Prevention of Significant Air Quality Deterioration Review

Preliminary Determination

April 2012
Facility Name: Chambers R&B Landfill
City: Homer
County: Banks
AIRS Number: 04-13-011-00014
Application Number: 20161
Date Application Received – Air Permit Application Package (no modeling included): January 13, 2011 (revised May 19, 2011)
Date Application Received – Air Toxics Modeling May 5, 2011; Air Dispersion Modeling Report October 3, 2011

Review Conducted by:
State of Georgia - Department of Natural Resources
Environmental Protection Division - Air Protection Branch
Stationary Source Permitting Program

Prepared by: Tracey Hiltunen – Combustion Unit
Modeling Approved by: Yan Huang - Data and Modeling Unit
Reviewed and Approved by: Susan Jenkins – PSD Coordinator Hamid Yavari – Minerals Unit Coordinator Eric Cornwell – Stationary Source Permitting Program Manager James A. Capp – Chief, Air Protection Branch

SUMMARY

The Environmental Protection Division (EPD) has reviewed the application submitted by Chambers R&B Landfill for a permit to construct and operate a landfill gas to energy (LFGTE) facility at the existing landfill site, consisting of a landfill gas (LFG) treatment system and six internal combustion (IC) engines. The proposed project will treat the LFG for use in generating electricity. The treatment system will filter, de-water, and compress the LFG prior to use as fuel in the internal combustion engines. Each Caterpillar G3520C internal combustion engine is rated at 2,233 bhp with a heat input of 17.87 MMBtu/hr. The engines are designed to use the LFG as fuel with each generator set able to produce up to 1,600 kilowatts (kW) of electricity. The Chambers R&B Landfill application also includes the operation of a leachate concentrator in an alternative operating scenario. The landfill will have the flexibility to operate the IC engines either with or without the leachate concentrator. In this process the heat content from the exhaust gas from three of the engines is used to evaporate water in the leachate.

The modification of the Chambers R&B Landfill due to this project will result in an emissions increase in carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOC), sulfur dioxide (SO_2), particulate matter (PM), particulate matter with an aerodynamic diameter of ten microns or less (PM_{10}), particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), and greenhouse gases (GHGs). A Prevention of Significant Deterioration (PSD) analysis was performed for the project for all regulated NSR pollutants to determine if any increase was above the "significance" level. The CO, NOx, VOC, PM_{10}, and $PM_{2.5}$ emissions increase was above the PSD significant level threshold.

The Chambers R&B Landfill is located in Banks County, which is classified as "attainment" or "unclassifiable" for SO_2, $PM_{2.5}$ and PM_{10}, NO_2, and CO. Banks County is designated as an area contributing to the ambient air level of ozone in the metropolitan Atlanta ozone non-attainment area per Georgia Rule 391-3-1-.03(8)(e).

The EPD review of the data submitted by Chambers R&B Landfill related to the proposed modifications indicates that the project will be in compliance with all applicable state and federal air quality regulations.

It is the preliminary determination of the EPD that the proposal provides for the application of Best Available Control Technology (BACT) for the control of CO, NOx, VOC, PM_{10}, and $PM_{2.5}$, as required by federal PSD regulation 40 CFR 52.21(j).

It has been determined through approved modeling techniques that the estimated emissions will not cause or contribute to a violation of any ambient air standard or allowable PSD increment in the area surrounding the facility or in Class I areas located within 300 km of the facility. It has further been determined that the proposal will not cause impairment of visibility or detrimental effects on soils or vegetation. Any air quality impacts produced by project-related growth should be inconsequential.

This Preliminary Determination concludes that an Air Quality Permit should be issued to Chambers R&B Landfill for the modifications necessary to construct and operate the LFGTE facility. Various conditions have been incorporated into the current Title V operating permit to ensure and confirm compliance with all applicable air quality regulations. This Preliminary Determination also acts as a narrative for the Title V Permit.

1.0 INTRODUCTION – FACILITY INFORMATION AND EMISSIONS DATA

Chambers R&B Landfill submitted an application for an air quality permit to install a LFG treatment system and six internal combustion engines to use LFG to generate electricity. The facility is located at 610 Bennett Road in Homer, Banks County. The application was received on January 13, 2011. The application was found to be deficient upon submittal and the applicant resolved all of the deficiencies by October 3, 2011. Table 1-1 specifies the application date, application addendum dates, and associated Georgia EPD correspondence that comprise the PSD application record for this application number:

Table 1-1

Date	Description
1/13/2011	Submittal of Initial PSD Application
1/27/2011	EPD Acknowledgement Letter
2/24/2011	Letter from Georgia EPD to Applicant regarding modeling protocol
3/25/2011	Letter from Georgia EPD to Applicant to address application deficiencies
5/4/2011	Letter from Applicant to Georgia EPD requesting extension to respond to Georgia EPD's letter dated 3/25/2011.
5/4/2011	Copy of email between applicant and USDA Forest Service
5/5/2011	Applicant's submittal of Air Toxics Modeling Results
5/11/2011	Letter from Georgia EPD to Applicant granting extension request
5/19/2011	Submittal of Revised PSD Application and response to Georgia EPD letter dated 3/25/2011.
7/6/2011	Letter from Georgia EPD to Applicant proposing BACT limits
7/25/2011	Letter from Applicant to Georgia EPD regarding Georgia EPD letter dated 7/6/2011.
8/26/2011	Letter from Georgia EPD to Applicant regarding BACT
10/3/2011	Applicant's submittal of Air Dispersion Modeling Report
01/12/2012	Letter from Georgia EPD to Applicant regarding Air Impact Assessment and Air Toxics Assessment
02/22/12	Submittal of Revised Air Impact Assessment Application and response to Georgia EPD letter dated 1/12/2012.

Title V Applicability

Table 1-2 specifies the Title V Major source status of the facility upon installation and operation of the proposed project.

Table 1-2: 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	Yes			✓
PM_{10}	Yes			✓
SO_2	Yes			✓
VOC	Yes			✓
NO_x	Yes	✓		
CO	Yes	✓		
TRS	n/a			
H_2S	n/a			
Individual HAP	Yes	✓		

Total HAPs	Yes	✓		

Table 1-3 below lists all current Title V permits, all amendments, 502(b)(10) changes, and off-permit changes, issued to the facility, based on a review of the "Permit" file(s) on the facility found in the Air Branch office.

Table 1-3: List of Current Permits, Amendments, and Off-Permit Changes

Permit Number and/or Off-Permit Change	Date of Issuance/ Effectiveness	Purpose of Issuance
4953-011-0014-V-02-0	September 18, 2006	Title V renewal permit
4953-011-0014-V-02-1	September 22, 2009	502(b)(10) change to add 2,500 scfm flare (F3)
4953-011-0014-V-03-0	Pending	Title V renewal permit

PSD Applicability Analysis

The proposed modification to the Chambers R&B Landfill involves the construction and operation of new emission units. The first step is to determine if the existing site is a major source. A named major stationary source is any source belonging to a list of 28 named source categories in 40 CFR 52.21(b)(1) which emits or has the potential to emit 100 tons per year or more of any regulated NSR pollutant. A major stationary source is also any source not belonging to the 28 named source categories which emits or has the potential to emit such pollutants in amounts equal to or greater than 250 tons per year. The Chambers R&B Landfill is not a named source category and the landfill has a current potential to emit less than 250 tpy of all criteria pollutants.

Since the site is not currently a PSD major source, the next step is to evaluate if the project is major. Since the proposed emissions of CO from the project are greater than 250 tons per year, the project is considered major and therefore a PSD review is required for each pollutant for which the proposed project increases are greater than the PSD significance level.

Based on the proposed project description and data provided in the permit application, the estimated incremental increases of regulated pollutants from the facility are listed in Table 1-4 below:

Table 1-4: Emissions Increases from the Project

Pollutant	Potential Emissions Increase (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD Review
PM	22.29	25	No
PM_{10}	22.29	15	Yes
$PM_{2.5}$	22.26	10	Yes
VOC	84.34	40	Yes
NO_x	77.62	40	Yes
CO	534.32	100	Yes
SO_2	37.98	40	No
TRS	N/A	10	N/A
Pb	N/A	0.6	N/A
Fluorides	N/A	3	N/A
H_2S	N/A	10	N/A

Pollutant	Potential Emissions Increase (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD Review
H_2SO_4 (SAM)	N/A	7	N/A
GHGs*	336 (as CO_{2e})	75,000 (as CO_{2e})	No

*Based on a ruling signed by EPA on July 1, 2011 and published in the Federal Register on July 20, 2011 (Vol. 76, No. 139, page 43490), greenhouse gas (GHG) permitting requirements for carbon dioxide (CO_2) emissions from biomass-fired and other biogenic sources are deferred for a period of three years. During the next three years, the EPA will conduct a "study to consider technical issues that must be resolved in order to account for biogenic CO_2 emissions in ways that are scientifically sound and also manageable in practice." EPA will also develop "a final rule by the conclusion of the three year deferral period regarding how biogenic CO_2 emissions should be treated and accounted for in PSD and Title V permitting based on the feedback from the scientific and technical review." The CO_{2e} emission values do not include CO_2 emissions from biogenic sources.

Based on the information presented in Table 1-4 above, Chambers R&B Landfill's proposed modification, as specified per Application No. 20161, is classified as a major modification under PSD because the potential emissions of PM_{10}, $PM_{2.5}$, NOx, CO, and VOC exceed the PSD significant emissions rate thresholds. The net emissions increase for the project is equivalent to the potential emissions from the project as there are no contemporaneous projects to be considered in the net emissions increase analysis.

Through its new source review procedure, EPD has evaluated Chambers R&B Landfill's proposal for compliance with State and Federal requirements. The findings of EPD have been assembled in this Preliminary Determination.

2.0 PROCESS DESCRIPTION

According to Application No. 20161, Chambers R&B Landfill has proposed to construct a landfill gas to energy facility to use treated LFG as a fuel to generate electricity. Chambers R&B Landfill accepts municipal solid waste and deposits it into the ground before covering the waste with soil. Once the waste is covered, the material starts a process of decomposition, resulting in the formation of landfill gas, which is extracted and collected from the landfill in a gas extraction and collection header. The landfill gas is currently combusted in three open flares.

