Irving Forest Products, Inc.
Aroostook County
Ashland, Maine
A-314-77-1-A

Departmental
Findings of Fact and Order
New Source Review
NSR #1

FINDINGS OF FACT

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 Maine Revised Statutes Annotated (M.R.S.A.), Section 344 and Section 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Irving Forest Products, Inc. (Irving)
LICENSE TYPE	06-096 CMR 115, Minor Modification
NAICS CODES	321912 (cutstock, resawing, planing), 32113 (sawmill), 321999 (misc. wood product mfg)
NATURE OF BUSINESS	Wood Products
FACILITY LOCATION	Ashland – Nashville Plantation

The facility has included operations of boilers, sawmill processes, and lumber kilns in Ashland, Maine.

The Irving facility is an existing stationary major source for criteria pollutants currently licensed under Part 70 air emission license A-314-70-E-R (issued January 11, 2011). The facility is considered an area source for hazardous air pollutants. The equipment at the facility had been temporarily shut down since August 2008; however, the air emission license was renewed and kept active to allow for future business opportunities.

B. Amendment Description

Irving has submitted a new source review 06-096 CMR 115 Minor Modification application for a mill modernization project. The proposed project involves relocating two existing 25.7 MMBtu/hr biomass boilers and two lumber kilns currently at facilities owned by Irving in New Brunswick, in addition to the

installation of new sawmill and planar mill equipment. An existing emergency generator is also included as part of the project.

The previously licensed Boiler 1 (10 MMBtu/hr), lumber kilns 1-9, and saw mill and planar mill equipment have been removed from the site and shall be removed from the license.

C. Emission Equipment

The following equipment is addressed in this air emission license:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Manufactured Date	Installed Date	Fuel Type	Stack #
Boiler 2 (existing)	30	214.3 gal/hr	1974	Prior to 1989	#2 fuel oil, 0.05% sulfur	2
Boiler 4 (relocated)	25.7	5711 lb/hr	1997	2014	Biomass (50 % moisture, 4500 Btu/lb)	4
Boiler 5 (relocated)	25.7	5711 lb/hr	2008	2014	Biomass (50 % moisture, 4500 Btu/lb)	5

Emergency Generator

Equipment	Maximum Capacity (MMBtu/hr)	Firing Rate (gal/hr)	Manufactured Date	Installed Date	Fuel Type
Generator 1 (existing fire pump)	1.67	12	Approx. 1967	1967	#2 fuel oil, 0.0015% sulfur

Process Equipment

Equipment	Production Rate	Pollution Control Equipment
Woodyard	175 MMBF various stages of lumber	-
Sawmill	130 MMBF rough green lumber	Cyclones
Planer mill	130 MMBF rough green lumber	Cyclones
Lumber Drying Kilns	130 MMBF lumber	-

Table Note: MMBF = million board feet

D. Application Classification

The modification of a major source is considered a major modification based on whether or not expected emissions increases exceed the "Significant Emission Increase Levels" as given in *Definitions Regulation*, 06-096 Code of Maine Rules (CMR) 100 (as amended).

For this license, the emission increases were determined by subtracting the baseline actual emissions of a 24 month period within the ten years preceding the modification (years 2004-2005) from the proposed licensed allowed emissions (calculated with proposed annual fuel use limits for biomass and distillate oil). The results of this test are as follows:

Pollutant	Baseline Actual Emissions 2004-2005 (ton/year)	Proposed Licensed Allowed Emissions (ton/year)	Net Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	42.7	50.9	+8.2	25
PM_{10}	38.8	50.9	+12.1	15
$PM_{2.5}$	27.7	33.0	+5.4	10
SO_2	2.1	4.8	+2.7	40
NO_x	15.7	40.9	+25.2	40
CO	39.3	95.6	+56.3	100
VOC	50.9	86.5	+35.6	40
CO_2e	19,994	34,229	+14,234	75,000

Table Notes for Baseline Calculations:

- Average sawmill production was 76.11 million board feet.
- All three boilers operated within the two years: average annual biomass use was 23,759 tons, average low sulfur diesel use was 5800 gal/year, and average waste oil use was 2800 gal/yr.
- Data used for the Dillon sawdust-fired boiler (Boiler 1) included EPA's air pollution factors (AP-42) ratio for PM_{10} based on PM licensed allowed, DEP inventory for SO_2, CO, and VOC, and the AP-42 factor for NO_X.
- Data used for the Cleaver Brooks oil-fired boiler (Boiler 2) included AP-42 factors for all pollutants, with PM, PM_{10}, and $PM_{2.5}$ consisting of both filterable and condensable particulate fractions.
- Data used for the bark, wood, and oil fired B & W boiler (Boiler 3) included AP-42 factors for all pollutants when firing oil, with PM, PM_{10}, and $PM_{2.5}$ consisting of both filterable and condensable particulate fractions and the following when firing biomass: alternative emission factors for PM, PM_{10}, and $PM_{2.5}$ based on information gathered from stack

tests, AP-42 factors, and licensed allowed, DEP inventory for SO_2, an average of stack test results for NO_X, stack test result for CO, and AP-42 factor for VOC.

Based on the emissions in the table above, this amendment 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 amendment into the Part 70 air emission license shall be submitted no later than 12 months from commencement of the requested operation.

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 *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 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.

Before proceeding with the control requirements for each unit, a general process description of the project is summarized below.

Facility and Project Description

Historically since operations began in the 1960's, the facility has been equipped to saw whole logs into lumber. The logs are debarked, sawed, chipped, resawed and sorted in the sawmill area. Next, the lumber is then dried in kilns by applying various cycles of heat and air flow to the stacked lumber. The dried lumber then goes to the planer mill where it is planed, trimmed, cut, chipped, graded and sorted. Annually, the facility has the capacity to produce 130 million board feet (MMBf) of kiln dried lumber consisting mainly of spruce wood species.

The proposed modernization project will include the relocation of two 25.7 MMBtu/hr biomass boilers and two lumber kilns to the site. The biomass boilers will supply process steam and heat utilizing biomass mainly from the sawmill operations at the site, with additional fuel transported to the facility as necessary.

The existing sawmill building will house new planer and sawmill equipment. The previously licensed Boiler 1, lumber kilns 1-9, and older planer and sawmill equipment have already been removed from the site. The relocated Boilers 4 and 5 will be installed in a new boiler house building.

B. Boilers 4 and 5

Biomass Boilers 4 and 5 were manufactured by KMW in 1997 and 2008, respectively, with a nominal capacity rating of 25.7 MMBtu/hr each. The units are being relocated from Irving's Deersdale, New Brunswick's facility. The steam from the boilers will be used in the lumber drying process, for log conditioning, and for space heating of the buildings. The proposed boilers will replace the steam demands previously supplied by Boilers 1, 2, and 3. Boiler 3 had been removed from the license at the time of the Part 70 air emission license renewal. Boiler 1 will be removed with this licensing action, and Boiler 2 will remain on the license.

Boilers 4 and 5 are each capable of generating up to 20,000 lb/hr of steam, firing biomass consisting of bark, wet wood, and sawdust. Irving has proposed an annual fuel limit of 35,000 tons/year biomass total (50% moisture content with a heat content of 4500 Btu/lb), or equivalent. Particulate matter emissions will be controlled with a multiclone collector on each unit. Boilers 4 and 5 will exhaust through separate 100 foot stacks, but will utilize a common ash collection system.

The boilers are subject to both New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* and 40 CFR Part 63, Subpart JJJJJJ, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*. The specific applicable rule requirements are discussed in the sections following the BACT summary.

