ADDENDUM TO

TECHNICAL EVALUATION

&

PRELIMINARY DETERMINATION

APPLICANT

Okeechobee Landfill, Inc.
c/o Waste Management Inc. of Florida
2700 Wiles Road
Pompano Beach, Florida 33073

Okeechobee Landfill
ARMS Facility ID No. 0930104

PROJECT

Draft Permit Modification No. PSD-FL-382A
Project No. 0930104-018-AC

Landfill Gas to Energy Project Permit Modification

COUNTY

Okeechobee County

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation
Special Projects Section
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

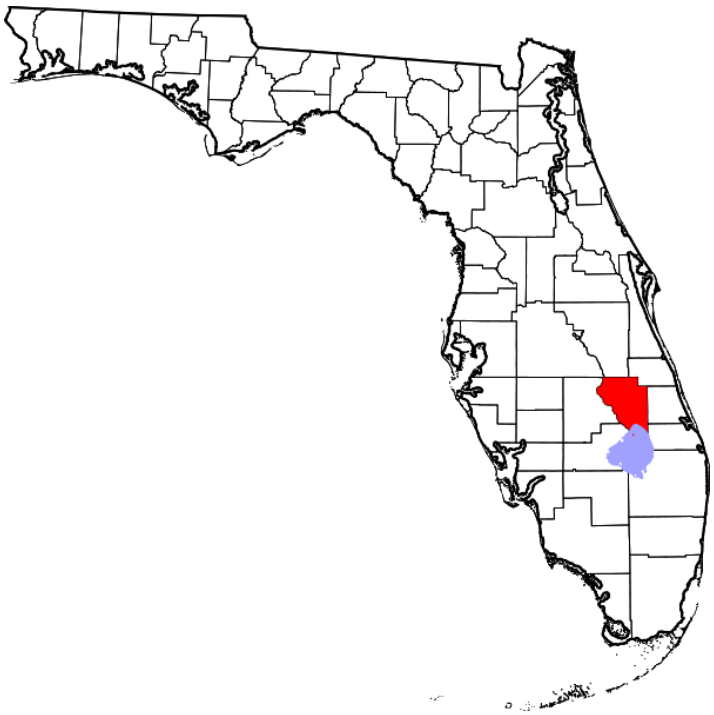
June 20, 2011

(Addendum to Document issued April 19, 2010)

1. GENERAL PROJECT INFORMATION

1.1 Facility Description and Location

The Okeechobee Landfill (OL) is located in Okeechobee County. The main entrance is approximately 3.5 miles north of State Road (SR) 70 at 10800 Northeast 128th Avenue. The landfill has a Standard Industrial Classification Code (SIC) of No. 4953. The UTM coordinates are Zone 17; 530.28 kilometers (km) East and 3023.96 km North. The location of Okeechobee County is shown in Figure 1 below. The location of the landfill within Okeechobee County is shown in Figure 2.



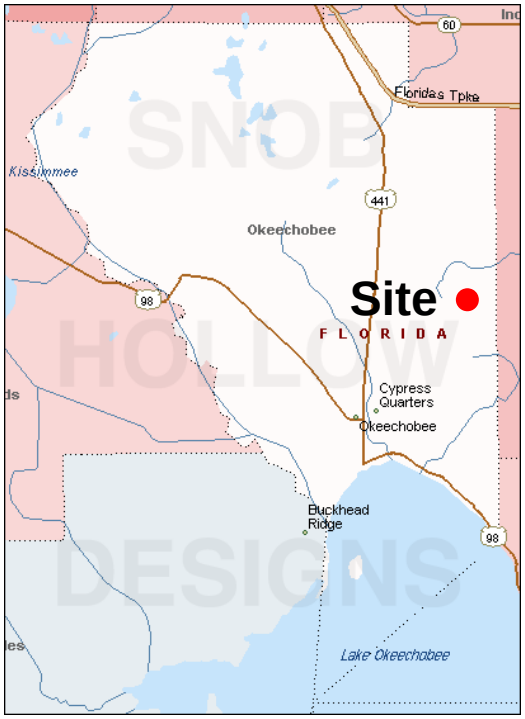


Figure 1 - Okeechobee County, Florida **Figure 2 - Location of Okeechobee Landfill**

The landfill is operated by Okeechobee Landfill, Inc. (OLI), a Waste Management Company. Communications regarding this project are through Waste Management, Inc. (WMI). The total OL area comprises approximately 847 acres within 4,150 acres owned by the applicant.

Figure 3 below is a depiction of the present OL configuration. There are two existing enclosed flares and one open flare that regularly operate. Two open flares that were authorized pursuant to previous consent orders are indicated. One was not installed and the one installed no longer operates.

