STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

Player Holdings, LLC
Aroostook County
Ashland, Maine
A-1155-71-A-N

Departmental
Findings of Fact and Order
Air Emission License

FINDINGS OF FACT

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

I. REGISTRATION

A. Introduction

Player Holdings, LLC (MaineFlame) has applied for an Air Emission License for the operation of emission sources associated with their extruded log manufacturing facility.

The equipment addressed in this license is located at 86 Clark Siding Road, Ashland, Maine.

B. Title, Right, or Interest

In their application, MaineFlame submitted copies of a property deed demonstrating ownership of the facility. MaineFlame has provided sufficient evidence of title, right, or interest in the facility for purposes of this air emission license.

C. Emission Equipment

The following equipment is addressed in this air emission license:

Fuel Burning Equipment

Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type, % sulfur	Date of Manuf.	Date of Install.	Stack #
Burner #1	13.7*	3,043 lb/hr*	Biomass	2020	1	Stack #1

*Based on firing biomass with a moisture content of 50% by weight.

MaineFlame may operate small stationary engines smaller than 0.5 MMBtu/hr. These engines are considered insignificant activities and are not required to be included in this license. However, they are still subject to applicable State and Federal regulations. More

information regarding requirements for small stationary engines is available on the Department's website at the link below.
http://www.maine.gov/dep/air/publications/docs/SmallRICEGuidance.pdf

Additionally, MaineFlame may operate portable engines used for maintenance or emergency-only purposes. These engines are considered insignificant activities and are not required to be included in this license. However, they may still be subject to applicable State and Federal regulations.

Process Equipment

Equipment	Production Rate	Pollution Control Equipment	Stack #
Dryer #1	3.6 ODT/hr*	Dropbox & Cyclone	Stack #1

* Based on drying throughput material to a moisture content of 10% by weight, which is considered "oven-dried" for this application.

D. Definitions

Biomass means a wood-based solid fuel that is not a solid waste. This includes wood products (*e.g.*, trees, ground tree stumps, tree limbs, bark, lumber, sawdust, scraps, slabs, millings, and shavings), wood chips, processed pellets, or extruded logs made from wood or other forest residues. Inclusion in this definition does not constitute a determination that the material is not considered a solid waste. MaineFlame should consult with the Department before adding any new biomass type to its fuel mix.

Portable or Non-Road Engine means an internal combustion engine which is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. This definition does NOT include engines which remain or will remain at a location (excluding storage locations) for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period.

An engine is not a non-road (portable) engine if it remains or will remain at a location for more than 12 consecutive months or for a shorter period of time if sited at a seasonal source. A seasonal source is a source that remains in a single location for two years or more and which operates for fewer than 12 months in a calendar year. If an engine operates at a seasonal source for one entire season, the engine does not meet the criteria of a non-road (portable) engine and is subject to applicable stationary engine requirements.

E. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the date this license was issued.

A new source is considered a major source based on whether or not total licensed annual emissions exceed the "Significant Emission" levels as defined in the Department's *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100.

Pollutant	Total Licensed Annual Emissions (TPY)	Significant Emission Levels
PM/PM_{10}	26.3	100
$PM_{2.5}$	9.9	100
SO_2	1.0	100
NO_x	11.3	100
CO	18.0	100
VOC	22.8	50

The Department has determined the facility is a minor source, and the application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115.

F. Facility Classification

The facility is licensed as follows:

- As a natural minor source of air emissions, because no license restrictions are necessary to keep facility emissions below major source thresholds for criteria pollutants; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

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 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

B. Process Description

MaineFlame has proposed to construct an extruded log manufacturing facility. The manufacturing process will consist of wood receiving and handling, a single pass 3.6 oven dried ton per hour (ODT/hr) rotary drum dryer, and log extrusion and packaging operations.

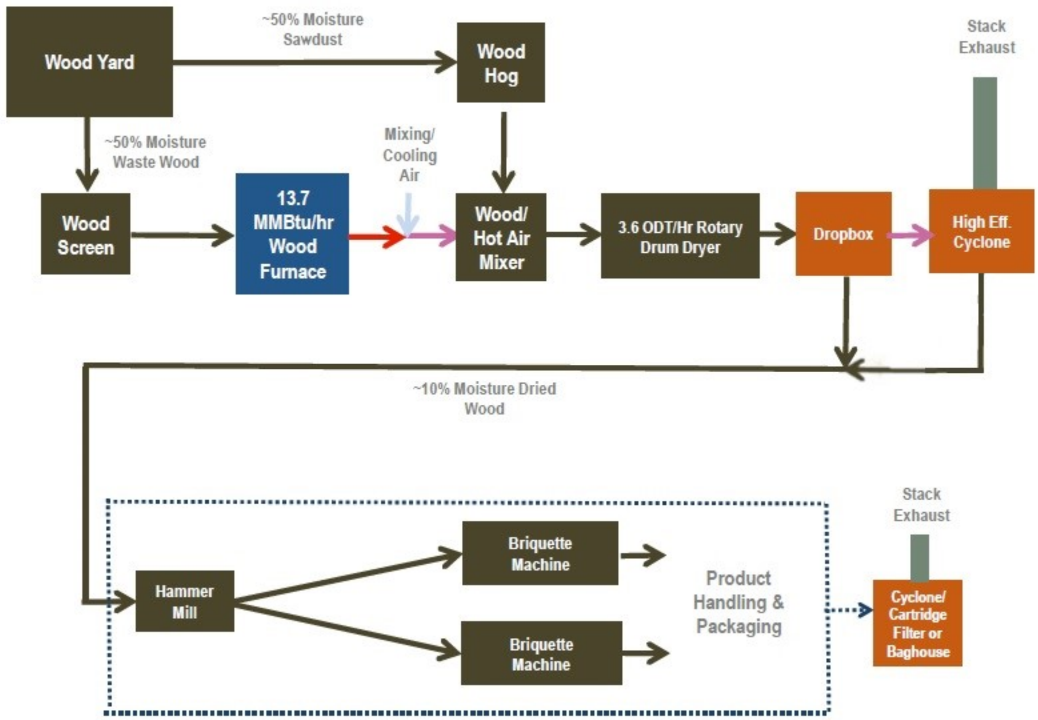
Raw material, including wood chips, shavings, sawdust, and bark, will be delivered to the facility by truck. This raw material will be conveyed to a raw material storage area where it will be loaded into hoppers by front end loaders. Covered conveyors will transport the material to a wood hog which will break the material down and roughly size it before drying. After the wood hog, the green wood will be introduced into Dryer #1 along with hot exhaust gas supplied by Burner #1. The drying process will reduce the moisture content of the wood from approximately 50% by weight to 8-12% by weight.

Once the wood passes through the dryer, it is separated from exhaust gases by use of a dropbox and cyclone, and then transferred into the log extrusion building. Dried wood will move from the dropbox and cyclone via a covered conveyor to another hammermill for final sizing. The material is then fed to the two log extrusion mills which have a combined maximum output of approximately 3.6 ton/hr. Particulate matter (PM) emissions from the hammermill and extruded log mills will be controlled by a cartridge filter/baghouse.

