NRO-256-08

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3801
www.deq.virginia.gov

L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

August 7, 2008

Mr. Lammot du Pont
Executive Chairman
Dupont Fabros Technology, Inc.
1212 New York Avenue, Suite 900
Washington, DC 20005

Registration No.:73180

Dear Mr. du Pont:

Attached is a permit to modify and operate a data center in accordance with the provisions of the Commonwealth of Virginia State Air Pollution Control Board's (Board) Regulations for the Control and Abatement of Air Pollution (Regulations). This permit supersedes your permit dated June 19, 2007.

In the course of evaluating the application and arriving at a final decision to approve the project, the Department of Environmental Quality (DEQ) deemed the application complete on June 09, 2008.

This permit approval to modify and operate shall not relieve Dupont Fabros Technology, Inc. of the responsibility to comply with all other local, state, and federal permit regulations.

The Board's Regulations as contained in Title 9 of the Virginia Administrative Code 5-170-200 provide that you may request a formal hearing from this case decision by filing a petition with the Board within thirty days after this case decision notice was mailed or delivered to you. 9 VAC 5-170-200 provides that you may request direct consideration of the decision by the Board if the Director of the DEQ made the decision. Please consult the relevant regulations for additional requirements for such requests.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty days from the date you actually received this permit or the date on which it was mailed to

Event	Date	Initials
Code: mNSR	8/7/08	EA
Scanned		
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you, whichever occurred first, within which to initiate an appeal of this decision by filing a Notice of Appeal with:

David K. Paylor, Director
Department of Environmental Quality
P. O. Box 1105
Richmond, VA 23218

If this permit was delivered to you by mail, three days are added to the thirty-day period in which to file an appeal. Please refer to Part Two A of the Rules of the Supreme Court of Virginia for information on the required content of the Notice of Appeal and for additional requirements governing appeals from decisions of administrative agencies.

If you have any questions concerning this permit, please contact the regional office at 703.583.3800.

Sincerely,

Terry H. Darton
Regional Air Permit Manager

TAF/THD/EHA/08-256-mnsr

Attachments: Permit

cc: Director, OAPP (electronic file submission)
Dan Hopkins (electronic file submission)
Manager/Inspector, Air Compliance
File

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L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

STATIONARY SOURCE PERMIT TO MODIFY AND OPERATE

This permit supersedes your permit dated June 19, 2007.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Dupont Fabros Technologies, Inc.
1212 New York Avenue, NW, Suite 900
Washington, DC 20005

Registration No.: 73180

is authorized to modify and operate

a data center facility

located at

8217 Linton Hall Road
Bristow, VA 20136

in accordance with the Conditions of this permit.

Approved on: August 7, 2008

Thomas A. Faha
Regional Director

Permit consists of 26 pages.
Permit Conditions 1 to 36.
Source Testing Report Format

INTRODUCTION

This permit approval is based on the permit application dated April 29, 2008 with supporting documentation dated June 9, 2008. Additional correspondence regarding this facility includes: (1) a previous permit application dated September 5, 2006, with supporting information, (2) a letter request for a permit amendment dated August 1, 2003, and supporting information dated September 12, 2003, and (3) a permit application dated January 5, 2001, with supporting documents dated April 16, 2001. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-80-1110 (definitions) and 9 VAC 5-10-20 of the State Air Pollution Control Board's (Board) Regulations for the Control and Abatement of Air Pollution (Regulations). The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the Department of Environmental Quality (DEQ) or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List** - Equipment at this facility consists of the following:

Equipment to be Modified by adding SCR (Selective Catalytic Reduction)				
Reference No.	**Equipment Description**	**Rated Capacity**	**Add-On Control Technology**	**Federal Requirements**
EG 3	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	N/A

EG 4	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	N/A
EG 7	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	N/A
EG 8	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	N/A

Equipment permitted prior to the date of this permit

Reference No.	Equipment Description	Rated Capacity	Add-On Control Technology	Original Permit Date
EG 1	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	May 16, 2001
EG 2	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	May 16, 2001
EG 5	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	May 16, 2001
EG 6	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	May 16, 2001
EG 9	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	May 16, 2001
EG 10	Caterpillar Model 3516B Diesel Engine	2,000 ekW, 2,847 bhp	SCR - Steuler Model CERNOx-3516B2000	May 16, 2001
RPU 1	Caterpillar Model 3516B Diesel Engine	1,333 ekW, 1,940 bhp	N/A	May 16, 2001
RPU 2	Caterpillar Model 3516B Diesel Engine	1,333 ekW, 1,940 bhp	N/A	May 16, 2001
RPU 3	Caterpillar Model 3516B Diesel Engine	1,333 ekW, 1,940 bhp	N/A	May 16, 2001

Equipment Exempt from Permitting

Reference No.	Equipment Description	Rated Capacity	Exemption Citation	Exemption Date
14	Natural gas-fired heat exchanger	1.875 MMBtu/hr	9 VAC 5-80-1320.B	May 16, 2001

