Air Quality Permitting
Response to Public Comments

February 14, 2020

Permit to Construct No. P-2008.0204 and Tier I Operating Permit No. T1-2018.0015

Project No. 62150 and 62007

Idaho Forest Group LLC – Bennett - Grangeville
Grangeville, Idaho

Facility ID No. 049-00003

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Final

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BACKGROUND

The Idaho Department of Environmental Quality (DEQ) provided for public comment on the proposed permit to construct for Idaho Forest Group LLC – Bennett - Grangeville from July 10, 2019, through August 9, 2019, in accordance with 58.01.01.209.01.c. The Idaho Department of Environmental Quality (DEQ) provided for public comment on the proposed permit to construct and tier one permit for Idaho Forest Group LLC – Bennett - Grangeville from December 18, 2019, through January 17, 2020, in accordance with 58.01.01.209.05.b. The Environmental Protection Agency Region 10, Nez Perce Tribe, and state of Washington were also notified as they are affected states to this permitting action. During this period, comments were submitted in response to DEQ's proposed action. Each applicable comment and DEQ's response is provided in the following section.

PUBLIC COMMENTS AND RESPONSES

Public comments regarding the technical and regulatory analyses and the air quality aspects of the proposed permit are summarized below. Questions, comments, and/or suggestions received during the comment period that did not relate to the air quality aspects of the permit application, the Department's technical analysis, or the proposed permit are not addressed. For reference purposes, a copy of the Rules for the Control of Air Pollution in Idaho can be found at:
http://adminrules.idaho.gov/rules/current/58/0101.pdf.

First Public Comment Period July 10, 2019, to August 9, 2019

Comment 1: This PTC is not Eligible to be Incorporated into the Tier I Permit as an Administrative Amendment. Contrary to the statement at the end of the Proposed Action section of the public notice, the Idaho Forest Group did not request to have its application (for a revision to the PTC) processed by Idaho DEQ pursuant to the procedures of IDAPA 58.01.01.209.05.c, thus enabling the revisions to the PTC to be incorporated into the Tier I operating permit through an administrative amendment (see Form G1, Box 16). This PTC does not fully meet the procedural requirements of IDAPA 58.01.01.209, 364 and 365 (e.g., affected State review) nor does the PTC meet the substantive requirements of IDAPA 58.01.01.300 to 381. Should Idaho DEQ send the proposed PTC to EPA Region 10 for review pursuant to IDAPA 58.01.01.366, the EPA would need to object to the PTC pursuant to IDAPA 58.01.01.366.02 even if it fully complies with the substantive requirements for a PTC pursuant to IDAPA 58.01.01.200 to 219.

The EPA notes that the Idaho Forest Group did request that its PTC be co-processed with a Tier I modification pursuant to IDAPA 58.01.01.209.05.b, so the Idaho DEQ should send the EPA the proposed Tier I modification for review pursuant to IDAPA 58.01.01.366.

Response 1: IDEQ published the Permit To Construct and Tier One Operating Permit in accordance with 58.01.01.209.05.b during the second comment period.

Comment 2: Proposed Revisions to PTC Do Not Establish Facility as a PSD Minor Facility
In describing the proposed 12-month rolling 224.0 tpy emission limit applicable to the lumber dry kilns at Condition 4.3 of the draft PTC, Idaho DEQ states, "The VOC emissions from the kilns are to be added to the VOC emissions from the boiler to ensure both emissions units combined remain under 250 T/year for the VOC criteria pollutant." Given the facility's industrial classification as a sawmill, the facility is a major facility for purposes of the PSD construction permitting program only if its emissions are at least 250 tpy. For the reasons discussed below, the proposed permit does not establish the facility as a PSD minor facility.

Volatile Organic Compounds
The facility pneumatically conveys wood residue at both the sawmill and planer mill. On page 15 of the permit, Idaho DEQ states the following about the pneumatic conveyance of wood residue (PCWR):

A pneumatic conveyor transfers the sawdust from the building to the sawdust transfer cyclone located on the outdoor sawdust truck… Planer shavings are transported pneumatically from the planer building to cyclones at the shavings bin… Planer chips are transferred pneumatically to a cyclone on the planer chip bin.

Idaho DEQ failed to identify PCWR as a non-fugitive VOC-emitting activity. The National Council for Air and Stream Improvement (NCASI) has conducted emissions testing of this activity and published its results

in a couple of technical bulletins.[1] EPA Region 10 has derived emission factors for PCWR based upon information presented in the technical bulletins, and these emission factors have been employed to estimate PCWR potential emissions.[2] If Idaho DEQ intends to establish the facility as a PSD minor facility, Idaho DEQ needs to estimate and account for PCWR emissions.

Biomass boiler B-1 generates VOC emissions from the combustion of hog fuel. Idaho DEQ calculates potential VOC emissions of approximately 25 tpy assuming an emission factor of 0.05 lb/MMBtu. Although the applicant portrays the emission factor as a "guarantee" or assurance from the boiler manufacturer that emissions will be no greater than the value referenced, it is unclear whether VOC emissions would remain less than or equal to 0.05 lb/MMBtu across all operating conditions. VOC emissions are largely a function of the degree to which complete combustion is achieved. The facility employs no control device to minimize VOC emissions. The following table presents a comparison of the different "average" uncontrolled emission factors published by EPA and NCASI for the combustion of wood residue in a boiler based upon emissions testing:

Reference	VOC Emission Factor (lb/MMBtu)	Fraction of 0.05 lb/MMBTU EF
EPA AP-42 (September 2003)[3]	0.017	1/3
NCASI TB 973 (February 2010)[4]	0.00632	1/8
NCASI TB 1013 (March 2013)[5]	0.00337	1/15

Neither the 0.05 lb/MMBtu emission factor nor any of the emission factors in the table above is enforceable. In an effort to try and calculate boiler B-1 potential emissions based upon existing emissions testing not specific to the emission unit, EPA Region 10 has calculated a VOC emission factor of 0.221 lb/MMBtu based upon the summation of worst-case emission factors appearing in EPA's AP-42 and NCASI's TB 973 and 1013. A copy of these calculations is included at the conclusion of today's comments. Considering boiler B-1's 115.8 MMBtu/hr heat input capacity and the worst-case 0.221 lb/MMBtu emission factor, boiler B-1's potential emissions equals 112 tpy. Adding boiler B-1's 112 tpy to the kiln's 224 tpy brings their total potential emissions to 336 tpy.

If Idaho Forest Group would like to reduce boiler B-1's potential VOC emissions to less than 112 tpy but not restrict its steam generating capacity, EPA Region 10 recommends that it consider undertaking the following steps (as an example of a mechanism to limit PTE):

1. Submit a test plan to Idaho DEQ proposing testing of individual VOC's at representative steaming rate(s) (as documented by histogram of hourly steaming rates) to determine lb/mlb steam emission rate(s).

2. Conduct VOC emissions testing while continuously measuring operating parameters like exhaust gas O2 and temperature that reflect the degree to which complete combustion is being achieved.

3. Submit test report to Idaho DEQ accompanied by an application requesting boiler emissions be limited (either individually or as part of a facility-wide emission limit). Propose that emissions be calculated hourly or daily by tracking steam production and multiplying by emission factors based upon emissions test results.

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[1] January 1999 NCASI Technical Bulletin No. 773 entitled, "Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities, Part VI - Hardboard and Fiberboard," Source ID No. 072-1LC1, page B46, and September 1996 NCASI Technical Bulletin No. 723 entitled, "Laboratory and Limited Field Measurements of VOC Emissions from Wood Residuals," Table 7 on page 27.

[2] June 21, 2019, Fact Sheet supporting Final PSD Permit No. R10PSD00100 issued to PotlatchDeltic St. Maries Complex. VOC emission factors derived on pages A-57 and 58 of the Fact Sheet (pages 80 and 81 of 172 of the pdf). PCWR VOC potential emissions estimated on pages A-31 and 32 of the Fact Sheet (pages 54 and 55 of 172 of the pdf). The document is available online at https://www.epa.gov/sites/production/files/2019-06/documents/190621_potlatchdeltic_psd_fact_sheet.pdf

[3] Chapter 1.6 of AP-42 entitled "Wood Residue Combustion in Boilers." 0.017 lb/MMBtu emission factor is an average value in Table 1.6-3 and reflects summation of average values of individual VOC's.

