217/785-1705

CONSTRUCTION PERMIT -- NSPS SOURCE

PERMITTEE

Power Ventures Group, LLC
c/o Garden Prairie Energy Facility
Attn: Thomas Graves
9400 Ward Parkway
Kansas City, Missouri 64114

Application No.: 09050009 I.D. No.: 007808AAC
Applicant's Designation: Date Received: May 6, 2009
Subject: Garden Prairie Energy Facility
Date Issued:
Location: 3465 Garden Prairie Road, Garden Prairie, Boone County

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a power generating facility, with 12 natural gas-fired engine-generators and ancillary equipment, as described in Attachment A and in the above referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

This permit authorizes construction of an electric power generating facility (the affected facility) with a nominal total output capacity of 112 MW. The facility would be developed to support wind power facilities, by serving as an alternative source of power during periods of low or variable wind, as well as to provide power to the grid during periods of peak demand.

The affected facility would have 12 natural gas fired internal combustion engine generators (the affected natural gas engines). Each affected engine will be equipped with a Selective Catalytic Reduction (SCR) system to control emissions of nitrogen oxides (NO_x) and an oxidation catalyst system for emissions of carbon monoxide (CO) and volatile organic material (VOM). The facility would also have a small natural gas fired fuel heater for the affected natural gas engines, two emergency diesel fired engines (the affected diesel engines), and other ancillary equipment.

2. Applicable Federal Emission Standards

a. i. Each affected natural gas engine is subject to the federal New Source Performance Standard (NSPS) for Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60 Subpart JJJJ. The Permittee must comply with applicable requirements of the NSPS, 40 CFR 60 Subpart JJJJ, and related requirements of 40 CFR 60 Subpart A, General Provisions, for these engines.

ii. Pursuant to 40 CFR 60.4233(e), each affected natural gas engines shall be designed and maintained to comply with the applicable emission standards in Table 1 of 40 CFR 60 Subpart JJJJ.

Note: The emissions limits set by this permit require achievement of emission rates that are more stringent than the applicable emissions standards under the NSPS, 40 CFR 60 Subpart JJJJ.

b. i. Each affected diesel engine is subject to the NSPS for Compression Ignition Internal Combustion Engines, 40 CFR 60 Subpart IIII. The Permittee musts comply with applicable requirements of the NSPS, 40 CFR 60 Subpart IIII, and related requirements of 40 CFR 60 Subpart A, for these engines.

ii. Pursuant to 40 CFR 60.4202(a)(2) and 60.4205(b), the affected diesel emergency engine generator shall be designed and maintained to comply with applicable emission standards in 40 CFR 89.112, including a standard of 4.0 grams per HP-hour for the combined emissions of nonmethane hydrocarbons (NMOC) and NO_x.

iii. Pursuant to 40 CFR 60.4202(d) the affected diesel emergency fire pump engine shall be designed and maintained to comply with applicable emission standards in Table 4 of 40 CFR 60 Subpart IIII, including a limit of 3.0 grams per HP-hour for the combined emissions of NMOC and NO_x.

c. The Permittee shall operate and maintain each affected engine and associated control devices, over the entire life of the engine, according to the manufacturer’s emission related written instructions and must keep records of conducted maintenance to demonstrate compliance, pursuant to 40 CFR 60.4243(a)(1) and (b)(1) for the affected natural gas engines and 40 CFR 60.4211(a), (f) and (g) for the affected diesel engines plus 40 CFR 60.4211(c) for the diesel generator.

3. State Emission Standards

a. Pursuant to 35 IAC 212.123(a), the opacity of the exhaust from each affected engine and the affected fuel heater shall not exceed 30 percent, except as allowed by 35 IAC 212.123(b) and 212.124.

b. Pursuant to 35 IAC 214.301, the emission of sulfur dioxide (SO_2) into the atmosphere from each affected engine shall not exceed 2,000 ppm.