15	Natural gas-fired heat exchanger	1.875 MMBtu/hr	9 VAC 5-80-1320.B	May 16, 2001
16	Underground diesel fuel storage tank	40,000 gallons	40 CFR 60.110b(b)	May 16, 2001
17	Underground diesel fuel storage tank	40,000 gallons	40 CFR 60.110b(b)	May 16, 2001
18	Underground diesel fuel storage tank	40,000 gallons	40 CFR 60.110b(b)	May 16, 2001
19	Underground diesel fuel storage tank	40,000 gallons	40 CFR 60.110b(b)	May 16, 2001

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit unless the specifications are needed to form the basis for one or more of the other terms or conditions in the permit.
(9 VAC 80-1180)

2. **Emission Controls** – Emissions from the engine-generator sets (Ref. No. EG 1-EG10 and RPU1-RPU3) shall be controlled by the following;

   a. Nitrogen Oxides (as NO_2) emissions from the engine-generator sets (Ref. No. RPU1-RPU3) shall be controlled by good engine design to include electronic fuel injection, turbocharged, after-cooled and the low NO_X 'B' emission package.

   b. Nitrogen Oxides (as NO_2) emissions from the engine-generator sets (Ref. No. EG3, EG4, EG7, and EG8) shall be controlled by good engine design to include electronic fuel injection, turbocharged, after-cooled and the low NO_X 'B' emission package until such time as Selective Catalytic Reduction (SCR) control devices have been installed. SCR system installation shall be completed by March 1, 2009.

   c. Once SCR systems have been installed (Ref. No. EG3, EG4, EG7, and EG8), each SCR system shall be equipped with temperature probes to monitor the catalyst exhaust temperature at all times when engine-generator sets are operating. The SCR urea enabling temperature shall be 570°F when using diesel fuel with a sulfur content $\leq$ 0.05% (500 parts per million). At such time as the sulfur content of the fuel used by the diesel engine falls below a content of 50 parts per million (ppm), the SCR urea enabling temperature shall be adjusted to 540°F. At such time as the sulfur content of the fuel used by the diesel engine falls below a content of 15 ppm, the SCR urea enabling temperature shall be adjusted to 500°F or such higher temperature as testing or other reliable information, as approved by DEQ, demonstrates is necessary to achieve at least ninety percent control of NOx emissions. Engine exhaust gas shall be treated with urea solution when the engine is operating at or above twenty percent load and the appropriate fuel-based temperature as identified above, has been

achieved, except for periods of start-up, shutdown, or malfunction. In the event that engine exhaust temperature exceeds 950°F, urea injection shall be discontinued and any operations above that level will be considered a malfunction. The SCR system control device shall be provided with adequate access for inspection.

d. Nitrogen Oxides (as NO_2) emissions from the engine-generator sets (Ref. No. EG 1, EG2, EG5, EG6, EG9, and EG10) shall be controlled by Selective Catalytic Reduction (SCR) control devices on each engine-generator set. Each SCR system shall be equipped with temperature probes to monitor the catalyst bed exhaust temperature at all times when engine-generator sets are operating. The SCR urea enabling temperature shall be 570°F when using diesel fuel with a sulfur content $\leq$ 0.05% (500 parts per million). At such time as the sulfur content of the fuel used by the diesel engine falls below a content of 50 parts per million (ppm), the SCR urea enabling temperature shall be adjusted to 540°F. At such time as the sulfur content of the fuel used by the diesel engine falls below a content of 15 ppm, the SCR urea enabling temperature shall be adjusted to 500°F or such higher temperature as testing or other reliable information, as approved by DEQ, demonstrates is necessary to achieve at least ninety percent control of NOx emissions. Engine exhaust gas shall be treated with urea solution when the engine is operating at or above twenty percent load and the appropriate fuel-based temperature as identified above, has been achieved, except for periods of start-up, shutdown, or malfunction. In the event that engine exhaust temperature exceeds 950°F, urea injection shall be discontinued and any operations above that level will be considered a malfunction. The SCR system control device shall be provided with adequate access for inspection.

e. Sulfur Dioxide (SO_2) emissions from all engine-generator sets shall be controlled by the use of low sulfur diesel fuel oil with a sulfur content not to exceed 0.05% by weight (500ppm) until such time as fuel sampling analysis (in accordance with Condition 11) indicates the diesel fuel has reached a sulfur content less than or equal to 15 ppm. At that time, Sulfur Dioxide (SO_2) emissions from all engine-generator sets shall be controlled by the use of ultra-low sulfur diesel fuel oil with a sulfur content not to exceed 0.0015% by weight (15 ppm).

f. Carbon Monoxide (CO) emissions from all engine-generator sets shall be controlled by good combustion practices.

g. Visible emissions from the engine-generator sets shall be controlled by the use of clean fuel and good operating practices.

(9 VAC 80-1180 and 9 VAC 5-50-260)

3. **Monitoring Devices** -

   a. Each engine-generator set (Ref. No. EG1-EG10 and RPU1-RPU3) shall be equipped with a non-resettable hour meter that measures the period that the engines are operated and a device to monitor and record the engine generator kilowatt output once every fifteen minutes, or more frequently. A record of the engine operation shall be maintained to provide dates, run times, and reason operated (as defined in Condition 5).

   b. The SCR system on each of the engine-generator sets (Ref. No EG1-EG10) shall be equipped with a device to measure and record the urea injection rate and catalyst bed exhaust temperature once every fifteen minutes, or more frequently. The information shall be correlated to run date, engine load/kilowatt output, and engine operating hours. Total operating time and load shall be recorded for all periods when an engine-generator set is operational.

   c. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, at a minimum, the manufacturer's written requirements or recommendations.

   d. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when its respective engine-generator set (Ref. No. EG1-EG10 and RPU1-RPU3) is operating.

