



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



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**Verso Bucksport LLC  
Hancock County  
Bucksport, Maine  
A-22-77-10-A**

**Departmental  
Findings of Fact and Order  
New Source Review  
NSR #8**

**FINDINGS OF FACT**

After review of the amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A, §344 and §590, the Maine Department of Environmental Protection (Department) finds the following facts:

**I. REGISTRATION**

A. Introduction

Facility	Verso Bucksport LLC (Verso Bucksport)
License Amendment Type	06-096 CMR 115 Minor Modification
NAICS Code	322121 (pulp mill that produces paper)
Nature of Business	Groundwood and thermomechanical pulp; papermaking
Facility Location	2 River Road, Bucksport, Maine

Verso Bucksport LLC (Verso Bucksport) operates a pulp and paper mill and is licensed as a major source through its Part 70 Air Emission License (A-22-70-A-I, December 30, 2004) with various Part 70 amendments and New Source Review amendments.

Verso Bucksport submitted a New Source Review minor amendment application to revise the start-up and shake-down period end date for Boiler 8's biomass capacity upgrade project from August 15, 2013 to February 15, 2014 and to extend the stack testing deadlines for ammonia, particulate matter (PM), and PM<sub>2.5</sub> to allow for fine-tuning of the boiler at full capacity prior to testing. In addition, for compliance purposes, Verso Bucksport has requested a clarification on calculating the initial 30 day rolling average lb/MMBtu emission limits. This minor amendment application proposes to adjust the language in air emission license A-22-77-4-A (November 29, 2010), as amended in air emission licenses A-22-77-6-M (June 30, 2011) and A-22-77-9-M (April 9, 2013).

To date, the facility has faced various issues while attempting to fire the upgraded Boiler 8 at full biomass capacity for a sustained period; however, progress

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continues to be made as detailed in this amendment. The Boiler 8 biomass capacity upgrade project included licensing an increased boiler biomass firing rate and the addition of a steam turbine generator. Verso Bucksport is not proposing to increase the fuel throughput, heat input, or Best Available Control Technology (BACT) emission limits over what was licensed in the original new source review license for the Boiler 8 biomass capacity upgrade project.

B. Emission Equipment

The emission unit addressed in this amendment is Boiler 8 (814 MMBtu/hr). The licensed allowed fuels include biomass (wood waste, wood chips, bark, paper mill sludge, waste papers, and fiber core ends), fuel oil (specification waste oil, off-specification waste oil, and fuel oil), and natural gas.

C. Application Classification

This amendment will not increase emissions of any pollutant and only lengthens the start-up and shake-down period of the Boiler 8 project to allow for necessary continued alterations to the unit and revises the stack test dates. Therefore, the Department has classified the application as a minor modification to New Source Review licenses A-22-77-4-A, A-22-77-6-M, and A-22-77-9-M. The application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (as amended).

## II. MINOR MODIFICATION DESCRIPTION

As part of the Boiler 8 biomass capacity upgrade project, Verso Bucksport has requested additional time for the upgraded Boiler 8 lb/MMBtu emission limits and stack test requirements to take effect. These date revisions are necessary as adjustments and changes to Boiler 8 operations continue to be investigated and applied in order to achieve the goal of being able to operate the boiler at sustainable full load conditions. The request does not involve any changes to Boiler 8's lb/hr emissions limits, applicable from the time the initial upgrade was complete.

A. Background

Verso Bucksport's 814 MMBtu/hr multi-fuel Boiler 8 was licensed in amendment A-22-77-4-A for an increase in the biomass feed rate of the unit (from 26 tons/hour to approximately 80 tons/hour) to allow for the production of additional energy from a new 25 MW steam turbine generator. Initially, the new lb/MMBtu emission limits were to be effective 9 months after startup of the upgraded boiler. Subsequent amendment A-22-77-6-M was issued to clarify when the new lb/MMBtu boiler emission limits would take effect. The lb/MMBtu limits were to take effect 6 months from the installation and check-out of the new steam turbine

generator. This timeframe, based on the turbine rather than the boiler, took into account the following facts: consistent operation of Boiler 8 at full capacity would not occur until the extra steam produced could be used in the generator and the boiler would need to undergo final tuning at the normal, near-full capacity operating scenario.

Various combustion boiler modifications occurred to allow for the additional biomass firing capacity, including upgrades to the air system for suspension fuel firing. On November 15, 2012 the final testing on the steam generator turbine took place, triggering the 6 month shake-down period. However, as the load of Boiler 8 increased and the suspension fuel firing system was utilized, operational complications arose.

