

State of Washington Department of Ecology
Notice of Construction Approval Order

In the matter of approving a new)	DRAFT Approval Order No.
air contaminant source for the)	21AQ-C255
Microsoft Corporation's EAT02)	
Data Center)	AQPID No. B0170071

Project Summary

The Microsoft Corporation, herein referred to as the Permittee, operates the EAT02 Data Center. The data center is located on Douglas County Parcel Nos. 22210920004, 22210920005, 22210920006, at 875 Urban Industrial Way, East Wenatchee, in Douglas County.

The Permittee is classified as a synthetic minor for nitrogen oxide emissions, in that the allowed emissions for that pollutant are below 80% of the 100 ton-per-year threshold that would trigger applicability of Title V of the federal Clean Air Act.

The project consists of installation and operation of 21 diesel-fired emergency engines to power 21 electrical generators at the data center. Each engine and generator pairing is also known as a generator set or 'genset'. Evaporative cooling units used onsite were determined not to be a source of air emissions, since there is no drift loss from the units.

Legal Authority

The emissions from the proposed project have been reviewed under the legal authority of RCW 70A.15.2210 and the applicable rules and regulations adopted thereunder. The proposed project, if operated as specified, will be in accordance with applicable rules and regulations, as set forth in Chapters 173-400 WAC and 173-460 WAC and the operation thereof, at the location proposed, will not result in ambient air quality standards being exceeded.

Therefore, it is ordered that the project, as described in the Notice of Construction (NOC) application and/or in the plans, specifications, and other information submitted to the Washington State Department of Ecology (Ecology), is approved for construction and operation provided the following conditions are satisfied:

Approval Conditions

1. Emission Units

The following emission units have been identified and are approved to be installed under this NOC Approval Order; the specified ID number will be used elsewhere in this Order to identify each emission unit:

ID No.	Engine Manufacturer	Engine Model	Engine Rating (kWm)	Performance Number	No. of Units
EU-1 through EU-20	CAT	C175-16	3,263	175DR86	20
EU-21	CAT	C15	568	DM8155	1

2. Operational Limitations

a. Operation Limits

The emission units are limited to the following operating limitations:

- i. For overall operations, including operations during unplanned power outages:
 - A. The cumulative runtime of EU-1 through EU-20 must be limited to 2,820 hours per any rolling 12-month period.
 - B. The runtime of EU-21 must be limited to 147 hours per any rolling 12-month period.
- ii. For planned operations:
 - A. The cumulative runtime of EU-1 through EU-20 must be limited to 820 hours per any rolling 12-month period, except as allowed under Condition 2.a.ii.E.
 - B. The runtime of EU-21 must be limited to 41 hours per any rolling 12-month period, except as allowed under Condition 2.a.ii.E.
 - C. EU-1 through EU-20 are each limited to no more than 9 hours of concurrent¹ operation with any other engine per rolling 60-month period, except as allowed under Condition 2.a.ii.E.
 - D. Concurrent operations must be limited to the operation of no more than five engines: four engines amongst EU-1 through EU-20; along with EU-21.
 - E. On a one-time basis, for the construction and commissioning of the gensets:
 - I. EU-1 through EU-20 may operate an additional 1,040 hours, cumulative.
 - II. EU-21 may operate an additional 58 hours.
 - III. EU-1 through EU-20 are each limited to no more than 12 hours of concurrent operation with any other engine.
 - F. Engine operation must be restricted to between 7:00 am – 7:00 pm, Pacific Time.

¹ Concurrent operation of engines occurs when two or more engines operate at the same moment.

b. Equipment Restrictions

- i. The generators must not be utilized to satisfy a financial arrangement with any entity (e.g. curtailment rate structures, load shedding, or distributed power generation), or to provide electrical power to any electric power provider or user, without first submitting a Notice of Construction Application to revise this order.
- ii. All engines must be certified for conformance with the emission limits specified in Condition 2.c.i.
 - A. Beyond the 18 months following issuance of this Order, any replaced engine will be treated as a new stationary source. Any such replacement must be preceded by submission of a Notice of Construction Application and issuance of a revised approval order.
 - B. Modifications that change emission rates from this project may trigger new source review.
- iii. The total fuel usage for EU-1 through EU-21 must be limited to 599,485 gallons per any rolling 12-month period.
- iv. The Permittee must use only ultra-low-sulfur diesel, i.e. No. 2 fuel oil containing a sulfur content of no greater than 15 parts per million, to fuel the engines.
- v. Exhaust stacks:
 - A. The exhaust stack for each EU-1 through EU-20 must: have an inside diameter of 24 inches; and extend to a height of 70 feet (two significant figures) above grade.
 - B. The exhaust stack for EU-21 must: have an inside diameter of 8 inches; and extend to a height of 15 feet above grade.
 - C. The stacks must be installed such that bends, obstructions, and building interferences with exhaust dispersion are minimized.
 - D. Exhaust from the exhaust stacks for each engine must be discharged vertically.
 - E. Stack caps that interfere with vertical dispersion are prohibited. At engine loads at or above 25%, the stack cap must open to at least an 85° angle from horizontal. Below 25% engine load, the stack cap must open to at least a 30° angle from the horizontal.