Chambers R&B Landfill is proposing the installation of a LFG treatment system and six Caterpillar G3520C internal combustion engines (SN01, SN02, SN03, SN04, SN05, and SN06), each powering an electrical generator. The treatment system will filter, de-water, and compress the LFG via a condensate knockout tank, blower, and a 10 micron filter prior to use as fuel in the internal combustion engines. Each Caterpillar G3520C internal combustion engine is rated at 2,233 bhp with a heat input of 17.87 MMBtu/hr. The engines are designed to use the LFG as fuel with each generator set able to produce up to 1,600 kilowatts (kW) of electricity. The three existing flares, currently used to combust the landfill gas, will serve as backup combustion devices once the LFGTE facility commences operation.

Chambers R&B Landfill is also proposing the operation of a leachate concentrator in an alternative operating scenario. The landfill will have the flexibility to operate the IC engines either with or without the leachate concentrator. In this process the heat content from the exhaust gas from three of the engines is used to evaporate water in the leachate. When the leachate concentrator is in operation, 100 percent of the exhaust from IC engines SN01 and SN02 and approximately 50 percent of the exhaust from IC engine SN03 is directed through the leachate concentrator. None of the exhaust from IC engines SN04, SN05, and SN06 will be directed through the leachate concentrator.

The Chambers R&B Landfill permit application and supporting documentation can be found online at www.georgiaair.org/airpermit.

3.0 REVIEW OF APPLICABLE RULES AND REGULATIONS

State Rules

Georgia Rule for Air Quality Control (Georgia Rule) 391-3-1-.03(1), Construction Permit**,** requires that any person prior to beginning the construction or modification of any facility which may result in an increase in air pollution shall obtain a permit for the construction or modification of such facility from the Director upon a determination by the Director that the facility can reasonably be expected to comply with all the provisions of the Act and the rules and regulations promulgated thereunder. Georgia Rule 391-3-1-.03(8)(b) continues that no permit to construct a new stationary source or modify an existing stationary source shall be issued unless such proposed source meets all the requirements for review and for obtaining a permit prescribed in Title I, Part C of the Federal Act [i.e., Prevention of Significant Deterioration of Air Quality (PSD)], and Section 391-3-1-.02(7) of the Georgia Rules (i.e., PSD).

Georgia Rule 391-3-1-.02(2)(b), Visible Emissions, limits the opacity of visible emissions from any air contaminant source, which is subject to some other emission limitation under 391-3-1-.02(2). The opacity of visible emissions from regulated sources may not exceed 40 percent under this general visible emission standard. The IC engines are subject to an emission standard in Rule 391-3-1-.02(2) and are therefore subject to the opacity standard specified by Georgia Rule 391-3-1-.02(2)(b). It is anticipated that the opacity of all emissions from the proposed IC engines will be well below 40 percent at all times.

Georgia Rule 391-3-1-.02(2)(g), Sulfur Dioxide, applies to all fuel-burning sources. In accordance with 391-3-1-.02(2)(g)2., all fuel burning equipment rated less than 100 MMBtu per hour shall not burn fuel containing more than 2.5 percent sulfur by weight. The proposed IC engines rated at 17.87 MMBtu per hour will burn landfill gas, which has a sulfur content less than 2.5 percent.

Georgia Rule 391-3-1-.02(2)(mmm), NOx Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity, limits NOx emissions from stationary engines with an electrical generating capacity greater than or equal to 100 kilowatts (kW) and less than or equal to 25 megawatts (MWe). Since the IC engines fall within this range and will be installed in Banks County, NOx emissions are limited to 80 ppm @ 15 percent O_2, on a dry basis, from May 1 through September 30 of each year.

Compliance with the above state rules is expected. As discussed in Section 4.0, the PSD BACT limits are all at least as stringent as, and in most cases are significantly more stringent than the state rules.

Georgia Rule 391-3-1-.08(c)15. – Additional Provisions for Electrical Generating Units Located in Areas Contributing to the Ambient Air Level of Ozone in the Metropolitan Atlanta Ozone Non-Attainment Area does not apply, in this case, because the proposed IC engines are not classified as "electrical generating units" per Rule 391-3-1-.08(c)15(vii).

Federal Rule - PSD

The regulations for PSD in 40 CFR 52.21 require that any new major source or modification of an existing major source be reviewed to determine the potential emissions of all pollutants subject to regulations under the Clean Air Act. The PSD review requirements apply to any new or modified source which belongs to one of 28 specific source categories having potential emissions of 100 tons per year or more of any regulated pollutant, or to all other sources having potential emissions of 250 tons per year or more of any regulated pollutant. They also apply to any modification of a major stationary source which results in a significant net emission increase of any regulated pollutant.

Georgia has adopted a regulatory program for PSD permits, which the United States Environmental Protection Agency (EPA) has approved as part of Georgia's State Implementation Plan (SIP). This regulatory program is located in the Georgia Rules at 391-3-1-.02(7). This means that Georgia EPD issues PSD permits for new major sources pursuant to the requirements of Georgia's regulations. It also

means that Georgia EPD considers, but is not legally bound to accept, EPA comments or guidance. A commonly used source of EPA guidance on PSD permitting is EPA's Draft October 1990 New Source Review Workshop Manual for Prevention of Significant Deterioration and Nonattainment Area Permitting (NSR Workshop Manual). The NSR Workshop Manual is a comprehensive guidance document on the entire PSD permitting process.

The PSD regulations require that any major stationary source or major modification subject to the regulations meet the following requirements:

- Application of BACT for each regulated pollutant that would be emitted in significant amounts;
- Analysis of the ambient air impact;
- Analysis of the impact on soils, vegetation, and visibility;
- Analysis of the impact on Class I areas; and
- Public notification of the proposed plant in a newspaper of general circulation

Definition of BACT

The PSD regulation requires that BACT be applied to all regulated air pollutants emitted in significant amounts. Section 169 of the Clean Air Act defines BACT as an emission limitation reflecting the maximum degree of reduction that the permitting authority (in this case, EPD), on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such a facility through application of production processes and available methods, systems, and techniques. In all cases BACT must establish emission limitations or specific design characteristics at least as stringent as applicable New Source Performance Standards (NSPS). In addition, if EPD determines that there is no economically reasonable or technologically feasible way to measure the emissions, and hence to impose and enforceable emissions standard, it may require the source to use a design, equipment, work practice or operations standard or combination thereof, to reduce emissions of the pollutant to the maximum extent practicable.

EPA's NSR Workshop Manual includes guidance on the 5-step top-down process for determining BACT. In general, Georgia EPD requires PSD permit applicants to use the top-down process in the BACT analysis, which EPA reviews. The five steps of a top-down BACT review procedure identified by EPA per BACT guidelines are listed below:

Step 1: Identification of all control technologies;
Step 2: Elimination of technically infeasible options;
Step 3: Ranking of remaining control technologies by control effectiveness;
Step 4: Evaluation of the most effective controls and documentation of results; and
Step 5: Selection of BACT.

The following is a discussion of the applicable federal rules and regulations pertaining to the equipment that is the subject of this preliminary determination, which is then followed by the top-down BACT analysis.

New Source Performance Standards

40 CFR 60 Subpart A - General Provisions, imposes generally applicable requirements for initial notifications, initial compliance testing, monitoring, and record keeping requirements.

***40 CFR 60 Subpart WWW – Standards of Performance for Municipal Solid Waste Landfills*:** Chambers R&B Landfill is subject to the requirements 40 CFR 60 Subpart WWW. According to 40 CFR 60.752(b)(2)(iii), landfills may route the collected gases to a landfill gas treatment system that processes the gas prior to sale or use. The control system for the proposed LFGTE facility will be a landfill gas treatment system.

The preamble to EPA's May 23, 2002 proposed rulemaking includes the following statements about the proposed definition of "treatment system": "At a minimum, the system must filter landfill gas using a dry filter or similar device…the filter should reduce particulate matter….In addition, the system must de-water landfill gas using chillers or other dehydration equipment.… Finally, the system must compress landfill gas using gas blowers…" In the proposed amendment to Subpart WWW (Federal Register/Vol. 71, No. 174/Friday, September 8, 2006/Proposed Rules, pages 53272-53293), a supplemental proposed definition of treatment system is presented: "a system that has an absolute filtration rating of 10 microns or less, lowers the water dew point of the landfill gas by at least 20 degrees Fahrenheit with a dewatering process, and compresses the landfill gas. EPA also clarifies its position on gas treatment: "Once landfill gas is treated, facilities that buy or use the gas have no further obligation related to the NSPS." Therefore, since the landfill is treating the landfill gas prior to burning it, the six IC engines are not subject to the emission standards or monitoring requirements of Subpart WWW.

***40 CFR 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*:** Applies to lean burn engines, combusting landfill gas, with a maximum engine power greater than or equal to 500 HP for which the owner commenced construction after June 12, 2006 and the manufacture date of the engine is July 1, 2007 or later. The IC engines are subject to this rule since the construction date is 2011 and the engines are rated at 2,233 hp. Emission standards from Table 1 of 40 CFR Part 60 Subpart JJJJ for NOx, CO, and VOC are given in the table below.

Engine type and fuel	Maximum engine power	Manufacture date	Emission Standards[a]					
			g/HP-hr			ppmvd at 15% O_2		
			NOx	CO	VOC	NOx	CO	VOC
Landfill/Digester	HP $\geq$ 500	7/1/2010	2.0	5.0	1.0	150	610	80

[a]Owners of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O_2.

The NOx, CO, and VOC emission limits required by the PSD BACT requirements subsume NOx, CO, and VOC emission limits required by NSPS Subpart JJJJ. Compliance with the NOx, CO, and VOC emission limit is determined through performance testing.

