Statement of Basis for the Air Operating Permit—Final

Sierra Pacific Industries
Mount Vernon, Washington

June 10, 2010
PERMIT INFORMATION
SIERRA PACIFIC INDUSTRIES
14353 McFarland Road, Mount Vernon, WA 98273

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NAICS 321113, 321999, & 221119
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UBI: 601-766-172

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<td>December 28, 2007</td>
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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. Skagit County is currently in attainment or unclassifiable for all criteria pollutants.

The SPI facility is a designated major source subject to the air operating permit program because it has the potential to emit more than 100 tons per year of nitrogen oxides (NO\textsubscript{X}), carbon monoxide (CO), volatile organic compounds (VOC), and particulate matter less than 2.5 microns in size (PM\textsubscript{2.5}), and more than 10 tons per year of hydrogen chloride (HCl) and 25 tons per year of total HAP emissions. 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 Sierra Pacific Industries Air Operating Permit (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.

This draft AOP is the original AOP for SPI. The AOP application was received on December 28, 2007.
2 FACILITY DESCRIPTION AND EMISSION UNITS

The SPI facility is capable of producing 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 and descriptions of applicability. Generally, plant-wide emission requirements are included in Sections 2 and 4 of the AOP while requirements for units that have specific permitting or regulatory requirements are delineated in Section 5 of the AOP. Section 3 brings forward general portions of federal regulations applicable to the site.

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 2-1 shows the location of the facility. Figure 2-2 is 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:

- \(1 \text{ ft} \times 1 \text{ ft} \times 1 \text{ in}\)
- \(12 \text{ in} \times 12 \text{ in} \times 1 \text{ in}\)
- \(144 \text{ in}^3\)
- \(1/12 \text{ ft}^3\)
- \(2,360 \text{ cm}^3\)
- \(2.360 \text{ liters}\)
- \(0.002360 \text{ cubic meters or steres}\)

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 permitting, SPI operates 2 8-hour shifts; Monday through Friday in the saw mill. Maintenance on the milling equipment is done as needed with a full shutdown every 6 months.

The cogeneration plant operates 24 hours per day with a scheduled minor maintenance shutdown every 6 months. The facility underwent the first major overhaul on the cogeneration plant in May 2009 after approximately 2.5 years of operation.

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 accepts 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. The balance are offloaded by log loaders (Caterpillar 988 or similar), which put the logs within reach of the portal crane. The logs are stacked in the log deck by the portal crane as shown in Figure 2-4.

The portal crane selects logs for feed to the saw mill through the debarker machine.

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**Figure 2-3 General Process Flow Diagram**
Figure 2-4 Log Storage and Crane

The debarker removes the bark from the log. The log is sent to the saw mill, while the bark is conveyed to a very 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.

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 emission unit (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 is permitted to emit less than 0.005 grain per standard cubic foot (gr/scf) of air exhausted. At the design capacity of the baghouse (50,440 acfm at 70 °F, equivalent to 50,250 scfm at 68 °F) 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

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\(^2\) 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).
has operated the mill in shifts on a non-continuous basis that results in fewer hours of operation and lower annual emissions.

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
2.3.2 Dry Kilns

SPI operates six double-track dry kilns to treat lumber produced by the saw mill (up to 400 MMbf\(^4\)/yr). The kilns are identified as EU-4. One of the kilns is shown in Figure 2-9 with 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 internals of the kilns. On the left, stacked lumber inside the kiln is shown, with a view up to the steam tubes surrounding the kiln. On the right is a view the upper portion of

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\(^4\) MMbf = million board feet
a kiln, where fans are used to circulate air inside the kilns when it's in operation.

Figure 2-11 Kiln Internal Equipment

Wood passing through the kilns is either hemlock or Douglas fir. During the drying process, wood releases volatile organic compounds (VOCs) 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 hazardous air pollutants (HAPs). Western hemlock and Douglas fir release methanol and formaldehyde as the largest portion of drying emissions.

Emission factors for kiln operation were reviewed closely during initial NWCAA permitting and the following permit amendments. Emission factors accepted by NWCAA were generally considered the most conservative or most specific to the facility and were from the Oregon Department of Environmental Quality (ODEQ) and Oregon State University (OSU) studies.

Kiln emission factors are developed in laboratory bench-scale studies. To date, no in situ testing has been widely accepted on kilns. The reason is that the kilns vent through many small roof vents and have variable air flow, and variable air flow directions, over the drying cycle. Common testing techniques require a stack to measure the flow rate along with the pollutant concentrations exiting an emissions unit, which is not possible on the traditional kiln vents. In the laboratory, green wood samples of a measured board-foot amount from mills are placed into a drying oven that operates at specific temperature profiles mimicking the operation of a full-scale kiln but with air flow rates that are known. The concentrations of the air pollutants are measured in the air stream to develop a mass of pollutant per board-foot of lumber. That factor is then used to estimate emissions from full-scale kiln.

SPI provided additional emission factors produced by Dr. Mike Milota of OSU, in which emission testing results from drying of Douglas fir averaged 0.023 lb/Mbf for methanol, and 0.0010 lb/Mbf for formaldehyde. A 2004 hemlock drying study conducted by OSU for SPI consisted of three runs with drying temperatures up to 200°F. The average of the three runs provided methanol and formaldehyde emission factors of 0.091 and 0.0013 lb/Mbf, respectively. NWCAA accepted these emission factors as the basis for those TAP/HAP emissions. NWCAA accepted the use of ODEQ/OSU Method 7 emission factors for PM$_{10}$ that include both condensable and filterable portions; 0.04 lb/Mbf hemlock and 0.02 lb/bf Douglas fir.

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.

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5 Mbf = thousand board feet
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 9 tons per year in the permit application assuming all VOC in the chemicals is emitted. The spray chamber emissions are addressed by the NWCAA minor new source review permit.

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. The minor permit for the facility 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](image)

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 (2) natural gas burners, each rated at 62.5 MMBtu per hour, for start up and flame stabilization. The boiler incorporates a selective non-catalytic reduction (SNCR) system to reduce oxides of nitrogen (NOₓ) 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 cogen plant is shown in Figure 2-13.

![Cogeneration Plant Flow Diagram](image)

**Figure 2-13 Cogeneration Plant Flow Diagram**

The boiler emits oxides of nitrogen (NO\textsubscript{X}), carbon monoxide (CO), particulate matter (PM\textsubscript{2.5}, PM\textsubscript{10} and PM), sulfur dioxide (SO\textsubscript{2}), and volatile organic compounds (VOCs), as well as several hazardous air pollutants (HAPs). The boiler exhaust is identified as EU-1. Figure 2-14 shows the SPI 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. A schematic flow diagram for the cogeneration facility is presented in Figure 2-13.

The steam turbine and generator do not emit air pollutants. The boiler potential criteria pollutant emissions are based on the permit limits established in the most recent PSD permit (PSD 05-04 Amendment 1) 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 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 hydrogen chloride (HCl) emission factor was based on SPI’s proposed HCl emission limit of 0.02 lb/MMBtu. 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\textsubscript{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 tpy. The cooling tower is identified as EU-2.

