STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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**Messalonskee School District (RSU #18)**
**Kennebec County**
**Oakland, Maine**
**A-1064-71-A-N**

**Departmental**
**Findings of Fact and Order**
**Air Emission License**
**After-the-Fact**

After review of the air emissions license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

## I. REGISTRATION

### A. Introduction

Messalonskee School District Regional School Union #18 (Messalonskee), located at 41 Heath Street Oakland, Maine has requested an after-the-fact air emissions license for an existing source from the Maine Department of Environmental Protection. The air emissions license is for emissions sources associated with their educational facility.

### B. Emission Equipment

The following equipment is addressed in this air emission license:

**Fuel Burning Equipment**

| Equipment | Maximum Capacity (MMBtu/hr) | Maximum Firing Rate | Fuel Type | Stack # | Date of Installation |
|---|---|---|---|---|---|
| Boiler #1 [a] | 8.8 | ton/hr | Wood chips | 1 | 2011 |
| Boiler #2 | 5.2 | 37.5 gal/hr | #2 fuel oil, ASTM [b] | 2 | 1968 |
| Boiler #3 | 5.2 | 37.5 gal/hr | #2 fuel oil, ASTM | 2 | 1968 |
| Boiler #4 | 3.0 | 21.5 gal/hr | #2 fuel oil, ASTM | 3 | 2003 |
| Boiler #5 | 3.0 | 21.5 gal/hr | #2 fuel oil, ASTM | 3 | 2003 |
| Boiler #6 | 2.0 | 14.1 gal/hr | #2 fuel oil, ASTM | 3 | 1987 |

[a] proposed wood-fired boiler
[b] meets the criteria in ASTM D396 for #2 fuel oil

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web site: www.maine.gov/dep

C. Application Classification

Messalonskee is classified as an existing source that is applying for its first air emission license, after the fact. A source is considered a major source based on whether or not expected emissions exceed the "Significant Emission Levels" as defined in the Department's regulations. The emissions for the new source are determined by the maximum future license allowed emissions, as follows:

| Pollutant | Max. Future License (TPY) | Sig. Level |
|---|---|---|
| PM | 2.5 | 100 |
| $PM_{10}$ | 2.5 | 100 |
| $SO_2$ | 3.7 | 100 |
| $NO_x$ | 4.2 | 100 |
| CO | 4.1 | 100 |
| VOC | 0.2 | 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 CMR 115 (as amended). The facility is considered a natural minor because the emissions from the source at maximum fuel use throughput operating 8760 hours/year for both wood and oil are still below significant emission levels.

D. Regulatory Review

Provided in this section is a summary of State and Federal air regulations that apply to the proposed biomass boiler and existing emission sources at Messalonskee. The school currently utilizes and has selected specific equipment that will achieve compliance with the following State and Federal air regulations.

*06-096 CMR 101 Visible Emission Regulation*

This rule establishes opacity limitations for emissions from several categories of air contaminant sources. The existing oil-fired boilers are subject to Section (2)(B)(1)(b), which limits visible emissions from any unit firing #2 fuel oil to an opacity of 20 percent on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 3-hour period.

The new wood-fired boiler is subject to Section (2)(B)(1)(e) which limits visible emissions from any wood waste or biomass unit to an opacity of 30 percent on a six (6) minute block average basis, except for no more than two (2) six (6) minute block averages in a 3-hour period.

*06-096 CMR 103 Fuel Burning Equipment Particulate Emission Standard*

This rule applies to all fuel burning equipment that has a rated heat input capacity of 3 MMBtu/hour or greater. The oil boilers (Boilers #2, #3, #4 and #5) meet the minimum heat input capacity threshold and must comply with Section 2(B)(1)(a), which establishes a PM limit of 0.12 lb/MMBtu for distillate fuel and gas-fired sources less than 50 MMBtu/hr, however, the units are subject to New Source Review (NSR) as part of 06-096 CMR 115 (as amended) and the BACT limit is more stringent. Per Section 2(B)(4)(a), wood-fired units (Boiler #1) less than 50 MMBtu/hr are required to meet a 0.3 lb/MMBtu, however, the BACT limit is more stringent.