   (9 VAC 5-80-1180)

4. **Monitoring Device Observations** - To ensure good performance, the monitoring devices identified in Condition 3 shall be observed by the permittee during each test firing. Data captured by the monitoring devices shall be reviewed or observed by the permittee at a frequency of not less than once each twenty-four hour period during days in which the engine-generator sets are called into service. Observations shall be maintained on site in a permanent log book.
   (9 VAC 5-80-1180D)

OPERATING LIMITATIONS

5. **Operating Scenarios** – The engine-generator sets (Ref. No. EG1-EG10 and RPU1-RPU3) shall be operated in a manner consistent with the following modes of operation only:

   a. Emergency / Critical Power Generation:

      i. Emergency: The engine-generator sets may be operated in situations where immediate action on the part of the facility is needed due to a failure or loss of electrical power service resulting from the failure of the primary power provider and the failure or loss of power service is beyond the reasonable

control of the facility. Operation under these circumstances shall be allowed for the period of time the primary electrical power provider service is unavailable. Once primary electrical power service is available, the engine-generator sets may be operated in accordance with Critical Power Generation, as defined below:

ii. Critical Power Generation: The engine-generator sets may be operated in situations where immediate action on the part of the facility is needed due to a loss or anticipated loss of acceptable electrical power service from the primary power provider and the loss or anticipated loss of power service is beyond the reasonable control of the facility. Operation under these circumstances shall be allowed until such time as acceptable power provider service is restored or the loss of acceptable power provider service is no longer reasonably anticipated.

b. Alternative Power Generation: An engine-generator set may be operated voluntarily for the purposes of peak-shaving, demand response, or as part of an interruptible power supply arrangement with a power provider, other market participant, or system operator if the engine is equipped with a selective catalytic reduction system (SCR) that achieves the manufacturer's guaranteed maximum emission reductions based on fuel type. Prior to construction of a new SCR unit, when changing from Emergency Power or Critical Power Generation to Alternate Power Generation, the permittee shall submit appropriate documentation to the DEQ and receive DEQ approval for the initial change in the method of operation of each engine-generator set.

c. The engine-generator sets may be operated for periodic maintenance, testing, and operational training.

At no time shall total annual emissions from all types of operations exceed the limits stated in Condition 13.
(9 VAC 5-80-1180 D and 9 VAC 5-50-260)

6. **Load Optimization** – The permittee shall operate only those units (Ref. No. EG1-EG10) necessary to meet the requirements of an alternative power agreement. When operating units (Ref. No. EG1-EG10) in accordance with an alternative power agreement, the permittee shall operate the alternative power agreement units at or above the load necessary to ensure the associated SCR unit maintains stable urea enabling temperatures. Engine-generator sets (Ref. No. RPU1 – RPU3) shall not operate during periods of alternative power generation except under the circumstances outlined in Condition 5.a.
(9 VAC 5-170-160, 9 VAC 5-50-260 and 9 VAC 5-80-1180)

7. **Operation of the Engine-Generator Sets** - The permittee must operate and maintain the engine-generator sets (Ref. No. EG 1-EG 10 and RPU1-RPU3) and

associated control devices according to the manufacturer's written instructions or procedures developed by the permittee that are approved by the manufacturer. In addition, the permittee may only change those settings that are permitted by the manufacturer and do not impact on air emissions.
(9 VAC 5-80-1180)

8. **Fuel** - The approved fuel for the engine-generator sets (Ref. No. EG 1-EG 10 and RPU1-RPU3) is diesel fuel oil. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-1180)

9. **Fuel Specifications** – The diesel fuel oil delivered subsequent to the issuance of this permit shall comply with the specifications below:

   a. DIESEL FUEL which conforms to the ASTM D975 specifications for grade ultra-low sulfur (ULSD) No. 1-D or No. 2-D, or Grade No. 1-D S15 or 2-D S15, Maximum sulfur content per shipment: 0.0015%, or

   b. DIESEL FUEL that:

      i. Has a minimum cetane number of forty, or has a maximum aromatic content of thirty-five percent by volume, and

      ii. Has a sulfur content per shipment not-to-exceed 0.0015%.

   (9 VAC 5-80-1180 and 9 VAC 5-50-260)

10. **Fuel Certification** - The permittee shall obtain a certification from the fuel supplier with each shipment of diesel fuel oil. Each fuel supplier certification shall include the following:

    a. The name of the fuel supplier;

    b. The date on which the diesel fuel oil was received;

    c. The quantity of diesel fuel oil delivered in the shipment;

    d. A statement that the diesel fuel oil:

       i. Complies with the American Society for Testing and Materials (ASTM) specification, D975, specified in Condition 9a, or

       ii. Has a sulfur content per shipment not to exceed 0.0015% by weight (15 ppm) and either a minimum cetane number of forty (40) or maximum aromatic content of thirty-five (percent), as specified in Condition 9b, or

iii. Alternatively, the permittee must obtain approval from the Regional Air Compliance Manager of the DEQ's Northern Regional Office (NRO) (at the address referenced in Condition 23) if other documentation will be used to certify the diesel fuel type.