The cooling towers emissions are addressed in the minor NWCAA permit applicable to SPI.

2.3.6 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 distributes water on roadways by water truck and operates a sweep truck regularly to maintain the paved surfaces free of wood dust and dirt.
3  COMPLIANCE HISTORY

SPI has submitted quarterly emissions reports, including stack testing results, to NWCAA under the PSD and NWCAA permits since operation of the facility began in December 2006. The facility has also provided notifications of startup, shutdown, and upset events to the NWCAA.

At the time of the application for the AOP, SPI was operating the boiler in accordance with the applicable short-term NO\textsubscript{x} limit in PSD 05-04 but in excess of the long-term NO\textsubscript{x} limit, as requested by the NWCAA and WA DOE. (More discussion of the permit condition changes is included in Section 5 of this document.)

The SPI boiler was installed with selective non-catalytic reduction (SNCR) for NO\textsubscript{x}, consisting of urea injection into the upper section of the firebox. As listed in the resolved enforcement actions section, initial startup of the NO\textsubscript{x} control system indicated that some design changes were necessary to optimize the effectiveness. The facility corrected the configuration of the system to meet the conditions of the permit.

However, at the same time that these corrections were being made, the feed to the boiler began including bark and chipped material from salt water-transported logs. Salts in the boiler fuel react with the excess ammonia from the SNCR control system, forming a significant secondary visible emissions plume. Based on information from other similar facilities, it was presumed that the plume was ammonium chloride and other salts that formed particulate matter. Because the plume was a secondary formation, forming after the materials left the stack, the opacity monitor could not read the level of visible emissions. The characteristics of the plume were that it was easily visible looking toward the sun and significantly less visible when looking at it with the sun at the observers back. This characteristic resulted in the receipt of a number of phone calls from concerned residents and very limited enforcement potential because the reference method for visible emissions requires the observer to have the sun behind him/her for a valid reading.

In response to action requests by NWCAA, SPI began segregating bark from salt-transported logs, which helped address the plume formation, but did not eliminate it.

The NWCAA in conjunction with WA DOE, agreed with SPI that the best solution to mitigate the plume formation was to remove excess ammonia from the stack. All parties agreed that compliance with the 0.13 lb NO\textsubscript{x}/MMBtu as read from the CEMS output. However, during startups and shutdowns, which are defined in the permit specifically, alternate lb CO/hr limits apply. Operators at SPI act conservatively, reporting all potential permit limit deviations. The quarterly reports received by the NWCAA then clarify which of the events called in to NWCAA during the reporting period were within the startup/shutdown provisions.

Upon review, 6 events in 2008 and 5 events in 2009 were found to be excess emissions periods or permit condition deviations (about half of the reported events). Each of these events was investigated by NWCAA. The reviews showed that the all the events were short in duration, lasting from 45 min to 2 hours. The facility promptly reported each event to NWCAA and demonstrated a prompt correction to the problem. The events triggering the non-compliance periods did not appear to be results of careless operation nor were part of a pattern of operational failures. Event excess emissions ranged from 4.3 lb CO to 111 lb CO. Excess CO emissions 2008 and 2009 were less than 0.01% of the facility total, which was approximately 100 tpy CO. None of the events met any criteria for high priority violations, as defined by EPA.
3.1 Resolved Enforcement Actions
The following Notices of Violation have been issued by the Northwest Clean Air Agency to SPI.

Table 3-1 Notices of Violation

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<th>Warning?</th>
<th>Notes</th>
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<tr>
<td>9/16/09</td>
<td>5/07-7/09</td>
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<td>Boiler NOx emissions exceeded the long-term limit in PSD 05-04 for all reported periods from May 2007 to July 2009 (a total of 27 months; 9 quarterly reporting periods). Boiler emissions were 0.11 lb NOx/million BTU heat input (12-month rolling average) for the entire period. Sierra Pacific implemented operation of the boiler at the higher NOx emission rate as part of a consensus decision with NWCAA and WA Department of Ecology. The permit limit was removed in PSD 05-04 Amendment 1, effective August 6, 2009, ending the period of noncompliance.</td>
</tr>
<tr>
<td>2/25/08</td>
<td>11/29/07</td>
<td></td>
<td>On November 29, 2007, SPI was found to have unapproved materials in the boiler fuel pile in violation of Condition 7 of NWCAA Order of Approval to Construct (OAC) 938; failure to adequately inspect fuel before acceptance and combusting prohibited materials in the boiler.</td>
</tr>
<tr>
<td>11/08/07</td>
<td>6/2/07</td>
<td>✓</td>
<td>On June 2 and June 4, 2007, SPI exceeded an emission limit contained in Prevention of Significant Deterioration (PSD) permit 05-04 and thereby violated Condition 1 of NWCAA OAC 938. Emissions of NOx were greater than 115% of the 0.13 lb NOx/MMBtu 24-hr average limit. During this period, the NOx control system was ineffective due to being improperly located in the boiler. The root cause of the excess emissions was improper design and/or construction, which is reasonably preventable.</td>
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<tr>
<td>11/08/07</td>
<td>4/28/07</td>
<td>✓</td>
<td>On April 28, May 17, 21, 22, 23, 25, 26, 30, 31, and on June 2, 4, and 5, 2007 SPI exceeded the daily NOx and/or the hourly CO emission limits in PSD permit 05-04 and thereby violated Condition 1 of NWCAA OAC 938. During this period, the NOx control system was ineffective due to being improperly located in the boiler. SPI was attempting to minimize NOx emissions by controlling the boiler in a way that increased CO emissions and for periods of time on each of the listed days was not able to comply with one or both of the limits. The root cause of these excess emissions was improper design and/or construction, which is reasonably preventable.</td>
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<td>5/2/07</td>
<td>5/28/07</td>
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<td>On May 28, 2007, from 10:00am until 9:00pm, SPI exceeded the 20% opacity limit in NWCAA OAC 938. The hoppers of the electrostatic precipitator (ESP) overfilled, which required that the boiler be shut down. The excess opacity occurred as the ESP hoppers were manually emptied. The hoppers overfilled because the rotary system that removes ash from the hoppers was constructed using incorrect parts. As a result, the rate at which ash was removed from the hopper was inadequate. The root cause of the excess emissions was improper design and/or construction, which is reasonably preventable.</td>
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<tr>
<td>4/5/07</td>
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<td>During a periodic facility inspection on May 2, 2007, NWCAA staff noted numerous and significant instances of fugitive emissions from...</td>
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<td>the SPI facility. Significant accumulation of sawdust on the facility surfaces indicated a lack of sufficient cleaning as is required by OAC 938. Several access hatches on the hog fuel handling system were left open and were observed as sources of emissions. Contrary to what was stated in the permit application, all surfaces upon which vehicles operate are not paved and hog fuel was observed substantially outside of the covered chip bins. Large, uncovered ash piles were observed onsite in violation of the OAC 938 requirement to store ash in closed containers.</td>
</tr>
</tbody>
</table>
4 FACILITY EMISSIONS

The SPI facility is subject to the Title V program because its potential annual NO\textsubscript{X}, CO, VOC, and the single HAP (HCl) and Total HAP emissions exceed the applicability thresholds.