4. Non-Applicability Provisions

a. This permit is issued based on the affected facility not being a major new source subject to the federal rules for the Prevention of Significant Deterioration (PSD), 40 CFR 52.21. In particular, permitted emissions of each regulated NSR pollutant other than greenhouse gases (GHG), would be less than 250 tons per year. The permitted GHG emissions would be less than 100,000 tons of carbon dioxide equivalents (CO_2e) per year.

b. This permit is issued based on the affected engines not being subject to the requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE), 40 CFR 63 Subpart ZZZZ. This is because the affected natural gas engines would be located at an area source as defined in this NESHAP, 40 CFR 63.6590(a)(2), so that this NESHAP only provides that the affected natural gas engine must comply with the applicable requirements of the NSPS, 40 CFR 60 Subpart JJJJ. No further requirements under this NESHAP apply for these engines as provided by 40 CFR 63.6590(c). The affected diesel engines are emergency engines with a capacity less than 500 horsepower.

c. This permit is issued based on the Permittee not being required to conduct initial performance tests for the affected engines under the NSPS because the Permittee is purchasing engines that are certified by the manufacturer according to procedures specified in the NSPS, as complying with applicable NSPS emission standards.

   Note: Initial emission testing is only required to demonstrate compliance with the emission limits of this permit as addressed in Condition 7.

d. This permit is issued based on the affected natural gas engines not being subject to the substantive requirements of the federal Acid Rain Program because each affected engine meets the new unit utility exemption of 40 CFR 72.7(a).

   Note: The Permittee must comply with the new unit exemption by providing appropriate documentation and meeting all procedures required under 40 CFR 70.7(b), (d) and (f).

e. The affected natural gas engines are not subject to 35 IAC Code Part 225 because they are not electricity generating units, as defined by 35 IAC 225.130.

f. This permit is issued based on the affected engines not being subject to the requirements of 35 IAC Part 212, Subpart L, because a process weight rate cannot be set, due to the nature

of internal combustion engines, so that these rules cannot reasonably be applied, pursuant to 35 IAC 212.323.

5. Operational Limits and Work Practices

a. i. The nominal rated capacity of each affected natural gas engine shall not exceed 12,526 HP.

ii. The rated heat input of the natural gas fired fuel heater shall not exceed 3.0 mmBtu/hour.

b. i. A. The total usage of natural gas by the affected natural gas engines shall not exceed 57 million scf per month per engine and 1,433 million scf per year for all 12 engines combined.

B. The operation of all 12 affected natural gas engines, combined, shall not exceed 18,200 engine-hours per year.

C. The total number of startups by the affected natural gas engines shall not exceed 3,000 per year for all engines combined.

ii. Each affected diesel engine shall not operate for more than 100 hours per year.

iii. Compliance with these annual limits and other annual limits set by this permit shall be determined from a running total of 12 months of data, unless otherwise specified in a particular provision.

c. Each affected natural gas engine shall be operated in a manner consistent with good air pollution control practice to minimize emissions during startup and malfunction or breakdown including:

i. Operation in accordance with the manufacturer’s written instructions or other written procedures developed and maintained by the Permittee, which shall include at a minimum the following measures:

A. Review of operating parameters of the engine during startup and malfunction or breakdown as necessary to make adjustments to reduce or eliminate excess emissions.

B. Operation of the SCR system as soon as and as long as the engine’s operating conditions are amenable to its effective use.

C. Implementation of inspection and repair procedures for an engine prior to attempting startup following repeated trips during previous attempts to start the engine.

ii. Maintenance of the emission control systems in accordance with written procedures developed and maintained by the Permittee.

iii. These procedures shall be reviewed by the Permittee at least annually and enhanced consistent with good air pollution control practices based on actual operating experience and equipment performance.

d. i. Upon malfunction of the SCR system that will result in NO_x emissions in excess of the applicable short-term NO_x limit in Condition 1.6, the Permittee shall as soon as practicable repair the affected system or remove the affected natural gas engine from service so that excess emissions cease.

ii. Consistent with the above, if the Permittee has maintained and operated the affected engines/SCR systems so that malfunctions are infrequent, sudden, not caused by poor maintenance or careless operation, and in general are not reasonably preventable, the Permittee shall begin shutdown of the engine within 60 minutes, unless the malfunction is expected to be repaired in 120 minutes or such shutdown could threaten the stability of the regional electrical power system. In such case, shutdown of the engine shall be undertaken when it is apparent that repair will not be accomplished within 120 minutes or shutdown would not endanger the regional power system. In no case shall shutdown of an engine be delayed solely for the economic benefit of the Permittee.

e. At all times, the Permittee shall maintain and operate the affected engines, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions, pursuant to 40 CFR 60.11(d).

