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

DEPARTMENT ORDER

Waste Management Disposal Services of Maine, Inc. **d/b/a Crossroads Landfill** **Somerset County** **Norridgewock, Maine** **A-816-77-5-A**	**Departmental** **Findings of Fact and Order** **New Source Review** **NSR #5**

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 (the Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Waste Management Disposal Services of Maine, Inc. (WMDSM) d/b/a Crossroads Landfill
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	562212
NATURE OF BUSINESS	Solid Waste Landfill
FACILITY LOCATION	357 Mercer Rd, Norridgewock, Maine

B. NSR License Description

WMDSM has requested a New Source Review (NSR) license to revise the emission limits for volatile organic compounds (VOC) from the landfill gas-to-energy (LFGTE) Engines #1 and #2.

C. Emission Equipment

The following equipment is addressed in this NSR license:

Landfill Gas-to-Energy Engines

Equipment	Maximum Heat Input Capacity (MMBtu/hr)	Output (kW)	Fuel Type, % sulfur	Stack #
Engine #1	17.9	1,600	landfill gas, < 1,500 ppmv	4
Engine #2	17.9	1,600	landfill gas, < 1,500 ppmv	5

D. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the issued date of this license.

The application for WMDSM does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing, or recordkeeping requirements. However, this application does seek to modify a Best Available Control Technology (BACT) analysis performed per New Source Review.

The modification of a major source is considered a major or minor modification based on whether or not expected emissions increases exceed the "Significant Emission Increase" levels as given in *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100.

Engines #1 and #2 were initially added through NSR license A-816-77-1-A (7/11/08) which restricted annual VOC emissions from the facility to 10.0 tpy. This amendment increases facility-wide emissions of VOC to 39.9 tpy keeping emissions from the project below the Significant Emissions Increase level of 40 tpy.

Therefore, this NSR license is determined to be a minor modification under *Minor and Major Source Air Emission License Regulations,* 06-096 C.M.R. ch. 115. An application to incorporate the requirements of this NSR license into the Part 70 air emission license has been submitted and is being processed concurrently with this NSR amendment.

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 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 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. Engines #1 and #2

WMDSM's solid waste landfill produces gas containing high levels of methane and carbon dioxide as well as smaller amounts of non-methane organic compounds (NMOC). NMOC consists of hazardous air pollutants (HAP) and VOC.

WMDSM's calculated emissions of NMOC are less than 50 megagrams per year. Therefore, this facility is not required to install a collection and control system that complies with *Standards of Performance for Municipal Solid Waste Landfills*, 40 C.F.R. Part 60, Subpart WWW. However, WMDSM has voluntarily installed a collection and control system that is designed to meet the criteria set forth in 40 C.F.R. Part 60, Subpart WWW.

This system consists of a gas collection system, two flares, and the LFGTE engines (Engines #1 and #2). The flares are designed to achieve 98% overall destruction of NMOCs and use a small amount of propane as a pilot light. WMDSM may use up to 20 passive wellhead flares, as necessary.

Engines #1 and #2 are the primary combustion devices used to control NMOC. The destruction efficiency for NMOC of the engines is equivalent to the destruction efficiency of the flares. Therefore, combustion of the landfill gas in the LFGTE plant is determined to be an equivalent strategy for control of NMOC to the flares and is considered BACT for emissions of NMOC and VOC from the landfill.

The VOC emission limits for Engines #1 and #2 were previously determined to be emission limits of 0.02 lb/hr per engine. This has been found to be in error and does not accurately reflect emission rates the engines are capable of achieving. Therefore, WMDSM has requested emission limits from the engines be revised to be based on more accurate numbers.

Engines #1 and #2 are Caterpillar G3520C engines. The RACT/BACT/LAER Clearinghouse shows VOC emission limits for similar landfill gas-fired engines as low as 0.56 g/bhp-hr which appears to be taken from the Caterpillar technical data sheet for operation of G3520C engines at 100% load. However, the same data sheet shows that emissions are significantly higher when the engines are operated at 50% load. WMDSM would like the flexibility to operate Engines #1 and #2 at less than 100% load.

Additionally, air emission license A-816-77-4-A (12/14/15) allowed for the installation of replacement engines when necessary. Replacement engines may be newer than the current units, and therefore may be subject to *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart JJJJ. Engines subject to 40 C.F.R. Part 60, Subpart JJJJ are limited to an emission rate of 1.0 g/bhp-hr.

Therefore, BACT for VOC from Engines #1 and #2, including any subsequent replacement engines, is determined to be an emission limit of 1.0 g/bhp-hr. The annual, facility-wide VOC emission limit will be raised accordingly.

Due to the flexibility allowed by this license, the different type of equipment that may be installed and/or operated at the facility, and the variability of the emissions from the landfill itself, it is difficult to limit annual emissions from the facility based solely on landfill gas throughput. Therefore, this facility is subject to annual (tpy) emission limits. When calculating annual emissions from Engines #1 and #2 to demonstrate compliance with the VOC tpy emission limit, WMDSM shall use one of the following emission rates:

1. The emission rate from the most recent compliance stack test;
2. The worst-case emission factor listed on the manufacturer's technical data sheet for the specific engine; or
3. 1.0 g/hp-hr.

