

217/782-2113

CONSTRUCTION PERMIT - REVISED
NSPS/NESHAP SOURCE

PERMITTEE

Countryside Genco, L.L.C.
d/b/a Illinois Electrical Generation Partners, L.L.C.
Attn: Steve Laliberty, President
40 Tower Lane
Avon, CT 06001

Application No.: 98050077

I.D. No.: 097025AAR

Applicants Designation:

Date Received: June 4, 2009

Subject: Landfill Gas-to-Energy Facility

Date Issued:

Location: Countryside Landfill, 31725 N. Route 83, Grayslake, Lake County

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a landfill gas treatment system and six landfill gas fired internal combustion engine driven generator sets, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Description

This Permit covers the construction of a gas-to-energy facility (the affected facility) that will use landfill gas (LFG) collected from the Countryside landfill as a fuel. The affected facility includes a LFG treatment system and six LFG fired internal combustion engines (the affected engines).

This affected facility and the associated Countryside landfill (Illinois EPA BOA I.D. No. 097806AAG) considered to be a single source pursuant to 40 CFR 52.21(b)6; 35 IAC 203.112, 203.136, and 211.6130; and Section 39.5(1) of the Illinois Environmental Protection Act.

2-1. Applicable Federal Emission Standards for Landfills

- a. i. The affected facility is subject to the New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills, 40 CFR 60 Subpart WWW and related requirements in 40 CFR 60 Subpart A, General Provisions (the Landfill NSPS). Pursuant to the Landfill NSPS, emissions from any atmospheric vent from a LFG treatment system at the facility are subject to the requirements of 40 CFR 60.752(b)(2)(iii)(A) and (B).

Note: The affected facility is subject to the Landfill NSPS because the associated landfill is subject to this NSPS and the facility receives untreated LFG collected from the landfill. For the purpose of the Landfill NSPS, this permit is issued based on the Permittee treating the LFG that is combusted at the affected facility (i.e., processing the LFG with compression, de-watering and filtration, with a system designed and operated to remove nonmethane organic compounds (NMOC) from the collected LFG in accordance with 40 CFR

60.752(b)(iii)(C)). As a consequence, the affected engines are not subject to the emission standards of the Landfill NSPS, pursuant to a determination for the affected facility made by the USEPA in a letter dated March 03, 2004. Compliance with the Landfill NSPS is not dependent upon the control efficiency for NMOC achieved by the engines and emission testing of the engines is not required pursuant to this NSPS

- ii. If the affected engines are relied upon in the future to comply with the requirements of the Landfill NSPS (e.g., the LFG treatment system is unable to treat all LFG being used as fuel in the engines):
 - A. For purposes of compliance with the NSPS, the affected engines are considered to be enclosed combustor type control devices, as defined under 40 CFR 60.751.
 - B. Pursuant to 40 CFR 60.752(b)(2)(iii)(B), the affected engines shall be operated to reduce NMOC emissions by 98 weight percent or reduce the outlet NMOC concentration for each engine to less than 20 parts per million by volume (ppmv), dry basis as hexane at 3 percent oxygen.
 - C. The Permittee shall operate the affected engines so as to comply with the provisions of 40 CFR 60.753. Specifically, these include:
 - I. Operation of the affected engines in compliance with 40 CFR 60.752(b)(2)(iii). In the event the affected engines are inoperable, the gas mover system shall be shut down and all valves in the control system contributing to venting off the gas to the atmosphere shall be closed within one hour; [40 CFR 60.753(e)]
 - II. Operation of the affected engines at all times when the collected gas is routed to them. [40 CFR 60.753(f)]
 - III. Fulfillment of all applicable operating, monitoring, testing, recordkeeping, and reporting requirements of the Landfill NSPS.
 - D. The Permittee shall conduct timely performance tests for the affected engines as required pursuant to the Landfill NSPS.
- b. The affected facility is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills, 40 CFR 63, Subpart AAAA and related requirements in 40 CFR 63 Subpart A, General Provisions (the Landfill NESHAP). Pursuant to this NESHAP, 40 CFR 63.1960, the Permittee must develop and implement a written Startup, Shutdown, and Malfunction Plan for the facility, including the engines, in accordance with 40 CFR 63.6(e)(3).
- c. As the affected facility is subject to the Landfill NSPS and Landfill NESHAP, the Permittee shall at all times, to the extent

practicable, maintain and operate the affected facility, including LFG treatment systems and affected engines, in a manner consistent with good air pollution control practice for minimizing emissions, as required pursuant to 40 CFR 60.11(d) and 63.6(e)(3).

