

Air Permit Review

Region: Wilmington Regional Office
County: Columbus
NC Facility ID: 2400125
Inspector's Name: Russell Morgan III
Date of Last Inspection: 09/13/2010
Compliance Code: 3 / Compliance - inspection

Permit Issue Date:

Facility Data			Permit Applicability (this application only)
Applicant (Facility's Name): West Fraser, Inc. - Armour Lumber Mill Facility Address: West Fraser, Inc. - Armour Lumber Mill 361 Federal Road Riegelwood, NC 28456 SIC: 2421 / Sawmills & Planing Mills General NAICS: 321113 / Sawmills Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			SIP: N/A NSPS: N/A NESHAP: 15A NCAC 2D .1109, 63-DDDDD PSD: N/A PSD Avoidance: N/A NC Toxics: N/A 112(r): N/A Other: N/A
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	Application Number: 2400125.09A Date Received: 09/14/2009 Application Type: 112(j) Part II Application Schedule: TV-Significant Existing Permit Data Existing Permit Number: 02248/T22 Existing Permit Issue Date: 08/06/2007 Existing Permit Expiration Date: 07/31/2011
Peter Provencher Plant Manager (910) 655-4106 361 Federal Road Riegelwood, NC 28456	Peter Provencher Plant Manager (910) 655-4106 361 Federal Road Riegelwood, NC 28456	Peter Provencher Plant Manager (910) 655-4106 361 Federal Road Riegelwood, NC 28456	
Review Engineer: Fern Paterson, P.E. Review Engineer's Signature: _____ Date: _____		Comments / Recommendations: Issue: 02248/T23 Permit Issue Date: _____ Permit Expiration Date: 07/31/2011	

I. Purpose of Application

The North Carolina Division of Air Quality (NC DAQ) received a Part 2 MACT "Hammer" application pursuant to 15A NCAC 2D .1109 for the West Fraser, Inc. facility located in Riegelwood, North Carolina (Armour Lumber Mill), on September 14, 2009. The application is for one existing wet wood-fired boiler, as follows:

ES-BW-1	wood-fired boiler (104.336 MMBtu/hr maximum heat input)	CD-3	multicyclone (72 tubes, each nine inches in diameter) venting to
		CD-2	venturi wet scrubber (350 gallons per minute minimum liquid injection rate, based on a 3-hour average)

The facility has an additional permitted boiler (**ID No. ES-BW-2**) that has not yet been constructed. This boiler was not included in the analysis, and does not have case-by-case limits pursuant to 15A NCAC 2D .1109.

This permit has been updated to include the CAA § 112(j) provisions for the affected boilers.

II. Permit Modifications/Changes

The following table describes the modifications to the current permit.

Page(s)	Section	Description of Change(s)
1	Permit Cover Page	Amend permit revision numbers and issuance/effective dates.
3	Section 1	Add “Case-By-Case MACT” designation to the affected boiler (ID No. ES-BW-1). Note that the other listed boiler, ID No. ES-BW-2, has not yet been constructed and therefore is not affected by the provisions of 15A NCAC 2D .1109.
4	Section 2.1.A., Table	Add 15A NCAC 2D .1109 to the list of applicable regulations.
7-9	Section 2.1.A.5.	Add Section to include Case-By-Case MACT Hammer requirements applicable to the affected boilers.
18-25	Section 3	Update General Provisions with the most recent revision (v. 3.3)

III. Regulatory Review

- A. **15A NCAC 2D .1109 – CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters** – On July 20, 2007, the D.C. Circuit Court vacated the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, which had been promulgated under 40 CFR 63, Subpart DDDDD. The North Carolina Attorney General’s office has determined that the NESHAP vacatur equates to the failure of the U.S. EPA to promulgate a standard as required under Section 112(d) of the Clean Air Act (CAA). As a result, the site-specific Maximum Achievable Control Technology (MACT) standards required under CAA §112(j), commonly referred to as the MACT “hammer” provisions, have been triggered. North Carolina regulations implementing the MACT hammer are found at 15A NCAC 2D .1109.

NC DAQ has developed this guidance to provide standards and compliance procedures that it has determined meet the requirements of § 112(j) (<http://daq.state.nc.us/permits/112j/>).

On September 14, 2009, the NC DAQ received a Part 2 MACT “Hammer” application from this facility asking that the NC DAQ establish 112(j) emissions limitations in accordance with NC DAQ’s recommendations.

