United States Environmental Protection Agency
Region 10, Office of Air, Waste and Toxics
AWT-150
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Permit Number: R10NT500401
Issued: September 30, 2014
Replaces: R10NT500400
AFS Plant I.D. Number: 41-065-00034

Non – Title V Air Quality Operating Permit

Revision No. 1

This permit is issued in accordance with the provisions of 40 CFR § 49.139 and applicable rules and regulations, to

Warm Springs Forest Products Industries

for operations in accordance with the conditions listed in this permit, at the following location:

Location: Warm Springs Reservation
Highway 26
Warm Springs, Oregon
Latitude: 44.765 N Longitude: 121.236 W

Person Responsible for Compliance: John Katchia Jr., Chief Executive Officer
Warm Springs Forest Products Industries
Highway 26
P.O. Box 810
Warm Springs, Oregon 97761-0810
Phone: 541.553.1131, Fax: 541.553.1561

A technical support document that describes the bases for conditions contained in this permit is also available.

Kate Kelly, Director
Office of Air, Waste and Toxics
U.S. Environmental Protection Agency, Region 10

9/30/2014
Date

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1. General Conditions

1.1. For purposes of this permit, the permitted source consists of the following equipment and/or activities:

Emission Unit ID	Emission Unit Description	Hazardous Air Pollutant Control Devices[1]
PH5	*Biomass Boiler*. Wellons Model No. NB234. Serial No. B2329-0503. Two-cell pile-burning design with automatic rotating grates and overfeed fuel delivery. Combustion air introduced below and above grates. Oxygen trim system. Heat input capacity 131 million Btu/hr (MMBtu/hr). Maximum steam production 80,000 lb/hr at 250 psig and 750ºF. Generates only superheated steam. Supplies steam to kilns (via desuperheater), to non-extractive steam turbine electric generating units and to Warm Springs Composite Products (via desuperheater). Permit authorizing construction issued May 4, 2005. Startup December 27, 2005.	1. Wellons multiclone. Model No. W144. Serial No. B2329-1226. 2. Wellons electrostatic precipitator. Model No. 2W-092-1422. Serial No. B2320-2425. Part of original boiler installation.
KLN-N	*Nardi Lumber Drying Kilns*. Indirectly heated. Five single-track Nardi kilns (No.'s 1-5) installed 1997. Annual capacity of approximately 77 million board feet (mmbf) with each track contributing 15.37 mmbf.	None
KLN-W	*Wellons Lumber Drying Kilns*. Indirectly heated. Two double-track Wellons kilns (No's 6a – 7b) installed 2000. Annual capacity of approximately 61 mmbf with each track contributing 15.37 mmbf.	None

[1] Multiclone and electrostatic precipitator are not required to be employed by this permit.

1.2. Warms Springs Forest Product Industries (permittee) shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Air Act.

1.3. Compliance with the terms of this permit does not relieve or exempt the permittee from compliance with other applicable Clean Air Act requirements or other applicable federal requirements, tribal, state or local laws or regulations.

2. Emission Limits and Work Practice Requirements

2.1. HAP emissions from this facility shall not exceed 24 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) for the previous eleven months.

2.1.1. Monthly PH5 emissions (tons) shall be determined by multiplying the recorded monthly heat input rate (MMBtu/month) determined pursuant to Condition 4.2 by 0.0220 lb/MMBtu and dividing by 2000 lb/ton.

2.1.2. Monthly KLN-N and KLN-W emissions (tons) shall be determined by multiplying the recorded monthly specie-specific and temperature-specific dry lumber production rates (thousand board feet (mbf)/month) determined pursuant to Condition 4.4 by the corresponding specie-specific and temperature specific total HAP emission factors (lb/mbf) presented in Appendix A of this permit, summing, and dividing by 2000 lb/ton.

2.2. Emissions of any single HAP from this facility shall not exceed 9 tons per year as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) for the previous eleven months.

2.2.1. Monthly PH5 emissions (tons) shall be determined by multiplying the recorded monthly heat input rate (MMBtu/month) determined pursuant to Condition 4.2 by the emission factors (lb/MMBtu) presented in Appendix B and dividing by 2000 lb/ton.

2.2.2. Monthly KLN-N and KLN-W emissions (tons) shall be determined by multiplying the recorded monthly specie-specific and temperature-specific dry lumber production rates (mbf/month) determined pursuant to Condition 4.4 by the corresponding specie-specific and temperature-specific single HAP emission factors (lb/mbf) presented in Appendix A of this permit, summing, and dividing by 2000 lb/ton.

2.3 The maximum one-hour block average dry bulb temperature (ºF) of heated air entering each lumber stack within KLN-N and KLN-W as determined pursuant to Condition 4.5 shall not exceed 200°F.

3. Testing Requirements

3.1. No later than 120 days after issuance of this permit and subsequently thereafter each time the permittee employs EPA Reference Method 2 to determine PH5 stack gas volumetric flow rate, the permittee shall conduct stack testing and perform fuel sampling and analysis to determine PH5's fuel-heat-input-to-steam-output ratio "FHISOR" (MMBtu/thousand lb (mlb)) using the methodology specified in the most recent version of EPA Region 10's "Procedure to Determine a Biomass Boiler's Fuel-Heat-Input-To-Steam-Output Ratio."

3.2. During each stack test run conducted to determine PH5's FHISOR as directed by Condition 3.1, the permittee shall:

3.2.1. Combust the wood residue (species, moisture content and by-product specific), or combination thereof, most often consumed during the most recent twelve months of operation;

3.2.2. Generate steam within ten percent of the maximum pressure (psig), temperature (°F) and mass flow rate (mlb/hr) observed during the most recent twelve months of operation;

3.2.3. Record the species, moisture content and category of wood residue (bark, chips, sawdust, planer shavings, forest slash etc.) combusted in the boiler and whether the fuel was generated on-site or off. If more than one species or more than one category of wood residue is combusted, then estimate and record the percentage of each; and

3.2.4. Measure and record the steam pressure (psig), temperature (°F) and mass flow rate (mlb/hr) no less than once every five minutes.

3.3. The permittee shall provide EPA at least 30 days prior notice of any stack test required to be performed pursuant to Condition 3.1 to afford EPA the opportunity to have an observer present. If

after 30 days notice for an initially scheduled test, there is a delay in conducting the scheduled stack test, the permittee shall notify EPA as soon as possible of any delay in the original stack test date, either by providing at least seven days prior notice of the rescheduled date of the stack test, or by arranging a rescheduled date with EPA by mutual agreement.

3.4. The permittee shall submit to EPA a test plan 30 days prior to any stack test required to be performed pursuant to Condition 3.1. The plan shall include and address the following elements:

3.4.1. Purpose and scope of testing;

3.4.2. Source description, including a description of the operating scenarios and mode of operation during testing and including fuel sampling and analysis procedures;

3.4.3. Schedule/dates of testing;

3.4.4. Process data to be collected during the test and reported with the results;

3.4.5. Sampling and analysis procedures, specifically requesting approval for any proposed alternatives to the reference test methods, and addressing minimum test length and minimum sample volume;

3.4.6. Sampling location description and compliance with the reference test methods;

3.4.7. Analysis procedures and laboratory identification;

3.4.8. Quality assurance plan;

3.4.9. Calibration procedures and frequency;

3.4.10. Sample recovery and field documentation;

3.4.11. Chain of custody procedures;

3.4.12. Quality assurance/quality control project flow chart;

3.4.13. Data processing and reporting;

3.4.14. Description of data handling and quality control procedures; and

3.4.15. Report content and timing.

3.5. Stack test reports and fuel sampling and analysis reports shall be submitted to EPA within 60 days of completing any test required by Condition 3.1 along with data required to be recorded in Conditions 3.2.3 and 3.2.4.

4. Monitoring and Recordkeeping Requirements

4.1. Each month, the permittee shall calculate and record facility-wide monthly and rolling 12-month total emissions (tons) for all HAP-emitting activities at the facility.

4.2. The permittee shall determine the monthly heat input to PH5 as follows:

4.2.1. Continuously track and record the boiler's steam generating rate in accordance with Condition 4.3 and total the month's steam production (mlb/month);

4.2.2. Employ a FHISOR of 1.520 MMBtu/mlb to calculate monthly heat input to the boiler until testing is performed pursuant to Condition 3.1; and

4.2.3. Once a test-derived FHISOR (MMBtu/mlb) has been determined pursuant to Condition 3.1, monthly heat input shall be determined by multiplying the monthly steam production (mlb/month) by the most recent FHISOR (MMBtu/mlb).

4.3. The permittee shall install, calibrate, operate and maintain, in accordance with manufacturer specifications, equipment necessary to measure and record PH5 steam pressure (psig), temperature (°F) and mass flow rate (mlb/hr).

4.3.1. The monitoring system shall provide for continuous measurement/display, one-hour block averages recorded with at least 90% monthly data capture.

4.3.2. At least annually, the permittee shall verify and document the accuracy of the monitoring equipment in accordance with manufacturer's specifications.

4.4. The permittee shall determine the monthly volume of lumber dried (mbf/month) in KLN-N and KLN-W according to species of lumber and maximum drying temperature (°F).

4.4.1. For each kiln charge, track and record the species and volume of lumber dried (mbf) and the maximum dry bulb temperature (ºF) of heated air entering the lumber stack in accordance with Condition 4.5.

4.4.2. Sort monthly kiln charges by species of lumber and into one of the following two categories: (a) maximum drying temperature less than or equal to 200°F and (b) maximum drying temperature greater than 200°F.

4.4.3. Sum the volumes (mbf) of kiln charges sorted in accordance with Condition 4.4.2.

4.5. The permittee shall install, calibrate, operate and maintain, in accordance with manufacturer specifications, equipment necessary to measure and record KLN-N and KLN-W dry bulb temperature (°F) of heated air entering the lumber stack.

4.5.1. The monitoring system shall provide for continuous measurement/display, one-hour block averages recorded with at least 90% monthly data capture;

4.5.2. At least annually, the permittee shall verify and document the accuracy of the monitoring equipment in accordance with manufacturing specifications.

4.6. The permittee shall maintain records of emission calculations and parameters used to calculate emissions for at least five years.

