



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE
GOVERNOR

PATRICIA W. AHO
COMMISSIONER

**Penobscot Bay Medical Center
Knox County
Rockport, Maine
A-504-71-L-M (SM)**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #1**

FINDINGS OF FACT

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

I. REGISTRATION

A. Introduction

Penobscot Bay Medical Center (PenBay) was issued Air Emission License A-504-71-J-R on May 1, 2012, permitting the operation of emission sources associated with this full service community hospital. PenBay has requested a minor revision to their license to modify the three boilers operated at the facility.

The facility is currently licensed to operate three boilers firing #2 and/or #6 fuel oil. PenBay will replace each boiler's burner with a new burner system capable of firing liquid petroleum gas (LPG) and distillate oil with the same MMBtu/hour rating.

This license amendment addresses equipment located at 6 Glen Cove Road, Rockport, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license:

Boilers

Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type	Date of Installation	Stack #
Boiler #1	8.17	58.3 gal/hr	Distillate fuel	2008	1
		89.3 gal/hr	LPG		
Boiler #2	8.17	58.3 gal/hr	Distillate fuel		
		89.3 gal/hr	LPG		
Boiler #3	8.17	58.3 gal/hr	Distillate fuel		
		89.3 gal/hr	LPG		

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
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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

C. Application Classification

This amendment will increase emissions by less than 4 ton/year for each single pollutant and less than 8 ton/year for all pollutants combined. Therefore, this modification is determined to be a minor revision and has been processed as such.

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

B. Boilers #1, #2, and #3

1. Description

PenBay operates Boilers #1, #2, and #3 to provide heat, ventilation, and domestic hot water for the facility. Boilers #1, #2 and #3 are Cleaver Brooks fire tube boilers manufactured in 2008 with a maximum heat input capacity of 8.17 MMBtu/hour each. The boilers are designed with a low emissions package utilizing a combustion air fan for induced flue gas recirculation. As of the completion date of the boilers' burner replacement project, these boilers will be licensed to fire either LPG (maximum firing rate of 89.3 gal/hour of LPG) or distillate fuel (maximum firing rate of 58.3 gal/hour).

2. New Source Performance Standards (NSPS)

Due to the size of these boilers, they are not subject to New Source Performance Standards (NSPS) found in 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, for units greater than 10 MMBtu/hour manufactured after June 9, 1989.

3. BACT/BPT Findings

Unless otherwise noted, the BACT/BPT emission limits for the boilers are based on the burner manufacturer's not-to-exceed emission guarantees, as follows:

Pollutant	Emission Rates when Firing...	
	Distillate Fuel	LPG/Natural Gas
PM, PM ₁₀	0.08 lb/MMBtu *	0.08 lb/MMBtu *

Pollutant	Emission Rates when Firing...	
	Distillate Fuel	LPG/Natural Gas
SO ₂	0.5 lb/MMBtu **	0.0011 lb/MMBtu
NO _x	0.178 lb/MMBtu	0.1053 lb/MMBtu
CO	0.039 lb/MMBtu	0.1145 lb/MMBtu
VOC	0.0024 lb/MMBtu	0.0083 lb/MMBtu

* based on current BACT/BPT determinations per Department data

** based on firing ASTM D396 compliant #2 fuel oil (0.5% sulfur by weight)

The BACT/BPT emission limits for each boiler firing either fuel are the following:

Pollutant	lb/MMBtu	Origin and Authority
PM	0.08	06-096 CMR 115, BACT/BPT

When firing distillate fuel, emissions from each boiler shall not exceed the following [06-096 CMR 115, BACT/BPT]:

PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
0.65	0.65	4.09	1.45	0.32	0.02

When firing LPG, emissions from each boiler shall not exceed the following [06-096 CMR 115, BACT/BPT]:

PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
0.65	0.65	0.01	0.86	0.94	0.07

Visible emissions from the combined stack serving Boilers #1, #2, and #3 shall not exceed 20% opacity on a six-minute block average, except for no more than one six-minute block average in a continuous three-hour period. [06-096 CMR 101]

PenBay shall be limited to a combined heat input for Boilers #1, #2, and #3 of 84,000 MMBtu per year for all fuels. Compliance shall be documented through fuel use records and calculations based on the following fuel content factors: 0.14 MMBtu/gallon of distillate fuel, and 0.0915 MMBtu/gallon of LPG.