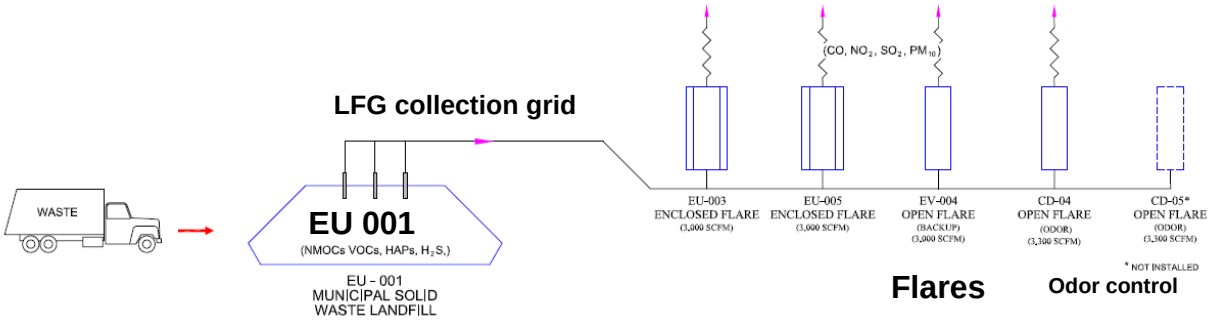


Figure 3 – Process Flow Diagram of Existing Configuration at the OL

Figures 4, 5 and 6 were taken at the landfill circa 2006. One relocatable odor control flare was operational and was moved as-needed around the landfill to cope with accelerated decay of waste following several highly active hurricane seasons.

Figure 4 – Landfill

Figure 5 – Enclosed Flare

Figure 6 – Relocatable Odor Flare

1.2 Previously Authorized Project

On April 19, 2010 the Florida Department of Environmental Protection (FDEP) issued an air construction permit pursuant to the rules for the Prevention of Significant Deterioration of Air Quality (PSD). The original permit requires construction of a landfill gas (LFG) desulfurization plant (GDP) for existing LFG and flares and authorizes the future installation of a landfill gas to energy (LFGTE) plant using desulfurized LFG as fuel in combustion turbine-electrical generators (CTG) with back up open flares.

The issued permit (DEP No. 0930104-014-AC/PSD-FL-382) is accessible at the following link:

www.dep.state.fl.us/Air/emission/construction/okeechobee/FPERMIT382.pdf

The original project triggered review under the PSD rules for particulate matter (PM/PM_{10}), nitrogen oxides (NO_X), carbon monoxide (CO), sulfur dioxide (SO_2) and visible emissions (VE). The Technical Evaluation and Preliminary Determination (TEPD), including determinations of Best Available Control Technology (BACT) for these pollutants, is accessible at the following link:

www.dep.state.fl.us/Air/emission/construction/okeechobee/TECH382.pdf

The future near-term and the long-term configurations including all flares and CTG are shown in Figure 7. The LFG will be directed to a GDP, where it will be treated prior to flaring or use as fuel in the described CTG. The EU designated in red in the diagram constitutes the near-term project.

The equipment in this project will be installed over a period of several years to decades depending upon the rate of solid waste disposal and gas generation. The GDP will be initially constructed of sufficient size to treat the LFG produced throughout the life and closure of the OL. The LFGTE plant will be constructed in steps beginning with a single 15 megawatts (MW) Solar Model T-130 CTG and three 3.5 MW Solar Model C-40 CTG. Over the life of the development, the applicant anticipates installing as many as 15 C-40 CTG or their equivalents. The future models may vary based on the future products available from several manufacturers. With a LFGTE plant, most of the flares operate as backup to the CTG while the remaining flares burn incremental amounts of LFG at least until additional CTG are added.

1.3 Status of Project

As of late January 2011, OLI had completed installation of three new open flares and extensive piping to deliver preconditioned raw LFG to the GDP. OLI decided to the install the biological process called the Paques/THIOPAQ® rather than the chemical process called LO-CAT®. Figures 8 and 9 document the status of the construction to date. The three new flares (not yet operational) are visible in Figure 9. The existing enclosed flares are visible in the distant background and will continue to operate (along with the existing open flare) at least until construction of the GDP is completed.

For reference, the expected high LFG generation rate predicted when the original project was proposed did not materialize and present flows and hydrogen sulfide (H_2S) concentration are much less than they were in 2004-2007.