National Emissions Standards For Hazardous Air Pollutants

40 CFR Part 63, Subpart A: This regulation contains national emission standards for hazardous air pollutants (NESHAP) established pursuant to section 112 of the Act as amended November 15, 1990. These standards regulate specific categories of stationary sources that emit (or have the potential to emit) one or more hazardous air pollutants (HAPs) listed in this part pursuant to section 112(b) of the Act. The standards in this part are independent of NESHAP contained in 40 CFR 61. The NESHAP in part 61 promulgated by signature of the Administrator before November 15, 1990 (i.e., the date of enactment of the Clean Air Act Amendments of 1990) remain in effect until they are amended, if appropriate, and added to 40 CFR 63 [40 CFR 63.1(a)(1) and (2)]. No emission standard or other requirement established under 40 CFR 63 shall be interpreted, construed, or applied to diminish or replace the requirements of a more stringent emission limitation or other applicable requirement established by the Administrator pursuant to other authority of the Act (section 111, part C or D or any other authority of this Act), or a standard issued under State authority. The Administrator may specify in a specific standard under this part

that facilities subject to other provisions under the Act need only comply with the provisions of that standard. [40 CFR 63.1(a)(3)]

According to Application Number 20161, the proposed modification will result in an increase in HAP emissions. Potential HAP emissions from this project will exceed the applicable major source thresholds of 10 tons for a single HAP and/or 25 tons per year for a combination of HAPs. The Chambers R&B Landfill becomes a major source for HAP with this modification.

40 CFR 63 Subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills: Chambers R&B Landfill is currently subject to the requirements of 40 CFR 63 Subpart AAAA, because the landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) of NMOC. The facility will continue to meet the requirements of this rule, which is to develop and implement a written SSM (startup, shutdown and malfunction) plan in accordance with 40 CFR 63.6(e)(3) and maintain a copy of its SSM plan on site.

Proposed Equipment – IC Engines burning LFG: The definition of municipal solid waste landfill in 40 CFR 63.1990 does not appear to include a leachate concentrator. Therefore, the Division has concluded that these requirements are not applicable to the proposed leachate concentrator.

Proposed Equipment – Leachate Concentrator: The definition of municipal solid waste landfill in 40 CFR 63.1990 does not appear to include a leachate concentrator. Therefore, the Division has concluded that these requirements are not applicable to the proposed leachate concentrator.

40 CFR 63 Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines: Establishes emission and operating limitations for HAP from RICE located at major and area sources of HAP emissions. The Chambers R&B Landfill becomes a major source for HAP with this modification.

A new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, combusting landfill gas equivalent to 10 percent or more of the gross heat input on an annual basis must meet the initial notification requirements of 40 CFR 63.6645(f) and the reporting and record keeping requirements of 40 CFR 63.6625(c), 63.6650(g), and 63.6655(c). The IC engines do not have to meet the emission limits and operating limitations of this subpart. The proposed IC engines, located at a major source of HAP, are new since construction commenced after December 19, 2002.

40 CFR 63 Subpart B, 112(g) (Case-by-Case MACT): A regulatory analysis was performed to determine if the leachate concentrator was subject to case-by-case MACT. The proposed leachate concentrator will receive input from up to three new IC engines. Since the proposed project is subject to 40 CFR 63 Subpart ZZZZ, 63 Subpart B, 112(g) is not an applicable requirement for the leachate concentrator**.**

Compliance Assurance Monitoring

40 CFR Part 64, Compliance Assurance Monitoring [CAM]: The CAM Plans provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation applies to units that use a control device to achieve compliance with an emission limit and whose pre-controlled emissions levels exceed the major source thresholds under the Title V permitting program. Although other units may potentially be subject to CAM upon renewal of the Title V operating permit, such units are not being modified under the proposed project and need not be considered for CAM applicability at this time. Therefore, this applicability evaluation only addresses the six new IC engine generator sets, which does not employ any air pollution control devices; therefore, the CAM requirements are not triggered by the proposed modification.

40 CFR 98, Greenhouse Gas (GHG) Reporting Program: In response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), EPA issued the Mandatory Reporting of Greenhouse Gases Rule (74 FR 5620) which requires reporting of greenhouse gas (GHG) data and other relevant information from large sources and suppliers in the United States. The purpose of this rule is to collect accurate and timely GHG data to inform future policy decisions. In general, the Rule is referred to as 40 CFR Part 98. Implementation of Part 98 is referred to as the Greenhouse Gas Reporting Program (GHGRP). The GHGRP is not an applicable requirement for the applicant's PSD/Title V amendment and is therefore not included.

Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule

On June 3, 2010 (75 FR 31514-31608), the U.S. EPA issued a final rule that establishes an approach to addressing greenhouse gas emissions from stationary sources under the Clean Air Act (CAA) permitting programs. This final rule sets thresholds for GHG emissions that define when permits under the New Source Review PSD and Title V Operating Permit programs are required for new and existing industrial facilities.

The CAA permitting program emissions thresholds for criteria pollutants such as lead, sulfur dioxide and nitrogen dioxide, are 100 and 250 tpy. While these thresholds are appropriate for criteria pollutants, they are not feasible for GHGs because GHGs are emitted in much higher volumes.

The final rule addresses emissions of a group of six GHGs:

1. Carbon dioxide (CO_2)
2. Methane (CH_4)
3. Nitrous oxide (N_2O)
4. Hydrofluorocarbons (HFCs)
5. Perfluorocarbons (PFCs)
6. Sulfur hexafluoride (SF_6)

Some of these GHGs have a higher global warming potential than others. To address these differences, the international standard practice is to express GHGs in carbon dioxide equivalents (CO_{2e}). Emissions of gases other than CO_2 are translated into CO_{2e} by using the gases' global warming potentials. Under this rule, EPA is using CO_{2e} as the metric for determining whether sources are covered under permitting programs. Total GHG emissions will be calculated by summing the CO_{2e} emissions of the six aforementioned constituent GHGs.

EPA will phase in the CAA permitting requirements for GHGs in two initial steps. Step 1, which took effect on January 2, 2011, pertains only to sources currently subject to the PSD permitting program (i.e., those that are newly constructed or modified in a way that significantly increases emissions of a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD.

Step 2, which took effect on July 1, 2011, pertains to all sources with emissions of regulated NSR pollutants including GHGs above the major source threshold and/or significant emission rates. Sources that have a PTE of at least 100,000 tpy CO_{2e} and an increase of 75,000 tpy or more of total GHG, on a CO_{2e} basis (excluding CO_2 emissions for biogenic source deferral[1]) are subject to PSD review.

[1] Based on a ruling signed by U.S. EPA on July 1, 2011 and published in the Federal Register on July 20, 2011 (Vol. 76, No. 139, page 43490), GHG permitting requirements for CO_2 emissions from biomass-fired and other biogenic sources are deferred for a period of three years. During the next three years, the EPA will conduct a "study to consider technical issues that must be resolved in order to account for biogenic CO_2 emissions in ways that are scientifically sound and also manageable in practice." EPA will also develop "a final rule by the conclusion of the three year deferral period regarding how biogenic CO_2 emissions should be treated and accounted for in PSD and Title V permitting based on the feedback from the scientific and technical review."

Currently, potential GHG emissions from the Chambers R&B Landfill are less then 100,000 tpy CO_{2e}[2]. The increase in GHG emissions from the modification is less than 75,000 tpy CO_{2e}. Since emissions of GHG are below the significant major source thresholds, a Best Available Control Technology (BACT) review is not required for GHG emissions.

State and Federal – Startup and Shutdown and Excess Emissions

Excess emission provisions for startup, shutdown, and malfunction are provided in Georgia Rule 391-3-1-.02(2)(a)7. NSPS emission standards are not covered by these provisions; instead, startup and shutdown emissions are addressed within the NSPS standards themselves. In NSPS 40 CFR 60.8(c), it states "Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test, nor shall emission in excess of the level of the applicable emission limits during periods of startup, shutdown and malfunction be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard." This is applicable to the IC engines subject to 40 CFR 60 Subpart JJJJ.

The IC engines are expected to remain in operation for long periods without interruption; however, the number of startups per year will be based on the flow of landfill gas and engine maintenance. The requirements of PSD apply during all periods of operation including startup and shutdown. The applicant states that the IC engines will not exceed the PSD BACT limits during startup and shutdown.

[2] Does not include biogenic CO_2 emissions.

4.0 CONTROL TECHNOLOGY REVIEW

The proposed project will result in emissions that are significant enough to trigger PSD review for the following pollutants: CO, NOx, VOC, PM_{10}, and $PM_{2.5}$.

Internal Combustion Engines

The six new IC engines are Caterpillar G3520C lean-burn, four-stroke, turbocharged, after cooled units equipped with air to fuel ratio control for lower emissions and engine efficiency. Each engine is rated at 2,233 bhp with a heat input of 17.87 MMBtu/hr.

Carbon Monoxide (CO) Emissions

Applicant's Proposal

Please refer to pages 5-2 through 5-4 of the application for the detailed CO BACT analysis.

Step 1: Identify all control technologies

- Catalytic oxidation
- Good combustion techniques

Step 2: Eliminate technically infeasible options

Catalytic oxidation is considered technologically infeasible for IC engines using LFG as fuel because siloxanes in the LFG are known to foul the post combustion catalyst.

Step 3: Rank remaining technologies by control effectiveness

The only control technology that is considered technically feasible is good combustion techniques, which includes lean burn design, air to fuel ratio controllers, and good combustion practices.

Step 4: Evaluate most effective controls and document results

Good combustion techniques are the most effective controls for this project.

Step 5: Select BACT

Chambers R&B Landfill proposes the utilization of good combustion techniques including lean burn design, air to fuel ratio controllers, and good combustion practices to control CO emissions from the IC engines as BACT. The applicant proposed a BACT limit for CO emissions for each IC engine as 4.13 g/bhp-hr based on Caterpillar vendor "Not-To Exceed" CO data.

EPD Review – CO Control

In addition to reviewing the permit application and supporting documentation, the Division has performed independent research of the CO BACT analysis and used the following resources and information:

- USEPA RACT/BACT/LAER Clearinghouse
- Final Permit, Technical Evaluation & Preliminary Determination, and Final Determination for Medley Landfill, Florida.
- White Paper – Revisiting BACT for Lean Burn Landfill Gas Fired Internal Combustion Engines, Bay Area Air Quality Management District, February 26, 2009

Chambers searched the RACT/BACT/LAER Clearinghouse (RBLC) database and its findings are included in the table on page 5-3 of Application 20161. The Division conducted its own review of the RBLC and the results of the Division's findings are located in the back of this document.