6. Emissions

a. i. The annual emissions from the affected facility shall not exceed the limits in Table 1.

ii. This permit is issued based on the affected facility having minimal emissions of sulfur dioxide (SO_2) and sulfuric acid mist. For this purpose, total emissions

of each pollutant from the facility shall not exceed 0.6 tons per year.

b. Emissions from the various emission units at the affected facility shall not exceed the limits in Table 2 (natural gas engines), Table 3 (diesel engine generator) and Table 4 (diesel engine fire pump). Compliance with the hourly limits for NO_x shall be determined on a 1-hour average basis. Compliance with other hourly limits shall be determined on a 3-hour average basis.

7. Emission Testing

a. Within 180 days of the initial startup of the affected facility, the Permittee shall have tests conducted for the affected natural gas engine for emissions of NO_x, CO, PM/PM_{10}, $PM_{2.5}$, VOM (NMHC and CH_4), N_2O, and HAPs by a qualified independent testing service. All performance tests for NO_x, CO, and VOM must be conducted in accordance with the requirements in 40 CFR 60.4212. For this purpose, emissions testing shall be conducted on five engines at the maximum load range (two engines for CH_4 and N_2O), either as selected by the Illinois EPA or randomly selected by the Permittee, with testing of two engines for emissions other than CH_4 and N_2O to also be conducted at two load levels other than maximum load.

b. As an alternative to emission testing for CH_4 and N_2O, as part of its test plan, the Permittee may propose to submit emission test report(s) for testing of CH_4 and N_2O from identical models of engines equipped with similar control equipment conducted at other source(s).

8. Operational Monitoring for SCR Systems

a. The Permittee shall install, evaluate, operate, and maintain meters to measure and record consumption of natural gas by each engine.

b. The Permittee shall install, evaluate, operate, and maintain meters to measure and record the gross electrical output of the generator(s) associated with each engine.

c. The Permittee shall equip, operate, and maintain each engine with instrumentation to measure ambient temperature, inlet air temperature, engine firing rate, SCR reagent injection rate, and flue gas temperature at the SCR catalyst.

d. The Permittee shall maintain the records of the measurements made by these systems and records of maintenance and operational activity associated with the systems.

9. Recordkeeping

a. i. For the affected natural gas engines, the Permittee shall comply with applicable recordkeeping requirements of the NSPS, including 40 CFR 60.4245(a).

ii. For the affected diesel engines, the Permittee shall comply with applicable recordkeeping requirements of the NSPS, including 60.4214(b).

b. The Permittee shall maintain records of the following items for each affected engines:

i. A. A file containing the manufacturer's specification for the engine, including the maximum engine capacity, the manufacturer's certification of compliance with applicable NSPS emission standards and the manufacturer's recommended operating and maintenance procedures for the engine and the SCR and oxidation catalyst systems.

B. Data for the maximum hourly emission rates for NO_x, CO, VOM, PM/PM_{10}, $PM_{2.5}$, CO_2, CO_2e and individual and total HAPs (lbs/hour) from the various affected engines, with supporting calculations.

ii. An operating log, which shall include the following information:

A. Information for each time the engine is operated, with date, time, duration, and purpose (i.e., exercise or standby need).

B. Information for any incident in which the operation of the engine continued during malfunction or breakdown, including: date, time, and duration; a description of the incident; the probable cause of the incident; whether emissions exceeded or may have exceeded any applicable standard; a description of the corrective actions taken to reduce emissions and the duration of the incident; and a description of any preventative actions taken.

iii. A maintenance and repair log, listing each activity performed with date and description.

c. The Permittee shall maintain the following records for the affected facility:

i. The following operating records:

A. 1. The total amount of natural gas used by the affected natural gas engines.

2. The amount of fuel used in the affected diesel engines, including maximum sulfur content.

B. 1. Operating hours of each affected engine (hours/month and hours/year);

2. The combined operation of the affected natural gas engines (engine-hours per month and engine-hours per year);

3. The total number of startups of the affected natural gas engines (per month and per year); and

4 Consumption of SCR reagent, as determined from inventory record, compiled on at least a monthly basis.

ii. The following records for actual emissions (tons/month and tons/year) with supporting calculations:

A. Records of total emissions of NO_x, CO, VOM, PM/PM_{10}, $PM_{2.5}$, CO_2, CO_2e, and HAPs from the affected natural gas engines.

