NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: Date needed

Region: Raleigh Regional Office
County: Durham
NC Facility ID: 3200375
Inspector's Name: Jeff Harris
Date of Last Inspection: 02/11/2022
Compliance Code: 3 / Compliance – inspection

Facility Data

Applicant (Facility's Name): MP Durham, LLC (Landfill Gas-to-Energy Project)

Facility Address:
MP Durham, LLC (Landfill Gas-to-Energy Project)
2115 East Club Boulevard
Durham, NC 27704

SIC: 4911 / Electric Services
NAICS: 221119 / Other Electric Power Generation

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 15A NCAC 02D .0516, 02D .0521, 02D .0524, 02D .1111, 02Q .0513, 02Q .0702
NSPS: Subpart JJJJ
NESHAP: Subpart ZZZZ
PSD: N/A
PSD Avoidance: N/A
NC Toxics: Yes: Formaldehyde
112(r): N/A
Other: State BACT (SB3), GS 62-133.8(g), HAP Major (formaldehyde)

Note: DAQ modeled for formaldehyde

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Greg Love Operations & Maintenance Specialist (910) 286-1399 2115 East Club Boulevard, Suite 170 Durham, NC 27704	Michael Hall Manager (404) 474-0744 PO Box 7316 Tupelo, MS 38802	Kayla Miller Operations Manager (504) 228-6289 PO Box 7316 Tupelo, MS 38802

Application Data

Application Number: 3200375.23A
Date Received: 03/29/2023
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 09971/T05
Existing Permit Issue Date: 03/16/2022
Existing Permit Expiration Date: 09/30/2023

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2021	1.16	11.78	8.54	49.40	2.15	7.28	7.21 [Formaldehyde]
2020	0.3300	9.18	7.97	35.66	2.02	6.84	6.77 [Formaldehyde]
2019	0.5700	13.45	13.81	59.60	3.46	11.73	11.59 [Formaldehyde]
2018	0.8000	12.70	12.10	59.00	3.50	12.18	11.56 [Formaldehyde]
2017	0.8900	12.50	12.30	57.70	3.50	12.42	11.72 [Formaldehyde]

Review Engineer: Jacob Larson

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue: 09971T06
Permit Issue Date: Date needed
Permit Expiration Date: Date needed

1. Purpose of Application

MP Durham, LLC currently holds Title V Permit No. 09971T05 with an expiration date of September 30, 2023 for a landfill gas-to-energy facility in Durham, North Carolina. This permit application is for a permit renewal without modification. The renewal application was received on March 29, 2023, or at least six months prior to expiration date. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

The facility has requested a revision to condition 2.1.A.3.d in permit 00971T04 to allow for a rotational testing schedule for the two engines. Historically, DEQ has approved testing waivers for MP Durham for the 2013 – 2019 test cycles, citing a historical demonstration of significant margin of compliance with Subpart JJJJ limits. The Stationary Source Compliance Branch issued an approval letter for the testing waiver request on April 20, 2023. The emissions data reported for this facility since 2014 demonstrates a significant margin of compliance (greater than 50%) for NOx and VOC emissions, and low variability in the CO emission test results even though CO emissions are consistently greater than 50% (but no greater than 77%) of the applicable standard. Therefore, NC DAQ approves the requested waiver of performance testing for identical units at the MP Durham, LLC (Landfill Gas-to-Energy Project) site on an ongoing basis, provided that the following conditions are met:

a. Each engine is tested every other year or other applicable testing cycle, with Engine ESEG2 being tested in 2023, since ES-02 is the only engine currently operating. (In 2021 and 2022, both engines were tested);
b. All new performance test results continue to meet the waiver criteria outlined above from the US EPA's Clean Air Act National Stack Testing Guidance;
c. A justification and supporting data for continuation of this waiver (including hours of operation for all engines since the last test) should be included in each performance test report that is intended to provide representative emission results for multiple identical engines on the same site; and
d. All future protocol submittals for representative testing of identical units include references to this approval letter and to the most recent justification and supporting data for continuation of this waiver. If future test data does not support requirements to maintain classification of the engines as identical or if future test data indicates non-compliance, a limited margin of compliance, or highly variable test results from year to year, MP Durham, LLC (Landfill Gas-to-Energy Project) may be required to perform additional testing. NC DAQ will review the facility's continual adherence to the criteria for performance test waivers for identical emission units by reviewing the justification and supporting data that is submitted with each future performance test report. This performance test waiver does not exempt the facility from complying with its permit, other applicable requirements of 40 CFR 60 Subpart JJJJ, and other state or federal air quality regulations. Because of the large compliance margin, the following permit condition will be added to the Title V permit.