*06-096 CMR 106 Low Sulfur Fuel Regulation*

This rule establishes the maximum sulfur content of fossil fuels allowed to be burned in various air quality control regions in the state unless the source is equipped with $SO_2$ controls or is subject to more stringent sulfur limitations by other requirements. Messalonskee is subject to this rule because the five (5) existing oil-fired boilers each burn a liquid fossil fuel. As such, Messalonskee is limited to a fuel sulfur content of 2.0% by weight in its liquid fossil fuels, however, the BACT analysis has required a more stringent limit.

*06-096 CMR 115 Major and Minor Source Air Emission License Regulations*

This rule specifies who must obtain an air emission license, describes the information an applicant must submit for a license, and describes the standards and criteria that must be complied with during and following the air licensing process. For minor sources such as Messalonskee, 06-096 CMR 115 (as amended) serves as an operating licensing program and a pre-construction license review program.

*06-096 CMR 116 Prohibited Dispersion Techniques*

This rule specifies the stack height and dispersion technique requirements utilized in the licensing of air emission sources, and defines where air quality standards have to be met. Messalonskee proposes to exhaust emissions from the new biomass boiler from a stack that will meet GEP stack height and has submitted an ambient air quality analysis described in Section III of this air emissions license.

Federal Air Regulations

*New Source Performance Standards (NSPS)*

40 CFR Part 60 Subpart Dc – Messalonskee's existing boilers and new wood-fired unit are rated below 10 MMBtu/hr and therefore are not 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.

*National Emissions Standards for Hazardous Air Pollutants (NESHAP)*

40 CFR Part 63 Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers at Area Sources. Messalonskee is subject to this federal regulation, the requirements of which are described in (Best Practical Treatment Analysis) Section II D.

## 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 Definitions Regulation, 06-096 CMR 100 (as amended). BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

### B. New Wood Boiler #1 (BACT)

Messalonskee is proposing to install a new wood-fired boiler rated with a maximum design heat input capacity of 8.75 MMBtu/hr. The school district currently operates five #2 oil-fired boilers, which serve the High School, Middle School and Elementary School. One of the two oil boilers at the High School will be decommissioned as part of this project. The school currently uses

approximately 67,000 gallons per year of #2 fuel oil and intends to displace approximately 85% of that fuel oil with approximately 1,000 tons per year of clean, green wood chips having varying quantities of bark. The new wood boiler will be provided by Messersmith Manufacturing.

Messersmith Systems has designed this system to provide 7 MMBtu/hour of heat output. Combustion chamber temperatures range from 1500°F to 2000°F, under-fire and over-fire air are coupled with automated combustion controls to maximize combustion efficiency. The system will have a heat input of 8.75 MMBtu/hour assuming a minimum thermal efficiency of 80%. Emissions will be controlled with a multi-cyclone and a number of Best Management Practices (BMPs). The wood boiler will provide heat and hot water to the elementary school, middle school, high school, and possibly a few other campus maintenance buildings. It will act as the primary heat source during the heating season unless it is off-line for maintenance. The wood boiler will burn wood in the form of wood chips. Wood fuel contains varying quantities of bark and moisture (moisture content is typically between 25% and 45%). The proposed wood-fired boiler will be designed to accommodate this range.

The fuel is metered by two metering augers located at the bottom of a metering bin and driven by a variable speed motor. The metering augers convey the fuel to a stoker auger, which in turn conveys fuel to the combustion chamber. Ash will be cleaned from the surface of the grates on an as needed basis according to the manufacturer, possibly daily but many operators find that the system will operate well for three or four days without needing to clean the grates. Cleaning the ash from the grates typically requires only five minutes each time they are cleaned. Ash is removed manually, using a long-handled ash rake, from the air chambers beneath the grates approximately once every two months. The ash will be disposed of in accordance with the Bureau of Remediation and Waste Management (BRWM).

