STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

PATRICIA W. AHO
COMMISSIONER

Verso Androscoggin LLC
Franklin County
Jay, Maine
A-203-77-13-A

Departmental
Findings of Fact and Order
New Source Review
Amendment #13

After review of the air emissions license 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., Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Verso Androscoggin LLC
LICENSE TYPE	06-096 CMR 115, Major Modification
NAICS CODES	322121
NATURE OF BUSINESS	Pulp & Paper Mill
FACILITY LOCATION	Jay, Maine
NSR AMENDMENT ISSUANCE DATE	January 19, 2012

Verso Androscoggin LLC (Verso Androscoggin) is an integrated pulp and paper manufacturing facility located in Jay, Maine. The facility is owned by Verso Paper Corporation and operated as Verso Androscoggin LLC. The facility will be referred to in this license by any of the following terms: Verso Androscoggin, the Androscoggin Mill, or the Mill. The Androscoggin Mill is an existing stationary source currently operating under a Part 70 License (A-203-70-A-I) and is considered a Part 70 major source as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Located in Franklin County, part of the Androscoggin Valley Interstate Air Quality Control Region (AQCR), the Androscoggin Mill is in an area that is in attainment or classified as unclassifiable for all Maine ambient air quality standards (MAAQS).

B. Amendment Description

Verso Androscoggin LLC of Jay, Maine has submitted an application in accordance with *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (as amended), to allow them to add the capability of firing natural gas as an alternative fuel in various existing equipment, including the "A" and "B" Lime Kilns, the Regenerative Thermal Oxidizer (RTO), the #3 Paper Machine Infrared Dryers, the #4 Paper Machine Infrared Dryers, the #4 Paper Machine Air Floatation Dryers, and the #4 Paper Machine Calender Roll. The addition of natural gas as an alternative fuel to the fuels that Verso Androscoggin

is currently licensed to utilize will increase the operational flexibility associated with these emission units. This project is referred to as the "natural gas conversion project" or as "the project" in this license.

Although the addition of natural gas as an alternative fuel is not generally expected to increase emissions of regulated pollutants, natural gas firing in the "A" and "B" Lime Kilns is expected to result in changes in the temperature profile of the lime kilns and increases in the exhaust flow rates compared to fuel oil firing. As a result of these differences, natural gas firing is expected to result in increases in thermal NO_x emissions from the lime kilns. The combination of higher exhaust flow rates and potentially higher concentrations of NOx gases in the exhaust gases are expected to result in increased NO_x emissions on a mass basis from the "A" and "B" Lime Kilns.

C. Emission Units

The following emission units are addressed in this air emission license:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type, % sulfur	Stack #
Regenerative Thermal Oxidizer (RTO)	8	88 gal/hr	Propane, negligible	RTO
		57 gal/hr	#2 Fuel Oil, 0.3%	
		7,843 cu.ft./hr	Natural Gas, negligible	
#3 PM Infrared Dryers	13.92	154 gal/hr	Propane, negligible	PM3ID
		13,647 cu.ft./hr	Natural Gas, negligible	
#4 PM Infrared Dryers	9.6	106 gal/hr	Propane, negligible	PM4IR
		9,412 cu.ft./hr	Natural Gas, negligible	
#4 PM Air Floatation Dryers	8	88 gal/hr	Propane, negligible	PM4FD
		7,843 cu.ft/hr	Natural Gas, negligible	
#4 PM Calender Roll	14	100 gal/hr	#2 Fuel Oil, 0.5%	PM4CR
		155 gal/hr	Propane, negligible	
		13,726 cu.ft./hr	Natural Gas, negligible	

Natural gas firing rates are based on a heat content of 1020 Btu/cu. ft.
Propane firing rates are based on a heat content of 90,500 Btu/gallon.

#2 fuel oil firing rates are based on a heat content of 140,000 Btu/gallon.

Process Equipment

Equipment	Production Rate	Pollution Control Equipment	Stack #
"A" Lime Kiln	248 tons/day of CaO	Wet Scrubber	LKA
"B" Lime Kiln	248 tons/day of CaO	Wet Scrubber	LKB

Note: The "A" and "B" Lime Kilns will be outfitted with new burners having design heat input capacities of 80 MMBtu/hr in each lime kiln to replace the existing 72 MMBtu/hr burners. Upon completion of the project, the lime kilns will continue to be licensed to fire fuel oil (including #6 fuel oil, #2 fuel oil, specification used oil and off-specification used oil) and propane in the burners, and natural gas will be added as an alternative fuel.

D. Application Classification

The application for Verso Androscoggin does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing or record keeping. The application does include a Best Available Control Technology (BACT) analysis performed in accordance with New Source Review requirements.

Additionally, the modification of a major source is considered a major modification based on whether or not the changes would result in a "Significant emission increase" for any regulated pollutant as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended).

The determination as to whether or not a significant emissions increase will occur is made by performing an actual-to-projected-actual PSD applicability test which includes comparing the net emissions increase rates to the significant emissions increase levels on a pollutant-by-pollutant basis. Net emissions increase rates are determined by totaling all differences (that are above zero) between "projected actual emissions" and "baseline actual emissions" for each emissions unit, on a pollutant-by pollutant basis. If net emissions increase rates will be equal to or exceed significant emissions increase levels, then the modification is a major modification. The results of this actual-to-projected-actual PSD applicability test are presented in the following tables:

Baseline Actual Emissions for the Modified Equipment

Pollutant	Baseline Actual Emissions (TPY)			
	"A" Lime Kiln	"B" Lime Kiln	RTO	#3 & #4 PM Fuel Burning Equipment (combined)
PM	48.1	46.3	0.01	1.8
PM_{10}	48.5	46.7	0.04	1.8
$PM_{2.5}$	42.4	40.8	0.04	0.1
SO_2	1.1	1.0	0.0	10.3
NO_x	60.0	47.4	0.7	12.7
CO	6.6	4.5	0.7	2.4
VOC	4.5	4.5	0.1	0.4
TRS	1.7	1.9	Negligible	Negligible
H_2SO_4	0.0	0.0	Negligible	Negligible
GHG	69,862	69,580	848	15,111
GHG (CO_2e)	69,862	69,580	867	15,317

Projected Actual Emissions for the Modified Equipment

Pollutant	Projected Actual Emissions (TPY)			
	"A" Lime Kiln	"B" Lime Kiln	RTO (fuel burning component only)	#3 & #4 PM Fuel Burning Equipment (combined)
PM	43.0	41.9	0.1	0.7
PM_{10}	43.3	42.2	0.1	0.7
$PM_{2.5}$	37.8	36.9	0.1	0.7
SO_2	1.7	1.0	0.01	0.1
NO_x	145.9	145.9	0.9	9.8
CO	8.0	4.7	0.7	8.2
VOC	5.1	5.1	0.1	0.5
TRS	1.9	1.9	Negligible	Negligible
H_2SO_4	0.05	0.03	Negligible	Negligible
GHG	70,656	70,656	1,057	11,719
GHG (CO_2e)	70,656	70,656	1,063	11,789

Comparison of Net Emissions Increases to Significant Emissions Increase Levels

Pollutant	Expected Emission Increases (TPY)				Total Net Emissions Increase Rates (TPY)	Significant Emissions Increase Levels (TPY)	Major Modification? (Yes/No)
	"A" Lime Kiln	"B" Lime Kiln	RTO (fuel only)	#3 & #4 PM Fuel Burning Equipment (combined)			
PM	0.0	0.0	0.1	0.0	0.1	25	No
PM_{10}	0.0	0.0	0.1	0.0	0.1	15	No
$PM_{2.5}$	0.0	0.0	0.1	0.6	0.7	10	No
SO_2	0.6	0.0	0.0	0.0	0.6	40	No
NO_x	85.9	98.5	0.2	0.0	184.6	40	Yes
CO	1.4	0.2	0.0	5.8	7.4	100	No
VOC	0.6	0.6	0.0	0.1	1.3	40	No
TRS	0.2	0.0	N/A	N/A	0.2	10	No
H_2SO_4	0.05	0.03	N/A	N/A	0.1	7	No
*GHG	794	1,076	209	0.0	2,079	N/A	N/A
*GHG (CO_2e)	794	1,076	196	0.0	2,066	75,000	No

* In order for a modification to be a major modification for GHG emissions, net emissions increase rates must be greater than zero for GHG emissions on a mass basis and equal or exceed significant emissions increase levels for GHG emissions in terms of CO_2e. Net emissions increase rates for GHG emissions are greater than zero on a mass basis, but are significantly less than the significant emissions increase level of 75,000 TPY for GHG emissions in terms of CO_2e.

