannot exceed 10% (EPA Method 9)
Operating Limits:	Differential Pressure Minimum	1.0 inches of water
	Differential Pressure Maximum	4.0 inches of water

C. Control Technology, Capture System

Controls:	Pressurized fabric filter baghouse.
Capture System:	Closed-duct system
Bypass:	Fan shuts off if abort gate is tripped and baghouse is bypassed. Operation of the fan indicates that the baghouse is not being bypassed.

II. Monitoring Approach

The key elements of the monitoring approach are presented in the attached table.

Normal process operations will not produce conditions that adversely affect the baghouse without affecting pressure drop; therefore, no process operational parameters will be monitored.

III. Response to Excursion

Excursion from the Operating Limits will trigger immediate Planer and baghouse shutdown.

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MONITORING APPROACH

	Indicator No. 1	Indicator No. 2	Indicator No. 3	Indicator No. 4
I. Indicator	Pressure drop	Pressure drop	Reference Method Testing	Reference Method Testing
Measurement Approach	Pressure drop through the baghouse is measured continuously using a differential pressure gauge.	Pressure drop through the baghouse is measured continuously using a differential pressure gauge.	Emissions testing using Methods 1-4 and 5.	Emissions testing using Methods 1-4 and 5.
II. Indicator Range	Differential Pressure Less than 1.0 inches H_2O ***Immediately shut down planer and baghouse.*** Differential Pressure Greater than 4.0 inches H_2O. ***Immediately shut down planer and baghouse.*** Do not resume operation until the problem is identified and corrected.	Differential Pressure Less than 1.2 inches H_2O Differential Pressure Greater than 3.5 inches H_2O. Investigate the cause of the low or high pressure drop and correct the cause within 4-hours.	Particulate matter $\geq$0.005 gr/dscf	Particulate matter $\leq$0.005 gr/dscf
III. Performance Criteria A. Data Representativeness	Pressure drop across the baghouse is measured at the baghouse inlet and exhaust. The minimum accuracy of the device is ±0.5 in. H_2O.	Pressure drop across the baghouse is measured at the baghouse inlet and exhaust. The minimum accuracy of the device is ±0.5 in. H2O.	Test sampling done at the exhaust of the baghouse.	Test sampling done at the exhaust of the baghouse.
B. Verification of Operational Status	NA	NA	NA	NA
C. QA/QC Practices and Criteria	Pressure taps checked daily for plugging.	Pressure taps checked daily for plugging.	Qualified personnel perform inspection.	Use reference method protocols.
D. Monitoring Frequency	Pressure drop is measured continuously.	Pressure drop is measured continuously.	If source test emissions are greater than 0.0025, source test must be done every 12-months	If source test emissions are less than 0.0025, source test may be done every 36-months
Data Collection Procedures	Pressure drop is recorded daily.	Pressure drop is recorded daily.	As required by Methods 1-4 and 5.	As required by Methods 1-4 and 5.
Averaging period	None	None	Average of three 2-hour testing periods	Average of three 2-hour testing periods

JUSTIFICATION

I. Background

SPI operates a lumber facility at Mount Vernon, Washington. As part of that facility, trimming and planning of dried and green lumber results in generation of particulate matter that is collected by a high efficiency cyclone and baghouse.

The baghouse, produced by Superior Systems is fitted with polyester bags cleaned by reverse air. Air flow is induced by a fan with a 300 hp electric motor.

The facility is subject to a federal Title V permit due to potential to emit (uncontrolled) emissions more than 100 tons/year for PM_{10}.

II. Rationale for Selection of Performance Indicators

The pressure drop through the baghouse is monitored as shown on the attached O&M procedures for the unit. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, or the bags are becoming blinded. Decreases in pressure drop may indicate significant holes and tears in the bags or missing bags.

Implementation of a baghouse inspection and maintenance program provides assurance that the baghouse is in good repair and operating properly. A summary of the facility current Baghouse Operation & Maintenance Procedures is attached.

III. Rationale for Selection of Indicator Ranges

Performance Indicator 1 requires an immediate equipment shutdown as required in AOP 019R1 condition 5.3.1.

Performance Indicator 2 was selected to initiate a response to correct operating conditions with the baghouse or planer operation to help ensure that the differential pressure at the baghouse will not reach the limits in Performance Indicator 1, to avoid a shutdown.

Performance Indicator 3 and Performance Indicator 4 are necessary to demonstrate compliance with the permit PM_{10} emission limits.

Operations & Maintenance Procedures

Superior Systems Baghouse – SPI Burlington Division

The Superior Systems Baghouse will be operated and maintained according to the Owner's manual supplied by the manufacturer.

FREQUENCY DESCRIPTION

Daily (when in operation)

- Check and record magnehelic gauge reading. Magnehelic should be between 1.2 and 3.5.
- If magnehelic is less than 1.0, the Planer and baghouse must be shut down.
- If magnehelic is greater than 4.0, the Planer and baghouse must be shut down.
- Check for discharge out of the bottom of the baghouse.
- Visually check for exhaust emission.

Information will be recorded on a spreadsheet (Bag House Daily Check) and printed and filed onsite. Any issues needing attention will be brought to the Maintenance Superintendents attention to be corrected. Correction will be noted on the spreadsheet.

Weekly

- Check bearings for excessive vibration or heat.
- Record magnehelic and purge pressure. Compare readings with previous weeks. Purge pressure should be between 7 and 11 psi.
- Check lubricator and filter on airline to purge control panel.
- Visually check purge arm for alignment during purge cycle.

Information will be recorded on the "Bag House Weekly Inspection" form. Items needing attention will be documented on the for, along with completion dates. Completed forms will be given to the Safety/Environmental Coordinator to be filed.