5. Reporting Requirements

5.1. Once each year, on or before April 1, the permittee shall, along with the annual registration required by 40 CFR § 49.138(e)(2), submit to EPA a report containing the twelve monthly rolling 12-month emissions calculations for the previous calendar year.

5.1.1. The report shall contain a description of all emissions estimating methods used, including emission factors and their sources, assumptions made and production data.

Appendix A: HAP Emission Factors for Lumber Drying

Species	Max Kiln Temp[1] °F	Total HAP lb/mbf	Methanol[2] lb/mbf	Formaldehyde[2] lb/mbf	Acetaldehyde lb/mbf	Propionaldehyde lb/mbf	Acrolein lb/mbf
Non-Resinous Softwood Species							
White Fir[3]	≤200	0.2107	0.1480	0.0034	0.0550	0.0018	0.0026
	>200	0.4956	0.4200	0.0163			
Western Hemlock	≤200	0.2921	0.1484	0.0016	0.1378	0.0018	0.0026
	>200	0.3661	0.2196	0.0044			
Western Red Cedar	≤200	0.2939	0.1484	0.0034	0.1378	0.0018	0.0026
	>200	0.5784	0.4200	0.0163			
Resinous Softwood Species (Non-Pine Family)							
Douglas Fir	≤200	0.1409	0.0690	0.0019	0.0682	0.0007	0.0011
	>200	0.1913	0.1170	0.0043			
Engelmann Spruce	≤200	0.0640	0.0250	0.0013	0.0360	0.0007	0.0010
	>200	0.1201	0.0780	0.0044			
Larch	≤200	0.1409	0.0690	0.0019	0.0682	0.0007	0.0011
	>200	0.1914	0.1170	0.0044			

Appendix A: HAP Emission Factors for Lumber Drying

Species	Max Kiln Temp[1] °F	Total HAP lb/mbf	Methanol[2] lb/mbf	Formaldehyde[2] lb/mbf	Acetaldehyde lb/mbf	Propionaldehyde lb/mbf	Acrolein lb/mbf
Resinous Softwood Species (Pine Family)							
Lodgepole Pine	≤200	0.1166	0.0628	0.0041	0.0420	0.0032	0.0045
	>200	0.1166	0.0628	0.0041			
Ponderosa Pine	≤200	0.1271	0.0740	0.0034	0.0420	0.0032	0.0045
	>200	0.2029	0.1440	0.0092			
Western White Pine	≤200	0.1271	0.0740	0.0034	0.0420	0.0032	0.0045
	>200	0.2029	0.1440	0.0092			

[1] Maximum kiln temperature reflects heated air entering load of lumber.

[2] Because methanol and formaldehyde emissions appear to be dependent upon drying temperature, separate values are calculated for low and high-temperature drying.

[3] White fir in this context refers to any one of several species of true fir grown in the West. The collection of timber commonly referred to as "white fir" includes the following species: white fir, grand fir, noble fir and subalpine fir.

Appendix B: HAP Emission Factors for Biomass Boiler

Hazardous Air Pollutants	Emission Factor lb/MMBtu
Antimony Compounds	7.90E-06
Arsenic Compounds (including arsine)	2.20E-05
Beryllium Compounds	1.10E-06
Cadmium Compounds	4.10E-06
Chromium Compounds (including hexavalent)	2.10E-05
Cobalt Compounds	6.50E-06
Lead Compounds (not elemental lead)	4.80E-05
Manganese Compounds	1.60E-03
Mercury Compounds	3.50E-06
Nickel Compounds	3.30E-05
Phosphorus	2.70E-05
Selenium Compounds	2.80E-06
Chlorine	7.90E-04
Hydrochloric acid (hydrogen chloride)	2.26E-03
Acetaldehyde	8.30E-04
Acetophenone	3.20E-09
Acrolein	4.00E-03
Benzene	4.20E-03
Bis(2-ethylhexyl)phthalate (DEHP)	4.70E-08
Carbon tetrachloride	4.50E-05
Chlorobenzene	3.30E-05
Chloroform	2.80E-05
Dibenzofurans	1.87E-09
2,4-Dinitrophenol	1.80E-07
Ethyl benzene	3.10E-05
Ethylene dichloride (1,2-Dichloroethane)	2.90E-05
Formaldehyde	4.40E-03
Methyl bromide (Bromomethane)	1.50E-05
Methyl chloride (Chloromethane)	2.30E-05
Methyl chloroform (1,1,1-trichloroethane)	3.10E-05
Methylene chloride (Dichloromethane)	2.90E-04
Naphthalene	9.70E-05
4-Nitrophenol	1.10E-07
Pentachlorophenol	5.10E-08

Appendix B: HAP Emission Factors for Biomass Boiler

Hazardous Air Pollutants	Emission Factor lb/MMBtu
Phenol	5.10E-05
Polychlorinated biphenyls (PCB)	8.15E-09
Polycyclic Organic Matter (POM)	1.27E-04
Propionaldehyde	6.10E-05
Propylene dichloride (1,2-Dichloropropane)	3.30E-05
Styrene	1.90E-03
2,3,7,8-Tetrachlorodibenzo-p-dioxin	8.60E-12
Tetrachloroethylene (Tetrachloroethene)	3.80E-05
Toluene	9.20E-04
Trichloroethylene (Trichloroethene)	3.00E-05
2,4,6-Trichlorophenol	2.20E-08
Vinyl chloride	1.80E-05
Xylenes (inlc isomers and mixtures)	2.50E-05

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Technical Support Document
Non-Title V Air Quality Operating Permit
Revision No. 1

Permit Writer: Dan Meyer

Warm Springs Forest Products Industries

Warm Springs, Oregon
Warm Springs Reservation

Purpose of Owner-Requested Non-Title V Operating Permit and Technical Support Document

Title 40 Code of Federal Regulations Section 49.139 establishes a permitting program to provide for the establishment of Federally-enforceable requirements for air pollution sources located within Indian reservations in Idaho, Oregon and Washington. The owner or operator of an air pollution source who wishes to obtain a Federally-enforceable limitation on the source's actual emissions or potential to emit must submit an application to the Regional Administrator requesting such limitation.

The United States Environmental Protection Agency (EPA) then develops the permit via a public process. The permit remains in effect until it is modified, revoked or terminated by EPA in writing.

This document, the Technical Support Document, fulfils the requirement of 40 CFR § 49.139(c)(3) by describing the proposed limitation and its effect on the actual emissions and/or potential to emit of the air pollution source. Unlike the air quality operating permit, this document is not legally enforceable. The permittee is obligated to follow the terms of the permit. Any errors or omissions in the summaries provided here do not excuse the permittee from the requirements of the permit.

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1. Purpose of This Technical Support Document

This technical support document (TSD) serves to describe the bases for the changes to permit conditions from the prior Non-Title V permit to operate issued on September 24, 2007. Consistent with Section 5.1 of the prior TSD, EPA is initiating this permit action to provide assurance that Warm Springs Forest Products Industries (WSFPI) is in compliance with Clean Air Act (CAA) requirements. Revisions to the prior permit will strengthen our position that the facility is an area (i.e. minor) source of hazardous air pollutants (HAP) and that the CAA's major source National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements therefore do not apply. This is being achieved by improving the practical enforceability of the prior permit's synthetic minor HAP emission limits. Minor revisions are also being made to the prior permit, and this TSD explains them all.

The legal and factual basis for the unchanged permit conditions remain as documented in the prior TSD issued on September 24, 2007.

The requirements created in Non-Title V operating permits are applicable requirements that must be incorporated into Title V operating permits. WSFPI was originally issued a Title V permit on May 4, 2005. EPA later revised that permit on October 10, 2008. The Title V permit expired on May 2, 2010, and although EPA proposed renewing it in August 2014, EPA did not take final action on that proposal. EPA is now proposing a new Title V permit that incorporates the requirements in the revised Non-Title V permit. EPA is revising the Non-Title V permit and renewing the Title V permit simultaneously.

2. EPA Authority to Issue Non-Title V Permits

On April 8, 2005 EPA adopted regulations (70 FR 18074) codified at 40 Code of Federal Regulations (CFR) Parts 9 and 49, establishing Federal Implementation Plans (FIPs) under the CAA for Indian reservations in Idaho, Oregon and Washington. The FIPs, commonly referred to as the Federal Air Rules for Reservations (FARR), put in place basic air quality regulations to protect health and welfare on Indian reservations located in the Pacific Northwest. 40 CFR § 49.139 creates a permitting program for establishing Federally-enforceable requirements for air pollution sources on Indian reservations. This FARR Non-Title V permit has been developed pursuant to 40 CFR § 49.139.

The requirements of 40 CFR § 49.158 pertaining to tribal NSR synthetic minor source permits do not prohibit EPA from revising Non-Title V permits.

3. Facility Information

3.1 Location

The WSFPI facility is located on the east side of Warm Springs, Oregon on the Warm Springs Reservation, bounded by Highway 26, the Deschutes River and Shitike Creek. The facility is located within the exterior boundaries of the 1855 Warm Springs Reservation and is in Indian Country as defined in 40 CFR Part 49, Subpart C.

3.2 Warm Springs Reservation

The WSFPI facility is located on the Warm Springs Reservation located in north central Oregon. The reservation was established by the Treaty of June 25, 1855 (12 Stat. 963), by which The Confederated Tribes of the Warm Springs Reservation of Oregon (Tribes) ceded to the United States their aboriginal title to approximately 10 million acres in north-central Oregon and reserved for their own use forever the Warm Springs Reservation. The reservation is considered to be Indian Country, as defined in 40 CFR Part 49, Subpart C.

The Tribes are a federally recognized Indian Tribe having a Constitution and By-laws and federal

Corporate Charter adopted pursuant to the Indian Reorganization Act of 1934. The Reservation is governed by an eleven-member Tribal Council consisting of the hereditary Chiefs of the three tribes comprising the Confederated Tribes and eight members elected from the three districts on the reservation, which represent traditional tribal areas.