Note: The above numbers are for equipment listed in the tables above only. None of the other emission units at the facility are affected by this amendment.

Therefore, this amendment is determined to be a major modification for NO_x emissions and a minor modification for all other listed pollutants and has been processed as such in accordance with *Minor and Major Source Air Emission License Regulations*, 06-096 CMR 115 (as amended).

II. BEST PRACTICAL TREATMENT (BPT) & EMISSION STANDARDS

A. Introduction

In order to receive a license the applicant must control emissions from each emissions unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated nonattainment areas. Verso Androscoggin is not currently located in any nonattainment areas.

BPT for new sources and modifications to existing emission units located in attainment/unclassified areas for all pollutants requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096 CMR 100 (as amended). BACT is a top-down approach to selecting air emission control requirements and associated emission limits considering economic, environmental and energy impacts.

Before proceeding with a summary of BACT determinations and other emission standards that may apply to the emissions from each emissions unit, a general process description is provided to identify where the equipment fits into the process.

Process Description

Verso Androscoggin is an integrated pulp and paper manufacturing facility with equipment, operations, and supporting activities designed to produce bleached kraft pulp (a chemical pulping process) and groundwood pulp which are used to make a wide variety of pulp and paper products. The bleached kraft pulp is produced in two (2) separate lines, designated "A" and "B". The groundwood pulp is produced in another separate process line.

Logs and wood chips are received in the Woodyard area, where they are stored and processed for eventual use in the bleached kraft pulping process (referred to as the Pulp Mill) or the groundwood pulping process (referred to as the Groundwood Mill). Logs destined for the Pulp Mill are debarked and chipped, then transferred to chip storage silos or chip storage piles. Chips are fed from the silos to a set of screens, and then sent on to the Pulp Mill. Bark from the debarker and fines from the chip screens are sent to a boiler (referred to as the Waste Fuel Incinerator (WFI)) where it is used as fuel to produce steam for use in generating electricity as well as for use in various parts of the pulp and paper making processes.

The Groundwood Mill receives debarked logs from the Woodyard. The logs are fed to a set of grinders and mixed with water to form a groundwood pulp slurry which is discharged to the Grinder Flume. From the Grinder Flume, the groundwood pulp is screened, refined, and cleaned, sent to deckers for thickening, and bleached before being sent on to the Paper Mill.

In the Pulp Mill, screened chips from the Woodyard are sent to one of the two process lines, designated Pulp Mill "A" and Pulp Mill "B". The "A" line includes a continuous digester, brown stock washing/screening units, pulp storage tanks, process liquid storage tanks and a pulp bleaching system, designated Bleach Plant "A". The "B" line includes a continuous digester, diffusion washing units, screening units, pulp storage tanks, process liquid storage tanks and a pulp bleaching system designated Bleach Plant "B". The chips are reacted with white liquor in the digesters on each line to form pulp, which is then washed and screened in brown stock washers and chemically whitened in a series of reaction towers and washers that make up the Bleach Plants. Pulp entering Bleach Plant "A" also passes through an oxygen delignification system that removes additional lignin. The Bleach Plants also receive pulp reclaimed from the Paper Mill. Chlorine Dioxide (ClO_2) used in the bleaching process is manufactured on site in a separate process system. A dual scrubber system on each bleach line controls emissions from certain units in each Bleach Plant and the ClO_2 from the generation system can be directed to either line.

Pulp produced at the facility is either used in the Paper Mill Area or dried on the paper machines for storage and/or sale. Knots (uncooked wood chips removed from the pulp by the screening units) are either recycled back to the digesters, land filled on site, or sent off site. Filtrate from the Brown Stock Washers or the Diffusion Washers, called "weak black liquor" is collected and sent to the Recovery Boiler process area.

Weak black liquor received from the Pulp Mills is fed to Multiple-effect Evaporators where it is concentrated to a solids level that will support combustion. In the Recovery Boilers, the black liquor is reduced to form a smelt, which flows out the bottom of the boilers into the Smelt Dissolving Tanks, where it is dissolved to form green liquor. The green liquor is in turn reacted with lime (CaO) to form white liquor and lime mud ($CaCO_3$). The white liquor is stored for subsequent use in the digesters while the lime mud is processed in the lime kilns (referred to as "A" Lime Kiln and "B" Lime Kiln) to recover lime.

The Paper Mill consists of all the equipment and operations used to convert pulp to paper or dried pulp, including stock preparation, additive preparation, coating preparation, starch handling, finishing, storage, and paper machines. Two of the paper machines (referred to as the #3 Paper Machine and the #4 Paper Machine) are equipped with several propane and/or oil fired dryers. As part of this project,

changes will be made to add natural gas as an alternative fuel to the drying equipment associated with these two paper machines.

Low-Volume, high concentration (LVHC) non-condensable gases (NCGs) collected throughout the process from certain units in the Pulp Mill and Power House are sent to the "A" and "B" Lime Kilns for destruction by means of combustion in the lime kilns. The high-volume, low-concentration (HVLC) gas from the A Digester chip bin is also sent to the lime kilns for destruction. The HVLC emission streams from certain other units are collected and sent to the RTO where they are incinerated.

Verso Androscoggin produces steam and electric power for mill operations with Recovery Boilers #1 and #2, Power Boilers #1 and #2, and the WFI. Electricity is also purchased off the grid. Mill operations are also served by the water/wastewater treatment plant, the landfill, a quality control print laboratory, several small maintenance and repair shops, and temporary units.

B. "A" & "B" Lime Kilns - A Summary of BACT

Lime Kilns can be a significant source of emissions of air pollutants at a pulp and paper mill. The regulated air pollutants of primary interest to the Department that are emitted by the "A" and "B" Lime Kilns include particulate matter (PM, PM_{10}, & $PM_{2.5}$), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), total reduced sulfur (TRS), and greenhouse gases (GHG). Of these pollutants, the only pollutant which is projected to be emitted in amounts greater than PSD major source levels and for which the proposed project is expected to result in a significant emissions increase from each of the lime kilns is NO_x. GHG emissions are projected to remain slightly less than the PSD major source level of 100,000 TPY of CO_2e and the project will not result in a significant emissions increase in GHG emissions. All of the other pollutants of primary interest are projected to be emitted at levels that are significantly less than PSD major source levels and will not increase in amounts equal to or greater than significant emissions increase levels.

1. Particulate Matter (PM, PM_{10}, & $PM_{2.5}$)

Verso Androscoggin's BACT analysis and proposal: The BACT analysis included a review of BACT determinations contained in the RACT/BACT/LAER Clearinghouse (RBLC) database for similar types of lime kilns which typically require the utilization of either electrostatic precipitators (ESPs) or wet scrubbers for the control of particulate matter emissions. Verso Androscoggin currently uses wet scrubbers to control particulate matter emissions from the "A" and "B" Lime Kilns. The BACT analysis evaluated the installation and operation of an ESP in combination with the existing wet scrubbers and found that the cost would exceed $17,300 per ton of additional particulate matter that would be removed. Verso

Androscoggin's review of the RACT/BACT/LAER Clearinghouse (RBLC) database found that PM emission limits ranged from 22.8 to 25.6 pounds per hour (lb/hr) and that PM_{10} emission limits ranged from 21.2 to 39.2 lb/hr. Verso Androscoggin's BACT analysis proposes to upgrade the existing wet scrubbers to handle the increase in volumetric flow from firing natural gas in the lime kilns and to reduce the load based particulate matter emission limit from the current level of 0.13 gr/dscf corrected to 10% O_2 to 0.03 gr/dscf corrected to 10% O_2 for each lime kiln and to maintain the current mass emission limit of 25.5 lb/hr for the "A" Lime Kiln and 25.0 lb/hr for the "B" Lime Kiln.

The Department's BACT Determination: Verso Androscoggin currently utilizes wet scrubbers to control particulate matter emissions from the "A" and "B" Lime Kilns. The incremental cost associated with constructing and operating an ESP in addition to the existing wet scrubbers, to remove additional particulate matter from the flue gas streams, is not economically justifiable. The particulate matter emission limits proposed by Verso Androscoggin are comparable to other BACT determined emission limits contained in the RBLC for similar types of lime kilns. Therefore, the Department finds that upgrading the existing wet scrubbers to comply with a load based PM emission limit of 0.03 gr/dscf corrected to 10% O_2 represents BACT for control of particulate matter emissions from the "A" and "B" Lime Kilns in conjunction with mass emission limits of 25.5 lb/hr for PM, PM_{10}, and $PM_{2.5}$ emissions for the "A" Lime Kiln and 25.0 lb/hr for PM, PM_{10}, and $PM_{2.5}$ emissions for the "B" Lime Kiln.

