Facility Name: **MAS Georgia LFG, LLC (Oak Grove)**
City: Winder
County: Barrow
AIRS #: 04-13-013-00083

Application #: TV-45608
Date Application Received: March 13, 2017
Permit No: 4911-013-0083-V-03-0

Program	Review Engineers	Review Managers
SSPP	Cynthia Dorrough	James Eason
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Introduction

This narrative is being provided to assist the reader in understanding the content of referenced operating permit. Complex issues and unusual items are explained here in simpler terms and/or greater detail than is sometimes possible in the actual permit. The permit is being issued pursuant to: (1) Georgia Air Quality Act, O.C.G.A § 12-9-1, et seq. and (2) Georgia Rules for Air Quality Control, Chapter 391-3-1, and (3) Title V of the Clean Air Act. Section 391-3-1-.03(10) of the Georgia Rules for Air Quality Control incorporates requirements of Part 70 of Title 40 of the Code of Federal Regulations promulgated pursuant to the Federal Clean Air Act. The narrative is intended as an adjunct for the reviewer and to provide information only. It has no legal standing. Any revisions made to the permit in response to comments received during the public participation and EPA review process will be described in an addendum to this narrative.

I. Facility Description

A. Facility Identification

1. Facility Name: MAS Georgia LFG, LLC (Oak Grove)

2. Parent/Holding Company Name

   I Squared Capital

3. Previous and/or Other Name(s)

   None known.

4. Facility Location

   967 Carl Bethlehem Road
   Winder, Georgia 30680

5. Attainment, Non-attainment Area Location, or Contributing Area

   MAS Georgia LFG, LLC (Oak Grove) is located in Barrow County which is currently in attainment for all air pollutants.

B. Site Determination

Oak Grove Sanitary Landfill and Speedway Landfill (AIRS No. 013-00068) are adjacent landfills located in Barrow County, Georgia. Oak Grove Landfill is an open landfill, and Speedway Landfill is closed. Both landfills are owned by Republic Services of Georgia Limited Partnership; however, the only source of landfill gas (LFG) for the power facility is Oak Grove Landfill.

The operation of the power facility will be managed separately from the landfill. There is no connection between the owner of the power facility, MAS Georgia LFG, and the owner of the landfill, Republic Services of Georgia Limited Partnership. Because the power facility will be located at the landfill and the landfill is the only source of LFG for the power facility, the landfill and power facility are considered one site for Title I, Title V and PSD/NSR purposes. The engines are permitted to burn a natural gas/LFG blend.

C. Existing Permits

Table 1 below lists all current Title V permits, all amendments, 502(b)(10) changes, and off-permit changes, issued to the facility, based on a comparative review of form A.6, Current Permits, of the Title V application and the "Permit" file(s) on the facility found in the Air Branch office.

Table 1: List of Current Permits, Amendments, and Off-Permit Changes

Permit Number and/or Off-Permit Change	Date of Issuance/ Effectiveness	Purpose of Issuance
4911-013-0083-E-01-0	11/26/2014	Initial construction and operating permit
4911-013-0083-E-01-1	5/22/2017	Correction of typographical errors and updating of control device for IC Engine 3.
4911-013-0083-E-01-2	6/11/2018	Introduction of natural gas (NG) as a combustion fuel for the IC Engines.
4911-013-0083-E-02-0	5/06/2019	Increase engines from 3,012 bhp at 100% load (2.176 MW) to 3,346 bhp at 100% load (2.411 MW).

D. Process Description

1. SIC Codes(s)

4911

The SIC Code(s) identified above were assigned by EPD's Air Protection Branch for purposes pursuant to the Georgia Air Quality Act and related administrative purposes only and are not intended to be used for any other purpose. Assignment of SIC Codes by EPD's Air Protection Branch for these purposes does not prohibit the facility from using these or different SIC Codes for other regulatory and non-regulatory purposes.

Should the reference(s) to SIC Code(s) in any narratives or narrative addendum previously issued for the Title V permit for this facility conflict with the revised language herein, the language herein shall control; provided, however, language in previously issued narratives that does not expressly reference SIC Code(s) shall not be affected.

2. Description of Product(s)

MAS Georgia LFG (Oak Grove) generates electricity for sale.

