COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
SOUTHWEST REGIONAL OFFICE
355-A Deadmore Street, Abingdon, Virginia 24210
Phone (276) 676-4800 Fax (276) 676-4899
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

Jeffrey Hurst
Regional Director

August 10, 2018

Mr. Michael W. Harris
Senior Manager
Equinix
18155 Technology Drive
Culpeper, VA 22701

Location: Culpeper County
Registration No.: 41064

Dear Mr. Harris:

Attached is a permit to construct and operate three additional emergency/standby diesel engine generator sets at Equinix located in Culpeper, Virginia 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 document dated January 13, 2016 (as amended March 9, 2018).

The Department of Environmental Quality (DEQ) deemed the application complete on July 6, 2018.

This permit contains legally enforceable conditions. Failure to comply may result in a Notice of Violation and/or civil charges. Please read all permit conditions carefully.

This permit approval to construct and operate shall not relieve Equinix of the responsibility to comply with all other local, state, and federal permit regulations.

The emergency diesel engine-generator sets may be subject to the requirements of 40 CFR Part 60, New Source Performance Standards (NSPS) Subpart IIII – *Standards of Performance for Stationary Compression Ignition Internal Combustion* Engines and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (MACT) Subpart ZZZZ – *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.* Virginia has not accepted delegation of this rule. In summary, the units may be required to comply with certain federal emission standards and operating limitations. The DEQ advises you to review the referenced MACT and NSPS to ensure compliance with applicable emission and operational limitations. As the owner/operator you are also responsible for any monitoring, notification, reporting and recordkeeping requirements of the MACT and NSPS. Notifications shall only be sent to EPA, Region III.

To review any federal rules referenced in the above paragraph or in the attached permit, the US Government Publishing Office maintains the text of these rules at www.ecfr.gov, Title 40, Part 60 and 63.

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 (30) days after this case decision notice was mailed or delivered to you. 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 30 days from the date you actually received this permit or the date on which it was mailed to 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 DEQ Northern Regional Office by phone at (703) 583-3800.

Sincerely,

Rob Feagins
Air Permit Manager
Southwest Regional Office

GRF/ECM/P-41064-18.doc

Attachment: Permit
Source Testing Report Format

cc: NRO Air Compliance Manager (electronic file submission)
File

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Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

Jeffrey Hurst
Regional Director

STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE

This permit supersedes your permit dated January 13, 2016 (as amended March 9, 2018).

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

Equinix
18155 Technology Drive
Culpeper, VA 22701
Registration No.: 41064

is authorized to construct and operate

three diesel engines for emergency/standby electrical power generation at a data center

located at

18155 Technology Drive
Culpeper, VA 22701

in accordance with the conditions of this permit.

Approved on: August 10, 2018

Jeffrey Hurst
Regional Director
Southwest Regional Office

Permit consists of 17 pages.
Permit Conditions 1 to 31.

INTRODUCTION

This permit approval is based on the following permit approvals and the respective permit applications:

Permit Program: Approval/Amendment Date	Application Signature Date	Application Supplemental Information Date
mNSR Permit March 21, 2008	November 6, 2007	November 14, 2007
mNSR Permit September 23, 2009	July 2, 2009	None
Amendment to September 23, 2009 mNSR Permit August 19, 2010	April 28, 2010	July 23, 2010
mNSR Permit January 14, 2015	November 13, 2014	December 30, 2014
mNSR Permit June 10, 2015	May 5, 2015	May 12, 2015
mNSR Permit January 13, 2016	November 16, 2015	None
Amendment to January 13, 2016 mNSR Permit March 9, 2018	October 24, 2017	February 23, 2018
mNSR Permit August 10, 2018	April 20, 2018	June 15, 2018 & July 6, 2018

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. In addition, this facility may be subject to additional applicable requirements not listed in this permit.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-20 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. 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 be either 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.