2. Sulfur Dioxide (SO_2)

Verso Androscoggin's BACT analysis and proposal: The BACT analysis included a review of BACT determinations contained in the RBLC database which typically require the utilization of the in-situ removal processes inherent to lime kiln operations in conjunction with wet scrubbing for the control of sulfur dioxide (SO_2) emissions from lime kilns of similar design to the lime kilns found at Verso Androscoggin's facility. Verso Androscoggin currently utilizes this same combination of control strategies and equipment to control SO_2 emissions from the "A" and "B" Lime Kilns. SO_2 emissions are primarily controlled by the in-situ removal of SO_2, inherent to the operation of lime kilns, which occurs through the interaction between SO_2 and the lime dust generated in the kiln and is responsible for the bulk of the SO_2 reductions. Some smaller amount of additional SO_2 removal occurs within the wet scrubber because of the alkaline conditions generally present in the wet scrubbing solution due to the absorption of lime dust carried over from the lime kiln. The BACT analysis did not consider any other control technologies as being technically feasible for removal of SO_2 emissions from lime kilns. Verso Androscoggin's review of the RBLC database found that SO_2 emission

limits for lime kilns equipped with wet scrubbers range between 2.59 and 23.4 lb/hr.

Verso Androscoggin's BACT analysis proposes the natural in-situ removal of SO_2 in the lime kilns as BACT. Upgrades to the existing wet scrubbers, which have the primary purpose of removing particulate matter at the increased volumetric flow rates from firing natural gas in the lime kilns provide an ancillary benefit of a small amount of additional SO_2 removal. Verso proposes to continue to comply with the existing SO_2 emission limits of 6.7 lb/hr while operating under loaded conditions and 24 lb/hr when operating under no load conditions.

The Department's BACT Determination: The Department finds that the inherent in-situ removal processes in conjunction with upgrading the existing wet scrubbers, which provide additional SO2 removal, represent BACT. BACT also includes meeting the SO_2 emission limits of 6.7 lb/hr under loaded conditions and 24 lb/hr under no load conditions which are within the range of SO_2 emission limits contained in the RBLC database and represent BACT for the control of SO_2 emissions from the "A" and "B" Lime Kilns.

3. Nitrogen Oxides (NO_x)

Verso Androscoggin's BACT analysis and proposal: Several NO_x control technologies were evaluated as part of the BACT analysis, including selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), and low NO_x technology. However, SCR and SNCR were not found to be technologically feasible due to the minimum temperature requirements (between 600 F and 750 F for SCR and approximately 1,600 F for SNCR) for proper operation of these technologies being substantially higher than the typical temperature of the exhaust gases exiting the "A" and "B" Lime Kilns (approximately 160 F). Verso Androscoggin's review of the RBLC database found that no add-on NO_x control technologies were identified as BACT for lime kilns. The utilization of low NO_x technology, good equipment design, and good combustion practices were identified as BACT for the control of NO_x emissions from lime kilns in the RBLC database. Therefore, Verso Androscoggin found low NO_x technology to be the only technically feasible option for control of NO_x emissions from the "A" and "B" Lime Kilns.

The BACT analysis describes low NO_x technology as representing the "tuning" or optimization of the fuel feed and mixing with air which impacts burner efficiency and overall flame length. Low NO_x technology is described as being intrinsic to the design of lime kilns in terms of being designed to have a long flame length (three to four times the value of the lime kiln diameter) which works to reduce thermal NO_x. Low NO_x technology is equated to good equipment design and good combustion practices and is

estimated by Verso Androscoggin to be capable of achieving approximately 50% reduction in NO_x emissions. The BACT analysis found that concentration based NO_x emission limits contained in the RBLC database for lime kilns utilizing different forms low NO_x technology range between 112 and 340 ppmv corrected to 10% O_2 and that mass emission limits range between 38.75 and 103.7 lb/hr.

Verso Androscoggin proposes that the utilization of low NO_x technology, including the "tuning" of the new burners being installed as part of the project to optimize the relationship of NO_x emission reductions and energy efficiency, and compliance with the existing concentration based emission limit of 120 ppmv wet corrected to 10% O_2 and the existing mass emission limit of 33.3 lb/hr represents BACT for NO_x emissions from the "A" and "B" Lime Kilns.

The Department's BACT Determination: The Department finds that the utilization of low NO_x technology, as proposed by Verso Androscoggin, in conjunction with a concentration based emission limit of 120 ppmv wet corrected to 10% O_2 and a mass emission limit of 33.3 lb/hr are within the range of NO_x emission limits contained in the RBLC database and represent BACT for the control of NO_x emissions from the "A" and "B" Lime Kilns.

4. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Verso Androscoggin's BACT analysis and proposal: Several CO and VOC control technologies were evaluated as part of the BACT analysis, although no add-on control technologies were identified as being utilized by lime kilns in the RBLC database and the use of good combustion practices was the only technology that were found to be technically feasible for use on the "A" and "B" Lime Kilns. The BACT analysis found that CO emission limits contained in the RBLC database for lime kilns utilizing good combustion practices range between 2 and 337 lb/hr and that VOC emission limits range between 4 and 8.3 lb/hr.

Verso Androscoggin proposes that the continued utilization of good combustion practices and complying with the existing emission limits of 333.3 lb/hr for CO emissions and 1.4 lb/hr for VOC emissions represents BACT for the "A" and "B" Lime Kilns.

The Department's BACT Determination: The Department finds that the proposed BACT emission limit for CO emissions is on the upper end of CO emission limits recently determined as BACT for similar types of lime kilns as found in the RBLC database. Although CO emissions can be highly variable in lime kilns depending on variable operating conditions, the Department has determined that continued employment of good combustion practices in conjunction with compliance with a significantly lower CO emission limit of

200 lb/hr is more representative of BACT for the "A" and "B" Lime Kilns and should still allow for enough room to account for variable operating conditions. The Department finds that the existing VOC emission limit of 1.4 lb/hr, as proposed by Verso Androscoggin, represents BACT for VOC emissions from the "A" and "B" Lime Kilns.

5. Total Reduced Sulfur Compounds (TRS)

Verso Androscoggin's BACT analysis and proposal: Total reduced sulfur compounds (TRS), which include hydrogen sulfide (H_2S), methyl mercaptan, dimethyl sulfide, and dimethyl disulfide, are emitted from lime kilns. Verso Androscoggin's review of potential control technologies to reduce TRS emissions resulted in finding that the utilization of wet scrubbing in conjunction with adherence to good combustion and operating practices are technologically feasible technologies. Verso Androscoggin currently uses all of these control technologies to minimize TRS emissions from the "A" and "B" Lime Kilns. TRS emission limits contained in the RBLC database for lime kilns utilizing wet scrubbing in conjunction with good combustion and operating practices range between 6.5 and 20 ppmvd corrected to 10% O_2.

Verso Androscoggin proposes that continued utilization of wet scrubbing in conjunction with good combustion and operating practices and meeting the existing TRS emission limit of 20 ppmvd corrected to 10% O_2 represents BACT for the "A" and "B" Lime Kilns.

The Department's BACT Determination: The Department believes that the "A" and "B" Lime Kilns may be capable of meeting a lower TRS emission limit than proposed by Verso Androscoggin, however more TRS emission data is needed, particularly following the introduction of natural gas as an alternative fuel and the completion of upgrades to the wet scrubbers, in order to support such a determination. Therefore, the Department finds that monitored TRS emissions data should be collected for a period of six months following startup of the "A" and "B" Lime Kilns after such changes have been completed and the data submitted so that the Department may determine if a lower TRS emission limit is appropriate.

Until the Department issues a license with a different BACT determination, based on review of the submitted TRS emissions data, the Department finds that upgrading the existing wet scrubbers in conjunction with continued adherence to good combustion and operating practices and compliance with the existing TRS emission limit of 20 ppmdv corrected to 10% O_2, on a 12-hour block average basis, represents BACT for TRS emissions from the "A" and "B" Lime Kilns.

6. Greenhouse Gases (GHGs)

Verso Androscoggin's BACT analysis and proposal: Emissions of greenhouse gases (GHG) from pulp and paper lime kilns result from both the lime mud calcination process and the combustion of fossil fuels. For the purposes of evaluating BACT for GHG emitted from the kilns, the Department advised Verso Androscoggin to consider only the non-biogenic portion of the GHG emitted from the combustion of fossil fuels. The GHG emissions that result from fossil fuel combustion in the kilns consists almost entirely CO_2 along with significantly lower amounts of N_2O and CH_4. Overall, the GHG emitted from fossil fuel combustion are a fraction of the total GHG emitted by the kilns.

