



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE
GOVERNOR

PAUL MERCER
COMMISSIONER

**President and Trustees of Bates College
Androscoggin County
Lewiston, Maine
A-373-71-L-A (SM)**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #2**

FINDINGS OF FACT

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

I. REGISTRATION

A. Introduction

President and Trustees of Bates College (Bates College) was issued Air Emission License A-373-71-J-N on May 23, 2013, for the operation of emission sources associated with their educational facility. The license was subsequently amended on December 3, 2015 (A-373-71-K-A).

Bates College has requested an amendment to their license in order to remove a boiler (Boiler #19) from their license, and to add a new boiler, a tank for gasoline, and a tank for renewable fuel oil to their license.

The equipment addressed in this license amendment is located on the Bates College Campus in Lewiston, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Boiler

| <u>Equipment</u> | <u>Max. Capacity (MMBtu/hr)</u> | <u>Fuel Type</u> | <u>Maximum Firing Rate</u> | <u>Date of Manuf.</u> | <u>Date of Install.</u> | <u>Stack</u> |
|-------------------|---------------------------------|------------------|----------------------------|-----------------------|-------------------------|--------------|
| Smith Hall Boiler | 1.0 | Natural gas | 980 scf/hr | 2016 | 2016 | Smith Stack |

Boiler #19, listed on air emission license A-373-71-J-N (issued May 23, 2013), has been removed from the site and is hereby removed from this license.

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

Storage Tanks

| <u>Tank</u> | <u>Capacity (gallons)</u> | <u>Product Stored</u> | <u>Roof Type</u> | <u>Date Installed</u> |
|-------------|---------------------------|-----------------------|------------------|-----------------------|
| 1 | 2,000 | Gasoline | Fixed | 2016 |
| 2 | 20,000 | RFO* | Fixed | 2016 |

*RFO = Renewable fuel oil

Tank #1 is subject to requirements from *Gasoline Dispensing Facilities Vapor Control*, 06-096 CMR 118 (as amended) and will be addressed in the license. There are no applicable requirements for Tank #2; it is included for inventory purposes only.

C. Application Classification

This amendment will not increase licensed emissions but does include the installation of new equipment; therefore, this modification is determined to be a minor modification and the application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 Code of Maine Rules (CMR) 115 (as amended).

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.

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. Smith Hall Boiler

Bates College will operate the Smith Hall Boiler for heat and hot water. The boiler is rated at 1.0 MMBtu/hr and fires natural gas. The boiler will be installed in 2016 and will exhaust through the Smith Stack.

1. BACT Findings

a. Particulate Matter (PM, PM₁₀, and PM_{2.5}) and Sulfur Dioxide (SO₂)

The emissions of PM/PM₁₀/PM_{2.5} and SO₂ from combustion of natural gas in units with high combustion efficiency are inherently low due to the low ash

content and negligible sulfur content of natural gas. Additional controls to reduce emissions of PM/PM₁₀/PM_{2.5} and SO₂ below current levels would not be economically practical given the small size (1.0 MMBtu/hr) of the unit. The Department finds good combustion controls and the firing of natural gas to constitute BACT for PM/PM₁₀/PM_{2.5} and SO₂ emissions from the Smith Hall Boiler.

b. Nitrogen Oxides (NO_x), Carbon Monoxide (CO), and Volatile Organic Compounds (VOC)

Emissions of NO_x, CO, and VOC from small natural gas-fired boilers are typically controlled through combustion controls; specifically by maintaining proper air-to-fuel ratios and optimal combustion conditions. The use of appropriate combustion controls along with proper operation and maintenance are generally sufficient to control emissions to acceptable levels. The use of NO_x emissions control equipment such as selective catalytic reduction systems and selective non-catalytic reduction systems are generally not cost-effective given the already low emission levels typically achieved by small, gas-fired boilers of this size. Similarly, the use of CO and VOC emissions control equipment such as oxidation catalysts are not economically practical for boilers of this size.

Additional combustion technologies such as flue gas recirculation and staged fuel/air mixing would not be economically practical for a boiler of this size. The Department finds that good combustion controls constitute BACT for emission of NO_x, CO, and VOC from the Smith Hall Boiler.