1. Best Available Control Technology (BACT) – Boilers 4 and 5

Irving submitted a BACT analysis for the relocation of the two 25.7 MMBtu/hr biomass boilers. The BACT procedure consists of a five step process: (1) identify control technologies, (2) eliminate technically infeasible options, (3) rank remaining control technologies by control effectiveness, (4) evaluate the most effective controls and document results, including case-by-case consideration of energy, environmental, and economic impacts, and an evaluation of the next most effective control option if the top option is not selected as BACT, and (5) select BACT, the most effective control option not rejected.

The following summarizes Irving's BACT analysis:

a. Identification of Currently Permitted Control Technologies

In order to identify potential control technologies currently in use on similar units, Irving reviewed the EPA RACT/BACT/LAER Clearinghouse Database and permitting determinations of the New England states with the results in the table below:

BACT Determinations for Small Biomass Boilers

					lb/MMBtu unless otherwise noted				
Facility and Location	**Unit Type**	**Date**	**Size (MMBtu/hr)**	**Controls**	**PM PM_{10} $PM_{2.5}$**	**SO_2**	**NO_X**	**CO**	**VOC**
Moose River Lumber Moose River, ME	Biomass Boiler 4	2008	29.39	Multiclone, Low sulfur fuel, Good design, combustion and operating practices	PM filterable 0.3 PM_{10} filterable 0.3	0.025	0.34	0.60	0.017
Middlebury College Middlebury, VT	Biomass Gasifier	ND	30	Multiclone plus Fabric Filter, Low sulfur fuel, Good design, combustion and operating practices	PM filterable 0.019	0.025	-	-	-
Ethan Allen Orleans, VT	Riley Stoker wood boiler	2001	34	Multiclone, Low sulfur fuel, Good design, combustion and operating practices	PM filterable 0.2 gr/dscf	0.025	-	-	-
North Country Hospital Newport, VT	Biomass Boiler	2003	15.6	Multiclone, Low sulfur fuel, Good design, combustion and operating practices	PM_{10} filterable 0.101	0.025	-	-	-
Durgin and Cromwell Lumber Springfield, NH	Wood-fired boiler grate fired	1978	15.5	Low sulfur fuel, Good design, combustion and operating practices	-	0.025	0.23 RACT	-	-

Crotched Mountain Rehab Greenfield, NH	Hurst FB 1660 wood-fired boiler	2006	13.9	Multiclone plus Fabric Filter Low sulfur fuel, Good design, combustion and operating practices	PM filterable 0.3 PM_{10} filterable 0.07	0.025	0.22	0.09	0.017
Elanor Slater Hospital Pascoag, RI	Messer-smith Hurst wood fired boiler	2011	8.56	Electrostatic Precipitator, Low sulfur fuel, Good design, combustion and operating practices	PM_{10} filter+ condensable 0.1 $PM_{2.5}$ filter+ condensable 0.06	0.025	0.22	0.18	0.017
Forster Glocester Regional N. Scituate, RI	Chiptec wood fired boiler	2007	9.1	Multiclone, Low sulfur fuel, Good design, combustion and operating practices	PM_{10} filter+ condensable 0.2 $PM_{2.5}$ filter+ condensable 0.18	0.025	0.22	0.18	0.017
Forster Glocester Regional N. Scituate, RI	Chiptec wood fired boiler	2007	4.56	Multiclone, Low sulfur fuel, Good design, combustion and operating practices	PM_{10} filter+ condensable 0.2 $PM_{2.5}$ filter+ condensable 0.18	0.025	0.22	0.18	0.017

b. Particulate Matter: $PM/PM_{10}/PM_{2.5}$

Particulate matter emissions from fuel combustion are formed from incomplete combustion of fuel and non-combustible material in the fuel. Potential particulate matter controls for biomass boilers consists of add-on controls, combustion of clean fuels, good combustion practices, or a combination of options.

The identification of add-on controls for the biomass boilers included electrostatic precipitators (ESPs), wet scrubbers, baghouses (fabric filters) and multiclones. ESPs control particulate matter emissions by applying a charge to the particles in the exhaust stream, oppositely charging a collection surface where the particles accumulate, removing the collected dust by a rapping process, and collecting the dust in hoppers. Wet scrubbers consist of using particle inertia and pressure to transfer particles

from the gas stream to a liquid stream using water, purging the liquid, and removing the particles in sludge form. Baghouses collect particulate matter on the surface of filter bags typically hung from a support at the top of the baghouse and have a closed top and an open cylindrical bottom into which the exhaust gases flow upward and outward, leaving the particulate collected on the inner surface. The bags are periodically cleaned (shaken) or replaced. Multiclones (multiple cyclones) or mechanical collectors are cylindrical units set up in series which remove particulate matter through centrifugal force. The exhaust gases enter each cyclone near the top and spiral down around the outer part and then spiral upward toward the top outlet, while the particulates forced together along the outer walls conglomerate and drop down for collection in a hopper.

In step two of the BACT analysis to eliminate technically infeasible control options, Irving did not pursue baghouses or fabric filters further due to the risk of fires if smoldering particulates were carried over past the multiclones into the baghouse. Although a gasifier type combustor in Vermont and a Hurst firebox biomass boiler in New Hampshire did incorporate fabric filters, they were not the same type of units as proposed Boilers 4 and 5.

In step three of the BACT analysis to rank the feasible particulate matter control technologies, Irving presented the following:

Particulate Matter Control Technology	Expected Performance Capture Efficiency	Ranking
Electrostatic Precipitator	PM: 95-99+%, PM_{10}: 95%, $PM_{2.5}$: 90%	1
Wet Scrubber	PM: 90-95%, PM_{10}: 90-95%, $PM_{2.5}$: 65-75%	2
Multiclone	PM: 65-75%, PM_{10}: 65-75%, $PM_{2.5}$: 45-50%	3

In step four of the BACT analysis to evaluate the technically feasible control options, Irving determined that an electrostatic precipitator is not feasible for economic reasons, along with additional environmental and energy impacts; and a wet scrubber was not feasible based on significant environmental impacts due to water management, along with having economic and energy impacts. The economics of installing an ESP was based on capital costs of $1,100,000, annual operating costs of $80,000, an incremental PM emission reduction of 37.3 tons/yr from multiclone control, and $6571 per ton of particulate matter reduced. ESP operations would also increase the facility's electrical use and solid waste disposal in the form of increased ash capture. The wet scrubber analysis showed that based on vendor's estimates, installation of a low energy wet scrubber retrofit would include an additional 2.4 million gallons of water use with a scrubber blow down generating 290 gallons/day of effluent. Irving has no

reasonable access to a wastewater treatment facility capable of processing this quantity of waste water on a continual basis. Although the large amount waste water discharge may be offset by evaporative losses if the discharge could be put in the existing hot pond, solids in the effluent would settle and dredging would be required to maintain hot pond volume. The solids would then need to be disposed. The economic analysis for a wet scrubber resulted in capital costs of $490,000, annual operating costs of $38,000, an incremental PM emission reduction of 26.1 tons/yr from multiclone control, and $4289 per ton of particulate matter reduced.

The proposed biomass boilers have multiclones on the units. Multiclones are identified most often for particulate matter control for biomass boilers of this age, type, and size. Operating costs were estimated to be $6000 and factoring in the initial capital costs, $481 per ton of particulate matter reduced was calculated for an emission reduction of 43.6 tons/year. The energy requirements are slightly higher for a unit with multiclones compared to no control due to flue gas system pressure drop. Multiclone use also requires disposal of solid waste.