Verso Androscoggin's review of the RBLC database resulted in the identification of no entries from the last 10 years for GHG control determinations for lime kilns. Verso Androscoggin then considered the guidance currently available from U.S. EPA on BACT for GHG emission sources. Specifically, U.S. EPA published the document entitled "Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Pulp and Paper Manufacturing Industry" in October 2010. Section II.C. of that document discusses control measures and energy efficiency improvements for direct GHG emitted from kraft and soda lime kilns. The information included in this guidance document was considered in preparing the GHG BACT evaluation for the Androscoggin Mill's lime kilns.

In the U.S. EPA document entitled "Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Pulp and Paper Manufacturing Industry" the agency concluded that they were unaware of control measures to reduce fossil fuel related GHG emissions from pulp mill lime kilns other than energy efficiency measures. The following energy efficiency measures were listed:

- Lime kiln oxygen enrichment
- Lime kiln modifications
- Lime kiln electrostatic precipitators

Verso Androscoggin evaluated each of the identified energy efficiency measures and found lime kiln modifications to be the only technologically viable option for controlling GHG emissions from the "A" and "B" Lime Kilns. Lime kiln oxygen enrichment was not found to be a demonstrated GHG control technology for lime kilns in the industry and Verso Androscoggin could not find any evidence where ESPs had replaced wet scrubbers as BACT for GHG emissions. In addition, the use of ESPs in place

of wet scrubbers on the "A" and "B" Lime Kilns would result in an increase in SO_2 emissions.

Lime kiln modifications include installing high efficiency filters to reduce the water content of the lime mud entering the kiln, replacing kiln refractory with a higher efficiency refractory, and using exhaust gases to preheat incoming lime and combustion air. While installing high efficiency filters may improve the kiln energy efficiency, U.S. EPA has not considered the additional energy needed for the filtration process that will likely offset the improved kiln fuel efficiency. Furthermore, this would be a process change that has not been previously demonstrated as BACT for reducing lime kiln GHG emissions. In terms of using higher efficiency refractory, efficiency and cost are already the key factors considered whenever kilns are "rebricked". Verso Androscoggin is not aware of any industry kiln rebricking with higher efficiency refractory as a form of BACT for GHG. Rather, it is inherent to the rebricking process to use the most efficient refractory available within the scope of the project. Recovering heat from the exhaust gas is also already in practice in the Androscoggin lime kilns. The kilns are equipped with sections of steel chain that is suspended in garlands at the feed end of the kiln. The chains recover heat from the exhaust gas and transfer it to the incoming lime mud as part of the drying process that occurs prior to calcination.

Verso Androscoggin is proposing to modify the lime kilns as part of the proposed natural gas conversion project to fire natural gas to displace a portion of the fuel oil currently fired. Based on U.S. EPA GHG emission factors, specifically for CO_2, the firing of natural gas in place of fuel oil will result in an approximate 28% reduction in CO_2 emissions on an equivalent BTU basis. As a result, Verso considers that lime kiln modification is a technically viable option for reducing GHG emissions from the Androscoggin lime kilns.

As detailed elsewhere in this application, Verso Androscoggin proposes that firing natural gas in place of fuel oil will have positive environmental and energy impacts for the Mill. Therefore, Verso Androscoggin proposes that modifying the "A" and "B" Lime Kilns to accommodate natural gas firing represents BACT for GHG emissions.

The Department's BACT Determination: GHG emissions from the "A" and "B" Lime Kilns are the result of a combination of CO_2 emissions generated during the calcination process and products of combustion from the firing of fossil fuels including, fuel oils, propane, and after completion of the project, natural gas. The energy from fuel combustion is used to dry the lime mud and precipitate the calcination process in the lime kilns. The GHG pollutants emitted due to fossil fuel combustion are almost entirely CO_2 emissions with

minimal amounts of methane (CH_4), and nitrous oxide (N_2O) emissions. The CO_2 emissions that are generated from the calcination process itself are considered to be biogenic GHG emissions. EPA recently decided to delay the application of PSD and Part 70 permitting requirements to CO_2 emissions from bio-energy and other biogenic stationary source activities. The purpose of the deferral is to provide EPA with additional time to review the scientific basis for excluding CO_2 emissions from biogenic sources from permitting programs.

Based on the information contained in Verso Androscoggin's BACT analysis and EPA's pending status of how biogenic CO_2 emissions should be treated, the Department finds that the employment of energy efficiency measures such as adding the capability of firing natural gas in the lime kilns, maintaining good combustion practices, and performing tuning of the burners during the shakedown periods and as necessary to maintain energy efficient operation of the lime kilns represents BACT for GHG emissions from the "A" and "B" Lime Kilns. The Department does not find the determination of emission limits for GHG emissions from the "A" and "B" Lime Kilns appropriate or necessary at this time.

C. Regenerative Thermal Oxidizer (RTO) - A Summary of BACT

The RTO is a pollution control device that was installed in the fall of 1995 as part of the RTO Source Group with the primary purpose of controlling TRS emissions from the brown stock washer systems in accordance with *Total Reduced Sulfur Control from Kraft Pulp Mills*, 06-096 CMR 124 (as amended). The RTO is also used to control VOC emissions from the Oxygen Delignification System as well as to destroy HVLC gases collected from various sources that make up the RTO Source Group in order to comply with Maximum Achievable Control Technology (MACT) standards contained in 40 CFR 63 Subpart S, *National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry*. The regulated air pollutants of primary interest to the Department that are emitted by the RTO include particulate matter (PM, PM_{10}, & $PM_{2.5}$), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), total reduced sulfur (TRS), and greenhouse gases (GHG), however, the fuel fired component of emissions of all of these pollutants, with the exception of GHG, are projected to be emitted in amounts of less than 1 TPY. GHG emissions are projected to be less than one half of one percent (<1/2 of 1%) of the PSD major source level of 100,000 TPY CO_2e.

Verso Androscoggin's BACT analysis and proposal: The RTO will continue to have a maximum design heat input capacity of 8.0 MMBtu/hr whether firing propane, #2 fuel oil, or natural gas. Verso Androscoggin's evaluation of emissions from the RTO projects minimal changes in emissions as a result of adding natural gas as an alternative fuel to propane and #2 fuel oil. The BACT

analysis found that because of the small burner sizes and low emission rates, installing any add-on pollution control equipment to control combustion related emissions from the RTO would be cost prohibitive.

Verso Androscoggin proposes that BACT for the RTO is represented by good combustion practices and maintaining compliance with existing emission limits.

The Department's BACT Determination: The Department finds that the addition of natural gas as an alternative fuel to the RTO in conjunction with adhering to good combustion practices and compliance with existing emission limits represents BACT for the RTO. Because of the low amounts of GHG projected to be emitted, the Department finds that the addition of natural gas as an alternative fuel and adhering to good combustion practices represents BACT for GHG emissions from the RTO. The Department does not find the determination of an emission limit for GHG emissions from the RTO appropriate or necessary at this time.

D. #3 and #4 Paper Machine Fuel Burning Equipment - A Summary of BACT

The natural gas conversion project includes adding natural gas as an alternative fuel for the fuel burning equipment on the #3 and #4 Paper Machines, including the #3 PM Infrared Dryers, the #4 PM Infrared Dryers, the #4 PM Air Floatation Dryers, and the #4 PM Calender Roll. The heat input capacities of the fuel burning equipment (all less than 15 MMBtu/hr) will not increase whether firing propane, #2 fuel oil, or natural gas. Emissions generated from the fuel burning equipment are mainly products of combustion from the fuels fired to provide the heat in these paper machine drying processes. The regulated air pollutants of primary interest to the Department that are emitted by the fuel burning equipment include particulate matter (PM, PM_{10}, & $PM_{2.5}$), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), and greenhouse gases (GHG), however, emissions of all of these pollutants, with the exception of NO_x, CO, and GHG emissions, are projected to be emitted in amounts of less than 1 TPY. Emissions of NO_x, CO, and GHG are projected to be less than ten percent (10%), less than four percent (4%), and less than twelve percent (12%) of their respective PSD major source levels of 100 TPY of NO_x, 250 TPY of CO, and 100,000 TPY of GHG (in terms of CO_2e).