The following tables contain potential to emit (PTE) from point sources at the SPI Mount Vernon facility as of the date of the AOP application.

Table 4-1 Potential to Emit - Criteria Pollutants

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Boiler tpy</th>
<th>Cooling Tower tpy</th>
<th>Planer Mill tpy</th>
<th>Dry Kilns tpy</th>
<th>Anti-mold Spray tpy</th>
<th>Fugitive Emissions tpy</th>
<th>Plant-wide tpy</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO\textsubscript{X}</td>
<td>245</td>
<td>9.4</td>
<td>5.9</td>
<td>2.2</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>659</td>
<td>0.9</td>
<td>9.4</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO\textsubscript{2}</td>
<td>47</td>
<td>0.9</td>
<td>9.4</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM/PM\textsubscript{10}</td>
<td>37.7</td>
<td>0.9</td>
<td>9.4</td>
<td>5.9</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PM\textsubscript{2.5}</td>
<td>37.7</td>
<td>0.9</td>
<td>9.4</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOC</td>
<td>35.8</td>
<td>120</td>
<td>9.00</td>
<td>165</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H\textsubscript{2}SO\textsubscript{4}</td>
<td>3.8</td>
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<td>3.8</td>
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</tr>
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</table>

Table 4-2 Potential to Emit - Toxic Air Pollutants

<table>
<thead>
<tr>
<th>Toxic Pollutants</th>
<th>Boiler lb/yr</th>
<th>Cooling Tower lb/yr</th>
<th>Planer Mill lb/yr</th>
<th>Dry Kilns lb/yr</th>
<th>Anti-mold Spray lb/yr</th>
<th>Plant-wide lb/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>618</td>
<td></td>
<td>33,200</td>
<td>33,818</td>
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<tr>
<td>Acetophenone</td>
<td>0.012</td>
<td></td>
<td></td>
<td>0.012</td>
<td></td>
<td></td>
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<tr>
<td>Acrolein</td>
<td>119</td>
<td></td>
<td>580</td>
<td>700</td>
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<tr>
<td>Antimony</td>
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<td></td>
<td></td>
<td>86.3</td>
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<tr>
<td>Arsenic</td>
<td>21.2</td>
<td></td>
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<td>21.2</td>
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<tr>
<td>Benzene</td>
<td>2,796</td>
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<td>2,796</td>
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<tr>
<td>Beryllium</td>
<td>5.85</td>
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<td>5.85</td>
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<td>Bis(2-ethylhexyl)phthalate</td>
<td>0.175</td>
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<td>0.175</td>
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<td>Bromomethane</td>
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<td>106</td>
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<td>2-Butanone</td>
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<td>Cadmium</td>
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<td>Carbon Tetrachloride</td>
<td>171</td>
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<tr>
<td>Chlorine</td>
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<tr>
<td>Chlorobenzene</td>
<td>125</td>
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<tr>
<td>Chloroform</td>
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<tr>
<td>Chromium, hexavalent</td>
<td>11.8</td>
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<td>11.8</td>
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<tr>
<td>Toxic Pollutants</td>
<td>Boiler lb/yr</td>
<td>Cooling Tower lb/yr</td>
<td>Planer Mill lb/yr</td>
<td>Dry Kilns lb/yr</td>
<td>Anti-mold Spray lb/yr</td>
<td>Plant-wide lb/yr</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>---------------------</td>
<td>-------------------</td>
<td>----------------</td>
<td>-----------------------</td>
<td>------------------</td>
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<tr>
<td>Chromium, trivalent</td>
<td>5.79</td>
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<td>Cobalt</td>
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<td>1,2-Dibromoethene</td>
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<td>1,2-Dichloroethane</td>
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<td>Dichloromethane</td>
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<td>Dinitrophenol-24</td>
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<td>Ethylbenzene</td>
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<td>Formaldehyde</td>
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<td>6,668</td>
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<td>Hydrogen chloride</td>
<td>75,365</td>
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<td>20</td>
<td>75,385</td>
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<tr>
<td>Lead</td>
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<td></td>
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<td>Manganese</td>
<td>370</td>
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<tr>
<td>Mercury</td>
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<tr>
<td>Methanol</td>
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<td>13,660</td>
<td>16,788</td>
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<tr>
<td>Naphthalene</td>
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<td>Nickel</td>
<td>9.52</td>
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<td>Nitrophenol-4</td>
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<tr>
<td>Pentachlorophenol</td>
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<tr>
<td>Phenol</td>
<td>47.3</td>
<td>600</td>
<td>647.3</td>
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<tr>
<td>Phosphorous</td>
<td>133</td>
<td></td>
<td></td>
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<td>133</td>
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<td>Propionaldehyde</td>
<td>230</td>
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<tr>
<td>Selenium</td>
<td>6.57</td>
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<td></td>
<td>6.57</td>
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<tr>
<td>Styrene</td>
<td>7,009</td>
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<td>7,009</td>
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<td></td>
</tr>
<tr>
<td>2,3,7,8-TCDD</td>
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<td></td>
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<td>0.000771</td>
<td></td>
</tr>
<tr>
<td>Tetrachloroethene</td>
<td>144</td>
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<td></td>
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<td>144</td>
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<tr>
<td>Terpene</td>
<td></td>
<td>128,000</td>
<td>128,000</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>80.1</td>
<td></td>
<td></td>
<td></td>
<td>80.1</td>
<td></td>
</tr>
<tr>
<td>1,1,1-Trichloroethane</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>Trichloroethene</td>
<td>114</td>
<td></td>
<td></td>
<td></td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>2,4,6-Trichlorophenol</td>
<td>0.0428</td>
<td></td>
<td></td>
<td></td>
<td>0.0428</td>
<td></td>
</tr>
<tr>
<td>Vinyl Chloride</td>
<td>69.3</td>
<td></td>
<td>69.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xylene</td>
<td>92.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>92.3</td>
</tr>
</tbody>
</table>

4.1 **Actual Emissions**

The following emissions were reported by SPI to the NWCAA under the emissions inventory program. Emissions inventory reporting includes emissions from normal operation and upsets. The reported emissions have been reviewed by the NWCAA.
### Table 4-3 Actual Criteria Air Pollutant Emissions

<table>
<thead>
<tr>
<th>Criteria Air Pollutant</th>
<th>2007 tpy</th>
<th>2008 tpy</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>29.5</td>
<td>42.1</td>
</tr>
<tr>
<td>PM$_{10}$</td>
<td>20.4</td>
<td>30.1</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>16.3</td>
<td>1.1</td>
</tr>
<tr>
<td>SO$_2$</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>NO$_X$</td>
<td>91</td>
<td>109</td>
</tr>
<tr>
<td>VOC</td>
<td>39.3</td>
<td>43.1</td>
</tr>
<tr>
<td>CO</td>
<td>95</td>
<td>109</td>
</tr>
<tr>
<td>NH$_3$</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

### Table 4-4 Actual Toxic Air Pollutant Emissions

<table>
<thead>
<tr>
<th>Toxic Air Pollutant</th>
<th>2007 lb/yr</th>
<th>2008 lb/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>11,800</td>
<td>14,884</td>
</tr>
<tr>
<td>Acrolein</td>
<td>200</td>
<td>198</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>200</td>
<td>195</td>
</tr>
<tr>
<td>Methanol</td>
<td>7,600</td>
<td>10,518</td>
</tr>
<tr>
<td>Phenol</td>
<td>400</td>
<td>515</td>
</tr>
<tr>
<td>Terpene</td>
<td>35,400</td>
<td>39,378</td>
</tr>
</tbody>
</table>
5 FEDERAL REQUIREMENTS

The facility owns and operates equipment regulated under federal regulations.

