



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



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**Verso Androscoggin LLC**  
**Franklin County**  
**Jay, Maine**  
**A-203-77-20-A**

**Departmental**  
**Findings of Fact and Order**  
**New Source Review**  
**NSR #20**

**FINDINGS OF FACT**

After review of the New Source Review (NSR) license application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes Annotated (M.R.S.A.), Section 344 and Section 590, the Maine Department of Environmental Protection (the Department) finds the following facts:

**I. REGISTRATION**

A. Introduction

FACILITY	Verso Androscoggin LLC
LICENSE TYPE	06-096 CMR 115, Minor Modification
NAICS CODES	322121
NATURE OF BUSINESS	Pulp & Paper Mill
FACILITY LOCATION	Riley Road, Jay, Maine

B. Amendment Description

Verso Androscoggin LLC (referred to in this license as Verso Androscoggin or Verso) is an integrated pulp and paper manufacturing facility in Jay, Maine owned by Verso Corporation. Verso has submitted an application requesting authorization to replace the economizers on the No. 1 Recovery Boiler (RB1). The longflow economizer on this recovery boiler has experienced a number of tube leaks, and the boiler economizer on the unit will also be replaced. This maintenance project is required to return the longflow economizer to a fully reliable condition and involves replacing both economizers with like-kind, comparable units.

The facility has also requested the removal of the requirement to operate a thermal imaging bed camera on the No. 1 Recovery Boiler. This technology was included in a previous NSR license but has since proven unreliable and inconsistent. The camera has repeatedly failed in practice; therefore, Verso is requesting the removal from the air emission license of this requirement.

C. Emission Equipment

The following equipment is addressed in this air emission license:

<u>Emission Unit</u>	<u>Max. Capacity (MMBtu/hr)</u>	<u>Max. Processing Rate (MMlb BLS/day)</u>	<u>Fuel Type (% sulfur)</u>	<u>Stack #</u>
No. 1 Recovery Boiler (RB1)	315*	2.5	Black Liquor; fuel oils (0.5%); natural gas	CRB**

\* This is the fossil fuel firing capacity only. The firing of black liquor at 2.5 MMlb BLS/day has the capacity to produce more energy output than the firing of fuel oil or natural gas at maximum capacity.

\*\* Combined Recovery Boiler Stack

D. Application Classification

The application for replacement of economizers on RB1 and removal of the thermal imaging bed camera requirement does not violate any applicable federal or state requirements and does not reduce emissions monitoring, reporting, testing, or recordkeeping requirements. However, in the removal of the requirement of a camera for bed combustion monitoring, this application does seek to modify a Best Available Control Technology (BACT) analysis performed per New Source Review.

The modification of a major source is identified as major or minor based on whether or not projected net emissions increases exceed the "Significant Emissions Increase" levels as given in *Definitions Regulation*, 06-096 Code of Maine Rules (CMR) 100 (as amended). The Department considers that the proposed project may constitute routine maintenance, repair, and replacement and, as such, be exempt from license modification requirements under Maine air licensing rules, in agreement with the discussion provided by Verso Androscoggin in the NSR license application. However, Verso has conservatively chosen to submit the NSR license application to address this project. Emissions increases from the project were quantified, evaluated, and included in the application package. The net change was documented as below the "Significant Emissions Increase" level for every evaluated pollutant; thus, the project is not a major modification.

In addition to the baseline-actuals-to-future emissions comparison, the definition of "projected actual emissions" as found in 40 CFR §52.21, *Prevention of Significant Deterioration of Air Quality* (PSD), §§(b)(41) allows for the exclusion of the portion of a unit's emissions following completion of the project that the unit could have accommodated during the consecutive 24-month period used to

establish the baseline actual emissions and that are also unrelated to the particular project, including any increased utilization due to product demand growth. [40 CFR §52.21 (b)(41)(ii)(c)] For the periods used to establish baseline emissions, RB1 could have accommodated a black liquor solids throughput greater than the projected throughput used to calculate future projected emissions in the modification classification determination. Therefore, based on the black liquor solids firing rate that the boiler could have accommodated, there is no projected emissions increase, further establishing the change to RB1 as a minor modification under 06-096 CMR 115.

Therefore, this NSR license is determined to be a minor modification under *Minor and Major Source Air Emission License Regulations* 06-096 CMR 115 (as amended) since the changes being made are not addressed or prohibited in the Part 70 air emission license. An application to incorporate the requirements of this NSR license into the Part 70 air emission license shall be submitted no later than 12 months after completion of the economizers replacement project on RB1.