Verso Androscoggin's BACT analysis and proposal: Verso Androscoggin's evaluation of emissions from the #3 and #4 PM fuel burning equipment projects minimal changes in emissions as a result of adding natural gas as an alternative fuel to propane and #2 fuel oil. The BACT analysis found that because of the small burner sizes and low emission rates, installing any add-on pollution control equipment to control combustion related emissions from the fuel burning equipment would be cost prohibitive.

Verso Androscoggin proposes that BACT for the fuel burning equipment associated with the #3 and #4 PMs is represented by good combustion practices and maintaining compliance with existing emission limits.

The Department's BACT Determination: The Department finds that the addition of natural gas as an alternative fuel to the #3 and #4 PM fuel burning equipment, in conjunction with adhering to good combustion practices and compliance with existing emission limits, represents BACT for the fuel burning equipment associated with the #3 and #4 PMs. Because of the low amounts of GHGs projected to be emitted, the Department finds that the addition of natural gas as an alternative fuel and adhering to good combustion practices represents BACT for GHG emissions from the #3 and #4 PM fuel burning equipment. The Department does not find the determination of emission limits for GHG emissions from these emission units appropriate or necessary at this time.

E. New Source Performance Standards (NSPS)

U.S. EPA has promulgated standards of performance for specific sources of air pollution at 40 CFR Part 60, Subparts A through MMMM. The proposed natural gas conversion project involves physical changes to Verso Androscoggin's "A" and "B" Lime Kilns, the RTO that serves to control NCGs from some of the facility's pulping related processes, and the fuel burning equipment associated with the #3 and #4 Paper Machines. As a result, the following NSPS Subparts potentially apply to the proposed project:

- Subpart A – General Provisions
- Subpart BB – Standards of Performance for Kraft Pulp Mills

NSPS apply to new sources that are constructed after the effective date as specified in each standard, or to units that are modified or reconstructed after the effective date. The concept of modification under NSPS is detailed in Subpart A, §60.14. The concept of reconstruction under NSPS is detailed in Subpart A, §60.15. The provisions of 40 CFR Part 60, Subpart A apply to the owner or operator of a stationary source that is subject to any of the NSPS.

In order for the proposed project to qualify as reconstruction of any of the affected sources, the fixed capital cost of the new components necessary for the natural gas conversion would need to exceed 50% of the fixed capital cost required to replace the existing affected source. Since the costs for the conversions are only a small fraction of the cost of replacing the entire affected source (e.g., the lime kilns), the project does not constitute reconstruction under NSPS.

Under §60.14, a physical change or change in the method of operation of an existing source such as a lime kiln qualifies as a modification only if it results in an increase in the emission rate of a pollutant regulated by the standard. Furthermore, §60.14 specifies that the increase is determined on a short-term basis (e.g., lb/hr) based on emissions factors, mass balance, test data, or other representative information. The proposed natural gas conversion project includes upgrades to the wet scrubbing systems that control particulate matter (PM) emissions from the lime kilns. The improved wet scrubbing systems are designed to reduce PM emissions to levels well below those previously emitted by each lime kiln and, therefore, short term PM emissions from each kiln will not increase as a result of the proposed project and future lime production rates will not exceed historic baseline production rates. TRS emissions from each kiln are the result of the combustion of Pulp Mill non-condensable gases (NCGs) and are not the result of the fuels combusted in the kilns. The installation of natural gas burners in the lime kilns will have no effect on the facility's pulp production operations and, consequently, will not cause TRS emission from the lime kilns to increase above the levels previously emitted. Since the proposed natural gas conversion project will not result in a short-term emissions increase of either PM or TRS, the project does not qualify as a modification under NSPS, and Subpart BB does not apply to either the "A" or "B" Lime Kiln as a result of this project.

F. National Emission Standards for Hazardous Air Pollutants (NESHAP)

Pursuant to the CAAA of 1990, process-specific NESHAPs are included in 40 CFR Part 63. NESHAPs promulgated under 40 CFR Part 63, also referred to as Maximum Achievable Control Technology (MACT) standards, apply to certain identified source categories that are considered area sources or major sources of hazardous air pollutants (HAP). A major source of HAP is defined as a source with a facility-wide potential-to-emit (PTE) of 10 tons per year or more of any single HAP, or a facility-wide PTE of 25 tons per year or more of total HAP. The Androscoggin Mill qualifies as a major source of HAP. The following 40 CFR Part 63 Subparts are potentially applicable to the proposed natural gas conversion project:

- Subpart A – General Provisions
- Subpart S – National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry
- Subpart MM – National Emission Standards for Hazardous Air Pollutants for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills

The provisions of 40 CFR Part 63, Subpart S apply to all major HAP sources that produce pulp, paper, or paperboard and use the Kraft, soda, sulfite, or semi-chemical pulping process. This MACT rule already applies to the Androscoggin Mill and the Mill is currently in compliance with all of the applicable provisions.

The individual Mill sources subject to Subpart S standards are classified as being part of one of three possible control systems:

- The LVHC system;
- The HVLC system; or
- The condensate collection/treatment system.

The "A" and "B" Lime Kilns serve as control devices for ensuring compliance for the LVHC system with the Subpart S standards. Adding natural gas as an alternative fuel to the lime kilns will not change the applicability of any of the current Subpart S requirements, nor will it impact the Mill's ability to comply with the standards. The RTO serves as a control device for ensuring compliance for the HVLC system with the Subpart S standards. Adding natural gas as an alternative fuel to the RTO will not change the applicability of any of the current Subpart S requirements, nor will it impact the Mill's ability to comply with the standards.

Subpart MM sets forth various PM emission limits, testing requirements, monitoring requirements, and recordkeeping/reporting requirements for chemical recovery combustion sources. Subpart MM codifies the NESHAPs for both new and existing Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills. Under the provisions of Subpart MM, the Androscoggin Mill's "A" and "B" Lime Kilns are both subject to a PM emission limit of 0.13 grains per dry standard cubic foot (gr/dscf) at 10% oxygen (O_2). This PM limit was established using the MACT Bubble option and is the MACT surrogate standard for controlling HAP metal emissions.

Under the Part 63 MACT standards, the affected sources are either existing units or new units. There are no provisions for modifications under these regulations. However, if a unit is reconstructed as defined in the standards it becomes subject to the requirements for new units. Reconstruction under the NESHAP MACT standards is defined similarly to the NSPS in that the fixed capital costs of the new components would need to exceed 50% of the fixed capital cost for constructing a comparable new source. Since the cost of modifying the "A" and "B" Lime Kilns to fire natural gas is only a small fraction of the costs for replacing each kiln, the proposed project will not qualify as reconstruction under the Part 63 standards. As a result, the current Subpart MM standards for PM will continue to apply to the "A" and "B" Lime Kilns, however the lime kilns are subject to a more stringent BACT determined PM emission limit.

G. Compliance Assurance Monitoring (CAM)

U.S. EPA's *Compliance Assurance Monitoring Provisions* (CAM rule) is codified at 40 CFR Part 64. Section 64.2 of the CAM rule specifies the criteria for determining applicability as well as identifies certain exemption clauses. If an emissions unit satisfies all of the applicability criteria contained in 40 CFR §64.2 and does not fit under any of the exemption clauses, the emissions unit is subject to CAM. Otherwise, CAM requirements do not apply to the emissions unit.

The "A" and "B" Lime Kilns are potentially subject to the *Compliance Assurance Monitoring Provisions* contained in 40 CFR Part 64 for PM emissions. The potential pre-control device emissions for PM are above major source threshold levels. However, because the "A" and "B" Lime Kilns are subject to NESHAP MACT requirements contained in 40 CFR Part 63, Subpart MM, which contains applicable emission limitations for PM that were proposed after November 15, 1990 pursuant to section 112 of the Clean Air Act (CAA), Verso Androscoggin is exempt from CAM requirements with respect to PM emissions from the "A" and "B" Lime Kilns.

SO_2 and TRS emissions from the "A" and "B" Lime Kilns are exempt from the *Compliance Assurance Monitoring Provisions* contained in 40 CFR Part 64 because the lime kilns do not have potential pre-control device SO_2 or TRS emissions that are greater than or equal to major source threshold levels.

H. Projected Actual Emissions

The application submitted utilized the actual-to-projected-actual PSD applicability test. Verso Androscoggin submitted calculations which demonstrate that there is no "reasonable possibility" that the natural gas conversion project will result in a significant emissions increase in any regulated NSR pollutant, other than NO_x emissions for which the project has been licensed as a major modification. The calculations show that projected actual emission increases for all regulated NSR pollutants, other than NO_x emissions, from the "A" and "B" Lime Kilns, the RTO, and the #3 and #4 Paper Machines will be less than 50% of significant emissions increase levels. Based on these calculations, Verso Androscoggin will not be required to track projected actual emissions for any of the NSR regulated pollutants as a result of the natural gas conversion project.