5.1 New Source Performance Standards

EPA has established New Source Performance Standards (NSPS) for new, modified, or reconstructed facilities and source categories in 40 CFR Part 60.

5.1.1 Subpart A – General Provisions

If a New Source Performance Standard in 40 CFR Part 60 applies to a facility, Subpart A also applies. Some of the requirements from Subpart A have been included in the permit, and some have not. 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.

5.1.2 Subpart Db - Standards Of Performance for Industrial-Commercial-Institutional Steam Generating Units

NSPS 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 pound per million Btu of heat input (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 (6-minute average), except for one 6-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 1) has a more stringent boiler exhaust PM emission limit, and NWCAA permit (OAC 938b) has a more stringent boiler exhaust opacity limit, than corresponding NSPS requirements.

The cogeneration unit burns natural gas during startup and to maintain flame stabilization. Subpart Db imposes SO2 and NOX limits on boilers that fire fossil fuels under certain conditions. The SO2 limits do not apply to boilers that combust natural gas. The NOX 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 boiler to ensure that gas provides less than ten percent of the annual fuel input. The air operating permit imposes a 0.10 annual fuel factor for natural gas exempting the facility from the NOX limits in the regulation.

5.2 National Emissions Standards for Hazardous Air Pollutants (NESHAP)

EPA has established National Emission Standards for Hazardous Air Pollutants (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 the potential to emit more than 10 tons per year of a single HAP or more than 25 tons per year of all HAPs 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 potential to emit of 58.6 tons per year for all HAPs. 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.
5.2.1 Subpart A – General Requirements

If a Standard in 40 CFR Part 63 applies to a facility, portions of Subpart A also apply. Some of the requirements from Subpart A have been included in the permit, and some have not. 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.

5.2.2 Subpart DDDD – Plywood and Composite Wood Products

As a major source of HAPs, the facility is subject to applicable promulgated 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.

5.2.3 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. The existing biomass-fired boiler qualifies as a “new large solid fuel unit” under the Boiler MACT, which includes a variety of emission standards, work practice standards, monitoring, testing, and recordkeeping requirements for such units.

However, as a result of the DC Circuit Court ruling on June 8, 2007, EPA vacated the Boiler MACT. EPA has stated that the 112(j) provisions, called the “MACT Hammer,” are triggered with the vacatur of the Boiler MACT, but no official guidance has been issued clarifying the path forward. The burden falls on the facility to propose requirements that constitute MACT at its affected sources. SPI proposes MACT requirements similar to those that would have applied prior to the vacatur of the Boiler MACT. No decision has been made at the time of this permit action regarding this proposal; therefore, the proposed terms are not included in the AOP.

5.3 Prevention of Significant Deterioration 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 initial PSD permit was issued on December 12, 2005 (PSD 05-04). PSD 05-04 Amendment 1 was issued on August 6, 2009.

5.4 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. Section 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 will be 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 an unaffected 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 considered an unaffected source.

5.5 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. 40 CFR Part 64.2 establishes the three applicability criteria for the CAM program:

- The unit is subject to an emission limit,
- The unit uses a control device to achieve compliance with that limit, and
- The unit has pre-control emissions of 100 percent of the major source threshold.

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.

The boiler is equipped with a multiclone and ESP for particulate control and an SNCR system for NOX control. The biomass-fired boiler is subject to emission limits for PM\textsubscript{10} and NO\textsubscript{X}; and the boiler uses control devices to achieve compliance with its PM\textsubscript{10} and NO\textsubscript{X} limits. Although the boiler has pre-control emissions of 100 tons or more per year for each of these two pollutants, a CAM plan is required only for PM\textsubscript{10}. The facility’s PSD permit requires that SPI install a NO\textsubscript{X} continuous emissions monitoring system (CEMS) on the boiler. As established in 40 CFR Part 64.3(d)(1), a CEMS satisfies the requirements of Part 64 and therefore a CAM plan for NO\textsubscript{X} is not required. The boiler does not employ a CEMS for PM\textsubscript{10} and as such, SPI must submit a CAM plan for the boiler multiclone and ESP with its first Title V renewal application as stated in 40 CFR 64.5(b).

The planer mill dust collection system employs a baghouse for particulate control. The planer mill dust collection system is subject to a PM\textsubscript{10} emission limit and a baghouse control device achieves compliance with its PM\textsubscript{10} limit. Assuming the baghouse has greater than 99 percent control efficiency for PM\textsubscript{10}, the pre-control PM\textsubscript{10} emissions are greater than 100 tons per year. As a result, SPI must submit a CAM plan for the planer mill dust collection system baghouse with its first Title V renewal application as stated in 40 CFR 64.5(b).

5.6 Other Federal New Source Review Programs

The entire jurisdiction of NWCAA is designated as in attainment for all criteria pollutants. For this reason no other federal new source review programs for new or modified sources of air pollution are applicable.
6 PREVENTION OF SIGNIFICANT DETERIORATION PERMITS AND ORDERS OF APPROVAL TO CONSTRUCT

SPI has been issued a series of permits by WA Department of Ecology and NWCAA.

6.1 Obsolete Orders

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

6.1.1 OAC 938 and PSD 05-04

SPI submitted a combined Notice of Construction (NOC) application and a Prevention of Significant Deterioration (PSD) permit application for the facility to the Northwest Clean Air Agency (NWCAA) and the Washington Department of Ecology (Ecology) on August 22, 2005. Order of Approval to Construct (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% hemlock and remain under the formaldehyde ASIL.

OAC 938 was superseded by OAC 938a.

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.

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

6.1.2 OAC 938a

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.

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

6.2 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.

6.3 PSD 05-04 Amendment 1

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 PM2.5 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 PM2.5 monitoring in the area of proposed impact within the facility boundary.

The application requested that the PSD NO\textsubscript{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\textsubscript{X} /MMBtu leaving only the short-term 0.13 lb NO\textsubscript{X} /MMBtu limit in place.

PSD 05-04 Amendment 1 was issued August 6, 2009 superseding and replacing PSD 05-04.

6.4 OAC 938b

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 5% to 10% 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 provides a term that allows for scheduled soot blowing twice per day, easing the opacity limit during that hour to the requested 10% 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 WA DOE 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 imposes facility-wide limits of acetaldehyde, acrolein, and formaldehyde reflective of the Tier 2 modeling analysis. The WAC 173-460 tier 2 approval by WA DOE is included as part of the OAC upon issuance of the permit.