(9 VAC 5-80-1180)

11. **Fuel Sampling and Analysis** –

a. The permittee shall sample and analyze the fuel from each storage tank, (Ref. No. 16-19) that supplies fuel oil to engine-generator sets equipped with SCR, (Ref. No. EG 1-EG 10). Fuel sampling and analysis shall be performed every calendar quarter on each tank that has taken delivery of fuel during that quarter. Fuel sampling shall be conducted in accordance with ASTM Method 5453, or other DEQ approved method, to determine fuel sulfur content by weight.

b. The results of the fuel analysis shall be reported to the Regional Air Compliance Manager of the DEQ's NRO (at the address referenced in Condition 23) within thirty calendar days after the end of each calendar quarter. Data shall include: fuel sulfur content by weight (weight % or ppm), company and individual collecting the sample, identification of sampling method used, sample volume, number of samples, date sample collected, location of fuel when sample taken, date of analysis, company and individual conducting the analysis.

c. At such time as the sulfur content of a tank is determined to be at or below 0.0015% (15 ppm Sulfur by weight), the permittee may discontinue fuel sampling of that tank.

(9 VAC 5-80-1180)

EMISSION LIMITS

12. **Emission Limits – Engine Generator Set** – The hourly emission limits shall be as follows:

a. Engine-generator sets EG1- EG10 (Units with SCR)

i.	NO_2	4.0 lbs/hr with SCR in operation
		OR
ii.	NO_2	40.0 lb/hr with SCR not in operation
iii.	CO	4.0 lbs/hr
iv.	VOC	1.2 lbs/hr

v. SO_2 1.0 lbs/hr

vi. PM_{10} 0.91 lbs/hr

b. Rotary power unit RPU1, RPU2, RPU3 (units without SCR):

i. NO_2 27.9 lbs/hr

ii. CO 3.1 lbs/hr

iii. VOC 1.2 lbs/hr

iv. SO_2 0.67 lbs/hr

v. PM_{10} 0.8 lbs/hr

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

13. **Facility wide Emission Limits** - Total emissions from all engine-generator sets (Ref. No. EG 1-EG 10 and RPU1-RPU3) and natural gas heat exchangers (Ref. No. 14 and 15) shall not exceed the limits specified below:

i. NO_2 24.4 tons/yr

ii. CO 14.0 tons/yr

iii. SO_2 4.0 tons/yr

iv. VOC 4.0 tons/yr

v. PM_{10} 3.0 tons/yr

Compliance with this emission limit may be determined as stated in Conditions 2, 7, 8, 9, 14, and 15.
(9 VAC 5-80-1180)

14. **Annual Emission Calculations –**

The total annual emissions of all pollutants from the facility shall be calculated monthly as the sum of each consecutive twelve-month period. Compliance for the consecutive twelve-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding eleven months.

Each month's emissions shall be calculated as follows:

A. Monthly emissions from rotary power units RPU1, RPU2, and RPU3 (units without SCR) shall be calculated as follows;

i. NO_2 emissions from the rotary power systems shall be determined by using the following calculation which was derived from stack testing data obtained December 2007.
lb/hr = [(0.0155 x kWe) + 7.5]
Total pounds NO_2 produced by the rotary power systems shall be determined by multiplying the hours, or fractions thereof, that the engines operated at a specific kWe load by the lb/hr factor determined above for that specific load.

ii. CO = (Total monthly hours of operation of the engine-generator sets x 2.58 lb/hr) ÷ 2000

SO_2 = (Total monthly hours of operation of the engine-generator sets x 0.67 lb/hr) ÷ 2000

PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.67 lb/hr) ÷ 2000

VOC = (Total monthly hours of operation of the engine-generator sets x 1.0 lb/hr) ÷ 2000

B. Monthly emissions from engine-generator sets EG1, EG2, EG5, EG6, EG9, and EG10 (units with SCR) shall be calculated as follows;

iii. During periods where SCR is not operational, NO_2 emissions from the engine generators shall be determined by using the following calculation which was derived from stack testing data obtained December 2007.
lb/hr = [(0.0155 x kWe) + 7.5]
Total pounds NO_2 produced by the engine generators shall be determined by multiplying the hours, or fractions thereof, that the engine operated at a specific kWe load, without SCR operation, by the lb/hr factor determined above for that specific load.

iv. During periods where SCR is operational, NO_2 emissions from the engine generators shall be

determined by using the following calculation which was derived from stack testing data obtained December 2007.
lb/hr = [(0.001 x kWe) + 2.4]
Total pounds NO_2 produced by the engine generators shall be determined by multiplying the hours, or fractions thereof, that the engines operated at a specific kWe load, with SCR operation, by the lb/hr factor determined above for that specific load.

v. NOTE: Should the SCR systems fail to operate as designed (i.e. 90% emissions reduction), the calculation in (iii) shall be used for all such hours of operation.

vi. CO = (Total monthly hours of operation of the engine-generator sets x 3.3 lb/hr) ÷ 2000

SO_2 = (Total monthly hours of operation of the engine-generator sets x 1.0 lb/hr) ÷ 2000

PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.75 lb/hr) ÷ 2000

VOC = (Total monthly hours of operation of the engine-generator sets x 1.0 lb/hr) ÷ 2000

C. Until such time the SCR units on engine-generator sets EG3, EG4, EG7, and EG8 have demonstrated compliance with the emission limits stated in Condition 12 and received approval from DEQ, NOx (as NO_2) emissions from these engine-generators shall be calculated using the calculation outlined in Condition C (vii) only. After approval of stack test results, monthly NOx emissions from engine-generator sets EG3, EG4, EG7, and EG8 shall be calculated using C (vii) and C (viii) as appropriate;

vii. During periods where SCR is not operational, NO_2 emissions from the engine generators shall be determined by using the following calculation which was derived from stack testing data obtained December 2007.
lb/hr = [(0.0155 x kWe) + 7.5]
Total pounds NO_2 produced by the engine generators shall be determined by multiplying the

hours, or fractions thereof, that the engine operated at a specific kWe load, without SCR operation, by the lb/hr factor determined above for that specific load.

viii. During periods where SCR is operational, NO_2 emissions from the engine generators shall be determined by using the following calculation which was derived from stack testing data obtained December 2007.
lb/hr = [(0.001 x kWe) + 2.4]
Total pounds NO_2 produced by the engine generators shall be determined by multiplying the hours, or fractions thereof, that the engines operated at a specific kWe load, with SCR operation, by the lb/hr factor determined above for that specific load.

ix. NOTE: Should the SCR systems fail to operate as designed (i.e. 90% emissions reduction), the calculation in (vii) shall be used for all such hours of operation.

All other pollutants can be calculated using the calculations outlined in below:

x. CO = (Total monthly hours of operation of the engine-generator sets x 3.3 lb/hr) ÷ 2000

SO_2 = (Total monthly hours of operation of the engine-generator sets x 1.0 lb/hr) ÷ 2000

PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.75 lb/hr) ÷ 2000

VOC = (Total monthly hours of operation of the engine-generator sets x 1.0 lb/hr) ÷ 2000

D. Monthly emissions from the natural gas fired heat excangers (Ref. No. 14 and 15) shall be calculated as follows;

xi. NO_2 emissions from the natural gas fired radiant heat exchangers shall use a factor of 100 lb NO_2 / million cubic feet.

xii. CO emissions from the natural gas fired radiant heat exchangers shall use a factor of 84 lb NO_2 / million cubic feet.

xiii. SO_2 emissions from the natural gas fired radiant heat exchangers shall use a factor of 0.60 lb NO_2 / million cubic feet.

xiv. PM_{10} emissions from the natural gas fired radiant heat exchangers shall use a factor of 7.6 lb NO_2 / million cubic feet.

xv. VOC emissions from the natural gas fired radiant heat exchangers shall use a factor of 5.5 lb NO_2 / million cubic feet.

E. Facility wide monthly emissions shall be the sum of the monthly emissions from Conditions 14A, 14B, 14C, and 14D.

F. The total annual emissions of all pollutants from the facility shall be calculated by the methods above, or by a method approved in advance by the Regional Air Compliance Manager of the DEQ's NRO, and be the sum of all emission units (Ref. No. EG1-EG10, RPU1-RPU3, 14, and 15). Any change in calculation methods must receive written approval from the Regional Air Compliance Manager of the DEQ's NRO prior to use.

(9 VAC 5-80-1180 and 9 VAC 5-50-260)

15. **Visible Emission Limit** –

A. Visible emissions from the engine-generator sets shall not exceed five percent opacity except during one six-minute period in any one hour in which visible emissions shall not exceed ten percent opacity, as determined by EPA Reference Method 9 (reference 40 CFR 60 Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.

B. During periods of start-up and shut-down, visible emissions from the engine-generator sets shall not exceed ten percent except during one six-minute period in any one hour in which visible emissions shall not exceed twenty percent opacity as determined by the EPA Reference Method 9 (reference 40 CFR 60, Appendix A).

(9 VAC 5-80-1180, 9 VAC 5-50-260 and 9 VAC 5-50-80)

INITIAL COMPLIANCE DETERMINATION

16. **Testing Verification Meeting** - The permittee shall arrange to meet with the Regional Air Compliance Manager of the DEQ's NRO (at the address referenced in Condition 23) to discuss the stack testing requirements and portable analyzer testing per Condition 17, and the Annual Performance Assessment testing per Condition 19. The meeting shall take place prior to the submittal of the final stack test protocol and is required in order for the protocol to be accepted.
(9 VAC 5-50-30 and 9 VAC 5-80-1200)

17. **Performance Testing –**

a. **Stack Test**: Performance tests shall be conducted for nitrogen oxides, (as NO_2), on at least two of the four diesel engines equipped with SCR (Ref. # EG 3, EG 4, EG7, and EG 8), using the emission compliance testing procedures outlined in 40 CFR 60, Appendix A to demonstrate compliance with the NO_2 emission limits in Condition 12.

i. Nitrogen oxides (as NO_2) emissions testing from each selected engine-generator set shall consist of three one-hour test runs. The average of the three runs shall be reported as the short-term emissions for the engine-generator set.

