

217/782-2113

CONSTRUCTION PERMIT

PERMITTEE

Village of Freeburg Power Plant
Attn: Ron Dintelmann, Public Works Director
14 Southgate Center
Freeburg, Illinois 62243

Application No.: 05060017

I.D. No.: 163060AAF

Applicant's Designation: Eng #10-Eng #12 Date Received: June 28, 2005

Subject: Diesel Engines - North Substation

Date Issued: November 8, 2005

Location: North Substation Power Plant, Intersection of Power Plant Road and Peabody Road, Freeburg, St. Clair County

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of three distillate fuel oil fired internal combustion engines (the affected engines) and associated ancillary equipments as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

- 1a. This permit is issued for construction of three internal combustion engines (Engines 10, 11, and 12) each rated with 1825 kW nominal capacity, at a facility near the intersection of Power Plant and Peabody Roads, known as the North Substation Power Plant.
- b. This new facility is considered a single source with the existing Power Plant located at 412 West High Street, Freeburg, which currently consists of eight engines (Units 1, 2, 3a, 4, 6, 7, 8, and 9).
- c. This permit supersedes the previous construction permit, 04020048, issued on April 13, 2004 for four diesel engines. Those engines have not been constructed, as indicated in the application for this permit.
- 2a. Pursuant to 35 IAC 214.301, emissions of sulfur dioxide into the atmosphere from each affected engine shall not exceed 2,000 ppmv.
- b. Pursuant to 35 IAC 214.161(b) and 214.304, the sulfur dioxide emissions from each affected engine shall not exceed 0.3 lb/mmBtu in any one hour period.
- 3a. The emission of smoke or other particulate matter from each affected engine shall not exceed an opacity greater than 30 percent, pursuant to 35 IAC 212.123(a), except as provided by 35 IAC 212.123(b) and 212.124 or Condition 3(b) below.
- b. Subject to the following terms and conditions, the Permittee is authorized to operate the affected engines in violation of applicable standard in Condition 3(a) (35 IAC 212.123) during startup. This authorization is provided pursuant to 35 IAC 201.149, 201.161 and

201.262, as the Permittee has applied for such authorization in its application, generally describing the efforts that will be used "...to minimize startup emissions, duration of individual startups and frequency of startups."

- i. This authorization does not relieve the Permittee from the continuing obligation to demonstrate that all reasonable efforts are made to minimize startup emissions, duration of individual startups and frequency of startups.
 - ii. The Permittee shall conduct startup of the affected engines in accordance with written procedures prepared by the Permittee that are specifically developed to minimize emissions from startups that include the following measures, at a minimum. These procedures may incorporate the manufacturers' written or automated instructions for startup of the engines. A copy of these procedures shall be kept in the control room or other work area for the operators of the engines:
 - A. Observation of the operation of an affected engine to confirm proper operation and identify any maintenance or repair activities that should be carried out before the engine is next operated.
 - iii. The Permittee shall fulfill applicable recordkeeping and reporting requirements of Conditions 9(b) and 13(a).
 - iv. As provided by 35 IAC 201.265, an authorization in a permit for excess emissions during startup does not shield a Permittee from enforcement for any violation of applicable emission standard(s) that occurs during startup and only constitutes a prima facie defense to such an enforcement action provided that the Permittee has fully complied with all terms and conditions connected with such authorization.
- c. Subject to the following terms and conditions, the Permittee is authorized to continue operation of an affected engine in violation of the applicable opacity standard in Condition 3(a) (35 IAC 212.123) in the event of a malfunction or breakdown of the engine. This authorization is provided pursuant to 35 IAC 201.149, 201.161 and 201.262, as the Permittee has applied for such authorization in its application, generally explaining why such continued operation would be required to provide essential service or to prevent injury to personnel or severe damage to equipment, and describing the measures that will be taken to minimize emissions from any malfunctions and breakdowns.
- i. This authorization only allows such continued operation as necessary to provide essential service or to prevent injury to personnel or severe damage to equipment and does not extend to continued operation solely for the economic benefit of the Permittee.