## II. BEST PRACTICAL TREATMENT (BPT)

### A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in 06-096 CMR 100. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas. BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096 CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

### B. Economizers Replacement Project on the No. 1 Recovery Boiler (RB1)

The No. 1 Recovery Boiler (RB1) is a 1964 Combustion Engineering boiler rated to produce 280,000 lb of 900 psig steam per day. Under normal operations, boilers operate up to 110% of their maximum continuous rating (110% of 280,000 lbs of steam). The licensed black liquor solids firing capacity of RB1 is 2.5 MMlb dry black liquor solids per day. The replacement of the economizers on RB1 is a like-kind replacement project. The project neither significantly enhances the present capacity of the boiler nor substantially extends the boiler's useful economic life. The replacement of the economizers may result in increased efficiency requiring less fuel burned for an equivalent boiler output as well as improvement of the overall reliability of the boiler to meet the facility's black liquor burning requirements. Economizers such as those described in this project

are not frequently replaced in individual units, although replacement of economizers in recovery boilers is common in the industry.

RB1 is licensed to fire natural gas, #2 fuel oil, #6 fuel oil, and both specification and off-specification used oil, with a maximum sulfur content not to exceed 0.5% by weight, as startup/supplemental fuels. RB1 is equipped with primary, secondary, and tertiary air providing NO<sub>x</sub> control within the combustion process.

A stacked air system was installed on RB1 in 2007, a combustion air modification which reduced TRS, SO<sub>2</sub>, and PM emissions from the boiler. The upper furnace tubes and roof were replaced in 2008, and a front wall section was replaced in 2012. The boiler added natural gas auxiliary fuel firing capacity in May 2013.

Flue gas emissions from RB1 are controlled by the operation of an electrostatic precipitator (ESP), which also controls emissions from the No. 2 Recovery Boiler (RB2). The ESP is a rigid frame, dry bottom design powered by transformer rectifier (TR) sets and has the design capacity to control emissions from both recovery boilers through one chamber while the other chamber is down for repairs. Verso uses a software control system to optimize ESP performance. RB1 exhausts through a 240-foot stack shared with RB2. Continuous emission monitoring systems sample SO<sub>2</sub>, TRS, and NO<sub>x</sub> in the individual boiler ducts. A continuous opacity monitoring system is on the boilers' common stack.

### C. BACT Determination

As a result of the BACT evaluation outlined below, none of the emission standards as currently licensed have been changed. The following is a summary of the BACT evaluation for individual pollutants emitted from RB1.

#### Control of Particulate Matter (PM, PM<sub>10</sub>, PM<sub>2.5</sub>)

Particulate emissions from kraft recovery boilers consist primarily of sodium salts, mostly from carryover of solids and sublimation and condensation of the inorganic chemicals. Recovery furnaces are designed and operated in a manner so as to ensure high levels of sodium fumes in the combustion chamber in order to capture the sulfur dioxide produced from oxidation of reduced sulfur compounds. Consequently, uncontrolled recovery furnace flue gases contain high levels of particulate matter. In addition, a significant portion of the particulate material is sub-micron in size, which makes removal with additional add-on control devices more challenging.

For RB1, an ESP is employed for particulate control efficiency from 98% to greater than 99%. Particulate matter emissions from Verso's recovery boilers are currently limited to levels below the applicable 40 CFR Part 63, Subpart MM (Maximum Achievable Control Technology, MACT) emission standard.

Based on available PM control technologies and the evaluation of the technical feasibility and associated economic impacts of each, the Department has determined that the existing ESP, the existing software control system to optimize precipitator performance, and optimization of combustion via the existing stacked air system represents BACT for emissions of PM, PM<sub>10</sub>, and PM<sub>2.5</sub> from RB1.

#### Control of SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub>

Emissions of sulfur dioxide (SO<sub>2</sub>) and sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) from recovery boilers are attributable to the presence of sulfur compounds in the fuel oil and black liquor. Emissions are controlled by the black liquor combustion/pyrolysis process. Sulfur in the black liquor reacts with sulfur in the fuel oil and forms salts, which are collected in the ESP or which exit the furnace with the smelt. SO<sub>2</sub> emissions from recovery boilers are extremely variable and depend on the physical and chemical properties of the black liquor (sulfidity, heating value, solids content), combustion air and liquor firing patterns, recovery boiler design, and operational parameters.

The Department has determined that BACT for emissions of SO<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> from RB1 is the continued use of black liquor and combustion optimization.