[4] "Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources - A Second Update." 0.00632 lb/MMBtu emission factor is a summation of average values in Table 7.1 for highest-emitting VOC's acetaldehyde, acrolein, benzene, formaldehyde, methanol and naphthalene.

[5] "A Comprehensive Compilation and Review of Wood-fired Boiler Emissions." 0.00337 lb/MMBtu emission factor is a summation of average values in Table presented Table 4.1 for highest-emitting VOC's acetaldehyde, acrolein, benzene, formaldehyde, methanol and naphthalene.

Request operating parameters be constrained to a range experienced during testing to assure that the emission factors are representative actual emissions.

4. Comply with the emission limit, operating limits, monitoring, recordkeeping and reporting requirements Idaho DEQ establishes in response to your application to limit PTE.

Idaho DEQ is proposing to limit the kilns' VOC emissions to 224.00 tpy. Idaho DEQ has established a compliance demonstration that requires emissions be calculated monthly and summed over each 12-month rolling period using defined temperature-dependent emission factors rooted in small-scale kiln emissions testing and OTM-26. Idaho DEQ is enabling a change to the compliance demonstration (and by extension the emission limit) be accomplished without public review by allowing the use of alternative emission factors (to the ones specified in the permit) that it approves of in writing. See proposed Condition 4.6. If Idaho DEQ wants to allow the use of alternative emission factors to demonstrate compliance with the 224.00 tpy VOC limit without having to revise the permit, then Idaho DEQ needs to define in this permit the decision making criteria it will be bound to employ for evaluating whether to approve the use of an alternative emission factor. The proposed permit lacks any such criteria.

In order to calculate emissions, the facility is required to track species, throughput and maximum drying temperatures. The emission factors in Table 4.3 of the proposed permit reflect drying lumber to 15 percent moisture content, dry basis. Additional emissions will be generated as you further reduce the lumber's moisture content. In order to assure that the emission factors remain representative, Idaho DEQ needs to establish minimum moisture content in the permit. For an example of this, see EPA Region 10's June 21, 2019 minor NSR and PSD permits to PotlatchDeltic St. Maries Complex.[6]

The draft permit appears to require the use of a batch's "set point" temperature as the temperature to use to calculate the emission factor for a particular batch of lumber. Neither the permit nor the statement of basis seems to define the term "set point." It is my general understanding that the "set point" temperature refers to the maximum spatial average temperate across the kiln that shall not be exceeded. It is my understanding that this "set point" temperature generally refers to the temperature of the air exiting the lumber. An operator directs the computerized kiln management system to manage the drying such that the "set point" temperature is not exceeded. The "set point" temperature is a defined value, not a measured value. It is not appropriate to use a defined value to establish a batch's emission factor. The emission factor must be based upon the actual temperature value measured. And because the temperature-dependent emission factor equations were derived based upon the temperature of the air entering the lumber, the temperature values to be used in the equations must also reflect the actual temperature of the air entering the lumber, not exiting the lumber. See EPA Region 10's June 21, 2019, minor NSR and PSD permits to PotlatchDeltic St. Maries Complex for examples of conditions requiring temperature monitoring and conditions requiring the use of actual temperature monitoring data (entering the lumber) to calculate temperature-dependent emission factors.

Carbon Monoxide

For the reasons similar to those expressed above with respect to VOC, more needs to be done to limit the facility's CO emissions to less than 250 tpy. The boiler manufacturer "guarantees" an emission factor of 0.20 lb/MMBtu which corresponds to potential emissions of 101 tpy if you were assured that the emission factor is representative of emissions across a range of steaming rates and exhaust gas temperatures and O2 concentrations. Use of AP-42's 0.60 lb/MMBtu emission factor corresponds to potential emissions of 304 tpy. EPA Region 10 recommends Idaho Forest Group consider undertaking aforementioned steps 1 through 4 outlined above (with respect to boiler B-1's VOC emissions) to limit boiler B-1's CO emissions.

Nitrogen Oxides

For the reasons similar to those expressed above with respect to VOC, more needs to be done to limit the facility's NOx emissions to less than 250 tpy. The boiler manufacturer "guarantees" an emission factor of 0.25 lb/MMBtu which corresponds to potential emissions of 127 tpy if you were assured that the emission factor is representative of emissions across a range of steaming rates and exhaust gas temperatures and O2 concentrations. Use of AP-42's 0.22 lb/MMBtu emission factor corresponds to potential emissions of 111 tpy. AP-42's 0.49 lb/MMBtu emission factor for combustion of dry hog fuel corresponds to potential emissions of 111 tpy. EPA understands that the facility currently combusts hog fuel in boiler B-1. There is nothing legally prohibiting the facility from exclusively combusting kiln-dried wood residue in boiler B-1.

[6] EPA Region 10 MNSR and PSD permits to PotlatchDeltic are available online at https://www.epa.gov/caa-permitting/potlatchdeltic-land-and-lumber-llc-tribal-minor-new-source-review-nsr-air-permit and https://www.epa.gov/caa-permitting/potlatchdeltic-land-and-lumber-llc-prevention-significant-deterioration-psd-air, respectively. These documents are searchable.

EPA Region 10 recommends Idaho Forest Group consider undertaking aforementioned steps 1 through 4 outlined above (with respect to boiler B-1's VOC emissions) to limit boiler B-1's NOx emissions.

Response 2: The volatile organic compounds (VOC) emissions from the pneumatic conveyance of the sawmill and planer mill were added to the facility's potential to emit.

IDEQ adjusted the emission factors to the following and included a source test within three years from the permit issuance date: 0.05 lb/MMBtu VOC emission factor, 0.49 lb/MMBtu NO_X emission factor, and 0.20 lb/MMBtu CO emission factor. This resulted in a calculated increase in the Potential to Emit for VOC, NO_X, and CO emissions from the boiler that are not an actual increase in emissions from the facility.

IDEQ removed, "or emission factors approved by IDEQ in writing." Therefore, only emission factors within the proposed PTC will be used to calculate emissions from the kilns.

The facility's application states they generally dry lumber to around 15% moisture content. In addition, in our discussions with the facility they have stated that the 15% moisture content is, "industry standard" for the quality of lumber they manufacturer for their customers. Therefore, IDEQ believes requiring an additional requirement to determine the moisture content is not warranted.

IDEQ revised the set point to the maximum instantaneous entering-air or the highest 60-min average entering-air, according to the, "Pen Charts".

Comment 3: Recent Emissions Testing Results Affirming Annual Dry Kiln Throughput Limit Protective of PM10 Annual NAAQS. On March 16, 2016, NCASI conducted PM10 and PM2.5 emissions testing at a full-scale batch-type steam-heated lumber dry kiln at a Georgia Pacific wood products facility in Pineland, Texas. Southern yellow pine lumber was being dried in the kiln while undergoing testing. In its January 26, 2017, test report, NCASI reports a PM10 emission factor of 0.0610 lb/mbf. This PM10 emission factor is higher than emission factors supported by testing conducted less recently but while drying Pacific Northwest lumber species Western Hemlock and Douglas Fir as presented in the following table that appeared in EPA Region 10's Permit Analysis for draft minor NSR permit No. R10TNSR01800.

Test Report Date	Species	PM2.5 Emission (lb/mbf)	Max Air Temperature Entering Lumber (°F)	Initial/Final Moisture Content* (%)	No. Drying Cycles	Test Method	Small-Scale Kiln Location
07/08/13	Western Hemlock	0.0197	180 (set point)	?/10.3	1	EPA RM 5/202	Chemco, Ferndale, WA
03/20/13	Western Hemlock	0.0158	175	?/17.3	1	EPA RM 5/202	Chemco in Ferndale, WA
02/11/99**	Douglas Fir	0.022	180	1: 38/12.8 2: 38/11.9	2	ODEQ Method 7 (Filter + CPM)	OSU Forest Research Laboratory, Corvallis, OR
01/11/99**	Western Hemlock	0.051	190	1: 134.3/15 2: 27.6/13.4	2	ODEQ Method 7 (Filter + CPM)	OSU Forest Research Laboratory, Corvallis, OR

* For the testing performed at Oregon State University, moisture content is reported on a dry basis. The test report associated with Chemco kiln does not report whether the moisture content is on a wet or dry basis.

** The applicant states that retired Oregon State University professor Dr. Mike Milota "expressed a lack of confidence in the findings" associated with 1998 testing performed by Horizon Engineering.