As the facility continued to work towards finding solutions to get Boiler 8 running at the full steam loads predicted by the modification design specification, Verso Bucksport requested three more months to be added to the shake-down period (from 6 months to 9 months from turbine commissioning). The Department approved a 9 month shake-down period in air emission license amendment A-22-77-9-M (April 9, 2013), defining August 15, 2013 as the end of the shake-down period. As described in more detail below, Verso Bucksport continues to have operational issues requiring a more substantial undertaking to overcome than expected. The current amendment request to set February 15, 2014 as the end of the shake-down period allows for the appropriate permanent fixes to Boiler 8 to take place. Notwithstanding the issues occurring with Boiler 8 operations, Verso Bucksport is required to meet the upgraded Boiler 8 lb/hr emission limits. The existing lb/MMBtu emission limits shall also be met until such time as the upgraded Boiler 8 lb/MMBtu emission limits become effective.

#### B. Progress-To-Date

##### *Previous Progress*

The Bucksport Renewable Energy Project, consisting of an upgrade of Boiler 8 to increase the unit's biomass capacity, included installation of a new fuel delivery system for grate firing, a biomass suspension firing system, a new over fire air system, and a Selective Non Catalytic Reduction (SNCR) NO<sub>x</sub> control system. The modified boiler was started at the end of May 2012, but the installation of the associated steam turbine generator did not occur until the fall of 2012. The initially licensed shake-down period was revised to allow for the tuning of the boiler to coincide with the commissioning of the new turbine, with an end shake-down date of May 2013. Until the commissioning of the turbine on November 15, 2012, the boiler was operated at low loads (approximately 250,000 lbs/hr of steam) since there was no place to put the steam. The boiler was optimized at these loads and the emissions were kept within the short term lb/hr limits of the new source review license and worked to meet the long term NO<sub>x</sub> and CO

lb/MMBtu emission limits as best they could without the use of the SNCR system. The SNCR could not be used because the temperatures in the boiler at reduced loads were lower than the temperature needed to make effective use of the urea. Using the urea at low temperatures would have caused ammonia slip and damage to the boiler from the emitted ammonia.

Once the boiler was able to fire at higher loads after the commissioning of the turbine, the suspension fuel firing system was used resulting in issues of char 'carry over' with bulky, unburned pieces of ash exiting the boiler. The char caused serious problems in the ash handling and collection systems. Verso Bucksport was forced to operate the boiler at much-reduced steam loads (between approximately 200,000 lb/hr to 280,000 lb/hr steam versus approximately 400,000 lb/hr steam at expected normal full load).

During the second week in January 2013, Verso Bucksport completely shut down the boiler and implemented many corrective actions in an attempt to solve the operational problems. While the measures improved overall boiler operations, the char carry-over issue was not fully resolved and the boiler still couldn't be operated at full load for any extended period because of the excessive char carry over. Further work was done on design changes to the boiler's air flows, over fire air systems, fuel delivery patterns, and combustion patterns. However, the char carry-over problem was not totally solved.

Over the course of attempting to ramp up Boiler 8's steam load, the char carry-over issue resulted in multiple boiler outages due to fires and damage in the ash handling systems and electrostatic precipitator (ESP). In between trouble shooting the unit, diagnostic emission testing was performed on Boiler 8 in February and March, 2013 to evaluate emissions and the results were below the particulate matter lb/MMBtu license limit. In addition, the continuous emission monitors (CEMs) data for NO<sub>x</sub> and CO also showed values below the license lb/hr limits. However, opacity exceedances did occur periodically until mid-April 2013 due to the high char carry-over and fires in the ESP.

A second shake-down date revision was submitted and granted, resulting in a date of August 15, 2013 rather than May 2013. The new shake-down date was requested to further tune the boiler; modify the over-fire air system; fuel distribution pattern and ash handling systems; and to eliminate the char carry-over issues.

#### *Present Progress*

Since April 2013, equipment has been installed and new operating procedures have been implemented to increase fuel firing while maintaining compliance with emissions standards. The equipment installed or modified includes: the addition of rotary valves on the multi-clone leading ash hoppers and ESP hopper's

conveyors discharges to increase the amount of ash removal capacity over the double dump valves, the removal of upper level oil guns (blanked off) to decrease air infiltration, modifications to the hogged fuel screen to obtain a smaller fuel particle size going to the boiler, and the addition of automatic valves to the ash collection system. An internal 'trigger point' power plant operator procedure was also implemented to prevent equipment damage and to reduce the potential of excessive emissions. Upon hitting any of the triggers, the power plant operators reduce the boiler load to no more than 40 tons/hr of fuel on the grate and suspension fuel is removed from the combustion process. Combustion air and grate setups are adjusted to these boiler operating conditions and then when the trigger point(s) issue is resolved, baseline boiler operations resume at approximately 300,000 lb/hr of steam. The triggers include:

- Visual observation of ash (greater than 50% char in the ash from the trailing dust collectors for more than 2 hours; any significant char in the ash from the precipitator sand tank).
- Opacity greater than 2.5% and trending up.
- Alarm set points for grate temperatures greater than 800°F which cannot be brought back in range with normal fuel and air bias changes.
- Precipitator temperature greater than 390°F and precipitator conveyors greater than 160°F.
- CO greater than 200 ppm for more than 30 minutes.
- Inability to control excess O<sub>2</sub>.
- Drops in dust collector temperatures, indicating plugging.
- Ash puffing from precipitator conveyor seals.

At this time, Boiler 8's baseline steam load is approximately 300,000 lb/hr steam with some suspension firing, which is below the 400,000 lb/hr steam load goal. The boiler can operate at the 300,000 lb/hr steam level without fires, emissions issues, or tripping off-line. However, Verso Bucksport cannot achieve the licensed goal of 400,000 lb/hr of steam with the current system and the steps necessary to operate consistently at the higher level cannot be achieved prior to August 15, 2013.

Verso Bucksport has undertaken several rounds of internal combustion boiler modeling and on-site boiler tuning. Based on this information, it is expected that Boiler 8 can meet the steam production goal and the emissions limits with additional boiler modifications that include: a newly configured over-fire air system and rearranging the suspension fuel burners to a lower level. There are no plans to increase the firing rate of the boiler or to change the emission limits from those found in the original license for the project.

C. Request for lb/MMBtu Timeframe Extension

Verso Bucksport continues to work towards operating Boiler 8 and the associated steam turbine generator to meet the original production goals in the shortest time possible; however, the current shake-down period deadline (ending August 15, 2013) will not allow enough time to troubleshoot, engineer, and implement all of the necessary corrective actions. Verso Bucksport has requested until February 15, 2014 to resolve the remaining boiler project issues prior to the new lb/MMBtu emissions limits taking effect. The short term lb/hr emission limits continue to be in effect during the shake-down period.

The Department approves revising condition (2)(D) in air emission license amendments A-22-77-4-A, A-22-77-6-M, and A-22-77-9-M to allow until February 15, 2014 as the date for the Boiler 8 upgrade lb/MMBtu emission limits to take effect. This additional amount of time is expected to allow for installation of a different over-fire air system and rearrangement of the suspension fuel burners, among other possible boiler modifications. The timeframe revision does not change any other facility requirements, including the lb/hr emission limits which were effective at the startup of the upgraded boiler and were the inputs to the ambient air quality impact analysis. The results of the ambient air quality impact analysis showed compliance with the National Ambient Air Quality Standards (NAAQS).

The Department's approval is also based on the fact that Verso Bucksport is not proposing to change the capacity of the boiler or the emission limits from what was licensed in the original new source review license for the Boiler 8 biomass capacity upgrade project. The boiler modifications expected to be undertaken are within the scope of the original project and are not considered to be a reconstruction for New Source Performance Standards (NSPS) and case-by-case Maximum Achievable Control Technology (MACT) purposes. With the original cost of the boiler modifications and fuel delivery systems, additional costs incurred since start-up in the spring of 2012, and estimated cost of the currently proposed boiler modifications, Verso Bucksport estimates a total expenditure of \$25 million. A new boiler is estimated at \$73 million. The cost for the upgrades will continue to be well below the 50% reconstruction threshold under the NSPS and MACT regulations.

In addition, the calculation for the initial 30 day rolling average lb/MMBtu emission limit will be clarified so that the initial average is based on the 30 days after the date specified in the license.

D. Request for Stack Test Deadline Revisions

Verso Bucksport has also requested additional time to perform the stack testing required in air emission license amendments A-22-77-4-A, A-22-77-6-M, and A-22-77-9-M due to the shake-down issues with Boiler 8. Without the unit operating at full load consistently, Verso Bucksport has not been able to tune Boiler 8 at its normal operating scenario.

The Department approves revising conditions (2)(D), (2)(F), and (2)(H) in air emission license amendments A-22-77-4-A, A-22-77-6-M, and A-22-77-9-M to allow for the timing of the Boiler 8 PM, PM<sub>2.5</sub>, and ammonia stack testing to be based on achieving a sustainable full load, defined as operating at an average steam load equal to or greater than 390,000 lb/hr for a 30 consecutive day period. However, in order to prevent an open-ended stack test timeframe, if sustainable full load has not been obtained by February 15, 2014, this February date will be the start of the 6 month and 12 month clock for stack testing.