ii. Testing shall be conducted with the engines operating at ninety percent or greater capacity, unless multiple load band testing is approved by DEQ during the Testing Verification Meeting required by Condition 16.

iii. Recorded information shall include, but not be limited to:

1. generator load/kilowatt output;

2. urea solution consumption;

3. catalyst bed exhaust temperature;

4. Fuel consumption

5. NOx (as NO_2) emission rate as determined by:

a. the reference method; and

b. the portable analyzer.

iv. The tests shall be performed to demonstrate compliance within sixty days after the installation of the new SCR systems, and no later than April 30,

2009. Tests shall be conducted, reported, and the data reduced as set forth in 9 VAC 5-50-30 and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-50-410.

v. The details of the tests are to be arranged with the Regional Air Compliance Manager of the DEQ's NRO at the address referenced in Condition 23. The permittee shall submit two copies of the test protocol, one paper copy and one on removable electronic media, to the Regional Air Compliance Manager of the DEQ's NRO and one paper copy to the Regional Air Permit Manger of the DEQ's NRO at least thirty days prior to testing.

vi. Should conditions occur which would require rescheduling the testing, the permittee shall notify the Regional Air Compliance Manager of the DEQ's NRO (at the address listed in Condition 23) in writing, within seven days of the scheduled test date or as soon as the rescheduling is deemed necessary. In any case the stack testing shall be rescheduled within thirty days.

vii. Two copies of the test results, one paper copy and one on removable electronic media, shall be submitted to the Regional Air Compliance Manager of the DEQ's NRO and one paper copy to the Regional Air Permit Manager of the DEQ's NRO (at the address referenced in Condition 23) within forty-five days after test completion and shall conform to the test report format enclosed with this permit.

b. **Initial Portable Analyzer Test**: An initial portable analyzer test shall be performed in conjunction with the performance testing for each engine-generator equipped with SCR being stack tested to establish a correlation between the stack test result values and the portable analyzer result values. These results will be used in the Annual Performance Assessment required by Condition 19. The procedure for the initial portable analyzer testing and the correlation determination shall be submitted in conjunction with the initial stack test protocol (Referenced in Condition 16) and agreed upon by the Regional Air Compliance Manager of the DEQ's NRO.

(9 VAC 5-50-30 and 9 VAC 5-80-1200)

18. **Testing/Monitoring Ports** – The facility shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. This includes constructing the facility/equipment such that volumetric flow rates and pollutant emission rates can be accurately determined by applicable test methods and providing a stack or duct that is free from cyclonic flow. Sampling ports shall be provided when requested by the DEQ and safe sampling platforms and access shall be provided.

(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

CONTINUING COMPLIANCE DETERMINATION

19. **Annual Performance Assessment** -

a. Engines selected for stack testing:

i. Within the first twelve months subsequent to the initial performance tests, concurrent with the annual maintenance, and annually thereafter, the permittee shall perform a portable analyzer test to determine the nitrogen oxide (as NO_2) emission rate for each engine-generator set. The annual analyzer test shall be performed at a comparable load at which the engine-generator set operated during the stack test performance demonstration. Details of the test shall be arranged with the Regional Air Compliance Manager during the Testing Verification Meeting required by Condition 16. The procedure for the portable analyzer testing shall be submitted in conjunction with the initial stack test protocol. Results of the testing shall be maintained on-site in accordance with Condition 24.

ii. Additional nitrogen oxide (as NO_2) stack testing may be required if the difference between the initial NOx emission rate established for the portable analyzer during the performance demonstration per Condition 17.b, and the NOx emission rate determined during the annual portable analyzer test per Condition 19.a.i is equal to or greater than ten percent (10%).

b. Engines not selected for stack testing:

i. Within the first twelve months, subsequent to the issuance of this permit, concurrent with the annual maintenance, and annually thereafter, the permittee shall perform a portable analyzer test to determine the nitrogen oxide (as NO_2) emission rate for each engine-generator set. Details of the test shall be arranged with the Regional Air Compliance Manager during the Testing Verification Meeting required by Condition 16. The procedure for the portable analyzer testing, including proposed operating load, shall be submitted in conjunction with the initial stack test protocol. Results of the testing shall be maintained on-site in accordance with Condition 24.

c. Immediately prior to conducting the portable analyzer test, the portable analyzer shall be calibrated using EPA Protocol 1 gases.

1) Calibrations shall be accurate to within five parts per million (ppm) of the sample gas.

2) The permittee shall maintain on-site records of annual calibration testing, calibration gas certifications, and any corrective action that may have been taken.