In finalizing minor NSR permit No. R10NTNSR01800, EPA Region 10 rejected the emission testing results presented in the table above. In the Response to Comments document, EPA Region 10 states:

> *With respect to the testing conducted by Horizon Engineering at Oregon State University (OSU) (referenced in the application), Region 10 has concerns about the accuracy of the test results because the testing was performed using a flow monitoring device that was not calibrated for the conditions under which sampling was performed. It is uncertain whether the lack of adequate calibration biased the results high or low. With respect to the testing conducted by ETI at Chemco (referenced in the application), Region 10 has concerns about the accuracy of the test results because the hot and wet kiln exhaust was routed through what effectively served as a giant condenser prior to sampling and analysis (a surrounding wood-framed enclosure covered with polyethylene plastic sheeting), such that at least some of the aerosols that would otherwise have been measured downstream as CPM in the EPA Reference Method 202 sampling train were instead cooling and condensing out of the kiln exhaust stream along with the liquid vapor. With the potential loss of CPM to the giant condenser, the test results would likely be biased low. In addition, similar to the testing at OSU, the Chemco testing was performed using a flow monitoring device that was not calibrated for the conditions under which sampling was performed.*
>
> EPA Region 10 estimates that PM10 emissions generated by the Idaho Forest Group kilns are approximately 122 pounds per day assuming a 0.0610 lb/mbf emission factor and a 2,000 mbf/day maximum throughput. Based upon statements made by Idaho Forest Group in the administrative record for this permitting action (Appendix B to the Statement of Basis – Facility Draft Comments), this estimate aligns fairly well with kilns' 135.6 lb/day PM10 emission rate modeled in the original permit application for this facility.

Response 3: During the Tier One renewal process a HAP/VOC issue for Title V purposes was identified as a new applicable requirement, which lead to the facility needing to be reevaluated as a HAP major facility with possible GACT/MACT applicability determinations. Once the facility was determined to be a HAP major facility and applicable to MACT rules, IDEQ reopened the underlying PTC for a revision. In response to EPA's comment, the PM_{10} emissions were modeled under a previous permitting action to determine the maximum annual lumber produced of 250 million board feet per year, in the PTC. The facility has not proposed a modification that would trigger a new source review or modeling for PM_{10}.

Comment 4: <u>CAM Applicability for Boiler B-1 Emission Limits not Affected by Boiler MACT Applicability</u>
On page 4 of the PTC application received by Idaho DEQ on December 11, 2018, Idaho Forest Group requests the following change to the PTC with respect to Compliance Assurance Monitoring, "Remove the CAM conditions on the boiler. CAM will not apply to the boiler after NESHAP Subpart DDDDD becomes applicable." Contrary to Idaho Forest Group's comment, CAM will continue to apply to emission limits outside of the Boiler MACT even though boiler B-1 will be subject to the Boiler MACT as of the effective date of the revised PTC. The federal CAM rules (as of July 1, 2018) are adopted into state regulations at IDAPA 58.01.01.107.03.j. The CAM rules at 40 CFR 64.2(b)(1)(i) state that the CAM rules do not apply to "emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 or 112 of the Act." This means that the CAM rule does not apply to the emission limits established in the Boiler MACT. 40 CFR 64.2(b)(1)(i), however, does not mean that all emission limitations or standards applicable to boilers that are subject to the Boiler MACT are exempt from the CAM requirements. It is only the Boiler MACT emission limits and standards that are not subject to CAM.

Response 4: Agreed, only the Boiler MACT emission limits and standards are not subject to CAM. In accordance with 40 CFR 6.2(b) the facilities current CAM requirements are exempt.

Second Public Comment Period December 18, 2019, to January 17, 2020

A. Idaho DEQ Must Make the 249 tpy NO_X and VOC Synthetic Minor Emission Limits Enforceable as a Practicable Matter by Finalizing the Draft Permit with the Changes Specified as Follows:

1. For the B-1 Wellons Hog Fuel Boiler:

Comment 1: *a. Link the Steam Output to Emissions for Monthly Compliance Demonstration*

Assuring compliance with the facility-wide 249 tpy NO_X and VOC emission limits is, in part, dependent upon accurate measurement of B-1 Wellons Hog Fuel Boiler heat input. Idaho DEQ requires IFG to determine B-1 Wellons Hog Fuel Boiler's daily heat input by employing steam generating rate data (collected pursuant to Condition 3.11) along with steam heat content and measured boiler efficiency, but does not specify the actual values to use. Condition 3.12 of the proposed PTC states:

The permittee shall use the actual boiler steam production tracked as per Condition 3.11, and the emission factors listed below, to calculate annual emissions of VOC, NO_X and CO from the boiler. Boiler steam output shall be converted to boiler heat input using steam heat content and measured boiler efficiency.

- *0.05 lb/MMBtu to calculate the tons per year of VOC's from the boiler;*
- *0.49 lb/MMBtu to calculate the tons per year of NO_X from the boiler;*

The facility's VOC emissions (including B-1 Wellons Hog Fuel Boiler's contribution) shall not exceed 249 tpy pursuant to Permit Condition 2.10. B-1 Wellons Hog Fuel Boiler's NO_X emissions shall not exceed 249.00 tpy, respectively, pursuant to Permit Condition 2.4. The limits establish the facility as a minor source for purposes of the PSD program. Synthetic minor limits must be enforceable as a practical matter.[7] Because IFG is required to track B-1 Wellons Hog Fuel Boiler's emissions to demonstrate compliance with three 12-month rolling emission limits (as opposed to tracking emissions to calculate and pay annual Title V operating permit program fees), it is especially critical that the permit clearly and completely spell out the methodology to calculate the boiler's emissions. As currently drafted, Permit Condition 3.12 does not adequately specify how boiler steam output is converted to heat input. Neither the application, statement of basis nor permit explain how the heat content of steam is determined, how the boiler efficiency is determined, the monitoring that is necessary to determine a value for each parameter, and the basis and frequency for making new determinations. These same documents do not explain how knowing the steam's heat content and measuring boiler efficiency enables the conversion of daily steam output to daily heat input.

Recognizing the need to create a fuel-heat-input-to-steam-output ratio (FHISOR) (MMBtu/mlb steam) in the absence of test-derived emission factors in units of "lb/mlb steam," Idaho DEQ must finalize Permit Condition 3.12 by either (a) expanding it with clear and detailed methodology for linking steam output to heat input using steam heat content and measured boiler efficiency, (b) specifying a FHISOR based upon the most recent source test during which EPA Reference Method 2 (RM2) was employed, or (c) requiring RM2 testing be performed while conducting fuel sampling and analysis and boiler steam monitoring in order to determine FHISOR.

With respect to option (b) above, for each run of the test, divide hourly heat input rate by hourly steam generating rate to determine run-specific FHISOR. The average of the three run-specific FHISOR values can be used to convert measured steaming rates to heat input.

Each test run's heat input rate (MMBtu/hr) can be estimated by employing the following formula:

$$\frac{(exhaust\ gas\ volumetric\ flow\ rate) * \left(\frac{20.9 - \%O2\ dry}{20.9}\right) * (60\frac{min}{hr})}{Fd}$$

where: exhaust gas volumetric flow rate is measured in units of dry standard cubic feet per minute (dscf/min);

%O2 dry = percent of O2 by volume in the exhaust gas on a dry basis; and

Fd is hogged fuel F-factor (dscf/MMBtu) based upon results from sampling the run's fuel and performing (a) an ultimate analysis and (b) analysis to determine gross calorific value (dry basis). See Steps 5, 6 and 7 of procedure to determine FHISOR. If run-specific or at least test-specific FHISOR cannot be determined due to lack of fuel sampling and analysis, then employ a default Fd value (wood – 9,240 dscf/MMBtu, wood bark – 9,600 dscf/MMBtu) from Table 19-2 of RM19.