Due to the size of the unit the wood-fired boiler is not 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. A detailed BACT analysis can be found in Messalonskee's Air Emissions License application submitted July 2011.

A summary of the BACT analysis for Boiler #1 is the following:

1. The total wood fuel use for the facility is limited to 1300 tons/year based on gross weight purchase records throughout the year and a heating value for 40% moisture wood of 5,100 Btu/lb.

2. Fuel Burning Equipment Particulate Emission Standard, 06-096 CMR 103 (as amended) regulates PM emission limits. The $PM_{10}$ limits are derived from the PM limits. The PM and $PM_{10}$ BACT emission limits are more stringent.
3. Messalonskee shall continuously operate the multi-cyclone on Boiler #1 when the unit is in operation. The multi-cyclone is required to meet the 0.25 lb/MMBtu BACT particulate emission limit.
4. $SO_2$, $NO_x$, CO, and VOC emission limits are based upon AP-42 data dated 9/03.
5. Visible emissions from the wood-fired unit 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.

C. Existing Oil-fired Boilers (BACT)

BPT for existing sources seeking a new air license requires an analysis similar to a Best Available Control Technology analysis per 06-096 CMR 115.

Messalonskee operates Boilers #2, #3, #4, #5 and #6 for facility heating and hot water needs. These boilers each have maximum heat inputs less than 10 MMBtu/hr and are therefore not subject to the New Source Performance Standards (NSPS) Subpart Dc for steam generating units greater than 10 MMBtu/hr manufactured after June 9, 1989.

The oil boilers will be used during extreme cold periods in the unlikely event the wood boiler is unable to accommodate campus heat demand. The oil boilers will also be used during extreme cold weater and the non-heating season.

A summary of the BACT analysis for the oil-fired boilers is the following:

1. The total fuel use for the facility shall not exceed 100,000 gal/year (calendar year basis) of fuel which meets the criteria in ASTM D396 for #2 fuel oil.
2. Chapter 106 regulates fuel sulfur content, however in this case a BPT analysis for $SO_2$ determined a more stringent limit of ASTM D396 compliant fuel was appropriate and shall be used.
3. Chapter 103 regulates PM emission limits; however, Messalonskee will meet the more stringent BACT limit of 0.08 lb/MMBtu. The $PM_{10}$ limits are derived from the PM limits.
4. $NO_x$ emission limits are based on data from similar #2 oil fired boilers of this size and age.
5. CO and VOC emission limits are based upon AP-42 data dated 9/03.
6. Visible emissions from each boiler stack shall not exceed 10% opacity on a six (6) minute block average, except for no more than one (1) six (6) minute block average in a continuous 3-hour period.

Until December 31, 2015, the fuel oil fired in oil-fired boilers shall be ASTM D396 compliant #2 fuel oil (maximum sulfur content of 0.5% by weight). Per 38 MRSA §603-A(2)(A)(3), beginning January 1, 2016, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.005% by weight (50 ppm), and beginning January 1, 2018, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.0015% by weight (15 ppm).

*Periodic Monitoring*

Periodic monitoring for the boiler shall include recordkeeping to document fuel use both on a monthly and calendar year basis. Documentation shall include the type and quantity of fuel used.

D. 40 CFR Part 63 Subpart JJJJJJ

The oil-fired boilers and wood fired unit 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 boilers rated less than 10 MMBtu/hr that do not combust coal.