2-2. Applicable Federal Emission standards for the Engines

- a. This permit is issued based on the source, i.e., the combination of the affected facility and the associated landfill, being an "area source" for emissions of hazardous air pollutants (HAPs), as defined by 40 CFR 63.6585(c). Accordingly, the Permittee shall comply with the applicable requirements of the NESHAP for Stationary Reciprocating Internal Combustion Engines, 40 CFR 63 Subpart ZZZZ, for each affected engine that meets the applicability provisions of this NESHAP, e.g., the engine is manufactured after June 11, 2006. In particular, pursuant to this NESHAP, 40 CFR 63.6590(c), each such subject engine shall comply with the applicable requirements of the NSPS for Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60 Subpart JJJJ (the Engine NSPS). No further requirements apply for subject engines under the NESHAP, 40 CFR 63 Subpart ZZZZ other than to comply with the Engine NSPS.

2-3. Applicable State Emission Standards

- a. The affected engines and other emission units at the affected facility are subject to 35 IAC 212.123(a), which provides that no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit except as allowed by 35 IAC 212.123(b) and 212.124.
- b. The affected engines and other emission units at the affected facility are subject to 35 IAC 214.301, which provides that no person shall cause or allow the emissions of sulfur dioxide (SO₂) into the atmosphere from any process emission unit to exceed 2000 ppm.
- c. The affected engines and other emission units at the affected facility are subject to 35 IAC 218.986(a), which provides that the owner or operator of a subject emission unit shall use emission capture and control technique(s) that achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent.

Note: The affected engines and other emission units at the affected facility are subject to this control requirement of 35 IAC 218 Subpart TT, "Other Emission Units", pursuant to 35 IAC 218.980(b), as the affected source, i.e., a combination of the affected facility and associated landfill, has the potential to emit 25 tons or more of VOM per year. Compliance with this requirement is addressed by applicability of the Landfill NSPS, as it addresses capture and control of LFG and emissions of NMOC from the source.

3. Non Applicability Provisions

- a. This permit is issued based on this project not constituting a major modification for the purpose of Prevention of Significant Deterioration (PSD), 40 CFR 52.21, or Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This is

a consequence of the emission limits and other conditions in this permit that ensure that the emissions from the source, do not trigger the applicability of PSD or MSSCAM, consistent with information provided in the application. (See Condition 5(b)(ii).)

4. Operating Limitations

- a. LFG shall be the principle fuel fired in the affected engines.
- b. The nominal rated heat input capacity of each affected engine shall not exceed 12.6 million Btu per hour.

5. Emission Limitations

- a. This permit is issued based on LFG treatment system being a closed system with no emissions of air pollutants to the atmosphere.
- b. i. The emissions from the affected engines and the facility shall not exceed the following limits. The hourly limits shall not apply during startup of an engine.

Pollutant	Limits		
	Lbs/hour for Each Engine	Tons/year	
		Each Engine	Facility
Nitrogen Oxides (NO _x)	5.9	25.84	155.0
Carbon Monoxide (CO)	5.55	24.3	145.9
Sulfur Dioxide (SO ₂)	3.0	13.1	78.6
Particulate Matter (PM/PM ₁₀)	0.7	3.1	18.6
Volatile Organic Material(VOM)/ Nonmethane Organic Compounds (NMOC)	0.4	1.75	10.5
Individual Hazardous Air Pollutant (HAP)	0.13	0.57	3.4

- ii. The total emissions of the source, i.e., the combination of the affected facility and the associated landfill, shall not exceed the following limits:

Pollutant	Emissions (Tons/year)
NO _x	245.0
CO	245.0
SO ₂	97.5

- c. i. Compliance with the annual limits in this permit shall be determined from a running total of 12 months of data.
- ii. Emissions shall be determined using appropriate emission factors which in order of preference shall be factors from on-site emission testing, manufacturer's emission data, and emission factors from USEPA's Compilation of Air Pollutant Emission Factors (AP-42).

