



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE  
GOVERNOR

PATRICIA W. AHO  
COMMISSIONER

**Mid-Maine Waste Action Corporation  
Androscoggin County  
Auburn, Maine  
A-378-70-D-A**

**Departmental  
Findings of Fact and Order  
Part 70 Air Emission License  
Amendment #2**

**FINDINGS OF FACT**

After review of the Part 70 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**

FACILITY	Mid-Maine Waste Action Corporation (MMWAC)
LICENSE TYPE	Part 70 Significant License Modification
NAICS CODES	562213, 562920
NATURE OF BUSINESS	Refuse Systems; Municipal Waste Combustion and Materials Recovery
FACILITY LOCATION	110 Goldthwaite Road, Auburn, Maine

The Mid-Maine Waste Action Corporation (MMWAC) was created by twelve area municipalities in 1986 to process and dispose of residential and commercial waste. The waste-to-energy process converts solid waste into an ash residue, which minimizes landfill reliance in the State and produces electricity from the fuel value of the trash. MMWAC produces electricity from the waste that is incinerated and sells excess to the local power grid.

MMWAC has the potential to emit more than 100 tons per year (TPY) of nitrogen oxides (NO<sub>x</sub>); therefore, the source is a major source for this criteria pollutant. MMWAC has the potential to emit more than 10 TPY of a single hazardous air pollutant (HAP) and more than 25 TPY of combined HAP; therefore, the source is a major source for HAP.

**B. Emission Equipment**

The following emission units are addressed by this Part 70 License Amendment:

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

**Municipal Solid Waste Combustors (MSW Combustors)**

<b>MSW Combustor</b>	<b>Max. Heat Input Capacity (each)</b>	<b>Max. Firing Rate (each)</b>	<b>Manuf. Date</b>	<b>Install. Date</b>	<b>Stack #</b>
Unit #1	47.7 MMBtu/hr firing waste*	125 tons/day municipal waste	1991	1992	Stack 1, Flue 1
Unit #2	17.0 MMBtu/hr firing natural gas	16,190 scf/hr natural gas (auxiliary burners)			Stack 1, Flue 2

\* (5200 Btu/lb x 9173 lb/hour)

**C. Application Classification**

Part 70 Significant License Modification procedures are used for applications requesting license changes that do not qualify as Part 70 Administrative Revisions or Part 70 Minor License Modifications. The revision of the classification of the facility's combustion technology and associated carbon monoxide (CO) limits for the municipal waste combustors is not considered a Part 70 Administrative Revision or Part 70 Minor License Modification; thus, it has been processed as a Part 70 Significant License Modification under *Part 70 Air Emission License Regulations*, 06-096 Code of Maine Rules (CMR) 140 (as amended).

**II. BEST PRACTICAL TREATMENT (BPT) AND EMISSION STANDARDS**

**A. Amendment Description**

1. Background

The Mid-Maine Waste Action Corporation (MMWAC), established in 1986, constructed a mass-burn, waste-to-energy (WTE) facility in 1991-1992 comprised of two municipal solid waste (MSW) combustors utilizing the Laurent Bouillet Mass-burn Oscillating Combustor technology. Though not an identical match to either, MMWAC's combustor units resemble either "Mass Burn Rotary Refractory" or "Mass Burn Rotary Waterwall" municipal solid waste (MSW) combustors, as defined in the federal New Source Performance Standard (NSPS) 40 CFR Part 60, Subpart BBBB. MMWAC's original air emission license contained a CO limit of 100 ppm on a 24-hour average basis for each of the two MSW combustors. This limit was carried through to the facility's initial Part 70 license (A-378-70-A-I) issued July 1, 2002. The renewal of the Part 70 license (A-378-70-B-R/A) was issued August 12, 2013. This renewal license contained a CO limit of 100 ppm on a 4-hour average basis, a change from the initial Part 70 license, which change was not detected by the facility until after the renewal license had been issued.

This change from a 24-hour to a 4-hour averaging period was initially thought to be a typographical error; however, it was subsequently ascertained that the new limit was actually based on a classification of MMWAC's combustor technology as "Mass Burn Rotary Refractory" per NSPS Subpart BBBB.