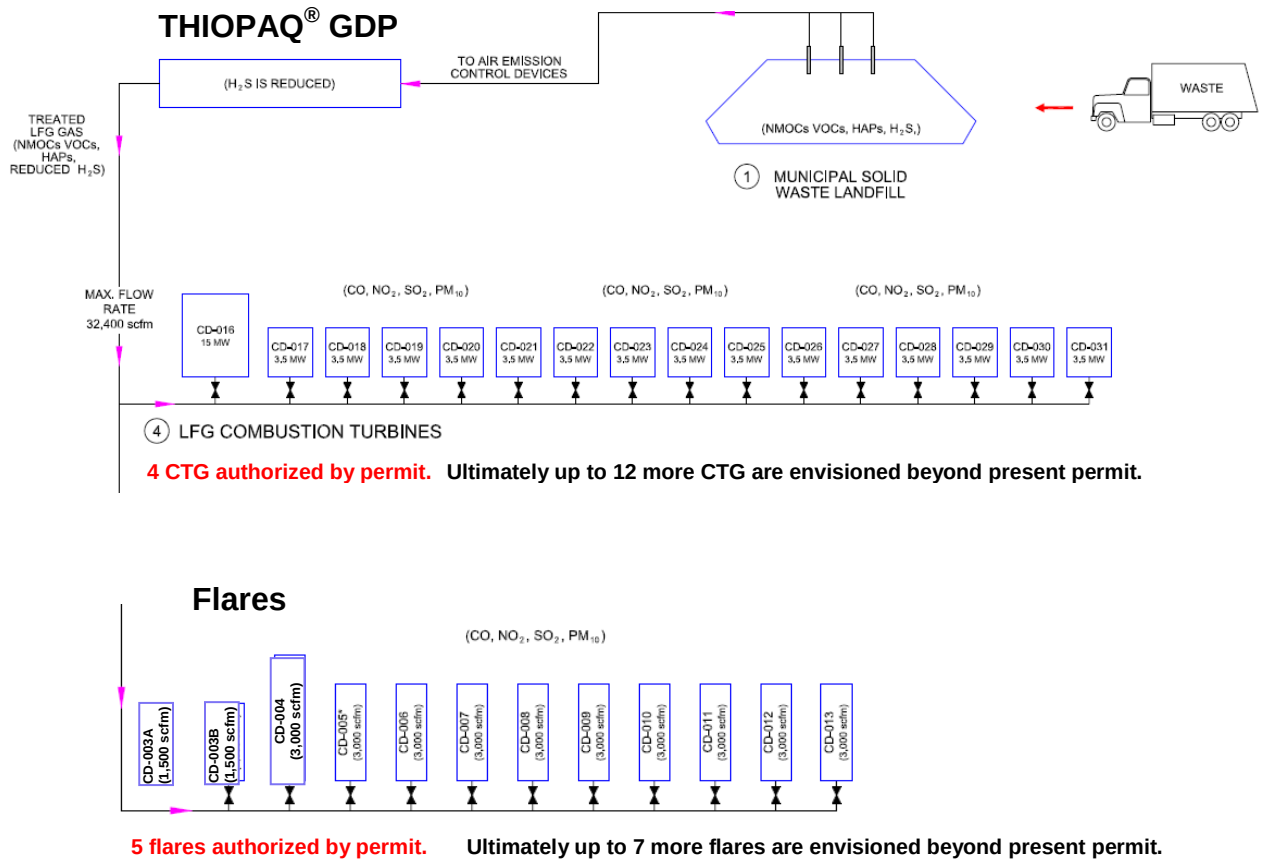


Figure 7 – Process Diagram of Future LFG Collection and Control System including LFGTE Plant

Figure 8 – Conditioned LFG Piping

Figure 9 – Piping to Planned GDP, New Open Flares

2. PERMIT MODIFICATIONS

2.1 Overall Description of Requested Permit Modification

Most of the requested changes were initially submitted as comments by OLI pursuant to the public notice and comment period during the initial permitting of the project. The comments are accessible at the following link: www.dep.state.fl.us/Air/emission/construction/okeechobee/L033010_505.pdf

The referenced comments were addressed in the Final Determination (FD) document included in the Final Permit package for Permit No. 0930104-014-AC (PSD-FL-382). Many of the requests submitted by OLI as comments could not be considered without a requirement for a new public notice.

The Department advised that it would entertain such requests through a future permit modification. The FD document is accessible at: www.dep.state.fl.us/Air/emission/construction/okeechobee/FDETER382.pdf

OLI submitted a permit modification application on October 12, 2010. No PSD regulated air emissions were expected to increase as a result of the permit modification request. Consequently, no air modeling was submitted and a new BACT determination is not required.

The permit modification application is accessible at:

www.dep.state.fl.us/Air/emission/construction/okeechobee/00005302.pdf

The changes requested by OLI, can be grouped into four categories. These include:

- Project schedule and facility descriptions;
- Operational, monitoring, recordkeeping and reporting for the GDP and flares;
- Purpose and restrictions on open flares; and
- Emission and fuel monitoring.

The key changes by category requested by OLI are paraphrased below in *italic format* and followed by the Department's analysis or determination. The Department's changes are shown in ~~strikethrough~~ and underline format in the attached draft permit modification.

2.2 Project Schedule and Facility Description

- ***Section I, General Information, New Emission Unit (EU) Descriptions:*** *OLI requests that in the second paragraph of this section, the landfill sizes be corrected from 208 acres to 309 acres and from 847 acres to 948.*

  Department Determination: The Department will make the requested changes.

  Other Department Changes: The Department is updating the EU Identification Numbers (ID Nos.) in the permit to correspond to the ID Nos. assigned by the Department's Air Resource Management System (ARMS). The renumbering changes are shown in the attached draft permit. The following table describes the EU at the facility after shut down of existing or previously authorized flares (EU 003 through EU 007) and implementation of the near-term LFGTE project.

EU ID No.	Emission Unit Description
001	Municipal solid waste landfill with LFG Collection System and GDP.
008	New open flare with a capacity of 1,500 standard cubic feet per minute (scfm).
009	New open flare with a total capacity of 3,000 scfm.
010	New open flare with a total capacity of 3,000 scfm.
011	New open flare with a total capacity of 3,000 scfm.
012	New open flare with a total capacity of 3,000 scfm.
013	One 15 MW Model Solar Titan 130 (T-130) CTG.
014	Three 3.5 MW Model Solar Centaur 40 (C-40) CTG.
015	Three 3.5 MW Model Solar Centaur 40 (C-40) CTG.
016	Three 3.5 MW Model Solar Centaur 40 (C-40) CTG.

- ***Conditions II.7 and III.A.1, Installation GDP Required:*** *OLI requests extension of the January 1, 2012 deadline to complete the GDP portion of the project to allow for unseen construction delays and allow a start-up "shake out" period.*

  Department Determination: The Department will make the requested change pursuant to the following rationale.