3. Overall Facility Process Description

MAS Georgia LFG, LLC (Oak Grove), is a power generation plant that is located at the Oak Grove Landfill which is currently an operating landfill subject to 40 CFR 60, Subpart WWW. The landfill gas (LFG) produced from the decomposition of deposited waste is collected using an active gas collection and control system (GCCS). This power generation plant operates three spark ignition (SI) internal combustion engines (ICE) using treated LFG as fuel. Each engine is a 3,346 bhp GE Jenbacher J616 GS-F22 and is coupled with an electrical power generator. Each engine-generator pair is rated at 2.411 megawatts of electricity. Emissions from each engine are controlled by an oxidation catalyst. The facility minimizes potential NOx emissions through the use of LEANOX lean-burn combustion system on each engine. The engines are permitted to burn a natural gas/LFG blend. Performance testing has been provided to demonstrate the engines can comply with applicable limits. Prior to being burned in the engines, the LFG is further purified in a LFG Pretreatment System. Emissions from the LFG Pretreatment System are controlled by a thermal oxidizer. A utility flare, owned and operated by the Oak Grove Landfill, is the back-up control device when the engines are offline and will combust the LFG in excess of that which the engines are capable of combusting.

4. Overall Process Flow Diagram

The facility provided a process flow diagram in their Title V permit application.

E. Regulatory Status

1. PSD/NSR

The combination of Oak Grove Landfill and MAS Georgia LFG, LLC (Oak Grove) is a major source under PSD regulations. Emissions of CO exceeds the major source threshold of 250 tons per year for PSD regulated pollutants. Condition 3.2.1 in this permit limits the annual emissions from the power generation facility of NOx to 98.4 tons, VOC to 22.2 tons, and CO to 93.4 tons per 12 consecutive months. These limits assure that the modification of the addition of the LFGTE facility was minor with respect to NAA NSR and PSD. These emission limits were negotiated between MAS Georgia LFG and Republic Services of Georgia. Landfills and LFG powered electricity generating facilities are not included in the list of 28 source categories that have a 100 tpy threshold to be subject to PSD regulations. The site has not been through PSD review.

The following table reflects the site-wide emissions from Oak Grove Landfill and MAS Georgia LFG, LLC as reported by MAS Georgia in Application No. 26957 dated February 18, 2019 and Oak Grove Landfill Application No. 43307 dated January 13, 2017. The PTE at the Oak Grove Landfill is limited by LFG generating rate. It should be noted that PTEs were calculated based on LFG generating rates or equipment capacities at each source. The PTEs do not consider that the LFG is shared between the two facilities; therefore, the site-wide PTE is conservatively high.

Site-Wide Potential Emissions[1]
(in tons per year)

Pollutant	Potential Emissions					
	Oak Grove LF		MAS LFGTE		Combined Site	
	Unlimited	Limited	Unlimited	Limited	Unlimited	Limited
$PM/PM_{10}/PM_{2.5}$	23.3	14.3	5.4	5.4	28.7	19.7
NOx	86.0	53.0	98.4	98.4	184.4	151.4
SO_2	37.9	23.4	29.1	29.1	52.5	67.0
CO	386.3	238.0	93.4	93.4	479.7	331.4
VOC	38.0	37.5	22.2	22.2	60.2	59.7
Total HAP	10.57	6.51	3.1	3.1	13.7	9.61

2. Title V Major Source Status by Pollutant

Table 2: Title V Major Source Status

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Y			✓
PM_{10}	Y			✓
$PM_{2.5}$	Y			✓
SO_2	Y			✓
VOC	Y			✓
NO_x	Y	✓		
CO	Y	✓		
TRS	N			
H_2S	N			
Individual HAP	Y			✓
Total HAPs	Y			✓

[1] The Site consists of both Oak Grove Landfill and the MAS Georgia LFGTE Facility.

3. MACT Standards

The Division calculated PTE for formaldehyde emissions using North Carolina Division of Air Quality emission factor of $1.1x10^{-3}$ lb/bhp-hr based on performance test at similar facilities. The engine manufacturer does not guarantee formaldehyde reduction in the oxidation catalyst when burning biogas or landfill gas. Using the $1.1x10^{-3}$ lb/bhp-hr emission factor for the three 3,346 bhp-hr engines, the Division calculated uncontrolled formaldehyde emissions to be in excess of 10 TPY. However, MAS Georgia contends their engines emit far less formaldehyde and are a minor source of HAPS. In order to ensure the facility is a true minor source of HAPS, it will be required to test one engine to demonstrate the site is below the major source threshold.