I. Incorporation into the Part 70 Air Emission License

Unless otherwise stated, the conditions contained in this New Source Review license amendment shall apply to the facility upon issuance of the license. Per *Part 70 Air Emission License Regulations*, 06-096 CMR 140 (as amended), Section 2(J)(2)(c), for a modification that has undergone NSR requirements or been processed through 06-096 CMR 115 (as amended), the source must then

apply for an amendment to the Part 70 license within one year of commencing the requested changes as provided in 40 CFR Part 70.5(a)(1)(ii).

J. Annual Emissions

Total licensed annual emissions for the facility will not change as a result of the natural gas conversion project.

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A refined modeling analysis was performed to show that emissions from Verso Androscoggin, in conjunction with other sources, will not cause or contribute to violations of Maine and National Ambient Air Quality Standards (MAAQS and NAAQS) and Class II increments for NO_2. Since SO_2, PM_{10} and CO were addressed as part of a previous modeling analysis and because no emissions changes for these pollutants are proposed, no further modeling for these pollutants is required.

The current licensing action for Verso Androscoggin represents a major modification to an existing major source. Based upon the magnitude of proposed emissions increases and the distance from the source to any Class I area, the affected Federal Land Managers (FLMs) and the Department have determined that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

B. Model Inputs

The AERMOD-PRIME refined model was used to address standards and increments in all areas. If applicable, the modeling analysis accounted for the potential of building wake and cavity effects on emissions from all modeled stacks that are below their calculated formula good engineering practice (GEP) stack heights.

All modeling was performed in accordance with all applicable requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA).

A valid 5-year hourly on-site meteorological database was used in the AERMOD-PRIME refined modeling analysis. Wind data was collected at two levels (10 and 91 meters) at Verso Androscoggin's meteorological monitoring site during the 5-year period 1991-1995. Missing data were interpolated or coded as missing, per USEPA guidance. In addition, hourly Augusta National Weather Service (NWS) data, from the same time period, were used to supplement the primary surface

dataset for the required variables that were not explicitly collected at Verso Androscoggin's monitoring site.

The surface meteorological data was combined with concurrent hourly cloud cover and upper-air data obtained from the Caribou NWS. Missing cloud cover and/or upper-air data values were interpolated or coded as missing, per USEPA guidance.

All necessary representative micrometeorological surface variables for inclusion into AERMET (surface roughness, Bowen ratio and albedo) were calculated using AERSURFACE from procedures recommended by USEPA.

Point-source parameters, used in the modeling for Verso Androscoggin are listed in Table III-1.

TABLE III-1: Point Source Stack Parameters

Facility/Stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter (m)	UTM Easting NAD83 (km)	UTM Northing NAD83 (km)
CURRENT/PROPOSED						
Verso Androscoggin						
• Power Boilers #1 & #2	125.27	91.40	104.40	3.81	401.399	4928.866
• Waste Fuel Incinerator	125.27	67.21	105.92	2.74	401.415	4928.848
• Recovery Furnaces #1 & #2	125.27	73.20	105.92	4.57	401.481	4928.820
• "A" Lime Kiln	125.27	33.54	104.40	1.35	401.596	4928.721
• "B" Lime Kiln	125.27	33.54	104.40	1.35	401.583	4928.709
• Regenerative Thermal Oxidizer	121.92	44.12	105.92	0.95	401.654	4928.848
• #3 Paper Machine – Infrared Dryers	121.92	20.00	79.55	0.51	401.462	4929.084
• #3 Paper Machine – Infrared Dryers	121.92	24.00	79.55	0.51	401.441	4929.108
• #4 Paper Machine – Infrared Dryers	121.92	28.00	64.78	0.51	401.473	4929.133
• #4 Paper Machine – Calender Roll	121.92	30.00	64.78	0.76	401.449	4929.181
• #4 Paper Machine – Calender Roll	121.92	30.00	64.78	0.76	401.451	4929.183
• #4 Paper Machine – Air Floatation Dryers	121.92	28.00	64.78	0.51	401.473	4929.133
• Water Treatment Furnaces	144.05	4.57	--	0.30	401.160	4928.680
Verso Androscoggin, LLC Cogeneration Plant						
• Main Stack	124.97	64.62	60.95	5.93	401.227	4928.890
Boralex – Livermore						
• Main Stack	131.06	67.06	83.24	2.44	407.475	4920.525
Specialty Minerals Inc.						
• Main Stack	125.27	18.29	105.92	0.61	401.614	4928.630

Emission parameters for MAAQS/NAAQS and increment modeling are listed in Table III-2.

TABLE III-2: Stack Emission Parameters

Facility/Stack	Averaging Periods	NO_2 (g/s)	Stack Temp (K)	Stack Velocity (m/s)
MAXIMUM LICENSE ALLOWED				
Verso Androscoggin				
• Power Boilers #1 & #2	All	65.30	485.00	19.26
• Waste Fuel Incinerator	All	24.20	338.70	14.94
• Recovery Furnaces #1 & #2	All	26.90	470.90	15.80
• "A" Lime Kiln	All	4.20	344.82	12.96
• "B" Lime Kiln	All	4.20	344.82	12.43
• Regenerative Thermal Oxidizer	All	0.22	394.26	13.15
• #3 Paper Machine – Infrared Dryers	All	0.13	344.26	0.001
• #3 Paper Machine – Infrared Dryers	All	0.13	344.26	0.001
• #4 Paper Machine – Infrared Dryers	All	0.30	344.26	36.18
• #4 Paper Machine – Calender Roll	All	0.27	463.71	1.50
• #4 Paper Machine – Calender Roll	All	0.27	463.71	1.50
• #4 Paper Machine – Air Floatation Dryers	All	0.25	344.26	30.27
• Water Treatment Furnaces	All	0.16	344.26	4.16
Verso Androscoggin, LLC Cogeneration Plant				
• Main Stack	All	3.62	421.50	24.52
Boralex – Livermore				
• Main Stack	All	11.07	439.30	27.80
Specialty Minerals, Inc				
• Main Stack	All	3.02	344.30	13.26
BASELINE – 1987				
Verso Paper conservatively assumed that no credit be taken for any sources existing in the 1987 baseline year				
BASELINE – 1977				
Verso Paper conservatively assumed that no credit be taken for any sources existing in the 1977 baseline year				

C. Use of Ozone Limiting Method

For the purposes of determining NO_2 impacts for the significant impact area, including the combined source impacts and increment impacts, the Ozone Limiting Method (OLM) was applied with prior approval from USEPA. The OLM is the third-tier screening approach which limits the conversion of NO to NO_2 based on the amount of monitored ozone available. Representative hourly ozone data, concurrent with the 1991-1995 meteorological database, was used in the analysis.

D. Single Source Modeling Impacts

AERMOD-PRIME refined modeling results for Verso Androscoggin alone are shown in Table III-3. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type.

TABLE III-3: Maximum AERMOD-PRIME Impacts from Verso Androscoggin Alone

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Significance Level ($\mu g/m^3$)
NO_2	1-hour	**163.28**[1]	401.455	4929.255	121.99	**10**[2]
	Annual	**21.45**	401.494	4929.224	122.05	**1**

[1] Value based on the 5-year arithmetic average of the H8H (highest-8th-high) concentration
[2] Interim Significant Impact Level (SIL) adopted by NESCAUM states

E. Combined Source Modeling Impacts

For predicted modeled impacts from Verso Androscoggin alone that exceeded significance levels, as indicated in boldface type in Table III-3, other sources not explicitly included in the modeling analysis must be accounted for by using representative background concentrations for the area.

Representative background concentrations were developed from data collected at the Presque Isle monitoring site and included into the analysis utilizing the 'background value by season and hour-of-day' method prescribed by USEPA (March 1, 2011 - NO_2 clarification memo). This method calculates the third-highest hourly average over a three year period (2007-2009) on a seasonal basis. The background data is then paired-in-time with meteorological data when incorporated into AERMOD.