  In the previous permit, the Department required, on the basis of good cause, the installation at an early date of the GDP to treat LFG prior to combustion or flaring whether or not OLI completes the LFGTE project. The purpose is to insure that the applicant installs controls following earlier expansion and flaring projects that the Department determined triggered PSD and a requirement for the installation of BACT.

  The present deadline of December 31, 2011 was set to insure the GDP is installed at an early date and under the assumption that OLI would install the chemical process called LO-CAT®. With which it has experience such as at the Central Disposal Sanitary Landfill (CDSL) in Broward County. Instead, OLI will install the biological process called the Paques THIOPAQ®.

  The Department documented that construction of the GDP project is actually underway during a visit to the site in January 2011. Additional time could be required for initial startup and conditioning of the bacteria that consume H_2S. The Department will extend the deadline to June 30, 2012 as requested to install and operate the GDP.

- ***Section III.A, EU ID No.1, OL Description:*** *OLI requests deletion of the statements regarding the closure and opening dates for the Berman Road Landfill and the Clay Farm Landfill. The dates are subject to revision at any time and are not accurate.*

  Department Determination: The Department concurs and notes that the Berman and Clay Farm Landfills are regulated by the air program as a single landfill (the OL). The variable closure and opening dates for individual parts of the OL are not necessary in the air construction permit and will be deleted.

2.3 Operational, Monitoring, Recordkeeping and Reporting for GDP and Flares

- ***Condition III.A.9, GDP Reports and Records:*** *OLI requests a quarterly or semi-annual reporting requirement in lieu of monthly, which is consistent with many other permits.*

  Department Determination: The Department agrees that the GDP reports and records can be submitted on a quarterly basis rather than a monthly basis and will change the permit condition language accordingly.

- ***Condition III.B.1, Flares Installation and Construction/Presence of Pilot Flames:*** *OLI requests removal of the requirement for continuous pilots. The OL will have automatic startup/shutdown sequences that include the starting of the pilot flame which will use liquid propane as a fuel source. Therefore, the pilot flame will be automatically started whenever LFG is directed to the flare. The pilot flame will be extinguished once the main flame is confirmed as determined by the main flame thermocouple.*

  Department Determination: The Department will replace the requirements related to pilot flames with the applicable monitoring requirements given in 40 Code of Federal Regulations (CFR) Part 60, Subpart WWW – Standards of Performance for Municipal Waste Landfills. Link to Subpart WWW

  The specific section applicable to pilot flames is §60.756, Monitoring of Operations. §60.756(c) relates to use of open flares used to satisfy the Subpart WWW requirement to route all the collected gas to a control system. §60.756(c) states:

  (c) Each owner or operator seeking to comply with §60.752(b)(2)(iii) using an open flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.

(2) A device that records flow to or bypass of the flare. The owner or operator shall either:

(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

- ***Condition III.B.3, Shutdown of Existing Flares:*** *OLI requests that the requirement to submit a flare shutdown plan be removed as it adds unnecessary burden on OLI.*

  Department Determination: This issue is moot because the flare shutdown plan was received and approved by the Department's Southeast District Office.

- ***Conditions III.B., 10, 11, 13, and 14 (all related to Flare Testing and Monitoring):*** *OLI requests removal of: flare flame temperature measurement because it is not feasible to measure on an open flare; visual inspection of the flares on a daily basis; monthly inspection and monitoring requirements; quarterly maintenance requirements; and requirement for a fire alarm or an auto dialer.*

  Department Determinations

  B.10, Continuous Monitoring Devices: The Department will replace the temperature monitoring requirement with flame presence and rely on §60.756(c) as described in the previous discussion. Those requirements were already listed in Condition III.B.10. The basis in §60.756(c) will be more specifically cited. For the reasons cited in B.14, Flare Malfunctions and Emergencies below, the Department will also remove the requirements of a fire alarm or an auto dialer.

  B.11, Flame Presence Visual Inspection Monitoring: The Department will remove the term "visual" as requested and incorporate into the condition the requirements §60.758(c)(4), Recordkeeping Requirements.

  §60.758(c)(4) states:

  (c) Except as provided in §60.752(b)(2)(i)(B), each owner or operator of a controlled landfill subject to the provisions of this subpart shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in §60.756 as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

  (4) Each owner or operator seeking to comply with the provisions of this subpart by use of an open flare shall keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under §60.756(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

  B.13, Inspection and Maintenance of the Flares: The inspection and monitoring requirements contained in 40 CFR 60, Subparts WWW and 40 CFR 63, Subpart AAAA National Emission Standards for Hazardous Air Pollutants (NESHAP): Municipal Solid Waste Landfills are sufficient for the purposes of this condition and the Department will remove the additional language. Link to Subpart AAAA

  B.14, Flare Malfunctions and Emergencies: The Department will remove the requirements for a fire alarm or auto dialer and refer to 40 CFR 60, Subpart WWW and 40 CFR 63, Subparts A and AAAA. Further reporting requirements are included in the facility Title V operation permit, Appendix TV 6.