A review of the data in the RBLC database indicates that one facility has recently proposed the use of an oxidation catalyst to control CO emissions.[3] Landfill gas engines in all previous determinations did not utilize any post combustion controls. Good combustion techniques including lean burn design, air to fuel ratio controllers, and good combustion practices were determined to be BACT. Although the use of an oxidation catalyst has been proposed at the Cinnamon Bay/Edgeboro Disposal facility in New Jersey, the Division has determined that the use of good combustion techniques is BACT for the proposed engines.

Based on the RBLC research conducted by the Division, a range of 2.5 – 3.5[4] g/bhp-hr was found. The Division is concerned that these IC engines cannot demonstrate continued compliance with the 2.75 g/bhp-hr CO emission limit listed by several facilities in the RACT/BACT/LAER Clearinghouse. The Caterpillar Gas Engine Technical Data Sheet quotes a nominal CO emission rate of 2.5 g/bhp-hr, which is representative of a new engine during the first 100 hours of operation. It also quotes a not to exceed value of 4.13 g/bhp-hr. The Bay Area Air Quality Management District recommends a CO BACT limit of 2.1 g/bhp-hr (NTE 3.6 g/bhp-hr) for engines that are predisposed to achieving low CO levels and higher NOx emissions and 2.5 g/bhp-hr (NTE 3.9 g/bhp-hr) for engines that are predisposed to achieving low NOx levels and higher CO emissions.

Based on the available information, the Division is establishing a BACT emission limit of 3.5 g/bhp-hr, which is more stringent than the 40 CFR 60 Subpart JJJJ emission limit of 5.0 g/bhp-hr and the proposed limit of 4.13 g/bhp-hr. The applicant is to meet this limit at all times including periods of startup and shutdown.

EPD CO BACT Selection: The Division has determined that the proposal to use good combustion techniques including lean burn design, air to fuel ratio controllers, and good combustion practices meets the requirement for BACT. The Division has determined BACT to be 3.5 g/bhp-hr on a 3-hour average.

Nitrogen Oxides (NOx) Emissions

Applicant's Proposal

Please refer to pages 5-4 through 5-8 of the application for the detailed NOx BACT analysis.

Step 1: Identify all control technologies

- SCR
- NSCR
- Siloxane removal followed by SCR
- Good combustion techniques (Lean burn design, Air to fuel ratio controllers, and good combustion practices)

Step 2: Eliminate technically infeasible options

Siloxane removal followed by SCR and NSCR, are considered technologically infeasible for IC engines because siloxanes in the LFG are known to foul the post combustion catalyst.

[3] Proposed in RBLC ID: NJ-0078 (draft) for Cinnamon Bay/Edgeboro Disposal, Determination last updated on October 21, 2011.

[4] Proposed in RBLC ID: FL-0326 (draft) for Medley Landfill, Determination last updated on September 21, 2011.

Step 3: Rank remaining technologies by control effectiveness

The only control technology that is considered technically feasible is good combustion techniques, which includes lean burn design, air to fuel ratio controllers, and good combustion practices.

Step 4: Evaluate most effective controls and document results

Good combustion techniques are the most effective controls for this project.

Step 5: Select BACT

Chambers R&B Landfill proposes the utilization of good combustion techniques including lean burn design, air to fuel ratio controllers, and good combustion practices to control NOx emissions from the IC engines as BACT. The applicant proposed a BACT limit for NOx emissisons from each IC engine as 0.6 g/bhp-hr based on information provided by the vendor.

EPD Review – NOx Control

In addition to reviewing the permit application and supporting documentation, the Division has performed independent research of the NOx BACT analysis and used the following resources and information:

- USEPA RACT/BACT/LAER Clearinghouse
- Final Permit, Technical Evaluation & Preliminary Determination, and Final Determination for Medley Landfill, Florida.
- White Paper – Revisiting BACT for Lean Burn Landfill Gas Fired Internal Combustion Engines, February 26, 2009

Chambers searched the RACT/BACT/LAER Clearinghouse (RBLC) database and its findings are included in the table on page 5-6 of Application 20161. The Division conducted its own review of the RBLC and the results of the Division's findings are located in the back of this document.

Based on the RBLC research conducted by the Division, a range of 0.5 – 0.6 g/bhp-hr was found. The Caterpillar Gas Engine Technical Data Sheet quotes a NOx emission rate of 0.5 g/bhp-hr with tolerances of +/- 18 percent of the specified value, which is 0.6 g/bhp-hr. Therefore, the Division will establish 0.6 g/bhp-hr as BACT for the proposed engines, which is more stringent than the 40 CFR 60 Subpart JJJJ emission limit of 2.0 g/bhp-hr and the Georgia Rule (mmm) limit of 80 ppm @ 15 percent O_2. The applicant is to meet this limit at all times including periods of startup and shutdown.

EPD NOx BACT Selection: The Division has determined that the proposal to use good combustion practices including lean burn design, air to fuel ratio controllers, and good combustion practices and an emission limit of 0.6 g/bhp-hr on a 3-hour average meets the requirement for BACT.

VOC Emissions

Applicant's Proposal

Please refer to pages 5-11 through 5-13 of the application for the detailed VOC BACT analysis.

Step 1: Identify all control technologies

- Catalytic oxidation
- Good combustion techniques

Step 2: Eliminate technically infeasible options

Catalytic oxidation is considered technologically infeasible for IC engines using LFG as fuel because siloxanes in the LFG are known to foul the post combustion catalyst.

Step 3: Rank remaining technologies by control effectiveness

The only control technology that is considered technically feasible is good combustion techniques, which includes lean burn design, air to fuel ratio controllers, and good combustion practices.

Step 4: Evaluate most effective controls and document results

Good combustion techniques are the most effective controls for this project.

Step 5: Select BACT

Chambers R&B Landfill proposes the utilization of good combustion techniques including lean burn design, air to fuel ratio controllers, and good combustion practices to control VOC emissions from the IC engines as BACT. The proposed BACT limit for VOC emissions from each IC engine is 1.0 g/bhp-hr as required by 40 CFR 60 Subpart JJJJ.

EPD Review – VOC Control

In addition to reviewing the permit application and supporting documentation, the Division has performed independent research of the VOC BACT analysis and used the following resources and information:

- USEPA RACT/BACT/LAER Clearinghouse
- Operating Permit for Ridgewood Power Management LLC, Rhode Island
- Operating Permit for Manchester Renewable Power Corp., New Jersey

Chambers searched the RACT/BACT/LAER Clearinghouse (RBLC) database and its findings are included in the table on page 5-6 of Application 20161. The Division conducted its own review of the RBLC and the results of the Division's findings are located in the back of this document.

A review of the data in the RBLC database indicates that landfill gas engines in previous determinations did not utilize any post combustion controls. Good combustion techniques including lean burn design, air to fuel ratio controllers, and good combustion practices were determined to be BACT. The Division has determined that the use of good combustion techniques is BACT for the proposed engines.

Based on the RBLC research conducted by the Division, a range of 0.16 – 0.8 g/bhp-hr was found. Note that these emission rates do not include emissions of formaldehyde. The Division has determined that the BACT emission limit should be more stringent than the emission limit of 1.0 g/bhp-hr required by 40 CFR Subpart JJJJ as proposed by the applicant. Therefore, the Division derived a VOC BACT emission rate of 0.652 g/bhp-hr, which includes formaldehyde emissions. See calculation below. The applicant is to meet this limit at all times including periods of startup and shutdown.

$$\left(\frac{3.21lb}{hr}\right)\left(\frac{engine}{2{,}233bhp}\right)\left(\frac{453.6g}{lb}\right)=\frac{0.652lb}{MMBtu}$$

EPD VOC BACT Selection: The Division has determined that the proposal to use good combustion techniques including lean burn design, air to fuel ratio controllers, and good combustion practices and an emission limit of 0.652 g/bhp-hr on a 3-hour average meets the requirement for BACT.

PM_{10} and $PM_{2.5}$ Emissions

Emissions of PM_{10} and $PM_{2.5}$ result from noncombustible solids contained in the fuel and products of incomplete combustion. The regulated NSR pollutant for PM_{10} and $PM_{2.5}$ is the filterable portion plus the condensable portion.

Applicant's Proposal

Please refer to pages 5-8 through 5-11 of the application for the detailed PM_{10} and $PM_{2.5}$ BACT analysis.

Step 1: Identify all control technologies

- Flue gas treatment such as electrostatic precipitator, fabric filters, or wet scrubber
- Good combustion practices including pretreatment of LFG and proper operation and maintenance of the IC engines

Step 2: Eliminate technically infeasible options

The flue gas treatments (i.e. electrostatic precipitator, fabric filters, or wet scrubber) are not feasible because there is insufficient particulate matter in the exhaust to warrant the use of these controls.

Step 3: Rank remaining technologies by control effectiveness

The only control technology that is considered technically feasible is good combustion techniques including pretreatment of the LFG and proper operation and maintenance of the engines.

Step 4: Evaluate most effective controls and document results

Good combustion techniques including pretreatment of the LFG and proper operation and maintenance of the engines are the most effective controls for this project.

Step 5: Select BACT

Chambers R&B Landfill proposes the utilization of good combustion techniques including pretreatment of the LFG and proper operation and maintenance of the engines to control PM_{10} and $PM_{2.5}$ emissions from the IC engines as BACT.

EPD Review – PM_{10} and $PM_{2.5}$ Control

In addition to reviewing the permit application and supporting documentation, the Division has performed independent research of the PM_{10} and $PM_{2.5}$ BACT analysis and used the following resources and information:

- USEPA RACT/BACT/LAER Clearinghouse
- USEPA AP-42, 3.2 Natural Gas-fired Reciprocating Engines, 7/2000
- USEPA AP-42, 3.3 Gasoline And Diesel Industrial Engines, 10/1996

Chambers searched the RACT/BACT/LAER Clearinghouse (RBLC) database and its findings are included in the table on page 5-6 of Application 20161. The Division conducted its own review of the RBLC and the results of the Division's findings are located in the back of this document. Note that particulate matter emission rates found in the RBLC may only represent the filterable portion of particulate matter.