(9 VAC 5-80-1180)

20. **Stack Tests** - Upon request by the DEQ, the permittee shall conduct additional performance testing of the engine-generator sets to demonstrate compliance with the emission limits contained in this permit. The details of the tests shall be arranged with the Regional Air Compliance Manager of the DEQ's NRO at the address referenced in Condition 23.
(9 VAC 5-80-1200 and 9 VAC 5-50-30 G)

21. **Visible Emissions Evaluation (VEE)** - Upon request by the DEQ, the permittee shall conduct additional visible emission evaluations of the diesel engines to demonstrate compliance with the visible emission limits contained in this permit. The details of the tests shall be arranged with the Regional Air Compliance Manager of the DEQ's NRO at the address referenced in Condition 23.
(9 VAC 5-80-1200 and 9 VAC 5-50-30 G)

22. **SCR Compliance Demonstration** - The permittee shall conduct testing for nitrogen oxides (as NO_2) on the engine-generator sets equipped with SCR (EG 1-EG 10)) within sixty days following each change or regeneration of the catalyst in an SCR by either stack testing or by use of the portable analyzer. This testing shall be arranged with the Regional Air Compliance Manager of the DEQ's NRO at the address referenced in Condition 23.
(9 VAC 5-50-30 and 9 VAC 5-80-1200)

RECORDS AND NOTIFICATIONS

23. **Notification Address –** All correspondence concerning this permit should be submitted to the following address:

Regional Air Compliance Manager
Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193

(9 VAC 5-50-50) and (9 VAC 5-50-410)

24. **On Site Records** - The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Regional Air Compliance Manager at the address referenced in Condition 23.

These records shall include, but are not limited to:

a. A monthly summary table containing monitoring device observations for each engine generator set (Ref. No. EG1-EG10 and RPU1-RPU3), per Condition 3, including:

   i. Monthly hours of operation of each engine-generator associated with each of the following:

      1. Generator load with and without SCR (if applicable),

      2. Catalyst bed exhaust temperature (if applicable),

      3. Urea consumption rates (if applicable),

      4. Reason operated (as defined in Condition 5), and

      5. Date and time of operation.

b. Monthly and annual emissions calculations for each pollutant from the engine-generator sets (Ref. No. Ref. No. EG1-EG10 and RPU1-RPU3) and natural gas radiant heaters (Ref. No. 14 and 15) using the calculation methods in Condition 14, or other methods approved by the Regional Air Compliance Manager of the DEQ's NRO, to verify compliance with the ton/yr emissions limitations in Condition 13.

c. The amount of natural gas burned by radiant heat exchangers (Ref. No. 14 and 15) per year in million cubic feet, calculated monthly as the sum of each consecutive twelve month period. Compliance for the consecutive twelve-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding eleven months.

d. A NOx Urea Table (Load Map) for each engine-generator set equipped with SCR (EG1-EG10), to verify that the SCR is operating as specified by the manufacturer. Each NOx Urea Table (Load Map) shall include the engine load, temperature after the catalyst, NOx concentration before and after the catalyst, the urea consumption rate, and the catalyst efficiency.

e. Fuel sampling analyses, per Condition 11, indicating the sulfur content of the diesel fuel oil to verify the urea enabling temperature in accordance with Condition 2(b).

f. A record of the date that each engine-generator set equipped with SCR (Ref. No. EG1-EG10) adjusted the urea enabling temperature to 540°F

and 500°F, or such higher temperature as specified in Condition 2.c and 2d.

g. A log of monitoring device observations, per Condition 4.

h. All fuel supplier certifications, per Condition 10.

i. All VEE, emission stack test reports, portable analyzer calibrations, and annual performance assessment results for each engine-generator.

j. A copy of the maintenance schedule and records of scheduled and unscheduled maintenance in accordance with Condition 30.

k. Operator training records for both the engine-generator sets and the SCR systems.

l. The manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer.

m. Any changes in settings that are permitted by the manufacturer.

n. The manufacturer's written operating instructions for the SCR systems.

o. Records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. The records shall be maintained in a form suitable for inspection and maintained for at least two years (unless a longer period is specified in the applicable emission standard) following the date of the occurrence.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years, unless otherwise noted.
(9 VAC 5-80-1180 and 9 VAC 5-50-50)

25. **Initial Notifications** - The permittee shall furnish written notification to the Regional Air Compliance Manager of the DEQ's NRO (at the address listed in Condition 23) of:

A. The actual date on which construction of each SCR device (Ref. No. EG3, EG4, EG7, and EG8) commenced within 30 days after such date. The notification must include the following:

a. Name and address of the permittee;

b. The address of the affected source;

c. Engine-generator set reference number to receive the SCR; and

d. SCR serial number to match the engine-generator set reference number.

B. The anticipated start-up date of each SCR (Ref. No. EG3, EG4, EG7, and EG8) postmarked not more than sixty days nor less than thirty days prior to such date.

C. The actual start-up date of each SCR within fifteen days after such date.
(9 VAC 5-50-50 and 9 VAC 5-80-1180)

GENERAL CONDITIONS

26. **Certification of Documents**

A. The following documents submitted to the Board shall be signed by a responsible official: (i) any emission statement, application, form, report, or compliance certification; (ii) any document required to be signed by any provision of the regulations of the Board; or (iii) any other document containing emissions data or compliance information the owner wishes the Board to consider in the administration of its air quality programs. A responsible official is defined as follows:

a. For a business entity, such as a corporation, association or cooperative, a responsible official is either:

i. The president, secretary, treasurer, or a vice president of the business entity in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the business entity; or

ii. A duly authorized representative of such business entity if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either (i) the facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars) or (ii) the authority to sign documents has been assigned or delegated to such representative in accordance with procedures of the business entity.

b. For a partnership or sole proprietorship, a responsible official is a general partner or the proprietor, respectively.

c. For a municipality, state, federal, or other public agency, a responsible official is either a principal executive officer or ranking elected official. A principal executive officer of a federal agency includes the chief executive officer having responsibility for the overall operations of the principal geographic unit of the agency.

d. Any person signing a document under subsection a. above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering and evaluating the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

e. Subsection "d" shall be interpreted to mean that the signer must have some form of direction or supervision over the persons gathering the data and preparing the document (the preparers), although the signer need not personally nor directly supervise these activities. The signer need not be in the same line of authority as the preparers, nor do the persons gathering the form need to be employees (e.g., outside contractors can be used). It is sufficient that the signer has authority to assure that the necessary actions are taken to prepare a complete and accurate document.