The last step in a BACT analysis is the selection of BACT.

BACT for particulate matter emissions from Boilers 4 and 5 is the use of multiclones, good combustion practices, a fuel cap of 35,000 tons of biomass per year (50% moisture content with a heat content of 4500 Btu/lb), or equivalent, and the following emission limits:

	Emission Limit Basis	lb/MMBtu	lb/hr
PM	06-096 CMR 103	0.30	7.7
PM_{10}	06-096 CMR 103	0.30	7.7
$PM_{2.5}$	AP-42, Table 1.6-1	0.21	5.3

c. Sulfur Dioxide: SO_2

Sulfur dioxide is formed from the combustion of sulfur present in the fuel. Control options identified for SO_2 emissions include the use of fuel with a low sulfur content, use of fuels that produce alkali ash which absorbs SO_2 (use of biomass may have some absorbing potential), sorbent injection, and SO_2 scrubbing technologies, including flue gas desulfurization or packed-bed scrubbers. All the potential controls were determined to be technically feasible, with a performance ranking as shown below:

SO_2 Control Technology	Expected Performance Capture Efficiency	Ranking
Low sulfur fuel (biomass only, no oil)	Sulfur content of biomass is extremely low compared to the sulfur content of fossil fuels	1
Sorbent injection	90-99%	2
SO_2 Scrubbing	90-99%	3

Evaluation of the technical feasible options resulted in a determination that add-on controls are not feasible for economic, energy, and environmental impact reasons. The capital cost for controls to minimize SO_2 emissions are substantial compared to firing biomass, which inherently produces low SO_2 emissions. Energy use would increase due to fan and pump electrical requirements. Environmental impacts would include chemical transport to the site, chemical storage on-site, potential chemical release risks, and waste water discharge and solid waste disposal. Installing the biomass boilers reduces the operational need for the existing oil-fired boiler, thereby also reducing overall SO_2 emissions from the facility.

BACT for sulfur dioxide emissions from Boilers 4 and 5 is the use of biomass as a low content sulfur fuel and the following emission limit:

	Emission Limit Basis	lb/hr
SO_2	AP-42, Table 1.6-2: 0.025 lb/MMBtu	0.6

d. Nitrogen Oxides: NO_X

Nitrogen oxides mainly consist of nitric oxide (NO) and nitrogen dioxide (NO_2). The two primary formation mechanisms are thermal NO_X and fuel NO_X. NO_X is formed from the oxidation of fuel bound nitrogen in the flame and from nitrogen in the combustion air in the post flame gas. NO_X can also be formed during combustion through the reaction of hydrocarbon fragments and nitrogen in the incoming combustion air.

Control options identified for NO_X emissions include selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), flue gas recirculation (FGR) and combustion control practices. SCR and SNCR technologies introduce a reagent, typically ammonia or urea, in the flue gas exhaust. The NO_X in the exhaust gases reacts with the reagents and is converted to nitrogen and water. SCR also utilizes a catalyst after the reagent injection point. Flue gas recirculation achieves a reduction of thermal NO_X by recirculating slightly cooled exhaust gases back in the combustion area, lowering flame temperature and reducing NO_X formation. Oxygen concentration is also reduced with the dilution of the

exhaust gas, which results in a lower flame temperature and lower NO_X formation. Combustion controls include optimization of combustion temperature, combustion stoichiometry, and fuel combustion efficiency to reduce NO_X, while limiting other pollutant emissions through complete combustion.

From the options for NO_X control, flue gas recirculation was eliminated from consideration due to the equipment needed to transport the flue gas at recirculation rates greater than 15%. A specific recirculation fan would be needed to withstand the high temperature and high particulate loading of the flue gas. The high particulate loading to the boiler is of concern, as is the cost of retrofitting the boilers since the cost could exceed 50% of the original cost of the boilers once the relocated expenses are added.

The following controls were determined to be technically feasible, with a performance ranking as listed:

NO_X Control Technology	**Expected Performance Reduction Efficiency**	**Ranking**
SCR	50-70%	1
SNCR	35-50%	2
Combustion Controls	Optimization of all pollutants	3

The evaluation of NO_X Control Technology resulted in a conclusion that add-on SCR and SNCR controls are primarily used on large industrial and utility boilers. Little information was available for smaller biomass units. Costs were difficult to find, so a factored cost for SCR was used based on a larger biomass unit resulting in estimations at $900,000 for capital, $60,000 for annual operating costs, NO_X emission reductions of 20.8 tons/year, and $9380 per ton of NO_X reduced. Additional cost could be incurred for particulate matter controls since SCR increases particulate emissions due to ammonia slip. A possible operating issue is that SCR has been found to have the potential for alkali particles from biomass combustion to deactivate the catalyst over time. Environmental impacts with SCR include storage and chemical deliveries of aqueous ammonia or urea, accidental chemical release risks, ammonia slip emissions, and disposal of the catalyst. Energy impacts include the electrical loads for pumps and fans. The SNCR analysis for the biomass boilers resulted in similar findings as SCR. Using published data, it was estimated that for SNCR capital costs were $300,000, annual operating costs were $23,000, NO_X emission reductions were 13.9 tons/year, and that NO_X reduced was $4906 per ton. Environmental impacts with SNCR include storage and chemical deliveries of aqueous ammonia or urea, accidental chemical release risks, and ammonia slip emissions; while energy impacts include

the load for pumps and fans. A report published by the National Council for Air and Stream Improvement in August 2003 stated that changing load and fuel conditions in biomass boilers may significantly reduce SNCR effectiveness.

NO_X emissions can be minimized by proper boiler operation and design practices. The key is to balance temperature and combustion stoichiometry while achieving efficient fuel combustion so that emissions of other pollutants such as carbon monoxide and volatile organic compounds are not adversely increased as NO_X is decreased.

BACT for NO_X emissions from Boilers 4 and 5 shall be the use of good combustion control and the following emission limits:

	Emission Limit Basis	lb/MMBtu	lb/hr
NO_X	AP-42, Table 1.6-2	0.22	5.7

e. Carbon Monoxide and Volatile Organic Compounds: CO and VOC

Carbon monoxide and volatile organic compound emissions are a result of incomplete combustion, caused by conditions such as insufficient residence time or limited oxygen availability. Control options identified for CO and VOC emissions include combustion controls and a catalyst system, both feasible for these boilers, with the following ranking:

CO Control Technology	Expected Performance	Ranking
CO and VOC Catalyst	0.12 lb/MMBtu (CO) 0.014 lb/MMBtu (VOC)	1
Combustion Controls	0.6 lb/MMBtu (CO) 0.017 lb/MMBtu (VOC)	2

The evaluation of the CO and VOC catalyst control option included the finding that an auxiliary fuel would be needed to reheat the flue gas stream to a minimum catalytic oxidation requirement of 500°F, resulting in an environmental impact of generating additional emissions from the reheating source. The cost for a catalyst system is significant, especially since the systems are typically installed as part of a SCR-oxidation catalyst package. SCR was considered cost prohibitive for these boilers.

Good combustion controls are considered the preferred control option for smaller boilers to balance NO_X, CO, and VOC emissions. All of the units reviewed used this technology as control for these pollutants.