Exhaust gases from a 13.7 MMBtu/hr biomass furnace (Burner #1) will enter the direct contact rotary drum dryer (Dryer #1) after being tempered by the introduction of mixing/cooling air via the bypass stack. The bypass stack is always open, and when the dryer ID fan is running, air goes in; if not, air goes out. During normal operation, all burner exhaust is directed to the dryer to be utilized in the direct contact drying process. During startup of the burner, a process that should take no longer than 15 minutes, the ID fan is not running, so flue gases are allowed to pass out of the bypass stack.

The exhaust from Dryer #1 will exit through Stack #1. Stack #1 will have an inside diameter of 2.5 feet and exhaust 50 feet above ground level (AGL).

Below is a process diagram of the facility.



C. <u>Burner #1 and Dryer #1</u>

Dryer #1 is a directed-fired, co-current flow, single-pass rotary drum dryer with a maximum hourly throughput rate of approximately 3.6 oven dried tons per hour (ODT/hr). Heat for Dryer #1 will be provided by Burner #1, which is a biomass fired burner with a maximum fuel throughput of 3,000 lb/hr, based on firing biomass with an average moisture content of 50% by weight. This equates to a maximum heat input capacity of 13.7 MMBtu/hr.

1. BACT Findings

MaineFlame submitted a BACT analysis for control of emissions from Burner #1 and Dryer #1.

a. <u>Particulate Matter (PM/PM_{10})</u>
The principal components of the particulate matter (PM/PM_{10}) emissions from the proposed wood dryer line include filterable and condensable PM from the wood drying process in Dryer #1 and fly ash and unburned carbon resulting from incomplete combustion in Burner #1. A portion of the PM emissions leave the dryer stack as vapor but condense at normal atmospheric temperature to form liquid particles or mist that can create a visible haze. Quantities emitted are dependent on

wood species, dryer temperature, and other factors including seasonality, time between logging and processing, and wood storage time.

Potential PM controls for the dryer line consist of add-on controls, good combustion and operating practices, or a combination of options. The evaluation of add-on controls for this dryer line included baghouses, wet scrubbers, thermal oxidizers, electrostatic precipitators (ESPs), wet electrostatic precipitators (WESPs), dropbox/cyclone system, and exhaust gas recycle (EGR).

Baghouses collect particulate matter on the surface of filter bags which are periodically cleaned or replaced to maintain a PM control efficiency of greater than 80%. Baghouses can theoretically control PM emissions from wood dryers, but moisture considerations can make them impractical for wood dryer applications. Condensation of water vapor and VOC may result in the fabric filters being overloaded or blinded. The gas stream's high moisture content cause baghouses to be technically infeasible for this project.

Thermal oxidizers destroy condensable PM by burning the exhaust gas at high temperatures, and they can also reduce CO emissions in direct-fired dryer exhausts by oxidizing the CO in the exhaust to CO_2. Regenerative thermal oxidizers (RTOs) preheat the inlet emission stream with heat recovered from the incineration exhaust gases. The inlet gas stream is passed through preheated ceramic media, and an auxiliary gas burner is used to reach temperatures between 1,450 ºF and 1,600 ºF at a specific residence time. The combusted gas exhaust then goes through a cooled ceramic bed where heat is extracted. The estimated cost to install and operate an RTO for control of PM from this exhaust stream exceeds $25,000 per ton of PM controlled. Therefore, the installation of a thermal oxidizer is not economically feasible for this project.

ESPs work by charging particles in the exhaust stream with a high voltage, oppositely charging a collection surface where the particles accumulate, removing the collected dust by a rapping process, and collecting the dust in hoppers. ESPs work best under steady-state conditions. The nature of a biomass-fired dryer system is prone to load and flow fluctuations. Dry ESPs are also not recommended for removing moist particles or those likely to adhere to the collection surface. The gas stream's high moisture content in conjunction with the high variability of the process cause dry ESPs to be technically infeasible for this project.

WESPs utilize a pre-quench to cool and saturate the gases prior to entering the ESP. WESPs collect only particles and droplets that can be electrostatically charged and consume significant water quantities during operation. The resulting effluent requires treatment and must be discharged to a solids-removing clarifying system prior to final disposal. The effluent may require additional sludge removal, pH adjustment, and/or additional treatment to remove dissolved solids. MaineFlame does not have the onsite capability to treat the effluent produced from a WESP. The estimated cost to install and operate a WESP alone (not including a wastewater treatment system) to control PM from this exhaust stream would exceed $20,000 per ton of PM controlled. This does not take into account the environmental impacts of wastewater production. Therefore, the installation of a WESP is not economically feasible for this project.

Wet scrubbers control particulate matter by forcing the PM in the air stream to contact a liquid, typically water. Particles are captured in the liquid droplets which are then collected. Wet scrubbers are efficient at collecting PM. However, they can require pre-treatment of the exhaust stream to remove larger particles from the drying process that can clog up the system. Wet scrubbers have a similar drawback to WESPs in that they create a liquid effluent stream that requires treatment prior to discharge. Although a technically feasible option, the use of a wet scrubber has been removed from consideration due to the adverse environmental impacts of the resulting effluent.

PM emissions, including condensable PM, can be controlled using a heat/energy system that accommodates exhaust gas recycle (EGR). EGR uses an oversized combustion unit that can accommodate recirculation of dryer exhaust gases which is mixed with combustion air and exposed directly to the burner flame. EGR controls only a portion of the PM generated by the dryer system, and the moisture laden return gas would result in increased operational complexity and variability in other emissions, including CO and VOC. Accordingly, the energy, environmental, and operational impacts associated with controlling only a portion of the potential particulate emissions make an EGR system technically infeasible.

Cyclones are an integral part of the post-rotary dryer separation process and are also a very common particulate control device used in many applications, especially those where relatively large particles need to be collected. Cyclones are very simple devices that utilize centripetal force to separate particles from gas streams. The stream of dried wood and exhaust gases enters the cyclone at a high velocity along the inner wall at the top of the cyclone. Gravity pulls the spinning gas down, and the taper of the cyclone body helps maintain cyclonic motion until particles drop out the bottom of the cyclone into a hopper. They are commonly constructed of sheet metal and have a relatively low capital cost, very low operating costs, and no moving parts. Multi-cyclones are smaller diameter cyclone units operating in parallel or in series and are designed to achieve high efficiency particulate collection using the same operational principles as the single cyclone. In the case of MaineFlame, a multi-clone has been considered but eliminated due to significant operational risk associated with buildup in the cones. Plugging of multi-clones is caused by moisture in the dryer exhaust stream. Water binds with sawdust in the throughflow and renders the cyclone units ineffective by blocking significant portions of the inlet cones. Such buildup also eventually poses a significant fire risk: As the layers build up, the lower layers dry out. Then eventually, when exposed to high heat, the dried material can ignite. MaineFlame is proposing a hybrid, two stage system consisting of a dropout box to remove the majority of the wood and dust from the airstream, followed by a cyclone to remove additional particulate material from the airstream. This varies from the traditional application of a single cyclone, serving a dual function of both separating the process wood from the air and serving as a particulate control device. The two-stage design will increase the control efficiency of the system over a traditional single cyclone while minimizing the risk of malfunction, bridging, and fires associated with multi-chamber multi-clones. The use of a dropbox/cyclone system has been determined to be feasible and has been selected as part of the BACT strategy for the proposed dryer system.