c. Emission Limits

- i. Emissions from each engine must not exceed the following weighted limits:

Pollutant(s)	AWM^a (g/kW-hr)
Non-Methane Hydrocarbons (NMHC) ^b + Nitrogen Oxides (NO _x)	6.4
Carbon Monoxide (CO)	3.5
Particulate Matter (PM)	0.20

^a A_{WM} is the weighted mass emission limit calculated using the formula specified by 40 C.F.R. 89.424(a), using the weighting factors specified in Table 2 of 40 C.F.R. Part 89, Subpart E, Appendix B.

^b NMHC are considered volatile organic compounds.

- ii. At all times, including startup:

- A. Aggregate NO_x emissions from EU-1 through EU-21 must not exceed 99.0 tons per year per any rolling 12-month period.
- B. The exhaust of each engine must contain no greater than 0.10 grains per dry standard¹ cubic foot (dscf) of particulate.
- C. Visible emissions from each engine must not exceed 10% opacity, as measured 40 C.F.R. Part 60, Appendix A, Test Method 9.
- D. There must be no visible emissions from any engine at or beyond the property boundary, as measured by 40 C.F.R. Part 60, Appendix A, Test Method 22.

3. Operation & Maintenance

- a. The Permittee must follow all recommended installation, configuration, operation, and maintenance provisions supplied by emission unit and component manufacturers.
- b. An operations and maintenance (O&M) manual must be developed by the Permittee for each emission unit. The manufacturer's instructions may be referenced in the O&M manuals.
 - i. The O&M manuals must include the following, at a minimum:
 - A. Normal operating parameters for emissions units.
 - B. A maintenance schedule for each emissions unit.
 - C. A description of the monitoring procedures.
 - D. Monitoring and record keeping requirements.

¹ "Standard conditions" means a temperature of 20°C (68°F) and a pressure of 760 mm (29.92 inches) of mercury.

- E. Actions for abnormal control system operation.
- F. Additional project-specific information, as needed.
- ii. The O&M manuals must be developed within 30 days of commencing operation of each emission unit.
- c. Emission units must be operated and maintained in accordance with the O&M manuals.
- d. The Permittee must assess all complaints received. The Permittee must initiate corrective action in response to a complaint within three calendar days of receipt of the complaint.

4. **Monitoring & Recordkeeping**

- a. The O&M manuals must be reviewed annually.
 - i. The date of each review and the person performing each review must be documented.
 - ii. The O&M manuals must be updated to reflect any modifications to emission units or operating procedures.
- b. O&M records must be kept on premises in hard copy or electronically.
- c. For all air-quality related complaints, the following records must be kept:
 - i. A written record of the complaint received by the Permittee or forwarded to the Permittee.
 - ii. The Permittee's action to investigate the validity of the complaint, any corrective action that was taken in response to the complaint, and the effectiveness of the remedial action.
- d. The date, time, duration, and cause of any periods where control technology equipment is out of service must be documented and maintained.
- e. All data required by this NOC Approval Order must be maintained in a readily retrievable manner for a period of five years and must be made available to authorized representatives of Ecology upon request.
- f. The Permittee must complete any additional monitoring or recordkeeping necessary to determine compliance with the requirements of this NOC Approval Order, as determined by Ecology.
- g. For the purposes of tracking and recording fuel consumption, measure and record:
 - A. The quantity of fuel in each generator belly tank (on a percent full basis) at least weekly, and at the start of the calendar month.
 - B. Fuel delivery receipts and the amount of fuel delivered to each generator belly tank per delivery.
- h. Fuel receipts displaying the quantity of diesel and sulfur content for each delivery.

- i. Each engine must be equipped with a properly installed and maintained non-resettable meter that continuously¹ tracks hours of operation.
 - A. The annual hours of operation for each engine must be compiled monthly, on a rolling 12-month basis.
 - B. An operation log must be maintained for each engine. The logs must indicate: the purpose of each period of engine operation; the hours operated; the operating load; and whether any other engines were operated concurrently.
- j. Written verification, from the engine manufacturer, which confirms that engine EU-1 through EU-20 uses the same electronic programmable system parameters (i.e. configuration parameters) in the electronic engine control unit must be maintained for the life of the engines.
- k. An upset condition log for each engine. The log must include the date, time, duration, cause, and corrective action taken for each upset.
- l. Any other data requested by Ecology to enable verification of the equipment operating properly.