Tribal Contact: Tim Outman
Tribal Air Quality Specialist
Tribal Environmental Quality Office
Natural Resources Bureau
The Confederated Tribes of the Warm Springs
Reservation of Oregon
P.O. Box C
Warm Springs, Oregon 97761-3001
Phone: 541.553.2016
Email: tim.outman@wstribes.org

3.3 Facility Description

The primary operation at the facility is the production of dimensional lumber from raw logs. The WSFPI facility has debarkers and saws, kilns for drying lumber, a planer, and a hog fuel fired boiler to supply steam to the kilns. The site comprises 34 acres and includes process areas, a log yard, shops, offices, open and covered storage, and warehouse areas. There are no chemical wood preservative or gluing operations. Logs are received and stored in the log yard. The process of cutting the logs into lumber includes debarking, sawing, chipping, kiln drying, planing, and packaging for shipping.

The byproducts of lumber manufacturing are sawdust, wood chips, planer shavings, and hog fuel. These byproducts may be burned in the hog fuel (wood-waste) boiler or stored in bins until the material is sold and transferred off-site. One hog fuel boiler is used to provide steam for the drying of rough green lumber in the drying kilns while also producing steam to produce electricity in three steam turbine-powered 3-megawatt capacity generators. The electricity produced is used on-site. It is not currently economical for WSFPI to generate electricity for sale, and capital improvements to the site would be necessary to supply electricity to the regional power supply grid.

The Non-Title V permit is being issued solely to WSFPI; a wholly owned business enterprise of the Tribes. WSFPI is both the sole owner and operator of the facility. WSFPI was not always the sole operator of the facility. Vanport International Inc. (Vanport) recently managed and operated the facility pursuant to a written agreement with WSFPI. That written agreement was terminated January 1, 2014, and written agreements entered into by the parties thereafter have not provided Vanport similar authority. This means that beginning January 1, 2014, Vanport no longer has any control over any operations at the facility. WSFPI is now solely responsible for complying with any CAA obligations applicable to the facility.

Another enterprise owned by the Tribes, Warm Springs Composite Products (WSCP), is co-located at the WSFPI plant site. WSCP manufactures “fireproof”-core (refractory) materials, fire-door components and door-jamb systems, and they perform pre-certification (fire) door testing. The manufacturing process at the WSCP facility is assigned to SIC code group 3272 (Concrete Products, Except Block and Brick) which is different from WSFPI’s 2421 primary SIC code. Although WSCP uses a fraction of the steam from the WSFPI boiler, no other materials are transferred between the facilities. WSFPI and WSCP are considered one source under CAA Section 112, i.e., EPA’s NESHAP or maximum achievable control technology “MACT” program for reducing HAP emissions from stationary sources. Because WSCP’s potential HAP emissions are estimated to be around 0.04 tons per year, that portion of the source is not considered further in this permitting action.

3.4 Emission Units and Emission Generating Activities

Emission units generating HAP emissions are listed by emission unit identification (EU ID) in Table 3-1 along with associated HAP-reducing air pollution control devices (APCD). None of the emission units vent through a stack shared with another emission unit. Capacities are listed based on the best information available from the applicant.

Table 3-1: HAP-Generating Emission Units and Associated HAP-Reducing APCD

EU ID	Emission Unit Description	Control Device[1]
PH 5	*Biomass Boiler*. Wellons Model No. NB234. Serial No. B2329-0503. Two-cell pile-burning design with automatic rotating grates and overfeed fuel delivery. Combustion air introduced below and above grates. Oxygen trim system. Heat input capacity 131 million Btu/hr (MMBtu/hr). Maximum steam production 80,000 lb/hr at 250 psig and 750ºF. Generates only superheated steam. Supplies steam to kilns (via desuperheater), to non-extractive steam turbine electric generating units and to WSCP (via desuperheater). Permit authorizing construction issued May 4, 2005. Startup December 27, 2005.	1. Wellons multiclone. Model No. W144. Serial No. B2329-1226. 2. Wellons electrostatic precipitator. Model No. 2W-092-1422. Serial No. B2320-2425. Part of original boiler installation.
KLN-N	*Nardi Lumber Drying Kilns*. Indirectly heated. Five single-track Nardi kilns (No.'s 1-5) installed 1997. Annual capacity of approximately 77 million board feet (mmbf) with each track contributing 15.37 mmbf.	None
KLN-W	*Wellons Lumber Drying Kilns*. Indirectly heated. Two double-track Wellons kilns (No's 6a – 7b) installed 2000. Annual capacity of approximately 61 mmbf with each track contributing 15.37 mmbf.	None

[1] Multiclone and electrostatic precipitator are not required to be employed by this permit.

HAP emissions generated by biomass combustion in a boiler and by lumber drying in a kiln have been measured through testing, and emission factors have been developed for each based upon heat input (MMBtu) and volume of lumber dried (mbf), respectively. See Appendices A and B of the permit for emission factors WSFPI is required to employ to determine actual emissions.

Activities at the facility other than those listed in Table 3-1 may potentially be generating HAP emissions. These other activities include, but are not limited to, the sawing, chipping and planing of wet or kiln-dried lumber along with the mechanical or pneumatic conveyance and subsequent storage and distribution of resultant wood residue. While methanol and other HAP may be evaporated from sawmill-produced wood residue at ambient temperatures, EPA is not aware of any organization having published associated HAP emission factors. Technical studies conducted by National Council for Air and Stream Improvement (NCASI) have quantified VOC emissions generated by sawmill-produced wood residue, but those studies did not evaluate HAP emissions. The facility employs no APCD to reduce HAP emissions, if any, from these activities.

An emission inventory generally reflects either the "actual" or "potential" emissions from a source. Actual emissions generally represent a specific period of time and are based on actual operation and controls. Potential emissions, referred to as potential to emit (PTE), generally represent the maximum capacity of a source to emit a pollutant under its physical and operational design, taking into consideration regulatory restrictions, but only required control devices. PTE is often used to determine applicability to several EPA programs, including Title V, PSD and CAA Section 112 MACT.

Emissions can be broken into two categories: point and fugitive. Fugitive emissions are those which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening. Examples of fugitive emissions are roads, piles that are not normally enclosed, wind blown dust from open areas, and those activities that are normally performed outside buildings. Point sources of emissions include any emissions that are not fugitive. Because the CAA and implementing MACT regulations require us to consider both point and fugitive emissions alike in calculating HAP emissions to determine whether a source is major, it is not necessary to distinguish point and fugitive emissions in this permitting action.

The equation below represents the general technique for estimating emissions (in tons per year or "tpy") from each emission unit at the facility. Emissions are calculated by multiplying an emission factor by an operational parameter. To estimate actual emission, the permittee will need to track the actual operational rates. Note that emission factors may be improved over time.

$$E = EF \times OP \times K$$

Where:

E = pollutant emissions in tpy
EF = emission factor (see Appendix A to this Statement of Basis)
OP = operational rate (or capacity for PTE)
K = 1 ton/2000 lbs for conversion from pounds per year to tpy

Given our current knowledge of emissions, EPA has documented the facility HAP PTE in an inventory presented in Appendix A. A summary of the facility's HAP PTE is presented in Table 3-2 below.

Table 3-2: Facility HAP Potential to Emit (tpy)

Pollutant	Emission Unit[1]			Total
	PH5	KLN-N	KLN-W	
Methanol	0	5.7	4.6	10.3
Acetaldehyde	0.5	5.3	4.2	10
Formaldehyde	2.5	0.1	0.1	2.8
Hydrochloric Acid	1.3	0	0	1.3
Acrolein	2.3	0.1	0.08	2.5
Benzene	2.4	0	0	2.4
Styrene	1.1	0	0	1.1
All other HAP	2.6	0.1	0.1	2.8
Total HAP	12.6	11.3	9.0	32.9
Considering emission limits appearing in the Non-Title V permit, HAP PTE is as follows:				
Any Individual HAP	9 tpy			
Total HAP	24 tpy			

[1] PH5 = biomass boiler, KLN-N = Nardi lumber drying kilns, KLN-W = Wellons lumber drying kilns.

The PTE estimates appearing in Table 3-2 (that do not consider the HAP emission limits appearing in the Non-Title V permit) assume all units operate 8760 hours per year. Except for HCl, PH5's potential emissions were calculated assuming emission factors appearing in Table 1.6-3 of AP-42 (September 2003) as documented in EPA Region 10's May 8, 2014 memorandum entitled, "HAP Potential to Emit

Emission Factors for Biomass Boilers Located in Pacific Northwest Indian Country."[1] For HCl, a PTE emission factor was derived assuming (a) a fuel chlorine concentration equal to the highest value observed by the facility over five-year period 2009 to 2013, and (b) a fuel-chlorine-to-exhaust-HCl conversion rate nearly twice the highest value observed for a couple of biomass boilers in Oregon. KLN-N and KLN-W HAP PTE was estimated by employing worst-case emission factors for drying lumber at less than or equal to 200°F derived from lab-scale testing conducted largely by Professor Mike Milota at Oregon State University.[2] For a derivation of emission factors employed to create lumber drying kiln PTE inventory, see document entitled, "EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, December 2012."[3]

4. Description of Permit Revision

4.1 Background

A major source is a collection of air pollutant emitting activities located within a contiguous area and under common control that emits or has the potential to emit 10 tpy or more of any single HAP or 25 tpy or more of any combination of HAP. Because WSFPI's potential HAP emissions would exceed major source thresholds in the absence of owner-requested emission limitations, EPA refers to the facility as a "synthetic minor" source. See Section 3.5 of this TSD for emission calculations of potential HAP emissions. The prior permit (that this one is replacing) limited WSFPI's HAP emissions to less than major source thresholds since its issuance on September 24, 2007.

If the facility were a major HAP source, it would be subject to the major source NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters codified at 40 CFR Part 63, subpart DDDDD and the major source NESHAP for activities processing Plywood and Composite Wood Products codified at 40 CFR Part 63, subpart DDDD. Because the facility was not a major source of HAP on subpart DDDD's first substantive compliance date of October 1, 2007, and because the facility continues to be an area source, it is not subject to MACT subpart DDDD. The first substantive compliance date for the major source boiler MACT is January 31, 2016.

4.2 Changes Related to Improving Practical Enforceability

As mentioned previously, EPA issued the prior permit in September 2007. The permit has not been revised until now. Since issuance of the original permit, EPA has become increasingly aware that the original permit can be improved with respect to the practical enforceability of its synthetic minor HAP emission limits. Because the emission limits are not accompanied by operational or production limits as is generally required by EPA guidance, it is imperative that the emission limits be enforceable as a practical matter.