Good combustion practices can reduce products of incomplete combustion, including particulate matter. The use of a new, efficient biomass burner and good combustion practices can minimize PM emissions and has been selected as part of the BACT strategy for the proposed dryer system.

The Department finds that BACT for $PM/PM_{10}/PM_{2.5}$ emissions from Burner #1 and Dryer #1 is the use of a dropbox/cyclone system, good combustion design and operating practices, an annual limit on hours of operation of 5,000 hr/year (12-month rolling total), and emission limits listed in the table below.

Particulate matter in the exhaust from Stack #1 is a combination of $PM/PM_{10}/PM_{2.5}$ emissions from both fuel-burning and process emissions. The BACT $PM/PM_{10}/PM_{2.5}$ limits are determined to be more stringent than the combination of the particulate matter limits found in *Fuel Burning Equipment Particulate Emission Standard,* 06-096 C.M.R. ch. 103 and *General Process Source Particulate Emission Standard,* 06-096 C.M.R. ch. 105. Therefore, by meeting the BACT emission limits, this equipment will also be meeting these other applicable limits. Therefore, only the BACT limits are carried forward in this license.

b. <u>Sulfur Dioxide (SO_2)</u>

Sulfur dioxide (SO_2) is formed from the combustion of sulfur present in the fuel. Control options for SO_2 include removing the sulfur from the flue gas by adding a caustic scrubbing solution or restricting the sulfur content of the fuel. The biomass fuel fired in Burner #1 is inherently a low sulfur fuel, with only trace amounts of sulfur available to combine with oxygen in the combustion process. Due to the low level of SO_2 emissions possible from this process, additional controls are neither technically nor economically justified for the dryer system

The Department finds that BACT for SO_2 emissions from Burner #1 and Dryer #1 is the firing of clean biomass materials including wood chips, bark, shavings, and sawdust, an annual limit on hours of operation of 5,000 hr/year (12-month rolling total), and the emission limit listed in the table below

c. Nitrogen Oxides (NO_x)

Potential add-on control strategies for NO_x include Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR), and water/steam injection.

SCR controls are primarily used on large industrial and utility boilers. SCR reduces NO_x emissions through the injection of ammonia in the gas exhaust stream in the presence of a catalyst to produce nitrogen and water. The effectiveness of an SCR system is directly dependent upon the exhaust temperature. The ideal exhaust temperature range for SCR operation is between 550 °F and 750 °F. With the expected exhaust temperature of 265 °F, an SCR system is not technically feasible without the installation of an exhaust re-heat system. The installation of an exhaust re-heat system would require additional fuel input to the system and subsequently increase NO_x emissions. The energy and environmental impacts associated with SCR control of NO_x emissions make an SCR system infeasible.

SNCR controls are primarily used on large industrial and utility boilers. SNCR reduces NO_x to nitrogen and water by reacting the exhaust gas with a reagent such as ammonia or urea, similar to SCR. The chemical reaction takes place at temperatures ranging between 1,600 °F and 2,100 °F. The NO_x reduction efficiency decreases rapidly at temperatures outside this temperature window. Operation below this temperature range results in emissions of unreacted ammonia. Exhaust temperatures from the dryer system will be well below the temperature range required for SNCR. Injecting the reagent further upstream would mean unreacted ammonia would enter the dryer and directly contact the biomass. The use of SNCR for control of NO_x is determined to be technically infeasible for this project.

Water/steam injection is the process of injecting water or steam into the combustion chamber to act as a thermal ballast in the combustion process. This lowers the combustion temperature, minimizing the formation of thermal NO_x. However, introducing additional moisture into a process designed to dry material would be counterproductive to the purpose of the rotary dryer. Therefore, water/steam injection has been determined to be technically infeasible for this project.

The Department finds that BACT for NO_x emissions from Burner #1 and Dryer #1 is an annual limit on hours of operation of 5,000 hr/yr (12-month rolling total) and the emission limit listed in the table below.

d. Carbon Monoxide (CO)

Carbon monoxide (CO) emissions are a result of incomplete combustion, caused by conditions such as insufficient residence time or limited oxygen availability. CO emissions from units with burners are typically minimized by good combustion, although oxidation catalyst systems have been used on larger units. Thermal oxidation is also an option for add-on CO control.

An oxidation catalyst lowers the activation energy needed for CO to react with available oxygen in the exhaust to produce CO_2. In order to prevent the occurrence of particulate contamination of the catalyst in a biomass system, the oxidation catalyst would need to be located after the particulate matter control technology. However, the process exhaust gas must then typically be preheated prior to contact with the catalyst bed. The cost of the oxidation catalyst, the associated need for a preheat burner, and the biomass plugging potential does not result in an oxidation catalyst as a technically feasible option for this project.

Thermal oxidation reduces CO emissions in the flue gas with high temperature post combustion. The application of a thermal oxidizer would require additional fuel usage, would result in additional secondary emissions, and would have a large economic impact on the project. There were no CO thermal oxidizer installations on the biomass boilers reviewed in the RBLC database. Therefore, thermal oxidation for CO controls is not a technically feasible option for this project.

Good combustion efficiency and proper equipment operation and maintenance incorporate various techniques to minimize CO emissions. Proper combustion techniques include maintaining optimum combustion conditions within the system via optimization of residence time, temperature, and mixing. Proper maintenance includes keeping the air-to-fuel ratio at the manufacturer's specified settings and having proper air pressure and fuel feed rates at the burner.

The Department finds that BACT for CO emissions from Burner #1 and Dryer #1 is the use of good combustion design and operating practices, proper equipment maintenance, an annual limit on hours of operation of 5,000 hr/year (12-month rolling total), and the emission limit listed in the table below.

e. Volatile Organic Compounds (VOC)

Volatile organic compounds (VOC) are generated in the wood dryer system because of incomplete combustion in Burner #1 and from evaporation in the dryer of naturally occurring VOC in the wood. The primary source of VOC is from the dryer, with quantities of VOC emitted dependent on wood species and operating parameters such as temperature, residence time, and oxygen content. During the drying process, water in the wood chip material is driven off (vaporized, evaporated) first. If additional heat is applied after the water is removed, the temperature of the wood subsequently increases, and VOC in the wood begin to evaporate. Wood chip materials must have a moisture content of 8-12% before the extruded log-forming process. Methods of controlling VOC-laden gas streams include thermal destruction, wet electrostatic precipitators (WESP), and wet scrubbers. MaineFlame has elected to construct and operate a dryer that will minimize the formation of VOC. The inlet temperature to Dryer #1 will be kept below 950 ºF, and MaineFlame has elected to exclude high resin eastern white pine from material that it will dry.