With respect to option (c) above, the eight-point procedure to determine FHISOR is provided in the first enclosure to these comments. The procedure is also available online at https://www.epa.gov/sites/production/files/2016-09/documents/fhisor_memo.pdf. The procedure requires

[7] For the most recent agency explanation of what is necessary to create "practicably enforceable" emission limits, see discussion beginning on page 36318 of EPA's July 26, 2019 proposed rule entitled "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act" available online at https://www.govinfo.gov/content/pkg/FR-2019-07-26/pdf/2019-14252.pdf

RM2 testing be conducted of the boiler exhaust while simultaneously measuring steam output and sampling the fuel stream (followed by laboratory analysis). The procedure's eight steps are as follows:

1. Simultaneously measure stack gas volumetric flow and steam generating rate
2. Sample fuel
3. Homogenize fuel sample
4. Determine fuel moisture
5. Determine fuel heat content (aka gross calorific value or high heat value)
6. Perform ultimate analysis (for composite sample)
7. Calculate hogged fuel F-factor (for composite sample)
8. Calculate conversation factor

EPA Region 10 has required sources in Indian Country to determine their boilers' FHISOR to enable use of emission factors in units of "lb/MMBtu." See current Title V permits issued to Empire Lumber Company (Kamiah, Idaho) and Stimson Lumber Company (Plummer, Idaho).[8]

To eliminate the requirement to employ a FHISOR to calculate emissions in the future, Idaho DEQ could require IFG to report test-derived NO_X and VOC emission factors in units of "lb/mlb steam." Idaho DEQ is already requiring source testing be performed to measure NO_X and VOC pursuant to Permit Condition 3.15. That permit condition could be finalized with requirement to report the emission factor in units of "lb/mlb steam," and to replace the "lb/MMBtu" emissions factors specified in Permit Condition 3.12 with the new test-derived "lb/mlb steam" factors.

Response 1: IDEQ changed the required source test to no later than 180 days of issuance. In addition in order to eliminate the requirement to employ a FHISOR to calculate emissions if the emission factors are kept in units if lb/MMBtu, IDEQ will require the facility to report test-derived NO_X, VOC, and CO emission factors in lb/mlb steam. Therefore, IDEQ is satisfied that a source test verification of the NO_X, VOC, and CO emission factors for the boiler within 180 days of permit issuance is reasonable to demonstrate compliance with the 249 T/yr VOC facility-wide emission limit.

Comment 2: *b. Measure and Report the Total Mass of Volatile Organic Compound Emissions*
IFG is required to conduct a source test to verify the B-1 Wellons Hog Fuel Boiler VOC emission factor specified in Permit Condition 3.12. Permit Condition 3.15 states:

The permittee shall complete a source test no later than three years from issuance of this permit to determine the Wellons Hog Fuel Boiler VOC, NO_X, and CO emission factors. The test shall be conducted to verify the emission factors contained in Permit Condition 3.12, and to demonstrate compliance with the emission rate limits specified by Permit Conditions 2.10 and 3.4. Each performance test conducted to demonstrate compliance shall be performed in accordance with IDAPA 58.01.01.157

Idaho DEQ must finalize Permit Condition 3.15 with more specificity about how IFG is to (a) conduct VOC source testing and (b) report the results to account for the entire emitted compounds, not just carbon. EPA Reference Method 25 (RM25) is clearly the best test choice for measuring VOC emissions (as a whole) in this instance. By requiring the use of RM25 as opposed to RM25A, the variable response of the flame ionization detector (FID) associated with different types of organics is eliminated. See Section 2.1 of RM25.[9] RM25A doesn't detect certain VOCs like formaldehyde altogether. Assuming Idaho DEQ chooses to require the use of RM25, be sure to require RM25 be modified to include a pre-condenser to remove water; a 500˚C recovery temperature; a 10-liter tank; a performance audit sample; and, a blank sample train evaluation. If Idaho DEQ elects to prescribe the use of RM25A, then it becomes necessary to also prescribe the use of test methods (e.g., RM18) to measure formaldehyde and other VOCs that the FID does not detect or only partially detects. For these individually-measured VOCs, the permit needs to prescribe a methodology for deducting their contribution (if any) from the RM25A measurements. Once the deduction has been performed, what remains of the RM25A measurement must be adjusted to account for the actual VOCs emitted (e.g., acetaldehyde, benzene, methanol), not just the carbon. Finally, the adjusted RM25A measurement must be added to the individually-measured VOC to arrive at the run-specific emission factor.

[8] Current Title V permit issued to Empire Lumber Company is available online at https://www.epa.gov/caa-permitting/empire-lumber-co-kamiah-mills-title-v-air-permit, and current Title V permit issued to Stimson Lumber Company is available online at https://www.epa.gov/caa-permitting/stimson-lumber-title-v-permit-and-statement-basis.
[9] https://www.epa.gov/emc/method-25-gaseous-nonmethane-organic-emissions

RM25 measures VOC as carbon, but PSD major source applicability is based upon the entire mass of VOC, not just the carbon. To convert test-derived VOC (as carbon) parts per million (ppm) concentration by volume to VOC (weighted average VOC) ppm concentration by volume, multiply by 1.355. This value is calculated as follows:

$$\frac{(MW\ of\ wt\ avg\ VOC)}{(MW\ of\ carbon) * (\#\ carbon\ atoms\ in\ wt\ avg\ VOC)}$$

where: MW of wt avg VOC = 64.689 lb/lb-mol. MW of wt avg VOC is the molecular weight of weighted average VOC emitted by a wood-fired boiler based upon data presented in Table 1.6-3 of AP-42 (September 2003);

MW of carbon = 12.011 lb/lb-mol; and

carbon atoms in wt avg VOC = 3.975 for wood-fired boiler based upon data presented in Table 1.6-3 of AP-42 (September 2003).

$$1.355 = \frac{64.689\ lb/lb{\cdot}mol}{\left(12.011\frac{lb}{lb{\cdot}mol}\right)*(3.975)}$$

For derivation of (a) molecular weight of weighted average VOC emitted by a wood-fired boiler and (b) number of carbon atoms in molecular weighted average VOC emitted by a wood-fired boiler, see page 5 and 6 of Appendix A to Statement of Basis for Title V operating permit issued by EPA Region 10 to Warm Springs Forest Products Industries September 30, 2014. The Title V permit and statement of basis for that permitting action are enclosed.

More broadly, the results of each test run shall be presented as an emission factor in units of lb VOC/mlb steam and shall be calculated as follows:

$$\text{VOC EF} = 1.355 * C * \frac{3.118\ x\ 10{-}8\ lb/scf}{ppmv} * Q * \frac{60\ min}{hr} * \frac{1}{S}$$

where: VOC EF = VOC emission factor in units of lb/mlb steam;

1.355 = factor to convert VOC (as carbon) to VOC (as compounds emitted);

C = VOC as carbon concentration as measured in units of ppmv;

$3.118x10^{-8}$ lb/scf per ppmv VOC as carbon is relationship for expressing carbon concentration based upon ideal gas law at EPA standard conditions;

Q = Stack exhaust flow rate as measured in units of scf/min;

S = Steam generating rate as measured in units of mlb/hr; and

Values for C and Q shall be expressed on the same moisture basis.

This methodology for calculating a lb/mlb steam VOC emission factor for a wood-fired boiler is presented in Permit Condition 5.15 of September 30, 2014 Title V permit to Warm Springs Forest Products. See enclosure to these comments.

Response 2: In response to EPA's comment of specifying the test method to capture all emitted VOC's, IDEQ has added test method RM 25 with the following applicable test parameters, and the calculation methodology listed below to the permit. Therefore with this requirement the facility will be able to account for the entire emitted VOC compounds and not just the carbon.

- RM 25 test method will be used
  - A pre-condenser to remove water;
  - 500° C recovery temperature;
  - 10-liter tank;
  - Performance audit sample;
  - And a blank sample train evaluation.
- To convert test-derived VOC (as carbon) parts per million (ppm) concentration by volume to VOC (weighted average VOC) ppm concentration by volume, multiply by 1.355. This value is calculated as follows:

$$\frac{(MW\ of\ wt\ avg\ VOC)}{(MW\ of\ carbon) * (\#\ carbon\ atoms\ in\ wt\ avg\ VOC)}$$

where: MW of wt avg VOC = 64.689 lb/lb-mol. MW of wt avg VOC is the molecular weight of weighted average VOC emitted by a wood-fired boiler based upon data presented in Table 1.6-3 of AP-42 (September 2003);

MW of carbon = 12.011 lb/lb-mol; and

carbon atoms in wt avg VOC = 3.975 for wood-fired boiler based upon data presented in Table 1.6-3 of AP-42 (September 2003).

$$1.355 = \frac{64.689\ lb/lb{\cdot}mol}{\left(12.011\frac{lb}{lb{\cdot}mol}\right)*(3.975)}$$

For derivation of (a) molecular weight of weighted average VOC emitted by a wood-fired boiler and (b) number of carbon atoms in molecular weighted average VOC emitted by a wood-fired boiler, see page 5 and 6 of Appendix A to Statement of Basis for Title V operating permit issued by EPA Region 10 to Warm Springs Forest Products Industries September 30, 2014. The Title V permit and statement of basis for that permitting action are enclosed.