Even though the DAQ Stationary Compliance Branch issued a testing waiver letter on April 20, 2023 giving this facility permission to perform alternate testing of each individual engine, this waiver will not be placed into the body of the permit.

Under the authority of 40 CFR 63.6670 we can change the requirements for testing frequency as it applies to individual engines because it does not constitute a major alternative under 63.90. Except where the language in the subpart is specific as to what will not be delegated, we are delegated to make this change under minor or intermediate alternatives consistent with the definitions in 40 CFR 63.90. Furthermore, under the Stack Testing Guidance we (DAQ) can allow a representative test of one engine for multiple identical engines *at a facility* at specific frequency consistent with the Policy and informed by EPA's Decisions in the Applicability Determination Index (ADI). Neither the Regional Office, any SSCB personnel or Supervisor, or any Permits personnel has the delegated signature authority to change the stack test frequency requirements. The signature authority has been delegated solely to the Technical Services Section Chief. If we put this in the Title V permit, then the Permitting Chief would be indicated as the signature authority. This facility can use the letter issued on April 20, 2023 for testing the engines. A condition will be placed into the permit that indicates that this is the method of obtaining a testing frequency waiver.

[Note: A waiver for testing frequency is currently in the sister facility located in Wayne County (was MP Wayne later renamed Terreva Wayne). That testing condition will also most likely be removed.]

2. Facility Description

MP Durham, LLC is the owner of a landfill gas-to-energy (LFGTE) facility located at 2115 East Club Boulevard, Durham North Carolina which is adjacent to the Durham County Municipal Solid Waste (MSW) Landfill on land owned by Durham County. The facility is only associated with the Durham County MSW Landfill in that it receives its landfill gas (LFG) for fuel. The gas is comprised of roughly a 50/50 mixture of methane and carbon dioxide that is created from decomposition of MSW. The Durham County MSW Landfill extracts LFG through gas collection wells, then sends it to MP Durham, LLC, which operates a treatment system to remove moisture and some particulates. MP Durham, LLC uses this pre-treated/conditioned LFG to fuel two engine/electric power generators (gensets). The gensets are GE Jenbacher model 320 LFG-fired, 4-stroke, lean burn, spark ignition reciprocating internal combustion engines (RICE) (1468 horsepower-hp output)/generators (1059 kilowatts - kW output) with a maximum 9.796 mmBtu/hr.

The energy produced with these gensets is sold the local power company (Duke Energy Progress). Duke Energy Progress also purchases renewable energy certificates to help meet its regulatory renewable energy obligation established in the North Carolina Renewable Energy Portfolio Standard. A flare, owned and operated by the Durham County MSW Landfill, serves as a backup combustion device to burn any excess landfill gas.

3. History/Background/Application Chronology

History/Background

February 25, 2015	TV permit renewal issued. Air Permit No. 09971T04 was issued on October 02, 2018 with an expiration date of September 30, 2023.
September 22, 2021	Raleigh Regional Office sent Notice of Deficiency (NOD) for facility replacing engine ES-EG2 prior to notification to the regional office. MP Durham, LLC was required to submit a Minor Modification prior to November 12, 2021 to resolve the NOD.

March 16, 2022 Air Permit No. 09971T05 was issued for a minor modification resolving NOD.

Application Chronology

March 29, 2023 DEQ received permit application 3200375.23A for Title V renewal.

March 31, 2023 Sent acknowledgment letter indicating that the application for permit renewal was complete.

April 28, 2023 Draft permit and review forwarded for comments to Permitting Supervisor.

May 05, 2023 Comments received from Booker Pullen, Permitting Supervisor.

May 08, 2023 Draft permit and review forwarded to the Stationary Compliance Branch for comments. No comments were received May 10, 2023.

May 08, 2023 Draft permit and review forwarded to the Raleigh Regional Office for comments. No comments were received May 17, 2023.

May 08, 2023 Draft permit forwarded to the applicant for comments. Minor comments were received May 22, 2023.

XXXX xx, 2023 Draft permit and permit review forwarded to public notice.

XXXX xx, 2023 Public comment period ends. ___ comments received.

XXXX xx, 2023 EPA comment period ends. ___ comments received.