Thermal oxidizers destroy condensable VOC by burning them at high temperatures. Thermal oxidizers also reduce VOC and CO emissions in direct-fired dryer exhausts by oxidizing the exhaust to H_2O and CO_2 (products of complete combustion). Regenerative thermal oxidizers (RTOs) are designed to preheat the inlet emission stream with heat recovered from the incineration exhaust gases. Gases entering an RTO are heated by passing through preheated beds packed with a ceramic media. A gas burner brings the preheated emissions up to an incineration temperature between 1,450° and 1,600 °F in a combustion chamber with sufficient gas residence time to complete the combustion. Combustion gases then pass through a cooled ceramic bed where heat is extracted. By reversing the flow through the beds, the heat transferred from the combustion exhaust air preheats the gases to be treated, thereby reducing auxiliary fuel requirements. The average annualized cost for an RTO to control roughly 11.45 cubic meters per second of exhaust would be above $500,000. Thus, the cost per ton of controlled VOC would be $25,000 based on an annual VOC limit of 22.8 TPY; therefore, the installation of a thermal oxidizer is cost prohibitive.

In a WESP, gases exiting the dryer enter a pre-quench to cool and saturate the gases before they enter the ESP. The pre-quench is essentially a low-energy scrubber that sprays water into the incoming gas stream. Some fraction of highly water-soluble VOC compounds, such as formaldehyde and methanol, may be scrubbed by the pre-quench and collected. However, the WESP collects only particles and droplets that can be electrostatically charged; vaporous components of the gas stream that do not condense are not collected by the device. In addition, the ability of the WESP to absorb water-soluble compounds diminishes as the recirculating liquid becomes saturated with these compounds; therefore, the disadvantage of the WESP is that it generates significant amounts of wastewater effluent. The average annualized cost to install and operate a WESP on the proposed wood dryer system would be roughly $698,000. This would conservatively result in a cost of $30,000 per ton of VOC controlled (based on a VOC annual limit of 22.8 TPY). For a wood dryer system of this size, the cost to install a WESP economically infeasible.

A wet scrubber functions much like the initial quench portion of the WESP described above, with a continuous flow of water droplets being sprayed into the dryer exhaust gas stream. This cools the gas stream and absorbs a portion of the water-soluble VOC compounds. The resulting cooled gas stream temperature can be forced below the dew point, causing the moisture to condense out of the gas stream while still in the system, causing corrosion and fouling of the ductwork. This and the creation a liquid effluent stream that requires treatment prior to discharge cause a wet scrubber to be removed from consideration due to the additional environmental, and technical impacts of the resulting effluent.

Another technology for control of wood dryer VOC emissions is the use of a heat/energy system that accommodates exhaust gas recycle. A fraction of the recirculated dryer exhaust is mixed with combustion air and exposed directly to the burner flame. VOC and organic PM emissions from burner combustion are incinerated in the second stage of the unit. High temperature exhaust from the combustion unit may either pass through a heat exchanger, which provides heat for dryer inlet air, and then through an add-on device for PM emission control or be directed back through the dryer. Exhaust gas recycle only controls a portion of the VOC generated by the wood dryer system and requires additional energy input to overcome the added static pressure in the system. Further, the moisture-laden return gas stream will result in increased operational complexity and variability in other emissions, including CO, NOx, and opacity, and is not advisable for a system this small. The energy, environmental, and operational impacts associated with controlling a portion of the estimated PTE of 22.8 tons VOC emissions make an FGR system infeasible.

The Department finds that BACT for VOC emissions from Burner #1 and Dryer #1 is the use of good combustion design and operating practices, proper equipment maintenance, the exclusion of eastern white pine from the material stream, maintaining the dryer inlet temperature at all times below 950 °F, an annual limit on hours of operation of 5,000 hr/year (12-month rolling total), and the emission limit listed in the table below.

f. <u>Emission Limits</u>

The BACT emission limits for Burner #1 and Dryer #1 (combined emissions) are the following:

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)
Burner #1 and Dryer #1	10.50	10.50	4.00	0.40	4.50	7.20	9.10

2. Visible Emissions

Visible emissions from Stack #1 or the bypass stack shall not exceed 20% opacity on a six-minute block average basis, except for periods of startup, shutdown, or malfunction, during which time visible emissions shall not exceed 40% opacity on a six-minute block average basis and MaineFlame shall comply with the following work practice standards.

a. Maintain a log (written or electronic) of the date, time, and duration of all operating time, startups, shutdowns, and malfunctions for Burner #1 and Dryer #1.

b. Develop and implement a written startup and shutdown plan for Burner #1 and Dryer #1.

c. Use clean, dry biomass with a moisture content between 5% and 15% by weight during startup.

d. Limit the duration of each unit startup, shutdown, and malfunction to no more than 30 minutes per occurrence.

e. At all times, operate Burner #1 and Dryer #1 in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the units.

MaineFlame shall have on-site during daylight hours when the Burner #1/Dryer #1 system is operating at least one person who is trained and certified in determining visible emissions in accordance with EPA Test Methods 9 and 22, after the first available Method 9 training course following initial startup. MaineFlame shall take all necessary steps to remedy any fault at the facility that is causing or contributing to excess visible emissions.

3. Fuel Requirements

During startup of Burner #1, MaineFlame shall fire clean, dry biomass with a moisture content between 5% and 15% by weight. During normal operation, MaineFlame shall fire clean biomass with a moisture content of 40% to 50% by weight. Dirt and other contaminants in the biomass shall be minimized.

4. Additional BACT Findings

a. The exhaust from Burner #1 and Dryer #1 shall exit through the cyclone except during periods of startup, shutdown, or malfunction when the exhaust may be diverted through the associated bypass stack.

b. MaineFlame shall inspect the dropbox and cyclone monthly for leaks and keep records of these inspections as well as any maintenance (planned or unplanned) performed.

c. Following performance testing, MaineFlame shall operate the cyclone at or above the differential pressure at which compliance with the PM/PM_{10}/$PM_{2.5}$ lb/hr limits was demonstrated.

d. Bypass stack use shall be limited to periods of startup, shutdown, and malfunction, each event not to exceed 30 minutes in duration. Records shall be kept of all startups, shutdowns, and malfunctions including the date, time, duration, cause, method utilized to minimize duration of the event and/or prevent reoccurrence, and whether the bypass stack was utilized and for how long.

e. Burner #1's normal operating exhaust gas temperature is expected to be approximately 1,800 °F. The exhaust from Burner #1 will be tempered with fresh air such that the inlet temperature to Dryer #1 is expected to be 700 °F. The drying of certain products at high temperatures has been shown to create blue, hazy visible emissions. To prevent the emission of this blue haze, MaineFlame shall limit the dryer inlet temperature to no more than 950 °F on a 1-hr block average basis. MaineFlame shall continuously monitor and record the inlet temperature of Dryer #1 to demonstrate compliance with the temperature limit listed above. "Continuously" is defined as at least 18, one-minute averages in each full operating hour with at least six (6) data points in each half-hour period.