BACT for CO and VOC emissions from Boilers 4 and 5 shall be the use of good combustion control and the following emission limits:

	Emission Limit Basis	lb/hr
CO	AP-42, Table 1.6-2, 0.6 lb/MMBtu	15.4
VOC	AP-42, Table 1.6-3, 0.017 lb/MMBtu	0.4

f. Greenhouse Gas: GHG

Greenhouse gas emissions are minimized from small to mid-sized units by the size and efficiency of the boilers. Based on the corresponding estimated potential GHG emissions from the units (31,417 tons/year total), no specific GHG emission limits are required for Boilers 4 and 5 at this time.

g. Opacity

BACT for visible emissions from each of the boilers' stacks shall be the following: Visible emissions shall not exceed 20% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block averages in a continuous 3-hour period.

h. Fuel Use

Irving shall be limited to a total biomass fuel use limit of 35,000 tons/yr (50% moisture content with a heat content of 4500 Btu/lb), or equivalent, for Boilers 4 and 5 on a 12-month rolling total basis.

2. Periodic Monitoring – Boilers 4 and 5

Periodic monitoring for the boiler multiclones consists of recordkeeping documenting maintenance, malfunctions, and downtime of the multiclones.

Irving shall maintain records documenting biomass fuel use on a monthly and 12-month rolling total basis.

3. New Source Performance Standards (NSPS)

Due to the size and year manufacture, the boilers are subject to the New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, for units greater than 10 MMBtu/hr manufactured after June 9, 1989. Boilers 4 and 5 fire wood, therefore they are not subject to the SO_2 emission standards in Subpart Dc. In addition, since the heat input

capacity of each boiler is less than 30 MMBtu/hr, the particulate matter emission standards and opacity monitor requirements of Subpart Dc do not apply to either unit. Irving will be subject to the applicable reporting and recordkeeping requirements in 40 CFR Part 60, Sections 60.48c and 60.7.

4. 40 CFR Part 63 Subpart JJJJJJ

Boilers 4 and 5 are subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources* (40 CFR Part 63, Subpart JJJJJJ). The units are considered to be existing biomass boilers since they are being relocated and are not defined as 'new' or 'reconstructed' under the rule. 40 CFR Part 63, Subpart JJJJJJ, Section 63.1194 states that units are considered new sources if commencing construction occurs after June 4, 2010 and the applicability criteria are met. The definition of construction in 40 CFR Part 63.2 includes the following: "Construction means the on-site fabrication, erection, or installation of an affected source. Construction does not include the removal of all equipment comprising an affected source from an existing location and reinstallation of such equipment at a new location..."

For informational purposes, a summary of the currently applicable federal 40 CFR Part 63 Subpart JJJJJJ requirements is listed below. At this time, the Department has not taken delegation of this area source MACT (Maximum Achievable Control Technology) rule promulgated by EPA, however Irving is still subject to the requirements. Notification forms and additional rule information can be found on the following website: http://www.epa.gov/ttn/atw/boiler/boilerpg.html.

a. Compliance Dates, Notifications, and Work Practice Requirements

i. Initial Notification of Compliance
An Initial Notification submittal to EPA is due no later than January 20, 2014 or 120 days after startup. [40 CFR Part 63.11225(a)(2)]

ii. Boiler Tune-Up Program

(a) A boiler tune-up program shall be implemented to include the initial tune-up of applicable boilers no later than March 21, 2014 or if not operating by that date, within 30 days of startup. [40 CFR Parts 63.11196(a)(1) and 63.11210(j)(2)]

(b) The boiler tune-up program, conducted to demonstrate continuous compliance, shall be performed as specified below:

1. As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled shutdown is permitted; not to exceed 36 months from the previous inspection for boilers

greater than 5 MMBtu/hr or 72 months from the previous inspection for oil fired boilers less than 5 MMBtu/hr, boilers with oxygen trim system, seasonal boilers, and limited use boilers. [40 CFR Part 63.11223(b)(1)]

2. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 CFR Part 63.11223(b)(2)]
3. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is permitted; not to exceed 36 months from the previous inspection for boilers greater than 5 MMBtu/hr or 72 months from the previous inspection for oil fired boilers less than 5 MMBtu/hr, boilers with oxygen trim system, seasonal boilers, and limited use boilers. [40 CFR Part 63.11223(b)(3)]
4. Optimize total emissions of CO, consistent with manufacturer's specifications. [40 CFR Part 63.11223(b)(4)]
5. Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 CFR Part 63.11223(b)(5)]
6. If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 CFR Part 63.11223(b)(7)]

(c) After conducting the initial boiler tune-up, a Notification of Compliance Status shall be submitted to EPA no later than July 19, 2014 or 120 days after initial startup of the boiler, whichever is later. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(b)]

(d) The facility shall implement a boiler tune-up program after the initial tune-up and initial compliance report (called a Notification of Compliance Status) has been submitted.

1. Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. See chart below:

Boiler Category	Tune-Up Frequency
New or Existing Oil, Biomass and Coal fired boilers that are not designated as "Boilers with less frequent tune up requirements" listed below	Every 2 years
New and Existing Oil, Biomass, and Coal fired Boilers with less frequent tune up requirements	
Seasonal (see definition §63.11237)	Every 5 years
Limited use (see definition §63.11237)	Every 5 years
With a heat input capacity of <5MMBtu/hr	Every 5 years
Boiler with oxygen trim system which maintains an optimum air-to-fuel ratio that would otherwise be subject to a biennial tune up	Every 5 years

[40 CFR Part 63.11223(a) and Table 2]

2. The tune-up compliance report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the concentration of CO in the effluent stream (ppmv) and oxygen in volume percent, measured at high fire or typical operating load, before and after the boiler tune-up, a description of any corrective actions taken as part of the tune-up of the boiler, and the types and amounts of fuels used over the 12 months prior to the tune-up of the boiler. [40 CFR Part 63.11223(b)(6)] The compliance report shall also include the company name and address; a compliance statement signed by a responsible official certifying truth, accuracy, and completeness; and a description of any deviations and corrective actions. [40 CFR Part 63.11225(b)]

iii. Energy Assessment

Boilers 4 and 5 are subject to the energy assessment requirement as follows:

(a) A one-time energy assessment shall be performed by a qualified energy assessor on the applicable boilers no later than March 21, 2014 or if not operating by that date, prior to startup of the boiler. [40 CFR Parts 63.11196(a)(3) and 63.11210(j)(2)]

(b) The energy assessment shall include a visual inspection of the boiler system; an evaluation of operating characteristics of the affected boiler systems, specifications of energy use systems, operating and maintenance procedures, and unusual operating constraints; an inventory of major energy use systems consuming energy from affected boiler(s) and which are under control of the

boiler owner or operator; a review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage; a list of major energy conservation measures that are within the facility's control; a list of the energy savings potential of the energy conservation measures identified; and a comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.
[40 CFR Part 63, Table 2(4)]

(c) A Notification of Compliance Status shall be submitted to EPA no later than July 19, 2014 or 120 days after startup of the boiler, whichever is later. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(c)]

b. Recordkeeping
Records shall be maintained consistent with the requirements of 40 CFR Part 63 Subpart JJJJJJ including the following [40 CFR Part 63.11225(c)]: copies of notifications and reports with supporting compliance documentation; identification of each boiler, the date of tune-up, procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned; documentation of fuel type(s) used monthly by each boiler; the occurrence and duration of each malfunction of the boiler; and actions taken during periods of malfunction to minimize emissions and actions taken to restore the malfunctioning boiler to its usual manner of operation. Records shall be in a form suitable and readily available for expeditious review.