The applicant did not address "smoke" or visible emissions (VE) from the IC engines in the PM_{10} and $PM_{2.5}$ BACT analysis. According to AP-42 Section 3.3, IC engines may emit blue and black smoke, which indicate problems with the operation of the engine. Blue smoke is emitted when lubricating oil leaks, often past worn piston rings, into the combustion chamber and is partially burned. The primary constituent of black smoke is agglomerated carbon particles (soot) formed in regions of the combustion mixtures that are oxygen deficient. Proper maintenance is the most effective method of preventing smoke emissions.

A review of the data in the RBLC database indicates that landfill gas engines in previous determinations did not utilize any post combustion controls. Good combustion practices and proper engine maintenance practices were determined to be BACT. The Division has determined that the use of good combustion techniques and engine maintenance is BACT for the proposed engines.

Based on the RBLC research conducted by the Division, a range of 0.1 – 0.2 g/bhp-hr was found. The applicant did not propose a PM_{10} and $PM_{2.5}$ emission limit. Therefore, the Division derived a PM_{10} and $PM_{2.5}$ BACT emission rate of 0.172 g/bhp-hr. See calculation below. The applicant is to meet this limit at all times including periods of startup and shutdown.

$$\left(\frac{0.848lb}{hr}\right)\left(\frac{engine}{2{,}233bhp}\right)\left(\frac{453.6g}{lb}\right)=\frac{0.172g}{bhp-hr}$$

EPD PM_{10} and $PM_{2.5}$ BACT Selection: The Division has determined that the proposal to use good combustion practices including pretreatment of the LFG and proper operation and maintenance of the engines and an emission limit of 0.172 g/bhp-hr on a 3-hour average meets the requirement for BACT.

PSD Avoidance for Sulfur Dioxide

Sulfur dioxide (SO_2) emissions are generated by the combustion of landfill gas. The amount of SO_2 can vary depending on the concentration of reduced sulfur compounds within the landfill gas itself.

Potential emissions of SO_2 are 37.98 tpy, which is just below the 40 tpy PSD significant emission threshold. In order to ensure that emissions remain below 40 tpy, the Division derived a SO_2 PSD avoidance limit of 1.52 lb/hr. See calculation below.

$$\left(\frac{39.9ton}{yr}\right)\left(\frac{2{,}000lb}{ton}\right)\left(\frac{year}{8{,}760hrs}\right)\left(\frac{1}{6engines}\right)=\frac{1.52lb}{hr}$$

5.0 TESTING AND MONITORING REQUIREMENTS

Testing Requirements:

Emission sources at the Chambers R&B Landfill are subject to testing requirements under PSD/NSR/BACT and NSPS Subpart JJJJ as discussed below.

40 CFR 60 Subpart JJJJ: The NSPS requires the facility to conduct initial performance tests on the IC engines, within 180 days of startup, to demonstrate compliance with the applicable CO, NOx, and VOC (excluding formaldehyde), emission limits. Applicable test methods to be used include Method 10, Method 7E, Method 18, and Method 25A. Subsequent performance testing is required every 8,760 hours of operating time or 3 years, whichever comes first.

PSD/NSR/BACT: The IC engines are subject to BACT requirements for CO, NOx, VOC, PM_{10}, and $PM_{2.5}$ emissions. There is a BACT avoidance limit for SO_2 emissions. The facility shall conduct performance tests to demonstrate compliance with the BACT and BACT avoidance limits using the applicable test methods including Method 10, Method 7E, Method 18 and Method 25A, Method 323, Method 5 in conjunction with Method 202, and Method 6C.

CO and NOx Emission Limits – Performance testing conducted to demonstrate compliance with NSPS Subpart JJJJ satisfies the testing requirement for demonstrating compliance with the CO and NOx BACT emission limits.

VOC Emission Limits – The VOC BACT emission limit includes formaldehyde emissions. The facility may use the performance testing conducted to demonstrate compliance with NSPS Subpart JJJJ as part of their demonstration to comply with the VOC BACT limit. However, the facility will also be required to conduct performance testing to determine formaldehyde emissions. Performance testing requirements for formaldehyde emissions shall follow the same schedule as NSPS Subpart JJJJ testing, which requires an initial performance test and subsequent performance testing every 8,760 hours of operating time or 3 years, whichever comes first.

PM_{10} and $PM_{2.5}$ Emission Limits - The facility is required to conduct initial performance tests on the IC engines, within 180 days of startup, to demonstrate compliance with the PM_{10} and $PM_{2.5}$ PSD emission limits. Subsequent performance testing is required every 5 years.

SO_2 Emission Limits – The facility is required to conduct initial performance tests on the IC engines, within 180 days of startup, to demonstrate compliance with the SO_2 PSD avoidance limit. Subsequent performance testing is required every 5 years.

Monitoring Requirements:

Emission sources and control devices at the Chambers R&B Landfill are subject to monitoring requirements under PSD/BACT, NSPS Subpart WWW, NSPS JJJJ, NESHAP Subpart ZZZZ, and applicable State Rules as discussed below.

40 CFR 60 Subpart WWW: The facility must install instrumentation to measure the landfill gas flow rate to the gas treatment system and monitor the parameters specified in the approved treatment system monitoring plan.

40 CFR 60 Subpart JJJJ: The facility must install non-resettable hour meters to track operating hours for conducting required performance tests on the IC engines.

40 CFR 63 Subpart ZZZZ: The facility must install instrumentation to measure the landfill gas flow rate to each IC engine to comply with the monitoring and recording requirements of this subpart.

PSD/NSR/BACT: The facility must install instrumentation to measure the manifold temperature, manifold pressure, ignition timing, and engine load on each IC engine to monitor engine operating parameters as required by 40 CFR 52.21 to demonstrate compliance with the NOx and CO BACT emission standard.

Georgia Rule 391-3-1-.02(2)(mmm): Although the BACT NOx emission limit is more stringent than Georgia Rule (mmm), the Division is requiring the facility to conduct annual test measurements to ensure that NOx emissionss are being maintained at applicable levels.

CAM Applicability:

Because the six new IC engine generator sets do not employ any air pollution control devices, CAM is not applicable and is not being triggered by the proposed modification. Therefore, no CAM provisions are being incorporated into the facility's permit.

6.0 AMBIENT AIR QUALITY REVIEW

An air quality analysis is required to determine the ambient impacts associated with the construction and operation of the proposed modifications. The main purpose of the air quality analysis is to demonstrate that emissions emitted from the proposed modifications, in conjunction with other applicable emissions from existing sources (including secondary emissions from growth associated with the new project), will not cause or contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) or PSD increment in a Class I or Class II area. NAAQS exist for NO_2, CO, $PM_{2.5}$, PM_{10}, SO_2, Ozone (O_3), and lead. PSD increments exist for SO_2, NO_2, and PM_{10}. A PSD increment for $PM_{2.5}$ became effective on October 20, 2011.

The proposed project at the Chambers R&B Landfill triggers PSD review for CO, NOx, VOC, PM_{10}, and $PM_{2.5}$. An air quality analysis was conducted to demonstrate the facility's compliance with the NAAQS and PSD Increment standards for CO, NO_2, PM_{10}, and $PM_{2.5}$. An additional analysis was conducted to demonstrate compliance with the Georgia air toxics program. This section of the application discusses the air quality analysis requirements, methodologies, and results. Supporting documentation may be found in the Air Quality Dispersion Report of the application and in the additional information packages.

Modeling Requirements

The air quality modeling analysis was conducted in accordance with Appendix W of Title 40 of the Code of Federal Regulations (CFR) §51, *Guideline on Air Quality Models*, and Georgia EPD's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised)*.

The proposed project will cause net emission increases of CO, NOx, VOC, PM_{10}, and $PM_{2.5}$ that are greater than the applicable PSD Significant Emission Rates. Therefore, air dispersion modeling analyses are required to demonstrate compliance with the NAAQS and PSD Increment.

Significance Analysis: Ambient Monitoring Requirements and Source Inventories

Initially, a Significance Analysis is conducted to determine if the CO, NOx, VOC, PM_{10}, and $PM_{2.5}$ emissions increases at the Chambers R&B Landfill would significantly impact the area surrounding the facility. Maximum ground-level concentrations are compared to the pollutant-specific U.S. EPA-established Significant Impact Level (SIL). The SIL for the pollutants of concern are summarized in Table 6-1.

If a significant impact (i.e., an ambient impact above the SIL) does not result, no further modeling analyses would be conducted for that pollutant for NAAQS or PSD Increment. If a significant impact does result, further refined modeling would be completed to demonstrate that the proposed project would not cause or contribute to a violation of the NAAQS or consume more than the available Class II Increment.

Under current U.S. EPA policies, the maximum impacts due to the emissions increases from a project are also assessed against monitoring *de minimis* levels to determine whether pre-construction monitoring should be considered. These monitoring *de minimis* levels are also listed in Table 6-1. If either the predicted modeled impact from an emission increase or the existing ambient concentration is less than the monitoring *de minimis* concentration, the permitting agency has the discretionary authority to exempt an applicant from pre-construction ambient monitoring. This evaluation is required for CO, NOx, PM_{10}, and $PM_{2.5}$.

If any off-site pollutant impacts calculated in the Significance Analysis exceed the SIL, a Significant Impact Area (SIA) would be determined. The SIA encompasses a circle centered on the facility with a radius extending out to (1) the farthest location where the emissions increase of a pollutant from the project causes a significant ambient impact, or (2) a distance of 50 km, whichever is less. All sources within a distance of 50 km of the edge of a SIA are assumed to potentially contribute to ground-level

concentrations within the SIA and would be evaluated for possible inclusion in the NAAQS and PSD Increment analyses.