5. Periodic Monitoring

Periodic monitoring for Burner #1 and Dryer #1 shall include the following:

a. Hours of operation of Burner #1 on a monthly and calendar year basis;

b. Records for Burner #1 of all startups, shutdowns, and malfunctions including date, time, duration, cause, method utilized to minimize duration of the event and/or to prevent reoccurrence, and whether the bypass stack was utilized and for how long;

c. Dryer #1 inlet temperature on a continuous basis and calculated 1-hr block averages when the unit is in operation;

d. Oven dried tons of wood dried (ODT) on a monthly and calendar year basis;

e. Differential pressure across the cyclone on a continuous basis and calculated 1-hr block averages;

f. Records of monthly inspections of the dropbox and cyclone; and

g. Records of any cyclone malfunction and all maintenance activities.

6. New Source Performance Standards (NSPS): 40 C.F.R. Part 60, Subpart Dc

Burner #1 is not subject to *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* 40 C.F.R. Part 60, Subpart Dc, which is applicable to steam generating units greater than or equal to 10 MMBtu/hr and less than or equal to 100 MMBtu/hr for which construction, modification, or reconstruction occurred after June 9, 1989. Steam generating unit is defined in 40 C.F.R. Part 60, Subpart Dc as "a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This does not include process heaters as defined in this subpart."

Burner #1 does not use heat transfer mediums; therefore, 40 C.F.R. Part 60, Subpart Dc is not applicable to this equipment since it is not considered a steam generating unit.

7. National Emission Standards for Hazardous Air Pollutants (NESHAP): 40 C.F.R. Part 63, Subpart JJJJJJ

   Burner #1 is not subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 C.F.R. Part 63, Subpart JJJJJJ, which is applicable to all new, reconstructed, and existing boilers firing coal, biomass, or oil located at an area source of hazardous air pollutants (HAPs). MaineFlame is an area source for HAP, with the facility's potential to emit less than 10 tons per year of a single HAP and 25 tons per year combined HAP. The definition of boiler in 40 C.F.R. Part 63, Subpart JJJJJJ states: "Boiler means an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam or hot water. Controlled flame combustion refers to a steady-state, or near steady-state, process wherein fuel and/or oxidizer feed rates are controlled. Waste heat boilers are excluded from this definition." Burner #1 does not heat water to recover thermal energy; therefore, 40 C.F.R. Part 63, Subpart JJJJJJ is not applicable to this unit since it is not considered a boiler.

8. Performance Testing

   a. Within 180 days of initial startup of Burner #1 and Dryer #1, MaineFlame shall conduct performance tests on Stack #1 for PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and visible emissions to demonstrate compliance with the licensed emission limits (lb/hr and percent opacity, as appropriate) using EPA stack test methods specified in the table below or other methods approved by the Department.

Pollutant	**EPA Test Method**
PM	Method 5
PM_{10}	Method 201 or 201A and Method 202
$PM_{2.5}$	Method 201A and Method 202
NO_x	Method 7E
CO	Method 10
VOC	Method 25A
Visible Emissions	Method 9

   b. Performance testing shall be conducted under normal operating conditions. MaineFlame shall record the amount of biomass fired (i.e., tons and moisture content) in Burner #1 during each test run for all pollutants. MaineFlame shall measure and record the amount of wood dried (i.e., tons of dry wood produced) during each test run for PM, PM_{10}, $PM_{2.5}$, and VOC.

c. For any regulated pollutant that tests above 75% of its emission limit as defined in this air emission license, MaineFlame shall repeat testing for that pollutant within a period not to exceed 1 year. If the facility is not operating when the 1-year period concludes, then testing shall be completed within 60 days after the facility re-starts. In subsequent testing, any regulated pollutant that tests at or below 75% of its emission limit will be retested on the 5-year schedule established below.

d. For those pollutants testing at or below 75% of its limit, MaineFlame shall conduct performance tests on Stack #1 for PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and visible emissions after a period of 5 years from the initial performance test and every 5 years thereafter. Testing methods shall be the same as the methods prescribed for the initial performance tests.

D. Process Equipment

Wood handling and extruded log processing operations at the facility will include screens, conveyors, hammermills, extruded log mills, and storage and packaging operations. The facility will operate two extruded log mills with a maximum process rate of approximately 3.6 tons of extruded logs per hour.

The dry hammermill, screens, extruded log mills, packaging operations, and some extruded log storage will be located within the production building. Air from inside the production building will be picked up by a ventilation system and routed to a fabric filter baghouse/cartridge filter for control of particulate matter before being exhausted outside.

The Department finds that the proper operation and maintenance of the baghouse/cartridge filter in accordance with manufacturer's recommendations and compliance with the fugitive and general process visible emission limits listed in this license, as appropriate, represents BACT for control of particulate matter emissions from the production building. MaineFlame shall inspect the baghouse/cartridge filter monthly for leaks and keep records of these inspections as well as any maintenance (planned or unplanned) performed including bag replacement.

All other wood handling and processing operations are located outside. This includes stockpiles of fuel and/or raw material, the green wood hog, storage silos, and various conveyors. BACT for the control of particulate matter emissions from this equipment includes fabric filters on all vents from storage silos, the use of enclosed conveyors for all outdoor conveying of materials, and the fugitive and general process visible emission limits listed in this license, as appropriate. MaineFlame shall inspect all fabric filters monthly for leaks and keep records of these inspections as well as any maintenance (planned or unplanned) performed including filter replacement.

MaineFlame shall not cause visible emissions (not including water vapor), measured as any opacity totaling twelve minutes or longer in any one-hour period, to occur at ground level over any land or surrounding any buildings not owned by MaineFlame. Opacity under this condition shall be determined pursuant to the Environmental Protection Agency's (EPA's) *Method 22 - Visual determination of fugitive emissions from material sources and smoke emissions from flares*, 40 C.F.R. Part 60, Appendix A

E. Portable Engines

MaineFlame may operate portable engines on-site for construction, maintenance, and emergency purposes. These engines are not to be used for primary electrical needs (i.e., to power production equipment) or to drive process equipment. Depending on their size and age, these engines may be subject to *Visible Emissions Regulation*, 06-096 C.M.R. ch. 101 and/or *Fuel Burning Equipment Particulate Emission Standard*, 06-096 C.M.R. ch. 103.

Any engine which cannot meet the definition of "portable engine" as defined by this license may be subject to additional State and Federal regulations. A license amendment may be necessary for a portable engine to be reclassified as stationary.

F. Fugitive Emissions

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed 20% opacity on a five-minute block average basis.

G. General Process Emissions

Visible emissions from any general process source shall not exceed 20% opacity on a six-minute block average basis.

H. Emission Statements

MaineFlame is subject to emissions inventory requirements contained in *Emission Statements*, 06-096 C.M.R. ch. 137. MaineFlame shall maintain the following records in order to comply with this rule:

1. Hours of operation of Burner #1 and Dryer #1 on a monthly and 12-month rolling total basis;
2. Tons of wood dried (ODT) on a monthly and calendar year basis.