1. One (1) green wood-fired boiler (ID No. ES-BW-1) with associated multicyclone (ID No. CD-3) and venturi wet scrubber (ID No. CD-2)

The facility proposed to comply with mercury (Hg) and carbon monoxide (CO) emission limitations that are consistent with the NC DAQ application guidance (<http://daq.state.nc.us/permits/112j/>). NC DAQ has developed this guidance to provide standards and compliance procedures that it has determined meet the requirements of § 112(j). The facility has chosen to comply with a Health-Based Compliance Alternative (HBCA) for both manganese (Mn) and hydrogen chloride (HCl). A discussion of each proposed standard proposed pursuant to 15A NCAC 2D .1109 is provided below:

a. Total Selected Metals (TSM), including HBCA for Manganese

In accordance with the 112(j) application guidance provided by NC DAQ, affected facilities may propose either a total selected metal (TSM) limit or a filterable PM limit. This facility has chosen to comply with the TSM limit. In general TSM includes arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, and selenium. However, by showing it is eligible for the HBCA for Mn, the facility may comply with the TSM emission limitation proposed in the NC DAQ application guidance without including manganese in the compliance demonstration.

This facility used the look-up table approach provided in Section 15 of the NC DAQ application guidance, which is identical in substance to Appendix A of the vacated 112(d) standard. The look-

up table approach to the HBCA requires the facility to determine the Allowable Manganese Emission Rate according to the following steps:

- Calculate the weighted average stack height (in meters, m) using the following equation:

$$H_{Mn} = \frac{\sum(E_{Mn,s} \times H_s)}{E_{Mn,T}}$$

Where:

- H_{Mn} = Weighted average stack height (in m);
- s = Individual affected emission sources;
- $E_{Mn,s}$ = Maximum hourly Mn emissions from emission point s (in lbs/hr);
- H_s = Height of each individual stack s
- $E_{Mn,T}$ = Total maximum hourly Mn emissions (in lbs/hr)

- Determine the shortest distance to property boundary (in m) from any affected source.
- Use the look-up table provided in the NC DAQ application guidance, which is identical to the look-up table provided in the vacated 112(d) standard, to determine the Allowable Manganese Emission Rate (in lbs/hr)
- Determine the worst-case manganese emission rates from each affected source (in lbs/hr) and sum the values to determine the total manganese emission rate.
- Compare the allowable manganese emission rate to the total manganese emission rate. If the total manganese emission rate is less than the allowable emission rate provided in the table, the facility is eligible for the HBCA.

The summary of stack heights and distance of stacks from the property boundary for each affected source is provided in the following table:

Affected Source	Distance to Property Boundary (m)	Stack Height (m)	Potential Mn Emission Rate* (lbs/hr)
ES-BW-1	175	18.3	0.17
Total Manganese Emission Rate:			0.17

* Potential Mn emissions are based on the heat input capacity of the boiler and the AP-42 emission factor for wood combustion (0.0016 lbs/MMBtu).

Using the look-up table, as provided below, the maximum allowable manganese emission rate is **0.47 lbs/hr**.

Table. Allowable Manganese Emission Rate (lbs/hr)

Stack Ht. (m)	Distance to Property Boundary (m)											
	0	50	100	150	200	250	500	1000	1500	2000	3000	5000
5	0.29	0.29	0.29	0.29	0.29	0.29	0.36	0.72	0.93	0.93	0.93	0.94
10	0.47	0.47	0.47	0.47	0.47	0.47	0.49	0.82	1.08	1.08	1.08	1.08
20	0.97	0.97	0.97	0.97	0.97	0.97	0.97	1.06	1.45	1.51	1.51	1.51
30	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.09	1.49	1.72	2.02	2.04
40	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.12	1.53	1.79	2.08	2.42
50	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.15	1.58	1.87	2.15	2.51
60	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.18	1.62	1.95	2.21	2.61
70	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.22	1.67	2.03	2.28	2.72
80	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.25	1.71	2.12	2.35	2.84
100	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.32	1.81	2.29	2.50	3.10
200	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.71	2.30	2.92	3.48	4.81

Because the total manganese emission rate is less than the allowable manganese emission rate, the facility is eligible to use the HBCA, and it need not include manganese emissions in its compliance demonstrations for TSM.

b. Mercury (Hg)

This facility has proposed a mercury limit of 5.0e-06 lbs/MMBtu, which is consistent with the NC DAQ application guidance.

c. Carbon Monoxide (CO)

This facility proposed a CO limit of 834 ppmvd, corrected to 7% oxygen, which is consistent with the NC DAQ application guidance.

d. HCl

In the 112(j) application guidance, NC DAQ provided for a risk-based HBCA that is consistent with the approach provided by U.S. EPA in Appendix A of the vacated 112(d) standard. This facility proposed to establish a facility-specific HCl-equivalent emission rate using this HBCA approach. A summary of the HBCA eligibility demonstration and resulting emissions limitations is provided below.

The look-up table approach to the HBCA requires the facility to determine the Allowable Toxicity Weighted Emission Rate in HCl-equivalent according to the following steps:

- Determine the worst-case HCl and Cl₂ emission rates (in lbs/hr) and calculate the toxicity-weighted emission rate in HCl-equivalents (in lbs/hr) using the following equation:

$$TW = E_{HCl} + E_{Cl_2} \left(\frac{RV_{HCl}}{RV_{Cl_2}} \right)$$

Where “RV” denotes the reference values. The reference value of HCl is 20 µg/m³. The reference value for Cl₂ is 0.2 µg/m³.