- ii. Upon occurrence of excess emissions due to malfunction or breakdown, the Permittee shall as soon as practicable reduce load of the affected engine, repair the affected engine, remove the affected engine from service or undertake other action so that excess emissions cease.
 - iii. The Permittee shall fulfill applicable recordkeeping and reporting requirements of Conditions 9(c) and 13(b). For these purposes, time shall be measured from the start of a particular incident. The absence of excess emissions for a short period shall not be considered to end the incident if excess emissions resume. In such circumstances, the incident shall be considered to continue until corrective actions are taken so that excess emissions cease or the Permittee takes the affected engine out of service.
 - iv. Following notification to the Illinois EPA of a malfunction or breakdown with excess emissions, the Permittee shall comply with all reasonable directives of the Illinois EPA with respect to such incident, pursuant to 35 IAC 201.263.
 - v. This authorization does not relieve the Permittee from the continuing obligation to minimize excess emissions during malfunction or breakdown. As provided by 35 IAC 201.265, an authorization in a permit for continued operation with excess emissions during malfunction and breakdown does not shield the Permittee from enforcement for any such violation and only constitutes a prima facie defense to such an enforcement action provided that the Permittee has fully complied with all terms and conditions connected with such authorization.
- 4a. Fuels with a sulfur content greater than 0.05 weight percent on an annual average as determined below, shall not be fired in each affected engine, pursuant to the Permittee's representation that each affected engine is exempt from the Acid Rain Program by meeting the new units exemption requirement of 40 CFR 72.7(a). As a consequence, the affected engines are only subject to the Acid Rain Program provisions of 40 CFR 72.2 through 72.7 and 72.10 through 72.13.
- b. The following equation shall be used to address compliance with the above sulfur limit, as applicable for oil-fired units pursuant to 40 CFR 72.7(d) (3):

$$\% S_{\text{annual}} = \frac{\sum_{n=1}^{\text{last}} \% S_n M_n}{\sum_{n=1}^{\text{last}} M_n}$$

Where:

$\%S_{\text{annual}}$ = Annual average sulfur content of the fuel burned during the year by the unit, as a percentage by weight;

- $\%S_n$ = Sulfur content of the nth sample of the fuel delivered during the year to the unit, as a percentage by weight;
- M_n = Mass of the nongaseous fuel in a delivery during the year to the unit of which the nth sample is taken, in lb; or for fuel delivered during the year to the unit continuously by pipeline, mass of the nongaseous fuel delivered starting from when the nth sample of such fuel is taken until the next sample of such fuel is taken, in lb;

M_n may be calculated by multiplying volume (V_n) and density (d_n), i.e. $M_n = V_n \times d_n$

where,

d_n is density of the nth sample of the fuel delivered during the year to the unit, in lb per gallon; and

V_n is volume of the fuel in a delivery during the year to the unit of which the nth sample is taken, in gallons; or, for fuel delivered during the year to the unit continuously by pipeline, volume of the nongaseous fuel delivered starting from when the nth sample of such fuel is taken until the next sample of such fuel is taken, in gallons.

- n = Each sample taken of the fuel delivered during the year to the unit, taken at least once for each delivery; or, for fuel that is delivered during the year to the unit continuously by pipeline, at least once each quarter during which the fuel is delivered.
- c. The Illinois EPA shall be allowed to sample all fuels stored at the facility.
- 5a. Distillate fuel oil shall be the only fuel fired in the affected engines.
- b. The annual heat input to the affected engines shall not exceed 29,150 million Btu/year, total.
- c. The emissions from the affected engines shall not exceed the following limits. These limits are based on information provided in the permit application.