Beginning with reporting year 2023 and every third year thereafter, MaineFlame shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). The Department will use these reports to calculate and invoice for the applicable annual air quality surcharge for the subsequent three billing periods. MaineFlame shall pay the annual air quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3). [38 M.R.S. § 353-A(1-A)]

For the purposes of submission of the annual emissions inventory per *Emission Statements*, 06-096 C.M.R. ch. 137, MaineFlame shall estimate actual emissions for the drying system (i.e., Burner #1 & Dryer #1 combined). If the electronic reporting system used to report emissions lists these units separately, MaineFlame shall report all emissions for the system under Dryer #1 and report zero emissions from Burner #1. Annual throughput for the system shall be reported as tons of finished product produced.

Inventory of emissions for all pollutants shall be calculated by multiplying the hours of operation of Burner #1 by the following emission factors, which will be superseded by emission factors established by stack testing:

Pollutant	Emission Factor (lb/hr)	Pollutant	Emission Factor (lb/hr)
PM_{10}	10.50	Acetaldehyde*	4.68×10^{-2}
$PM_{2.5}$	4.00	Acrolein*	1.62×10^{-2}
SO_2	0.40	Arsenic**	2.57×10^{-5}
NO_x	4.50	Benzene*	3.56×10^{-3}
CO	7.20	Cadmium**	5.01×10^{-6}
VOC	9.10	Chromium**	3.27×10^{-5}
Lead*	1.73×10^{-4}	Cobalt**	3.23×10^{-5}
Carbon Dioxide**	2672	Dioxins**	1.13×10^{-9}
Methane**	0.29	Formaldehyde*	9.00×10^{-2}
Nitrous Oxide**	0.18	Manganese**	1.25×10^{-3}
		Mercury**	1.46×10^{-5}
		Nickel**	3.84×10^{-5}
		Polycyclic Organic Matter**	5.78×10^{-3}

* AP-42 10.6 2.3 dated 3/2002
** Maine DEP default emission factors used for emissions inventory reporting

I. Annual Emissions

The table below provides an estimate of facility-wide annual emissions for the purposes of calculating the facility's annual air license fee. Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included. Maximum potential emissions were calculated based on operating Burner #1 and Dryer #1 for 5,000 hrs/yr.

Please note, this information provides the basis for fee calculation only and should not be construed to represent a comprehensive list of license restrictions or permissions. That information is provided in the Order section of this license.

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
Burner #1 & Dryer #1	26.3	26.3	9.9	1.0	11.3	18.0	22.8
Total TPY	**26.3**	**26.3**	**9.9**	**1.0**	**11.3**	**18.0**	**22.8**

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A refined modeling analysis was performed to show that emissions from MaineFlame, 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 or to Class II increments for SO_2, PM_{10}, $PM_{2.5}$, or NO_2.

Since MaineFlame is classified as a new minor source, an assessment of Class I Air Quality Related Values (AQRVs) is not required.

B. Model Inputs

The AERMOD dispersion model was used to address NAAQS and increment impacts 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). The most-recent regulatory version of the AERMOD model and its associated processors were used to conduct the analyses.

A valid five-year hourly off-site meteorological database was used in the 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 the AERSURFACE utility program and from procedures recommended by USEPA.

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

TABLE III-1: Point Source Stack Parameters

Stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter (m)	UTM Easting NAD83 (m)	UTM Northing NAD83 (m)
CURRENT/PROPOSED						
• Stack #1 (Dryer Stack)	188.73	15.24	20.57	0.76	544,597	5,163,287
2012 BASELINE ($PM_{2.5}$ INCREMENT)						
• MaineFlame did not exist during the 2012 baseline year, no $PM_{2.5}$ credits to be taken.						
1987 BASELINE (NO_2 INCREMENT)						
• MaineFlame did not exist during the 1987 baseline year, no NO_2 credits to be taken.						
1977 BASELINE (SO_2/PM_{10} INCREMENT)						
• MaineFlame did not exist during the 1977 baseline year, no SO_2/PM_{10} credits to be taken.						

Emission parameters for NAAQS and increment 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}; and
- all $PM_{2.5}$ emissions were explicitly modeled as $PM_{2.5}$.

TABLE III-2: Stack Emission Parameters

Stack	Averaging Periods	SO_2 (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_x (g/s)	CO (g/s)	Stack Temp (K)	Stack Velocity (m/s)
MAXIMUM PROPOSED EMISSION RATES								
• Stack #1 (Dryer Stack) – 100%	All	0.044	1.323	0.499	0.567	0.907	409.80	25.12
• Stack #1 (Dryer Stack) – 75%		0.033	0.992	0.374	0.425	0.680	409.80	18.84
• Stack #1 (Dryer Stack) – 50%		0.022	0.661	0.249	0.283	0.454	409.80	12.56
2012 BASELINE ($PM_{2.5}$ INCREMENT)								
• MaineFlame did not exist during the 2012 baseline year, no $PM_{2.5}$ credits to be taken.								
1987 BASELINE (NO_2 INCREMENT)								
• MaineFlame did not exist during the 1987 baseline year, no NO_2 credits to be taken.								
1977 BASELINE (SO_2/PM_{10} INCREMENT)								
• MaineFlame did not exist during the 1977 baseline year, no SO_2/PM_{10} credits to be taken.								

C. Single Source Modeling Impacts

The significant impact model results for MaineFlame alone are shown in Table III-3. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type. For comparison to the Class II significance levels, the impacts for 1-hour NO_2 was conservatively based on the maximum High-1st-High predicted values, averaged over five years of meteorological data. All other pollutants/averaging periods were conservatively based on their maximum High-1st-High predicted values. No additional refined NAAQS or increment modeling was required for pollutants that did not exceed their respective significance levels.

TABLE III-3: Maximum AERMOD-PRIME Significant Impact Results

Pollutant	Averaging Period	Max Impact (μg/m^3)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Class II Significance Level (μg/m^3)	Load Case
SO_2	1-hour	5.26	544,612	5,163,286	188.98	7.9	50%
	3-hour	3.24	544,112	5,163,316	225.45	25	100%
	24-hour	0.94	544,652	5,163,046	189.41	5	100%
	Annual	0.06	544,782	5,163,116	201.65	1	100%
PM_{10}	24-hour	**28.20**	544,652	5,163,046	189.41	5	100%
	Annual	**1.28**	544,962	5,162,766	224.85	1	100%
$PM_{2.5}$	24-hour	**6.96**	577,572	5,163,376	187.87	1.2	50%
	Annual	**0.48**	544,961	5,163,116	196.90	0.2	100%
NO_2	1-hour	**55.19**	545,162	5,163,366	228.11	7.5	50%
	Annual	0.77	544,782	5,163,116	201.65	1	100%
CO	1-hour	108.62	544,612	5,163,286	188.98	2,000	50%
	8-hour	41.07	544,572	5,163,366	187.91	500	100%

D. Combined Source Modeling Impacts

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.

Background concentrations, listed in Table III-4, are derived from representative rural background data for use in the Northern Maine region.