2. Emission Limits

The BACT emission limits for the Smith Hall Boiler when firing natural gas were based on the following:

- PM/PM₁₀/PM_{2.5} – 0.05 lb/MMBtu based on 06-096 CMR 115, BACT
- SO₂ – 0.6 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
- NO_x – 100 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
- CO – 84 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
- VOC – 5.5 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
- Visible Emissions – 06-096 CMR 115, BACT

The BACT emission limits for the Smith Hall Boiler are the following:

| Unit | PM (lb/hr) | PM₁₀ (lb/hr) | PM_{2.5} (lb/hr) | SO₂ (lb/hr) | NO_x (lb/hr) | CO (lb/hr) | VOC (lb/hr) |
|----------------------------------|-----------------------|------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|-----------------------|------------------------|
| Smith Hall Boiler Natural gas | 0.05 | 0.05 | 0.05 | 0.01 | 0.10 | 0.08 | 0.01 |

Visible emissions from the Smith Hall Boiler shall not exceed 10% opacity on a six-minute block average basis.

The Smith Hall Boiler shall be included in the non-steam plant boiler heat input limit of 90,000 MMBtu/year on a 12-month rolling total basis.

3. Periodic Monitoring

Periodic monitoring for the Smith Hall Boiler shall include the following:

- a. Fuel records from the supplier(s) showing the quantity and type of fuel delivered; and
- b. Documentation of the amount and type of fuel used on a monthly basis, the Btu value of the fuel, and the monthly and 12-month rolling total fuel heat input Btu calculations.

4. New Source Performance Standards (NSPS): 40 CFR Part 60, Subpart Dc

Due to its size, the Smith Hall 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. [40 CFR §60.40c]

5. National Emission Standards for Hazardous Air Pollutants (NESHAP): 40 CFR Part 63, Subpart JJJJJ

Smith Hall Boiler is not subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 CFR Part 63, Subpart JJJJJ. The unit is considered a new gas-fired boiler rated less than 10 MMBtu/hr. Gas-fired boilers are exempt from 40 CFR Part 63, Subpart JJJJJ. [40 CFR §§63.11193 and 63.11195]

C. Tank #1

Tank #1 is a 2,000 gallon capacity gasoline tank that will be installed in 2016. Tank #1 is subject to *Gasoline Dispensing Facilities Vapor Control*, 06-096 CMR 118 (as amended).

The applicable requirements from 06-096 CMR 118 for Tank #1 are as follows:

1. Tank #1 shall have a submerged fill pipe that extends to within six inches of the bottom of the tank. [06-096 CMR 118]
2. Bates College shall maintain records of monthly and annual gasoline throughput for Tank #1. If Tank #1 ever exceeds the initial applicability threshold, Bates College shall notify the Department of its change of applicability within 30 days. These

records shall be maintained for a minimum of three years, shall be available for inspection during normal business hours, and shall be provided to the Department and/or EPA upon request. [06-096 CMR 118]

D. Annual Emissions

This amendment will not affect the facility's licensed annual emissions or greenhouse gas totals.

III. AMBIENT AIR QUALITY ANALYSIS

Bates College previously submitted an ambient air quality impact analysis for air emission license A-373-74-D-A/R (dated April 6, 1995) demonstrating that emissions from the facility, in conjunction with all other sources, do not violate Ambient Air Quality Standards (AAQS). An additional air quality impact analysis is not required for this amendment.

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 Amendment A-373-71-L-A, subject to the conditions found in Air Emission License A-373-71-J-N, in amendment A-373-71-K-A, and the following conditions.

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

SPECIFIC CONDITIONS

The following shall replace Condition (17)(C) in Air Emission License Amendment A-373-71-K-A (issued December 3, 2015):