A key EPA guidance document illustrating what it means to create a PTE limit that is enforceable as a practical matter is the June 13, 1989 memorandum entitled, "Guidance on Limiting Potential to Emit in New Source Permitting."[4] In general, emission limits in combination with operational or production limits are necessary to constrain a source's PTE. When operational or production limits are not practical due to unique characteristics of the source, PTE may be limited solely through emission limits. EPA's 2011 Shell Kulluk permitting action illustrates how to limit PTE in the absence of production or operational

[1] http://www.epa.gov/region10/pdf/air/technical/bbhappteef_memo.pdf
[2] In its September 25, 2014 comments on the draft permit, WSFPI requested EPA to limit the temperature inside the kilns to less than or equal to 200°F so that PTE calculations would reflect emissions resulting from drying at those relatively lower temperatures.
[3] http://www.epa.gov/region10/pdf/air/technical/ldkhapvocpteef_memo.pdf
[4] See http://www.epa.gov/ttn/atw/pte/june13_89.pdf

limits.[5] Both the 1989 guidance and the more recent Shell Kulluk permitting action were consulted in preparing this permitting action for WSFPI. In this permitting action, we are improving the prior permit's synthetic minor HAP emission limits by (a) specifying the emission units subject to the emission limits, and (b) specifying the operational or production parameters and accompanying emission factors to be employed in the monthly compliance demonstration. The permit's testing, monitoring and recordkeeping requirements are also being revised to specify and improve the information-gathering activity that must be performed to enable monthly calculations of actual emissions to demonstrate compliance with the 12-month rolling limits. EPA has chosen to revise the original WSFPI permit at this particular time to benefit from the efficiency gained with concurrently processing this permit revision with the renewal of the facility's Title V operating permit.

Permit Section 1 – General Conditions. While the language from the existing permit has not been changed, Condition 1.1 has been added to identify and describe in detail the facility's known HAP-emitting activities. Clear identification of these activities is a first step to creating limits that are enforceable as a practical matter. EPA is aware that there may be additional HAP-emitting activities at WSFPI, either existing or yet-to-be constructed, beyond those identified in Condition 1.1. This permit does not apply to them. As additional HAP-emitting activities are identified, it may become necessary to revise the permit to accommodate them if the facility wants to remain an area source.

Permit Section 2 – Emission Limits and Work Practice Requirements. The following language appears in the prior permit's Condition 2.1, "Monthly [total] HAP emissions (tons) shall be determined by multiplying appropriate emission factors (lb/unit) by the recorded monthly operation/production rates (units/month) and dividing by 2000 lb/ton." Similar language appears in Condition 2.2 of the prior permit except that Condition 2.2 applies to individual HAP rather than total HAP. This "catch all" methodology for determining emissions for unidentified HAP-emitting activities has not been carried forward into the new permit. Instead, the language has been revised and tailored to each emissions generating activity identified in Condition 1.1 of the new permit. The new language appears in Conditions 2.1.1 and 2.2.1 for boiler PH5, and in Conditions 2.1.2 and 2.2.2 for lumber drying kilns KLN-N and KLN-W.

For KLN-N and KLN-W, the permit specifies that the recorded monthly specie-specific and temperature-specific dry lumber production rates be multiplied by the corresponding specie-specific and temperature-specific emission factors appearing in Appendix A of the permit to determine HAP emissions. For PH5, the permit specifies that the recorded monthly heat input value be (a) multiplied by 0.0220 lb/MMBtu to determine total HAP, and (b) multiplied by individual emission factors appearing in Appendix B of the permit to determine individual HAP. The 0.0220 lb/MMBtu emission factor for total HAP is the summation of all factors appearing in Appendix B except for the dibenzofurans, naphthalene and 2,3,7,8-tetrachlorodibenzo-p-dioxin factors. Because each of these three HAP are also accounted for in the calculation of the HAP polycyclic organic matter "POM", their individual contributions for this calculation are discounted so as to avoid double-counting.

Permit Section 3 – Testing Requirements. This section of the new permit did not appear in the prior permit. Part of improving the permit to help assure that its HAP synthetic minor emission limits are enforceable as a practical matter includes creating a condition requiring the facility to determine PH5's unique fuel-heat-input-to-steam-output ratio "FHISOR" (MMBtu/mlb) so that fuel heat input, and by extension actual HAP emissions, can be tracked more accurately. Calculation of those emissions will now be based upon a boiler-specific conversion factor rather than one based on a methodology of the source's choosing.

[5] See details of EPA 2011 permitting of Shell Kulluk, including a March 30, 2012 Environmental Appeals Board order denying petitions for review, at http://yosemite.epa.gov/r10/airpage.nsf/permits/kullukap/

To determine PH5's FHISOR, the facility is required to use the methodology specified in the most recent version of EPA Region 10's "Procedure to Determine a Biomass Boiler's Fuel-Heat-Input-To-Steam-Output Ratio." The current May 8, 2014 version is available online.[6] The facility is directed to carry out the stack test and fuel sampling portion of the procedure over the course of at least three 60-minute runs while PH5 generates steam at or near the maximum temperature, pressure and mass flow rate observed over the most recent 12-month period. To learn about the resultant FHISOR's representativeness, the facility is required to measure and record the following information about boiler operating conditions during testing: species, moisture content and category of wood residue by-product combusted (including whether generated on-site or off) and steam pressure, temperature and mass flow rate. How the boiler is operated, including the fuel combusted, influences its FHISOR. Each valid stack test run and associated fuel sampling and analysis will yield a single FHISOR, and the arithmetic average of those values is the resultant FHISOR to be employed to calculate PH5 actual emissions across all operating conditions.

Permit Section 4 – Monitoring and Recordkeeping Requirements. Conditions 3.1 of the prior permit now appears as Condition 4.1 of the new permit without edification. Condition 3.1.1 of the prior permit has been expanded and tailored to each emissions generating activity identified in Condition 1.1 of the new permit. There is no longer a "catch all" monitoring and recordkeeping requirement to track unidentified HAP-emitting activities' operations and production.

Condition 4.2 requires the facility to determine monthly PH5 heat input by continuously tracking the boiler's steam production and multiplying the monthly total by PH5-specific FHISOR. The prior permit did not specifically require the permittee to do either. According to the company's July 28, 2014 six-month monitoring report, it appears that the facility is already employing a FHISOR of 1.52 MMBtu/mlb steam. Condition 4.2.2 requires the facility to employ a FHISOR of 1.52 MMBtu/mlb steam until testing to determine a new FHISOR is conducted pursuant to Condition 3. The 1.52 MMBtu/mlb steam value is based upon April 2010 PH5 stack testing and corresponding fuel sampling and analysis while PH5 was generating around 81,000 pounds of superheated steam at 240 psi and 690°F. The three-run average value is an average of the following values: 1.537, 1.445 and 1.557. Calculation of the run-specific values was carried out consistent with step no. 8 of EPA Region 10's May 8, 2014 "Procedure to Determine a Biomass Boiler's Fuel-Heat-Input-To-Steam-Output Ratio." The calculation to determine FHISOR is as follows:

$$\text{FHSIOR} = [(\text{exhaust flow})\ ((20.9 - \text{exhaust } O_2\%)/20.9) \times (60 \text{ min/hr})] \ / \ [(F_d) \times (\text{steam production})]$$

In using the above equation while employing data gathered for PH5 in April 2010, exhaust flow was in units of dry standard cubic feet per minute (dscf/min), F_d was in units of dscf/MMBtu, and steam production was in units of 1,000 lb steam per hour (mlb steam/hr).

Condition 4.3 requires the facility to monitor and record PH5's steam pressure (psig), steam temperature (°F) and mass flow rate (mlb/hr). This tracking was not previously specifically required. Steam production is necessary to determine monthly heat input, and by extension monthly PH5 emissions. By requiring the facility to monitor and record steam pressure and temperature hourly, the representativeness of FHISOR can be weighed with more detail. The EPA inspector can compare day-to-day boiler operations (reflected in these parameters for steam) to those experienced during the procedure to determine FHISOR.

Conditions 4.4 and 4.5 require the facility to monitor and record for each kiln charge its volume (bf), the species of lumber dried and the maximum dry bulb temperature (°F) of heated air entering the lumber stack. This tracking was not previously specifically required. Because lumber drying emissions vary by species and drying temperature, it is critical to monitor each. EPA understands that there may be other

[6] http://www.epa.gov/region10/pdf/air/technical/fhisor_memo.pdf

factors that influence lumber drying emissions, but we do not possess information enabling us to correlate emissions to those other parameters.

Appendix A – HAP Emission Factor for Lumber Drying. Although lumber drying emission factors appeared in the TSD to the prior 2007 permitting action, they did not previously appear in the permit. Now they do, but the factors themselves are different from the ones appearing in the 2007 TSD. EPA first presented the new emission factors to WSFPI in a February 8, 2013 letter to the company in which we requested WSFPI to begin employing the new factors on April 1, 2013. In the letter, EPA explains the difference between the new factors and those from 2007. EPA states,

> *While the emission factors continue to be based upon actual emission data measured while drying lumber in a lab-scale kiln, some important adjustments have been made. With these additions, we believe we have developed emission factors for all species of wood dried in lumber kilns on reservations in the Pacific Northwest. Second, eighteen more tests have been added to the database from which emission factors are calculated. Finally, we have refined our approach for developing emission factors; rather than using average values, we are using the 90th percentile value for specie-specific data sets with more than two data points and the maximum value for specie-specific data sets with two or fewer data points. This approach assures adequate conservatism to rely on the emission factors for applicability and compliance determinations. When compared to those used in 2007, most of the emission factors have increased. Most notably, the emission factor for methanol more than doubled for drying Douglas Fir and White Fir at high temperatures.*
>
> *For lumber kilns, the EPA plans to specify procedures and/or the recommended emission factors in future revised, renewed and issued permits that house synthetic minor limits. As before, the EPA will allow companies to test their own lumber to develop emission factors that apply to their specific operations. We are committed to ensuring that the best available emission factors are being used.*

As alluded to in the letter, EPA welcomes WSFPI to test their lumber and develop emission factors to replace any appearing in Appendix A. Before employing any newly-developed emission factor, the company would first need to apply to EPA for a revision to the permit. Before applying for a permit revision, EPA encourages WSFPI to coordinate with EPA to develop a test plan that identifies the procedure for determining the new emission factor along with the parameters to be monitored and recorded both during testing and thereafter. Establishing thresholds or ranges for emission-influencing factors (e.g. species of wood, maximum drying temperature, lumber dimensions, lumber moisture content, drying schedule, etc.) tracked during testing will enable us to determine under what operating conditions it is appropriate to employ the test-derived emission factor.

