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

DEPARTMENT ORDER

Unum Corporation **Cumberland County** **Portland, Maine** **A-657-71-Q-A**	**Departmental** **Findings of Fact and Order** **Air Emission License** **Amendment #1**

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 (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

Unum Corporation (Unum) was issued Air Emission License A-657-71-P-R/M on October 15, 2024, for the operation of emission sources associated with their office facility.

The equipment addressed in this license amendment is located at 2211 Congress St., Portland, Maine.

Unum has requested an amendment to their license in order to replace HO3 Boilers #1, #2, and #3 with new units, identified as HO3-Boilers #1a, #2a, and #3a.

B. Emission Equipment

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

Boilers

Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type	Date of Manuf.	Date of Install.	Stack #
HO3-Boiler #1a	4.0	3,921	Natural Gas	2024	2025	6
HO3-Boiler #2a	4.0	3,921	Natural Gas	2024	2025	7
HO3-Boiler #3a	4.0	3,921	Natural Gas	2024	2025	7
*HO3-Boiler #1**	*4.5*	*4,369*	*Natural Gas*	*1998*	*1998*	*6*
*HO3-Boiler #2**	*4.5*	*4,344*	*Natural Gas*	*1998*	*1998*	*7*
*HO3-Boiler #3**	*4.5*	*4,344*	*Natural Gas*	*1998*	*1998*	*7*

* This equipment will be removed from this air emission license.

C. 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.

The modification of a minor source is considered a major or minor modification based on whether or not expected emission increases exceed the "Significant Emissions" levels as defined in the Department's *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. The emission increases are determined by subtracting the current licensed annual emissions preceding the modification from the maximum future licensed annual emissions, as follows:

Pollutant	Current License (tpy)	Future License (tpy)	Net Change (tpy)	Significant Emission Levels
PM	7.5	7.2	-0.3	100
PM_{10}	7.5	7.2	-0.3	100
$PM_{2.5}$	7.5	7.2	-0.3	100
SO_2	0.5	0.5	0.0	100
NO_x	21.5	21.0	-0.5	100
CO	13.7	13.2	-0.5	100
VOC	1.0	1.0	0.0	50*

* Unum is located in an area of the state included in the Ozone Transport Region. Therefore, the significant emission level for VOC is 50 tpy.

This modification is determined to be a minor modification and has been processed as such.

D. Facility Classification

With the operating hours restriction on the emergency generators, the facility is licensed as follows:

- As a synthetic minor source of air emissions for criteria pollutants, because Unum is subject to license restrictions that keep facility emissions below major source thresholds for NO_x; 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. HO3-Boilers #1a, #2a, and #3a

HO3-Boilers #1a, #2a, and #3a are replacing the existing units, HO3-Boilers #1, #2, and #3. Unum will use HO3-Boilers #1a, #2a, and #3a for heat. HO3-Boilers #1a, #2a, and #3a are each rated at 4.0 MMBtu/hr and fire natural gas. HO3-Boiler #1a exhausts through its own existing stack, Stack #6, while HO3-Boilers #2a and #3a exhaust through the existing shared stack, Stack #7.

1. BACT Findings

Following is a BACT analysis for control of emissions from HO3-Boilers #1a, #2a, and #3a.

a. Particulate Matter (PM, PM_{10}, $PM_{2.5}$)
Unum has proposed to burn only low-ash content fuel (natural gas) in the boilers and to ensure proper combustion by following maintenance practices recommended by the manufacturer. Additional add-on pollution controls are not economically feasible.

BACT for $PM/PM_{10}/PM_{2.5}$ emissions from HO3-Boilers #1a, #2a, and #3a is the use of natural gas, proper operation and maintenance, and the emission limits listed in the tables below.

b. Sulfur Dioxide (SO_2)
Unum has proposed to fire only natural gas. The use of this fuel results in minimal emissions of SO_2, and additional add-on pollution controls are not economically feasible.

BACT for SO_2 emissions from HO3-Boilers #1a, #2a, and #3a is the use of natural gas and the emission limits listed in the tables below.

c. Nitrogen Oxides (NO_x)
Unum considered several control strategies for the control of NO_x including Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR), water/steam injection, flue gas recirculation (FGR), the use of high efficiency boilers to reduce fuel usage, and use of a modulating burner system.

Both SCR and SNCR are technically feasible control technologies for minimizing NO_x. However, they have a negative environmental impact of emissions of unreacted ammonia. In addition, due to the initial capital cost and the annual

operating costs, these systems are typically only considered cost effective for units larger than HO3-Boilers #1a, #2a, and #3a.

Water/steam injection and FGR can attain similar NO_x reduction efficiencies through lowering burner flame temperature and thereby reducing thermal NO_x formation. However, both control strategies reduce the boiler's fuel efficiency.

A modulating burner system varies the fuel and air admittance rates into the burner to optimize the air-to-fuel ratio. The use of a high efficiency multi-pass heat exchanger in the boiler design will reduce the total amount of fuel used, thus reducing the total fuel burned and emissions produced. The use of a modulating burner and a high efficiency heat exchanger system on HO3-Boilers #1a, #2a, and #3a has been determined to be feasible and has been selected as part of the BACT strategy.

BACT for NO_x emissions from HO3-Boilers #1a, #2a, and #3a is firing natural gas, the use a modulating burner and a high efficiency heat exchanger system, and the emission limits listed in the tables below.

d. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Unum considered several control strategies for the control of CO and VOC including oxidation catalysts, thermal oxidizers, and use of a modulating burner system.

Oxidation catalysts and thermal oxidizers both have high capital, maintenance, and operational costs considering the size of the boilers in question. These controls were determined to not be economically feasible.