Federal regulation 40 CFR, Part 60, BBBB, Table 5 specifies various CO limits for small MWCs based on their combustor technology. This table does not contain a category for oscillating combustors such as the MMWAC units. This may be because these are the only Oscillating MSW Combustors in North America, or it could be because this technology was not known to exist by EPA when the background material for Table 5 was developed.

The MMWAC facility has been in operation since 1992 and has demonstrated the ability to consistently achieve the 100 ppm, 24-hour standard. However, due to operational requirements of the oscillating combustor technology, the facility is not able to consistently achieve the 100 ppm 4-hour CO standard. It is crucial to the continued reliable operation of the MMWAC facility that this change in CO averaging time be amended, either through the creation of an Oscillating Combustor class in the federal regulation or by assigning the MMWAC combustors to the "Rotary Waterwall" classification for purposes of CO averaging time.

Unlike "Rotary Refractory" combustors, which continuously rotate 360 degrees, the MMWAC Oscillating Combustor oscillates back and forth through an arc of 210 degrees. Through an opening on the top of each combustor, flue gases exit from the combustion chamber to a tranquilization chamber, and then progress to a water tube boiler. High pressure steam created in the boiler proceeds to a turbine generator to produce electricity.

## 2. Comparison of Combustor Classifications

Because 40 CFR Part 60, Subpart BBBB, Table 5 does not specifically identify the oscillating combustor technology utilized by MMWAC, per EPA guidance after realization of the CO limit change in the Part 70 license renewal, the units must be classified in the category identified in Subpart BBBB which most closely aligns with the oscillating combustor technology. MMWAC has submitted comparison information based on EPA's AP-42, Fifth Edition, Volume I, Chapter 2, *Solid Waste Disposal* (October, 1996), and Emission Factor Documentation for AP-42, Section 2.1, *Refuse Combustion* (May 1993), the municipal waste combustor operator training program's ASME-QRO Provisional Certification Test Preparation Course (American Society of Mechanical Engineers Qualification and Certification of Resource Recovery Facility Operators), and the design, operation, control equipment, and performance record of the MMWAC units, as follows:

- a. Mass Burn Rotary Refractory (MBRR) and MMWAC's Oscillating Combustors

MBRR Information

- MBRR designs are older and typically do not include any heat recovery, per EPA's AP-42, 2.1.1.1 (October 1996).
- The fact that the design includes no heat recovery capabilities precludes the use of modern air pollution control equipment due to the high exhaust temperatures.
- It is not expected that additional plants with the MBRR design will be built in the United States, per EPA's AP-42, 2.1.2.3 (October 1996).

MMWAC's Oscillating Combustors Comparison

- Unlike MBRR, MMWAC's combustors include heat recovery, generating high pressure steam used to generate electricity.
- Unlike the obsolete MBRR technology, the MMWAC facility was one of the last WTE facilities built in the U.S., coming online in 1992.
- MMWAC's air pollution control equipment includes a scrubber, carbon injection, and a baghouse, all of which would be inappropriately applied if there was no heat recovery.

- b. Mass Burn Rotary Waterwall (MBRW) and MMWAC's Oscillating Combustors

MBRW Information

- Underfire air is injected through the waste bed, and overfire air is provided above the waste bed, per EPA's AP-42, 2.1.2.2 October 1996.
- MBRW units typically incorporate heat recovery.
- Heat recovery allows for the use of advanced air pollution control equipment in MBRW units.
- MBRW units have steam tubes incorporated into the inner wall of the combustor, providing a cooling medium for the walls.

MMWAC's Oscillating Combustors Comparison

- MMWAC's oscillating combustors work more similarly to MBRW units. Each oscillating combustor has a double walled shell with channels between the two walls to provide primary underfire air through the bed of trash, the same as MBRW combustors. Secondary, or overfire, air is directed over the top of trash, again the same as MBRW units. MBRR units *do not* utilize primary underfire air.
- MMWAC's units incorporate heat recovery, used to generate high pressure steam to make electricity.
- Heat recovery allows for the use of advanced air pollution control equipment in MMWAC's oscillating combustors.

- Each of MMWAC's oscillating combustors is a double-walled shell with air channels between the two walls to provide primary underfire air through the bed of trash, which acts as a cooling medium in the walls like the waterwalls on MBRW units.
  - The Energy Recovery Council (ERC) 2010 Directory of Waste-to-Energy Plants includes MMWAC and classifies its technology as Mass Burn Rotary Waterwall.
- c. The following table shows a range of factors for comparison of these three technologies.