Appendix B – HAP Emission Factors for Biomass Boiler. Although biomass boiler emission factors appeared in the TSD to the prior permitting action, they did not previously appear in the permit. The factors are largely unchanged from the 2007 permitting action with a few exceptions. Appendix B of the new permit includes aggregated emission factors for each of the following groups of HAP: dibenzofurans, polychlorinated biphenyls (PCB) and polycyclic organic matter (POM). The 9 tpy synthetic minor emission limit applies to the sum of all compounds in each group combined, and not just to the individual compounds separately. Therefore, we created a single emission factor each for dibenzofurans, PCB and POM. While the HCl emission factor in the 2007 TSD is rooted in AP-42, the HCl emission factor in Appendix B of the new permit is not. See discussion in Section 4.3 of this TSD for basis of new HCl emission factor.

EPA welcomes WSFPI to test their boiler and develop emission factors to replace any appearing in Appendix B of the permit. Before employing any newly-developed emission factor, the company would

first need to apply to EPA for a revision to the permit. EPA encourages WSFPI to coordinate with EPA in the development of an application.

4.3 Other Changes

Permit Cover Page. The EPA mailing address has been updated to reflect "Suite 900" as part of the address. The zip code extension of "3140" has been added. The latitude "44.765 N" and longitude "121.236 W" listed for the physical location of the facility has been revised based upon new information presented in the company's October 16, 2009 Title V renewal application. The text, "Revision No. 1" has been added to the existing title. The name and details for the facility contact have been updated to reflect the new person responsible for the facility's compliance with the permit. The name of the EPA official signing the permit "Kate Kelly" has been updated to reflect the replacement of the prior EPA official "Richard Albright" who held the same position. The upper right-hand corner of the cover page lists the new permit number (R10NT500401) and the permit that this revision replaces. Non-Title V permit numbers are created as follows:

"R10" denotes the permit is being issued by Region 10 of EPA
"NT5" denotes that this is a Non-Title V permit
"004" denotes that the original permit was the fourth Non-Title V permit issued by EPA
"01" denotes that this is the first revision to this permit

Permit Table of Contents. A table of contents page was added to underscore the existence of appendices listing emission factors.

Permit Section 2 – Emission Limits and Work Practice Requirements. In Conditions 2.1 and 2.2, the word "average" has been removed. The word was confusing the fact that the emissions limits are in fact emissions totals, not averages.

Conditions 2.1.1 and 2.2.1 of the prior permit have been removed. The identical conditions were related to the selection of a hydrogen chloride (HCl) emission factor (based upon most recent quarterly fuel sampling results) to calculate biomass boiler PH5 emissions in the context of the two HAP synthetic minor emission limits; one to limit HAPs individually to less than 9 tpy, and the other to limit HAPs in aggregate to less than 24 tpy. Both conditions stated,

> *Hydrogen chloride emission factors shall be based on the most recent fuel sampling results. Prior to the first fuel analyses being conducted, the permittee shall use the hydrogen chloride emission factors in Section 4.3.3 of the technical support document*.

This permit language fails to specify how the permittee is to account for the fact that only a portion of the fuel chlorine is exhausted as HCl in determining an emission factor. If EPA were to continue requiring fuel sampling and analysis, EPA would also need to specify how to determine an emission factor given the inherent capture of fuel chlorine in the boiler's bottom and fly ash.

Rather than continue requiring the facility to determine a new HCl emission factor each quarter based upon new fuel sampling and analysis results, EPA has decided to specify a single HCl emission factor based upon worst-case chlorine concentration in the fuel and worst-case conversion of fuel chlorine to hydrogen chloride in the boiler exhaust. Condition 2.1.1 of the new permit references a total HAP emission factor of 0.0220 lb/MMBtu, of which a contribution of 0.00226 lb/MMBtu (i.e. 10%) comes from HCl. Condition 2.2.1 of the new permit references the HAP emission factors appearing in Appendix B of the permit, and the HCl emission factor appearing in Appendix B is again 2.26×10^{-3} lb/MMBtu. The 2.26×10^{-3} lb/MMBtu HCl emission factor is derived as follows:

$$\text{HCl EF} = (\%\text{wt Cl}/100)\ (\text{MW HCl}/\text{MW Cl})\ (1/\text{HHV})\ (1\times10^{6}\ \text{Btu}/\text{MMBtu})\ (\%\text{wt Cl} \rightarrow \text{HCl}/100)$$

where:

%wt Cl = 0.01269%; percent by weight of chlorine in biomass on a dry basis. Value is the maximum 12-month average concentration of chlorine observed (quarterly frequency) in biomass combusted at the facility over the last five years. See page A-4 of Appendix A to this TSD for basis for selection of this value. Value equal to 126.9 ppm (dry) or 126.9 mg/kg (dry).

MW HCl = 36.46 lb/lb-mol; molecular weight of hydrogen chloride

MW Cl = 35.453 lb/lb-mol; molecular weight of chlorine

HHV = 8,667 Btu/lb; HHV wood = (5200/(1-0.4)). See page A-5 of Appendix A to AP-42, September 1985. (HHV wood < HHV bark)

%wt Cl→ HCl = 15%; percentage by weight chlorine in biomass exhausted from stack as hydrogen chloride. Value is approximately two times the highest value observed for analyses performed on the biomass and exhaust of two boilers not employing wet scrubber. See page A-4 of Appendix A to this TSD for basis for selection of this value. EPA is not aware of any other data quantifying the conversion rate of fuel chlorine to hydrogen chloride in the exhaust of a biomass boiler not employing wet scrubber.

For comparison, the permit's 2.26 x 10^{-3} lb/MMBtu HCl emission factor for boiler PH5 is nearly one and one-half times greater than the mean emission factor of 1.61 x 10^{-3} lb/MMBtu for biomass boilers appearing in NCASI's February 2010 technical bulletin 973 entitled, "Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources – A Second Update." The NCASI value is based upon testing of seven biomass boilers not employing wet scrubbers. The PH5 emission factor is nearly eight and one-half times less than the emission factor of 1.9 x 10^{-2} lb/MMBtu for biomass boilers appearing in Table 1.6-3 of EPA's AP-42 (September 2003). The AP-42 value is based upon the same data that NCASI considered except that EPA considered an additional eighth value that NCASI identified as an outlier and disqualified from further consideration. See page 169 of NCASI Technical Bulletin 973 for further discussion.

Permit Section 4 – Monitoring and Recordkeeping Requirements. Conditions 3.2 and 3.3 of the prior permit required the facility to sample and analyze wood fuel at least quarterly to determine an HCl emission factor for PH5. EPA is no longer requiring the facility to sample and analyze wood fuel to determine an HCl emission factor for PH5. EPA is specifying the use of a single HCl emission factor that appears in Appendix B of the permit. See discussion above with respect to how the HCl emission factor of 2.26 x 10^{-3} lb/MMBtu was derived.

Permit Section 5 – Reporting Requirements. Conditions 4.1 and 4.2 of the prior permit now appear as Conditions 5.1 and 5.1.1 of the new permit without edification.

5. Other Federal Requirements

EPA Trust Responsibility. As part of the EPA Region 10's direct federal implementation and oversight responsibilities, EPA Region 10 has a trust responsibility to each of the 271 federally recognized Indian tribes within the Pacific Northwest and Alaska. The trust responsibility stems from various legal authorities including the U.S. Constitution, Treaties, statutes, executive orders, historical relations with Indian tribes, and in this case the Treaty with the Middle Oregon Tribes, November 15, 1865. In general terms, EPA is charged with considering the interest of tribes in planning and decision making processes. Each office within EPA is mandated to establish procedures for regular and meaningful consultation and collaboration with Indian tribal governments in the development of EPA decisions that have tribal implications. EPA Region 10's Office of Air, Waste and Toxics has contacted the Warm Springs Tribe to invite consultation on revisions to the WSFPI Non-Title V operating permit.

Endangered Species Act. EPA is obligated to consider the impact that a federal project may have on listed species or critical habitats. Based on the fact that the permit contains a voluntarily-requested emission

limit, it is EPA's conclusion that the issuance of this permit will not affect a listed species or critical habitat. Therefore, no additional requirements will be added to this permit for Endangered Species Act (ESA) reasons. EPA's 'no effect' determination concludes EPA's obligations under Section 7 of the ESA.[7]

National Environmental Policy Act. Under Section 793(c) of the Energy Supply and Environmental Coordination Act of 1974, no action taken under the CAA shall be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969 (NEPA). This permit is an action taken under regulations implementing the CAA and is therefore exempt from NEPA.

National Historic Preservation Act. This project involves establishing a limit on emissions. No part of the facility will be physically altered directly as a result of this permit. Consequently, no adverse effects are expected and no further review is necessary.

Environmental Justice Executive Order. Under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed on February 11, 1994, EPA is directed, to the greatest extent practicable and permitted by law, to make achieving environmental justice (EJ) part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies. Meaningful involvement means that people have an opportunity to participate in decisions about activities that may affect their environment and/or health; the public's contribution can influence the regulatory agency's decision; their concerns will be considered in the decision making process; and the decision makers seek out and facilitate the involvement of those potentially affected. EPA's goal is to provide an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work.

EPA solicited public input prior to final decision-making consistent with the FARR's Rule for Non-Title V Operating Permits – 40 CFR § 49.139. See Section 7.2 of this TSD for further details. EPA provided notice of proposed action in the weekly Madras Pioneer newspaper and the biweekly Spilyay Tymoo tribal newspaper. EPA made relevant information (draft permit and support materials, including this TSD) readily available at the local Warm Springs Tribe Management Office (Info Desk), Jefferson County Library and on our website at http://yosemite.epa.gov/R10/homepage.nsf/information/r10pn.