SPI submitted an ammonia emissions monitoring plan to the NWCA in 2007. The plan noted that testing demonstrated that at the highest input of urea, the facility does not exceed the 50 ppmvd 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.

OAC 938b was issued on February 23, 2009, superseding and replacing OAC 938a.
7  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.

7.1  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.

7.2  40 CFR 63 Subpart DDDDD, §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.

7.3  PSD 05-04 Amendment 1

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 Northwest Clean Air Agency 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, more particularly described as follows:

Commencing at the Northeast corner of Lot 1, SP No. 94-035 and Southeast corner of Lot 3, SP No. 7-89 of said Boundary Line Adjustment;

Thence South 0°05'32‖ West along the East line thereof, a distance of 346.07 feet to the Northeast corner of said Lot 2 and the TRUE POINT OF BEGINNING;

Thence South 64°44'57‖ West a distance of 106.24 feet;

Thence South 32°07'06‖ West a distance of 76.28 feet;

Thence South 02°55'39‖ East a distance of 64.91 feet;

Thence South 36°39'48‖ East a distance of 80.70 feet;

Thence South 78°46'53‖ East a distance of 86.39 feet to a point on the East line of said Lot 2, which bears South 00°05'32‖ West from the TRUE POINT OF BEGINNING;

Thence North 00°05'32‖ East a distance of 256.37 feet to the TRUE POINT OF BEGINNING.

Situated in Skagit County, Washington

AND ALSO INCLUDING
That portion of vacated Swinomish Avenue contiguous to the South line of Block 9, Plan of Fredonia according to the plat there of recorded in Volume 2 of Plats, page 25, records of Skagit County, said portion lying Northerly of the following described line:

Beginning at the Northwest corner of Block 10 of said Plan of Fredonia as shown on that certain Record of Survey map recorded under Skagit County Auditor's File No. 200006020092;

thence South 0°05'33" West 521.96 feet along the West line of said Plan of Fredonia to the Southwest corner of said Block 9;

thence continue South 0°05'33" West 1.8 feet, more or less, along said West line, to an existing wire fence and the TRUE POINT OF BEGINNING of said line;

thence South 86°23'42" West 29.4 feet from the Northeast corner of the Quit Claim Deed for Boundary Line Adjustment as recorded under Auditor's File number 200009250093, records of Skagit County, Washington;

thence South 45°29'47" East 40.29 feet to the East line of said Quit Claim Deed for Boundary Line Adjustment as recorded under Auditor’s File Number 200009250093, records of Skagit County, Washington, at a point that is South 1°18'59" West 26.4 feet from said Northeast corner of the Quit Claim Deed for boundary Line Adjustment, said point being the terminus of said line.

Situated in 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 Department of Ecology on 11/18/09.

Condition 8.1.2: Control of the property in Condition 2 and satisfaction of the recordkeeping requirements in Condition 10, this condition no longer applies.

Condition 10: Control of the property, including construction of a fence, was confirmed by SPI in correspondence, approved by NWCAA and Department of Ecology on 11/18/09.

Condition 12: Startup of boiler occurred 12/30/06 - initial compliance demonstration was due by 6/30/07 (180 days). Initial compliance with the boiler NOx permit limit (below) was demonstrated on 6/13/07 using a certified NOx CEMS (4/3/07 RATA). Results were in compliance with the permit terms at the time, including the current term 5.1.10:

Boiler stack NOx limits

NOx emissions shall not exceed, on a daily average:

0.13 lb NOx/MMBtu

56 lb NOx/hr

Therefore, condition 12 is completed and not included in the AOP.

Condition 13: Startup of boiler occurred 12/30/06 - initial compliance demonstration was due by 6/30/07 (180 days). Initial compliance with the boiler CO permit limit (below) was demonstrated on 6/13/07 using Method 10 concurrently running a certified CO CEMS (4/3/07 RATA). Results were in compliance with the permit terms at the time, including the current term 5.1.12:

Boiler stack CO limits

CO emissions shall not exceed;

- 0.35 lb CO/MMBtu, 1-hour average

659 tons CO in any consecutive 12-month period (including startups and shutdowns).
Therefore, condition 13 is completed and not included in the AOP.

**Condition 14:** Startup of boiler occurred 12/30/06 - initial compliance demonstration was due by 6/30/07 (180 days). Initial compliance with the planer and boiler PM$_{10}$ permit limits (below) were demonstrated on 4/5/07 and 6/13/07, respectively, both using Methods 5 and 202. Results were in compliance with the permit terms at the time, including the current terms 5.1.12 and 5.3.1:

Boiler stack PM/PM$_{10}$/PM$_{2.5}$ limits (filterable + condensable) expressed as PM$_{10}$ emissions shall not exceed:

- 0.02 lb PM$_{10}$/MMBtu 24-hour average, based on the heat input value of the fuel
- 37.7 tons PM$_{10}$ in any consecutive 12-month period
- 0.005 gr PM$_{10}$/dscf 1-hour average
- 9.4 tons PM$_{10}$ in any consecutive 12-month period

Therefore, condition 14 is completed and not included in the AOP.

**PSD 05-04 Amendment 1, Condition 15:** Startup of boiler occurred 12/30/06 - initial compliance demonstration was due by 6/30/07 (180 days). Initial compliance with the boiler SO$_2$ permit limits (below) were demonstrated on 6/13/07 using Method 6c. Results were in compliance with the permit terms at the time, including the current terms 5.1.11:

Boiler stack SO$_2$ limits

SO$_2$ emissions shall not exceed:

- 0.025 lb SO$_2$/MMBtu on a 3-hour average, based on the heat input value of the fuel
- 47.1 tons SO$_2$ over any consecutive 12-month period

Therefore, condition 15 is completed and not included in the AOP.

**PSD 05-04 Amendment 1, Condition 16:** Startup of boiler occurred 12/30/06 - initial compliance demonstration was due by 6/30/07 (180 days). Initial compliance with the boiler VOC permit limits (below) were demonstrated on 6/13/07 using Method 25a. Results were in compliance with the permit terms at the time, including the current term 5.1.15

*Boiler stack VOC limits*

Emissions calculated as propane (MW 44) shall not exceed:

- 0.019 lb VOC/MMBtu 1-hour average, based on the heat input value of the fuel

35.8 tons VOC in any consecutive 12-month period

Other ongoing VOC requirements are included in terms 5.4.4, and 5.5.4 that are reflective of the initial requirements: Initial compliance with the kiln VOC condition (implementation of the computerized stem management system with an operating manual) was verified during the 2008 inspection. Initial compliance with the VOC limit in the spray chamber (implementing a mist eliminator and recycle system with an operating manual) was verified during the 2008 inspection.

Therefore, condition 16 is completed and not included in the AOP.

**Condition 27** includes several initial notifications to be submitted to Ecology and the NWCAA. All the time frames have passed for these provisions and they are considered met by NWCAA at the time of permitting and therefore, are not included in the AOP.