TABLE III-4: Background Concentrations

Pollutant	Averaging Period	Background Concentration (μg/m³)	Monitoring Site
PM_{10}	24-hour	32	Presque Isle
	Annual	12	
$PM_{2.5}$	24-hour	17	Greenville
	Annual	5	
NO_2	1-Hour	43	Presque Isle

MEDEP examined other nearby sources to determine if any impacts would be significant in or near the MaineFlame significant impact area. Due to the location of the MaineFlame facility, extent of the predicted significant impact area, and other nearby source's emissions, MEDEP has determined that no other sources would be included in combined-source refined modeling.

The maximum modeled impacts, which were explicitly normalized to the form of their respective NAAQS, were added with conservative rural background concentrations to demonstrate compliance with NAAQS, as shown in Table III-5.

Because all significant pollutant/averaging period impacts using this method meet NAAQS, no further NAAQS modeling analyses needed to be performed.

TABLE III-5: Maximum Combined Source Impacts (μg/m³)

Pollutant	Averaging Period	Max Impact (μg/m³)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Back-Ground (μg/m³)	Total Impact (μg/m³)	NAAQS (μg/m³)
PM_{10}	24-hour	19.78	544,572	5,163,376	187.87	32	51.78	150
	Annual	1.27	544,962	5,162,766	224.85	12	13.27	50
$PM_{2.5}$	24-hour	3.24	544,712	5,163,126	196.28	17	20.24	35
	Annual	0.48	544,962	5,162,766	224.85	5	5.48	15
NO_2	1-Hour	36.79	516,266	5,163,266	230.71	43	79.79	188

E. Class II Increment

Results of the Class II increment analysis are shown in Tables III-6. All modeled maximum increment impacts were below all increment standards. Because all predicted increment impacts meet increment standards, no additional Class II SO_2, PM_{10}, $PM_{2.5}$, and NO_2 increment modeling needed to be performed.

TABLE III-6 : Class II Increment Consumption

Pollutant	Averaging Period	Max Impact (μg/m³)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Class II Increment (μg/m³)
PM_{10}	24-hour	19.78	544,572	5,163,376	187.87	30
	Annual	1.79	544,782	5,163,116	201.65	17
$PM_{2.5}$	24-hour	8.53	544,572	5,163,376	187.87	9
	Annual	0.68	544,782	5,163,116	201.65	4

Federal guidance and 06-096 C.M.R. ch. 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 MaineFlame is classified as a new minor source, these additional analyses were not required.

F. Class I Impacts

Since MaineFlame is classified as a new minor source, it has been determined by MEDEP-BAQ that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

G. Summary

In summary, it has been demonstrated that MaineFlame will not cause or contribute to a violation of any SO_2, PM_{10}, $PM_{2.5}$, NO_2, or CO NAAQS or of any Class II increments for SO_2, PM_{10}, $PM_{2.5}$, or 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, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-1155-71-A-N subject to the following conditions.

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

STANDARD CONDITIONS

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S. § 347-C).

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 C.M.R. ch. 115]

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 C.M.R. ch. 115]

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 C.M.R. ch. 115]

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S. § 353-A. [06-096 C.M.R. ch. 115]

(6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 C.M.R. ch. 115]

(7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 C.M.R. ch. 115]

(8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 C.M.R. ch. 115]

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license.
[06-096 C.M.R. ch. 115]

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license.
[06-096 C.M.R. ch. 115]

(11) In accordance with the Department's air emission compliance test protocol and 40 C.F.R. Part 60 or other method approved or required by the Department, the licensee shall:

A. Perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
   1. Within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
   2. Pursuant to any other requirement of this license to perform stack testing.

B. Install or make provisions to install test ports that meet the criteria of 40 C.F.R. Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and

C. Submit a written report to the Department within thirty (30) days from date of test completion.

[06-096 C.M.R. ch. 115]

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

A. Within thirty (30) days following receipt of the written test report by the Department, or another alternative timeframe approved by the Department, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 C.F.R. Part 60 or other method approved or required by the Department; and

B. The days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

C. The licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

[06-096 C.M.R. ch. 115]

(13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or license requirement. [06-096 C.M.R. ch. 115]

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 C.M.R. ch. 115]

(15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status.
[06-096 C.M.R. ch. 115]

(16) The licensee shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (38 M.R.S. § 605). [06-096 C.M.R. ch. 115]

SPECIFIC CONDITIONS

(17) **Burner #1 and Dryer #1**

A. Burner #1 is licensed to fire biomass. [06-096 C.M.R. ch. 115, BACT]

B. During startup of Burner #1, MaineFlame shall fire clean, dry biomass with a moisture content between 5% and 15% by weight. During normal operation, MaineFlame shall fire clean biomass with a moisture content of 40% to 50% by weight. Dirt and other contaminants in the biomass shall be minimized. [06-096 C.M.R. ch. 115, BACT]

C. MaineFlame shall utilize good combustion design and operating practices along with a dropbox followed by a high efficiency cyclone to minimize emissions from Burner #1 and Dryer #1. [06-096 C.M.R. ch. 115, BACT]

D. MaineFlame shall not process eastern white pine in Dryer #1.
[06-096 C.M.R. ch. 115, BACT]

E. Burner #1 and Dryer #1 shall not exceed 5,000 hours of operation on a 12-month rolling total basis. Compliance shall be demonstrated by the periodic monitoring and recordkeeping required by this license. [06-096 C.M.R. ch. 115, BACT]

F. Emissions shall not exceed the following [06-096 C.M.R. ch. 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)
Burner #1 and Dryer #1 (combined emissions)	10.50	10.50	4.00	0.40	4.50	7.20	9.10

G. Visible emissions from Stack #1 or the bypass stack shall not exceed 20% opacity on a six-minute block average basis, except for periods of startup, shutdown, or malfunction, during which time visible emissions shall not exceed 40% opacity on a six-minute block average basis, and MaineFlame shall comply with the following work practice standards.

1. Maintain a log (written or electronic) of the date, time, and duration of all operating time, startups, shutdowns, and malfunctions for Burner #1 and Dryer #1.

2. Develop and implement a written startup and shutdown plan for Burner #1 and Dryer #1.

3. Use clean, dry biomass in Burner #1 with a moisture content between 5% and 15% by weight during startup.

4. Limit the duration of each unit startup, shutdown, and malfunction to no more than 30 minutes per occurrence.

5. At all times, operate Burner #1 and Dryer #1 in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

[06-096 C.M.R. ch. 115, BACT]

H. MaineFlame shall have on-site during daylight hours when the Burner #1/Dryer #1 system is operating at least one person who is trained and certified in determining visible emissions in accordance with EPA Test Methods 9 and 22, after the first available Method 9 training course following initial startup. MaineFlame shall take all necessary steps to remedy any fault at the facility that is causing or contributing to excess visible emissions. [06-096 C.M.R. ch. 115, BACT]

I. The exhaust from Burner #1 and Dryer #1 shall exit through the dropbox, cyclone and through Stack #1, except during periods of startup, shutdown, or malfunction when the exhaust may be diverted through the associated bypass stack.
[06-096 C.M.R. ch. 115, BACT]

J. Stack #1 will have an inside diameter of 2.5 feet and exhaust 50 feet above ground level (AGL). [06-096 C.M.R. ch. 115, BACT]