This final permit action does not authorize WSFPI to generate new or additional HAP emissions, and by extension does not authorize new HAP impacts. EPA has no information to suggest that issuance of this Non-Title V operating permit will result in a disproportionately high and adverse human health or environmental effect upon minority populations and low-income populations.

6. Permit Content

The permit includes HAP emission limits that reduce the facility's potential and actual emissions to less than major source thresholds. Accompanying the HAP synthetic minor limits are emission factors that must be employed to calculate emissions and determine compliance. The permit also includes testing,

[7] See Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act, FWS and NMFS, March 1998, at Figure 3-1.

monitoring, recordkeeping and reporting requirements necessary to assure compliance with each limit. Each section of the permit is discussed below. The permit is organized into five sections as follows:

Permit Section 1: General Conditions. This section of the permit identifies HAP-emitting activities and carries forward from the prior permit conditions of a general nature that apply to the facility.

Permit Section 2: Emission Limits and Work Practice Requirements. This section of the permit contains two HAP synthetic minor emission limits along with emission-unit-specific procedures for calculating emissions monthly to determine compliance with the 12-month rolling limit. To determine monthly lumber drying emissions, one must multiply volume of lumber dried (by species and maximum drying temperature) by emission factors appearing in Appendix A of the permit. To determine monthly biomass boiler emissions, one must multiply heat input (based upon measured steam generation rate at test-derived FHISOR) by emission factors appearing in Appendix B of the permit. Condition 2.3, created in response to comments received during the public comment period, prohibits the temperature in the kilns from exceeding 200°F. This condition does not limit HAP emissions to less than major source thresholds. Although temperature in the kilns shall not exceed 200°F, emission factors for both low (≤ 200 °F) and high-temperature (>200°F) drying appear in Appendix A in the event drying temperature exceeds 200°F. Compliance with the synthetic minor limits is determined by calculating actual emissions that are based upon emission factors representative of actual temperatures observed.

Permit Condition 3: Testing Requirements. This permit section contains requirements to determine and record PH5's "FHISOR" (MMBtu/mlb) using the methodology specified in the most recent version of EPA Region 10's "Procedure to Determine a Biomass Boiler's Fuel-Heat-Input-To-Steam-Output Ratio." In addition to the requirement to determine FHISOR within 120 days of permit issuance, FHSIOR shall also be determined thereafter each time the company otherwise conducts EPA Reference Method 2 testing for any reason. The accompanying Title V permit requires Method 2 testing for determination of NO_X and VOC emission factors employed to calculate actual emissions to determine compliance with PSD-avoidance emission limits. The testing is to be carried out while PH5 is operating at or near the maximum rate observed during the twelve months preceding the test.

Permit Condition 4: Monitoring and Recordkeeping Requirements. This permit section contains emission unit-specific requirements to calculate and record the monthly and rolling 12-month HAP emissions generated by HAP-emitting activities. This section contains requirements to track certain aspects of HAP-emitting activities so that the emission factors appearing in Appendices A and B of the permit can be employed to calculate actual emissions. Records of emission calculations and parameters used to calculate emissions shall be maintained for at least five years.

In addition to tracking steam mass flow rate, steam pressure and temperature are also required to be tracked so as to create a record which can be reviewed to judge the representativeness of FHISOR in day-to-day operations. This record can be reviewed to determine the conditions under which to conduct testing to determine FHISOR in the future.

Permit Section 5: Reporting Requirements. This permit section requires the facility to annually submit to EPA a record of the twelve monthly 12-month emissions calculations. For ease in coordinating submittals, this report is required to be submitted concurrently with the annual FARR registration submittal. As specified in 40 CFR § 49.138(f), the annual FARR registration submittal must be submitted with the annual emission report and fee calculation required by 40 CFR Part 71. This annual report must include details on how the emissions were calculated as well as identifying the sources for various data elements.

7. Permit Procedures

7.1 Permit Revision, Termination and Reissuance

The facility may request EPA to revise the conditions of this permit by submitting an application that contains the information specified in 40 CFR § 49.139(d). EPA will revise the permit using the same procedures that apply to initial permit issuance.

If the facility wishes to terminate the permit, a written request must be submitted to EPA explaining the reasons for the request and, if necessary for continued operation, submitting applications for any CAA permits or approvals that the facility avoided by establishment of the limits contained in this permit.

This permit may be terminated, revised, or revoked and reissued by EPA for cause. Cause exists to terminate, revise, or revoke and reissue this permit under the following circumstances:

1. This permit contains a material mistake;
2. Inaccurate statements were made in establishing the terms or conditions of this permit;
3. The facility fails to comply with any condition of this permit; or
4. This permit must be terminated, revised, or reopened and reissued to assure compliance with CAA requirements.

EPA will use the same proceedings to terminate, revise, or revoke and reissue a permit for cause as for initial permit issuance. Before initiating proceedings to terminate, revise, or revoke and reissue a permit, EPA will provide WSFPI at least 30 days' advance written notice of EPA's intent to terminate, revise, or revoke and reissue the permit, except that EPA may provide a shorter notice period in the case of an emergency.

7.2 Public Notice and Comment

As required under 40 CFR § 49.139(c), all draft owner-requested operating permits must be publicly noticed and made available for public comment. For this permit action, the requirements of 40 CFR § 49.139(c)(5) have been satisfied as follows:

1. Make available for public inspection, in at least one location in the area affected by the air pollution source, a copy of the draft operating permit prepared by EPA, the TSD for the draft permit, the application, and all supporting materials (see 40 CFR § 49.139(c)(5)(i)). From August 27, 2014 through September 25, 2014, a copy of the public notice, draft permit, the TSD and relevant supporting materials were made available at the Region 10 office in Seattle, Washington and at the locations listed below:

   Management Office (Info Desk)
   The Confederated Tribes of the Warm Springs Reservation of Oregon
   1233 Veterans Street
   Warm Springs, Oregon 97761

   Jefferson County Library
   241 SE 7th Street
   Madras, Oregon 97741

2. Publish public notice for this draft permit, by prominent advertisement in a newspaper of general circulation in the area affected by this source, of the availability of the draft permit to operate and supporting materials and of the opportunity to comment. Where possible, notices will also be made in the Tribal newspaper (see 40 CFR § 49.139(c)(5)(ii)). Publication was provided in the weekly Madras Pioneer newspaper on Wednesday August 27, 2014 and in the biweekly Spilyay Tymoo tribal newspaper on Friday August 29, 2014.

3. Provide copies of the notice to the owner or operator of the air pollution source, the Tribal governing body, and the Tribal, State and local air pollution authorities having jurisdiction in

areas outside of the Indian reservation potentially impacted by the air pollution source (see 40 CFR § 49.139(c)(5)(iii)). Notice was provided to WSFPI, Warms Springs Tribal Council, Warm Springs Tribal Environmental Quality Office, Lane Regional Air Pollution Agency and Oregon Department of Environmental Quality.

4. Provide for a 30-day period for submittal of public comments, starting upon the date of publication of the notice. If requested, the Regional Administrator may hold a public hearing and/or extend the public comment period for up to an additional 30 days (see 40 CFR § 49.139(c)(5)(iv)). A 30-day public comment period was provided from August 27, 2014 (date of publication in the Madras Pioneer) to September 25, 2014.

7.3 Response to Public Comments and Permit Issuance

The public comment period for this permit ran from August 27, 2014 to September 25, 2014. EPA received comments from TSS Consultants. As required in 40 CFR § 49.139(c)(6), EPA has considered the comments and has developed a response to each. The comments are summarized below along with a response that explains whether any change to the permit resulted and the reason why a change was or was not made. There was no public hearing requested or held. As required in 40 CFR § 49.139(c)(7), EPA will provide the final permit and TSD to the owner or operator of the air pollution source and each person who has submitted comments on the draft permit. The final permit and TSD are also being made available for 30 days at all of the locations where the draft permit was made available.

Comments from TSS Consultants Submitted September 25, 2014

1. Permit Condition 3.1 (Condition 4.14 of Title V permit No. R10T5010100) – Fuel Heat Input to Steam Output Ratio (FHISOR). The commenter states:

> *The subject permit instructs WSFPI to use the May 8, 2014 guidance document entitled "Procedure to Determine a Biomass Boiler's Fuel-Heat-Input-To-Steam-Output", to which WSFPI will comply. WSFPI does not have any comments on the appropriateness of the methodology presented in the May 8, 2014 version of the procedure but would like EPA to clarify the Statement of Basis to more accurately reflect the regulatory status of the procedure.*
>
> EPA Response – The May 8, 2014 EPA Region 10 technical memorandum entitled, "Procedure to Determine a Biomass Boiler's Fuel-Heat-Input-To-Steam-Output Ratio" is not a rule. It is not a proposed rule. It is a document that reflects our current thinking of how to determine a biomass boiler's FHISOR for the purpose of translating measured steam output into heat input for the purpose of conducting emission calculations. EPA most recently required a facility's use of it in a July 30, 2014 Title V permit issued to Empire Lumber Company for its planer mill on the Nez Perce Reservation. While EPA intends to continue to prescribe the procedure's use here and in future Title V permits, we do not intend to codify the procedure into the Code of Federal Regulations. The WSFPI Title V and non-Title V permits require you to follow the procedures outlined in the most recent version of the memorandum. Right now, the May 8, 2014 version is the one and only. The procedure can be accessed online at http://www.epa.gov/region10/pdf/air/technical/fhisor_memo.pdf

2. Permit Section 2 (Sections 6 and 7 of Title V permit No. R10T5010100) and TSD Appendix A (SOB Appendix A for Title V permit No. R10T5010100) – Request to Limit Temperature in Kilns. The commenter states:

> *In Appendix A, the Potential to Emit (PTE) for the Hazardous Air Pollutants emission factors for the kilns appear to be those for factors where the kilns exceed 200 degrees. As has been stated the WSFPI kilns will not exceed 200 degrees, so we propose that the < 200 degrees applicable HAPs emission factors be used in the PTE inventory. We request the inclusion of a permit condition in*

the non-Title V permit to prohibit the operation of the kilns above 200 F, as demonstrated by the use of a temperature recording system.