**Comparison of Combustor Technologies**  
**Rotary Refractory, Rotary Waterwall, MMWAC's Oscillating Units**

<b>Feature of Comparison</b>	<b>Combustor Technology</b>		
	<b>MBRR</b>	<b>MBRW</b>	<b>MMWAC</b>
Older technology, most pre-1970, some 1970's to 1980's	X		
No new plants of this design expected to be built in the US	X		
No heat recovery	X		
No heat recover precludes modern APC equip. due to high temps	X		
Excellent PM and CDD/CDF control, high organics burnout		Possible	X
Heat recovery		X	X
Steam generation in boiler		X	X
Electric generation		Possible	X
Advanced APC equipment: scrubber, carbon, baghouse		Possible	X
Combustor rotates 360 degrees	X	X	
Combustor oscillates 210 degrees			X
Combustion air added in vertical secondary chamber	X		
Primary air introduced through the bed of waste		X	X
Secondary air introduced over the top of the bed of waste		X	X
Combustor refractory lined. No waterwall or air channels for cooling	X		
Combustor lined with waterwall tubes, some tubes protected with refractory		X	
Combustor double walled, void filled with air channels in lieu of waterwall, refractory protects inner wall			X

d. Conclusion

While 40 CFR, Part 60, BBBB, Table 5 does not list MMWAC's specific technology, because it must be categorized for regulatory purposes as either "Mass Burn Rotary Refractory" or "Mass Burn Rotary Waterwall", the design of MMWAC's combustors and the various advanced functions that are incorporated in them justify their being associated with Rotary Waterwall for purposes of CO limits.

3. The Department's Determination

Based on the information provided by MMWAC, supporting documentation, and information contained in the Department's files concerning this facility, the Department concludes that the oscillating combustor technology units most closely align with the criteria and characteristics of "Mass Burn Rotary Waterwall" units as defined in 40 CFR Part 60, Subpart BBBB. For such, Subpart BBBB identifies the following CO emission standard:

250 parts per million by dry volume, using a 24-hour block average, arithmetic mean [Table 5 to Subpart BBBB of 40 CFR Part 60]

While Table 5 lists the CO limit as 250 ppm on a 24-hour average basis, MMWAC's long operating history in compliance with a CO limit of 100 ppm on a 24-hr average basis indicates the facility's ability to continue to comply with the 100 ppm limit. The Department determines that the CO emission limit in the facility's initial Part 70 license shall remain as the limit for these units. Thus, CO emissions for MMWAC's oscillating combustors shall not exceed 100 ppm<sub>dv</sub> on a 24-hour block average basis, arithmetic mean. [A-378-70-A-I (July 1, 2002), BACT/BPT]

**B. Facility Annual Emissions**

Total licensed annual emissions for the facility will not change as a result of this Part 70 License amendment.

**III. AMBIENT AIR QUALITY ANALYSIS**

MMWAC previously submitted an ambient air quality analysis demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards (see license A-378-72-B-A, issued on July 27, 1990). An additional ambient air quality analysis is not required for this Part 70 License amendment.

**ORDER**

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

- will receive Best Practical Treatment;
- will not violate applicable emissions standards; and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

Mid-Maine Waste Action Corporation  
Androscoggin County  
Auburn, Maine  
A-378-70-D-A

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The Department hereby grants the Part 70 License A-378-70-D-A pursuant to 06-096 CMR 140 and the preconstruction permitting requirements of 06-096 CMR 115, and subject to the conditions found in Air Emission License A-378-70-B-R/A and in amendment A-378-70-C-A.

Because the CO emission limit and averaging time was changed as part of Part 70 License Amendment A-378-70-C-A, issued January 24, 2014, there are no new Specific Conditions or additional changes to existing conditions required as part of this Part 70 License amendment.

DONE AND DATED IN AUGUSTA, MAINE THIS *24* DAY OF *July*, 2014.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: *Marie Allen Robert Corne for*  
PATRICIA W. AHO, COMMISSIONER

**The term of this amendment shall be concurrent with the term of Air Emission License A-378-70-B-R/A.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: March 14, 2014

Date of application acceptance: March 18, 2014

Date filed with the Board of Environmental Protection:

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