Prior to July 1, 2016, or by the date otherwise stated in 38 MRSA §603-A(2)(A)(3), the distillate fuel fired at PenBay 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 July 1, 2016, or on the date specified in the statute, distillate fuel fired at the facility shall have a maximum sulfur content of 0.005% by weight (50 ppm); and beginning January 1, 2018, or on the date specified in the statute, distillate fuel fired at the facility shall have a maximum sulfur content of 0.0015% by weight (15 ppm). The specific dates contained in this paragraph reflect the current dates in the statute as

of the effective date of this license; however, if the statute is revised, the facility shall comply with the revised dates upon promulgation of the statute revision.

4. Periodic Monitoring

Periodic monitoring for each boiler shall include recordkeeping to document fuel use both on a monthly and 12-month rolling total basis. Documentation shall include the type of fuel used and sulfur content of the fuel.

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

a. Applicability

Boilers #1, #2, and #3, which will be considered dual-fired boilers upon completion of the burner replacement project, may be subject to applicable requirements of 40 CFR Part 63, Subpart JJJJJ, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*. Gas-fired boilers are not subject to this Subpart, per 40 CFR §63.11195 (e); however, boilers which fire distillate fuel are not exempt.

A *gas-fired boiler* is defined by this Subpart as follows [40 CFR §63.11237]: any boiler that burns gaseous fuels not combined with any solid fuels, and burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. Periodic testing on liquid fuel shall not exceed a combined total of 48 hours during any calendar year.

The definition of *gaseous fuels* as found in §63.11237 includes, but is not limited to, natural gas, process gas, landfill gas, coal derived gas, refinery gas, hydrogen, and biogas.

The definition of *natural gas* as found in §63.11237 includes LPG and propane.

Under Subpart JJJJJ, any boiler designed to burn fuels besides gaseous fuels prior to June 4, 2010, is considered an existing boiler under this rule.

Thus, Boilers #1, #2, and #3 are not subject to requirements under Subpart JJJJJ when operated as *gas-fired boilers*. When operating outside of that definition, PenBay shall comply with the applicable requirements of Subpart JJJJJ.

b. Applicable Requirements for Distillate Fuel-Fired Boilers

A summary of the currently applicable requirements of 40 CFR Part 63, Subpart JJJJJ is provided below. At this time, the Department has not taken delegation of this rule promulgated by EPA; however PenBay may still be 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>.

(1) Compliance Dates, Notifications, and Work Practice Requirements

i. Initial Notification of Compliance

An Initial Notification submittal to EPA was due no later than January 20, 2014. [40 CFR Part 63.11225(a)(2)]

ii. Boiler Tune-Up Program

(a) A boiler tune-up program shall be implemented to include the initial tune-up of applicable boilers no later than March 21, 2014. [40 CFR Part 63.11223]

- 1) Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. Per Subpart JJJJJ, tune-ups of Boilers #1, #2, and #3 are required every two years. [40 CFR Part 63.11223(a) and Table 2]
- 2) The tune-up compliance report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the concentration of CO in the effluent stream (ppmv) and oxygen in volume percent, measured at high fire or typical operating load, both **before** and **after** the boiler tune-up; a description of any corrective actions taken as part of the tune-up of the boiler; and the types and amounts of fuels used over the 12 months prior to the tune-up of the boiler. [40 CFR Part 63.11223(b)(6)] The compliance report shall also include the company name and address; a compliance statement signed by a responsible official certifying truth, accuracy, and completeness; and a description of any deviations and corrective actions. [40 CFR Part 63.11225(b)]