Equipment List – Equipment at this facility consists of the following:

Equipment to be Constructed as part of this project:					
Reference No.	**Equipment Description**	**Rated Capacity**	**Add-On Control Technology**	**Original Permit Date**	**Delegated Federal Requirements**
DCD-D, DCD-E, DCD-R	Three (3) Caterpillar 3516C-HD Diesel Engine Generator Sets	3634 hp 2500 kW_e each	Caterpillar CAT® Selective Catalytic Reduction (SCR)	August 10, 2018	None

Equipment Previously Permitted and Installed:					
Reference No.	**Equipment Description**	**Rated Capacity**	**Add-On Control Technology**	**Original Permit Date**	**Delegated Federal Requirements**
DCA-A through DCA-E and DCA-Swing	Six (6) Caterpillar 3516B TA Diesel Engine Generator Sets	3286 hp 2250 kW_e each	N/A	March 21, 2008	None
DCB-A through DCB-F	Six (6) Caterpillar 3516C DITA Diesel Engine Generator Sets	3634 hp 2500 kW_e each	SCR-Endure Systems	September 23, 2009	None
DCB-G through DCB-H	Two (2) Caterpillar 3512C-HD Diesel Engine Generator Sets	2206 hp 1500 kW_e each	Caterpillar CAT® Selective Catalytic Reduction (SCR)	January 13, 2016	None
DCC-A through DCC-D	Four (4) Caterpillar 3516C DITA Diesel Engine Generator Sets	3634 hp 2500 kW_e each	SCR-Endure Systems	August 19, 2010	None
DCC-E through DCC-F	Two (2) MTU 12V4000 G43 Model 1500RXC6DT2 Diesel Engine Generator Sets	2039 hp 1500 kW_e each	AirClarityTM 1500 SCR Systems	January 14, 2015	None
DCD-A through DCD-C	Three (3) Caterpillar 3516C-HD Diesel Engine Generator Sets	3634 hp 2500 kW_e each	Caterpillar CAT® Selective Catalytic Reduction (SCR)	June 10, 2015	None

Equipment Exempt from Permitting				
Reference No.	**Equipment Description**	**Rated Capacity**	**Exemption Citation**	**Exemption Date**
FOST-1 through FOST-3	Three (3) ASTs for diesel fuel	20,000 gallons each	9 VAC 5-80-1105B.8	March 21, 2008
FOST-4 through FOST-6	Three (3) ASTs for diesel fuel	20,000 gallons each	9 VAC 5-80-1105B.8	September 23, 2009
FOST-7 through FOST-9	Three (3) ASTs for diesel fuel	20,000 gallons each	9 VAC 5-80-1105B.8	June 10, 2015

Specifications included in the above tables are for informational purposes only and do not form enforceable terms or conditions of the permit.

PROCESS REQUIREMENTS

1. **Emission Controls** – Emissions from the diesel engine-generator sets shall be controlled by the following:

   a. Use of proper operating techniques and performing maintenance in accordance with the manufacturer's recommendations. In addition, the permittee may only change those settings that are permitted by the manufacturer and do not affect regulated air pollutant emissions from the diesel engines.

   b. Sulfur dioxide (SO_2) emissions from the diesel engines shall be controlled by the use of ultra low sulfur diesel fuel with a sulfur content not to exceed 0.0015% by weight (15 ppm).

   c. Carbon monoxide (CO), volatile organic compounds (VOC), and visible emissions from the diesel engines shall be controlled by proper operating practices as prescribed by the manufacturer of the engine generator and the manufacturer of the emissions control devices.

   d. Nitrogen oxides (NO_x) emissions from the diesel engines (Ref. Nos. DCA-A through DCA-E, and DCA-Swing) shall be controlled by proper combustion practices.

   e. Nitrogen oxides (NO_x) emissions from the diesel engines (Ref. Nos. DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) shall be controlled by closed loop selective catalytic reduction (SCR) control devices. Each SCR system shall be equipped with temperature probes to monitor the catalyst bed exhaust temperature at all times when the engine-generator sets are operating. In the event that the engine exhaust gas temperature exceeds 930°F, urea injection shall be discontinued and any operations above that level will be considered a malfunction. Urea injection shall begin when the engine-generators are operating at or above the corresponding urea enabling temperature and percent load shown in the table below.