- Calculate the weighted average stack height (in meters, m)
- Determine the distance to property boundary (in m)
- Use the look-up table provided in the NC DAQ application guidance, which is identical to the look-up table provided in the vacated 112(d) standard, to determine the Allowable Toxicity Weighted Emission Rate in HCl-equivalent (in lbs/hr)
- Compare the Allowable Toxicity Weighted Emission Rate in HCl-equivalent to the maximum toxicity-weighted emission rate to determine eligibility.

HCl-Equivalent Emission Rates

The calculation of the HCl-equivalent emission rates for the affected sources at this facility are provided below.

Boiler ID No.	HCl Emission Rate (lbs/hr)	Cl ₂ Emission Rate (lbs/hr)	HCl-Equivalent Emission Rate (lbs/hr)
ES-BW-1	1.982	0.082	10.182
Total HCl-Equivalent Emission Rate:			10.182

* Potential HCl and Cl₂ emissions are based on the heat input capacity of the boiler and the AP-42 emission factors for wood combustion (Cl₂: 0.00079 lbs/MMBtu, HCl: 0.019 lbs/MMBtu).

Calculate the Weighted Average Stack Height & Determine the Distance to Property Boundary

The summary of stack heights and distance of stacks from the property boundary for each affected source is provided in the following table:

Affected Source	Distance to Property Boundary (m)	Stack Height (m)	HCl-Equivalent Emission Rate (lbs/hr)
ES-BW-1	175	18.3	10.182

Determine the Allowable Toxicity Weighted Emission Rate in HCl-Equivalents
Based on the following look-up table:

Table. Allowable Toxicity Weighted Emission Rate Expressed in HCl-Equivalents (lbs/hr)

Stack Ht. (m)	Distance to Property Boundary (m)											
	0	50	100	150	200	250	500	1000	1500	2000	3000	5000
5	114.9	114.9	114.9	114.9	114.9	114.9	144.3	287.3	373.0	373.0	373.0	373.0
10	188.5	188.5	188.5	188.5	188.5	188.5	195.3	328.0	432.5	432.5	432.5	432.5
20	386.1	386.1	386.1	386.1	386.1	386.1	386.1	425.4	580.0	602.7	602.7	602.7
30	396.1	396.1	396.1	396.1	396.1	396.1	396.1	436.3	596.2	690.6	807.8	816.5
40	408.1	408.1	408.1	408.1	408.1	408.1	408.1	448.2	613.3	715.5	832.2	966.0
50	421.4	421.4	421.4	421.4	421.4	421.4	421.4	460.6	631.0	746.3	858.2	1002.8
60	435.5	435.5	435.5	435.5	435.5	435.5	435.5	473.4	649.0	778.6	885.0	1043.4
70	450.2	450.2	450.2	450.2	450.2	450.2	450.2	486.6	667.4	813.8	912.4	1087.4
80	465.5	465.5	465.5	465.5	465.5	465.5	465.5	500.0	685.9	849.8	940.9	1134.8
100	497.5	497.5	497.5	497.5	497.5	497.5	497.5	527.4	723.6	917.1	1001.2	1241.3
200	677.3	677.3	677.3	677.3	677.3	677.3	677.3	682.3	919.8	1167.1	1390.4	1924.6

For a stack height of 10 meters and a distance to boundary of 150 meters, the allowable toxicity weighted emission rate is **188.5 lbs/hr.**

The maximum HCl-equivalent emission rate (7.2 lbs/hr) is less than 4% of the allowable toxicity-weighted emission rate determined using the look-up table approach. Based on this large compliance margin, NC DAQ had determined that the facility is eligible to use the HBCA compliance option for HCl for its two wood-fired boilers.

2. One (1) green wood-fired boiler (ID No. ES-BW-2) with associated multicyclone (ID No. CD-5) and electrostatic precipitator (ID No. CD-4)

This boiler has not yet been constructed. This boiler was not included in the HBCA analysis, and does not have case-by-case limits pursuant to 15A NCAC 2D .1109.

IV. Draft Permit Review Summary

Dean Carroll and Russell Morgan of the Wilmington Regional Office were provided a draft permit and draft permit review document on March 30, 2011.

Jim Thornton of West Fraser was provided a draft permit for review on March 23, 2011.

Public notice of the proposed permit was posted on the NCDAQ website on March 30, 2011.

Ms. Katy Forney and Ms. Gracy DeNois (U.S. EPA, Region IV) were provided a draft permit for review on March 30, 2011.

V. Recommendations

This permit modification application for the West Fraser, Inc. facility located in Riegelwood, Columbus County, North Carolina has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

Issue Permit No. 02248T23