40 CFR 63, Subpart ZZZZ – "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines"

4. Program Applicability (AIRS Program Codes)

Program Code	Applicable (y/n)
Program Code 6 - PSD	no
Program Code 8 – Part 61 NESHAP	no
Program Code 9 - NSPS	yes
Program Code M – Part 63 NESHAP	yes
Program Code V – Title V	yes

Regulatory Analysis

II. Facility Wide Requirements

A. Emission and Operating Caps:

None applicable.

B. Applicable Rules and Regulations

40 CFR 60 Subpart WWW – Standards of Performance for Municipal Solid Waste Landfills
The facility was reconstructed or modified after May 30, 1991; therefore, it is subject to 40 CFR 60 Subpart WWW. The facility has a design capacity (31.2 MM yd^3) greater than 2.5 MM m^3 and emits greater than 50 megagrams per year of NMOC, therefore it is subject to the requirements specified in 40 CFR 60.752(b).

40 CFR 63 Subpart AAAA - National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills
The facility is an area source of HAP emissions with a design capacity greater than 2.5 MM m^3. Per 40 CFR 63.1935(a) and (b), the facility is subject if it has estimated uncontrolled NMOC emissions equal to or greater than 50 Mg/yr or it includes a bioreactor. The NMOC emission shows that the facility's calculated NMOC exceeds 50 Mg/yr, therefore it is subject to the applicable requirements of the subpart.

C. Compliance Status

The company did not indicate any non-compliance issues in its application.

D. Permit Conditions

Permit Condition 2.2.1 requires the Permittee to comply with all applicable requirements of New Source Performance Standards (NSPS), 40 CFR 60, Subpart A, "General Provisions," and Subpart WWW, "Standards of Performance for Municipal Solid Waste Landfills."

Permit Condition 2.2.2 requires the Permittee to comply with all applicable requirements of National Emission Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 63, Subpart A, which contains the NESHAP "General Provisions," and Subpart AAAA, "National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills."

III. Regulated Equipment Requirements

A. Equipment List for the Process

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
IC01	IC Engine 1 GE Jenbacher J616 GS-F22	40 CFR 60 Subpart A 40 CFR 60 Subpart JJJJ 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g) 391-3-1-.02(2)(mmm)	3.2.1, 3.3.1, 3.3.2, 3.3.3, 3.4.1, 3.4.2, 3.4.3, 3.5.3, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 5.2.1, 5.2.2, 6.1.7, 6.2.1, 6.2.2, 6.2.3	CAT1	Oxidation Catalyst System
IC02	IC Engine 2 GE Jenbacher J616 GS-F22	40 CFR 60 Subpart A 40 CFR 60 Subpart JJJJ 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g) 391-3-1-.02(2)(mmm)	3.2.1, 3.3.1, 3.3.2, 3.3.3, 3.4.1, 3.4.2, 3.4.3, 3.5.3, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 5.2.1, 5.2.2, 6.1.7, 6.2.1, 6.2.2, 6.2.3	CAT2	Oxidation Catalyst System
IC03	IC Engine 3 GE Jenbacher J616 GS-F22	40 CFR 60 Subpart A 40 CFR 60 Subpart JJJJ 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g) 391-3-1-.02(2)(mmm)	3.2.1, 3.3.1, 3.3.2, 3.3.3, 3.4.1, 3.4.2, 3.4.3, 3.5.3, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 5.2.1, 5.2.2, 6.1.7, 6.2.1, 6.2.2, 6.2.3	CAT3	Oxidation Catalyst System
PTS1	LFG Pretreatment System	391-3-1-.02(2)(b) 391-3-1-.02(2)(g)	3.2.1, 3.4.1, 3.4.2, 3.5.1, 3.5.2, 5.2.1, 5.2.3, 6.1.7, 6.2.2, 6.2.3	TO01	Thermal Oxidizer

B. Equipment & Rule Applicability

Emission and Operating Caps:

Emissions of NOx, CO, and VOC are limited from the MAS Georgia LFG (Oak Grove) equipment. The following table contains the emission limits for MAS Georgia LFG (Oak Grove) and the potential emissions from the landfill for these pollutants.

	NOx (tons/year)	CO (tons/year)	VOC (tons/year)
MAS Georgia LFG (Oak Grove)	98.4	93.4	22.5
Oak Grove Landfill	53.0	238.0	37.5
Total	151.4	331.4	59.7

Note that MAS Georgia LFG requested these specific numerical emission limits which were negotiated between MAS Georgia LFG and the landfill.