XXXX xx, 2023 Permit issued.

4. Permit Modifications/Changes and TVEE Discussion

The following table describes the modifications to the current permit as part of the renewal process.

Page No.	Section	Description of Changes
--	Cover page and throughout permit	• Updated all dates and permit revision numbers.
Pg 4 of the cover letter	Summary of Changes to Permit	• Updated the table to reflect the changes to the permit
Page 4 of the Permit	Permitted Emissions Table	• Removed the ** and footnote at the bottom of the table
Page 10 of the Permit	Section 2.1	• Changed testing requirement 2.1(A)(3)(d)
Pages 8 through 16	Section 3	• Added most recent revision of the General Conditions

This permit renewal is without modification, and no changes to the Title V Equipment Editor are needed.

5. Regulatory Review

This facility is subject to the following air quality regulations, in addition to the requirements in the General Conditions:

- 15A NCAC 02D .0516, Sulfur Dioxide Emissions from Combustion Sources
- 15A NCAC 02D .0521, Control of Visible Emissions
- 15A NCAC 02D .0524, New Source Performance Standards, 40 CFR 60, Subpart JJJJ
- 15A NCAC 02D .1111, Maximum Achievable Control Technology, 40 CFR 63, Subpart ZZZZ

15A NCAC 02D .0516, "Sulfur Dioxide Emissions from Combustion Sources"

Sulfur dioxide emissions from LFG-fired engines ES-EG1 and EG2 are limited to 2.3 pounds per million Btu heat input each. Treated LFG is considered equivalent to natural gas and its combustion produces negligible emissions of sulfur dioxide. No monitoring, recordkeeping or reporting is required for LFG combustion. Compliance is expected.

15A NCAC 02D .0521, "Control of Visible Emissions"

This Rule shall apply to all fuel burning sources and to other industrial processes having a visible emission. Sources subject to a specific visible emission standard in 15A NCAC 02D .0506, .0508, .0524, .1110, .1111, .1206, or .1210 shall meet that standard instead of the standard contained in this Rule. This Rule does not apply to engine maintenance, rebuild, and testing activities where controls are infeasible, but it does apply to the testing of peak shaving and emergency generators. Engines ES-EG1 and EG2 are each limited to a six-minute average opacity of 20%. Treated LFG is considered equivalent to natural gas and its combustion produces negligible visible emissions. No visible emissions have been observed from the engines in the past, or during the site inspections or stack testing, and neither the facility nor DAQ have received complaints from nearby residents. No monitoring, recordkeeping or reporting is required for LFG combustion in this engine. Compliance is expected.

15A NCAC 02D .0524, New Source Performance Standards, 40 CFR 60, Subpart JJJJ

Engine ES-EG2 is subject to New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines – specifically the standards that apply to LFG-fired lean burn engines with a maximum engine power greater than or equal to 500 HP and manufactured after July 1, 2007, but before July 1, 2010. LFG-fired engines have no fuel requirements but must be maintained and operated in a manner consistent with good air pollution control practice for minimizing emissions.

LFG contains small amounts of nitrogen, oxygen, carbon monoxide (CO), and nonmethane organic compounds including volatile organic compounds (VOC). Some of the nitrogen content in the fuel is oxidized to nitrogen oxides (NOx) and emitted along with other LFG constituents during the combustion process. Additional NOx is formed from the high temperature oxidation of nitrogen present in the combustion air. Most CO emissions result from incomplete combustion of LFG. Good combustion practices employed by MP Durham, LLC provide compliance with the emissions standards.

The engine must meet the emission standards in §60.4233(e). The applicable NSPS emissions standards are as follows:

Pollutant	Emission Standard*		
NOx	3.0 g/hp-hr	-or-	220 ppmvd at 15% O_2
CO	5.0 g/hp-hr	-or-	610 ppmvd at 15% O_2
VOC	1.0 g/hp-hr	-or-	80 ppmvd at 15% O_2

* The permittee may choose to comply with the emission standard in either g/hp-hr or ppmvd at 15% O_2.

15A NCAC 02D .1111, Maximum Achievable Control Technology, 40 CFR 63, Subpart ZZZZ

ES-EG1 and EG2 are subject to the 40 CFR 63 Subpart ZZZZ standards that apply to LFG-fired SI RICE with a site rating of more than 500 brake HP located at a major source of HAP rather than the standards for an area source. However, LFG-fired engines at major sources do not have to meet emissions or operational limits. Their applicable requirements include operating in a manner which reasonably minimizes HAP emissions, monitoring and recording of daily fuel usage, maintaining daily fuel usage monitor records, and annual reporting. Compliance is expected.