For informational purposes, a summary of the current applicable federal 40 CFR Part 63 Subpart JJJJJJ requirements is listed below. At this time, the Maine Department of Environmental Protection has not taken delegation of this area source MACT (Maximum Achievable Control Technology) rule promulgated by EPA, however Messalonskee 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 should have been submitted to EPA no later than September 17, 2011. [40 CFR Part 63.11225(a)(2)]

ii. Boiler Tune-Up Program – Initial and Biennial

(a) A boiler tune-up program shall be implemented to include the tune-up of applicable boilers by March 21, 2012. [40 CFR Part 63.11196(a)(1)]

(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; however, the burner must be inspected at least once every 36 months. [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. [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 (ppm), by volume, and oxygen in volume percent, before and after adjustments are made. [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 one week of start-up. [40 CFR Part 63.11223(b)(7)

(c) A Notification of Compliance Status shall be submitted to EPA no later than 120 days after conducting the initial boiler tune-up. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(b)]

(d) The facility shall implement a biennial boiler tune-up program after the initial tune-up and initial compliance report has been submitted.

1. Each biennial tune-up shall be conducted no more than 25 months after the previous tune-up. [40 CFR Part 63.11223(a)]
2. The biennial report shall be maintained onsite and submitted to EPA, if requested. The report shall contain the concentration of CO in the effluent stream (ppmv) and oxygen in volume percent, measured 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 type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler. [40 CFR Part 63.11223(b)(6)] The biennial 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)]

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.

E. Annual Emissions

Messalonskee shall be restricted to the following annual emissions, based on 100,000 gallons per year (calendar year basis) for oil and 1300 tons/year based on a gross weight purchase records throughout the year.

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

| | PM | $PM_{10}$ | $SO_2$ | $NO_x$ | CO | VOC |
|---|---|---|---|---|---|---|
| Oil-fired Boilers | 0.9 | 0.9 | 3.5 | 2.8 | 0.2 | 0.1 |
| Wood-fired Boiler | 1.6 | 1.6 | 0.3 | 1.4 | 3.9 | 0.1 |
| **Total TPY** | **2.5** | **2.5** | **3.8** | **4.2** | **4.1** | **0.2** |

## III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

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

Since the current licensing action for Messalonskee represents a minor modification to an existing minor source, 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 and increments in all areas. If applicable, the modeling analysis accounted for the potential of

building wake and cavity effects on emissions from all modeled stacks that are below their calculated formula GEP stack heights.

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

A valid 5-year hourly off-site meteorological database was used in the AERMOD-PRIME refined modeling analysis. Five years of wind data (1997-2001) was collected at a height of 15 meters at the Maine DEP meteorological monitoring site located at the Augusta State Airport. Surface data, collected at the Augusta State Airport FAA ASOS (Augusta) site, were substituted for missing surface data. All other missing data were interpolated or coded as missing, per USEPA guidance.

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

The surface meteorological data was combined with concurrent hourly cloud cover and upper-air data obtained from the Gray National Weather Service (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 Messalonskee are listed in Table III-1.

**TABLE III-1 : Point Source Stack Parameters**

| Facility/Stack | Stack Base Elevation (m) | Stack Height (m) | GEP Stack Height (m) | Stack Diameter (m) | UTM Easting NAD83 (km) | UTM Northing NAD83 (km) |
|---|---|---|---|---|---|---|
| **CURRENT/PROPOSED** | | | | | | |
| **Messalonskee** | | | | | | |
| • Boiler #1 Stack | 71.93 | 19.81 | 16.76 | 0.61 | 443.255 | 4933.510 |

Emission parameters for MAAQS, NAAQS and increment modeling are listed in Table III-2. For the purposes of determining $PM_{10}$ and $NO_2$ impacts, all PM and $NO_x$ emissions were conservatively assumed to convert to $PM_{10}$ and $NO_2$, respectively.