Note: EPA will require submission of Notification of Compliance Status reports for tune-ups and energy assessments through their electronic reporting system. However, the system will not be in place until October 2013, so sources may submit the written NOCS to the EPA Administrator. [63.1125(a)(4)(vi)]

C. Sawmill and Planer Mill Operations

New sawmill and planer mill equipment will be installed in the existing sawmill building. Sawmill and planer processes include debarking, sawing, hogging, chipping, re-sawing (trimming), planning, and sorting. Particulate matter activities will be enclosed within the sawmill building. Emissions from the sawing, trimming, and planer operations will be collected by a pneumatic conveying system that utilizes cyclones to capture particulate matter in the system's exhaust.

1. BACT – Sawmill and Planer Mill Operations

   BACT for Sawmill and Planer Mill Operations includes the use of a pneumatic conveying system with cyclones to minimize particulate matter emissions. For each process cyclone exhausting to the atmosphere, visible emissions shall not exceed an opacity of 20% on a 6 minute block average basis, except for no more than 1 six minute block average in a 1 hour period.

2. Periodic Monitoring

   Periodic monitoring for the sawmill and planer mill process cyclones which exhaust to the atmosphere shall consist of recordkeeping to document maintenance, malfunctions, and downtime of the cyclones.

D. Lumber Kilns

The two relocated Lumber Kilns from Georgetown, Prince Edward Island will replace the previous nine kilns which were removed from the site. In the lumber drying kilns, green lumber is dried while stacked in the insulated chamber using air and heat from indirect steam. Water is removed to attain a wood moisture content below 20%. The two Lumber Kilns will produce up to 130 million board feet of finished spruce/fir lumber per year.

VOC emissions from the two kilns were calculated using a total estimated production of 130 million board feet (MMBF)/year and an emission factor for spruce/fir kiln drying of 1.283 lb VOC/1000 board feet (MBF) based on testing performed at the University of Maine. VOC emissions from the two kilns are estimated to be 83.4 ton/year.

1. BACT – Lumber Kilns

   The control of VOC emissions from lumber kilns includes pollution prevention measures and add-on controls. Pollution prevention measures are not applicable for this operation since no VOC containing chemicals are used. Add-on controls are not technically feasible due to the gas stream flow rates, VOC emissions, and moisture content during the drying cycles for various grades and species of wood, as well as large variations in venting by season. VOC control devices used in other manufacturing facility categories often include combustion devices which create additional environmental concerns.

   BACT from the Lumber Kilns shall be a total VOC limit of 83.4 tons/year, based on a 12 month rolling total.

2. Periodic Monitoring – Lumber Kilns

   Periodic monitoring for the Lumber Kilns shall consist of recordkeeping for VOC emissions, including production records (monthly kiln throughput) and the factor used to calculate the VOC emissions depending on the species dried.

E. Material Handling and Storage

1. Biomass Handling

   The boiler's current biomass handling system will be relocated on-site with Boilers 4 and 5. Biomass will be generated by the sawmill operations and brought on-site from other suppliers, as needed. Sawmill generated bark will be screened prior to use. A covered conveyor will deliver the biomass fuel from the yard to the storage area to be deposited in covered bins which will each have the capacity to hold enough material for up to 72 hours of operation. A paved, uncovered pad will be used as overflow storage.

   Biomass will be conveyed from the storage bins through a conveyor system to boiler feed bins located outside the steam plant. The feed bins will provide an even fuel distribution and prevent back draft.

2. Ash Handling

   The common ash handling system for the biomass boilers' bottom ash will consist of a covered main ash conveyor and a covered above-grade storage bin (covered roll-off container) located outside, adjacent to the boiler and fuel storage building. Bottom ash will be collected from a number of points within the boilers using screw conveyors and will be deposited onto the main conveyor. Fly ash will be collected using the multiclone collectors, stored in a small ash hopper with a rotary air lock, and will be discharged onto the main ash conveyor. The roll-off storage container will periodically be transported off-site for disposal.

3. Wood Yard

   The wood yard consists of log and lumber storage, loading, and unloading. It is estimated that the wood yard can accommodate up to 175 million board feet of wood in various stages of lumber, including rough green lumber, rough dry lumber, and finished dry lumber.

4. BACT – Material Handling and Storage

   BACT from the wood yard and fugitive material handling sources is opacity limited to no greater than 20%, except for no more than 5 minutes in any 1 hour period, per 06-096 CMR 101 (as amended). Compliance shall be determined by an aggregate of the individual 15 second opacity observations which exceed 20% in any 1 hour.

F. Boiler 2

Boiler 2 is an existing Cleaver Brooks #2 oil fired boiler rated at 30 MMBtu/hr and manufactured in 1974. Irving plans to use Boiler 2 for heat during the construction season while Boilers 4 and 5 are being relocated. Once Boilers 4 and 5 are operating in Ashland, it is expected that Boiler 2 will be used for back-up or limited use only.

As a result of ambient air quality modeling, in order to meet the 1-hr SO_2 standard, Boiler 2 shall be restricted to firing distillate oil with a maximum sulfur content of 0.05%, by weight. This is a reduction from the currently licensed 0.5% sulfur content. The SO_2 emission limit from Boiler 2 shall be 1.5 lb/hr.

A $PM_{2.5}$ emission rate from Boiler 2 was included in the ambient air quality modeling. There was no previous $PM_{2.5}$ licensed emission limit for Boiler 2. The emission rate was based on the cumulative particle size distribution stated in AP-42 Table 1.3-6 of 12% $PM_{2.5}$. The $PM_{2.5}$ emission limit from Boiler 2 shall be 0.75 lb/hr.

With the exception of a lower SO_2 emission limit and the addition of a $PM_{2.5}$ emission limit, the license emission limits and the 250,000 gal/yr #2 fuel oil limit in air emission license A-314-70-E-R shall continue to apply to Boiler 2.

Boiler 2 is subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources* (40 CFR Part 63, Subpart JJJJJJ) as an existing oil fired boiler [see summary in section II (B)(4) of this license for existing boiler requirements].

G. Emergency Generator 1

Irving is proposing to operate and maintain the fire pump engine located in the Skerry house as an emergency generator. The unit, manufactured in 1967 is rated at 1.67 MMBtu/hr (12 gal/hr) and fires #2 fuel oil/diesel. Sulfur content of fuel shall not exceed 0.0015%. The site currently has three diesel generators for fire pumps, but only the Skerry house fire pump will be licensed and operated.

1. BACT – Emergency Generator 1

The BACT emission limits for the generator are based on the following:

PM/PM_{10}	- 0.31 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
SO_2	- combustion of #2 fuel oil/diesel fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur)
NO_x	- 4.41 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
CO	- 0.95 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
VOC	- 0.36 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
Opacity	- 06-096 CMR 101

The BACT emission limits for the generator shall be the following:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generator # (1.67 MMBtu/hr) Diesel	0.52	0.52	0.003	7.36	1.59	0.60

Visible emissions from the emergency generator shall not exceed 20% opacity on a 6-minute block average, except for no more than two (2) six (6) minute block averages in a 3-hour period.

Emergency Generator 1 shall be limited to 500 hours of operation a year, based on a 12-month rolling total. Irving shall keep monthly and 12-month rolling total records of the hours of operation for the unit.

2. 40 CFR Part 63, Subpart ZZZZ

The federal regulation 40 CFR Part 63, Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines* is applicable to the emergency generator. EPA's August 9, 2010 memo (*Guidance Regarding Definition of Residential, Commercial, and Institutional Emergency Stationary RICE in the NESHAP for Stationary RICE*) specifically does not exempt this unit from the federal requirements. The unit is considered an existing, emergency stationary reciprocating internal combustion engine at an area HAP source. The unit is not subject to the New Source Performance Standards regulations found in 40 CFR Part 60.

a. Emergency Definition:
Emergency stationary RICE means any stationary reciprocating internal combustion engine that meets all of the following criteria:

(1) The stationary RICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc.