More broadly, the results of each test run shall be presented as an emission factor in units of lb VOC/mlb steam and shall be calculated as follows:

$$\text{VOC EF} = 1.355 * C * \frac{3.118\ x\ 10{-}8\ lb/scf}{ppmv} * Q * \frac{60\ min}{hr} * \frac{1}{S}$$

where: VOC EF = VOC emission factor in units of lb/mlb steam;

1.355 = factor to convert VOC (as carbon) to VOC (as compounds emitted);

C = VOC as carbon concentration as measured in units of ppmv;

$3.118x10^{-8}$ lb/scf per ppmv VOC as carbon is relationship for expressing carbon concentration based upon ideal gas law at EPA standard conditions;

Q = Stack exhaust flow rate as measured in units of scf/min;

S = Steam generating rate as measured in units of mlb/hr; and
Values for C and Q shall be expressed on the same moisture basis.

Comment 3: *c. Monitor the Exhaust Gas O_2 to Assure Representativeness of NO_X and VOC Emission Factors*
As discussed above, Permit Condition 3.12 specifies B-1 Wellons Hog Fuel Boiler NO_X and VOC emission factors IFG is to use to calculate emissions and determine compliance with the 12-month rolling emission limits in Permit Conditions 2.10 (VOC) and 3.4 (NO_X). According to Idaho DEQ's Statement of Basis for this permitting action, the NO_X emission factor is based upon the AP-42 factor for combustion of dry wood and the VOC emission factor is based upon a boiler manufacturer's guarantee. NO_X and VOC emissions are influenced by the degree of complete combustion achieved. Assuring compliance with the facility-wide 249 tpy NO_X and VOC emission limits is, in part, dependent upon ongoing verification of good combustion.

Exhaust gas O_2 concentration is a good indicator as to whether good combustion is being achieved. If exhaust O_2 levels remain within a pre-defined range indicative of good combustion, a measure of assurance can be claimed that the default emission factors are representative of actual emissions. In an effort to maintain efficient boiler operation (complete combustion), boiler operators typically observe the exhaust gas O_2 concentration (and not necessarily temperature) to determine whether to increase, decrease or hold steady the rate at which combustion air is introduced.

On page A.17-3 of its August 1998 Compliance Assurance Monitoring Technical Guidance Document[10], EPA states:

Excess air levels can have a significant impact on boiler performance. Excess air is defined as that air exceeding the theoretical amount necessary for combustion. Insufficient excess air will result in incomplete combustion and an increase in emissions. A minimum of about 50 percent excess air is necessary for combustion of wood or bark fuels. Provision of too much excess air causes the furnace to cool and also can result in incomplete combustion. Therefore, the proper excess air level is important for proper operation of the boiler. The percent oxygen in the exhaust gas stream is an indicator of the excess air level (0 percent oxygen would equal 0 percent excess air, 8 percent oxygen is approximately 50 percent excess air, and 12 percent oxygen is approximately 100 percent excess air).

[10] https://www.epa.gov/sites/production/files/2016-05/documents/cam-tgd.pdf

According to the Air and Waste Management Association's Air Pollution Engineering Manual (2nd Edition, 2000):

[S]ufficient secondary air must be supplied over the fuel bed to burn the volatiles that account for most of the combustible material in the waste. When proper drying conditions do not exist or when secondary combustion is incomplete, the combustion temperature is lowered, and increased particulate, carbon monoxide, and hydrocarbon emissions may result. The lowering of combustion temperature generally means decreased nitrogen oxide emissions. Also, emissions can fluctuate over short periods if significant variations occur in fuel moisture content.
(page 235)

In EPA's October 1990 New Source Review Workshop Manual, EPA affirms the role of surrogate parameters in a compliance demonstration for an emission limit. On pages H.6 and H.7, EPA states

Where continuous, quantitative measurements are infeasible, surrogate parameters must be expressed in the permit. Examples of surrogate parameters include: mass emissions/opacity correlations, maintaining pressure drop across a control (e.g., venturi throat of a scrubber), raw material input/mass emissions output ratios, and engineering correlations associated with specific work practices. These alternate compliance parameters may be used in conjunction with measured test data to monitor continuous compliance or may be independent compliance measures where source testing is not an option and work practice or equipment parameters are specified. Only those parameters that exhibit a correlation with source emissions should be used. Identifying and quantifying surrogate process or control equipment parameters (such as pressure drop) may require initial source testing or may be extracted from confirmed design characteristics contained in the permit application.

Parameters that must be monitored either continuously or periodically should be specified in the permit, including averaging time for continuously monitored data, and data recording frequency for periodically (continually) monitored data. The averaging times should be of a short term nature consistent with the time periods for which dispersion modeling of the respective emissions rate demonstrated compliance with air quality standards, and consistent with averaging times used in compliance testing. This requirement also applies to surrogate parameters where compliance may be time-based, such as weekly or monthly leak detection and repair programs (also see Appendix C). Whenever possible, "never to be exceeded" values should be specified for surrogate compliance parameters. Also, operating and maintenance (O&M) procedures should be specified for the monitoring instruments (such as zero, span, and other periodic checks) to ensure that valid data are obtained. Parameters which must be monitored continuously or continually are those used by inspectors to determine compliance on a real-time basis and by source personnel to maintain process operations in compliance with source emissions limits.

According to page 70 of the PTC application, IFG does not currently employ an oxygen trim system.

Idaho DEQ is not proposing to require IFG to monitor exhaust gas O_2 concentration. Idaho DEQ is not proposing to identify an operating range or threshold values for either parameter outside of which corrective action is required. Neither the permit, statement of basis nor application state whether IFG is already monitoring this parameter. The Boiler MACT requires IFG to employ an O_2 analyzer system, but the Boiler MACT does not currently apply to B-1 Wellons Hog Fuel Boiler. Compliance is required three years from permit issuance as indicated on page 53 of the PTC's statement of basis. If Idaho DEQ ultimately requires IFG to conduct source testing (as IFG is proposing and EPA Region 10 recommends) to either confirm the existing emission factors or to generate new ones for use in determining 12-month rolling emissions, that same testing can be used to establish an operating range for exhaust gas O_2 concentration.

Idaho DEQ must require periodic monitoring. That could be achieved by (a) monitoring of O_2 concentration, and (b) requiring corrective action when one-hour exhaust gas O_2 concentration is outside a defined range (upper and lower bounds) reflecting the conditions under which the test-derived emission factors are established (or factor verification testing is conducted). To establish an interim exhaust gas O_2 concentration operating range for time period between permit issuance and source testing, Idaho DEQ can review the recorded O_2 concentration values generated by the facility's existing O_2 monitor (assuming one exists and was employed during testing for RM5 PM for example) documented in source test reports.

Idaho DEQ can also inquire IFG for records of O_2 concentration values generated by the facility's existing O_2 monitor outside of source test events.

Response 3: The permit does not currently list an O_2 concentration limit or monitoring requirements. The O_2 concentration limit and monitoring requirements will be established during the compliance demonstration with 40 CFR 63 DDDDD. Therefore, IDEQ will not be requiring the facility to demonstrate compliance with this limit and monitoring requirements outside of the 40 CFR 63 DDDDD compliance timeframes.

2. For the Lumber Dry Kilns

Comment 4: *a. Monitor the Actual Entering-Air-Temperature*
Permit Condition 4.5, in part, requires IFG to monitor and record for each kiln charge, "The maximum entering-air-temperature for the schedule used to dry the kiln charge, in units of degrees Fahrenheit (°F)." Idaho DEQ states in the statement of basis (page 122), "The purpose of this parameter (maximum entering-air temperature) is to ensure the maximum entering air during the wood specie specific charge is being used in the VOC emission factor equation to accurately calculate the VOC emissions generated from that charge." Assuring compliance with the facility-wide 249 tpy VOC emission limit is, in part, dependent upon accurate measurement of the kiln entering-air-temperature over the duration of the run.

Idaho DEQ must finalize Permit Condition 4.5 to clearly require IFG to employ thermocouples (or other temperature measurement devices) and a data acquisition and handling system to measure, calculate and record on a certain frequency (e.g., every two minutes) the actual kiln-wide average entering-air temperature (not just the maximum) inside the kiln. The record may be in the form of a plot of kiln-wide average entering-air temperature over time for the duration of the run.