By and large, the requirements in Subpart AAAA refer back to Subpart WWW. However, the requirement for a Startup, Shutdown and Malfunction (SSM) plan is given in Subpart AAAA at §63.1955, Standards (What requirements must I meet) accessible at the above link. The specific requirement for a SSM plan is §63.1955(c) which states:

(c) For approval of collection and control systems that include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions, you must follow the procedures in 40 CFR 60.752(b)(2). If alternatives have already been approved under 40 CFR part 60 subpart WWW or the Federal plan, or EPA approved and effective State or tribal plan, these alternatives can be used to comply with this subpart, except that all affected sources **must comply with the SSM requirements in Subpart A of this part as specified in Table 1 of this subpart** and all affected sources must submit compliance reports every 6 months as specified in §63.1980(a) and (b), including information on all deviations that occurred during the 6-month reporting period. Deviations for continuous emission monitors or numerical continuous parameter monitors must be determined using a 3 hour monitoring block average.

The SSM requirements in Subpart AAAA refer back to 40 CFR 63, Subpart A – General Provisions. This condition subtitle will be revised to indicate the SSM plan.

Link to Subpart A

The SSM requirements in Subpart A are given at §63.6, Compliance with Standards and Maintenance Requirements.

The specific section is §63.6(e)(3) which states:

(3) SSM plan. (i) The owner or operator of an affected source must develop a written startup, shutdown, and malfunction plan that describes, in detail, procedures for operating and maintaining the source during periods of SSM; and a program of corrective action for malfunctioning process, air pollution control, and monitoring equipment used to comply with the relevant standard. The SSM plan does not need to address any scenario that would not cause the source to exceed an applicable emission limitation in the relevant standard. This plan must be developed by the owner or operator by the source's compliance date for that relevant standard. The purpose of the SSM plan is to:

(A) Ensure that, at all times, the owner or operator operates and maintains each affected source, including associated air pollution control and monitoring equipment, in a manner which satisfies the general duty to minimize emissions established by paragraph (e)(1)(i) of this section;

(B) Ensure that owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and

(C) Reduce the reporting burden associated with periods of SSM (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

- ***Condition III.B.19, Records (Flare Events):*** *OLI requests that the permit reference the SSM required by Subparts A and AAAA instead of the permit requirement to "record in a written log the duration of each flare event and the reason for flaring". Also to remove references to Rule 62-4.070 (3) F.A.C.*

  Department Response: The Department will modify this condition to include reference to 40 CFR 63, Subparts A and AAAA and the required SSM plan. There is no reason to remove the reasonable assurance rule reference.

2.4 Purpose and Restrictions on Open Flares

- ***Previous Final Determination and Permit BACT for Flares:*** *OLI does not agree with the Department's assessment in the Final Determination (Department response to OLI comments on draft permit) that BACT requires enclosed combustion devices such as CTG or enclosed flares. In the letter dated April 7, 2009, OLI explained to the Department why open flares are BACT for operation with CTG compared to enclosed flares. Open flares are favored over enclosed flares for operation with gas turbines and that is why OLI proposed the open flares.*

  Department Determination: The Department accepted the installation of open flares within the project PSD review and BACT determination under the premise that all or most of the flare capacity would be used as back up to enclosed combustion devices, namely CTG. If CTG were not proposed, the Department would have specified enclosed flares as BACT rather than open flares (and no CTG). The main reasons are that enclosed flares destroy non-methane organic compounds (NMOC) and CO more effectively (based on refractory heating) and their design is compatible with emission measurement.

- ***Conditions III.B.1 and B.5, Flares Installation and Construction/Restricted Operation*****:** *– The flares have a capacity of 13,500 standard cubic feet per minute (scfm) whereas the CTG have a capacity of 9,500 scfm. The OL subject to Subpart WWW of which §60.752(b)(2)(iii) requires the operator to "route all the collected gas to a control system". The design capacity must be present to flare all of the LFG in case the CTG are off-line. This should not be interpreted that flares are required as backup devices for the CTG, but instead as an alternate method of operation.*

  OLI requests that the operation restriction (III.B.5) for the flares (to operate only) when the CTG are unavailable be removed. To comply with the Subpart WWW requirements, the flares should be allowed to operate at any time, not just when the CTG are unavailable. When all CTG are available, the total capacity of the CTG will be less than the landfill design capacity. Therefore, the flares must be allowed to operate at all times to combust the excess LFG. There will be equal or lower emissions of all pollutants when all flares are operating instead of all CTG plus some flares operating.

  Department Analysis: The full requirement is to: Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii)(A), (B) or (C) of this section.

  (A) An open flare designed and operated in accordance with §60.18 except as noted in §60.754(e);

  (B) A control system designed and operated to reduce non-methane organic compounds (NMOC) by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in §60.754(d).

    (1) If a boiler or process heater is used as the control device, the landfill gas stream shall be introduced into the flame zone.

    (2) The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in §60.756;

  (C) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of paragraph (b)(2)(iii)(A) or (B) of this section.

  The restriction in Condition III.B.5 is as follows: The hours of operation of these emission units are not limited (8,760 hours per year). However, the flares may only be operated when the CTG are unavailable due to maintenance or malfunction or when LFG flow rate is insufficient to support operation of a CTG.

Installed flare capacity will initially be greater than CTG capacity and may at different times in the future be greater than CTG capacity. Thus, for at least some of the time, some of the flare capacity will comprise part of or the entire control system rather than serve as back up to the CTG.