**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** | | | | | | | | |
| **Messalonskee** | | | | | | | | |
| • Boiler #1 Stack | All | 0.03 | 0.28 | 0.23 | 0.24 | 0.20 | 435.93 | 6.73 |
| **BASELINE – 1987** | | | | | | | | |
| **Messalonskee** | | | | | | | | |
| • Messalonskee conservatively assumed no credit for sources existing in the 1987 baseline year. | | | | | | | | |
| **BASELINE – 1977** | | | | | | | | |
| **Messalonskee** | | | | | | | | |
| • Messalonskee conservatively assumed no credit for sources existing in the 1977 baseline year. | | | | | | | | |

C. Single Source Modeling Impacts

AERMOD-PRIME refined modeling was performed for four scenarios that represented a range of maximum, typical and minimum operations.

The modeling results for Messalonskee alone are shown in Tables III-3. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type. No further modeling was required for pollutant/terrain combinations that did not exceed their respective significance levels.

**TABLE III-3 : Maximum AERMOD-PRIME Impacts from Messalonskee Alone**

| Pollutant | Averaging Period | Max Impact ($\mu g/m^3$) | Receptor UTM E (km) | Receptor UTM N (km) | Receptor Elevation (m) | Class II Significance Level ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| $SO_2$ | 1-hour | 7.12[1] | 443.120 | 4933.458 | 75.44 | **10**[2] |
| | 3-hour | 5.19 | 443.130 | 4933.458 | 75.44 | **25** |
| | 24-hour | 1.41 | 443.220 | 4933.338 | 72.54 | **5** |
| | Annual | 0.11 | 443.260 | 4933.698 | 71.69 | **1** |
| $PM_{10}$ | 24-hour | **10.59** | 443.250 | 4933.698 | 72.18 | **5** |
| | Annual | **1.03** | 443.260 | 4933.708 | 72.18 | **1** |
| $PM_{2.5}$ | 24-hour | **11.02**[1] | 443.220 | 4933.338 | 72.45 | **5** |
| | Annual | 0.85 | 443.260 | 4933.708 | 72.18 | **1** |
| $NO_2$ | 1-hour | **33.17**[3] | 443.140 | 4933.438 | 75.44 | **10**[4] |
| | Annual | 0.90 | 443.260 | 4933.708 | 72.18 | **1** |
| CO | 1-hour | 51.19 | 443.120 | 4933.458 | 75.44 | **2000** |
| | 8-hour | 21.60 | 443.130 | 4933.448 | 75.44 | **500** |

[1] Value based on the H1H (highest-1st-high) concentration from five years of meteorological data
[2] Interim Significant Impact Level (SIL) adopted by Maine
[3] Value based on the H8H (highest-8th-high) concentration from five years of meteorological data
[4] Interim Significant Impact Level (SIL) adopted by NESCAUM states

D. Combined Source Modeling Impacts

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

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

**TABLE III-4 : Background Concentrations**

| Pollutant | Averaging Period | Background Concentration ($\mu g/m^3$) |
|---|---|---|
| $PM_{10}$ | 24-hour | 47[1] |
| | Annual | 11[1] |
| $PM_{2.5}$ | 24-hour | 22[2] |
| $NO_2$ | 1-hour | 47[3] |

Notes:
[1] Androscoggin River Valley - Jay
[2] Rumford Avenue Site - Rumford
[3] MicMac Site - Presque Isle

MEDEP examined other area sources whose impacts would be significant in or near Messalonskee's significant impact area. Due to the applicant's location, extent of the significant impact area and other nearby source emissions, MEDEP has determined that no other sources would be considered for combined source modeling.

For pollutant averaging periods that exceeded significance levels, the maximum modeled impacts for all sources were added with conservative rural background concentrations to demonstrate compliance with MAAQS and NAAQS, as shown in Table III-5. Because impacts for all pollutants using this method meet all MAAQS and NAAQS, no further modeling analyses need to be performed.