**Condition 27:** SPI-Burlington will notify and report to Ecology and the NWCAA, and maintain related records as follows:

- 27.1 Notifications and reports will be in written format unless otherwise approved by Ecology. General conditions in Section 2 require hardcopy reports submitted to the agency.
27.2 The following notifications shall be submitted to Ecology and the NWCAA:

27.2.1 Commencement of construction of the mill and of the wood-fired cogeneration unit: No later than 30 calendar days after such date. Commencement of construction was notified to the NWCAA/Ecology in January 2006.

27.2.2 Initial startup of the mill and of the wood-fired cogeneration unit: No later than 15 calendar days after such date. Initial startup of the cogen and mill was notified to the NWCAA/Ecology in December 2006.

27.2.3 Completion of the entry into the operation and maintenance manual of the items specified in Condition 29, within 15 days after such entries were completed. The operation and maintenance manual was inspected and confirmed complete by NWCAA in 2008.

27.2.4 At the time of submittal of the notification required in Condition 27.2.3, certification by the responsible party for the facility that the relevant equipment was installed consistent with the parameters developed pursuant to Condition 29. All reports submitted to NWCAA/Ecology have been certified by the responsible official.

27.2.5 The date on which the NO\textsubscript{X} CEMS first demonstrated satisfactory performance pursuant to Condition 26.1, no later than 30 calendar days after such date. The NO\textsubscript{X} CEMs completed performance specifications demonstration in April 2007.

27.2.6 The date on which the CO CEMS first demonstrated satisfactory performance pursuant to Condition 26.2, no later than 30 calendar days after such date. The CO CEMS completed performance specifications demonstration in April 2007.

The remaining Sections 27.3 and 27.4 are included in the AOP.

**Condition 28** requires that access and sampling ports compliant with Method 1 be constructed. The stack and ports are constructed. Therefore, this term is completed and not included in the AOP.

**Condition 29** requires O&M manuals and procedures be implemented for the facility. The O&M manuals were reviewed during the 2008 NWCAA inspection. The initial requirements have not been included in the AOP.

**Conditions 30 and 31** have no ongoing compliance provisions and are similar to regulatory language in Section 2 of the AOP. They have not been included in the AOP.

**Condition 32** indicates actions that would cause the approval to become invalid and are similar to regulatory language in Section 2 of the AOP. They have not been included in the AOP.

**Condition 33** coordinates issuance with the permit with EPA Endangered Species Act the Magnuson-Stevens Fishery and Conservation Act.

These requirements have been met as noted in a Region 10 email from 7/16/09. They have not been included in the AOP.

**Condition 34** addresses public comment and is similar to regulatory language in Section 2 of the AOP. The condition has not been included in the AOP.
8 GENERAL PERMIT ADMINISTRATION AND ASSUMPTIONS

8.1 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 7). Also, regulations that require action by a regulatory agency, but not of the regulated source are not included as applicable permit conditions.

8.2 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 or through other delegation mechanisms. 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 federal approval/delegation lags behind changes made to the Washington Administrative Code (WAC) or to the NWCAA Regulation. 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.

Chapter 173-401 WAC is not federally enforceable although the requirements of this regulation are based on federal requirements for the air operating permit program. Upon issuance of the permit, the terms based on Chapter 173-401 WAC will become federally enforceable for the source.

8.3 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 application that the facility will meet any future applicable requirements on a timely basis.

8.4 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.

8.5 Gap Filling
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.” Some of the older general regulations and federal NSPS do not have monitoring, recordkeeping and reporting requirements that are sufficient to reasonably assure continuous compliance with emission limitations. Title V, 40 CFR 70, and WAC 173-401-615 all contain a “gap-filling”
provision for that situation\(^6\). The permitting agency is required to create monitoring, recordkeeping and reporting requirements that fill the gap and to put those requirements in the air operating permit. In any term where gap-filling has taken place, the regulatory citation for that term will contain the words “directly enforceable.” The introductory paragraphs for the table include the reference to the citation of the gap-filling requirement in Chapter 173-401 WAC: “WAC 173-401-615(b) & (c), 10/17/02.”

On August 19, 2008, the U.S. Court of Appeals vacated EPA’s 2006 interpretive rule that prohibited states from enhancing monitoring in Title V permits. As a result, permitting authorities again must ensure that monitoring in each permit is sufficient to assure compliance with the terms and conditions of the permit.

### 8.6 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.

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\(^6\) 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.
9 PERMIT ELEMENTS AND BASIS FOR TERMS AND CONDITIONS

9.1 Permit Organization
The permit is organized in the following sequence:

- Permit Information
- Attest
- Table of Contents
- Emission Unit Identification
- Standard Terms and Conditions
- Generally Applicable Requirements
- Specific Requirements for Emissions Units
- Inapplicable Requirements

9.2 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, 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.

9.3 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.

9.4 Section 3 – Standard Terms and Conditions for 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.

9.5 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.

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 requirements are numbered consecutively so that the reader may easily locate a listed requirement. 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.

9.5.1 Visible Emissions (Permit Term 4.1):

The cogeneration facility and the sawmill baghouse exhaust stacks and the kilns are the only likely point sources of visible emissions in the SPI facility, and they are covered as specifically applicable requirements in Section 5. For the purpose of ongoing compliance, SPI performs monthly inspections of the facility in general, and will investigate any observations of visual emissions and document the incident and corrective action taken.

9.5.2 Particulate Matter (Permit Terms 4.2 through 4.4):

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.

9.5.3 Sulfur Dioxide and Fuel bound Sulfur (Permit Terms 4.5 through 4.9)

Below is a discussion on each of the generally applicable terms related to SO₂.

9.5.3.1 Fuel Sulfur Content (Permit Term 4.5):

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:

\[
\frac{2 \text{ gr.}}{100 \text{ ft}^3} \times \frac{1 \text{ lb}}{7000 \text{ gr}} \times \frac{1 \text{ lb - mole}}{32 \text{ lb}} \times \frac{385 \text{ ft}^3}{1 \text{ lb - mole}} \times 10^6 = 34 \text{ ppm}
\]
A “lb-mole” of a pure gas weighs the molecular weight of that gas in pounds and occupies 385 ft³ at 32° F and 1 atmosphere pressure. A “lb-mole” of sulfur (S) weighs 32 lb and reacts with a lb-mole of oxygen (O₂) which also weighs 32 lb to form a lb-mole of sulfur dioxide, which weighs 64 lb. Therefore, 2 lb of SO₂ 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 4.5. No oil is burned in any of the equipment at SPI.

9.5.3.1 Fuel Sulfur Content (Permit Term 4.6):

This condition limits SO₂ emissions to 1.5 pounds per million British thermal units of energy consumed. Combustion of natural gas causes emissions of about 0.0021 lb/MMBtu SO₂ as shown in the following calculation:

\[
\frac{0.76 \text{ gr. Sulfur}}{100 \text{ ft}^3} \times \frac{1 \text{ lb Sulfur}}{7000 \text{ gr Sulfur}} \times \frac{1000 \text{ ft}^3}{1.05 \text{ MMBtu}} \times \frac{2 \text{ lb SO}_2}{1 \text{ lb Sulfur}} = 0.0021 \frac{\text{lb SO}_2}{\text{MMBtu}}
\]

9.5.3.2 Sulfur Dioxide, Stack Emissions (Permit Terms 4.7 through 4.9):

Northwest Clean Air Agency Regulations 462 and 410 and WAC 173-400-040(6) have been grouped together under Permit Terms 4.7 through 4.9 since they are equivalent requirements (SO₂ emissions not to exceed 1,000 parts per million on a dry, volumetric basis (ppm)) and have the same monitoring requirements.