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Lbs/Hour)</u> <u>(Each)</u>	<u>(Tons/Year)</u> <u>(Total)</u>
NO _x	48.0	39.0
CO	3.9	3.2
SO ₂	0.9	0.8

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Lbs/Hour)</u> <u>(Each)</u>	<u>(Tons/Year)</u> <u>(Total)</u>
VOM	1.3	1.1
PM/PM ₁₀	0.7	0.6
Individual HAP**	1.3	1.1

** Emissions of individual HAP, e.g., formaldehyde, benzene, etc.

- d. i. Compliance with annual limits 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).
- e. These limits are intended to ensure that the construction and operation of the affected engines do not constitute a major modification subject to Major Stationary Source Construction and Modification (MSSCAM), 35 IAC Part 203 or Prevention of Significant Deterioration (PSD), 40 CFR 52.21. The source has requested that Illinois EPA establish emission limits and other appropriate terms and conditions in this permit to ensure that the emissions from the affected engines do not trigger the applicability of MSSCAM or PSD, consistent with information provided in the construction permit application.
- 6. The existing engines at the facility at 412 West High Street, Freeburg, units 1, 2, 3a, 4, 6, 7, 8 and 9 shall comply with the following:
 - a. The annual heat input to the engines shall not exceed 67,000 million Btu/year, total.
 - b. The emissions from the existing engines, in total, shall not exceed the following limits. These limits are based on information provided in the permit application and in previous permits for the existing engines.

<u>Pollutant</u>	<u>Short-Term Limits</u>	<u>Emissions</u>
	<u>(Lb/mmBtu)</u>	<u>(Tons/Year) (Total)</u>
VOM	0.09	3.0
PM	0.07	2.4
Individual HAP*	0.09	3.0

* Emissions of individual HAP, e.g., formaldehyde, benzene, etc.

- c. i. Compliance with annual limits shall be determined from a running total of 12 months of data.

- ii. Annual 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).
 - d. These limits, together with the PM, VOM and HAP limits in Condition 5, are intended to ensure that this source is not major for emissions of hazardous air pollutants. These limits have been requested by the Permittee so that the source is not subject to requirements for a major source of hazardous air pollutants, i.e., 40 CFR 63 Subpart ZZZZ, for Reciprocating Internal Combustion Engines.
- 7a. If the affected engines are routinely operated or exercised to confirm that the affected engine will operate when needed, the operation and opacity of each affected engine shall be observed by operating personnel for the engine on a regular basis to assure that the affected engine is operating properly, which observations shall be made on at least a semi-annual basis.
- b. If the affected engines are not routinely operated or exercised, i.e., the time interval between operation of the affected engine is greater than six months, the operation and opacity of the affected engine shall be observed as provided above each time the Permittee carries out a scheduled exercise of the affected engine.
 - c. The Permittee shall also conduct observations of operation and opacity of each affected engines upon written request of the Illinois EPA. With the agreement of the Illinois EPA, the Permittee may schedule these observation to take place during normal operation of the affected engine.
8. Within 90 days of a written request from the Illinois EPA, or the date agreed upon by the Illinois EPA, whichever is later, the Permittee shall have emission tests conducted for affected engines for NO_x, VOM, benzene, and formaldehyde by an approved independent testing service.
9. The Permittee shall maintain records of the following items, and such other items as may be appropriate for each affected engine to demonstrate compliance with the requirements of this permit:
- a. Fuel Records
 - i. The following records related to the sulfur content of the oil fuel supply and SO₂ emissions of the affected engines:

Records for each shipment of fuel for the affected engines, including date, supplier, quantity (in gallons), sulfur content in lb/mmBtu or sulfur content, and minimum heat content, and whether the SO₂ emissions from the burning of such fuel would meet the standard in Condition 2(a).

- ii. The Permittee shall have the sulfur content of the oil supply to the affected engines, in lb/mmBtu, determined from an analysis of representative sample of the oil supply, as follows.
 - A. From a sample taken no later than 30 days after acceptance of a shipment of fuel whose sulfur content would not meet Condition 2(b) based upon supplier data, provided however, that if the affected engines are operated following acceptance of such a shipment, the sample shall be taken prior to adding a subsequent shipment of oil to the relevant storage tank.
 - B. From a sample taken no later than 30 days after a request for such a sample is made by the Illinois EPA, provided, however, that such sample shall be taken prior to adding more oil to the relevant storage tank.
 - iii. Sampling and analysis, including that which forms the basis for the suppliers' data, shall be conducted using methods that would be acceptable under the federal New Source Performance Standards for Stationary Gas Turbines, 40 CFR 60.335(b)(2) and (c) or the federal Acid Rain Program, 40 CFR 75, Appendix D, Optional SO₂ Emissions Data Protocol for Gas-Fired and Oil-Fired Units e.g., ASTM D4057-88 and ASTM D129-91.
 - iv. Total usage of fuel oil for all affected engines (gallons/month and gallons/yr).
 - v. Total heat input for the affected engines, with supporting calculations (million Btu/month and million Btu/year).
- b. Records for startup