State BACT Analysis [NC GS §62-133.8 (g)] – STATE ENFORCEABLE ONLY

Since the General Statue §62-133.8 (g), Senate Bill 3 – Session Law 2007-397 (State-Enforceable Only) has been in effect, the State of North Carolina has gained a lot of experience and knowledge working with consultants and the landfill gas-to-energy facilities concerning landfill gas contaminants and their effect on pollutant emissions from internal combustion engines.

The most cost-effective control of pollutants from landfill gas-fired internal combustion (IC) engines established in Title Air Permit No. 09971T04 is:

- good combustion practices with no added pre-combustion or post combustion controls, and the use of design characteristics that are inherent to the lean burn engines. A review of the Federal Register preface and the promulgated regulation for NSPS Subpart JJJJ indicated that no add on controls were used to establish the compliance emission rates for new IC engines. Therefore, the facility's permit will reflect the following:

A. In order to comply with the BACT determination pursuant to GS 62.133.8(g) for each pollutant, the following shall apply:
   1. CO emissions shall not exceed the New Source Performance limits per Subpart JJJJ.
   2. NOx emissions shall not exceed the New Source Performance limits per Subpart JJJJ.
   3. PM10/PM2.5, SO_2, VOCs, Pb, and Hg shall be controlled from each engine using good combustion practices and the burning of landfill gas in the engine.

B. Testing shall be performed according to the requirements of 40 CFR 60.4244 (NSPS Subpart JJJJ) and shall be used to demonstrate compliance with the State BACT limits (NSPS Subpart JJJJ limits).

C. The Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations, or if there are no manufacturer's inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:
   1. The Permittee shall perform an annual inspection (for each 12-month period following the initial inspection) to ensure the engine is operating properly.

2. The results of the inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
   a. The date and time of each recorded action;
   b. The results of each inspection;
   c. The results of any maintenance performed on the engine; and
   d. Any variance from manufacturer's recommendations, if any, and the corrections made.
   e. The Permittee shall maintain a summary report, acceptable to the Regional Air Quality Supervisor, of monitoring and recordkeeping listed above and shall submit the results within 30 days of a written request by the DAQ.

MP Durham burns only LFG in the engines and follows good combustion practices. Prior source testing for NOx and CO demonstrates that MP Durham can comply with these revised State BACT limits. Continued compliance is expected.

6. NSPS, NESHAPS/MACT, PSD, 112(r), CAM

NSPS

The LFG-fired engine/generator units (ID Nos. ES-EG1 and ES-EG2) are subject to 40 CFR 60, Subpart JJJJ "Stationary Spark Ignition Internal Combustion Engines," since the engines were manufactured in September 2009. The Permittee shall comply with the following emission standards for spark ignition, lean burn landfill gas-fired engines as specified in Table 1 of 40 CFR Part 60, Subpart JJJJ for stationary landfill gas-fired internal combustion engines that are lean burn engines greater than or equal to 500 HP and manufactured after July 1, 2007, but before July 1, 2010. Under the previous renewal the facility was required to conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first thereafter, to demonstrate compliance. Units ES-EG1 and ES-EG2 were both tested on April 21, 2022 in which compliance was demonstrated.

Pollutant	**Emission Standard (g/hp-hr)-or-Emission Standard (ppmvd at 15% O_2)**	
NOx	3.0 g/hp-hr	220 ppmvd at 15% O_2
CO	5.0 g/hp-hr	610 ppmvd at 15% O_2
VOC	1.0 g/hp-hr	80 ppmvd at 15% O_2

Under permit renewal 09971T06 MP Durham shall test one engine every 12-months on a rotating basis such that each engine is tested at least once every three years. Same emission standards in the table above apply under this new revision.

NESHAP/MACT

These RICE engines are considered "new" in accordance with MACT Subpart ZZZZ because they were placed at the site after June 12, 2006. Compliance with 40 CFR Part 60, Subpart JJJJ meets the compliance requirements of 40 CFR Part 63, Subpart ZZZZ, for a new SI RICE located at an area source of HAP emissions. Continued compliance is expected.

PSD

The facility is not a major source for PSD purposes. PSD is not impacted by this permit renewal application. Durham County has not triggered increment tracking under PSD. Continued compliance is expected.