Response 4: Proposed PTC Permit Condition 4.8 requires the facility to develop an Operations and Maintenance Manual to ensure compliance with the accurate measurement of kiln entering-air wet bulb, and dry bulb temperatures, procedures for installation, calibration, and maintenance of kiln temperature controllers and sensors in accordance with the kiln manufacturer's instructions. Therefore, further permit conditions pertaining to thermocouples or other temperature measurement devices are not warranted.

The maximum entering-air temperature is defined under proposed PTC Permit Condition 4.7 as the highest instantaneous temperature, or the highest 60-min average temperature during the charge. The data is collected on a plot of the kiln temperature versus time, from the start of the charge to the completion of drying the charge. The facility can use the established plot, "pen chart" up to six months for the same species, when recording temperature to calculate VOC emissions. After speaking with industry six months was chosen to account for infrequent changes due to product consistency, and seasonality. Therefore, as discussed above the process of measuring the temperature seemed the most reasonable and feasible.

Comment 5: b. Use the Maximum Entering-Air Temperature in the Emission Factor Equations
Permit Condition 4.6 specifies the entering-air-temperature (single dependent variable) equations the permittee is to use to calculate a charge's VOC emission factor. The first bulleted item in Permit Condition 4.6 states, in part, "The value X in the emission factor equation is the, "Maximum Entering-Air Temperature" as per the Kiln Drying Schedules and Maximum Entering-Air Temperature Determinations Permit Condition." Idaho DEQ states in the statement of basis (page 123), "This permit condition explains which emission factor equation to use specific to each individual wood species, how to monitor and record the maximum entering-air temperature of the kilns, and how to calculate the emission factor required to calculate and track VOC emissions on a monthly and annual basis…" Assuring compliance with the facility-wide 249 tpy VOC emission limit is, in part, dependent upon the use of an entering-air-temperature value (to calculate a charge/run's VOC emission factor) that is equal to or greater than the actual measured maximum kiln-wide spatial average entering-air-temperature for that charge/run.

Permit Condition 4.7 is the "Kiln Drying Schedules and Maximum Entering-Air Temperature Determinations" permit condition referenced in Permit Condition 4.6. Permit Condition 4.7 states:

The permittee shall maintain records onsite of at least two example control charts ("pen charts") for each drying schedule used over the most recent five-year period, and copies of all control charts used in audits completed over the most recent five-year period. For the purposes of assessing actual kiln VOC emissions for facility-wide emission limits compliance monitoring,

and the maximum entering-air temperature ("Enter Air") determined from at least two example control charts shall be used.

The maximum entering-air temperature for each schedule shall be determined as either the highest instantaneous temperature, or the highest 60-minute average temperature, exhibited in the two or more example control charts evaluated (i.e., the highest maximum exhibited).

At a minimum, the applicable information required under Permit Condition 4.5 shall be identified or recorded on each example control chart evaluated.

Idaho DEQ states in the statement of basis (page 123), "This permit condition explains how to monitor and record the maximum entering-air of the kilns to be used in the VOC calculations."

Permit Condition 4.8, entitled, "Kiln Operations and Maintenance Manual Requirement," states, in part:

Procedures and frequency for auditing and updating maximum entering-air temperature determinations for each kiln drying schedule. At least once every six months or more frequently when appropriate (e.g., such as when drying schedule parameters are changed), each drying schedule maximum entering-air temperature determination shall be audited by comparing the control chart from the most recent charge processed using that schedule to the control chart used in determining the maximum entering-air temperature for that schedule. The maximum entering-air temperature for the most recent charge processed shall be determined using one of the specified methods, and if this maximum temperature exceeds the previously-determined maximum temperature for that drying schedule, then the most recent maximum temperature shall be used in assessing emissions from the kilns beginning from the starting time that the charge was processed. If schedule parameters are changed, or a new schedule is created, the maximum entering-air temperature shall be established initially using one of the specified methods for the first charge processed using the new parameters, and subsequently audited every six months as described above.

Idaho DEQ states in the statement of basis (page 123):

This permit condition requires the facility to develop an O&M manual for the kilns. The maximum entering air temperature used to calculate the VOC emission factors specific to each wood species is dependent upon the thermocouples within the kilns. This O&M manual is to keep the thermocouples functioning according to the manufacturer specifications, which in turn will provide a more accurate measurement of the maximum entering air temperature to be used in calculating VOC emissions. The permittee shall also check the calibration semiannually, and develop a procedure and the frequency to audit the, "Pen Charts" which are used to log the maximum entering-air, to ensure compliance with the VOC emission limits.

Idaho DEQ is requiring IFG to conduct a spot audit every six months of the most recent charge (for every schedule employed during that previous six-month period) to confirm that the default maximum entering-air-temperature (used to calculate emission factors) is greater than or equal to the actual maximum entering-air-temperature. If it is not, then the greater actual maximum entering-air-temperature becomes the default for calculating the emission factor for that schedule from that point forward (beginning with the audited charge). This methodology implicitly allows for IFG to underestimate emissions for charges prior to the one being audited because the permit does not require those charges to be audited. In addition, the permit requires IFG to go back and amend monthly emission calculations (for the audited charge) if a higher maximum entering-air-temperature value is discovered through audit.

A preferable approach is for the permit to require IFG to use the actual charge-specific measured maximum entering-air-temperature to calculate an emission factor for every charge. Then, leave it to IFG's discretion to use that charge-specific measured temperature value or to use a "default" value equal to or greater than the measured value. To assure that IFG is not using "default" values less than actual measured maximum entering-air-temperature values, Idaho DEQ inspectors can perform annual on-site audit of charge-specific temperature monitoring records to assure that emissions are not being underreported.

Response 5: As discussed previously in response 4, the temperature monitoring process as proposed in the permit seemed the most reasonable and feasible. Therefore, the temperature monitoring process as proposed in the permit allows for a reasonable and feasible process at the facility to monitor and record the emissions from the kilns.

Comment 6: *c. Approve Alternative Lumber Dry Kiln Emission Factors Only after Public Review*
Idaho DEQ is enabling a change to the compliance demonstration (and by extension the facility-wide 249 tpy VOC emission limit) be accomplished without public review by allowing the use of alternative emission factors (to the ones specified in the permit) that it approves of in writing. The first bulleted item in proposed Permit Condition 4.6 states, in part:

VOC emissions from all of the kilns shall be calculated using the Dry Kiln Production and Temperature Monitoring Permit Condition and VOC emission factor equations contained in Table 4.3 (or emission factors approved by IDEQ in writing).

If Idaho DEQ wants to allow the use of alternative emission factors to demonstrate compliance with the 249 tpy VOC limit without having to revise the permit, then Idaho DEQ needs to define in the final permit the decision-making criteria it will be bound to employ for evaluating whether to approve the use of an alternative emission factor. If Idaho DEQ chooses not to develop such criteria, Idaho DEQ must finalize Permit Condition 4.6 strictly specifying that the emission factors in the permit are the only ones that can be used to calculate emissions.

Response 6: IDEQ removed, "or emission factors approved by IDEQ in writing." Therefore, only emission factors in the permit will be used to calculate emissions from the kilns.

3. For the Pneumatic Conveyance of Wood Residue:

Comment 7: *a. Specify Throughput Accounting Details in Compliance Demonstration for 249 tpy VOC Limit*
Permit Condition 5.3 of the permit states as follows:

The VOC emissions from all pneumatic conveyance of wood residue shall be tracked to demonstrate compliance with the facility-wide VOC emissions limit contained in Permit Condition 2.10.

The Statement of Basis adds the following on page 123:

This permit condition states the pneumatic VOC emissions shall be tracked to demonstrate compliance with the facility-wide VOC emission limit listed in permit condition 2.10.

The permit condition and associated explanation in the Statement of Basis are vague. The permit condition is not enforceable as a practicable matter. Idaho DEQ must finalize the permit condition to clearly specify how these emissions must be accounted for (e.g. species-specific continuous measurement and daily record of mass conveyed on a cyclone-by-cyclone basis, monthly accounting of wood residue generated and later either sold or consumed by B-1Wellons Hog Fuel Boiler). If a wood residue stream experiences pneumatic conveyance through a series of cyclones or baghouses, the permit needs to specify that the emission factor (the full factor and not just a portion of it) needs to be applied each instance the wood residue is conveyed to a different cyclone or baghouse.