K. MaineFlame shall inspect the dropbox and cyclone monthly for leaks and keep records of these inspections as well as any maintenance (planned or unplanned) performed.
[06-096 C.M.R. ch. 115, BACT]

L. Following performance testing, MaineFlame shall operate the cyclone at or above the differential pressure at which compliance with the $PM/PM_{10}/PM_{2.5}$ lb/hr limits was demonstrated. [06-096 C.M.R. ch. 115, BACT]

M. MaineFlame shall limit the use of the bypass stack to periods of startup, shutdown, and malfunction, each event not to exceed thirty minutes in duration. Records shall be kept of all startups, shutdowns, and malfunctions including the date, time, duration, cause, method utilized to minimize duration of the event and/or prevent reoccurrence, and whether the bypass stack was utilized and for what duration.
[06-096 C.M.R. ch. 115, BACT]

N. MaineFlame shall limit the dryer inlet temperature to no more than 950 °F on a 1-hr average basis. MaineFlame shall continuously monitor and record the inlet temperature of Dryer #1 to demonstrate compliance with the temperature limit listed above.

"Continuously" is defined as at least 18, one-minute averages in each full operating hour with at least six (6) data points in each half hour period.
[06-096 C.M.R. ch. 115, BACT]

O. Performance Testing

1. Within 180 days of initial startup of Burner #1 and Dryer #1, MaineFlame shall conduct performance tests on Stack #1 for PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and visible emissions to demonstrate compliance with the licensed emission limits (lb/hr and percent opacity, as appropriate) using EPA stack test methods specified in the table below or other methods approved by the Department.

Pollutant	EPA Test Method
PM	Method 5
PM_{10}	Method 201 or 201A and Method 202
$PM_{2.5}$	Method 201A and Method 202
NO_x	Method 7E
CO	Method 10
VOC	Method 25A
Visible Emissions	Method 9

2. Performance testing shall be conducted under normal operating conditions. MaineFlame shall measure and record the amount of biomass fired (i.e., tons and moisture content) in Burner #1 during each test run for all pollutants. MaineFlame shall record the amount of wood dried (i.e., tons of dry wood produced) during each test run for PM, PM_{10}, $PM_{2.5,}$ and VOC.

3. For those pollutants testing at or below 75% of its limit, MaineFlame shall conduct performance tests on Stack #1 for PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and visible emissions after a period of 5 years from the initial performance test and every 5 years thereafter. Testing methods shall be the same as the methods prescribed for the initial performance tests.

4. For any regulated pollutant that tests above 75% of its emission limit as defined in this air emission license, MaineFlame shall repeat testing for that pollutant within a period not to exceed 1 year. If the facility is not operating when the 1-year period concludes, then testing shall be completed within 60 days after the facility re-starts. In subsequent testing, any regulated pollutant that tests at or below 75% of its emission limit will be retested on the 5-year schedule.

[06-096 C.M.R. ch. 115, BACT]

(18) **Process Equipment**

A. All exterior conveyors shall be equipped and operated as enclosed conveyors. [06-096 C.M.R. ch. 115, BACT]

B. All storage silo vents shall be equipped and operated with fabric filters. [06-096 C.M.R. ch. 115, BACT]

C. Air from inside the production building shall be picked up by a ventilation system and routed to a fabric filter baghouse/cartridge filter for control of particulate matter. [06-096 C.M.R. ch. 115, BACT]

D. MaineFlame shall operate the baghouse/cartridge filters at all times the screening and/or extruded log processing operations are operating. [06-096 C.M.R. ch. 115, BACT]

E. MaineFlame shall inspect all baghouse/cartridge filters monthly for leaks. Compliance shall be demonstrated by the periodic monitoring and recordkeeping required by this license. [06-096 C.M.R. ch. 115, BACT]

F. MaineFlame shall not cause visible emissions (not including water vapor), measured as any opacity totaling twelve minutes or longer in any one-hour period, to occur at ground level over any land or surrounding any buildings not owned by MaineFlame. Opacity under this condition shall be determined pursuant to the Environmental Protection Agency's (EPA's) *Method 22 - Visual determination of fugitive emissions from material sources and smoke emissions from flares,* 40 C.F.R. Part 60, Appendix A.

(19) **Portable Engines**

MaineFlame may operate portable engines on-site for construction, maintenance, and emergency purposes. These engines shall not be used for primary electrical needs (i.e., to power production equipment) or to drive process equipment. [06-096 C.M.R. ch. 115, BACT]

(20) **Fugitive Emissions**

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed 20% opacity on a five-minute block average basis. [06-096 C.M.R. ch. 115, BPT]

(21) **General Process Sources**

Visible emissions from any general process source shall not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BPT]

(22) **Periodic Monitoring and Recordkeeping**

MaineFlame shall monitor, record, and keep the following records, as applicable:

A. Hours of operation of Burner #1 and Dryer #1 on a monthly and 12-month rolling total basis;
[06-096 C.M.R. ch. 115, BACT and 06-096 C.M.R. ch. 137]

B. Records of all Burner #1 startups, shutdowns, and malfunctions including date, time, duration, cause, method utilized to minimize duration of the event and/or to prevent reoccurrence, and whether the bypass stack was utilized and for how long;
[06-096 C.M.R. ch. 115, BACT]

C. Dryer #1 inlet temperature on a continuous basis and calculated 1-hr block averages when the unit is in operation; [06-096 C.M.R. ch. 115, BACT]

D. Oven dried tons of wood dried (ODT) on a monthly and calendar year basis;
[06-096 C.M.R. ch. 137]

E. Records of monthly inspections of the dropbox, cyclone, baghouses, and all fabric filters; and
[06-096 C.M.R. ch. 115, BACT]

F. Records of any cyclone, baghouse, or fabric filter malfunction and all maintenance activities. [06-096 C.M.R. ch. 115, BACT]

(23) **Annual Emission Statements**

A. In accordance with *Emission Statements*, 06-096 C.M.R. ch. 137, MaineFlame shall annually report to the Department, in a format prescribed by the Department, the information necessary to accurately update the State's emission inventory. The emission statement shall be submitted as specified by the date in 06-096 C.M.R. ch. 137.

B. In reporting year 2023 and every third year thereafter, MaineFlame shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). MaineFlame shall pay the annual air quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3).
[38 M.R.S. § 353-A(1-A)]

DONE AND DATED IN AUGUSTA, MAINE THIS 25th DAY OF FEBRUARY, 2021.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY____ for ______
MELANIE LOYZIM, ACTING COMMISSIONER

The term of this license shall be ten (10) years from the signature date above.

[Note: If a renewal application, determined as complete by the Department, is submitted prior to expiration of this license, then pursuant to Title 5 M.R.S. § 10002, all terms and conditions of the license shall remain in effect until the Department takes final action on the license renewal application.]

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 11/13/20
Date of application acceptance: 11/17/20

Date filed with the Board of Environmental Protection:

This Order prepared by Chris Ham, Bureau of Air Quality.

FILED

FEB 25, 2021

State of Maine
Board of Environmental Protection