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

- 1) As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled shutdown is permitted, not to exceed 36 months from the previous inspection. [40 CFR §63.11223(b)(1)]
- 2) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 CFR Part 63.11223(b)(2)]
- 3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is

permitted, not to exceed 36 months from the previous inspection.
[40 CFR Part 63.11223(b)(3)]

- 4) Optimize total emissions of CO, consistent with manufacturer's specifications. [40 CFR Part 63.11223(b)(4)]
- 5) Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, both **before** and **after** adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 CFR Part 63.11223(b)(5)]
- 6) If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 CFR Part 63.11223(b)(7)]

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

(2) Recordkeeping

Records shall be maintained consistent with the requirements of 40 CFR Part 63, Subpart JJJJJ 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.

EPA requires submission of Notification of Compliance Status reports for tune-ups and energy assessments through their electronic reporting system. [63.1125(a)(4)(vi)]

C. Annual Emissions

PenBay shall be restricted to the following annual emissions, based on a 12-month rolling total. The tons per year limits were calculated based on the following:

- Worst-case emissions from Boilers #1, #2, and #3 firing either distillate fuel or LPG, with a combined total cap for the three boilers not to exceed an input of 84,000 MMBtu/year. Worst case for CO, PM₁₀, and VOC were from the firing of LPG,

based on the burner manufacturer's test results; worst case for NO_x and SO₂ were from firing distillate fuel, based on the burner manufacturer's test results.

Generators #1A, #2A, and #3 each limited to 500 hours of operation per year firing distillate fuel with a sulfur content not to exceed 0.0015% by weight.

PenBay is limited to the following annual emissions, based on a 12-month rolling total:

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

	PM	PM₁₀	SO₂	NO_x	CO	VOC
Boilers #1, #2, and #3	3.36	3.36	21.00	7.48	4.81	0.35
Generator #1A	0.15	0.15	0.01	3.92	1.04	0.11
Generator #2A	0.16	0.16	0.01	2.32	0.50	0.19
Generator #3	0.06	0.06	0.01	2.00*	1.08	2.00*
Total TPY	3.7	3.7	21.0	15.7	7.4	2.7

* This is a combined NO_x-VOC emission rate, and by applying it individually to NO_x and VOC is an over estimation of actual emissions.

III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 CMR 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM ₁₀	25
SO ₂	50
NO _x	50
CO	250

The total licensed annual emissions for the facility are below the emission levels contained in the table above and there are no extenuating circumstances; therefore, an ambient air quality impact analysis is not required as part of this license 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 A-504-71-L-M subject to the conditions found in Air Emission License A-504-71-J-R and 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.

SPECIFIC CONDITIONS

The following shall replace Specific Condition (16) in Air Emission License A-504-71-J-R.

(16) **Boilers #1, #2, and #3**

A. Fuel

1. PenBay shall be limited to a combined heat input for Boilers #1, #2, and #3 of 84,000 MMBtu per year for all fuels, on a 12-month rolling total basis. Compliance shall be documented through fuel use records and calculations based on the following fuel content factors: 0.14 MMBtu/gallon of distillate fuel, and 0.0915 MMBtu/gal of LPG. [06-096 CMR 115, BPT]
2. Prior to July 1, 2016, or the date specified in 38 MRSA §603-A(2)(A)(3), the distillate fuel fired in these boilers shall be ASTM D396 compliant #2 fuel oil (max. sulfur content of 0.5% by weight). [06-096 CMR 115, BPT]
3. Beginning July 1, 2016, or on the date specified in 38 MRSA §603-A(2)(A)(3), distillate fuel fired at the facility shall have a maximum sulfur content of 0.005% by weight (50 ppm). [38 MRSA §603-A(2)(A)(3)]
4. Beginning January 1, 2018, or on the date specified in 38 MRSA §603-A(2)(A)(3), distillate fuel fired at the facility shall have a maximum sulfur content 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 monthly and 12-month rolling total basis. [06-096 CMR 115, BPT]