(2) Paragraph (1) above notwithstanding, the emergency stationary RICE may be operated for any combination of the purposes specified below for a maximum of 100 hours per calendar year:

(i) Maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.

(ii) Emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §63.14), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii)Periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Paragraphs (1) and (2) above notwithstanding, emergency stationary RICE may be operated for up to 50 hours per calendar year in non-emergency situations. These 50 hours are counted as part of the 100 hours per calendar year for maintenance checks and readiness testing, emergency demand response, and periods of voltage deviation or low frequency, as provided in paragraph (2) above.

The 50 hours per calendar year for non-emergency situations cannot be used for peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity, except provided in the following paragraphs:

(i) Prior to May 3, 2014, the 50 hours per year for non-emergency situations can be used for peak shaving or non-emergency demand response to generate income for a facility, or to otherwise supply power as part of a financial arrangement with another entity if the engine is operated as part of a peak shaving (load management program) with the local distribution system operator and the power is provided only to the facility itself or to support the local distribution center.

(ii) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(a) The engine is dispatched by the local balancing authority or local transmission and distribution system operator.

(b) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(c) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(d) The power is provided only to the facility itself or to support the local transmission and distribution system.

(e) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

Emergency Generator 1 shall be limited to the usage outlined in §63.6640(f) and therefore may be classified as an existing emergency stationary RICE as defined in 40 CFR Part 63, Subpart ZZZZ. Failure to comply with all of the requirements listed in §63.6640(f) may cause this engine to not be considered an emergency engine and therefore subject to all the requirements for non-emergency engines.

b. 40 CFR Part 63, Subpart ZZZZ Requirements:

(1) Operation and Maintenance Requirements

	Compliance Dates	Operating Limitations* (40 CFR §63.6603(a) and Table 2(d))
Compression ignition (diesel, fuel oil) unit: Emergency Generator 1	No later than May 3, 2013	- Change oil and filter every 500 hours of operation or annually, whichever comes first; - Inspect the air cleaner every 1000 hours of operation or annually, whichever comes first, and replace as necessary; and - Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

* Note: Due to the 500 hour operation limit on the emergency generator, the inspections and oil/filter changes shall be performed annually to meet the requirements of 40 CFR Part 63, Subpart ZZZZ.

The generator shall be operated and maintained according to the manufacturer's emission-related written instructions or Irving shall develop a maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. [40 CFR §63.6625(e)]

(2) Optional Oil Analysis Program
Irving has the option of utilizing an oil analysis program which complies with the requirements of §63.6625(i) in order to extend the specified oil change requirement. If this option is used, Irving must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine. [40 CFR§63.6625(i)]

(3) Non-Resettable Hour Meter Requirement
A non-resettable hour meter shall be installed and operated on the emergency generator. [40 CFR §63.6625(f)]

(4) Startup Idle and Startup Time Minimization Requirements
During periods of startup the facility must minimize the engine's time spent at idle and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30

minutes, after which time the non-startup emission limitations apply. [40 CFR §63.6625(h) & 40 CFR Part 63, Subpart ZZZZ Table 2d]

(5) Annual Time Limit for Maintenance and Testing
The generator shall be limited to 100 hours/year for maintenance checks and readiness testing, emergency demand response, and periods of voltage or frequency deviation from standards. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity unless the conditions in §63.6640(f)(4)(ii) are met). [40 CFR §63.6640(f)]

(6) Recordkeeping
Irving shall keep records that include maintenance conducted on the generator and the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If the generator is operated during a period of demand response or deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), Irving must keep records of the notification of the emergency situation, and the date, start time, and end time of generator operation for these purposes. [40 CFR §63.6655(e) and (f)]

(7) Requirements for Demand Response Availability Over 15 Hours Per Year (and greater than 100 brake hp)

If Irving operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), the facility shall submit an annual report containing the information in §63.6650(h)(1)(i) through (ix). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx).

However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the following address:

Director, Office of Ecosystem Protection
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

[40 CFR §63.6650(h)]

H. Incorporation into the Part 70 Air Emission License

The requirements in this 06-096 CMR 115 New Source Review amendment shall apply to the facility upon amendment issuance. Per *Part 70 Air Emission License Regulations*, 06-096 CMR 140 (as amended), Section 1(C)(8), 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 as provided in 40 CFR Part 70.5.

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A refined modeling analysis was performed to show that emissions from Irving, in conjunction with other sources, will not cause or contribute to violations of National Ambient Air Quality Standards (NAAQS) for SO_2, PM_{10}, $PM_{2.5}$, NO_2 or CO.

It has been determined that Irving does not consume SO_2, PM_{10}, $PM_{2.5}$ or NO_2 increment, therefore, a Class II increment analyses was not performed.

Since the current licensing action for Irving represents a minor modification, it has been determined by MEDEP-BAQ 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 in all areas. 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 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 five-year hourly off-site meteorological database was used in the AERMOD-PRIME refined modeling analysis. Five years of wind data (2003-2007) was collected at a height of 10 meters at the Maine DEP meteorological monitoring site located at the Presque Isle Regional Office. Surface data, collected at the Caribou National Weather Service (NWS) site, were substituted for missing Presque Isle wind data. All other missing data were interpolated or coded as missing, per USEPA guidance.

In addition, hourly Caribou NWS data, from the same time period, were used to supplement the primary surface dataset for the required AERMET variables that were not explicitly collected for the primary meteorological dataset.

Presque Isle/Caribou surface meteorological data was combined with concurrent hourly cloud cover and upper-air data also 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 Irving 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)	NAD83 UTM Easting (km)	NAD83 UTM Northing (km)
CURRENT						
Irving						
• Oil Boiler Stack 2 (Boiler #2)	196.60	7.92	32.76	0.61	539.442	5171.983
• Biomass Stack 4 (Boiler #4)	196.60	30.48	30.48	0.53	539.498	5172.093
• Biomass Stack 5 (Boiler #5)	196.60	30.48	30.48	0.53	539.507	5172.083
Maine Woods Products						
• Stack #1	201.77	16.76	16.76	0.88	537.960	5177.850
ReEnergy						
• Stack #1	176.17	67.05	89.28	2.44	543.060	5164.815

The emission parameters for Irving for NAAQS modeling are listed in Table III-2. For the purpose of determining impacts, the following assumptions were used:

- all NO_x emissions were conservatively assumed to convert to NO_2,
- all particulate emissions were conservatively assumed to convert to PM_{10},
- all $PM_{2.5}$ were explicitly modeled as $PM_{2.5}$.

TABLE III-2 : Stack Emission Parameters

Facility/Stack	Averaging Periods	SO_2 (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_2 (g/s)	CO (g/s)	Stack Temp (K)	Stack Velocity (m/s)
MAXIMUM LICENSE ALLOWED								
Irving								
• Oil Boiler Stack 2 (Boiler #2)	All	0.19	0.76	0.09	0.95	0.15	450.00	14.69
• Biomass Stack 4 (Boiler #4)	All	0.08	0.97	0.67	0.72	1.94	450.00	23.50
• Biomass Stack 5 (Boiler #5)	All	0.08	0.97	0.67	0.72	1.94	450.00	23.50
Maine Woods Products								
• Stack #1	All	0.07	0.49	0.49	0.17	1.18	528.00	12.48
ReEnergy								
• Stack #1	All	6.82	1.47	1.47	11.08	70.13	436.00	27.80

C. Combined Source Modeling Impacts

Previous AERMOD-PRIME modeling results indicate that predicted impacts for all pollutants, except CO, from Irving alone had exceeded their respective significance levels. Therefore, due to the extent of the previous modeled significant impact area, Irving's location and other nearby source's emissions, MEDEP has determined that two sources would be considered for combined source modeling: ReEnergy Ashland LLC and Maine Woods Products.