Rules and Regulations Assessment:

40 CFR 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Subpart JJJJ regulates emissions from spark ignition internal combustion engines where construction commences after June 12, 2006, and, for emergency generators, where the engine is manufactured on or after January 1, 2009.

The LFGTE engines at MAS Georgia are subject to NSPS Subpart JJJJ because they were constructed after January 1, 2009. The spark ignition (SI) engines are currently subject to the emission standards for landfill gas engines ≥ 500 HP manufactured after July 1, 2010. Permit Amendment 4911-013-0083-E-01-2 introduced the combustion of natural gas, therefore lower applicable emission standards would apply since the engines are classified as non-emergency natural gas SI engines greater than or equal to 500 HP manufactured after July 1, 2010.

A comparison between the NSPS Subpart JJJJ emissions standards for natural gas combustion engines, the manufacturer-provided controlled emission rates for the natural gas/LFG blend, and the 2018 emission rate from performance testing is as follows:

Pollutant	NSPS Subpart JJJJ Emissions Standard (g/hp-hr)	Manufacturer NG/LFG Emission Rate (g/hp-hr)	2018 Test Results [Highest of 3 units tested] (g/hp-hr)
NOx	1.0	0.60	0.60
CO	2.0	0.95	0.16
VOC	0.7	0.22	0.11

Based on the estimated emissions rate calculations and the historic site-specific stack test results for LFG combustion, Oak Grove expects the engines operating on the NG/LFG blend, with the associated control devices will be able to comply with the more stringent natural gas standards. The facility intends to demonstrate compliance with the applicable natural gas NSPS Subpart JJJJ standard during the next routine performance test.

40 CFR 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Subpart ZZZZ regulates emissions from reciprocating internal combustion engines at major and area sources of HAPs. This facility is a minor source of HAP emissions. In accordance with 40 CFR 63.6590(c)(1), compliance with Subpart ZZZZ will be shown by showing compliance with 40 CFR 60 Subpart JJJJ.

Georgia Rule 391-3-1-.02(2)(b) – Visible Emissions

This rule limits opacity to 40 percent from any air contaminant source, except as provided in other more restrictive or specific rules or subdivisions of the regulation. The engines and pretreatment system are subject to this regulation.

Georgia Rule (g) - Sulfur Dioxide

Rule (g) applies to all fuel burning sources. The fuel sulfur content limit for fuels burned is limited to 2.5 percent by weight, in accordance with Rule (g)2. Landfill gas and natural gas are the fuels that will be used in the facility which complies with Rule (g). The engines and pretreatment system are subject to this regulation.

391-3-1-.02(2)(mmm) – NOx Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity

Rule (mmm) applies to stationary engines used to generate electricity whose nameplate capacity is between 100 kilowatts (kW) and 25 megawatts (MW) located in the area around Atlanta including Barrow County. The engines at this facility are subject to the NOx limit in this rule during the ozone season.

C. Permit Conditions

Condition 3.2.1 contains NOx, CO, and VOC limits requested by the Permittee that apply to the entire power generation facility.

Condition 3.3.1 requires the Permittee to comply with all applicable provisions of the New Source Performance Standards (NSPS), 40 CFR 60, Subpart A, "General Provisions," and Subpart JJJJ, "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines for IC Engines 1 through 3.

Condition 3.3.2 contains the NOx, CO, and VOC limits that apply to the engines per NSPS Subpart JJJJ.

Condition 3.3.3 requires the Permittee to comply with all applicable provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63, Subpart A, "General Provisions," and Subpart ZZZZ, "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines," for the operation of IC Engines 1 through 3.

Conditions 3.4.1 and 3.4.2 contain the emission limits due to Georgia Rules (b) and (g).

Condition 3.4.3 contains the NOx limit that applies to the engine during the ozone season due to Georgia Rule (mmm).

Conditions 3.5.1 and 3.5.2 requires the use of the Thermal Oxidizer with the LFG Pretreatment System and sets a minimum operating temperature for the Thermal Oxidizer.

Condition 3.5.3 requires the use of the oxidation catalyst system for HAP major source avoidance.

IV. Testing Requirements (with Associated Record Keeping and Reporting)

A. General Testing Requirements

The permit includes a requirement that the Permittee conduct performance testing on any specified emission unit when directed by the Division. Additionally, a written notification of any performance test(s) is required 30 days (or sixty (60) days for tests required by 40 CFR Part 63) prior to the date of the test(s) and a test plan is required to be submitted with the test notification. Test methods and procedures for determining compliance with applicable emission limitations are listed and test results are required to be submitted to the Division within 60 days of completion of the testing.