TABLE III-4: Background Concentrations

Hour of Day	NO_2 Background Concentration ($\mu g/m^3$)			
	Winter	Spring	Summer	Fall
1	32.0	16.9	7.5	15.0
2	33.8	18.8	5.6	13.2
3	32.0	18.8	5.6	13.2
4	33.8	18.8	5.6	13.2
5	35.7	22.6	5.6	13.2
6	37.6	26.3	7.5	13.2
7	43.2	32.0	9.4	18.8
8	43.2	22.6	9.4	16.9
9	39.5	16.9	7.5	15.0
10	37.6	16.9	5.6	13.2
11	33.8	11.3	5.6	9.4
12	28.2	9.4	5.6	9.4
13	22.6	9.4	3.8	9.4
14	18.8	9.4	3.8	9.4
15	22.6	9.4	5.6	11.3
16	28.2	9.4	5.6	13.2
17	35.7	13.2	5.6	20.7
18	41.4	15.0	7.5	22.6
19	45.1	16.9	7.5	24.4
20	43.2	20.7	13.2	22.6
21	35.7	20.7	13.2	24.4
22	37.6	18.8	11.3	20.7
23	35.7	18.8	11.3	16.9
24	33.8	16.9	9.4	15.0

MEDEP-BAQ examined other area sources whose impacts would be significant in or near Verso Androscoggin's significant impact area. Due to the applicant's location, extent of the significant impact area and other nearby source emissions, MEDEP-BAQ determined that three additional sources would be considered for combined-source modeling: Verso Androscoggin, LLC Cogeneration Plant, Boralex – Livermore, and Specialty Minerals Inc..

The maximum AERMOD-PRIME refined modeling results for all modeled sources, including background, are shown in Table III-5. Because impacts for all NO_2 averaging periods using this method meet all MAAQS and NAAQS, no further modeling analyses need to be performed.

TABLE III-5: Maximum Combined Source Impacts

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	MAAQS/ NAAQS ($\mu g/m^3$)
NO_2	1-hour	**174.40**	401.455	4929.254	121.99	**188**
	Annual	**24.24**	401.533	4929.192	121.42	**100**

F. Increment

AERMOD-PRIME refined modeling was performed to predict the maximum Class II increment impacts. Verso Androscoggin conservatively assumed no credit would be taken for any sources that existed during the baseline years.

Results of the Class II increment analysis are shown in Table III-6. All modeled maximum increment impacts were below all increment standards. Because all predicted increment impacts meet increment standards, no further Class II increment modeling needed to be performed.

TABLE III-6: Class II Increment Consumption

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Increment ($\mu g/m^3$)
NO_2	Annual	**24.24**	401.533	4929.192	121.42	**25**

Federal regulations and 06-096 CMR140 (as amended) require that any source undergoing a major modification provide additional analyses of impacts that would occur as a direct result of the general, commercial, residential, industrial and mobile-source growth associated with the construction and operation of that source.

GENERAL GROWTH: Very minimal increases in local emissions due to construction-related activities are expected to occur, as the proposed modification will involve relatively minor and short-lived general construction. Increases in potential emissions of NO_x due to increased traffic to the mill will be minimal, as there will be an insignificant increase in construction truck traffic in and out of the

area. Fugitive PM emissions (if any) will be minimized by the use of "Best Management Practices".

RESIDENTIAL, COMMERCIAL AND INDUSTRIAL GROWTH: Population growth in the impact area of a proposed source can be used as a surrogate factor for the growth in emissions from combustion sources. Since the population in Franklin County has increased approximately 1.5% since the minor source baseline date was established and the modification is not expected to create any new jobs, no new significant residential, commercial and industrial growth will likely follow from the modification associated with this source.

MOBILE SOURCE AND AREA SOURCE GROWTH: Since area and mobile sources are considered minor sources of NO_2, their contribution to increment has to be evaluated. Technical guidance from USEPA points out that screening procedures can be used to determine whether additional detailed analyses of minor source emissions are required. Compiling a minor source inventory may not be required if it can be shown that little or no growth has taken place in the impact area of the proposed source since the baseline date (February 8, 1988) was established. Emissions during the calendar year 1987 are used to determine baseline emissions. As stated previously, the population in Franklin County has increased approximately 1.5% since the minor source baseline date was established; therefore, no further assessment of additional area source growth of NO_2 increment is needed.

Any emissions associated with the minimal increases in vehicle miles traveled have been more than offset by decreases in NO_x emissions in terms of reduced average grams-per-vehicle-mile emission rates since the minor source baseline date was established. Therefore, no increase in actual NO_x emissions from mobile sources is expected. No further detailed analyses of mobile NO_2 emissions are needed.

G. Class I Impacts

The current licensing action for Verso Androscoggin represents a major modification to an existing major source. Based upon the magnitude of proposed emissions increases and the distance from the source to any Class I area, the affected Federal Land Managers (FLMs) and MEDEP-BAQ have determined that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

H. Summary

In summary, it has been demonstrated that Verso Androscoggin will not cause or contribute to violations of Maine and National Ambient Air Quality Standards (MAAQS and NAAQS) and Class II increments for NO_2.

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,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-203-77-13-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 (as amended) and subject to the standard and special conditions below.

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.

SPECIFIC CONDITIONS

(1) **"A" Lime Kiln**

A. **Fuel Use Requirements**
The "A" Lime Kiln is licensed to fire fuel oil (including #6 fuel oil, #2 fuel oil, specification used oil and off-specification used oil), propane, and natural gas. Verso Androscoggin shall maintain records of the amounts of each type of fuel fired in the lime kiln. [06-096 CMR 115, BACT]

B. **Air Pollution Control Equipment/Strategies**
Verso Androscoggin shall ensure that the "A" Lime Kiln and its associated air pollution control equipment are designed, operated, and maintained in a manner consistent with good air pollution control practices for minimizing emissions, such that applicable emission limits are met, and in accordance with the following requirements:

1. Prior to firing natural gas in the "A" Lime Kiln, upgrade the existing wet scrubber system to handle the increased exhaust flow rates due to the firing of natural gas to control particulate matter emissions.

2. Following the addition of natural gas in the "A" Lime Kiln, utilize low NO_x technology consisting of good equipment design and good combustion practices to minimize NO_x emissions.

3. Conduct tuning operations during shakedown of the new burners, and as necessary thereafter, in an effort to minimize emissions and optimize energy efficiency.

4. Utilize good combustion practices to minimize CO, VOC, and GHG emissions.

5. Utilize good combustion and operating practices to minimize SO_2 and TRS emissions.

[06-096 CMR 115, BACT]

C. **Emission Limits**

Emissions from the "A" Lime Kiln shall not exceed the following upon completion of the natural gas conversion project with respect to the kiln:

Pollutant	Emission Limit	Units	Origin and Authority
PM	0.03	gr/dscf @ 10% O_2	06-096 CMR 115, BACT
$PM_{10}/PM_{2.5}$	25.5	lb/hr	06-096 CMR 115, BACT
SO_2	6.7 (loaded condition)	lb/hr	06-096 CMR 115, BACT
	24 (no load condition*)	lb/hr	06-096 CMR 115, BACT
NO_x	120	ppmv wet @ 10% O_2	06-096 CMR 115, BACT
	33.3	lb/hr	06-096 CMR 115, BACT
CO	200	lb/hr	06-096 CMR 115, BACT
VOC	1.4	lb/hr	06-096 CMR 115, BACT
TRS	20	ppmdv @ 10% O_2 on a 12-hour block average basis	06-096 CMR 115, BACT

* No load condition means the lime kiln is in operation when NCGs are being combusted in the kiln in the absence of lime and the lime mud feed to the kilns has stopped without interruption for a period greater than one hour.

D. **TRS Emission Limit Review**
Verso Androscoggin shall monitor TRS emissions from the "A" Lime Kiln for a period of six months following startup on natural gas and shall submit the data to the Department for its review and determination as to whether a lower TRS emission limit is appropriate. [06-096 CMR 115, BACT]

(2) **"B" Lime Kiln**

A. **Fuel Use Requirements**
The "B" Lime Kiln is licensed to fire fuel oil (including #6 fuel oil, #2 fuel oil, specification used oil and off-specification used oil), propane, and natural gas. Verso Androscoggin shall maintain records of the amounts of each type of fuel fired in the lime kiln. [06-096 CMR 115, BACT]

B. **Air Pollution Control Equipment/Strategies**
Verso Androscoggin shall ensure that the "B" Lime Kiln and its associated air pollution control equipment are designed, operated, and maintained in a manner consistent with good air pollution control practices for minimizing emissions, such that applicable emission limits are met, and in accordance with the following requirements:

1. Prior to firing natural gas in the "B" Lime Kiln, upgrade the existing wet scrubber system to handle the increased exhaust flow rates due to the firing of natural gas to control particulate matter emissions.

