



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE

4949-A Cox Road, Glen Allen, Virginia 23060

(804) 527-5020

www.deq.virginia.gov

Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director
(804) 698-4020

Jerome A. Brooks
Regional Director

September 5, 2023

via Electronic Mail

Mr. Jeff Bertocci
Datacenter Operations Manager
Microsoft Corporation
101 Herbert Drive, Office 1118
Boydton, VA 23917
Jeff.Bertocci@microsoft.com

Location: Mecklenburg County
Registration No.: 52820

Dear Mr. Bertocci:

Attached is a permit to construct and operate engine-generator sets at Microsoft Corporation – LVL Datacenter in accordance with the provisions of the Virginia State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. This permit supersedes your permit dated August 3, 2022.

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 21, 2023.

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 Microsoft Corporation of the responsibility to comply with all other local, state, and federal permit regulations.

The proposed engine-generator sets are subject to 40 CFR 63, Maximum Achievable Control Technology (MACT), Subpart ZZZZ and 40 CFR 60, New Source Performance Standard (NSPS), Subpart IIII. Virginia has not accepted delegation of these rules. In summary, the units are required to comply with certain federal emission standards and operating limitations. The Department of Environmental Quality (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 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 DEQ within 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:

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 (804) 527-5020.

Sincerely,



James E. Kyle, P.E.
Air Permit Manager

JEK/EDS/52820-03 Microsoft LVL NSR

Attachment: Permit

Federal regulations can be found at: <http://www.gpo.gov/fdsys/search/showcitation.action>
40 CFR Part 60 Subpart IIII and 40 CFR Part 63 Subpart ZZZZ

cc: File
Inspector, Air Compliance



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STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE

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

Microsoft Corporation
101 Herbert Drive
Boydton, VA 23917
Registration No.: 52820

is authorized to construct and operate

engine-generator sets at a datacenter (Ref. Nos. EG01-EG63 at LVL01, LVL02, and LVL03; EG64-EG105 at LVL04 and LVL05; and EG106-EG147 at LVL06 and LVL07)

located at

Microsoft Corporation – LVL Datacenter
960 Prison Road
Boydton, VA 23917 (Mecklenburg County)

in accordance with the Conditions of this permit.

Approved on September 5, 2023.

A handwritten signature in blue ink, appearing to read "J. Kyle", written over a horizontal line.

James E. Kyle, P.E.
Air Permit Manager, Department of Environmental Quality

Permit consists of 10 pages.
Permit Conditions 1 to 21.

INTRODUCTION

This permit approval is based on the permit application dated September 26, 2019 and revised submittal dated December 3, 2019 and supplemental information dated December 27, 2019; permit application dated June 4, 2020 and revised submittal dated March 6, 2022, and permit application dated May 19, 2023. 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 5-10-10 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 DEQ 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.

Equipment List – Equipment at this facility covered by this permit consists of:

Equipment to be Constructed:

Reference No.	Equipment Description	Rated Capacity	Delegated Federal Requirements
EG106-EG125, EG127-EG146	Forty (40) Cummins Model C3000 D6e QSK95 series engine-generator sets	4,308 bhp 3000 kWe, each	--
EG126, EG147	Two (2) Cummins Model DFEK QSK15 engine-generator sets	732 bhp 500 kWe, each	--

Other Permitted Equipment:

Reference No.	Equipment Description	Rated Capacity	Delegated Federal Requirements
EG1-EG20, EG22-EG41, EG43-EG62, EG64-EG83, EG85-EG104	One hundred (100) Cummins Model C3000 D6e QSK95 series engine-generator sets	4,308 bhp 3000 kWe, each	--

Reference No.	Equipment Description	Rated Capacity	Delegated Federal Requirements
EG21, EG42, EG63, EG84, EG105	Five (5) Cummins Model DFEK QSX15engine-generator sets	732 bhp 500 kWe, each	--