Background concentrations, listed in Table III-3, are derived from representative rural background data for use in the Northern Maine region.

TABLE III-3 : Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)	Data Source
SO_2	1-hour	24	MicMac Site, Presque Isle
	3-hour	18	McFarland Hill, Bar Harbor
	24-hour	11	
	Annual	1	
PM_{10}	24-hour	32	Skyway Park, Presque Isle
	Annual	12	
$PM_{2.5}$	24-hour	17	Greenville Site, Greenville
	Annual	5	
NO_2	1-hour	43	MicMac Site, Presque Isle
	Annual	4	
CO	1-hour	365	MacFarland Hill, Acadia
	8-hour	322	

The maximum AERMOD-PRIME modeled combined-source impacts were added with conservative rural background concentrations to demonstrate compliance with NAAQS, as shown in Table III-4.

TABLE III-4 : Maximum Combined Sources Impacts

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Back-Ground ($\mu g/m^3$)	Max Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
SO_2	1-hour	**30.97**	539.650	5172.300	197.30	**24**	**54.97**	**196**
	3-hour	**22.97**	539.600	5172.350	198.90	**18**	**40.97**	**1300**
	24-hour	**9.15**	539.350	5171.750	186.30	**11**	**20.15**	**365**
	Annual	**0.22**	543.650	5164.250	170.80	**1**	**1.22**	**80**
PM_{10}	24-hour	**41.31**	539.350	5171.750	186.30	**32**	**73.31**	**150**
	Annual	**4.67**	539.550	5172.400	200.40	**12**	**16.67**	**50**
$PM_{2.5}$	24-hour	**13.31**[1]	-	-	-	**17**	**30.31**	**35**
	Annual	**1.33**	539.550	5172.400	200.40	**5**	**6.33**	**12**
NO_2	1-hour	**143.88**[2]	-	-	-	**43**	**186.88**	**188**
	Annual	**5.26**	539.550	5172.400	200.40	**4**	**9.26**	**100**
CO	1-hour	**192.37**	542.650	5166.000	170.60	**365**	**557.37**	**40000**
	8-hour	**75.63**	542.650	5165.500	174.60	**322**	**397.63**	**10000**

[1] Average of H1H (high-1st-high) concentrations from each of the five years of meteorological data
[2] Three-year average of H8H (high-8th-high) concentrations from five years of meteorological data

D. Increment

It has been determined that Irving does not consume SO_2, PM_{10}, $PM_{2.5}$ or NO_2 increment, therefore, a Class II increment analyses was not performed.

Federal guidance and 06-096 CMR 115 require that any major new source or major 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. Since this licensing action represents a minor modification, no additional analyses were required.

E. Class I Impacts

Since the current licensing action for Irving represents a minor modification, it has been determined by MEDEP-BAQ that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

F. Summary

In summary, it has been demonstrated that Irving will not cause or contribute to violations of National Ambient Air Quality Standards (NAAQS) for SO_2, PM_{10}, $PM_{2.5}$, NO_2 or CO.

IV. ANNUAL EMISSIONS

A. Criteria Pollutants

Irving shall be restricted to the following annual emissions, based on a 12 month rolling total. The tons per year limits were calculated based on a biomass annual use limit of 35,000 tons/year, a #2 fuel oil use limit of 250,000 gallons/year, and a 500 hr/year operating restriction on the emergency generator:

Total Licensed Annual Emissions for the Facility
Tons/year
(used to calculate the annual license fee)

	PM	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**NO_x**	**CO**	**VOC**
Boiler 2	3.5	3.5	0.4	0.9	4.4	0.7	0.2
Boilers 4 and 5 total	47.3	47.3	32.6	3.9	34.7	94.5	2.7
Emergency Generator 1	0.13	0.13	-	0.0006	1.8	0.4	0.15
Lumber Kilns	-	-		-	-	-	83.4
Total TPY	**50.9**	**50.9**	**33.0**	**4.8**	**40.9**	**95.6**	**86.5**

B. Hazardous Air Pollutants

Emissions of hazardous air pollutants from Irving have been calculated to be below the major source threshold based on the boiler fuel limits, the kilns' operations, information in the Part 70 air emission license A-314-70-E-R, and data submitted in the application associated with this new source review amendment. Irving shall be limited to the following HAP emissions:

Single HAP	10 tons/year
Total HAPs	25 tons/year

C. Greenhouse Gases

Greenhouse gases are considered regulated pollutants as of January 2, 2011 through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans,* 40 CFR Part 52, Subpart A, §52.21 Prevention of Significant

Deterioration of Air Quality rule. "Greenhouse gases" as defined in 06-096 CMR 100 (as amended) means the aggregate group of the following gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Greenhouse gases (GHG) for purposes of licensing are calculated and reported as carbon dioxide equivalents (CO_2 e).

Based on the facility's fuel use limit(s), the worst case emission factors from AP-42, IPCC (Intergovernmental Panel on Climate Change), and *Mandatory Greenhouse Gas Reporting*, 40 CFR Part 98, and the global warming potentials contained in 40 CFR Part 98, Irving is below the major source threshold of 100,000 tons of CO_2e per year. Therefore, no additional licensing requirements are needed to address GHG emissions at this time.

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-314-77-1-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the 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) **Boilers 4 and 5** (25.7 MMBtu/hr each)

A. Irving may install and operate two relocated biomass boilers. [06-096 CMR 115, BACT]

1. The boilers shall each be equipped with a multiclone system to be operated when the boilers are in operation. Irving shall keep records documenting maintenance, malfunctions, and downtime of the multiclones. [06-096 CMR 115, BACT]

2. Each boiler shall exhaust through individual stacks with a stack height of at least 100 feet above local ground level. [06-096 CMR 115, BACT]

B. Fuel
1. Total fuel use for Boilers 4 and 5 shall not exceed 35,000 tons/year biomass (50% moisture content with a heat content of 4500 Btu/lb), or equivalent, based on based on a 12 month rolling total basis.
2. Records of annual fuel use, calculated based on actual steam production or other method approved by the Department, shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BACT]

C. Emissions from the boilers shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler 4	PM	0.3	06-096 CMR 103(2)(B)(4)(a)
Boiler 5	PM	0.3	06-096 CMR 103(2)(B)(4)(a)

D. Emissions from the boilers shall not exceed the following [06-096 CMR 115, BACT]:

Emission Unit	**PM (lb/hr)**	**PM_{10} (lb/hr)**	**$PM_{2.5}$ (lb/hr)**	**SO_2 (lb/hr)**	**NO_x (lb/hr)**	**CO (lb/hr)**	**VOC (lb/hr)**
Boiler 4	7.7	7.7	5.3	0.6	5.7	15.4	0.4
Boiler 5	7.7	7.7	5.3	0.6	5.7	15.4	0.4

E. Visible Emissions
Visible emissions from each boiler shall not exceed 20% opacity on a 6 minute block average, except for no more than two (2) six (6) minute block averages in a 3 hour period. [06-096 CMR 115, BACT]

F. 40 CFR Part 60, Subpart Dc
Irving shall comply with all requirements of 40 CFR Part 60, Subpart Dc applicable to Boilers 4 and 5 including, but not limited to, the following:

1. Irving shall submit notification to EPA and the Department of the date of construction and actual start-up. This notification shall include the design heat input capacity of the boilers and the type of fuel to be combusted. [40 CFR §60.48c(a)]
2. Irving shall record and maintain records of the amounts of fuel combusted each calendar month. [40 CFR §60.48c(g)(2)]
3. Irving shall submit to EPA and the Department semi-annual reports. These reports shall include the calendar dates covered in the reporting period.