As a requirement of the current air emission license A-22-70-A-I, Verso Bucksport will be performing PM testing on Boiler 8 in the fall of 2013. Compliance will be determined with the existing lb/MMBtu limit and the recently licensed lb/hr limit (the lb/hr limit became effective at startup of the upgraded boiler).

**ORDER**

Based on the above Findings and subject to conditions listed below, the Department concludes that emissions from this source:

- will receive Best Practical Treatment;
- will not violate applicable emissions standards
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-22-77-10-A, subject to the following conditions.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

**SPECIAL CONDITIONS**

The following shall replace Condition 2(D) in Air Emission Licenses A-22-77-4-A, A-22-77-6-M, and A-22-77-9-M:

- (2) D. Emissions from Boiler 8 shall not exceed the following, with the lb/MMBtu limits becoming effective on February 15, 2014 and the lb/hr limits effective at startup of the upgraded boiler. The existing lb/MMBtu license limits shall apply until February 14, 2014.

	lb/MMBtu	Origin and Authority
PM	0.03	06-096 CMR 115, BACT
SO <sub>2</sub>	0.80 (3-hr rolling ave)	40 CFR §60.43
NO <sub>x</sub>	0.15 (30 day rolling ave)*	06-096 CMR 115, BACT
CO	0.30 (30 day rolling ave)*	06-096 CMR 115, BACT

\* The initial 30 day rolling average shall be calculated using the average of the 30 days after the date specified in the license.

Pollutant	lb/hr	Origin and Authority
PM	24.4	06-096 CMR 115, BACT
PM <sub>10</sub>	24.4	06-096 CMR 115, BACT
SO <sub>2</sub>	651.2	06-096 CMR 115, BACT
NO <sub>x</sub>	244.2	06-096 CMR 115, BACT
CO	435 (24-hr block ave)	06-096 CMR 115, BACT
VOC	40.7	06-096 CMR 115, BACT

The following shall replace Condition 2(F) in Air Emission Licenses A-22-77-4-A, A-22-77-6-M, and A-22-77-9-M:

- (2) F. Ammonia emissions shall not exceed 40 ppmv from startup of the upgraded boiler until 24 months later when the limit shall be 20 ppmv. Compliance with the ammonia limit shall be demonstrated by a stack test conducted within 12 months of Boiler 8 achieving sustainable full load or within 12 months of February 15, 2014, whichever date is earlier. For the purposes of stack testing timeframes, sustainable full load shall be defined as operating at an average steam load equal to or greater than 390,000 lb/hr for a 30 consecutive day period. A subsequent ammonia stack test shall be performed again within 24 months of the initial test and by request thereafter. The stack test shall be performed in accordance with the appropriate 40 CFR Part 60, Appendix A Method or other method as approved by EPA and the Department. [06-096 CMR 115, BACT]

The following shall replace Condition 2(H) in Air Emission Licenses A-22-77-4-A, A-22-77-6-M, and A-22-77-9-M:

- (2) H. Verso Bucksport shall perform stack tests on Boiler 8 to determine compliance with the PM emission limits (lb/MMBtu and lb/hr). A PM stack test shall be performed within 6 months of Boiler 8 achieving sustainable full load or within 6 months of February 15, 2014, whichever date is earlier. A subsequent PM stack test shall be performed again within 12 months of the initial test and every other year thereafter. The stack tests shall be performed in accordance with 40 CFR Part 60, Appendix A, Method 1-5 or other method as approved by EPA and the Department.

Verso Bucksport shall perform PM<sub>2.5</sub> stack tests on Boiler 8. A PM<sub>2.5</sub> stack test shall be performed within 6 months of Boiler 8 achieving sustainable full load or within 6 months of February 15, 2014, whichever date is earlier. A subsequent PM<sub>2.5</sub> stack test shall be performed again within 12 months of the initial test and by request thereafter. The stack tests shall be performed in accordance with the appropriate EPA method or other method as approved by EPA and the Department. Verso Bucksport shall submit an amendment application to the Department which shall include a proposed lb/MMBtu PM<sub>2.5</sub> limit for the boiler within 6 months of the second test date.

For the purposes of stack testing timeframes, sustainable full load shall be defined as operating at an average steam load equal to or greater than 390,000 lb/hr for a 30 consecutive day period.

[06-096 CMR 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 31 DAY OF July, 2013.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marie Allen Robert Corne for  
PATRICIA W. AHO, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: July 10, 2013

Date of application acceptance: July 10, 2013

Date filed with the Board of Environmental Protection:

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.