Department Determination: The Department will not remove the references to the open flares as back up flares but will remove the restrictions that limit their operation to when CTG are unavailable. It is clear that OLI intends to install CTG having already initiated construction on an expensive GDP.

2.5 Emission and Fuel Monitoring.

- ***Condition III.A.8, Hydrogen Sulfide (H_2S) Continuous Emission Monitoring System (CEMS):*** *OLI requests removal of the requirement for a H_2S-CEMS to monitor LFG after it is processed by the GDP and before it is combusted in the CTG or the backup flares. OLI believes a H_2S-CEMS is very costly (estimated at $150,000). OLI proposes instead to use the procedures developed for determining Total Sulfur (TS) content in gaseous fuels (used in CTG) as described in 40 Code of Federal Regulations (CFR), Part 60, Subpart GG – Standards of Performance for Stationary Gas Turbines [40 CFR 60.335(b)(10)] - Sulfur Content of Fuel Combusted in CTG.*

Department Analysis: The requirements from Subpart GG are as follow:

The treated LFG will be combusted primarily in CTG subject to 40 CFR 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines (that commenced construction after February 18, 2005) rather than 40 CFR 60, Subpart GG. The procedure required (as an alternative to SO_2 monitoring) by Subpart KKKK is described in §60.4415 as follows:

(1) If you choose to periodically determine the sulfur content of the fuel combusted in the turbine (i.e. in lieu of testing for SO_2), a representative fuel sample would be collected following American Society for Testing and Materials (ASTM) D5287 (incorporated by reference, see §60.17) for natural gas or ASTM D4177 (incorporated by reference, see §60.17) for oil. Alternatively, for oil, you may follow the procedures for manual pipeline sampling in section 14 of ASTM D4057 (incorporated by reference, see §60.17). The fuel analyses of this section may be performed either by you, a service contractor retained by you, the fuel vendor, or any other qualified agency. Analyze the samples for the total sulfur content of the fuel using:

(ii) For gaseous fuels, ASTM D1072, or alternatively D3246, D4084, D4468, D4810, D6228, D6667, or Gas Processors Association Standard 2377 (all of which are incorporated by reference, see §60.17).

The cost information developed by OLI was based on a H_2S-CEMS. OLI proposes instead to use manual fuel monitoring. A H_2S Continuous Fuel Monitor (H_2S-CFM) would accomplish the same purpose as intended by the H_2S-CEMS and at a much lower price. Such H_2S-CFM are common and there are at least two examples of such instruments at South Florida landfills. Total Sulfur CFM (TS-CFM) compatible with the analytical procedures described within Subpart KKKK are also available.

Figure 10 shows a gas chromatograph (GC) – based ultraviolet system used to measure H_2S concentrations from the LOCAT® at the Waste Management Central Disposal Sanitary Landfill (CDSL) in Pompano Beach. It was installed in the 1990s. Figure 11 shows the new H_2S-CFM installed at the Brevard Landfill GTE facility. This analyzer was installed in 2009 at a cost of approximately $50,000 including training. According to the Brevard County representative, the equipment included installation, training and a complement of spare parts. The unit is housed within an existing building and in its own heated panel.

The GC located at the CDSL is a much older instrument. Typical output is shown in Figure 12 below. At the time the measurement was taken, a H_2S value of 39 ppm was recorded from the LOCAT® GDP at the CDSL. The Department's purpose was to achieve at least a similar level of monitoring for the OL LFGTE project (that triggered PSD) as accomplished at the CDSL and at the Brevard Landfill.

Figure 10- Gas Chromatograph at CDSL Figure 11- Ultraviolet Spectroscopy Instrument

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                                   Analysis

Date-Time: 03/30/10 14:54  Analysis Time:    60  Cycle Time:     75
Stream: 1  Stream 1        Mode: ANLY      Cycle Start Time: 14:53
Analyzer: 24877            Strm Seq:1
Company: Waste Management of North America
SN: 385864

    Component        Mole
       Name         Percent
 H2S               38.6 PPM
 TOTALS            38.6 PPM

'*' indicates user-defined components

Base Pressures                14.73000
----------------------------------------
Average Molecular Wgt.     =      0.00
                                   Analysis

Date-Time: 03/30/10 14:56  Analysis Time:    60  Cycle Time:     75
Stream: 1  Stream 1        Mode: ANLY      Cycle Start Time: 14:55
Analyzer: 24877            Strm Seq:1


Company: Waste Management of North America
SN: 385864

    Component        Mole
       Name         Percent
 H2S               38.2 PPM
 TOTALS            38.2 PPM

'*' indicates user-defined components

Base Pressures                14.73000
----------------------------------------
Average Molecular Wgt.     =      0.00
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Figure 12 - H_2S Data Collected at CDSL at 14:55 on March 30, 2010.

According to information submitted by OLI, approximately 97% of all sulfur from the GDP will be in the form of H_2S. Because Subpart KKKK requires SO_2 emission monitoring or TS (in lieu of SO_2 monitoring), a H_2S-CFM will not suffice for fuel monitoring of a CTG subject to Subpart KKKK. Instead it would be better to install a TS-CFM that will meet the compliance requirements of both the GDP and the CTG. Such monitors are available and comply with the TS methods given in Subpart GG and Subpart KKKK such as ASTM D6667 (in lieu of SO_2 testing).