5. Testing

- a. The Permittee must follow engine manufacturer recommended diagnostic testing and maintenance procedures to ensure that each engine will conform to the emission limits listed under Condition 2.c throughout the life of the engine.
- b. For EU-1 through EU-20, the Permittee must perform source testing of at least one representative engine to show compliance with the emission limits listed under Section 2.c.
 - i. An initial source test must be conducted within 6 months of the issuance date of this Order.
 - ii. Ongoing testing must be performed on a 5-year recurring cycle, based on the issuance date of this Order. Testing may be performed more frequently.
 - iii. Testing must be conducted as specified under Condition 5.d.
 - iv. For ongoing testing, the engine with the most operating hours is the likely candidate for ongoing testing, as long as it is a different engine from that which was tested during the previous testing event. The selected engine(s) must be approved by Ecology.
- c. For EU-21, the Permittee must perform source testing to show compliance with the emission limits listed under Section 2.c.

¹ Continuously means 95% of the monthly engine operations, except for periods of monitoring system down-time, provided that the Permittee demonstrates that the down time was not a result of inadequate design, operation, maintenance, or any other reasonably preventable condition, and any necessary repairs to the monitoring system were conducted prior to the next planned operation.

- i. An initial source test must be conducted within 6 months of the issuance date of this Order.
- ii. Ongoing testing must be performed on a 15-year recurring cycle, based on the issuance date of this Order. Testing may be performed more frequently.
- iii. Testing must be conducted as specified under Condition 5.d.
- d. Source testing must include:
 - i. Measure the emissions of pollutants listed in Condition 2.c using the equipment and in-use testing procedures for compression-ignition engines specified in 40 C.F.R. Part 1065, Subpart F, as approved by Ecology.
 - ii. Measure emissions of CO₂ as described in 40 C.F.R. 1039.235.
 - iii. Measure visible emissions per 40 C.F.R. Part 60, Appendix A, Method 9.
 - iv. Use the applicable duty cycles specified in 40 C.F.R. 89.410, as approved by Ecology.
 - v. Use the F-factor described in 40 C.F.R. Part 60, Appendix A, Method 19 to calculate exhaust flow rate through the exhaust stack.
 - vi. Calculate emissions of sulfur oxides (SO_x), on a mass-balance basis, using the sulfur content of the fuel. Use the sulfur content based on analysis of the fuel purchased; vendor-provided test data may be utilized.
 - vii. Measure fuel usage with a properly installed and calibrated fuel-flow monitoring system.
- e. In the event that an engine source test shows noncompliance with any applicable emission limit listed under Condition 2.c, the Permittee must:
 - i. Repair the engine, where appropriate.
 - ii. If there are three or more installed engines of the same genset model as that tested, repeat the test on the same engine, plus two additional equivalent engines, as approved by Ecology. Otherwise, test all installed engines within the genset model.
- f. The Permittee must submit a test plan to Ecology for review and approval at least 60 days prior to source testing¹. The test plan must include the following information, at a minimum:
 - i. Identification of each emission unit to be tested.
 - ii. The operating parameters to be monitored during the test.
 - iii. A description of the emission units to be tested, including the: manufacturer; model number; engine serial number; generator serial number; design capacity; installed engine control software; certification that all engines have the same engine control

¹ Ecology may require a new protocol for re-test events conducted after a failed source test; when required, Ecology may approve a shorter timeframe for submission of the re-test protocol.

- software installed; the subset of engines that will be tested; and the location of the sample ports or test locations.
- iv. The date and time of the proposed source test.
 - v. Identification and qualifications of the source test personnel.
 - vi. A description of the test methods and procedures to be used.
 - vii. Alternate test methods and procedures may be proposed in writing by the Permittee for Ecology review; a justification for the change must be included. Proposed alternates must not be utilized unless an approval is issued by Ecology, in writing, prior to the test.
- g. Deviations from the test plan due to conditions encountered while conducting the test must be approved by the Ecology representative identified as the point of contact. The initial request and approval may be verbal, so long as the request is formalized in writing within 24 hours of completing the test.
- h. Test reports must be submitted to Ecology within 60 days of completion of the source testing. Test reports must include the following information, at a minimum:
- i. The information described in the test plan and any subsequent test plan approval letters.
 - ii. Field and analytical laboratory data.
 - iii. Quality assurance/quality control procedures and documentation.
 - iv. Analyzer data, recorded at least once every minute during the test.
 - v. A summary of results, reported in units and averaging periods consistent with the applicable emission limit. NMHC and NO_x emissions must be reported separately as well.
 - vi. A summary of control system and equipment operating conditions.
 - vii. Copies of all field data.
 - viii. Chain of custody information. At a minimum, chain of custody documentation must include:
 - A. Filter IDs for all filters, including sample blanks.
 - B. Adequate information to determine which run and engine load correspond to each filter.
 - ix. Calibration documentation.
 - x. Discussion of any abnormalities associated with the results.
 - xi. A statement signed by the senior management official of the testing firm certifying the validity of the source test report.
 - xii. Emission calculations.
 - xiii. Engine run time and horsepower output for each test run for each load.

xiv. Fuel meter data.