#### Control of NO<sub>x</sub>

NO<sub>x</sub> emissions from kraft recovery furnaces are generally lower than NO<sub>x</sub> emissions from boilers of similar capacity firing coal or residual oil. This is due to several factors inherent in kraft recovery furnace operations, including low nitrogen concentrations in most as-fired black liquor solids; recovery furnace NO<sub>x</sub> formation resulting predominantly from “fuel NO<sub>x</sub>” mechanisms (insufficient temperatures for “thermal NO<sub>x</sub>” formation); the highly staged combustion design of recovery furnaces; and the existence of sodium fumes that might participate in NO<sub>x</sub> reduction or removal within the combustion chamber.

Available NO<sub>x</sub> control technologies include several related to combustion optimization and several post-combustion controls. RB1 currently undergoes annual maintenance and combustion tuning for maximized combustion efficiency. The unit also has stacked combustion air and can-type liquor nozzles with optimized liquor firing pressure and droplet size formation.

Because additional combustion modifications for control of NO<sub>x</sub> are economically prohibitive, Verso has proposed the existing stacked air system on RB1 and annual tuning and maintenance as BACT for NO<sub>x</sub> emissions from this unit. The Department concurs with this assessment.

Control of CO, VOC, and TRS

Emissions of CO, VOC, and TRS from kraft recovery boilers result from incomplete or poor combustion, and available control strategies for these pollutants are similar. Thus, these pollutants were evaluated together to determine BACT. Verso Androscoggin proposes that maintaining the current CO, VOC, and TRS emissions limits in conjunction with good combustion practices represents BACT for CO, VOC, and TRS emissions from RB1. The Department concurs with this assessment.

Greenhouse Gases (GHG)

Emissions of CO<sub>2</sub> from kraft recovery boilers result primarily from biomass (black liquor solids) combustion. Under air licensing regulations, a BACT analysis for CO<sub>2</sub> emissions is not required for minor modifications. Natural gas is the primary auxiliary fuel used during startup and shutdown and to stabilize operation as needed. Use of natural gas is not expected to increase as a result of this project.

As part of the BACT determination for GHG emissions from RB1 in a previous NSR license (A-203-77-14-A, issued March 12, 2012), Verso Androscoggin was required to install, operate, and maintain a camera for bed combustion monitoring in RB1. Although installed and operated as required, the camera has repeatedly failed in use and has required near continuous maintenance and/or replacement. The intent of the imaging bed camera was to monitor bed combustion and better inform operation and optimization of boiler function. Because of the unreliability of this technology in this specific application and because the absence of an unreliable camera will not increase emissions from the unit, the Department finds the use of a camera for bed combustion monitoring is not a required part of the identified BACT for GHG emissions from RB1. BACT for GHG emissions from RB1 shall be as determined in NSR license A-203-77-14-A (March 12, 2012) without the bed combustion monitoring camera.

D. Incorporation into the Part 70 Air Emission License

The requirements in this 06-096 CMR 115 NSR license shall apply to the facility upon issuance. Per Section 1(C)(8) of 06-096 CMR 140, *Part 70 Air Emission License Regulations* (as amended), for a modification that has undergone NSR requirements or been processed through 06-096 CMR 115, the source must then apply for an amendment to the Part 70 license within one year of commencing the proposed operations in order to incorporate the NSR terms and conditions, as provided in 40 CFR Part 70.5.

E. Annual Emissions

The proposed minor modification will not result in any changes to the annual emissions totals currently in Verso Androscoggin's Air Emission Licenses, including any amendments. License allowed annual emissions remain unchanged.

**III. AMBIENT AIR QUALITY ANALYSIS**

Verso Androscoggin previously submitted an ambient air quality analysis (NO<sub>2</sub> modeling in association with air emission license A-203-77-13-A, dated January 19, 2012; SO<sub>2</sub>, PM<sub>10</sub>, and CO modeling in association with air emission license A-203-71-E-R, dated September 3, 1996) demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards. An additional ambient air quality analysis is not required for this minor modification.

**ORDER**

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

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

The Department hereby grants NSR License A-203-77-20-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the specific conditions below.

Severability. The invalidity or unenforceability of any provision of this NSR License or part thereof 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.

**SPECIFIC CONDITIONS**

- (1) Verso Androscoggin is licensed to conduct the like-kind replacement of the longflow economizer and the boiler economizer on the No. 1 Recovery Boiler.
- (2) As of the issuance of this NSR license, Verso Androscoggin is no longer required to operate a thermal imaging bed camera on the No. 1 Recovery Boiler.

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- (3) Verso Androscoggin shall submit an application to incorporate this NSR license into the facility's Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 CMR 140, Section 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS 16 DAY OF January, 2015.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for  
PATRICIA W. AHO, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: November 14, 2014

Date of application acceptance: November 19, 2014

Date filed with the Board of Environmental Protection:

This Order prepared by Jane E. Gilbert, Bureau of Air Quality.