SCR Urea Injection Parameters		
Reference Number	Urea Enabling Temperature (°F)*	Percent Load
DCB-A through DCB-F, and DCC-A through DCC-D	536	20
DCC-E and DCC-F	480	20
DCD-A through DCD-C, DCB-G, and DCB-H	662	30
DCD-D, DCD-E, and DCD-R	572	30

*Catalyst Bed Temperature

f. Visible emissions from the diesel engines shall be controlled by proper operating practices as prescribed by the manufacturer of the engine generator and the manufacturer of the emissions control devices.

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

2. **Monitoring Devices**

a. Each engine-generator set (Ref. Nos. DCA-A through DCA-E, DCB-A through DCB-H, DCA-Swing, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) shall be equipped with a non-resettable hour meter which measures the duration of time each engine is operated including any periodic maintenance and operation checks. See Condition 20 for associated recordkeeping to assure compliance.

b. The hourly average load from each engine-generator set (Ref. No. DCA-A through DCA-E, and DCA-Swing) shall be monitored and recorded during the operation of the engine-generator sets.

c. The closed loop SCR system on each of the engine-generator sets (Ref. Nos. DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) shall be equipped with a device to measure and record the NOx emissions measured after the catalyst (expressed in ppm), 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.

d. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the engines are operating.

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

(9 VAC 5-80-1180 D)

3. **Monitoring Device Observation** – To ensure proper performance, the monitoring devices identified in Condition 2.a, 2.b, and 2.c shall be observed by the permittee at a minimum frequency of once per day during each test firing and during days in which the engine generator sets are called into service.

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. See Condition 20 for associated recordkeeping to assure compliance.
(9 VAC 5-80-1180 D)

OPERATING LIMITATIONS

4. **Operating Scenarios for Diesel Engine Generator Sets –**

   a. Emergency / Critical Power Generation:

      i. Emergency: The engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) 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 a 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 provider service is available, the engine-generator sets may be operated in accordance with Critical Power Generation as defined below.

      ii. ISO-Declared Emergency: The engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R,) may be operated for participation in an Independent System Operator's (ISO) Emergency Load Response Program (ELRP) during times of an ISO-declared emergency, as defined in the ISO's emergency operations manual. Operations under this scenario shall not exceed 60 hours per generator each calendar year. The permittee shall submit notification to the Regional Air Permit Manager of the DEQ's NRO within thirty days of signing a contract to participate in the ERLP.

      iii. Critical Power Generation: The engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) 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 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. Alternate Power Generation: The engine generator sets that are equipped with a selective catalytic reduction system (Ref. No's DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) 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. Operations, as outlined in this subsection, shall be allowed when the engine-generator set is operating at a load level necessary to sustain urea injection as defined in Condition 1.e.

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

Total emissions for any twelve-month period, calculated as the sum of all emissions from operations under scenarios in Conditions 4.a. through 4.c above, shall not exceed the limits stated in Condition 11.
(9 VAC 5-80-1180 D and 9 VAC 5-50-260)

5. **Operating Hours** – Each engine-generator set (Ref. No. DCB-G, DCB-H, DCC-E, DCC-F, DCD-A through DCD-E, and DCD-R) shall not operate more than 500 hours per year, 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 number of hours operated for the most recently completed calendar month to the individual monthly totals of hours operated for the preceding eleven months. Refer to Condition 20 for record keeping requirements to demonstrate compliance with this condition.
(9 VAC 5-80-1180)

6. **Operation of the Engine-Generator Sets** – The permittee must operate and maintain all engine-generator sets and control devices according to the manufacturer's written instructions or procedures developed by the permittee that are approved by the engine manufacturer. In addition, the permittee may only change those settings that are permitted by the manufacturer and do not degrade air emissions.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

7. **Engine-generator Load** – The permittee shall operate each of the engine-generator sets (Ref. Nos. DCA-A through DCA-E and DCA-Swing) at a maximum hourly average load of eighty (80) percent capacity. A log of the hourly average load value shall be maintained in accordance with Condition 2.b and Condition 20 in order to demonstrate compliance.
(9 VAC 5-170-160 and 9 VAC 5-80-1180)

8. **Fuel** – The approved fuel for the engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) is ultra low sulfur diesel fuel as specified below:

   a. Does not exceed the American Society for Testing and Materials (ASTM) specification, D975, for grade ultra low sulfur 2-D or grade 2-D S15, or,

   b. Has a minimum cetane number of forty, or has a maximum aromatic content of thirty-five percent by volume, and has a sulfur content per shipment not-to-exceed 0.0015% by weight (15 ppm).