(17) **Non-Steam Plant Boilers**

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

| Unit | Fuel | PM (lb/hr) | PM₁₀ (lb/hr) | SO₂ (lb/hr) | NO_x (lb/hr) | CO (lb/hr) | VOC (lb/hr) |
|---|-----------------|-----------------------|------------------------------------|-----------------------------------|-----------------------------------|-----------------------|------------------------|
| Furnace #10 Underhill Arena (2.5 MMBtu/hr) | nat'l gas | 0.13 | 0.13 | 0.002 | 0.25 | 0.21 | 0.01 |
| Furnace #11 Underhill Arena (2.5 MMBtu/hr) | nat'l gas | 0.13 | 0.13 | 0.002 | 0.25 | 0.21 | 0.01 |
| Boiler # 12 Rzasa House/Villages (2.5 MMBtu/hr) | distillate fuel | 0.30 | 0.30 | 1.25 | 0.90 | 0.09 | 0.01 |
| | nat'l gas | 0.13 | 0.13 | 0.002 | 0.25 | 0.21 | 0.01 |
| Boiler # 13 Rzasa House/Villages (2.5 MMBtu/hr) | distillate fuel | 0.30 | 0.30 | 1.25 | 0.90 | 0.09 | 0.01 |
| | nat'l gas | 0.13 | 0.13 | 0.002 | 0.25 | 0.21 | 0.01 |
| Boiler # 14 Rzasa House/Villages (2.5 MMBtu/hr) | distillate fuel | 0.30 | 0.30 | 1.25 | 0.90 | 0.09 | 0.01 |
| | nat'l gas | 0.13 | 0.13 | 0.002 | 0.25 | 0.21 | 0.01 |
| Boiler #16 Chase Hall/Commons (3.8 MMBtu/hr) | nat'l gas | 0.19 | 0.19 | 0.002 | 0.37 | 0.31 | 0.02 |
| Boiler #17 Parker Hall (1.8 MMBtu/hr) | distillate fuel | 0.22 | 0.22 | 0.90 | 0.65 | 0.06 | 0.004 |
| Merrill Boiler Merrill Gym (1.2 MMBtu/hr) | nat'l gas | 0.06 | 0.06 | 0.001 | 0.12 | 0.10 | 0.01 |
| Ladd Boiler Ladd Hall (1.5 MMBtu/hr) | nat'l gas | 0.08 | 0.08 | 0.001 | 0.15 | 0.12 | 0.008 |
| Pettengill Boiler #1 Pettengill Hall (1.1 MMBtu/hr) | nat'l gas | 0.06 | 0.06 | 0.001 | 0.11 | 0.09 | 0.005 |
| Pettengill Boiler #2 Pettengill Hall (1.1 MMBtu/hr) | nat'l gas | 0.06 | 0.06 | 0.001 | 0.11 | 0.09 | 0.005 |
| Campus Ave Boiler #1 (1.0 MMBtu/hr) | nat'l gas | 0.05 | 0.05 | 0.0006 | 0.1 | 0.08 | 0.005 |

| <u>Unit</u> | <u>Fuel</u> | <u>PM (lb/hr)</u> | <u>PM₁₀ (lb/hr)</u> | <u>SO₂ (lb/hr)</u> | <u>NO_x (lb/hr)</u> | <u>CO (lb/hr)</u> | <u>VOC (lb/hr)</u> |
|--|-------------|-----------------------|------------------------------------|-----------------------------------|-----------------------------------|-----------------------|------------------------|
| Campus Ave Boiler #2 (1.0 MMBtu/hr) | nat'l gas | 0.05 | 0.05 | 0.0006 | 0.1 | 0.08 | 0.005 |

The following Conditions shall be added to Air Emission License A-373-71-J-N (issued May 23, 2013):

(23) **Smith Hall Boiler**

A. Fuel

1. Total fuel use for the Smith Hall Boiler shall be included in the non-steam plant boiler heat input limit of 90,000 MMBtu/year, based on a 12-month rolling total. [06-096 CMR 115, BACT]
2. Compliance shall be demonstrated by:
 - a. Fuel records from the supplier(s) showing the quantity and type of fuel delivered; and
 - b. Documentation of the amount and type of fuel used on a monthly basis, the Btu value of the fuel, and the monthly and 12-month rolling total fuel heat input Btu calculations. [06-096 CMR 115, BACT]

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

| <u>Unit</u> | <u>PM (lb/hr)</u> | <u>PM₁₀ (lb/hr)</u> | <u>PM_{2.5} (lb/hr)</u> | <u>SO₂ (lb/hr)</u> | <u>NO_x (lb/hr)</u> | <u>CO (lb/hr)</u> | <u>VOC (lb/hr)</u> |
|----------------------------------|-----------------------|------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|-----------------------|------------------------|
| Smith Hall Boiler Natural gas | 0.05 | 0.05 | 0.05 | 0.01 | 0.10 | 0.08 | 0.01 |

C. Visible emissions from the Smith Hall Boiler shall not exceed 10% opacity on a six-minute block average basis. [06-096 CMR 115, BACT]

(24) **Tank #1**

- A. Tank #1 shall have a submerged fill pipe that extends to within six inches of the bottom of the tank. [06-096 CMR 118]

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B. Bates College shall maintain records of monthly and annual gasoline throughput for Tank #1. If Tank #1 ever exceeds the initial applicability threshold, Bates College shall notify the Department of its change of applicability within 30 days. These records shall be maintained for a minimum of three years, shall be available for inspection during normal business hours, and shall be provided to the Department and/or EPA upon request. [06-096 CMR 118]

DONE AND DATED IN AUGUSTA, MAINE THIS 28 DAY OF July, 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Corse for
PAUL MERCER, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-373-71-J-N.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 6/14/2016
Date of application acceptance: 6/16/2016

Date filed with the Board of Environmental Protection:

This Order prepared by Jonathan E. Rice, Bureau of Air Quality.