**TABLE III-5 : Maximum Combined Source Impacts**

| Pollutant | Averaging Period | Max Impact ($\mu g/m^3$) | Receptor UTM E (km) | Receptor UTM N (km) | Receptor Elevation (m) | Back-Ground ($\mu g/m^3$) | Max Total Impact ($\mu g/m^3$) | MAAQS/ NAAQS ($\mu g/m^3$) |
|---|---|---|---|---|---|---|---|---|
| $PM_{10}$ | 24-hour | **10.59** | 443.250 | 4933.698 | 72.18 | **47** | **57.59** | **150** |
| | Annual | **1.03** | 443.260 | 4933.708 | 72.18 | **11** | **12.03** | **40** |
| $PM_{2.5}$ | 24-hour | **11.02** | 443.220 | 4933.338 | 72.45 | **22** | **33.02** | **35** |
| $NO_2$ | 1-hour | **30.52**[1] | -- | -- | -- | **47** | **77.52** | **188** |

[1] Value based on the five-year arithmetic average of H8H (highest-8th-high) concentrations

E. Increment

AERMOD-PRIME refined modeling was performed to predict Messalonskee's maximum Class II increment impacts. Messalonskee conservatively assumed no credit would be taken for any sources that existed in the 1977 and 1987 baseline years.

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 further Class II $SO_2$, $PM_{10}$ and $NO_2$ increment modeling for Messalonskee needed to be performed.

**TABLE III-6 : Class II Increment Consumption**

| Pollutant | Averaging Period | Max Impact ($\mu g/m^3$) | Receptor UTM E (km) | Receptor UTM N (km) | Receptor Elevation (m) | Class II Increment ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| $SO_2$ | 3-hour | **5.19** | 443.130 | 4933.458 | 75.44 | **512** |
| | 24-hour | **1.41** | 443.220 | 4933.338 | 72.54 | **91** |
| | Annual | **0.11** | 443.260 | 4933.698 | 71.69 | **20** |
| $PM_{10}$ | 24-hour | **10.59** | 443.250 | 4933.698 | 72.18 | **30** |
| | Annual | **1.03** | 443.260 | 4933.708 | 72.18 | **17** |
| $NO_2$ | Annual | **0.90** | 443.260 | 4933.708 | 72.18 | **25** |

Federal guidance and 06-096 CMR 115 (as amended) 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 to an existing minor source, no additional analyses were required.

F. Class I Impacts

Since the current licensing action for Messalonskee represents a minor modification to an existing 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 Messalonskee in its proposed configuration will not cause or contribute to a violation of any MAAQS or NAAQS for $SO_2$, $PM_{10}$, $PM_{2.5}$, $NO_2$ or CO; or any $SO_2$, $PM_{10}$ or $NO_2$ averaging period Class II increment standards.

## 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-1064-71-A-N subject to the following conditions.

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

### 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.A. §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 06-096 CMR 115. [06-096 CMR 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 CMR 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 CMR 115]

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

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

(11) In accordance with the Department's air emission compliance test protocol and 40 CFR 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 CFR 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 CMR 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 such test results, 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 CFR 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 CMR 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 Part 70 license requirement. [06-096 CMR 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 emission 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 CMR 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 CMR 115]

## SPECIFIC CONDITIONS

(16) **Boiler #1**

A. Messalonskee is licensed to install and operate Boiler #1 with a maximum design heat input capacity rated at 8.8 MMBtu/hr. [06-096 CMR 115, BACT]

B. Total fuel use for the wood-fired Boiler #1 shall not exceed 1300 tons per year (calendar year basis) based on a gross weight purchase records throughout the year and a heating value for 40% moisture wood of 5,100 Btu/lb. [06-096 CMR 115, BACT]

C. Messalonskee shall operate a multi-cyclone to control particulate emissions from Boiler #1 whenever the boiler is in operation. [06-096 CMR 115, BACT]

D. Emissions shall not exceed the following:

| Emission Unit | Pollutant | lb/MMBtu | Origin and Authority |
|---|---|---|---|
| Boiler #1 | PM | 0.25 | 06-096 CMR, BACT |