The second paragraph of WAC 173-400-040(6), which is not in the Northwest Clean Air Agency 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 SO₂ concentrations to 1,000 ppm. This requirement is not federally enforceable and is not an applicable requirement for sources regulated by the Northwest Clean Air Agency.

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 \(1.306 \times 10^{-5}\) cubic foot of sulfur, each cubic foot of stack exhaust will contain approximately:

\[
7 \text{ ppm} \text{ means “parts per million on a dry, volumetric basis.” Sometimes this is written as “ppmdv.” 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. If you had a stack with 50% moisture that was running right at the 1,000 ppm SO₂ standard, you would have 1,000 cubic feet of SO₂ for every million cubic feet of dry stack gas. You would also have 1,000 cubic feet of SO₂ for every two million cubic feet of “wet” (as is) stack gas, which is 500 ppm. This is why it’s important to know how stack sampling is done and why stack sampling and continuous emission monitoring methods are so specific.}
Sierra Pacific Industries, SOB #019  
Final June 10, 2010

\[
1.306 \times 10^{-5} \frac{ft^3 S}{ft^3 nat. gas} \times 1 \frac{ft^3 SO_2}{ft^3 S} \times \frac{1 ft^3 nat. gas}{11 ft^3 stack exhaust} = 1.188 \times 10^{-6} \frac{ft^3 SO_2}{ft^3 stack exhaust}
\]

This is equivalent to 1.19 ppmdv 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 Northwest Clean Air Agency Regulations 462 and 410 and WAC 173-400-040(6).

9.5.4 Nuisance (odor) and Fugitive Emissions (Permit Terms 4.10 through 4.18):

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 4.18 comes from Condition 2 of OAC 938b, 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.

9.6 Section 5 – Specific Requirements for Emissions Units

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 New Source Performance Standard or National Emissions Standard for Hazardous Air Pollutants. The format and organization of this section is the same as the table for the generally applicable requirements in Section 4.


10 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 (Table 6.1 below) 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 10-1 below:

Table 10-1 Insignificant Activities and Emissions Units (Categorically Exempt)

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

The Swinomish Indian Tribal Community (SITC) provided comments on the SPI Draft Statement of Basis (SOB) and Air Operating Permit (AOP) via email on April 14, 2010. The SITC contact is Scott Andrews, Swinomish Indian Tribal Community - Office of Planning and Community Development.

Comments are copied here immediately followed by the Northwest Clean Air Agency (NWCAA) response. All comments are addressed.

Swinomish Comment 1:

―First, given several factors, we request a two week extension of the draft operating permit comment period. This is necessary as the facility in question has been operating on an interim permit for a long period, and yet the draft permit review period is relatively short and we will need to review more data from our air quality monitoring station to correlate with the documents. It has also been somewhat difficult to follow some of the calculations in these application documents and we need more time for a detailed review.‖

NWCAA Response to Comment 1:

Due to a typographical error on the NWCAA website, the SITC believed that the comment period ended on April 15, 2010. The actual ending date of the comment period was April 25, 2010. On the date of the request for an extension, there were actually 10 days left in the comment period. On April 15, the NWCAA corrected the website posting and informed the SITC via email of the available time left in the comment period.

The comment period remained open until April 25, 2010. The SITC did not provide further comments.

All air permits for the SPI facility have been issued in accordance with WA regulations. There are no, nor have there ever been, any "interim" permits.

Swinomish Comment 2:

―We have several concerns regarding SPI operating permit and past operations. Over the past few years one of our staff has called in several opacity violations which apparently did not get into the violation history. These opacity violations were reported by a certified opacity reader. Please review your records regarding these incidents and include them in your documents. If you do not have them, please contact Tony Basabe in our office for his list of opacity violation reports of the facility. In the future we would like to have our complaints answered in writing.‖

NWCAA response to Comment 2:

The NWCAA has received a total of 8 complaints regarding SPI from Tony Basabe, identifying himself as representing the Swinomish Reservation. These complaints were recorded in the NWCAA database and investigated when possible.

Four of the complaints were received as "information call only" notifications. The remaining four notifications were investigated by NWCAA staff. In each of these cases, Mr. Basabe alleged opacity observations from the boiler/cogen unit at the SPI facility.

The NWCAA investigations of these allegations consisted of contacting the source, and collecting the continuous opacity monitoring data from the boiler/cogen system. The continuous opacity monitoring system (COMS) data demonstrated that the facility was operating in compliance during the alleged events. The NWCAA found no evidence of excess emissions during the alleged events reported by Mr. Basabe.

The facility has completed all required testing and quality assurance activities applicable to the COMS, which is the primary demonstration of compliance for opacity at the boiler stack.

It is unclear to the NWCAA what the following Swinomish comment is requesting: "Please review your records regarding these incidents and include them in your documents". All information regarding complaints and related investigations are readily available to the public through the information request process.
The request to respond to the SITC in writing does not relate to an applicable requirement of the AOP or to a requirement of WAC 173-401.

**Swinomish Comment 3:**

“The Tribe has also measured NO\textsubscript{2} at our monitoring station located approximately 5 Miles NW of SPI. We submitted our data to your agency as requested but did not receive any reply. There are a several incidents in which the facility appears to have been a major contributing factor to what would now under the new NO\textsubscript{2} standards, be exceedences of those standards. This fact should be addressed in the draft permit documents. We will continue to give you notice when high NO\textsubscript{2} values are recorded at our official AQS monitoring during which time SPI was upwind from our site. We would appreciate a written response when we take the time and effort to assist you with our monitoring data.”

**NWCAA Response to Comment 3:**

Mr. Basabe has indicated on several occasions to various NWCAA staff both over the phone and in the NWCAA office, that he has collected ambient monitoring data and that he is concerned about the measurements. NWCAA staff members have informally expressed interest in reviewing the raw data. To date, NWCAA has not received any data directly from Mr. Basabe or the SITC.

NWCAA neither formally requested nor received any ambient NO\textsubscript{2} data directly from the SITC during the period 2005 to date. The NWCAA was not aware that any response was requested from the SITC regarding ambient data. In discussions with Mr. Basabe regarding the data, NWCAA staff has posed questions which have not been answered to date.

No reports of NO\textsubscript{2} measured in excess of any NAAQS have been received by the NWCAA from the SITC. NWCAA has not received any information to date demonstrating that the SPI facility significantly impacts the NO\textsubscript{2} NAAQS for the region.

The request to respond to the SITC in writing does not relate to an applicable requirement of the AOP or to a requirement of WAC 173-401.