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 – Nitrogen oxides (NO_x) emissions from the engine-generator sets (Ref. Nos. EG1-EG20, EG22-EG41, EG43-EG62, EG64-EG83, EG85-EG104, EG106-EG125, EG127-EG146) shall be controlled by turbocharged engine and aftercooler. Nitrogen oxides (NO_x) emissions from the engine-generator sets (Ref. Nos. EG21, EG42, EG63, EG84, EG105, EG126, EG147) shall be controlled by turbocharged engine and charge air cooler. The permittee shall maintain documentation that demonstrates the engine design and/or control device has been installed on the engine-generator sets.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
2. Emission Controls – Visible emissions, particulate (PM, PM10 and PM2.5), volatile organic compound (VOC), nitrogen oxides (NO_x) and carbon monoxide (CO) emissions from the engine-generator sets (Ref. Nos. EG1- EG147) shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations. In addition, the permittee may only change those settings that are permitted by the manufacturer and does not increase air emissions.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
3. Monitoring Devices – Each engine-generator set shall be equipped with a non-resettable hour metering device to monitor the operating hours and a fuel flow meter to monitor the fuel throughput. The non-resettable hour meter used to continuously measure the hours of operation and fuel flow meter used to continuously measure the amount of fuel consumed by each engine-generator set shall be observed by the owner with a frequency of not less than once each day the engine-generator set is operated. The owner shall keep a log of these observations.

Each monitoring device shall be installed, maintained, calibrated (as appropriate) and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the engine-generator sets are operating.
(9 VAC 5-80-1180 D)

OPERATING/EMISSION LIMITATIONS

4. Operation of the Engine-Generator Set – The permittee shall operate and maintain each engine-generator set and control device 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 does not increase air emissions.
(9 VAC 5-80-1180)
5. Fuel – The approved fuels for the engine-generator sets (Ref. Nos. EG1-EG147) are diesel and renewable diesel fuel. The diesel and renewable diesel fuel shall meet the ASTM D975 specification for S15 diesel fuel oil with a maximum sulfur content per shipment of 0.0015%. A change in the fuel shall be considered a change in the method of operation of the engine-generator sets and may require a new or amended permit. However, if a change in the fuel is not subject to new source review permitting requirements, this condition should not be construed to prohibit such a change.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)
6. Fuel Throughput – The engine-generator sets (Ref. Nos. EG1-EG147) shall consume no more than the following:

Reference Number	Throughput Limit (combined)
EG1-EG20, EG22-EG41, EG43-EG62, EG64-EG83, EG85-EG104, EG106-EG125 and EG127-EG146	815,360 gallons diesel per year 852,208 gallons renewable diesel per year
EG21, EG42, EG63, EG84, EG105, EG126 and EG147	9,473 gallons diesel per year 9,473 gallons renewable diesel per year

Each throughput shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-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 11 months.
(9VAC5-80-1180)

7. Fuel Certification – The permittee shall obtain a certification from the fuel supplier with each shipment of diesel and renewable diesel. Each fuel supplier certification shall include the following:
 - a. The name of the fuel supplier;
 - b. The date on which the diesel and renewable diesel fuel was received;
 - c. The quantity of diesel and renewable diesel fuel delivered in the shipment;

- d. A statement that the diesel and renewable diesel fuel complies with the American Society for Testing and Materials specifications (ASTM D975) for S15 diesel fuel oil; and
- e. The sulfur content of the diesel and renewable diesel fuel.

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

EMISSION LIMITS

- 8. Emission Limits - Emissions from the operation of the engine-generator sets (Ref. Nos. EG1-EG147) shall not exceed the limits specified below:

Pollutant	EG1-EG20, EG22-EG41, EG43-EG62, EG64-EG83, EG85-EG104, EG106-EG125 and EG127-EG146 Cummins C3000 D6e (each unit)	EG21, EG42, EG63, EG84, EG105, EG126 and EG147 Cummins DFEK (each unit)
PM	0.6 lb/hr	0.1 lb/hr
PM ₁₀	0.6 lb/hr	0.1 lb/hr
PM _{2.5}	0.6 lb/hr	0.1 lb/hr
Nitrogen Oxides (as NO ₂)	50.5 lb/hr	7.1 lb/hr
Carbon Monoxide	1.9 lb/hr	0.6 lb/hr
Volatile Organic Compounds	0.9 lb/hr	0.2 lb/hr