Pursuant to 35 IAC 201.263, the following records related to startup of the affected engines:

- i. The Permittee's startup procedures for the affected engines, as required by Condition 3(b)(iii), accompanied by the Permittee's estimate of opacity levels during a typical startup, with supporting information.
- ii. The following information for each startup of an affected engine:
 - A. Date, time, duration, description of startup (e.g., scheduled or unscheduled startup), and fuel fired.
 - B. If stable operation with engine systems operating to enable compliance with the applicable opacity

standard is achieved within 12 minutes of initial firing of fuel, confirmation that the Permittee's startup procedures were followed.

- C. I. If stable operation with engine systems operating to enable compliance with the applicable opacity standard was not achieved within 12 minutes of initial firing of fuel:
 - (1) The elapsed time from initial firing of fuel to achievement of such conditions, and (2) A detailed explanation why startup of the engine could not be completed sooner.
 - II. If the Permittee's startup procedures were not followed, a detailed explanation why such procedures were not followed.
 - III. If an exceedance of 35 IAC 212.123 (Condition 3(a)) may have occurred during startup, a detailed explanation of the reasons for excess opacity and the estimated duration of excess opacity (minutes).
 - D. If the startup of the engine was observed, the nature of opacity, i.e., severity and duration, during the startup and the nature of opacity at the conclusion of startup, if above normal.
 - E. If operation of the engine was scheduled or the operation of the engine after completion of startup was otherwise observed, the observed condition of the engine, after completion of startup.
- c. Records for Continued Operation During Malfunctions And Breakdowns

Pursuant to 35 IAC 201.263, the Permittee shall maintain the following records related to malfunction and breakdown of the affected engines:

- i. Maintenance and repair log(s) for the affected engines that, at a minimum, address aspects or components of the engines for which malfunction or breakdown has resulted in excess emissions, which shall list the activities performed on such aspects or components, with date, description and reason for the activity.
- ii. Records for each incident when operation of an affected engine continued with excess emissions, including malfunction or breakdown as addressed by Condition 3(c), that, at a minimum, include the following information:

- A. Date, time, duration and description of the incident.
- B. The corrective actions used to reduce the quantity of emissions and the duration of the incident.
- C. Confirmation of fulfillment of the requirements of Condition 13(b), as applicable, including copies of follow-up reports submitted pursuant to Condition 13(b) (ii).
- D. If opacity exceeded the applicable standard for two or more hours during the incident:
 - I. A detailed explanation why continued operation of the affected engine was necessary.
 - II. The preventative measures that have been or will be taken to prevent similar incidents or reduce their frequency and severity, including any repairs to the affected engines and associated equipment and any changes to operating and maintenance procedures.

d. Records of Opacity

Records for all opacity measurements made in accordance with USEPA Method 9 for an affected engine 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.

e. Emissions Records

- i. The Permittee shall maintain the following records for each affected engine:
 - A. Manufacturer's data such as emissions guarantee, horsepower or rated heat input capacity (mmBtu/hr), and operating and maintenance procedures suggested by the manufacturer.
 - B. An operating log.
- ii. The Permittee shall maintain records of maximum hourly emission rates from each affected engine (lb/hr), with supporting engineering calculations.
- iii. Monthly and annual NO_x, CO, SO₂, VOM, PM and HAP emissions (tons/month and tons/year) based on actual fuel consumption

for the affected engines and the appropriate emission factors with supporting calculations, which shall be compiled on at least a quarterly basis.