Response 7: The species specific emissions factors are listed under the proposed PTC Permit Condition 5.8. The facility is required to track and report emissions from all pneumatic conveyance operations as a Title V facility. A permit condition was added requiring the facility to finalize and submit the methodology used to calculate the VOC emissions from this source. Therefore, IDEQ feels it is reasonable to require the facility to determine the method of tracking emissions from this source, and using facility inspections by IDEQ staff as a reasonable method to ensure compliance with this emission limit and process.

Comment 8: *b. Correct an Important Typographical Error*
A typographical error appears in the second paragraph of Permit Condition 5.8 which states, "When tracking a multiple-species charge, the permittee shall use the highest emission factor for any wood species in the charge." Perhaps Idaho DEQ was intending to state, "When tracking conveyance of wood residue involving multiple species, the permittee shall use the highest emission factor for any wood species in the residue mix."

Response 8: IDEQ changed the verbiage in proposed PTC Permit Condition 5.8 to, "When tracking conveyance of wood residue involving multiple species, the permittee shall use the highest emission factor for any wood species in the residue mix."

4. For the Fire Water Pump Engine and Waste Oil Heater:

Comment 9: *a. Account for Engine and Heater Emissions in Compliance Demonstration for 249 tpy NO_X and VOC Limits*

Permit Condition 2.10 limits 12-month rolling VOC emissions generated by dry kilns, B-1 Wellons Hog Fuel Boiler and pneumatic conveyance of wood residue to no greater than 249 tpy. Permit Condition 3.4 limits 12-month rolling NO_X emissions generated by B-1 Wellons Hog Fuel Boiler to 249.00 tpy. Although their NO_X and VOC emissions may be comparatively small, the fire water pump engine and waste oil heater must be considered when developing synthetic minor source emission limits. Idaho DEQ must address the engine and heater emissions in one of two ways. One option is to incorporate these units into the monthly 249 tpy compliance demonstration (including the specification of the emission factors). Require emission-unit-specific monitoring and recordkeeping necessary to calculate emissions and assure representativeness of emission factors. The second option is to set the facility-wide numerical ton-per-year emission limit sufficiently less than the major source threshold so as to accommodate the potential emissions of the engine and heater. Note that 249.500 rounds up to 250, and that a source that has the potential to emit 250 tpy or more of a regulated NSR pollutant is a PSD major source. If Idaho DEQ chooses this second option, the statement of basis needs to present the PTE of the engine and heater in explaining that the synthetic minor emission limit accomplishes what its label suggests.

Response 9: IDEQ feels it is reasonable to require the facility to determine the method of tracking emissions from these sources. Therefore, the fire water pump and the waste oil heater VOC emissions were added to the facility-wide emission limit of 249 T/yr. The waste oil heater and a permit condition for VOC tracking was added to section 6 of the proposed PTC. In addition the PTE in the S.O.B. was updated.

B. Other Suggestions for Improving the Permits

Comment 10: *1. Assure the Accuracy of Boiler Steam and Exhaust Gas O_2 Monitoring Equipment*

IFG is required to monitor and record the mass of steam generated each day by B-1 Wellons Hog Fuel Boiler. Condition 3.11.1 of the proposed PTC states:

The permittee shall monitor and record the total pounds of steam produced by the boiler on a daily basis. Records shall be kept on site for the most recent five-year period and shall be made available to DEQ representatives upon request.

Assuring compliance with the facility-wide 249 tpy NO_X and VOC emission limits is, in part, dependent upon accurate measurement of the mass of steam generated by B-1 Wellons Hog Fuel Boiler. The PTC specifies no additional steam monitoring requirements for B-1 Wellons Hog Fuel Boiler. IFG's PTC application (received by Idaho DEQ on December 11, 2018) provides no information on IFG's operation and maintenance (O&M) procedures. To ensure that valid steam generating data is obtained, the permit could specify the following: (a) measurement system type and/or technology (e.g. multivariable (differential pressure, static pressure and temperature) mass flow transmitter employing piezoresistive pressure sensors and associated primary element such as an orifice plate, venturi tube, flow nozzle or multi-point pitot tube) used to measure daily steam generation, (b) the method(s) used to calibrate each component, and (c) calibration frequency for each component. This is consistent with guidance presented in Chapter H (Elements of an Effective Permit) of EPA's October 1990 draft document entitled, "New Source Review Workshop Manual – Prevention of Significant Deterioration and Nonattainment Area Permit."[11] On page H.7 of the draft workshop manual, EPA states, "O&M procedures should be specified (in the permit) for the monitoring instruments (such as zero, span, and other periodic checks) to ensure that valid data are obtained. EPA provides a discussion of flow rate measurement systems in section 4.4 of its August 1998 revised draft Compliance Assurance Monitoring (CAM) Technical Guidance Document.[12]

EPA Region 10 suggests Idaho DEQ request IFG to submit the information referred to above regarding B-1 Wellons Hog Fuel Boiler's steam monitoring system. Assuming IFG submits complete information and that Idaho DEQ finds the steam monitoring system and IFG's associated O&M procedures to be acceptable, EPA Region 10 suggests Idaho DEQ finalize the permit with additional conditions that specify (a) the measurement system type and/or technology, (b) the method(s) used to calibrate each component, and (c) calibration frequency for each component.

Alternatively, Idaho DEQ may finalize a permit condition requiring IFG to develop and submit an O&M plan for review and approval. This is particularly convenient if IFG does not already possess an

[11] https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf
[12] https://www.epa.gov/sites/production/files/2016-05/documents/cam-tgd.pdf

approvable O&M plan. Idaho DEQ can specify in the permit what the O&M plan needs to address, such as (a) description of sensors, measurement principle, and measurement system components, (b) expected accuracy and precision ranges, (c) calibration techniques, and (d) quality assurance and quality control procedures. EPA Region 10 suggests using the aforementioned CAM guidance document as a guide.

The discussion above regarding the permit assuring the accuracy of boiler steam monitoring data applies also to the data generated by exhaust gas O_2 concentration monitoring equipment

Response 10: The facility is applicable to 40 CFR 63 DDDDD and will have three years from the date of permit issuance to come into compliance with the applicable federal regulation. Therefore, IDEQ will be using the requirements and timeframes listed in 40 CFR 63 DDDDD.

Comment 11: *2. Assure Representative Boiler Operating Conditions During NO_X and VOC Emission Factor Testing*
It appears that emission factor verification testing must be conducted in accordance with IDAPA 58.01.01.157. Given that the permit (chiefly Permit Conditions 2.6 and 3.15) does not specify the operating conditions under which testing is to be conducted, it would appear that IDAPA 58.01.01.157.02.a requires the test be conducted in accordance with conditions established by Department approval of a source test protocol or at worst-case normal operating conditions. IDAPA 58.01.01.157.02.a and b state:

The test must be conducted under operational conditions specified in the applicable state or federal regulation, rule, permit, order, consent decree or by Department approval. If the operational requirements are not specified, the source should test at worst-case normal operating conditions. Worst-case normal conditions are those conditions of fuel type, and moisture, process material makeup and moisture and process procedures which are changeable or which could reasonably be expected to be encountered during the operation of the facility and which would result in the highest pollutant emissions from the facility.

The Department may impose operational limitations or require additional testing in a permit, order or consent decree if the test is conducted under conditions other than worst-case normal.

It is EPA Region 10's understanding that Idaho DEQ typically limits a wood-fired boiler's steam generating rate to that observed during a RM5 particulate matter (PM) source test if the test was not conducted at the boiler's maximum steaming rate. Idaho DEQ assumes worst-case normal operating conditions for PM emissions are experienced at maximum steaming rates when PM loading to the post-combustion control device is highest. EPA Region 10 is aware of test information (for a hog fuel spreader stoker boiler employing a multiclone and electrostatic precipitator to reduce PM emissions) demonstrating that maximum PM emission rates (lb/MMBtu and lb/hr) are not always generated at the maximum steaming rate. And for NO_X and VOC, it is not obvious that operating at the maximum steaming rate represents the worst-case operating condition.