The Department obtained a budgetary cost estimate from Teledyne for a TS-CFM. Their estimate is $50,000 if located inside a building and $55,000 if located outside. Interestingly, their H_2S-CFM would cost an additional $10,000 as TS is the easier (and actually the better) parameter to measure.

The present BACT limit is 200 ppmv of H_2S for which compliance would be demonstrated by an H_2S-CFM. Since the Department limit is based on H_2S and this pollutant comprises at least 95% of TS, an equivalent BACT limit would be 210 ppmv of TS.

Following is a conversion to express this limit in terms of the Subpart KKKK limit which is 0.15 pounds of SO_2 per million British thermal units of heat input (lb SO_2/mmBtu):

(210 f^3 TS/million f^3 of LFG)x(32 lb S/lb-mol TS)x(1 f^3 LFG/500 Btu)x(lb-mol TS/379 f^3 TS)

= 0.0355 lb S/mmBtu = 0.071 lb SO_2/mmBtu < 0.15 lb/mmBtu = Subpart KKKK limit.

Department Determination: The permit language of the original PSD permit will be changed include an alternative TS limit of 210 ppmv in the treated gas from the GDP (fuel to the CTG) on a 30-day basis demonstrated by a TS-CFM.

For the CTG, the applicant must comply with the Subpart KKKK limit of 0.15 lb SO_2/mmBtu and can demonstrate compliance by fuel monitoring techniques given in 40 CFR 60, Subpart KKKK (e.g. an ASTM D6667 compliant TS-CFM).

Permit language also will be modified to allow daily sampling of the LFG H_2S concentration per the protocol submitted by the applicant to be used as a backup when the H_2S-CFM (if used) is not available. Back up fuel monitoring methods for the CTG must comply with the procedures given in § 60.4360 and § 60.4370 of NSPS 40 CFR 60, Subpart KKKK.

- ***Condition III.A.10., H_2S LFG Concentration Exceedance:*** *OLI requests that the reference to H_2S-CEMs be deleted from the 4th bullet of the condition which reads:*

  "For any periods for which monitoring data are not available, any changes made in operation of the CEMS system during the period of data unavailability which could affect the ability of the system to record the applicable H_2S concentration limit. Operations of the CEMS system and affected facility during periods of data unavailability are to be compared with operation of the CMS system and affected facility before and following the period of data unavailability."

  Department Determination: Refer to previous discussion regarding H_2S-CEMS above. The condition will be modified to reflect a H_2S-CFM or a TS-CFM.

- ***Conditions III.B.15 and 20:*** *OLI asks to insert "stack" before "tests" in the requirements to notify and submit reports to the Compliance Authority.*

  Department Determination: The Department will modify these conditions as requested.

- ***Condition III.B.17:*** *OLI requests removal of the words "methods for minimizing excess emissions" and "all operators and supervisors shall be properly trained to operate and ensure maintenance" from the requirement regarding the Work Practice condition. According to OLI, open flares burn LFG as open flames with a windshield to protect the flame from the wind and do not have combustion control through adjustment of the flow of air. They indicated that the "open flares will be operated according to manufacturer's operating instructions and by trained operators who are currently operating the existing flares ..... if a problem arises, the open flares are shutdown to avoid any excess emissions". The condition as written suggests that* ***all*** *potential* ***managers*** *and landfill* ***operators****, regardless of their job description, must be trained to operate and maintain the flare.*

  Department Determination: The Department will modify this condition partially with the exception of removing the training requirements for **operators** of the landfill gas collection and control system. The Department believes that the training required in the condition provides the reasonable assurance for the good operation and functioning of the flares.

- ***Condition III.B.19:*** *OLI requests that the permit reference the startup, shutdown and maintenance plan required by 40 CFR Chapter 63, Subpart AAAA instead of the permit requirement to maintain "a written log the duration of each flare event and the reason for flaring" based on Rule 62-4.070 (3) F.A.C.*

  Department Determination: The Department will modify this condition to include reference to Subpart AAAA and the associated startup, shutdown and maintenance (SSM) plan.

- ***Condition III.C.5:*** *OLI requests use of the term "design heat input" for the Solar T-130 (as used for the Solar C-40) instead of "maximum heat input".*

  Department Determination: The Department will make the suggested change to be consistent with Specific Condition 4 in Subsection III-D for the SOLAR C-40 CTG.

- ***Previous Final Determination and Permit BACT for CTG:*** *OLI does not agree with the Department's assessment in the Final Determination (Department response to OLI comments on draft permit) that NO_X-CEMS are required by the BACT determination, if not by the requirements of 40 CFR 60, Subpart KKKK. BACT determines emission control technology, which in this case is good combustion practices. OLI believes that requiring NO_X CEMS based on BACT is, therefore, unreasonable.*

  Department Analysis: BACT is defined at Rule 62-210.200(40), F.A.C., which includes the following provisions: Link to Rule 62-210, F.A.C.

  (c) Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

  The Department can and often does require NO_X-CEMS as part of a BACT determination or as reasonable assurance of continuous compliance with permit conditions. Further details related to this matter are provided in the responses to the following comments.