6-1. Original Emission Testing Requirements

- a. Within 60 days after achieving the maximum production rate at which each affected engine will be operated, but not later than 180 days after initial startup of the engine, emissions from the engine shall be measured by an approved testing service, during conditions which are represent of maximum emissions. This testing may include measurement of the following:
 - i. The NMOC reduction efficiency or parts per million by volume emission rate shall be established by an initial performance test, required under 40 CFR 60.8 using the test methods specified in 40 CFR 60.754(d). This testing shall include the LFG treatment system if the Permittee is relying upon it to comply with the reduction requirements in 40 CFR 60.752(b)(2)(iii)(B).
 - ii. Opacity and emissions of NO_x, CO, PM/PM₁₀, and VOM/NMOC.
- b. i. Within 90 days of a written request from the Illinois EPA, the Permittee shall perform such other emissions and/or performance tests specified by the Illinois EPA. The 90 day time period will automatically be extended for an additional 60 days upon written request by the Permittee. The Illinois EPA may provide additional time for the performance of these tests upon written request by the Permittee.
 - ii. Upon written request of the Illinois EPA, the Permittee shall promptly conduct observations of operation and opacity of the affected engines. Opacity shall be determined in accordance with USEPA Method 9, during representative operation of the engines.
- c. Unless otherwise specified, each test shall consist of three separate runs each of at least 60 minutes in duration. For the purpose of determining, the arithmetic means of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances, beyond the owner or operator's control, compliance may, upon the Illinois EPA approval, be determined using the arithmetic mean of the results of the two other runs. [40 CFR 60.8(f)]
- d. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA: Refer to 40 CFR 60, Appendix A.

Sample and Velocity Traverses	USEPA Method 1
Stack Gas Velocity and Volumetric Flow Rate	USEPA Method 2
Gas Analysis for Carbon Dioxide, Oxygen, Excess Air, and Dry Molecular Weight	USEPA Method 3
Moisture Content in Stack Gases	USEPA Method 4
Particulate Emissions	USEPA Method 5
Nitrogen Oxide Emissions	USEPA Method 7
Visual Determination of Opacity	USEPA Method 9
Carbon Monoxide Emissions	USEPA Method 10
Total Gaseous Nonmethane Organic Emissions as Carbon	USEPA Method 25 or 18

- e. At least 60 days prior to the actual date of testing a written test plan shall be submitted to the Illinois EPA for review and approval. This plan shall describe the specific procedures for testing, including as a minimum:
 - i. The name and identification of the affected unit(s);
 - ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.
 - iii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the source and any control equipment will be determined.
 - iv. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations.
 - v. The test method(s) which will be used, with the specific analysis method, if the method can be used with different analysis methods.
 - vi. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.
 - vii. Any proposed use of an alternative test method, with detailed justification.
 - viii. The format and content of the Source Test Report.
- f. The Illinois EPA shall be notified prior to these tests to enable the Illinois EPA to observe these tests. Notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual test date.
- g. Copies of the Final Report(s) for these tests shall be submitted to the Illinois EPA within 30 days after the test results are compiled and finalized. The Final Report shall include as a minimum:
 - i. A summary of results.
 - ii. General information.
 - iii. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.
 - iv. Detailed description of test conditions, including:
 - A. Total flow of LFG to the facility;
 - B. LFG treatment system operating parameters; and

- C. Engine operating parameters, i.e., LFG flow to the engine, average engine cylinder combustion temperature, RPM, etc.
- v. Data and calculations, including copies of all raw data sheets and records of laboratory analysis, sample calculations, and data on equipment calibration.
- vi. The results of all quality control evaluations, including a copy of all quality control data.

6-2. Additional Emissions Testing Requirements

- a. For an affected engine, which is subject to the applicable requirements of the Engine NSPS, if emission testing is required pursuant to the Engines NSPS (for example, if the affected engine is non-certified by the manufacturer or the certified engine is not operated and maintained in accordance with the manufacturer's emissions-related written instructions), the Permittee shall comply with the applicable testing requirements of the NSPS, 40 CFR 60.8 and 60.4243(b)(2)(ii).

7-1. Monitoring Requirements.