B. Specific Testing Requirements

Condition 4.2.1 requires the Permittee to conduct performance tests for NOx, CO, and VOC emissions from IC Engines 1 through 3 (Source Codes IC01 through IC03) every 8,760 operating hours or 3 years, whichever comes first, to demonstrate compliance with the emission limits in Conditions 3.2.1 and 3.3.2.

Condition 4.2.2 requires that emission factors for NOx, VOC, and CO be determined whenever the IC engines are tested for Subpart JJJJ purposes. The emission factors are used to show compliance with the ton per year emission limits.

Condition 4.2.3 requires the Permittee to determine emission factors for NOx, CO, and VOC from each engine. The emission factors shall be in units of grams per horsepower-hour (g/hp-hr) and shall be submitted with the test report required by Condition 4.1.1.

Condition 4.2.4 requires the Permittee to conduct the initial performance tests for formaldehyde emissions from one of the IC Engines 1 through 3 (Source Codes IC01 through IC03) to confirm formaldehyde emissions from the facility is less than 10 typ. The tests must be performed within 180 days of issuance of the permit.

V. Monitoring Requirements

A. General Monitoring Requirements

Condition 5.1.1 requires that all continuous monitoring systems required by the Division be operated continuously except during monitoring system breakdowns and repairs. Monitoring system response during quality assurance activities is required to be measured and recorded. Maintenance or repair is required to be conducted in an expeditious manner.

B. Specific Monitoring Requirements

Condition 5.2.1 requires monitoring of various parameters including flow rate to the treatment system due to Subpart WWW, thermal oxidizer temperature monitor, catalyst temp monitor and hour meters on engines.

Condition 5.2.2 contains annual monitoring of the engines due to Georgia Rule (mmm).

Condition 5.2.3 requires the monthly hours of operation of the Thermal Oxidizer be recorded for purposes of determining the annual emissions for the facility in Condition 6.2.2.

C. Compliance Assurance Monitoring (CAM)

Not Applicable

VI. Record Keeping and Reporting Requirements

A. General Record Keeping and Reporting Requirements

The Permit contains general requirements for the maintenance of all records for a period of five years following the date of entry and requires the prompt reporting of all information related to deviations from the applicable requirements. Records, including identification of any excess emissions, exceedances, or excursions from the applicable monitoring triggers, the cause of such occurrence, and the corrective action taken, are required to be kept by the Permittee and reporting is required on a or semiannual basis.

B. Specific Record Keeping and Reporting Requirements

Conditions 6.2.1 requires the Permittee keep records of the information required in NSPS Subpart JJJJ.

Condition 6.2.2 and 6.2.3 require the determination of the monthly and 12-consecutive month total emissions of NOx, VOC, HAP, and CO for the facility.

VII. Specific Requirements

A. Operational Flexibility

None applicable.

B. Alternative Requirements

None applicable.

C. Insignificant Activities

See Permit Application on GEOS website.
See Attachment B of the permit

D. Temporary Sources

None applicable.

E. Short-Term Activities

None applicable.

F. Compliance Schedule/Progress Reports

None applicable.

G. Emissions Trading

None applicable.

H. Acid Rain Requirements

None applicable.

I. Stratospheric Ozone Protection Requirements

None applicable.

J. Pollution Prevention

None applicable.

K. Specific Conditions

None applicable.

VIII. General Provisions

Generic provisions have been included in this permit to address the requirements in 40 CFR Part 70 that apply to all Title V sources, and the requirements in Chapter 391-3-1 of the Georgia Rules for Air Quality Control that apply to all stationary sources of air pollution.

Template Condition 8.14.1 was updated in September 2011 to change the default submittal deadline for Annual Compliance Certifications to February 28.

Template Condition Section 8.27 was updated in August 2014 to include more detailed, clear requirements for emergency generator engines currently exempt from SIP permitting and considered insignificant sources in the Title V permit.

Template Condition Section 8.28 was updated in August 2014 to more clearly define the applicability of the Boiler MACT or GACT for major or minor sources of HAP.

Addendum to Narrative

The 30-day public review started on month day, year and ended on month day, year. Comments were/were not received by the Division.

//If comments were received, state the commenter, the date the comments were received in the above paragraph. All explanations of any changes should be addressed below.//