112(r)
The facility does not store any of the listed 112(r) chemicals in amounts that exceed the threshold quantities. Therefore, the facility is not required to maintain a written Risk Management Plan (RMP).

CAM
The CAM rule (40 CFR 64; 15A NCAC 02D .0614) applies to each pollutant specific emissions unit (PSEU) at major TV facilities that meets all three following criteria:

- the unit is subject to any (non-exempt: e.g. pre November 15, 1990, Section 111 or Section 112 standard) emission limitation or standard for the applicable regulated pollutant.
- the unit uses any control device to achieve compliance with any such emission limitation or standard.
- The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source (i.e., 100 tons per year for criteria pollutants or 10/25 tons per year for HAPs).

These criteria do not apply to engines ES-EG1 or EG2. Therefore, CAM does not apply to this facility. Continued compliance is expected.

7. Facility Wide Air Toxics

The facility was evaluated for toxic air emissions when initially permitted, and acrylonitrile, bromine, chlorine, hydrogen chloride, and hydrogen fluoride were all identified as toxic air pollutants whose emissions exceeded their respective TPERs. The facility conducted modeling to demonstrate compliance with the AAL, the results of which are shown below:

Pollutant	Averaging Period	Emission Rate	Concentration at Property Boundary µg/m^3	AAL µg/m^3	% AAL
Acrylonitrile	lb/yr	111.24	0.0056	0.15	3.7%
Bromine	lb/hr	0.096	0.8296	200	0.41%
Chlorine	lb/hr	0.15	1.3229	900	0.15%
	lb/day	3.68	0.5292	37.5	1.4%
Hydrogen Chloride	lb/hr	1.55	13.4152	700	1.9%
Hydrogen Fluoride	lb/hr	0.29	2.5381	250	1.02%
	lb/day	7.05	1.0152	30	3.38%
Vinyl Chloride	lb/yr	152.95	0.0076	0.38	2.0%

As previously stated, in 2016 DAQ became aware of testing which showed significant formaldehyde emissions from engines combusting LFG, including ES-EG3. Using the 1.107×10^{-3} lb/bhp-hr emission factor, and the total site rating of the LFG-fired engines, the formaldehyde emission rate was compared to its respective TPER from 15A NCAC 02Q .0711 for obstructed or non-vertically oriented stacks since the stacks have rain caps:

Pollutant	Averaging Period	Maximum Emission Rate	TPER	Modeling Required?
Formaldehyde	lb/hr	4.88	0.04	**YES**

Matt Porter, of DAQ AQAB, conducted a dispersion modeling analysis for formaldehyde emissions from the LFG-fired engines using five years of meteorological data. The facility sits on, and is surrounded by, property owned by Durham County, so a property boundary was conservatively estimated using boundaries of adjoining parcels and proximity of publicly accessible parcels. The dispersion modeling analysis was conducted for three engines since the request to remove engine ES-EG3 came after the analysis was completed. The following impacts resulted:

Pollutant	Averaging Period	Emission Rate	Concentration at Property Boundary $\mu g/m^3$	AAL $\mu g/m^3$	% AAL
Formaldehyde	lb/hr	4.89	141.4	150	94.2%

Since none of the toxic air pollutants exceed their respective AAL, DAQ has determined that there is NOT an unacceptable risk to human health.

8. Facility Emissions Review

The facility-wide potential emissions do not change under this TV permit renewal. Actual emissions for criteria pollutants and HAPs for the years 2017 through 2021 are provided in the header of this permit review.

9. Compliance Status

DAQ has reviewed the compliance status of MP Durham. During the most recent inspection, conducted on February 02, 2022 by Jeff Haris of RRO, the facility appeared to be in compliance with all applicable requirements. The facility received a NOD for replacing ES-EG2 without notifying the DEQ. The NOD was resolved with the issuance of Air Permit No. 09971T05.

10. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected state at or before the time notice provided to the public under 02Q .0521 above. No affected states or local agencies are within 50 miles of this facility.

11. Other Regulatory Considerations

- A P.E. seal is NOT required for this renewal application.
- A zoning consistency determination is NOT required for this renewal application.
- A permit fee is NOT required for this renewal application.

12. Recommendations

The permit renewal application for MP Durham LLC. located in Durham, Durham County, North Carolina has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. DAQ recommends the issuance of Air Permit No. 09971T06.