   A change in fuel type or sulfur content may require a permit to modify and operate. Exceedance of these specifications may be considered credible evidence of an exceedance of emission limits.
   (9 VAC 5-80-1180 and 9 VAC 5-50-260)

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

   a. The name of the fuel supplier; and

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

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

d. A statement that the diesel fuel oil:

i. Conforms to the requirements of Condition 8 – Fuel Specification; or

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

Fuel sampling and analysis, independent of that used for certification, as may be periodically required or conducted by the DEQ, may be used to determine compliance with the fuel specifications stipulated in Condition 8.
(9 VAC 5-80-1180)

EMISSION LIMITS

10. **Emission Limits** – Emissions from the operation of each diesel engine-generator set (DCA-A through DCA-E and DCA-Swing) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	46.36 lbs/hr*	
Carbon Monoxide (CO)	9.33 lbs/hr	
Particulate Matter (PM_{10})	0.54 lbs/hr	
Volatile Organic Compounds (VOC)	0.98 lbs/hr	

Emissions from the operation of each diesel engine-generator set (DCB-A through DCB-F, and DCC-A through DCC-D) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	4.81 lbs/hr*	with SCR in operation
Nitrogen Oxides (as NO_2)	48.11 lbs/hr*	with SCR not in operation
Carbon Monoxide (CO)	5.86 lbs/hr	
Particulate Matter (PM_{10})	0.40 lbs/hr	
Volatile Organic Compounds (VOC)	1.17 lbs/hr	

Emissions from the operation of each diesel engine-generator set (DCB-G and DCB-H) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	3.17 lbs/hr*	with SCR in operation
Nitrogen Oxides (as NO_2)	31.67 lbs/hr*	with SCR not in operation
Carbon Monoxide (CO)	4.17 lbs/hr	
Particulate Matter (PM_{10})	0.22 lbs/hr	
Volatile Organic Compounds (VOC)	0.77 lbs/hr	

Emissions from the operation of each diesel engine-generator set (DCC-E and DCC-F) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	3.21 lbs/hr*	with SCR in operation
Nitrogen Oxides (as NO2)	32.14 lbs/hr*	with SCR not in operation
Carbon Monoxide (CO)	3.04 lbs/hr	
Particulate Matter (PM_{10})	0.36 lbs/hr	
Volatile Organic Compounds (VOC)	0.71 lbs/hr	

Emissions from the operation of each diesel engine-generator set (DCD-A through DCD-C) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	5.06 lbs/hr*	with SCR in operation
Nitrogen Oxides (as NO_2)	50.59 lbs/hr*	with SCR not in operation
Carbon Monoxide (CO)	6.01 lbs/hr	
Particulate Matter (PM_{10})	0.41 lbs/hr	
Volatile Organic Compounds (VOC)	1.10 lbs/hr	

Emissions from the operation of each diesel engine-generator set (DCD-D through DCD-E and DCD-R) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	4.81 lbs/hr*	with SCR in operation
Nitrogen Oxides (as NO_2)	48.07 lbs/hr*	with SCR not in operation
Carbon Monoxide (CO)	6.09 lbs/hr	
Particulate Matter (PM_{10})	0.40 lbs/hr	
Volatile Organic Compounds (VOC)	1.12 lbs/hr	

*NO_2 – subject to change based on initial compliance test emission rate determination. If the compliance test shows a lower rate (rate x 120%), the facility has the option of using the lower hourly rate by undergoing a permit amendment to incorporate the new lower rate.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

11. **Facility Wide Limits** – Combined annual emissions from the engine-generator sets (DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) shall not exceed the limits specified below:

Nitrogen Oxides (as NO_2)	53.7 tons per year
Carbon Monoxide (CO)	22.0 tons per year
Particulate Matter (PM_{10})	1.6 tons per year
Volatile Organic Compounds (VOC)	4.2 tons per year