Table 6-1: Summary of Modeling Significance Levels

Pollutant	Averaging Period	PSD Significant Impact Level (ug/m^3)	PSD Monitoring Deminimis Concentration (ug/m^3)
PM_{10}	Annual	1	--
	24-Hour	5	10
$PM_{2.5}$	Annual	0.3	--
	24-Hour	1.2	4
NO_2	Annual	1	14
	1-Hour	7.5	--
CO	8-Hour	500	575
	1-Hour	2000	--

NAAQS Analysis

The primary NAAQS are the maximum concentration ceilings, measured in terms of total concentration of pollutant in the atmosphere, which define the "levels of air quality which the U.S. EPA judges are necessary, with an adequate margin of safety, to protect the public health." Secondary NAAQS define the levels that "protect the public welfare from any known or anticipated adverse effects of a pollutant." The primary and secondary NAAQS are listed in Table 6-2 below.

Table 6-2: Summary of National Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS	
		Primary / Secondary (ug/m^3)	Primary / Secondary (ppm)
PM_{10}	Annual	*Revoked 12/17/06	*Revoked 12/17/06
	24-Hour	150 / 150	--
$PM_{2.5}$	Annual	15 / 15	--
	24-Hour	35 / 35	--
NO_2	Annual	100 / 100	0.053 / 0.053
	1-Hour	188/188	--
CO	8-Hour	10,000 / None	9 / None
	1-Hour	40,000 / None	35 / None

If the maximum pollutant impact calculated in the Significance Analysis exceeds the SIL at an off-property receptor, a NAAQS analysis is required. The NAAQS analysis would include the potential emissions from all emission units at the Chambers R&B Landfill, except for units that are generally exempt from permitting requirements and are normally operated only in emergency situations. The emissions modeled for this analysis would reflect the results of the BACT analysis for the modified emission unit. Facility emissions would then be combined with the allowable emissions of sources included in the regional source inventory. The resulting impacts, added to appropriate background concentrations, would be assessed against the applicable NAAQS to demonstrate compliance. For an annual average NAAQS analysis, the highest modeled concentration among five consecutive years of meteorological data would be assessed, while the highest second-high impact would be assessed for the short-term averaging periods.

PSD Increment Analysis

The PSD Increments were established to "prevent deterioration" of air quality in certain areas of the country where air quality was better than the NAAQS. To achieve this goal, U.S. EPA established PSD Increments for certain pollutants. The sum of the PSD Increment concentration and a baseline concentration defines a "reduced" ambient standard, either lower than or equal to the NAAQS that must be met in an attainment area. Significant deterioration is said to have occurred if the change in emissions occurring since the baseline date results in an off-property impact greater than the PSD Increment (i.e., the increased emissions "consume" more that the available PSD Increment).

U.S. EPA has established PSD Increments for NO_X, SO_2, PM_{10}, and $PM_{2.5}$; no increments have been established for CO. The Chambers R&B Landfill is located in a Class II area. The PSD Increments are listed in Table 6-3. The $PM_{2.5}$ increments will not apply in this case since the applicant submitted a "complete" application by October 20, 2011.

Table 6-3: Summary of PSD Increments

Pollutant	Averaging Period	PSD Increment	
		Class I (ug/m^3)	Class II (ug/m^3)
PM_{10}	Annual	4	17
	24-Hour	8	30
NO_x	Annual	2.5	25

To demonstrate compliance with the PSD Increments, the increment-affecting emissions (i.e., all emissions increases or decreases after the appropriate baseline date) from the facility and those sources in the regional inventory would be modeled to demonstrate compliance with the PSD Class II increment for any pollutant greater than the SIL in the Significance Analysis. For an annual average analysis, the highest incremental impact will be used. For a short-term average analysis, the highest second-high impact will be used.

The determination of whether an emissions change at a given source consumes or expands increment is based on the source classification (major or minor) and the time the change occurs in relation to baseline dates. The major source baseline date for NO_X is February 8, 1988, and the major source baseline for SO_2 and PM_{10} is January 5, 1976. Emission changes at major sources that occur after the major source baseline dates affect Increment. In contrast, emission changes at minor sources only affect Increment after the minor source baseline date, which is set at the time when the first PSD application is completed in a given area, usually arranged on a county-by-county basis. The minor source baseline dates have been set for PM_{10} and SO_2 as January 30, 1980, and for NO_2 as April 12, 1991.

Modeling Methodology

Details on the dispersion model, including meteorological data, source data, and receptors can be found in EPD's PSD Dispersion Modeling and Air Toxics Assessment Review in the back of this Preliminary Determination and in Waste Management's Air Dispersion Modeling Report dated September 2011 and revised February 2012.

Modeling Results

Table 6-4 show that the proposed project will not cause ambient impacts of CO and PM_{10} above the appropriate SIL. Because the emissions increases from the proposed project result in ambient impacts less than the SIL, no further PSD analyses were conducted for these pollutants.

However, ambient impacts above the SILs were predicted for NO_2 annual and 1-hour averaging periods, and $PM_{2.5}$ for annual and 24-hour periods, requiring NAAQS and Increment analyses be performed for NO_2 and $PM_{2.5}$.

Table 6-4: Class II Significance Analysis Results – Comparison to SILs

Pollutant	Averaging Period	Year	UTM East (km)	UTM North (km)	Maximum Impact (ug/m^3)	SIL (ug/m^3)	Significant?
NO_2	Annual	1993	276990.6	3803841.0	1.77	1	**Yes**
	1-hour	5 yr average	274883.7	3805118.2	38.53	7.5	**Yes**
PM_{10}	Annual	1993	276990.6	3803841.0	0.54	1	No
	24-hour	1989	276727.6	3803952.2	3.96	5	No
$PM_{2.5}$	Annual	5 yr average	276990.6	3803841.0	0.47	0.3	**Yes**
	24-hour	5 yr average	276727.6	3803952.2	3.58	1.2	**Yes**
CO	8-hour	1989	276883.7	3804018.2	169.45	500	No
	1-hour	1991	274883.7	3805118.2	348.84	2000	No

Data for worst year provided only.

Significant Impact Area

For any off-site pollutant impact calculated in the Significance Analysis that exceeds the SIL, a Significant Impact Area (SIA) must be determined. The SIA encompasses a circle centered on the facility being modeled with a radius extending out to the lesser of either: 1) the farthest location where the emissions increase of a pollutant from the proposed project causes a significant ambient impact, or 2) a distance of 50 kilometers. All sources of the pollutants in question within the SIA plus an additional 50 kilometers are assumed to potentially contribute to ground-level concentrations and must be evaluated for possible inclusion in the NAAQS and Increment Analysis.

Based on the results of the Significance Analysis, the distance between the facility and the furthest receptor from the facility that showed a modeled concentration exceeding the corresponding SIL was determined to be 1.1 km for $PM_{2.5}$, 1.1 km for annual NO_2, and 21 km for 1-hour NO_2.

NAAQS and Increment Modeling

The next step in completing the NAAQS and Increment analyses was the development of a regional source inventory. To develop the $PM_{2.5}$ and NO_2 inventories, the applicant evaluated all major and minor sources within SIDs plus 50km (total screening area) for possible inclusion in the refined NAAQS and PSD increment analysis. The annual NO_2 Minor Source Baseline Date (MinSBD) for the entire state of Georgia is 05/05/1988. The $PM_{2.5}$ MinSBD of 10/20/11 was preceded by the completeness determination for this application, so no $PM_{2.5}$ Increment assessment was conducted. The 20D methodology was applied to screen out those facilities not large enough – in terms of emission rates – to be included in the modeling analysis, with the exception of those facilities located within the SIA that were all included regardless of their size. The regional sources located within close proximity to each other (2 km) were clustered together and their total emissions were used to apply the 20D methodology.

Due to the large significant impact distance of the 1-hour NO_2 (21 km), minor sources were screened using the 20d technique (short-term "d") for 1-hour NO_2 NAAQS modeling if they were beyond the annual average SID plus 5 km. Major sources were subject to the 20D screening (long-term "D") if located beyond the 1-hour NO_2 SID. No sources were screened out within the area of receptors with significant project concentrations.

In addition, the proposed Chambers LFGTE facility is located approximately 35 km from the South Carolina, less than the SID plus 50km. Therefore, off-site source retrieval from SC was processed for inclusion in the NAAQS modeling.

As for the emission inventory for the NO_2 increment analysis, the applicant used the annual NO_2 regional inventory for the NAAQS analysis for conservatism. No 1-hour NO_2 increment limit exists, and no $PM_{2.5}$ increment analysis is necessary for this application, as Georgia EPD has not incorporated the $PM_{2.5}$ Increment, SILs, and SMC Rule into GA rules yet, and since the application was deemed complete prior to the $PM_{2.5}$ trigger date (10/20/11). The only Increment-consuming sources, which did not screen out were those of the Chambers project itself.

NAAQS Analysis

In the NAAQS analysis, impacts within the facility's SIA due to the potential emissions from all sources at the facility and those sources included in the regional inventory were calculated. Since the modeled ambient air concentrations only reflect impacts from industrial sources, a "background" concentration was added to the modeled concentrations prior to assessing compliance with the NAAQS.

The results of the NAAQS analysis are shown in Table 6-5. For the short-term averaging periods, the impacts are the highest second-high impacts. For the annual averaging period, the impacts are the highest impact. When the total impact at all significant receptors within the SIA are below the corresponding NAAQS, compliance is demonstrated.

Table 6-5: NAAQS Analysis Results

Pollutant	Averaging Period	Year	UTM East (km)	UTM North (km)	Maximum Impact (ug/m^3)	Background (ug/m^3)	Total Impact (ug/m^3)	NAAQS (ug/m^3)	Exceed NAAQS?
$PM_{2.5}$	Annual	5 yr average	276864.4	3804295.0	1.89	11.4	13.3	15	No
	24-hour	5 yr average	276683.7	3802918.2	8.44	22.4	30.8	35	No
NO_2	1-hour	5 yr average	279700.0	3806400.0	47.26	33.2	80.5	188	No
	Annual	1993	276990.6	3803841.0	2.09	5.2	7.3	100	No

Data for worst year provided only.