- i. The Permittee must provide adequate sampling ports, safe sampling platforms, and access to platforms and utilities for sampling and testing, in accordance with 40 C.F.R. 60.8, 40 C.F.R. 63.7(d), and WAC 173-400-105(4).
- j. Failure of one engine to meet the emission limits specified under Condition 2.c will be taken as failure of all engines to meet said limits.
- k. When information obtained by Ecology indicates the need to quantify emissions, Ecology may require the Permittee to conduct material analysis or air emission testing. This testing requirement is in addition to any testing required by Ecology in this NOC Approval Order.

6. Reporting

- a. All notifications, plans, reports, and other submittals must be submitted in a manner approved by Ecology.
- b. The Permittee must notify Ecology within three business days of the receipt of any complaint.
- c. The Permittee must notify Ecology of commissioning of each genset one week prior to initiating such activities. The notice must include:
 - i. The engine make, model, serial number, and location.
 - ii. Identification of the software version used in the engine control module.
 - iii. If a phased construction schedule is employed, the phase under which the genset is installed.
 - iv. Date of commission completion.
- d. At least seven days prior to source testing, the Permittee must submit notification to Ecology confirming the date and start time of the test.
- e. The Permittee must notify Ecology within thirty days of the following events:
 - i. Commencement of construction of the project.
 - ii. Completion of the construction of the project.
 - iii. If construction or operation has been discontinued for more than 18 months.
- f. Engine, generator, and control device electronic data must be supplied by the source in a readable format, as specified by Ecology

7. General Conditions

- a. **Activities Inconsistent with this Order** - Any activity undertaken by the Permittee, or others, in a manner that is inconsistent with the data and specifications submitted as part of the NOC application or this NOC Approval Order, must be subject to Ecology enforcement under applicable regulations.

- b. **Availability of Order** - Legible copies of this NOC Approval Order and any O&M manual(s) must be available to employees in direct operation of the equipment described in the NOC application and must be available for review upon request by Ecology.
- c. **Compliance Assurance Access** - Access to the source by representatives of Ecology or the United States Environmental Protection Agency (EPA) must be permitted upon request. Failure to allow access is grounds for enforcement action under the federal Clean Air Act or the Washington State Clean Air Act, and may result in revocation of this NOC Approval Order.
- d. **Discontinuing Construction or Operation** – This NOC Approval Order will become invalid if construction of the equipment described in the NOC application and this NOC Approval Order does not commence within 18 months after receipt of this NOC Approval Order.

If construction or operation is discontinued for 18 months or longer on a portion or all of the equipment described in the NOC application and this NOC Approval Order, the portion of the NOC Approval Order regulating the inactive equipment will become invalid. Ecology may extend the 18-month period upon request by the Permittee and a satisfactory showing that an extension is justified.

- e. **Equipment Operation** - Operation of the facility must be conducted in compliance with all data and specifications submitted as part of the NOC application and in accordance with O&M manuals, unless otherwise approved in writing by Ecology.
- f. **Registration** - Periodic emissions inventory and other information may be requested by Ecology. The requested information must be submitted within 30 days of receiving the request, unless otherwise specified. All fees must be paid by the date specified.
- g. **Obligations Under Other Laws or Regulations** - Nothing in this NOC Approval Order must be construed so as to relieve the Permittee of its obligations under any state, local, or federal laws or regulations.
- h. **Maintaining Compliance** - It must not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the operations in order to maintain compliance with the conditions of this NOC Approval Order.
- i. **Visible Emissions** - No visible emissions from the source are allowed beyond the property line, as determined by 40 C.F.R. Part 60, Appendix A, Test Method 22.
- j. **Changes in Operations** - Any changes in operation contrary to information submitted in the NOC application must be reported to Ecology at least 60 days before the changes are implemented. Such changes in operation may require a new or amended NOC Approval Order.

Authorization may be modified, suspended, or revoked in whole or part for cause, including, but not limited to, the following:

- I. Violation of any terms or conditions of this authorization.

- II. Obtaining this authorization by misrepresentation or failure to disclose full all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization or application of any provision to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this authorization, must not be affected thereby.

Your Right to Appeal

You have a right to appeal this NOC Approval Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this NOC Approval Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this NOC Approval Order:

- File your appeal and a copy of this NOC Approval Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this NOC Approval Order on Ecology in paper form - by mail or in person (see addresses below); email is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Address and Location Information

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel Rd SW STE 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