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of exceedance of emission limits. Compliance with these emission limits shall be determined by calculation methods as stated in Condition 12 or by an alternate method as approved by the Regional Air Compliance Manager of the DEQ's NRO. Any changes in calculation methods shall 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)

12. **Annual Emissions Calculations** – The annual emissions of NOx (as NO_2), CO, PM10 and VOC from the diesel engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-F, DCB-G, DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) shall be calculated monthly as the sum of each consecutive twelve-month period.

    a. Monthly emissions from diesel engine-generator sets (Ref. Nos. DCA-A through DCA-E and DCA-Swing) shall be calculated as follows:

    NOx = (Total monthly hours of operation of the engine-generator sets x 46.36 lb/hr) ÷ 2000 lb/ton

    CO = (Total monthly hours of operation of the engine-generator sets x 5.18 lb/hr) ÷ 2000

    PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.39 lb/hr) ÷ 2000 lb/ton

    VOC = (Total monthly hours of operation of the engine-generator sets x 0.74 lb/hr) ÷ 2000 lb/ton

    b. Monthly emissions from diesel engine-generator sets (Ref. Nos. DCB-A through DCB-F and DCC-A through DCC-D) shall be calculated as follows:

    NOx = {[(Total monthly hours of operation of the engine-generator sets when SCR is operational x 4.01 lb/hr) ÷ 2000 lb/ton] + [(Total monthly hours of operation of the engine-generator sets when SCR is not operational x 40.09 lb/hr) ÷ 2000 lb/ton]}

    CO = (Total monthly hours of operation of the engine-generator sets x 3.25 lb/hr) ÷ 2000 lb/ton

    PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.28 lb/hr) ÷ 2000 lb/ton

    VOC = (Total monthly hours of operation of the engine-generator sets x 0.88 lb/hr) ÷ 2000 lb/ton

    c. Monthly emissions from diesel engine-generator sets (Ref. Nos. DCB-G and DCB-H) shall be calculated as follows:

    NOx = {[(Total monthly hours of operation of the engine-generator sets when SCR is operational x 3.17 lb/hr) ÷ 2000 lb/ton] + [(Total monthly hours of operation of the engine-generator sets when SCR is not operational x 31.67 lb/hr) ÷ 2000 lb/ton]}

    CO = (Total monthly hours of operation of the engine-generator sets x 4.17 lb/hr) ÷ 2000 lb/ton

    PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.22 lb/hr) ÷ 2000 lb/ton

    VOC = (Total monthly hours of operation of the engine-generator sets x 0.77 lb/hr) ÷ 2000 lb/ton

d. Monthly emissions from diesel engine-generator sets (Ref. Nos. DCC-E and DCC-F) shall be calculated as follows:

NOx = {[(Total monthly hours of operation of the engine-generator sets when SCR is operational x 3.21 lb/hr) + 2000 lb/ton] + [(Total monthly hours of operation of the engine-generator sets when SCR is not operational x 32.14 lb/hr) + 2000 lb/ton]}

CO = (Total monthly hours of operation of the engine-generator sets x 3.04 lb/hr) + 2000 lb/ton

PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.36 lb/hr) + 2000 lb/ton

VOC = (Total monthly hours of operation of the engine-generator sets x 0.71 lb/hr) + 2000 lb/ton

e. Monthly emissions from diesel engine-generator sets (Ref. Nos. DCD-A through DCD-C) shall be calculated as follows:

NOx = {[(Total monthly hours of operation of the engine-generator sets when SCR is operational x 5.06 lb/hr) + 2000 lb/ton] + [(Total monthly hours of operation of the engine-generator sets when SCR is not operational x 50.59 lb/hr) + 2000 lb/ton]}

CO = (Total monthly hours of operation of the engine-generator sets x 6.01 lb/hr) + 2000 lb/ton

PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.41 lb/hr) + 2000 lb/ton

VOC = (Total monthly hours of operation of the engine-generator sets x 1.10 lb/hr) + 2000 lb/ton

f. Monthly emissions from diesel engine-generator sets (Ref. Nos. DCD-D, DCD-E, and DCD-R) shall be calculated as follows:

NOx = {[(Total monthly hours of operation of the engine-generator sets when SCR is operational x 4.81 lb/hr) + 2000 lb/ton] + [(Total monthly hours of operation of the engine-generator sets when SCR is not operational x 48.07 lb/hr) + 2000 lb/ton]}

CO = (Total monthly hours of operation of the engine-generator sets x 6.09 lb/hr) + 2000 lb/ton

PM_{10} = (Total monthly hours of operation of the engine-generator sets x 0.40 lb/hr) + 2000 lb/ton

VOC = (Total monthly hours of operation of the engine-generator sets x 1.12 lb/hr) + 2000 lb/ton

g. Facility wide monthly emissions shall be the sum of the monthly emissions from Conditions 12a, 12b, 12c, 12d, 12e, and 12f.

After the initial performance demonstration testing, the facility has the option of using lower lb/hr NOx (as NO_2) emission rate by requesting a permit modification to incorporate the new lower rate. (9 VAC 5-80-1180 and 9 VAC 5-50-260)

13. **Visible Emission Limit** – Visible emissions from the engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) 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 40 CFR 60 Appendix A, Reference Method 9. This condition applies at all times except during startup, shutdown, and malfunction. During startup and shutdown times visible emissions from the engine-

generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) shall not exceed ten percent opacity except during one six-minute period in any one hour in which visible emissions shall not exceed twenty percent opacity as determined by 40 CFR 60 Appendix A, Reference Method 9.
(9 VAC 5-80-1180, 9 VAC 5-50-260 and 9 VAC 5-50-80)

INITIAL COMPLIANCE DETERMINATION

14. **Stack Test** - Initial performance tests shall be conducted on one of the engine-generator sets (DCD-D, DCD-E, or DCD-R), while SCR is operating, for NO_X and CO emissions to determine compliance with the emission limits contained in Condition 10. The tests shall be performed, reported, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. Tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30. The details of the tests are to be arranged with the Regional Air Compliance Manager of the DEQ's NRO. The permittee shall submit a test protocol at least 30 days prior to testing. One copy of the test results shall be submitted to the Regional Air Compliance Manager of the DEQ's NRO within 45 days after test completion and shall conform to the test report format enclosed with this permit.

    a. Emissions testing of each pollutant for each selected engine-generator set shall consist of three one-hour test runs under load. The average of the three runs shall be reported as the short-term emission rate for that engine-generator.

    b. Testing shall be conducted with the engine operating at greater than 90% electrical capacity, unless multiple load band testing is approved by DEQ.

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

        i. Generator load/kilowatt output.

        ii. Fuel consumption and fuel sulfur content of the diesel fuel oil.

        iii. Urea solution consumption for units equipped with SCR.

        iv. Catalyst bed exhaust temperature for units equipped with SCR.

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

CONTINUED COMPLIANCE DETERMINATION

15. **Continuing SCR NOx Monitoring System Assessment** – The permittee shall conduct an assessment annually, on the closed loop SCR NOx monitoring system for each engine-generator set, so equipped, in accordance with procedures as approved by the Regional Air Compliance Manager of the DEQ's NRO. The permittee shall maintain on-site records of:

    a. The SCR NOx monitoring assessment procedures.

    b. The results of each annual assessment.

    c. Calibration gas certifications.

d. Any corrective action taken during the annual assessments.
(9 VAC 5-80-1180)

16. **Stack Tests** – Upon request by the DEQ, the permittee shall conduct performance testing of the engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) 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.
(9 VAC 5-50-30 G and 9 VAC 5-80-1200)

17. **Visible Emissions Evaluation** – Upon request by the DEQ, the permittee shall conduct visible emission evaluations of the engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) to demonstrate compliance with the visible emission limits contained in this permit. The details of the VEE shall be arranged with the Regional Air Compliance Manager of the DEQ's NRO.
(9 VAC 5-80-1200 and 9 VAC 5-50-30 G)

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 at the appropriate locations and safe sampling platforms and access shall be provided.
(9 VAC 5-50-30 F and 9 VAC 5-80-1180)

RECORDS AND NOTIFICATIONS

19. 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)