**Swinomish Comment 4:**

“Regarding the Statement of Basis Section 4 we have a number of questions that need to be addressed.

- Why do the actual emissions for acrolein, acetaldehyde, methanol and phenol exceed the potential emissions for those sources?”

**NWCAA Response to Comment 4:**

Emissions of acetaldehyde and acrolein, as noted in comment 4, were inadvertently left out of the dry kiln lb/yr column of Table 4-2. The corrections are shown in italicized text and have been included in the proposed draft:

<table>
<thead>
<tr>
<th>Toxic Pollutants</th>
<th>Boiler lb/yr</th>
<th>Cooling Tower lb/yr</th>
<th>Planer Mill lb/yr</th>
<th>Dry Kilns lb/yr</th>
<th>Anti-mold Spray lb/yr</th>
<th>Plant-wide lb/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>618</td>
<td></td>
<td></td>
<td>33,200</td>
<td>33,818</td>
<td></td>
</tr>
<tr>
<td>Acrolein</td>
<td>119</td>
<td></td>
<td></td>
<td>580</td>
<td>700</td>
<td></td>
</tr>
</tbody>
</table>

The following are the entries in Table 4-2 as published for methanol and phenol:

<table>
<thead>
<tr>
<th>Toxic Pollutants</th>
<th>Boiler lb/yr</th>
<th>Cooling Tower lb/yr</th>
<th>Planer Mill lb/yr</th>
<th>Dry Kilns lb/yr</th>
<th>Anti-mold Spray lb/yr</th>
<th>Plant-wide lb/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>3,128</td>
<td></td>
<td></td>
<td>13,660</td>
<td>16,788</td>
<td></td>
</tr>
<tr>
<td>Phenol</td>
<td>47.3</td>
<td></td>
<td></td>
<td>600</td>
<td>647.3</td>
<td></td>
</tr>
</tbody>
</table>
Facility actual emission totals, as shown in Table 4-4 (included below) do not exceed the listed potential to emit (with the noted corrections for acetaldehyde and acrolein).

Table 11-1 Actual Toxic Air Pollutant Emissions (as published)

<table>
<thead>
<tr>
<th>Toxic Air Pollutant</th>
<th>2007 lb/yr</th>
<th>2008 lb/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>11,800</td>
<td>14,884</td>
</tr>
<tr>
<td>Acrolein</td>
<td>200</td>
<td>198</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>200</td>
<td>195</td>
</tr>
<tr>
<td>Methanol</td>
<td>7,600</td>
<td>10,518</td>
</tr>
<tr>
<td>Phenol</td>
<td>400</td>
<td>515</td>
</tr>
<tr>
<td>Terpene</td>
<td>35,400</td>
<td>39,378</td>
</tr>
</tbody>
</table>

Swinomish Comment 5:
"Why isn’t terpene listed under the potential to emit? Such a listing would also identify the actual sources of this pollutant within the facility which was not done."

NWCAA Response to Comment 5:
Potential emissions of terpene was inadvertently left out of Table 4-2. The corrections are shown in italicized text and have been included in the proposed draft:

<table>
<thead>
<tr>
<th>Toxic Pollutants</th>
<th>Boiler lb/yr</th>
<th>Cooling Tower lb/yr</th>
<th>Planer Mill lb/yr</th>
<th>Dry Kilns lb/yr</th>
<th>Anti-mold Spray lb/yr</th>
<th>Plant-wide lb/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terpene</td>
<td></td>
<td></td>
<td></td>
<td>128,000</td>
<td></td>
<td>128,000</td>
</tr>
</tbody>
</table>

Terpene emissions were addressed during initial construction permitting in accordance with WAC 173-460 requirements.

Swinomish Comment 6:
"The environmental transformation of terpenes to formaldehyde is significant and should be addressed in the documents."

NWCAA Response to Comment 6:
Terpene emissions were addressed during initial permitting in accordance with WAC 173-460 requirements.

Swinomish Comment 7:
"The total actual VOC emissions in Table 4.3 from SPI in 2007 and 2008 were 39.3 and 109 respectively. In the PSD permit 5.1.15 states that the VOC missions from the boiler is limited to 35.8 t/yr. It is not clear from the permit application documents where this discrepancy is accounted for."

NWCAA Response to Comment 7:
The facility total VOC emissions listed in Table 4-3, reported by SPI, were 39.3 tons in 2007 and 43.1 tons in 2008. These totals include emissions from all facility sources, including the boiler, the dry kilns, and the anti-mold spray chamber.
The facility total permitted VOC emissions are 165 tons per year as listed in Table 4-1.

The AOP 019 permit term 5.1.15 addresses only the boiler VOC emissions, as derived from PSD permit 05-04 Amendment 1. SPI has reported boiler stack VOC emissions for 2007 and 2008 as 3.5 tons and 5.2 tons, respectively. These data were not included in the Statement of Basis.

Swinomish Comment 8:

“It is difficult to follow the calculations on the potential to emit formaldehyde. The formaldehyde emission factors for kin drying Douglas fir and western hemlock are 0.0010lb/Mbf and 0.0013lb/Mbf respectively. When these emission factors are applied to the potential emissions, the resulting potential emissions are between 400 to 520 lbs/yr. Please address these differences between these values and the 195 lbs/yr in Table 4-2.”

NWCAA Response to Comment 8:

The calculation of the potential to emit for formaldehyde has several factors that must be considered. The calculation is not a direct multiplication of total maximum throughput (400 MMbf/yr) with the emission factor.

AOP 019 term 4.19 represents the facility-wide potential to emit for HAP emissions including formaldehyde: 6,917 lb/year 12-month rolling total. As listed in Table 4-2 of the Statement of Basis document, formaldehyde is emitted from both the boiler stack and the dry kilns. The facility must account for all formaldehyde sources when demonstrating compliance with term 4.19 of AOP 019.

The potential emissions of particulate matter (PM10 and PM2.5) from the dry kilns are also limited; AOP 019 term 5.4.3. These particulate matter emissions are attributed with the semi-volatile fraction of the VOC emissions from the dry kilns.

Therefore, the facility must demonstrate compliance with term 5.4.3 as it is meeting term 4.19. It is up to the facility to balance load conditions and operations to meet all applicable permit terms.

The formaldehyde potential to emit reported in Table 4-2 reflects the projected operation of the boiler and kilns by the facility in the application, resulting in 195 lb/year of formaldehyde from the kilns. SPI reported 22 lb formaldehyde emitted from the dry kilns in 2009.
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.


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
NOx  oxides of nitrogen
NSPS  New Source Performance Standard
NSR  New Source Review
NWCAA  Northwest Clean Air Agency
O2  Oxygen
OAC  Order of Approval to Construct
ODEQ  Oregon Department of Environmental Quality
OSU  Oregon State University
PM  particulate matter
PM10  particulate matter less than 10 microns in diameter
PM2.5  particulate matter less than 2.5 microns in diameter
ppm  parts per million
ppmdv  (same as ppmvd) 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
SO2  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 permit application and any technical support documents are available at the following at [www.nwcleanair.org](http://www.nwcleanair.org) and the following location:

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