C. Incorporation into the Part 70 Air Emission License

The NSR requirements in this 06-096 C.M.R. ch. 115 New Source Review license shall apply to the facility upon issuance. WMDSM has applied to make

corresponding changes to their Part 70 license issued under *Part 70 Air Emission License Regulations*, 06-096 C.M.R. ch. 140. The changes to the Part 70 license will not take effect until that license amendment is complete.

D. Annual Emissions

1. Emission Totals

WMDSM is licensed for the following annual emissions, based on a 12 month rolling total.

The totals listed do not reflect operation of all equipment at full capacity. Instead they reflect maximum anticipated emissions associated with full operation of the engines with excess gas burned at the flares. WMDSM is restricted to the total emissions listed below based on a Federally-enforceable license condition.

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	Total HAP
Flare #1	1.3	1.3	37.4	5.2	28.2	–	–
Flare #3	3.9	3.9	112.3	15.6	84.8	–	–
LFGTE Engines #1 & #2	7.4	7.4	75.8	25.9	181.1	–	–
Emerg. Gen. #1	–	–	–	0.2	–	–	–
Emerg. Gen #2	–	–	–	0.2	–	–	–
Emerg. Gen #3	–	–	–	0.2	0.1	–	–
Facility-Wide	–	–	–	–	–	39.9	9.9
Total TPY	**12.6**	**12.6**	**225.5**	**47.3**	**294.2**	**39.9**	**9.9**

2. Greenhouse Gases

Greenhouse gases are considered regulated pollutants as of January 2, 2011, through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans,* 40 C.F.R. Part 52, Subpart A, § 52.21, *Prevention of Significant Deterioration of Air Quality* rule. Greenhouse gases, as defined in 06-096 C.M.R. ch. 100 are the aggregate group of the following gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and

sulfur hexafluoride. For licensing purposes, greenhouse gases (GHG) are calculated and reported as carbon dioxide equivalents (CO_2e).

The quantity of CO_2e emissions from this facility is less than 100,000 tons per year, based on the following:

- the facility's fuel use limits;
- worst case emission factors from the following sources: U.S. EPA's AP-42, the Intergovernmental Panel on Climate Change (IPCC), and *Mandatory Greenhouse Gas Reporting,* 40 C.F.R. Part 98,; and
- global warming potentials contained in 40 C.F.R. Part 98.

III. AMBIENT AIR QUALITY ANALYSIS

WMDSM 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-816-77-1-A issued on 7/11/08). An additional ambient air quality analysis is not required for this NSR license.

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 New Source Review License A-816-77-5-A pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the specific conditions below.

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 Condition (1)(D) of NSR Air Emission License A-816-77-4-A:

(1) Landfill Gas-Fired Engines

D. Emissions from Engines #1 and #2 (and any subsequent replacement unit subject to 40 C.F.R. Part 63, Subpart ZZZZ) shall each not exceed the following limits:

Pollutant	lb/MMBtu	Origin and Authority	Enforceability
PM	0.05	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**

Pollutant	g/bhp-hr	Origin and Authority	Enforceability
NO_x	0.6	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
CO	4.2	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
VOC	1.0	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**

Pollutant	lb/hr	Origin and Authority	Enforceability
PM	0.85	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
PM_{10}	0.85	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
SO_2	8.65	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
NO_x	2.95	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
CO	20.70	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**

The following shall replace Condition (1)(E) of Air Emission License A-816-77-4-A:

(1) Landfill Gas-Fired Engines

E. Emissions from any replacement unit for Engines #1 and #2 manufactured after July 1, 2007 shall each not exceed the following limits:

Pollutant	lb/MMBtu	Origin and Authority	Enforceability
PM	0.05	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**

Pollutant	g/bhp-hr	Origin and Authority	Enforceability
NO_x	0.6	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
CO	4.2	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
VOC	1.0	40 CFR §60.4233(e) & Table 1 06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**

Pollutant	lb/hr	Origin and Authority	Enforceability
PM	0.85	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
PM_{10}	0.85	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
SO_2	8.65	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
NO_x	2.95	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**
CO	20.70	06-096 C.M.R. ch. 115, BACT	**Federally Enforceable**

The following shall replace Condition (6) of Air Emission License A-816-77-1-A:

(6) Facility Wide Emission Limits

WMDSM shall not exceed the following emission limits on a 12 month rolling total basis [06-096 C.M.R. ch. 115, BACT]:

Pollutant	Ton/year
PM	12.6
PM_{10}	12.6
SO_2	225.5
NO_x	47.3
CO	294.2
VOC	39.9

The following is a New Condition added through this license (A-816-77-5-A):

(1) When calculating annual emissions from Engines #1 and #2 to demonstrate compliance with the VOC tpy emission limit, WMDSM shall use one of the following emission rates:
A. The emission rate from the most recent compliance stack test;
B. The worst-case emission factor listed on the manufacturer's technical data sheet for the specific engine; or
C. 1.0 g/hp-hr.
[06-096 C.M.R. ch. 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 9 DAY OF December , 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PAUL MERCER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 7/27/16
Date of application acceptance: 7/28/16

Date filed with the Board of Environmental Protection:

This Order prepared by Lynn Muzzey, Bureau of Air Quality.