B. Records of the emissions of NO_x, CO, VOM, PM, CO_2 and CO_2e of each affected diesel engine and the fuel heater.

d. The Permittee shall maintain detailed records related to continued operation of an affected engine with excess or above normal emissions due to malfunction or breakdown, including the following:

i. The following detailed information for each period of excess NO_x emissions accompanying malfunction or breakdown of the SCR system:

A. Date, time and duration of excess NO_x emissions;

B. Identification of the affected engine, the NO_x emission rate, the operating condition of the engine, and possible causes for excess NO_x emissions, e.g., interruption or reduction in SCR reagent flow;

C. A description of corrective actions taken by the Permittee to return NO_x emissions to its permitted limit;

D. If corrective actions did not promptly return NO_x emissions to acceptable levels, the time that the Permittee initiated shutdown of the engine and, if not immediate, a description of the circumstances that made immediate shutdown unsound and a demonstration that shutdown was deferred only until it became safe to do so, with supporting documentation; and

E. A description of further investigation and corrective actions taken by the Permittee following shutdown of the engine prior to returning the affected engine to service.

ii. Hours of operation for each engine, excluding startup and shutdown (hours/month, hours/year);

iii. Hours of excess NO_x emissions for each engine, excluding startup and shutdown (hours/month, hours/year);

iv. Whether the SCR system was available for 90 and 95 percent of the operating time of the engine in the previous month and year, respectively;

v. Whether the catalyst was spent (i.e., no longer usable);

vi. If the above criteria are not met, an explanation whether the SCR system was properly maintained; and

vii. The following information for each period of above normal opacity:

A. Date, time and duration of observed opacity above normal;

B. Name and position of observer;

C. Identification of the affected engine, a description of the observed opacity, the operating condition of the engine, and possible causes for above normal opacity, e.g., excess natural gas pressure or low natural gas temperature;

D. Whether exceedances of Condition 4.2.3-2(a) [30 percent opacity] may have occurred,

including any Method 9 readings taken by a qualified observer;

E. A description of corrective actions taken by the Permittee to restore normal opacity levels;

F. If corrective actions did not promptly restore acceptable opacity levels, the time that the Permittee initiated shutdown of the turbine and, if not immediate, a description of the circumstances that made immediate shutdown unsound and a demonstration that shutdown was deferred only until it became safe to so, with supporting documentation; and

G. A description of further investigation and corrective actions taken by the Permittee following shutdown of the turbine prior to returning the affected turbine to service.

f. The Permittee shall maintain records for opacity observations made in accordance with USEPA Method 9 for an affected engine or the fuel heater that it conducts or that are conducted on its behest 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.

10. Records Retention

All records required by this permit shall be retained on site for a period of at least five years and shall be readily available for inspection and copying by the Illinois EPA upon request. Any record 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 request for records during the course of a source inspection.

11. Notification and Reporting

a. For the affected engines, the Permittee shall fulfill applicable notification and reporting requirements of the NSPS.

b. The Permittee shall notify the Illinois EPA of deviations with permit requirements within 30 days of an occurrence. Reports shall describe the deviation, its probable cause, the corrective action(s) taken and any preventive measures taken.

12. Notification and Reporting Addresses

Two copies of all required reports and notifications shall be sent to:

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

Telephone: 217/782-5811 Fax: 217/782-6348

and one copy of all required reports and notifications shall be sent to the Illinois EPA's regional office at the following address, unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
5415 North University
Peoria, Illinois 61614

Telephone: 309/693-5461 Fax: 309-693-5467

13. Authorization to Operate

The Permittee may operate the affected facility pursuant to this construction permit until an operating permit is issued for this facility.

If you have any questions concerning this permit, please contact Bob Smet at 217/785-1705.