(9 VAC 5-20-230)

27. **Permit Invalidation** – The portions of this permit to install the SCR control devices on engine-generators EG3, EG4, EG7, and EG8 shall become invalid, unless an extension is granted by the DEQ, if:

A. A program of continuous construction is not commenced within the latest of the following:

a. Eighteen months from the date of this permit;

b. Nine months from the date that the last permit or other authorization was issued from any other governmental entity;

c. Nine months from the date of the last resolution of any litigation concerning any such permits or authorization; or

B. A program of construction is discontinued for a period of eighteen months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of a phased construction project.

(9 VAC 5-80-1210)

28. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the permittee:

    a. Knowingly makes material misstatements in the permit application or any amendments to it;

    b. Fails to comply with the conditions of this permit;

    c. Fails to comply with any emission standards applicable to a permitted emissions unit, included in this permit;

    d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or

    e. Fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

    (9 VAC 5-80-1210 F)

29. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

    a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;

    b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;

    c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and

    d. To sample or test at reasonable times.

    For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency. (9 VAC 5-170-130 and 9 VAC 5-80-1180)

30. **Maintenance/Operating Procedures** – At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control

equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to the thirty-three diesel fired engine-generators with closed loop SCR:

a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.

b. Maintain an inventory of spare parts.

c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.

d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

Records of maintenance and training shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.
(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

31. **Record of Malfunctions** – The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shutdown or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause), corrective action, preventive measures taken and name of person generating the record.
(9 VAC 5-20-180 J and 9 VAC 5-80-1180 D)

32. **Notification for Facility or Control Equipment Malfunction** - The permittee shall furnish notification to the Regional Air Compliance Manager of the DEQ's NRO (at the address referenced in Condition 23) of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone, telegraph, or electronic communication. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the

equipment is again in operation, the permittee shall notify the Regional Air Compliance Manager of the DEQ's NRO.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)

33. **Notification for Control Equipment Maintenance** - The permittee shall furnish notification to the Regional Air Compliance Manager, NRO (at the address referenced in Condition 23) of the intention to shut down or bypass, or both, air pollution control equipment for necessary scheduled maintenance, which results in excess emissions for more than one hour, at least twenty-four hours prior to the shutdown. The notification shall include, but is not limited to, the following information:

    a. Identification of the air pollution control equipment to be taken out of service, as well as its location, and registration number;

    b. The expected length of time that the air pollution control equipment will be out of service;

    c. The nature and quantity of emissions of air pollutants likely to occur during the shutdown period;

    d. Measures that will be taken to minimize the length of the shutdown or to negate the effect of the outage.

    (9 VAC 5-20-180 B)

34. **Violation of Ambient Air Quality Standard** - The permittee shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
    (9 VAC 5-20-180 I and 9 VAC 5-80-1180)

35. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Regional Air Compliance Manager of the DEQ's NRO (at the address referenced in Condition 23) of the change of ownership within thirty days of the transfer.
    (9 VAC 5-80-1240)

36. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

SOURCE TESTING REPORT FORMAT

Report Cover
1. Plant name and location
2. Units tested at source (indicate Ref. No. used by source in permit or registration)
3. Test Dates.
4. Tester; name, address and report date

Certification
1. Signed by team leader/certified observer (include certification date)
2. Signed by responsible company official
3. *Signed by reviewer

Copy of approved test protocol

Summary
1. Reason for testing
2. Test dates
3. Identification of unit tested & the maximum rated capacity
4. *For each emission unit, a table showing:
   a. Operating rate
   b. Test Methods
   c. Pollutants tested
   d. Test results for each run and the run average
   e. Pollutant standard or limit
5. Summarized process and control equipment data for each run and the average, as required by the test protocol
6. A statement that test was conducted in accordance with the test protocol or identification & discussion of deviations, including the likely impact on results
7. Any other important information

Source Operation
1. Description of process and control devices
2. Process and control equipment flow diagram
3. Sampling port location and dimensioned cross section Attached protocol includes: sketch of stack (elevation view) showing sampling port locations, upstream and downstream flow disturbances and their distances from ports; and a sketch of stack (plan view) showing sampling ports, ducts entering the stack and stack diameter or dimensions

Test Results
1. Detailed test results for each run
2. *Sample calculations
3. *Description of collected samples, to include audits when applicable

Appendix
1. *Raw production data
2. *Raw field data
3. *Laboratory reports
4. *Chain of custody records for lab samples
5. *Calibration procedures and results
6. Project participants and titles
7. Observers' names (industry and agency)
8. Related correspondence
9. Standard procedures

- Not applicable to visible emission evaluations