Monthly

- Visually inspect pneumatic actuator and ratchet assembly for wear.
- Grease bearings.
- Change purge pump oil (Every 1500 hours of operation).

Bi-Annually (June and December)

- Grease ratchet assembly
- Visually inspect bags

11 INSIGNIFICANT EMISSIONS UNITS

Some categorically exempt insignificant emission units as defined in the WAC 173-401-532 are present at SPI and are listed in this Statement of Basis rather than in the AOP. Emission units at SPI that have been determined to be insignificant on the basis of size or production rate as defined in WAC 173-401-530 and WAC 173-401-533 are listed in Table 11-1 below:

Table 11-1 Insignificant Activities and Emissions Units (Categorically Exempt)

Insignificant Emission Unit	Basis
Lubricating Oil Tank	WAC 173-401-532(3)
Hydraulic Oil Tank	WAC 173-401-532(4)
Pressurized Storage of Gases	WAC 173-401-532(5)
Vehicle Exhaust from Maintenance Shops	WAC 173-401-532(7)
CEMS	WAC 173-401-532(8)
Vents	WAC 173-401-532(9)
Vehicle Internal Combustion Engines	WAC 173-401-532(10)
Welding Operations	WAC 173-401-532(12)
Plant Upkeep Activities	WAC 173-401-532(33)
Street/Pavement Cleaning and Sweeping	WAC 173-401-532(35)
Food Preparation	WAC 173-401-532(41)
Portable Drums and Totes	WAC 173-401-532(42)
Lawn and Landscaping Activities	WAC 173-401-532(43)
General Vehicle Maintenance	WAC 173-401-532(45)
Comfort Air Conditioning	WAC 173-401-532(46)
Office Activities	WAC 173-401-532(49)
Sampling Connections	WAC 173-401-532(51)
Parking Lot Exhaust	WAC 173-401-532(54)
Indoor Activities	WAC 173-401-532(55)
Repair and Maintenance	WAC 173-401-532(74)
Totally Enclosed Conveyors	WAC 173-401-532(86)
Air Compressors	WAC 173-401-532(88)
Steam Leaks	WAC 173-401-532(89)
Vacuum System Exhausts	WAC 173-401-532(108)
Water Cooling Towers	WAC 173-401-532(121)

12 DEFINITIONS AND ACRONYMS

Definitions are assumed to be those found in the underlying regulation. A short list of definitions has been included to cover those not previously defined.

An "applicable requirement" is a provision, standard, condition or requirement in any of the listed regulations or statutes as it applies to an emission unit or facility at a stationary source.

"Ecology" means the Washington State Department of Ecology.

An "emission unit" is any part or activity of a stationary source that emits or has the potential to emit any regulated air pollutant.

"SPI" means Sierra Pacific Industries

"Oil" means low sulfur No. 2 diesel fuel, containing no more than 0.05 percent sulfur by weight.

A "permit" means for the purposes of the air operating permit program an air operating permit issued pursuant to Title 5 of the 1990 Federal Clean Air Act Amendments.

"State" means for the purposes of the air operating permit program NWCAA or the Washington State Department of Ecology.

The following is a list of Acronyms used in the Air Operating Permit and/or Statement of Basis:

acfm actual cubic feet per minute

AOP air operating permit

ASIL acceptable source impact level

bf board-feet of lumber

CEM continuous emissions monitor

CEMS continuous emissions monitoring system

CFR Code of Federal Regulations

CO carbon monoxide

EPA The United States Environmental Protection Agency

ESP electrostatic precipitator

EU emission unit

FCAA Federal Clean Air Act

gpm gallons per minute

gr grain (measurement of mass)

HAP hazardous air pollutant

HCl hydrochloric acid

lb/hr pound per hour

lb/MMBtu pound per million British thermal unit

Mbf thousand board feet of lumber

mg/L milligram per liter

MMbf million board feet of lumber

MMBtu million British thermal units

MR&R Monitoring, Recordkeeping and Reporting

MW megawatt

NESHAP National Emission Standards for Hazardous Air Pollutants

NOC Notice of Construction

NO_X oxides of nitrogen

NSPS New Source Performance Standard

NSR New Source Review

NWCAA Northwest Clean Air Agency

O_2 Oxygen

OAC Order of Approval to Construct

ODEQ Oregon Department of Environmental Quality

OSU Oregon State University

PM particulate matter

PM_{10} particulate matter less than 10 microns in diameter

$PM_{2.5}$ particulate matter less than 2.5 microns in diameter

ppm parts per million

ppmvd (same as ppmdv) parts of pollutant per million parts of dry stack gas on a volumetric basis

PSD Prevention of Significant Deterioration (federally required program for pre-construction review of sources)

QA/QC quality assurance/quality control

RCW Revised Code of Washington

scf standard cubic foot (cubic foot of gas at Standard Conditions)

SIP State Implementation Plan

SNCR selective non-catalytic reduction

SO_2 sulfur dioxide

TDS total dissolved solids

TPY tons per year

VOC volatile organic compounds

WAC Washington Administration Code

13 PUBLIC DOCKET

Copies of SPI's air operating permit and technical support documents are available at the following at www.nwcleanairwa.gov and the following location:

Northwest Clean Air Agency
1600 South Second Street
Mount Vernon, WA 98273-5202

NWCAA held a 30-day public comment period on the SPI draft air operating permit renewal period from April 10, 2026 to May 10, 2026. Notice was posted in the Washington Department of Ecology's Permit Register, as well as the NWCAA website. Copies of the draft permit and statement of basis were available on NWCAA's website and at NWCAA's office during the comment period. NWCAA received no comments on the draft AOP renewal during the public comment period.

On May 12, 2026 NWCAA submitted the proposed AOP and SOB to EPA Region 10 for the 45-day EPA review period.