- ***Conditions III.C.3, C.9, C.12 and C.17 and III.D.3, D.9, D.12 and D.17****: OLI requests removal of NO_X-CEMS and NO_X-CEMS based emission standards. According to OLI the proposed CTG are not subject to §§60.4335 or 60.4345. These sections relate to CTG that (unlike those at OLI) employ water or steam injection to control NO_X emissions and are equipped with NO_X-CEMS to demonstrate compliance (instead of continuous steam or water injection monitoring).*

  According to OLI, such CTG are subject to the requirements contained in §60.4340, which states "you must perform annual performance tests in accordance with §60.4400 to demonstrate continuous compliance" for NO_X. §60.4340 does not require NO_X-CEMS, which may be installed as an "alternative" to annual EPA Method 7E or Method 20 performance tests.

  Department Analysis: The Department agrees with the OLI that annual performance tests are the only specific requirement to demonstrate compliance with NSPS Subpart KKKK. The Department notes that prior to issuance of the PSD permit, EPA promulgated a new 1-hour nitrogen dioxide (NO_2) ambient air quality standard (AAQS) providing even greater justification to continuously control and monitor NO_X emissions (or at least related process parameters or surrogates).

  NO_X emissions from the 15 MW LFG-fueled T-130 CTG are limited to 72 parts per million by volume, dry at 7 percent oxygen (ppmvd) and the potential to emit is more than 200 tons per year (TPY). The PTE of NO_X from the single T-130 CTG is about twice the PTE of NO_X from three T-130 CTG slated for the Northwest Florida Renewable Energy Center for which the Department required NO_X-CEMS.

  Link to NWFREC

  NO_X emissions from each of the three 3.5 MW LFG-fueled C-40 CTG are limited to 42 ppmvd and the PTE of NO_X emissions from each is less 35 TPY.

In addition to NO_X-CEMS, §60.4340(b)(2) also references another alternative to annual performance tests for diffusion flame as follows:

(i) For a diffusion flame turbine without add-on selective catalytic reduction (SCR) controls, you must define parameters indicative of the unit's NO_X formation characteristics, and you must monitor these parameters continuously.

This continuous parameter monitoring system (CPMS) provision is not as robust as use of a NO_X-CEMS or establishment and monitoring of a minimum water or steam to fuel ratio to demonstrate continuous compliance. The latter is not available for the T-130 or C-40 because it does not incorporate steam or water injection.

Department Determination: The requirement for a NO_X-CEMS will be changed to CPMS for the larger SOLAR T-130 CTG. The CPMS shall be installed, calibrated, maintained and utilize defined parameters indicative of the unit's NO_X formation characteristics per § 60.4340(2)(i). Annual stack testing for the small SOLAR C-40 CTG will be used to show NO_X compliance in lieu of CEMS or CPMS. The NO_X BACT determinations for the CTG are hereby modified to allow for the NO_X compliance methods discussed above for the SOLAR T-130 and C-40 CTG.

As a result of this compliance monitoring change for the SOLAR T-130 CTG, the NO_X CEMS requirement will be removed from Specific Condition III.C.3 and replaced with a CPMS requirement. Specific Condition III.C.9 will also be modified to reflect the CPMS based requirement.

For the C-40 CTG, the NO_X CEMS requirement in Specific Condition III.D.3 will be removed. Also the 4-hour averaging time requirement will be removed from Specific Condition III.D.8 since this is a CEMS or CPMS based requirement. Finally, the requirements for a NO_X CEMS and a diluent monitor in Specific Condition III.D.15 will be removed since annual stack testing is now required.

The Department reserves its authority to require NO_X-CEMS for all CTG regardless of size in future BACT determinations or in minor permits (as reasonable assurance that the project does not trigger PSD) based on the specific circumstances of such future projects including expansions of the OLI LFGTE plant.

- ***Conditions III.C.9 and C.12***: *OLI request that the words "4-hour block average" be replaced with "4-hour rolling average". This change is necessary to be consistent with Section 60.4380(c) of Subpart KKKK.*

  Department Determination: The Department will modify these conditions as requested.

- ***Conditions III.C.17***: *OLI request that the words "and a diluent monitor" from the first paragraph of Condition 17 be removed. Also OLI requests that Condition 17.b (Diluent Monitor) be removed. A diluent monitor is required for oxygen corrections of continuously measured CO and NO_X emissions.*

  Department Determination: Per the discussion of NO_X CEMS requirements above, a NO_X CEMS is no longer required for the SOLAR T-130, the Department will modify the requested paragraph and remove the requested condition. In addition, the Department will remove Specific Condition 17.a dealing with the NO_X CEMS.

- ***Condition III.C.19***: *OLI request that a permitting note be added to the condition to clarify that even thorough the acid rain provisions of 40 CFR 75 is cited for continuous monitoring requirements for the consumption rate and heat content of allowable fuels, the CTG is not an acid rain unit.*

  Department Determination: The Department will add a permitting note as requested to indicate the SOLAR T-130 CTG is not an acid rain unit.

- ***Condition III.D.11***: *OLI request that this condition be removed since the NO_X excess emission requirement is based on CEMS data.*

  Department Determination: Since annual NO_X stack testing is now required for compliance purposes for the C-40 CTG, this Specific Condition will be removed.

3. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the modification of Air Permit No. 0930104-014-AC (PSD-FL-382) for the LFGTE project at the OL will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit (Air Permit No. 0930104-018-AC). This determination is based on a technical review of the application, the reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project does not result in any increase in PSD-pollutant emissions. Teresa Heron is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 or by phone at 850-717-9082.