EPA Response – EPA has created Permit Condition 2.3 as follows, "The maximum one-hour block average dry bulb temperature (ºF) of heated air entering each lumber stack within KLN-N and KLN-W as determined pursuant to Condition 4.5 shall not exceed 200°F." Creation of this permit condition does not result in the facility's potential HAP emissions becoming less than the major source thresholds as illustrated in Table 3-2 above. Permit Conditions 2.1 and 2.2 reduce the facility's HAP PTE to less than major source thresholds. EPA has amended Table 3-2 along with KLN-N and KLN-W HAP PTE calculations in TSD Appendix A to reflect operating restriction imposed by Permit Condition 2.3.

Comment from TSS Consultants Submitted September 26, 2014[8]

3. First Page of the Permit – Responsible Official. The commenter indicates that the title of the WSFPI official responsible for compliance has changed to "Chief Executive Officer."

EPA Response – EPA has amended the permit to reflect the change.

8. Changes to Permit

EPA has made two changes to the permit in response to public comments as detailed below. Underlined text has been added, and ~~strikethrough~~ text has been deleted.

1. First page of the permit.

***

Person Responsible for Compliance: John Katchia Jr., ~~General Manager~~ Chief Executive Officer
Warm Springs Forest Products Industries

***

2. Condition 2.3 of the permit.

2.3 The maximum one-hour block average dry bulb temperature (ºF) of heated air entering each lumber stack within KLN-N and KLN-W as determined pursuant to Condition 4.5 shall not exceed 200°F.

9. Abbreviations and Acronyms

AFS	Air Facility System
ASTM	American Society for Testing and Materials
AWT	EPA Region 10 Office of Air, Waste and Toxics
CAA	Clean Air Act
CFR	Code of Federal Regulations
EF	emission factor
EJ	Environmental Justice
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FARR	Federal Air Rules for Reservations
FHISOR	fuel-heat-input-to-steam-output ratio
FWS	United States Fish and Wildlife Service

[8] Although EPA is not obligated to consider this comment as it was received after the close of the public comment period, EPA has chosen to accept it.

FR	Federal Register
gal	gallon
HAP	hazardous air pollutant
HCl	hydrogen chloride
ICIB/PH	Industrial, Commercial, and Institutional Boilers and Process Heaters
lb	pound
MACT	Maximum Achievable Control Technology
mmbf/yr	million board feet per year
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants (Title 40 CFR Parts 61 and 63)
NMFS	United States National Marine Fisheries Services
NSR	New Source Review
NT5	Non-Title V
ODEQ	Oregon Department of Environmental Quality
OSU	Oregon State University
ppm	parts per million
PCWP	Plywood and Composite Wood Products
$PM_{2.5}$	fine particulate matter with aerodynamic diameter less than 2.5 microns
POM	polycyclic organic matter
PSD	prevention of significant deterioration
PTE	potential to emit
T	temperature
TSD	Technical Support Document
tpy	tons per year

Appendix A

EPA Estimation of Warm Springs Forest Products Industries Potential Hazardous Air Pollutant Emissions

Technical Support Document
Non-Title V Air Quality Operating Permit
R10NT500401

Warm Springs, Oregon

Appendix A: Potential Emissions Inventory

Summary of Facility HAP Potential to Emit

Potential to Emit, (tons per year)

Hazardous Air Pollutants	PH5 Wellons Boiler	KLN-N Nardi Lumber Drying Kilns	KLN-W Wellons Lumber Drying Kilns	Single HAP Plantwide Totals
Trace Metal Compounds				
Antimony Compounds	4.53E-03			4.5E-03
Arsenic Compounds (including arsine)	1.26E-02			1.3E-02
Beryllium Compounds	6.31E-04			6.3E-04
Cadmium Compounds	2.35E-03			2.4E-03
Chromium Compounds (including hexavalent)	1.20E-02			1.2E-02
Cobalt Compounds	3.73E-03			3.7E-03
Lead Compounds (not elemental lead)	2.75E-02			2.8E-02
Manganese Compounds	9.18E-01			9.2E-01
Mercury Compounds[2]	2.01E-03			2.0E-03
Nickel Compounds	1.89E-02			1.9E-02
Phophorus	1.55E-02			1.5E-02
Selenium Compounds	1.61E-03			1.6E-03
Other Inorganic Compounds				
Chlorine	4.53E-01			4.5E-01
Hydrochloric acid (hydrogen chloride)	1.30E+00			1.3E+00
Organic Compounds				
Acetaldehyde	4.76E-01	5.29E+00	4.24E+00	1.0E+01
Acetophenone	1.84E-06			1.8E-06
Acrolein	2.30E+00	9.99E-02	7.99E-02	2.5E+00
Benzene	2.41E+00			2.4E+00
Bis(2-ethylhexyl)phthalate (DEHP)	2.70E-05			2.7E-05
Carbon tetrachloride	2.58E-02			2.6E-02
Chlorobenzene	1.89E-02			1.9E-02
Chloroform	1.61E-02			1.6E-02
Dibenzofurans[1]	1.07E-06			1.1E-06
2,4-Dinitrophenol	1.03E-04			1.0E-04
Ethyl benzene	1.78E-02			1.8E-02
Ethylene dichloride (1,2-Dichloroethane)	1.66E-02			1.7E-02
Formaldehyde	2.52E+00	1.31E-01	1.05E-01	2.8E+00
Methanol		5.70E+00	4.56E+00	1.0E+01
Methyl bromide (Bromomethane)	8.61E-03			8.6E-03
Methyl chloride (Chloromethane)	1.32E-02			1.3E-02
Methyl chloroform (1,1,1-trichloroethane)	1.78E-02			1.8E-02
Methylene chloride (Dichloromethane)	1.66E-01			1.7E-01
Naphthalene[1]	5.57E-02			5.6E-02
4-Nitrophenol	6.31E-05			6.3E-05
Pentachlorophenol	2.93E-05			2.9E-05
Phenol	2.93E-02			2.9E-02
Polychlorinated biphenyls (PCB)	4.55E-06			4.5E-06
Polycyclic Organic Matter (POM)	7.27E-02			7.3E-02
Propionaldehyde	3.50E-02	6.92E-02	5.53E-02	1.6E-01
Propylene dichloride (1,2-Dichloropropane)	1.89E-02			1.9E-02
Styrene	1.09E+00			1.1E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin[1]	4.93E-09			4.9E-09
Tetrachloroethylene (tetrachloroethene)	2.18E-02			2.2E-02
Toluene	5.28E-01			5.3E-01
Trichloroethylene (Trichloroethene)	1.72E-02			1.7E-02
2,4,6-Trichlorophenol	1.26E-05			1.3E-05
Vinyl chloride	1.03E-02			1.0E-02
Xylenes (inlc isomers and mixtures)	1.43E-02			1.4E-02
TOTAL[2]	12.6	11.3	9.0	

Predicted Highest Plantwide Single HAP	~~10.3~~	tons per year, methanol
Predicted Plantwide HAP Total	~~32.9~~	tons per year, based on summing estimates
Highest Plantwide Single HAP PTE	9	tons per year, based on emission limit in FARR Non-Title V permit R1
Plantwide HAP PTE	24	tons per year, based on emission limit in FARR Non-Title V permit R1

[1] designates a HAP that is subject individually to the 10 tpy major source threshold, but that is also one of several polycyclic organic matter (POM) compounds that, in aggregate, are subject to the same 10 tpy major source threshold.

[2] Because dibenzofurans, naphthalene and 2,3,7,8-Tetrachlorodibenzo-p-dioxin (one of several dibenzodioxins) are accounted for individually and in the calculation of POM EF, their individual contribution here is discounted so as to avoid double-counting.

Potential to Emit

Emission Unit: **PH5**
Description: Wellons Boiler. Model Number NB234. Serial Number B2329-0503.
Two-cell pile-burning design with automatic rotating grates. Overfeed fuel delivery.
Combustion air introduced below grates and also above grates at 2 separate heights.
See combustor cell system at http://www.wellons.ca/energycombustors.html
Maximum Steam Production: 80,000 lb/hr at 250 psig and 750°F
Particulate Matter Control Device: Multiclones and electrostatic precipitator (not required by this non-Title V permit)
Fuel: Biomass (hog fuel, wood residue or purchased forest slash)
Commence Construction: After 06/09/84 but before 02/28/05. NSPS Subpart Db and PM limit applicability.
Startup: 12/27/2005
Design Maximum Heat Input Capcity: 131 MMBtu/hr
Operation: 8760 hours per year

Potential to Emit, (tons per year)

Hazardous Air Pollutants	EF (lb/MMBtu)	PTE (tpy)
Trace Metal Compounds		
Antimony Compounds	7.90E-06	4.53E-03
Arsenic Compounds (including arsine)	2.20E-05	1.26E-02
Beryllium Compounds	1.10E-06	6.31E-04
Cadmium Compounds	4.10E-06	2.35E-03
Chromium Compounds (including hexavalent)	2.10E-05	1.20E-02
Cobalt Compounds	6.50E-06	3.73E-03
Lead Compounds (not elemental lead)	4.80E-05	2.75E-02
Manganese Compounds	1.60E-03	9.18E-01
Mercury Compounds	3.50E-06	2.01E-03
Nickel Compounds	3.30E-05	1.89E-02
Phophorus	2.70E-05	1.55E-02
Selenium Compounds	2.80E-06	1.61E-03
Other Inorganic Compounds		
Chlorine	7.90E-04	4.53E-01
Hydrochloric acid (hydrogen chloride)	2.26E-03	1.30E+00
Organic Compounds		
Acetaldehyde	8.30E-04	4.76E-01
Acetophenone	3.20E-09	1.84E-06
Acrolein	4.00E-03	2.30E+00
Benzene	4.20E-03	2.41E+00
Bis(2-ethylhexyl)phthalate (DEHP)	4.70E-08	2.70E-05
Carbon tetrachloride	4.50E-05	2.58E-02
Chlorobenzene	3.30E-05	1.89E-02
Chloroform	2.80E-05	1.61E-02
Dibenzofurans[1]	1.87E-09	1.07E-06
2,4-Dinitrophenol	1.80E-07	1.03E-04
Ethyl benzene	3.10E-05	1.78E-02
Ethylene dichloride (1,2-Dichloroethane)	2.90E-05	1.66E-02
Formaldehyde	4.40E-03	2.52E+00
Methyl bromide (Bromomethane)	1.50E-05	8.61E-03
Methyl chloride (Chloromethane)	2.30E-05	1.32E-02
Methyl chloroform (1,1,1-trichloroethane)	3.10E-05	1.78E-02
Methylene chloride (Dichloromethane)	2.90E-04	1.66E-01
Naphthalene[1]	9.70E-05	5.57E-02
4-Nitrophenol	1.10E-07	6.31E-05
Pentachlorophenol	5.10E-08	2.93E-05
Phenol	5.10E-05	2.93E-02
Polychlorinated biphenyls (PCB)	7.93E-09	4.55E-06
Polycyclic Organic Matter (POM)	1.27E-04	7.27E-02
Propionaldehyde	6.10E-05	3.50E-02
Propylene dichloride (1,2-Dichloropropane)	3.30E-05	1.89E-02
Styrene	1.90E-03	1.09E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin[1]	8.60E-12	4.93E-09
Tetrachloroethylene (tetrachloroethene)	3.80E-05	2.18E-02
Toluene	9.20E-04	5.28E-01
Trichloroethylene (Trichloroethene)	3.00E-05	1.72E-02
2,4,6-Trichlorophenol	2.20E-08	1.26E-05
Vinyl chloride	1.80E-05	1.03E-02
Xylenes (inlc isomers and mixtures)	2.50E-05	1.43E-02
TOTAL[2]	2.20E-02	12.6