As indicated in Table 6-5 above, the total modeled impact at all significant receptors within the SIA are below the corresponding NAAQS.

Increment Analysis

The modeled impacts from the NAAQS run were evaluated to determine whether compliance with the Increment was demonstrated. The results are presented in Table 6-6.

Table 6-6: Increment Analysis Results

Pollutant	Averaging Period	Year	UTM East (km)	UTM North (km)	Maximum Impact (ug/m^3)	Increment (ug/m^3)	Exceed Increment?
NO_2	Annual	1993	276990.6	3803841.0	2.09	25	No

Data for worst year provided only

Table 6-6 demonstrates that the impacts are below the corresponding increments for NO_2 for the annual averaging period even with the conservative modeling assumption that all NAAQS sources were Increment sources.

Ambient Monitoring Requirements

Table 6-7: Significance Analysis Results – Comparison to Monitoring *De Minimis* Levels

Pollutant	Averaging Period	Year*	UTM East (km)	UTM North (km)	Monitoring De Minimis Level (ug/m^3)	Modeled Maximum Impact (ug/m^3)	Significant?
NO_2	Annual	1993	276990.6	3803841.0	14	1.77	No
PM_{10}	24-hour	1989	276727.6	3803952.2	10	3.96	No
$PM_{2.5}$	24-hour	5 yr average	276727.6	3803952.2	4	3.58	No
CO	8-hour	1989	276883.7	3804018.2	575	169.45	No

Data for worst year provided only

The impacts for NO_X, CO, PM_{10}, and $PM_{2.5}$ quantified in Table 6-4 of the Class I Significance Analysis are compared to the Monitoring *de minimis* concentrations, shown in Table 6-1, to determine if ambient monitoring requirements need to be considered as part of this permit action. Because all maximum modeled impacts are below the corresponding de minimis concentrations, no pre-construction monitoring is required for NO_2, PM_{10}, $PM_{2.5}$, or CO.

Ozone Impact Analysis

Since no significant air quality concentration has been established for ozone impact analysis, PSD permit applicants with a proposed net emission increase of 100 tons/year or more of VOC or NOx are required to conduct an ambient air impact analysis that includes pre-application monitoring data to determine the current state of the ambient air conditions for this pollutant. The proposed Chambers LFGTE facility is expected to emit 97.3 tpy NOx and 34.4 tpy VOC (both less than 100 tpy), therefore, no ozone impact analysis is needed.

Class I Area Analysis

Federal Class I areas are regions of special national or regional value from a natural, scenic, recreational, or historic perspective. Class I areas are afforded the highest degree of protection among the types of areas classified under the PSD regulations. U.S. EPA has established policies and procedures that generally restrict consideration of impacts of a PSD source on Class I Increments to facilities that are located near a federal Class I area. Historically, a distance of 100 km has been used to define "near", but more recently, a distance of 200 kilometers has been used for all facilities that do not combust coal. Also the Federal Land Manager has requested that sources within 300 kilometers be reviewed.

The five Class I areas within approximately 300 kilometers of the Chambers R&B Landfill are the Cohutta Wilderness Area, located approximately 117 kilometers northwest of the facility; the Joyce-Kilmer Slickrock Wilderness Area, located approximately 120 kilometers north of the facility; the Great Smokey Mountains National Park, located approximately 120 kilometers north of the facility; the Shining Rock Wilderness Area, located approximately 120 kilometers northeast of the facility; and the Linvelle Gorge Wilderness Area, located approximately 213 km northeast of the facility. The U.S. Forest Service is the designated Federal Land Manager (FLM) responsible for oversight of all five of these Class I areas.

As shown in Table 6-8 the modeled maximum impacts for all pollutants were below their respective significance levels for the Class I areas.

Table 6-8: Significance Analysis Results – Comparison to Significance Level (Class I Areas)

Criteria Pollutan	Averaging Period	Significance Level	Maximum Projected Concentration*	Receptor UTM Zone: 17		Model Met Data Period	Exceeds SIL?
		($\mu g/m^3$)	($\mu g/m^3$)	meter East)	meter North)		(Yes/No)
NO_2	Annual	0.1	0.008	308254.6	3842652.3	1989	No
PM_{10}	Annual	0.20	0.0025	308254.6	3842652.3	1989	No
	24-Hour	0.32	0.073	258058.3	3850154.2	1992	No

7.0 ADDITIONAL IMPACT ANALYSES

PSD requires an analysis of impairment to visibility, soils, and vegetation that will occur as a result of a modification to the facility and an analysis of the air quality impact projected for the area as a result of the general commercial, residential, and other growth associated with the proposed project.

Soils and Vegetation

To address the potential soil and vegetation impacts, the applicant adopted the NAAQS results of the NO_2 at 1-hour and annual period because EPA recently proposed to use the secondary NAAQS standards for such analysis. Note that CO was not significant (the maximum modeling concentration due to the proposed project were less than their respective SILs). Table 7-1 shows the total potential impact of NO_2 is less than its screening threshold levels.

Table 7-1: Class II Area Vegetative Impact Results

Pollutant	Averaging Period	All Source Impact * ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Potential Impact* ($\mu g/m^3$)	Screening Level+ ($\mu g/m^3$)	Exceed Screening Level?
NO_2	1-hour	47.26	33.2	80.5	188	No
	Annual	2.09	5.2	7.3	100	No
CO	No impact area defined					

Growth

The growth analysis is a projection of the commercial, industrial, residential, and other growth that may be projected to occur in the area as a result of the construction and operation of the proposed source. The anticipated increase in industrial, commercial, or residential growth in the area as a direct result of the proposed project will be negligible. Long-term, it is not anticipated that a significant number of new jobs will be generated by this project. No significant amount of related industrial growth is expected to accompany the operation of the plant. Since no significant associated commercial or industrial growth is projected as a result of the proposed action, negligible growth-related air pollution impacts are expected.

Visibility

Visibility impairment is any perceptible change in visibility (visual range, contrast, atmospheric color, etc.) from that which would have existed under natural conditions. Poor visibility is caused when fine solid or liquid particles, usually in the form of volatile organics, nitrogen oxides, or sulfur oxides, absorb or scatter light. This light scattering or absorption actually reduces the amount of light received from viewed objects and scatters ambient light in the line of sight. This scattered ambient light appears as haze.

Another form of visibility impairment in the form of plume blight occurs when particles and light-absorbing gases are confined to a single elevated haze layer or coherent plume. Plume blight, a white, gray, or brown plume clearly visible against a background sky or other dark object, usually can be traced to a single source such as a smoke stack.

Georgia's SIP and Georgia *Rules for Air Quality Control* provide no specific prohibitions against visibility impairment other than regulations limiting source opacity and protecting visibility at federally protected Class I areas. To otherwise demonstrate that visibility impairment will not result from continued operation of the landfill, the VISCREEN model was used to assess potential impacts on ambient visibility at so-called "sensitive receptors" within the SIA of the Chambers R&B Landfill. The maximum $PM_{2.5}$ and annual NO_2 significant impact distances are both 1.1 km. There are no potentially sensitive receptors (such as, scenic vistas or airports) within these SIAs of the project site. For this reason, it was not necessary to conduct an analysis of visible plume impacts. Since there is no ambient visibility

protection standard for Class II areas, this analysis is presented for informational purposes only and predicted impacts in excess of screening criteria are not considered "adverse impacts" nor cause further refined analyses to be conducted.

The primary variables that affect whether a plume is visible or not at a certain location are (1) quantity of emissions, (2) types of emissions, (3) relative location of source and observer, and (4) the background visibility range. For this exhaust plume visibility analysis, a Level-1 visibility analysis was performed using the latest version of the EPA VISCREEN model according to the guidelines published in the *Workbook for Plume Visual Impact Screening and Analysis* (EPA-450/4-88-015). The VISCREEN model is designed specifically to determine whether a plume from a facility may be visible from a given vantage point. VISCREEN performs visibility calculations for two assumed plume- viewing backgrounds (horizon sky and a dark terrain object). The model assumes that the terrain object is perfectly black and located adjacent to the plume on the side of the centerline opposite the observer.

In the visibility analysis, the total project NO_X and PM_{10} emissions increases were modeled using the VISCREEN plume visibility model to determine the impacts. For both views inside and outside the Class II area, calculations are performed by the model for the two assumed plume-viewing backgrounds. The VISCREEN model output shows separate tables for inside and outside the Class II area. Each table contains several variables: theta, azi, distance, alpha, critical and actual plume delta E, and critical and actual plume contrast. These variables are defined as:

1. *Theta* – Scattering angle (the angle between direction solar radiation and the line of sight). If the observer is looking directly at the sun, theta equals zero degrees. If the observer is looking away from the sun, theta equals 180 degrees.

2. *Azi* – The azimuthal angle between the line connecting the observer and the line of sight.

3. *Alpha* – The vertical angle between the line of sight and the plume centerline.

4. *delta E* – Used to characterize the perceptibility of a plume on the basis of the color difference between the plume and a viewing background. A delta E of less than 2.0 signifies that the plume is not perceptible.

5. *Contrast* – The contrast at a given wavelength of two colored objects such as plume/sky or plume/terrain.

The analysis is generally considered satisfactory if *delta E* and *Contrast* are less than critical values of 2.0 and 0.05, respectively, both of which are Class I, not Class II, area thresholds. The Division has reviewed the VISCREEN results presented in the permit application and have determined that the visual impact criteria (*delta E* and *Contrast*) at the affected sensitive receptors are not exceeded as a result of the proposed project. Since the project passes the Level-1 analysis for a Class I area for the Class II area of interest, no further analysis of exhaust plume visibility is required as part of this air quality analysis.

Georgia Toxic Air Pollutant Modeling Analysis

Georgia EPD regulates the emissions of toxic air pollutant (TAP) emissions through a program covered by the provisions of *Georgia Rules for Air Quality Control*, 391-3-1-.02(2)(a)3.(ii). A TAP is defined as any substance that may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. Procedures governing the Georgia EPD's review of TAP emissions as part of air permit reviews are contained in the agency's "*Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised)*."