- f. Records of operation of the affected engines with fuel oil with a sulfur content in excess of the sulfur content limit specified in Condition 4(a), with date, duration, sulfur content of oil, and explanation for usage.
 - g. Records of Maintenance Activities

Maintenance and repair logs for each affected engine, listing each activity performed with date.
10. The Permittee shall keep records for existing engines similar to the records required by Conditions 9(a) (i) and (e), to address compliance with Condition 6.
11. 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.
12. If there is an exceedance of the requirements of this permit, other than excess opacity during startup or malfunction/breakdown, as addressed by Conditions 3(b), (c) and 13, as determined by the records required by this permit or by other means, the Permittee shall submit a report to the Illinois EPA within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.
- 13a. The Permittee shall submit Semi-annual reports to the Illinois EPA that include the following information for the affected engines during each calendar half (January through June, and July through December), pursuant to 35 IAC 201.263.
- i. A. For each affected engine, a listing of each startup, including date and description, accompanied by a copy of the records pursuant to Condition 9(b) (ii) (C) for each startup for which such records were required.
 - B. If there have been no startups of an affected engine during the reporting period, this shall be stated in the report.
 - ii. A. For each affected engine, a listing of incidents during the reporting period in which affected engine continued to

operate during malfunction or breakdown with excess opacity, in chronological order, that includes: (1) the date, time, and duration of each incident, and (2) whether a follow-up notice was submitted for the incident pursuant to Condition 13(b) (ii), with the date of the notice.

- B. The detailed information for each such incident required pursuant to Condition 12 (as each incident constitutes a deviation) and Condition 13(b) (ii). For this purpose, the Permittee need not resubmit information provided in a prior report for an incident, as identified above, but may elect to supplement the prior submittal.
 - C. The aggregate duration of all incidents during the reporting period.
 - D. If there have been no such incidents during the reporting period, this shall be stated in the report.
- b. Pursuant to 35 IAC 201.263, the Permittee shall provide the following notifications and reports to the Illinois EPA, Compliance Section and Regional Office, concerning incidents when operation of an affected engine continued with excess emissions, including continued operation during malfunction or breakdown as addressed by Condition 3(c). These requirements do not apply to such excess emissions, if any, that occur during startup or shutdown of an affected engine.
- i. The Permittee shall immediately notify the Illinois EPA's Regional Office, by telephone (voice, facsimile or electronic) for each incident in which the opacity from an affected engine exceeds or may have exceeded 30 percent for four or more 6-minute averaging periods unless the Permittee has begun the shutdown of an affected engine by such time. (Otherwise, as related to opacity, if opacity during an incident only exceeds or may have exceeded 30 percent for no more than four six 6-minute averaging periods, the Permittee need only report the incident in the semi-annual report, in accordance with Condition 13(a).)
 - ii. Upon conclusion of each incident in which exceedances of the opacity standard are one hour or more in duration, the Permittee shall submit a follow-up report to the Illinois EPA, Compliance Section and Regional Office, within 15 days that includes: a detailed description of the incident and its cause(s); an explanation why continued operation of an affected engine was necessary; the length of time during which operation continued under such conditions, until repairs were completed or the engine was taken out of service; a description of the measures taken to minimize and correct deficiencies with chronology; and a description of the preventative measures that have been and are being taken.
- c. The Permittee shall provide an annual report, submitted with the Annual Emission Report, to the Illinois EPA concerning startup of affected

engines. At a minimum, this report shall include the total number of startups and the total number of startups that may have resulted in opacity in excess of Condition 3(a) as determined by the records required by Condition 9.

14. Two copies of all reports 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 shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
2009 Mall Street
Collinsville, Illinois 62234

Tel: 618/346-5120

Fax: 618/346-5155

15. This permit does not relax any requirements and conditions that apply to the operation of the existing engines, including applicable monitoring, testing, recordkeeping, and reporting requirements pursuant to the current CAAPP permit issued for this source. In particular, the annual NO_x emissions of the existing eight engines are still limited to 100 tons and the annual NO_x emissions from engines 8 and 9 by themselves are limited to 39 tons.
16. The affected engines may be operated pursuant to this construction permit until a CAAPP permit is issued for the source that address them, provided that a timely and complete application for the revision of the source's CAAPP is submitted within one year of initial startup of the first affected engine.

If you have any questions concerning this permit, please call Manish Patel at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:MNP:psj

cc: Region 3