- a. The Permittee shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:
 - i. A gas flow rate measuring device that shall record the flow to the control system (e.g., the total combined gas flow to all the engines) at least every 15 minutes;
 - ii. A gas flow rate measuring device that provides a measurement of gas flow to or bypass of the control system. For this purpose the Permittee shall either:
 - A. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control system at least every 15 minutes; or
 - B. Secure the bypass line valve(s) 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(s) are maintained in the closed position and that the gas flow is not diverted through the bypass line(s).
- b. For the affected engine(s), the Permittee shall comply with the applicable monitoring requirements of the Landfill NSPS when affected engine(s) are relied upon for compliance with this NSPS.

7-2. Requirements for Sampling And Analysis of LFG

- a. i. The Permittee shall conduct sampling and analysis at least once per year for the composition of LFG arriving at the facility and produced by the LFG treatment system. The samples shall be analyzed for methane, sulfur, and NMOC content (percent by volume) and heat content (Btu/cubic foot) of the LFG. If USEPA Method 18 is used to determine NMOC content, the minimum list of compounds to be tested

shall be those published in the most recent version of AP-42. These analyses may be performed by the operator of the associated landfills or an independent company. Written notification of testing or submittal of a formal testing protocol is not required for these tests.

- ii. The Permittee shall keep records for this activity, including both collected data and documentation for the sampling and analysis.

8. Recordkeeping Requirements

- a.
 - i. The Permittee shall maintain records for the affected facility, as necessary, to demonstrate compliance with the Landfill NSPS, including actions taken by the Permittee to verify that the LFG supply to the affected engines has been properly treated and any period when engines were relied upon or should have been relied upon for compliance, with explanation.
 - ii. For each affected engine that is subject to the applicable requirements of the Engine NSPS, the Permittee shall comply with the applicable recordkeeping requirements of this NSPS.
- b. The Permittee shall maintain a file for each affected engine containing the following:
 - i. Manufacturer's data for the engine including emissions guarantees, horsepower or rated heat input capacity (mmBtu/hour), and operating and maintenance procedures suggested by the manufacturer.
 - ii. The maximum hourly emission rates for NO_x, CO, SO₂, PM, PM₁₀, VOM, NMOC and HAP (lbs/hour), with supporting documentation and calculations.
- c. The Permittee shall maintain an operating log or other records for each affected engine that at a minimum includes the following records related to startup of the engine:
 - i. Date, time and duration of each startup; and
 - ii. Description of the startup, if written operating procedures are not followed during the startup or a significant problem occurs during the startup including detailed explanation.
- d. The Permittee shall keep inspection, maintenance and repair logs with dates and the nature of such activities for the LFG treatment system and each affected engine.
- e. The Permittee shall maintain following records related to emissions:
 - i. Records for the heat content and composition of the LFG, based on representative sampling and analysis.
 - ii. LFG throughput (scf/month and scf/year) to the affected facility.
 - iii. A file identifying the maximum level(s) of sulfur in LFG

combusted at the affected facility at which compliance with 35 IAC 214.301 is maintained, with supporting documentation and analysis.

- iv. A file containing: 1) The emission factors or emission rates used by the Permittee for calculating emissions of NO_x, CO, PM, VOM, NMOC and HAPs, with supporting documentation; and 2) Engineering calculations for the maximum hourly emissions of NO_x, CO, PM, VOM, NMOC and HAPs from the engines.
- v. Records of the emissions of NO_x, CO, SO₂, PM, VOM, NMOC and HAPs from the affected facility (tons/month and tons/year), based on the operation of the facility, the composition of the LFG and the appropriate emission factors, with supporting data and calculations.
- vi. The Permittee shall maintain records of the emissions of NO_x, CO and SO₂ from the source (tons/month and tons/year), with supporting documentation and calculations. For this purpose, for the emissions from the associated landfill, the Permittee may on a routine basis obtain a copy of the emission data from the operator of the landfill, with supporting documentation and calculations.
- f. The Permittee shall maintain records for all opacity measurements made in accordance with USEPA Method 9 for the affected engines that the Permittee conducts or that are conducted on its behalf by individuals who are qualified to make such observations. For each occasion on which such observations are made, these records shall include the identity of the observer, a description of the various observations that were made, the observed opacity, and copies of the raw data sheets for the observations.
- g. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least five years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.