Selection of Toxic Air Pollutants for Modeling

For projects with quantifiable increases in TAP emissions, an air dispersion modeling analysis is generally performed to demonstrate that off-property impacts are less than the established Acceptable Ambient Concentration (AAC) values. The TAP evaluated are restricted to those that may increase due to the proposed project. Thus, the TAP analysis would generally be an assessment of off-property impacts due to facility-wide emissions of any TAP emitted by a facility. To conduct a facility-wide TAP impact evaluation for any pollutant that could conceivably be emitted by the facility is impractical. A literature review would suggest that at least one molecule of hundreds of organic and inorganic chemical compounds could be emitted from the various combustion units. This is understandable given the nature of the landfill gas fed to the combustion sources, and the fact that there are complex chemical reactions and combustion of fuel taking place in some. The vast majority of compounds potentially emitted however are emitted in only trace amounts that are not reasonably quantifiable.

The proposed facility will emit the following air toxic pollutants (TAPs): HCl, Formaldehyde, and other 23 TAPs (see detailed TAP list in the applicant's Air Toxic Modeling submittal). The annual, 24-hour and 15-minute AACs of all TAPs were reviewed based on U.S. EPA IRIS reference concentration (RfC), and OSHA Permissible Exposure (PEL), etc., according to the Georgia Air Toxics Guideline. The modeled maximum ground-level concentrations (MGLCs) were calculated using the ISCST3 (version 02035) for 1-hour, 24-hour, and annual averaging periods.

The toxic impact assessment performed by Chambers R&B Landfill can be found in the Air Toxics Modeling Results submittal dated May 5, 2011.

For each TAP identified for further analysis, both the short-term and long-term AAC were calculated following the procedures given in Georgia EPD's *Guideline*. Figure 8-3 of Georgia EPD's *Guideline* contains a flow chart of the process for determining long-term and short-term ambient thresholds. Chambers R&B Landfill referenced the resources previously detailed to determine the long-term (i.e., annual average) and short-term AAC (i.e., 24-hour or 15-minute). The AACs were verified by the EPD.

Determination of Toxic Air Pollutant Impact

The Georgia EPD *Guideline* recommends a tiered approach to model TAP impacts, beginning with screening analyses using SCREEN3, followed by refined modeling, if necessary, with ISCST3 or ISCLT3. For the refined modeling completed, the infrastructure setup for the SIA analyses was relied upon with appropriate sources added for the TAP modeling. Note that per the Georgia EPD's *Guideline*, downwash was not considered in the TAP assessment.

Initial Screening Analysis Technique

Generally, an initial screening analysis is performed in which the total TAP emission rate is modeled from the stack with the lowest effective release height to obtain the maximum ground level concentration (MGLC). Note the MGLC could occur within the facility boundary for this evaluation method. The individual MGLC is obtained and compared to the smallest AAC. Due to the likelihood that this screening would result in the need for further analysis for most TAP, the analyses were initiated with the secondary screening technique.

Table 7-2 summarizes the AAC levels and MGLCs of the TAPs for the specified averaging periods. As shown in Table 7-2 below and Tables 3 - 5 of the applicant's Air Toxic Modeling submittal, the modeled MGLCs for all TAPs evaluated by the applicant are below their respective AAC levels. Therefore, the applicant meets the applicable Georgia Air Toxics Guideline.

Table 7-2: Modeled MGLCs and the respective AACs

Pollutant	CAS	Averaging period	MGLC ($\mu g/m^3$)	AAC ($\mu g/m^3$)	Averaging period	MGLC ($\mu g/m^3$)	AAC ($\mu g/m^3$)
HCl	7647-01-0	Annual	1.0	20	15-min	43.8	700
Formaldehyde	50-00-0	Annual	1.1*	1.1	15-min	50.0	246
Generic TAP	(1 lb/hr)	Annual	0.129	---	1-hour	3.326	---
		24-hour	0.895	---			

* The MGLC of Formaldehyde is presented as the highest concentration averaged over 5-year modeling.

8.0 EXPLANATION OF DRAFT PERMIT CONDITIONS

The permit requirements for this proposed facility are included in draft Permit Amendment No. 4953-011-0014-V-03-1.

Section 1.0: Facility Description

Section 1.3 describes the proposed modification. Chambers R&B Landfill is proposing the installation of a landfill gas to energy facility, which includes a landfill gas treatment system and six IC engines to use landfill gas as fuel to generate electricity.

Section 2.0: Requirements Pertaining to the Entire Facility

No conditions in Section 2.0 are being added, deleted or modified as part of this permit action.

Section 3.0: Requirements for Emission Units

Table 3.1.1 has been updated to include the landfill gas treatment system and the six new IC engines.

Condition 3.3.2 has been modified to include the landfill gas treatment system.

New Condition 3.3.5 establishes the applicability of 40 CFR 60 Subpart A and Subpart JJJJ to the IC engines.

New Condition 3.3.6 establishes the applicability of 40 CFR 63 Subpart A and Subpart ZZZZ to the IC engines.

New Condition 3.3.7 requires the installation and operation of a gas treatment system to comply with the provisions of 40 CFR 60 Subpart WWW. The design plan is to be submitted to and approved by the EPD Air Branch.

New Condition 3.3.8 requires the facility to operate the IC engines in a manner consistent with good air pollution control practice for minimizing emissions, and to keep a maintenance plan with records of conducted maintenance.

New Condition 3.3.9 contains the BACT emission limits for CO, NOx, VOC, PM_{10}, and $PM_{2.5}$, and the PSD avoidance limit for SO_2.

New Condition 3.4.2 establishes the Georgia Rule (b) opacity limit of 40 percent as applicable to the six IC engines.

Section 4.0: Requirements for Testing

Condition 4.1.3 was modified to add the applicable test methods for the IC engines.

New Conditions 4.2.2, 4.2.4, and 4.2.5 require the facility to conduct performance testing for NOx, CO, VOC, PM_{10}, $PM_{2.5}$, and SO_2.

New Condition 4.2.3 requires the facility to use the data recorded per Conditions 4.2.2 and 4.2.4 to develop an acceptable range of manifold temperature, manifold pressure, ignition timing, and engine load. This is to assure that the engines are operating as designed so that emissions of pollutants are minimized.

New Condition 4.2.6 specifies the procedures to be followed for conducting performance testing as required by 40 CFR 60 Subpart JJJJ for CO, NOx, and VOC emissions.

Section 5.0: Requirements for Monitoring

Condition 5.2.1 has been modified to require the facility to install and operate the following: devices to monitor specified treatment system parameters, a device to measure the gas flow rate to the IC engines, a non-resettable hour meter on each engine, and devices to monitor manifold temperature, manifold pressure, ignition timing, and engine load on each engine.

New Condition 5.2.10 contains a plan with the recording frequency for monitoring the manifold temperature, manifold pressure, ignition timing, and engine load.

New Condition 5.2.11 requires a NOx measurement to demonstrate compliance with Georgia Rule (mmm).

New Condition 5.2.12 requires monitoring the specified treatment system parameters.

Section 6.0: Other Recordkeeping and Reporting Requirements

Condition 6.1.7 has been modified to define the excursions associated with the installation of the landfill gas treatment system and IC engines. Excursions include measurements of manifold temperature, manifold pressure, ignition timing, engine load, and any readings or monitoring taken of the specified operating parameters that are outside of those established in the current approved treatment monitoring plan.

Condition 6.2.7 has been modified to include an updated list of records the facility must submit with the semiannual report.

New Condition 6.2.18 requires the facility to provide initial notification of construction and the actual startup date of each new IC engine.

New Condition 6.2.19 contains requirements to submit and maintain records for IC engines as required by 40 CFR 60 Subpart JJJJ.

New Condition 6.2.20 contains requirements to keep records of the date and time when landfill gas is directed to the flare(s) and treatment system.

Section 7.0: Other Specific Requirements

Chambers R&B Landfill is proposing the operation of a leachate concentrator. The landfill will have the flexibility to operate the IC engines either with or without the leachate concentrator. In this process the heat content from the exhaust gas from three of the engines is used to evaporate water in the leachate. When the leachate concentrator is in operation, 100 percent of the exhaust from IC engines SN01 and SN02 and approximately 50 percent of the exhaust from IC engine SN03 is directed through the leachate concentrator. None of the exhaust from engines SN04, SN05 and SN06 will be directed through the leachate concentrator. There are no permit conditions being added as a result of this permit action.

Chambers R&B Landfill PSD Permit Application and Supporting Data

Chambers R&B Landfill submitted an application for an air quality permit to install a LFG treatment system and six internal combustion engines to use LFG to generate electricity. The facility is located at 610 Bennett Road in Homer, Banks County. The application was received on January 13, 2011. The application was found to be deficient upon submittal and the applicant resolved all of the deficiencies by October 3, 2011. Table 1-1 specifies the application date, application addendum dates, and associated Georgia EPD correspondence that comprise the PSD application record for this application number:

Date	Description
1/13/2011	Submittal of Initial PSD Application
2/24/2011	Letter from Georgia EPD to Applicant regarding modeling protocol
3/25/2011	Letter from Georgia EPD to Applicant to address application deficiencies
5/4/2011	Copy of email between applicant and USDA Forest Service
5/5/2011	Applicant's submittal of Air Toxics Modeling Results
5/19/2011	Submittal of Revised PSD Application and response to Georgia EPD letter dated 3/25/2011.
7/6/2011	Letter from Georgia EPD to Applicant proposing BACT limits
7/25/2011	Letter from Applicant to Georgia EPD regarding Georgia EPD letter dated 7/6/2011.
8/26/2011	Letter from Georgia EPD to Applicant regarding BACT
10/3/2011	Applicant's submittal of Air Dispersion Modeling Report
01/12/2012	Letter from Georgia EPD to Applicant regarding Air Impact Assessment and Air Toxics Assessment
02/22/12	Submittal of Revised Air Impact Assessment Application and response to Georgia EPD letter dated 1/12/2012.

EPD'S PSD Dispersion Modeling and Air Toxics Assessment Review

EPD'S BACT Comparison Spreadsheet