A modulating burner system varies the fuel and air admittance rates into the burner to optimize the air-to-fuel ratio. The use of a modulating burner system has been determined to be feasible and has been selected as part of the BACT strategy for HO3-Boilers #1a, #2a, and #3a.

BACT for CO and VOC emissions from HO3-Boilers #1a, #2a, and #3a is firing natural gas, the use of a modulating burner system and the emission limits listed in the tables below.

e. Emission Limits

The BACT emission limits for HO3-Boilers #1a, #2a, and #3a were based on the following:

Natural Gas

$PM/PM_{10}/PM_{2.5}$	–	0.05 lb/MMBtu based on 06-096 C.M.R. ch. 115, BACT
SO_2	–	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 C.M.R. ch. 115, BACT

The BACT emission limits for HO3-Boilers #1a, #2a, and #3a are the following:

Unit	Pollutant	lb/MMBtu
HO3-Boiler #1a	PM	0.05
HO3-Boiler #2a	PM	0.05
HO3-Boiler #3a	PM	0.05

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)
HO3-Boiler #1a	0.20	0.20	0.20	0.01	0.39	0.33	0.02
HO3-Boiler #2a	0.20	0.20	0.20	0.01	0.39	0.33	0.02
HO3-Boiler #3a	0.20	0.20	0.20	0.01	0.39	0.33	0.02

2. Visible Emissions

Visible emissions from Stacks #6 and #7 shall each not exceed 10% opacity on a six-minute block average basis.

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

Due to their size, HO3-Boilers #1a, #2a, and #3a are not subject to *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* 40 C.F.R. Part 60, Subpart Dc for units greater than 10 MMBtu/hr manufactured after June 9, 1989. [40 C.F.R. § 60.40c]

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

   HO3-Boilers #1a, #2a, and #3a are 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 because the units fire exclusively natural gas. [40 C.F.R. § 63.11193]

C. 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 and establishing the facility's potential to emit (PTE). Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included except when required by state or federal regulations. Maximum potential emissions were calculated based on the following assumptions:

- Operating the boilers for 8,760 hr/yr each; and
- Operating the generators for 100 hrs/yr each.

This information does not 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**
Boilers	6.9	6.9	6.9	0.5	13.4	11.2	0.7
Generators	0.3	0.3	0.3	0.0	7.6	2.0	0.3
Total TPY	**7.2**	**7.2**	**7.2**	**0.5**	**21.0**	**13.2**	**1.0**

Pollutant	**Tons/year**
Single HAP	7.9
Total HAP	19.9

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 C.M.R. ch. 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
$PM_{2.5}$	15
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.

This determination is based on information provided by the applicant regarding the expected construction and operation of the proposed emission units. If the Department determines that any parameter (e.g., stack size, configuration, flow rate, emission rates, nearby structures, etc.) deviates from what was included in the application, the Department may require Unum to submit additional information and may require an ambient air quality impact analysis at that time.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, 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-657-71-Q-A subject to the conditions found in Air Emission License A-657-71-P-R/M 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) of Air Emission License A-657-71-P-R/M:

(17) **Boilers**

A. The following boilers are licensed to fire natural gas: 2211-Boiler #1; HO2-Boilers #1a, #1b, #2a, #2b, #2c, #2d, #2e, and #3; and HO3-Boilers #1a, #2a, and #3a. [06-096 C.M.R. ch. 115, BPT and BACT]

B. HO3 Boilers #1a, #2a, and #3a shall each be equipped with a modulating burner and a high efficiency heat exchanger. [06-096 C.M.R. ch. 115, BACT]

C. Emissions shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
HO2-Boiler #1a	PM	0.05	06-096 C.M.R. ch. 115, BPT
HO2-Boiler #1b	PM	0.05	06-096 C.M.R. ch. 115, BPT
HO3-Boiler #1a	PM	0.05	06-096 C.M.R. ch. 115, BACT
HO3-Boiler #2a	PM	0.05	06-096 C.M.R. ch. 115, BACT
HO3-Boiler #3a	PM	0.05	06-096 C.M.R. ch. 115, BACT

D. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BPT and 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)
2211-Boiler #1	0.05	0.05	0.05	0.01	0.10	0.08	0.01
HO2-Boiler #1a	0.18	0.18	0.18	0.01	0.34	0.28	0.02
HO2-Boiler #1b	0.18	0.18	0.18	0.01	0.34	0.28	0.02
HO2-Boiler #2a	0.11	0.11	0.11	0.01	0.20	0.17	0.01
HO2-Boiler #2b	0.11	0.11	0.11	0.01	0.20	0.17	0.01
HO2-Boiler #2c	0.11	0.11	0.11	0.01	0.20	0.17	0.01
HO2-Boiler #2d	0.11	0.11	0.11	0.01	0.20	0.17	0.01
HO2-Boiler #2e	0.11	0.11	0.11	0.01	0.20	0.17	0.01
HO2-Boiler #3	0.05	0.05	0.05	0.01	0.10	0.08	0.01
HO3-Boiler #1a	0.20	0.20	0.20	0.01	0.39	0.33	0.02
HO3-Boiler #2a	0.20	0.20	0.20	0.01	0.39	0.33	0.02
HO3-Boiler #3a	0.20	0.20	0.20	0.01	0.39	0.33	0.02

E. Visible emissions from Stacks #1, #6, and #7 shall each not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BPT and BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 30th DAY OF JANUARY , 2025.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____ for ____
MELANIE LOYZIM, COMMISSIONER

The term of this license amendment shall be ten (10) years from the issuance of Air Emission License A-657-71-P-R/M (issued 10/15/2024).

[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: 12/3/24
Date of application acceptance: 12/3/24

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