IDAPA 58.01.01.157 does not require a source test protocol be submitted for review and approval. The proposed permit does not require IFG to submit a source test protocol for emission factor testing. Permit Condition 2.6 of the proposed permit encourages the submittal of a test protocol, but not a requirement to do so. Under circumstances such as this where the selection of worst-case normal operating conditions does not appear straightforward, it is appropriate for the permittee to be required to submit a source test protocol for approval. Not only could the protocol propose (and explain) the steaming rate(s) at which to propose testing, the protocol could also address worst-case normal operating conditions for other relevant parameters (e.g. exhaust gas O_2 concentration and fuel moisture content) that need to be monitored during the source test. Idaho DEQ's October 2015 Source Test Guidance Manual (Version 2.0) states that a source test protocol mandated by a permit typically contains, among other things:

Explanation of the worst-case normal operating conditions (Section 1.4, "General Source Test Conditions"), rated capacity of the process, and conditions at which the process and any associated air pollution control devices will be operated during the testing.

EPA Region 10 suggests that the permit be finalized to require IFG to submit a source test protocol for approval in advance of NO_X and VOC testing of the B-1 Wellons Hog Fuel Boiler.

Response 11: A permit condition requiring the facility to submit a source test protocol in advance of the source test, listing what the facility's, "worst-case" normal conditions was added to the permit.

Comment 12: *3. Evaluate the Need for Lumber Moisture Content Monitoring in the Kilns*

The VOC emission factors in Table 4.3 of the permit are representative of lumber dried to no less than 15% moisture content, dry basis. Drying lumber to lower moisture contents can lead to increased emissions. Assuring compliance with the facility-wide 249 tpy VOC emission limit is, in part, dependent upon accurate measurement of the lumber moisture content over the duration of the run. To provide assurance that IFG will not be underreporting its lumber dry kiln VOC emissions, Idaho DEQ should become knowledgeable of the lumber products IFG manufactures and the associated standards for the products' maximum moisture content. If Idaho DEQ determines that IFG does not (and will not) dry its lumber to less than 15% moisture content, dry basis, then it is not critical that the permit establish a limit on the lumber's final moisture content. And if there is no limit, then it is not necessary to require IFG to monitor and record moisture content either.

Alternatively, Idaho DEQ should consider creating a work practice standard prohibiting the lumber from being dried to a moisture content of less than 13%, dry basis. The work practice standard could be accompanied by monitoring, recordkeeping and reporting requirements. See EPA Region 10's PSD permit issued to PotlatchDeltic for construction of LK-6.[13]

Another option is for Idaho DEQ to attempt to scale up the emission factors to accommodate the additional emissions associated with drying the lumber beyond 15% percent moisture content, dry basis. In that case, the final permit needs to specify the scaled-up emission factors and the statement of basis needs to explain the methodology employed to derive them. Whether the final permit limits moisture content to 13% or not, the final permit needs to require IFG monitor and record lumber moisture content and calculate, record and report emissions reflecting consideration of each charge's final moisture content.

Response 12: The facility's application states they generally dry lumber to around 15% moisture content. In addition, in our discussions with the facility they have stated that the 15% moisture content is, "industry standard" for the quality of lumber they manufacturer for their customers. Therefore, IDEQ believes requiring an additional requirement to determine the moisture content is not warranted.

Comment 13: *4. Document VOC Potential Emissions*
Tables 2 and 3 (pages 8 and 9) of the statement of basis, in part, list the kilns' pre and post-project collective potential VOC emissions as 188 tpy. Table 2 should list pre-project VOC potential to emit (PTE) for the kilns as 371 tpy as explained briefly below.

Idaho DEQ refers the reader to Appendix A of the statement of basis for a presentation of the calculations supporting the values in the two tables. On the sixth page of Appendix A, a value of 193 tpy is calculated for the kilns as follows:

193 tpy = (250,000 mbf/yr) * (1.54 lb/mbf) * (ton/2000 lb)

where 250,000 mbf/yr is the 12-month rolling restriction on kiln production (Condition 4.4 of the permit) and 1.54 lb/mbf is apparently the permittee's estimate for a VOC emission factor based upon the permittee's assumption for relative species-specific kiln throughput (% of total) as follows: 30.0% white fir, 60% douglas fir and 10% ponderosa pine. This is not a calculation of the kilns' PTE. In the absence of a species-specific restriction on kiln throughput, one must assume the highest-emitting species is the only species processed through the kiln during a 12-month period. The calculations in Appendix A suggests that IFG dries ponderosa pine and western white pine at a maximum entering-air-temperature of 205°F. According to IFG, this corresponds to a VOC emission factor of 2.97 lb/mbf using equations listed in the permit. Using this worst-case emission factor (as opposed to weighted-average value of 1.54 lb/mbf) and an annual capacity of 250,000 mbf/yr results in VOC PTE estimate of 371 tpy rather than either 188 or 193 tpy. Thus, it becomes apparent that IFG needs Idaho DEQ to further limit emissions in order to reduce facility-wide PTE to 249 tpy in order to become a minor source with respect to the PSD permit program, as has been done in the permit to construct.

Response 13: A footnote has been added to the S.O.B to reflect that the facility's worst case scenario for VOC emissions from the kilns is 371 T/yr. However, due to the Facility-Wide VOC emission limit of 249 T/yr, the total VOC emissions will be presented as 249 T/yr. This was done because the VOC emissions can fluctuate between emission units as long as the total remains under 249 T/yr.

Comment 14: *5. Document PM10/2.5 Potential Emissions*

[13] https://www.epa.gov/caa-permitting/potlatchdeltic-land-and-lumber-llc-prevention-significant-deterioration-psd-air

Tables 2 and 3 (pages 8 and 9) of the statement of basis, in part, list the kilns' pre and post-project collective potential PM10/2.5 emissions as 24 tpy. The statement of basis does not explain the basis for that value. That value overstates the kilns' PTE. EPA Region 10 suggests the tables list PM10/2.5 PTE for the kilns as no greater than 7.6 tpy as explained briefly below.

Idaho DEQ refers the reader to Appendix A of the statement of basis for a presentation of the calculations supporting the values in the two tables. On the sixth page of Appendix A, values of 4.75 and 4.13 tpy are calculated for the kilns for PM10 and PM2.5, respectively, as follows:

4.75 tpy PM10 = (250,000 mbf/yr) * (0.038 lb/mbf) * (ton/2000 lb)
4.13 tpy PM2.5 = (250,000 mbf/yr) * (0.033 lb/mbf) * (ton/2000 lb)

where 250,000 mbf/yr is the 12-month rolling restriction on kiln production (Condition 4.4 of the permit) and 0.038 and 0.033 lb/mbf are apparently "negotiated" emission factors for PM10 and PM2.5, respectively, agreed upon by IFG and Idaho DEQ considering western hemlock and douglas fir test results. According to the statement of basis, the factors are based upon testing conducted by Horizon Engineering and performed at Oregon State University (OSU) on behalf of Willamette Industries in 1998. EPA Region 10 has previously communicated to Idaho DEQ our concerns about the accuracy of the Horizon Engineering 1998 testing conducted at OSU due to lack of calibration of flow metering equipment at flow rates experienced during actual testing. In that August 9, 2019 communication to Idaho DEQ, EPA Region 10 pointed out the existence of recent kiln testing conducted by NCASI producing PM10/2.5 emission factor of 0.061 lb/mbf. EPA Region 10 has more confidence in the validity of the NCASI test results.

At a minimum, the PM10/2.5 PTE should be at least 6.4 tpy by employing an emission factor of 0.051 lb/mbf based upon Horizon Engineering 1998 testing of western hemlock at OSU as follows:

6.4 tpy PM10/2.5 = (250,000 mbf/yr) * (0.051 lb/mbf) * (ton/2000 lb)

Because IFG is not restricted from exclusively drying western hemlock in their kilns, the PTE should reflect use of western hemlock emission factor. Western hemlock is higher emitting than douglas fir for PM10/2.5 based upon the Horizon Engineering test results.

A more conservative estimate of PM10/2.5 PTE is reflected in the following calculation resulting in PTE of 7.6 tons per year by employing the NCASI emission factor of 0.061 lb/mbf (for southern yellow pine) as follows:

7.6 tpy PM10/2.5 = (250,000 mbf/yr) * (0.061 lb/mbf) * (ton/2000 lb)

In no case is the kilns' PM10/2.5 PTE as high as 24 tpy as presented in Tables 2 and 3 of the statement of basis.

Response 14: As stated previously in response 3, PM_{10} emissions were modeled under a previous permitting action to determine the maximum annual lumber produced of 250 million board feet per year. The facility has not proposed a modification that would trigger new source review or modeling for PM_{10}.