20. **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 Air Compliance Manager of the Virginia DEQ Northern Regional Office. These records shall include, but are not limited to:

    a. Monthly log of the hours of operation, date, and reason operated (as defined in Condition 4) for each engine-generator set (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R), in accordance with Condition 2. In addition the log shall contain:

        i. Generator load with and without SCR (if applicable)

        ii. Hours of operation with and without SCR (for units equipped with SCR)

iii. Catalyst bed exhaust temperature (if applicable)

iv. the NOx emissions measured after the catalyst, expressed in ppm (if applicable)

b. Monthly and annual emissions calculations for each pollutant from the engine-generator sets (Ref. Nos. DCA-A through DCA-E, DCA-Swing, DCB-A through DCB-H, DCC-A through DCC-F, DCD-A through DCD-E, and DCD-R) using the calculation methods in Condition 12 to verify compliance with the ton/yr emissions limitations in Condition 11. Annual emissions 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.

c. A log of the average hourly load for the engine-generator sets subject to Condition 2.b to demonstrate compliance with Condition 7.

d. All fuel supplier certifications per Condition 9.

e. All VEE and emission stack test reports.

f. All Continuing SCR NOx Monitoring System Assessment records per Condition 15.

g. A copy of the maintenance schedule and records of all scheduled and unscheduled maintenance in accordance with Condition 25.

h. Logs of monitoring device observations as per Condition 3.

i. Operator training in accordance with Condition 25.

j. 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.

k. Records of the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer.

l. Records of changes in settings that are permitted by the manufacturer of the engine-generator sets.

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

21. **Initial Notifications** – The permittee shall furnish written notification to the Regional Air Compliance Manager of the DEQ's NRO of:

a. The actual date(s) on which construction of engine generators (Ref. Nos. DCD-D, DCD-E, and DCD-R) commenced within 30 days after such date(s). Along with this notification, the information below shall be included:

i. Name and address of the permittee;

ii. The address of the affected source;

iii. Engine information, including make, model, engine family, serial number, model year, maximum engine power and engine displacement.

b. The anticipated start-up date of each engine-generator set (Ref. Nos. DCD-D, DCD-E, and DCD-R), postmarked not more than sixty days nor less than thirty days prior to such date.

c. The actual start-up date of the diesel engine-generator sets within fifteen days after such date. The actual start-up date shall be the date on which each engine completes manufacturer's trials, but shall be no later than thirty days after start-up for manufacturer's trials unless otherwise approved by DEQ.

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

GENERAL CONDITIONS

22. **Permit Invalidation** – The portion of this permit to construct and operate the diesel engine-generator sets (Ref. Nos. DCD-D, DCD-E, and DCD-R) shall become invalid, unless an extension is granted by the DEQ, if:

a. A program of continuous construction , reconstruction, or modification is not commenced within the latest of the following eighteen months from the date of this permit;

b. A program of construction, reconstruction, or modification 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)

23. **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 terms or conditions of this permit;

c. Fails to comply with any emission standards applicable to an 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 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;

e. Fails to comply with the applicable provisions of 9 VAC 5-80-1100 et seq.

(9 VAC 5-80-1210 F and 9 VAC 5-80-1210 G)

24. **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)

25. **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. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Regional Air Compliance Manager of the DEQ's NRO, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures and inspection of the source.

    The permittee shall take the following measures in order to minimize the duration and frequency of excess emissions:

    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)

26. **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 of malfunction), corrective action, preventive measures taken and name of person generating the record.
    (9VAC 5-20-180 J and 9 VAC 5-80-1180 D)

27. **Notification for Facility or Control Equipment Malfunction** – The permittee shall furnish notification to the Regional Air Compliance Manager of the DEQ's NRO 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, e-mail, telephone or telegraph. 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)

28. **Notification for Control Equipment Maintenance** – The permittee shall furnish notification to the Regional Air Compliance Manager of the DEQ's NRO 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 its 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 shut-down period.

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

    (9 VAC 5-20-180B)

29. **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)

30. **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 of the change of ownership within thirty days of the transfer.
(9 VAC 5-80-1240)

31. **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

8. Description of process and control devices
9. Process and control equipment flow diagram
10. 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