Edwin C. Bakowski, P.E. Date Signed: _____
Manager, Permit Section
Division of Air Pollution Control

ECB:RPS:psj

cc: FOS - Region 2, Illinois EPA
Lotus Notes

Attachment A

Listing of Emission Units

Unit I.D.	Description	Number of Units	Rated Heat Input (HHV) (mmBtu/Hr)	Rated Output	Control
ICE1 - ICE12	Main Engine Generators	12	80.3[1]	9.34 MWe 12,526 HP	Selective Catalytic Reduction and Oxidation Catalyst
GH1	Natural Gas Heater	1	3.0	---	None
EG1	Emergency Diesel Engine Generator[2]	1	---	268 HP	None
FP1	Emergency Diesel Engine Fire Pump[2]	1	---	150 HP	None

[1] Nominal rating per unit, based on the higher heating value of natural gas.

[2] Engine operates on a limited basis for emergency purposes.

Attachment B

Table 1

Permitted Emissions of the Facility (Tons/Year)

Pollutant	Main Engines (all engines combined)	Fuel Heater	Emergency Generator	Emergency Fire Pump	Total
NO_x	27.8	1.3	0.4	0.2	29.7
CO	46.3	1.1	0.1	0.1	47.6
VOM	35.3	0.1	0.1	0.1	35.7
PM/PM_{10}	18.9	0.1	0.1	0.1	19.2
$PM_{2.5}$	16.5	0.1	0.1	0.1	16.8
CO_2	97,989	1536	14.3	7.9	99,547
GHG (as CO_2e)	98,073	1537	14.3	8.0	99,639

Table 2

Emission Limits for the Affected Natural Gas Engines

Pollutant	Per Engine (Lbs/Hour)		Total, All Engines (Tons/Year)[3]
	Normal[1]	Startup[2]	
NO_x	1.4	10.5	27.8
CO	2.7	16.0	46.3
VOM	2.7	8.7	35.5
PM/PM_{10}	1.6	3.5	18.9
$PM_{2.5}$	1.6	1.92	16.5
CO_2	9979	9777	97,989
GHG (as CO_2e)	9988	9786	98,080
HAP (Individual/Total)	0.36/1.15	0.36/1.15	3.2/10.9

[1] These limits apply at all times except during startup, as addressed herein in the following column, and during malfunction and/or breakdown as addressed by Condition 5(d).

[2] These limits apply during the first hour of operation of an engine, including the period of startup.

[3] Annual limits address all emissions for all 12 engines combined, including emissions during startup and malfunction.

Table 3

Emissions limits for the affected diesel engine generator

Pollutant	Lbs/Hour	Tons/Year
NO_x	8.3[1]	0.4
CO	1.5[2]	0.1
VOM	0.7[3]	0.1
PM	0.1[2]	0.1

[1] The NO_x limit is based on USEPA AP-42 emission factor for engines, Table 3.3-1, Section 3.3, i.e., 0.031 lb/hp-hour.

[2] The limits for CO and PM are based on applicable NSPS standards, i.e., 3.5 and 0.20 g/KW-hour, respectively and the maximum engine output, i.e., 268 HP, from information in the application.

[3] The VOM limit is based on the USEPA AP-42 emission factor for engines, Table 3.3-1, Section 3.3, i.e., 0.00247 lb/hp-hour plus 0.0000441 lb/hp-hour.

Table 4

Emissions limits for the affected diesel engine fire pump

Pollutant	Lbs/Hour	Tons/Year
NO_x	4.7[1]	0.2
CO	1.2[2]	0.1
VOM	0.4[3]	0.1
PM	0.1[2]	0.1

[1] The NO_x limit is based on USEPA AP-42 emission factor for engines, Table 3.3-1, Section 3.3, i.e., 0.031 lb/hp-hour.

[2] The limits for CO and PM are based on applicable NSPS standards, i.e., 3.7 and 0.22 g/KW-hour, respectively, and the maximum engine output, i.e., 150 HP, from information in the application.

[3] The VOM limit is based on USEPA AP-42 emission factor for engines, Table 3.3-1, Section 3.3, i.e., 0.00247 lb/hp-hour plus 0.0000441 lb/hp-hour.