The semi-annual reports are due within 30 days of the end of each 6-month period.

4. The following address for EPA shall be used for any reports or notifications required to be copied to them:

Compliance Clerk
USEPA Region 1
5 Post Office Sq. Suite 100
Boston, MA 02109-3912

G. 40 CFR Part 63, Subpart JJJJJJ
Irving shall comply with the applicable requirements in 40 CFR Part 63, Subpart JJJJJJ, for Boilers 4 and 5 including tune-up, recordkeeping, and energy assessment requirements.

(2) **Sawmill and Planer Mill Operations**

A. For each of the process cyclones exhausting to the atmosphere, visible emissions shall not exceed an opacity of 20% on a six minute block average basis, except for no more than 1 six minute block average in a one hour period. [06-096 CMR 101]
B. Irving shall keep records documenting maintenance, malfunctions, and downtime of the cyclones exhausting to the atmosphere. [06-096 CMR 115, BACT]

(3) **Lumber Kilns** (2 relocated kilns)

Irving shall be limited to 83.4 tons/year VOC from the wood drying kilns on a 12 month rolling total basis. Records documenting compliance shall include the monthly kiln throughput rate and the VOC emission factor used for the specific species of wood dried. [06-096 CMR 115, BACT]

(4) **Material Handling and Storage**

Visible emissions from a fugitive emission source (including material handling, stockpiles, and roadways) shall not exceed an opacity of 20%, except for no more than five (5) minutes in any 1-hour period. Compliance shall be determined by an aggregate of the individual fifteen (15)-second opacity observations which exceed 20% in any one (1) hour. [06-096 CMR 101]

(5) **Boiler 2** (30 MMBtu/hr)

[Note: The current requirements in air emission license A-314-70-E-R condition (15) shall continue to apply to Boiler 2, except as stated below or unless amended in a separate licensing action. This fuel sulfur requirement and associated change

to the SO_2 emission limit, as well as the addition of a $PM_{2.5}$ emission limit, is not prohibited by the Part 70 air emission license, therefore they can be addressed by stand-alone conditions in this New Source Review amendment.]

A. The maximum sulfur content of the #2 fuel oil fired in Boiler 2 shall not exceed 0.05%, by weight. Records shall be maintained documenting fuel sulfur content. [06-096 CMR 115, BACT per ambient air quality analysis results]

B. SO_2 emissions from Boiler 2 shall not exceed 1.5 lb/hr. [06-096 CMR 115, BACT]

C. $PM_{2.5}$ emissions from Boiler 2 shall not exceed 0.75 lb/hr. [06-096 CMR 115, BACT]

D. 40 CFR Part 63, Subpart JJJJJJ
Irving shall comply with the applicable requirements in 40 CFR Part 63, Subpart JJJJJJ, for Boiler 2 including tune-up, recordkeeping, and energy assessment requirements.

(6) **Emergency Generator 1**

A. Emergency Generator 1 is limited to 500 hours per year total operation, based on a 12-month rolling total. Compliance shall be demonstrated by a written log of all generator operating hours. [06-096 CMR 115, BACT]

B. The fuel oil/diesel fuel sulfur content for Emergency Generator 1 shall be limited to 0.0015% sulfur, by weight. Compliance shall be demonstrated by fuel records from the supplier documenting the type of fuel delivered and the sulfur content of the fuel. [06-096 CMR 115, BACT]

C. Emissions shall not exceed the following [06-096 CMR 115, BPT]:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator 1 (1.67 MMBtu/hr, diesel)	0.52	0.52	0.003	7.36	1.59	0.60

D. Visible Emissions

Visible emissions from Emergency Generator 1 shall not exceed 20% opacity on a 6 minute block average, except for no more than two (2) six (6) minute block averages in a 3 hour period. [06-096 CMR 101]

E. Emergency Generator 1 shall meet the applicable requirements of 40 CFR Part 63, Subpart ZZZZ, including the following:

1. No later than May 3, 2013, Irving shall meet the following operational limitations for the compression ignition emergency generator:
   a. Change the oil and filter annually,
   b. Inspect the air cleaner annually and replace as necessary, and
   c. Inspect the hoses and belts annually and replace as necessary.

   A log shall be maintained documenting compliance with the operational limitations.

   [40 CFR §63.6603(a) and Table 2(d); and 06-096 CMR 115]

2. Oil Analysis Program Option
   Irving has the option of utilizing an oil analysis program which complies with the requirements of §63.6625(i) in order to extend the specified oil change requirement. If this option is used, Irving must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine. [40 CFR§63.6625(i)]

3. Non-Resettable Hour Meter
   A non-resettable hour meter shall be installed and operated on the emergency generator. [40 CFR §63.6625(f)]

4. Maintenance, Testing, and Non-Emergency Operating Situations
   a. The generator shall be limited to 100 hours/year for maintenance checks and readiness testing, emergency demand response, and periods of voltage or frequency deviation from standards. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity unless the conditions in §63.6640(f)(4)(ii) are met). These limits are based on a calendar year. Compliance shall be demonstrated by a written log of all generator operating hours. [40 CFR §63.6640(f) and 06-096 CMR 115]
   b. Irving shall keep records that include maintenance conducted on the generator and the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If the generators are operated during a period of demand response or

deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), Irving must keep records of the notification of the emergency situation, and the date, start time, and end time of generator operation for these purposes. [40 CFR §63.6655(e) and (f)]

5. Operation and Maintenance
   The generator shall be operated and maintained according to the manufacturer's emission-related written instructions or Irving shall develop a maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. [40 CFR §63.6625(e)]

6. Startup Idle and Startup Time Minimization
   During periods of startup the facility must minimize the engine's time spent at idle and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply. [40 CFR §63.6625(h) & 40 CFR Part 63, Subpart ZZZZ Table 2d]

7. Requirements For Demand Response Availability Over 15 Hours Per Year (and greater than 100 brake hp)
   If Irving operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), the facility shall submit an annual report containing the information in §63.6650(h)(1)(i) through (ix). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the following address:

   Director, Office of Ecosystem Protection
   U.S. Environmental Protection Agency
   5 Post Office Square, Suite 100
   Boston, MA 02109-3912

   [40 CFR §63.6650(h)]

(7) **Equipment Removed and/or Not To Be Operated**

A. The following equipment shall no longer be licensed or operated: Boiler 1, the previously existing kilns 1-9, and the sawmill and planer equipment not addressed by this facility modernization license amendment (the equipment has been removed from site). [06-096 CMR 115, BACT]

B. The two additional emergency fire pump engines still located on-site shall not be operated and are not considered licensed. The units shall be rendered inoperable through a physical limitation. [06-096 CMR 115, BACT]

(8) Irving Forest Products shall submit an application to incorporate this amendment into the 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 25 DAY OF October , 2013.

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: September 25, 2013
Date of application acceptance: September 25, 2013

Date filed with the Board of Environmental Protection:

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

Filed
OCT 25 2013
State of Maine
Board of Environmental Protection