B. Emissions shall not exceed the following:

Pollutant	lb/MMBtu	Origin and Authority
PM	0.08	06-096 CMR 103 2(B)(1)(a), BPT

When firing distillate fuel, emissions from each boiler shall not exceed the following [06-096 CMR 115, BACT/BPT]:

PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
0.65	0.65	4.09	1.45	0.32	0.02

When firing LPG, emissions from each boiler shall not exceed the following [06-096 CMR 115, BACT/BPT]:

PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
0.65	0.65	0.01	0.86	0.94	0.07

- C. Visible emissions from the combined stack serving Boilers #1, #2, and #3 shall not exceed 20% opacity on a six-minute block average, except for no more than one six-minute block average in a continuous three-hour period. [06-096 CMR 101]
- D. 40 CFR Part 63, Subpart JJJJJ Requirements for Boilers #1, #2, and #3 [incorporated under 06-096 CMR 115, BPT]
 1. An Initial Notification submittal to EPA was due no later than January 20, 2014. [40 CFR §63.11225(a)(2)]
 2. The facility shall implement a boiler tune-up program. [40 CFR §63.11223]
 - a. Tune-ups of Boilers #1, #2, and #3 are required every two years, when the boilers are not operated as gas-fired boilers. [40 CFR Part 63.11223(a) and Table 2]
 - b. The tune-up compliance report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the concentration of CO in the effluent stream (ppmv) and oxygen in volume percent, measured at high fire or typical operating load, both **before** and **after** the boiler tune-up; a description of any corrective actions taken as part of the tune-up of the boiler; and the types and amounts of fuels used over the 12 months prior to the tune-

- up of the boiler. [40 CFR Part 63.11223(b)(6)] The compliance report shall also include the company name and address; a compliance statement signed by a responsible official certifying truth, accuracy, and completeness; and a description of any deviations and corrective actions. [40 CFR §63.11225(b)]
3. The boiler tune-up program, conducted to demonstrate continuous compliance, shall be performed as specified below:
 - a. As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled shutdown is permitted, not to exceed 36 months from the previous inspection. [40 CFR §63.11223(b)(1)]
 - b. 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 §63.11223(b)(2)]
 - c. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is permitted, not to exceed 36 months from the previous inspection. [40 CFR §63.11223(b)(3)]
 - d. Optimize total emissions of CO, consistent with manufacturer's specifications. [40 CFR §63.11223(b)(4)]
 - e. Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, both **before** and **after** adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 CFR §63.11223(b)(5)]
 - f. If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 CFR §63.11223(b)(7)]
 4. After conducting the initial boiler tune-up, a Notification of Compliance Status shall be submitted to EPA no later than July 19, 2014. [40 CFR §63.11225(a)(4) and 40 CFR §63.11214(b)]
 5. Records shall be maintained consistent with the requirements of 40 CFR Part 63, Subpart JJJJJ including the following [40 CFR §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 each boiler was tuned; documentation of fuel type(s) used monthly by each boiler; the occurrence and duration of each malfunction of each boiler; and actions taken during periods of malfunction to minimize emissions and actions taken to restore the

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malfunctioning boiler to its usual manner of operation. Records shall be in a form suitable and readily available for expeditious review.

DONE AND DATED IN AUGUSTA, MAINE THIS *26* DAY OF *November*, 2014.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: *Man Allen Robert Carr for*
PATRICIA W. AHO, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-504-71-J-R.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: October 31, 2014

Date of application acceptance: October 31, 2014

Date filed with the Board of Environmental Protection:

This Order prepared by Jane E. Gilbert, Bureau of Air Quality.