2. Following the addition of natural gas in the "B" Lime Kiln, utilize low NO_x technology consisting of good equipment design and good combustion practices to minimize NO_x emissions to minimize GHG emissions.

3. Conduct tuning operations during shakedown of the new burners, and as necessary thereafter, in an effort to minimize emissions and optimize energy efficiency.

4. Utilize good combustion practices to minimize CO, VOC, and GHG emissions.

5. Utilize good combustion and operating practices to minimize SO_2 and TRS emissions.

[06-096 CMR 115, BACT]

C. **Emission Limits**

Emissions from the "B" Lime Kiln shall not exceed the following upon completion of the natural gas conversion project with respect to the kiln:

Pollutant	Emission Limit	Units	Origin and Authority
PM	0.03	gr/dscf @ 10% O_2	06-096 CMR 115, BACT
$PM_{10}/PM_{2.5}$	25.0	lb/hr	06-096 CMR 115, BACT
SO_2	6.7 (loaded condition)	lb/hr	06-096 CMR 115, BACT
	24 (no load condition*)	lb/hr	06-096 CMR 115, BACT
NO_x	120	ppmv wet @ 10% O_2	06-096 CMR 115, BACT
	33.3	lb/hr	06-096 CMR 115, BACT
CO	200	lb/hr	06-096 CMR 115, BACT
VOC	1.4	lb/hr	06-096 CMR 115, BACT
TRS	20	ppmdv @ 10% O_2 on a 12-hour block average basis	06-096 CMR 115, BACT

* No load condition means the lime kiln is in operation when NCGs are being combusted in the kiln in the absence of lime and the lime mud feed to the kilns has stopped without interruption for a period greater than one hour.

D. **TRS Emission Limit Review**

Verso Androscoggin shall monitor TRS emissions from the "B" Lime Kiln for a period of six months following startup on natural gas and shall submit the data to the Department for its review and determination as to whether a lower TRS emission limit is appropriate. [06-096 CMR 115, BACT]

(3) **Regenerative Thermal Oxidizer (RTO)**

A. **Fuel Use Requirements**

The RTO is licensed to fire propane, #2 fuel oil, and natural gas as supplemental fuels. Verso Androscoggin shall maintain records of the amounts of each type of fuel fired in the RTO. [06-096 CMR 115, BACT]

B. **Air Pollution Control Strategies**
Verso Androscoggin shall ensure that the RTO is operated and maintained in a manner consistent with good combustion practices such that applicable emission limits are met. [06-096 CMR 115, BACT]

C. **Emission Limits**
Emissions from the RTO shall not exceed the following:

Pollutant	Emission Limit	Units	Origin and Authority
$PM/PM_{10}/PM_{2.5}$	1.0	lb/hr	06-096 CMR 115, BACT
SO_2	2.0	lb/hr	06-096 CMR 115, BACT
NO_x	1.7	lb/hr	06-096 CMR 115, BACT
CO	1.2	lb/hr	06-096 CMR 115, BACT
VOC	3.0	lb/hr	06-096 CMR 115, BACT
TRS	0.2	lb/hr	06-096 CMR 115, BACT

(4) **#3 Paper Machine Infrared Dryers**

A. **Fuel Use Requirements**
The #3 PM Infrared Dryers are licensed to fire propane and natural gas. Verso Androscoggin shall maintain records of the amounts of each type of fuel fired in the #3 PM Infrared Dryers. [06-096 CMR 115, BACT]

B. **Air Pollution Control Strategies**
Verso Androscoggin shall ensure that the #3 PM Infrared Dryers are operated and maintained in a manner consistent with good combustion practices such that applicable emission limits are met. [06-096 CMR 115, BACT]

C. **Emission Limits**
Emissions from the #3 PM Infrared Dryers shall not exceed the following:

Pollutant	Emission Limit	Units	Origin and Authority
PM	0.05	lb/MMBtu	06-096 CMR 115, BACT
$PM/PM_{10}/PM_{2.5}$	0.7	lb/hr	06-096 CMR 115, BACT
SO_2	0.05	lb/hr	06-096 CMR 115, BACT
NO_x	2.0	lb/hr	06-096 CMR 115, BACT
CO	2.2	lb/hr	06-096 CMR 115, BACT
VOC	0.14	lb/hr	06-096 CMR 115, BACT

(5) **#4 Paper Machine Infrared Dryers**

A. **Fuel Use Requirements**
The #4 PM Infrared Dryers are licensed to fire propane and natural gas. Verso Androscoggin shall maintain records of the amounts of each type of fuel fired in the #4 PM Infrared Dryers. [06-096 CMR 115, BACT]

B. **Air Pollution Control Strategies**
Verso Androscoggin shall ensure that the #4 PM Infrared Dryers are operated and maintained in a manner consistent with good combustion practices such that applicable emission limits are met. [06-096 CMR 115, BACT]

C. **Emission Limits**
Emissions from the #4 PM Infrared Dryers shall not exceed the following:

Pollutant	Emission Limit	Units	Origin and Authority
PM	0.05	lb/MMBtu	06-096 CMR 115, BACT
$PM/PM_{10}/PM_{2.5}$	0.5	lb/hr	06-096 CMR 115, BACT
SO_2	0.01	lb/hr	06-096 CMR 115, BACT
NO_x	2.4	lb/hr	06-096 CMR 115, BACT
CO	3.8	lb/hr	06-096 CMR 115, BACT
VOC	1.0	lb/hr	06-096 CMR 115, BACT

(6) **#4 Paper Machine Air Floatation Dryers**

A. **Fuel Use Requirements**
The #4 PM Air Floatation Dryers are licensed to fire propane and natural gas. Verso Androscoggin shall maintain records of the amounts of each type of fuel fired in the #4 PM Air Floatation Dryers.
[06-096 CMR 115, BACT]

B. **Air Pollution Control Strategies**
Verso Androscoggin shall ensure that the #4 PM Air Floatation Dryers are operated and maintained in a manner consistent with good combustion practices such that applicable emission limits are met.
[06-096 CMR 115, BACT]

C. **Emission Limits**
Emissions from the #4 PM Air Floatation Dryers shall not exceed the following:

Pollutant	Emission Limit	Units	Origin and Authority
PM	0.05	lb/MMBtu	06-096 CMR 115, BACT
$PM/PM_{10}/PM_{2.5}$	0.4	lb/hr	06-096 CMR 115, BACT
SO_2	0.1	lb/hr	06-096 CMR 115, BACT
NO_x	2.0	lb/hr	06-096 CMR 115, BACT
CO	3.2	lb/hr	06-096 CMR 115, BACT
VOC	0.8	lb/hr	06-096 CMR 115, BACT

(7) **#4 Paper Machine Calender Roll**

A. **Fuel Use Requirements**
The #4 PM Calender Roll is licensed to fire propane, #2 fuel oil, and natural gas. Verso Androscoggin shall maintain records of the amounts of each type of fuel fired in the #4 PM Calender Roll. [06-096 CMR 115, BACT]

B. **Air Pollution Control Strategies**
Verso Androscoggin shall ensure that the #4 PM Calender Roll is operated and maintained in a manner consistent with good combustion practices such that applicable emission limits are met. [06-096 CMR 115, BACT]

C. **Emission Limits**
Emissions from the #4 PM Calender Roll shall not exceed the following:

Pollutant	Emission Limit	Units	Origin and Authority
PM	0.12	lb/MMBtu	06-096 CMR 115, BACT
PM	1.7	lb/hr	06-096 CMR 115, BACT
$PM_{10}/PM_{2.5}$	1.4	lb/hr	06-096 CMR 115, BACT
SO_2	7.1	lb/hr	06-096 CMR 115, BACT
NO_x	4.2	lb/hr	06-096 CMR 115, BACT
CO	4.2	lb/hr	06-096 CMR 115, BACT
VOC	1.4	lb/hr	06-096 CMR 115, BACT

(8) **Incorporation into the Part 70 License**
Verso Androscoggin shall submit an application to incorporate this amendment into the Part 70 license, in accordance with 06-096 CMR 140, Section 2(J)(2)(c) (as amended) and 40 CFR Part 70.5(a)(1)(ii), within 12 months of commencing the requested changes. [06-096 CMR 140 and 40 CFR Part 70]

DONE AND DATED IN AUGUSTA, MAINE THIS 19th DAY OF January , 2012.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Melanie Loyzim for
PATRICIA W. AHO, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: August 30, 2011
Date of application acceptance: September 15, 2011

Date filed with the Board of Environmental Protection:

This Order prepared by Eric Kennedy, Bureau of Air Quality.