Pollutant	Annual Emission Limit (all units combined)
PM	4.4 tons/yr
PM ₁₀	4.8 tons/yr
PM _{2.5}	4.8 tons/yr
Nitrogen Oxides (as NO ₂)	97.8 tons/yr
Carbon Monoxide	8.6 tons/yr
Volatile Organic Compounds	4.7 tons/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits may be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Conditions 5 and 6.
 (9 VAC 5-80-1180 and 9 VAC 5-50-260)

- 9. Visible Emission Limit - Visible emissions from each engine-generator set exhausts (Ref. Nos. EG1-EG147) shall not exceed 10% opacity except during one 6-minute period in any one hour in which visible emissions shall not exceed 20% opacity as determined by EPA

Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown and malfunction.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

10. Emissions Testing - 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 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

11. 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 Piedmont Regional Office. These records shall include, but are not limited to:
 - a. Annual hours of operation of each engine-generator set, calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12 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 11 months.
 - b. Annual consumption of diesel fuel for the combined operation of the engine-generator sets (EG1-EG20, EG22-EG41, EG43-EG62, EG64-EG83, EG85-EG104, EG106-EG125 and EG127-EG146), calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12 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 11 months.
 - c. Annual consumption of renewable diesel fuel in gallons for the engine-generator sets (EG1-EG20, EG22-EG41, EG43-EG62, EG64-EG83, EG85-EG104, EG106-EG125 and EG127-EG146), calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12 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 11 months.
 - d. Annual consumption of diesel fuel for the combined operation of the engine-generator sets (EG21, EG42, EG63, EG84, EG105, EG126 and EG147), calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12 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 11 months.

- e. Annual consumption of renewable diesel fuel in gallons for the engine-generator sets (EG21, EG42, EG63, EG84, EG105, EG126 and EG147), calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12 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 11 months.
- f. Annual emission calculations for the combined operation of the engine-generator sets (EG1-EG147), calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12 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 11 months.
- g. All fuel supplier certifications.
- h. Engine information including make, model, serial number, model year, maximum engine power (bhp), and engine displacement for each engine-generator set.
- i. The manufacturer's written operating instructions or procedures developed by the owner/operator that are approved by the engine manufacturer for each engine-generator set.
- j. Records of the reasons for operation for each engine-generator set (Ref. Nos. EG1-EG147), including, but not limited to, the date, cause of operation, cause of the emergency, and the hours of operation.
- k. Results of all stack tests and visible emission evaluations.
- l. Scheduled and unscheduled maintenance and operator training.
- m. A log of monitoring device observations as required by Condition 3.

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)

NOTIFICATIONS

- 12. Initial Notifications - The permittee shall furnish written notification to the Piedmont Regional Office of:
 - a. The actual date on which construction of the engine-generator sets (Ref. Nos. EG1-EG147) commenced within 30 days after such date.

- b. The anticipated start-up date of the engine-generator sets (Ref. Nos. EG1-EG147) postmarked not more than 60 days nor less than 30 days prior to such date.
- c. The actual start-up date of the engine-generator sets (Ref. Nos. EG1-EG147) within 15 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 the initial start up for manufacturer's trials.

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

GENERAL CONDITIONS

13. Permit Invalidation - The portions of this permit to construct backup engine-generator sets (Ref. Nos. EG106-EG147) shall become invalid, unless an extension is granted by the DEQ, if:

- a. A program of continuous construction is not commenced within 18 months from the date of this permit.
- b. A program of construction is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of the phased construction of a new stationary source or project.

(9 VAC 5-80-1210)

14. 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;
- 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 emissions limitations, in the State Implementation Plan in effect at the time an application for this permit is submitted.

(9 VAC 5-80-1210 G)

15. 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)

16. 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:

- 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)

17. 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)

18. Notification for Facility or Control Equipment Malfunction - The permittee shall furnish notification to the Piedmont Regional Office of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour. Such notification shall be made 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 14 days 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 Piedmont Regional Office.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)
19. 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)
20. 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 Piedmont Regional Office of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)
21. 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)