[1] designates a HAP that is subject individually to the 10 tpy major source threshold, but that is also one of several polycyclic organic matter (POM) compounds that, in aggregate, are subject to the same 10 tpy major source threshold.

[2] Because dibenzofurans, naphthalene and 2,3,7,8-Tetrachlorodibenzo-p-dioxin (one of several dibenzodioxins) are accounted for individually and in the calculation of POM EF, their individual contribution here is discounted so as to avoid double-counting

EF Reference: HAP Potential to Emit Emission Factors for Biomass Boilers Located in Pacific Northwest Indian Country, EPA Region 10, May 8, 2014. Because the boiler is not subject to NESHAP DDDDD, employ default AP-42 emission factors for all pollutants except for HCl. The HCl emission factor is determined as follows:

Appendix A: Potential Emissions Inventory

PH5 HCl EF = (% wt Cl / 100) X (MW HCl / MW Cl) X (1 / HHV) X ($1x10^6$ Btu / MMBtu) X (% Cl → HCl / 100)

PH5 HCl EF = 0.00226 lb/MMBtu

Values for Parameters in Equation

% wt Cl:	0.01269	% dry, highest 12-month average concentration based on WSFPI fuel sampling and analysis conducted 2008 to 2013
MW HCl:	36.46	lb/lb-mol (constant)
MW Cl:	35.453	lb/lb-mol (constant)
High Heating Value:	8667	Btu/lb, HHV wood = (5200/(1-0.4)). See page A-5 of Appendix A to AP-42, September 1985. (HHV wood < HHV bark)
Fuel Cl → Exhaust HCl:	15	%, upper bound estimation based upon fuel sampling and stack test data for two biomass boilers in Oregon

PH5 HCl EF based upon 15% conversion of fuel chlorine to exhaust HCl. Here is a summary of the data supporting 15% value:

Source	Test Date	Fuel Type	Fuel HHV Btu/lb	Fuel Chlorine Content ppm (dry)	Fuel HCl[1] lb/mmBtu	Stack HCl[2] lb/mmBtu	Fuel Cl → Exhaust HCl[3] %
Boise Building (Elgin, OR)[4]	4/5/2012	Hog Fuel	8935	73	0.008402	0.00071	8.5
	4/5/2012	Hog Fuel	8810	69.5	0.008113	0.00032	3.9
Flakeboard (Eugene, OR)[5]	8/26/2009	Sanderdust/NG	8360	82	0.010087	0.000718	7.1

High Conversion (%): 8.5

Footnotes:

[1] HCl emission factor assuming all fuel chlorine is converted to HCl

[2] Measured HCl in boiler exhasut

[3] Percentage of fuel chlorine that is converted to HCl and is exhausted.

[4] Fuel = 65% wood, 35% bark with plytrim added

[5] Fuel = 28% sanderdust and 72% natural gas

Assumptions:

Sanderdust high heating value = 8509 Btu/lb

Ratio of 36.5/35.5 used to convert Cl to HCl

The 15% value employed to estimate the extent of the conversion of fuel chlorine to exhaust HCl is nearly twice the highest measured conversion rate of 8.5%.

PH5 HCl EF based upon highest chlorine content measured for 19 separate WSFPI sampling and analysis events conducted over 5 years. Here is a summary of the data:

Year	Month	Chlorine % by wt - wet	Moisture Content %	Average Chlorine % by wt - dry	12-month Rolling Chlorine, % by wt - dry	Document
2008	apr	0.01	44.88	0.01909		07/29/08 Six Month Monitoring Report, p 8
		0.011	43.95			
		0.011	43.59			
2009	mar	0.003	38.17	0.00542		01/29/10 Annual Compliance Report, p 52
		0.003	38.59			
		0.004	38.59			
	sep	0.008	23.07	0.00867		01/29/10 Annual Compliance Report, p 54
		0.004	24.15			
		0.008	22.65			
	Quarter 4	0.008	38.77	0.00767	0.01021	01/29/10 Annual Compliance Report, p 55
		0.003	38.97			
		0.003	40.38			
2010	mar	0.003	40.62	0.00502	0.00669	03/29/11 Emissions Report for 2010, p 26
		0.003	39.54			
		0.003	40.49			
	jun	0.013	32.68	0.01832	0.00992	03/29/11 Emissions Report for 2010, p 27
		0.013	35.33			
		0.01	35.65			
	sep	0.005	11.87	0.00570	0.00918	03/29/11 Emissions Report for 2010, p 28
		0.005	12.50			
		0.005	12.46			
	dec	0.003	41.18	0.00514	0.00855	03/29/11 Emissions Report for 2010, p 29
		0.003	42.19			
		0.003	41.69			
2011	feb	0.012	38.30	0.01285	0.01050	2011 Six Month Monitoring Report, p 22
		0.005	36.78			
		0.007	37.49			
	sep	0.008	35.47	0.01552	0.00980	2011 Six Month Monitoring Report, p 24
		0.008	31.24			
		0.016	28.97			
	dec	0.007	35.79	0.01154	0.01126	2011 Six Month Monitoring Report, p 25
		0.007	37.56			
		0.008	36.07			
2012	mar	0.005	37.75	0.01084	0.01269	NT5 Report for 2012, pg 22
		0.01	38.97			
		0.005	38.32			
	may	0.004	32.07	0.00500	0.01073	NT5 Report for 2012, pg 23
		0.003	34.88			
		0.003	33.33			
	sep	0.004	25.59	0.00558	0.00824	NT5 Report for 2012, pg 24
		0.004	33.18			
		0.004	25.52			
	Quarter 4	0.003	32.54	0.00451	0.00648	NT5 Report for 2012, pg 25
		0.003	32.85			
		0.003	34.86			
2013	mar	0.005	37.75	0.01084	0.00648	NT5 Report for 2013, pg 1
		0.01	38.97			
		0.005	38.32			
	jun	0.006	25.98	0.00614	0.00677	NT5 Report for 2013, pg 2
		0.003	34.49			
		0.004	30.35			
	Quarter 3	0.004	21.76	0.00941	0.00772	NT5 Report for 2013, pg 3
		0.004	22.39			
		0.014	22.02			
	dec	0.003	34.57	0.00813	0.00863	NT5 Report for 2013, pg 4
		0.007	35.03			
		0.006	33.63			

Highest 12-month avg % by wt - dry: 0.01269

Appendix A: Potential Emissions Inventory

Potential to Emit

Emission Unit: **KLN-N**
Description: Lumber drying
Control Device: None
Work Practice: None
Fuel: None - indirect steam provided by Wellons Boiler
Predominant Species Dried: Douglas Fir, Hemlock, Ponderosa Pine, White Fir
Installed: 5 single-track Nardi kilns (No.'s 1 - 5) installed 1997
Annual Capacity: 76,850 mbf/yr

Potential to Emit, (tons per year)

Hazardous Air Pollutants	EF (lb/mbf)	PTE (tpy)
Methanol	0.1484	5.7
Formaldehyde	0.0034	0.1
Acetaldehyde	0.1378	5.3
Propionaldehyde	0.0018	0.1
Acrolein	0.0026	0.1
TOTAL		11.3

EF Reference: EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, December 2012. Because the facility has the ability to dry resinous and non-resinous softwood species but at temperatures less than or equal to 200^{0}F as restricted by non-Title V permit No. R10NT500401, select the highest EF from among all softwood species for drying at less than or equal to 200^{0}F. See EF for drying western red cedar.

Abbreviations
mbf: 1,000 board foot lumber

Appendix A: Potential Emissions Inventory

Potential to Emit

Emission Unit: **KLN-W**
Description: Lumber drying
Control Device: None
Work Practice: None
Fuel: None - indirect steam provided by Wellons Boiler
Predominant Species Dried: Douglas Fir, Hemlock, Ponderosa Pine, White Fir
Installed: 2 double-track Wellons kilns (No.'s 6A- 7B) installed 2000
Annual Capacity: 61,480 mbf/yr

Potential to Emit, (tons per year)

Hazardous Air Pollutants	EF (lb/mbf)	PTE (tpy)
Methanol	0.1484	4.6
Formaldehyde	0.0034	0.1
Acetaldehyde	0.1378	4.2
Propionaldehyde	0.0018	0.1
Acrolein	0.0026	0.1
TOTAL		9.0

EF Reference: EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, December 2012. Because the facility has the ability to dry resinous and non-resinous softwood species but at temperatures less than or equal to 200^{0}F as restricted by non-Title V permit No. R10NT500401, select the highest EF from among all softwood species for drying at less than or equal to 200^{0}F. See EF for drying western red cedar.

Abbreviations
mbf: 1,000 board foot lumber