9. Reporting Requirements

- a.
 - i. The Permittee shall notify the Illinois EPA within 10 days if an affected engine is being relied upon for routine compliance with the Landfill NSPS (rather than treatment of LFG), with explanation.
 - ii. If affected engine(s) is being relied upon for routine compliance with the Landfill NSPS, the Permittee shall notify the Permittee for the associated landfill (i.e., Countryside Landfill) and the Illinois EPA as soon as it becomes aware that the affected facility will not or is not controlling collected LFG so as to comply with applicable requirements for control of LFG.
- b. The Permittee shall notify the Illinois EPA with its semi-annual compliance reports if any affected engine has been relied upon for

compliance with the Landfill NSPS, during outages of the LFG treatment system, with identification of each such outage and explanation.

- c. Pursuant to the Landfill NSPS, the Permittee shall submit to the Illinois EPA annual reports of the following information. If there have been no exceedances during the prior calendar year the Annual Emissions Report shall include a statement to that effect. The initial annual report shall be submitted within 180 days of installation and start-up of the control system, and shall include the initial performance test report required under 40 CFR 60.8. Thereafter, these reports shall be submitted with the annual emissions report, as required pursuant to 35 IAC Part 254. [40 CFR 60.757(f)]
- i. Description and duration of all periods when the gas stream is diverted from the control system through a bypass line or the indication of bypass flow as specified under §60.756. [40 CFR 60.757(f)(2)]
- ii. Description and duration of all periods when the control system was not operating for a period exceeding 1 hour and length of time the control system was not operating. [40 CFR 60.757(f)(3)]
- iii. Other reportable deviation as shown in Condition 8(c) and defined under 40 CFR 60.758(c).
- d. If there is any deviation from the requirements of this permit, the Permittee shall submit a report to the Illinois EPA within 30 days after the deviation. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the deviation or violation and efforts to reduce emissions and future occurrences. The report shall include the emissions released in accordance with recordkeeping requirements, a copy of the relevant records, and a description of the deviation and efforts taken to minimize emissions and future occurrences.
- e. For each affected engine that is subject to the Engine NSPS, the Permittee shall comply with the applicable notification and reporting requirements of this NSPS.
- f. Two copies of all reports, notifications, and correspondence required by this permit shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

Tel: 217/782-5811

Fax: 217/782-6348

And one (1) copy to the Regional Office:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

Tel: 847-294-4000

Fax: 847-294-40188

10. Compliance Provisions

- a. Compliance with the emission limits for PM, NO_x, VOM, and CO in Condition 5 and 6 shall be based on the emission factors developed from the emission rates below as they are higher than the results of the testing required by Condition 6:

<u>Pollutant</u>	<u>Emission Rates (Lb/Hr)</u>	<u>Notes</u>
PM	0.7	1
NO _x	5.90	2
VOM	0.4	3
CO	5.55	4

Notes

- 1 Emissions rate based upon, AP-42 and the maximum gas flow rate provided by the engine manufacturer.
- 2 Emission rate provided by the engine manufacturer
- 3 Emission rate based upon a maximum emission concentration of 20 ppmv as hexane @ 3% O₂.
- 4 Emission rate provided by the engine manufacturer and a multiplier of 1.5.
11. The Permittee shall take appropriate measures to allow the Permittee for the associated landfill to assure applicable requirements related to control of LFG are being met, if any, including:
- a. Keeping all required records.
- b. Keeping copies of the required reports and notifications.
- c. Allowing access to such records.
12. This permit does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as all other applicable Federal, State and Local requirements. In particular, this permit does not excuse the Permittee from the obligation to undertake further actions at the source as may be needed to eliminate air pollution, including nuisance due to odors, such as implementation of additional work practices for handling of LFG at this gas-to-energy facility.
13. Authorization to Operate

The Permittee may operate the affected engines with LFG treatment system pursuant to this revised construction permit until the CAAPP permit for the source is revised to address the revisions made in this permit.

Please note that this permit has been revised at the request of the Permittee to increase the permitted emissions of SO₂ of the affected facility to address data collected for the actual sulfur content of the LFG, as compared to data provided in the original application submitted in 1999. Additionally, the revised permit more clearly addresses the applicability of the NSPS and NESHAP regulations to the facility, including provision of a site-specific applicability determination made for this facility by the USEPA.

If you have any questions regarding this permit please contact Minesh Patel at 217/782-2113.

Edwin C. Bakowski, P.E.
Manager, Permit Section
Division of Air Pollution Control

Date Signed: _____

ECB:CPR:KMP:

cc: Region 1
Christopher Rubek, Countryside Landfill