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

| Emission Unit | PM (lb/hr) | $PM_{10}$ (lb/hr) | $SO_2$ (lb/hr) | $NO_x$ (lb/hr) | CO (lb/hr) | VOC (lb/hr) |
|---|---|---|---|---|---|---|
| Boiler #1 | 2.2 | 2.2 | 0.2 | 1.9 | 5.3 | 0.1 |

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

F. Ash from Boiler #1 shall be disposed of in accordance with the Bureau of Remediation and Waste Management (BRWM). Ash shall be sufficiently conditioned with water or transported in covered containers so as to prevent fugitive emissions. [06-096 CMR 115, BACT]

(17) **Boilers #2, #3, #4, #5, and #6**

A. Fuel

1. Total fuel use for Boilers #2, #3, #4, #5 and #6 shall not exceed 100,000 gal/yr of #2 fuel oil, on a calendar year basis.
2. Until December 31, 2015, the #2 fuel oil fired in the boiler shall be ASTM D396 compliant (max. sulfur content of 0.5% by weight). [06-096 CMR 115, BACT]
3. Beginning January 1, 2016, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.005% by weight (50 ppm). [38 MRSA §603-A(2)(A)(3)]
4. Beginning January 1, 2018, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.0015% by weight (15 ppm). [38 MRSA §603-A(2)(A)(3)]
5. Compliance shall be demonstrated by fuel records from the supplier showing the quantity, type, and the percent sulfur of the fuel delivered (if applicable). Records of annual fuel use shall be kept on a calendar year basis. [06-096 CMR 115, BACT]

B. Emissions from each boiler shall not exceed the following:

| Emission Unit | Pollutant | lb/MMBtu | Origin and Authority |
|---|---|---|---|
| Boilers #2, #3, #4, #5 and #6 | PM | 0.08 | 06-096 CMR 115, BACT |

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

| Emission Unit | PM (lb/hr) | $PM_{10}$ (lb/hr) | $SO_2$ (lb/hr) | $NO_x$ (lb/hr) | CO (lb/hr) | VOC (lb/hr) |
|---|---|---|---|---|---|---|
| Boiler #2 | 0.5 | 0.5 | 2.6 | 2.1 | 0.2 | 0.1 |
| Boiler #3 | 0.5 | 0.5 | 2.6 | 2.1 | 0.2 | 0.1 |
| Boiler #4 | 0.3 | 0.3 | 1.5 | 1.2 | 0.1 | 0.1 |
| Boiler #5 | 0.3 | 0.3 | 1.5 | 1.2 | 0.1 | 0.1 |
| Boiler #6 | 0.2 | 0.2 | 1.0 | 0.8 | 0.1 | 0.1 |

D. Visible emissions from each boiler shall not exceed 10% opacity on a six (6) minute block average, except for no more than one (1) six (6) minute block averages in a continuous 3-hour period. [06-096 CMR 101]

(18) Messalonskee shall notify the Department in writing within 5 days of startup and shall develop and submit for approval by the Department a best management

practice (BMP) plan for the control and minimization of particulate matter emissions from Boiler #1. The BMP plan shall be developed and submitted to the Department no later than 120 days after start-up. Upon the Department's approval of the BMP plan, Messalonskee shall adhere to the commitments made in the BMP plan. [06-096 CMR 115, BACT]

(19) **Fugitive Emissions**
Visible emissions from a fugitive emission source (including 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]

(20) **General Process Sources**
Visible emissions from any general process source shall not exceed an opacity of 20% on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 1-hour period. [06-096 CMR 101]

(21) Messalonskee 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.A. §605).

DONE AND DATED IN AUGUSTA, MAINE THIS 24th DAY OF October , 2011.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Melanie for
PATRICIA W. AHO, COMMISSIONER

**The term of this license shall be five (5) years from the signature date above.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: July 28, 2011
Date of application acceptance: August 4, 2011

Date filed with the Board of Environmental Protection:

This Order prepared by Edwin Cousins, Bureau of Air Quality

Filed
OCT 25 2011
State of Maine
Board of Environmental Protection