



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

December 13, 2017

Mr. Mark Johnson
Site Operations Manager
Vantage Data Centers
2101 M Street NE
Quincy, WA 98848

Re: Approval Order No. 16AQ-E026

Dear Mr. Johnson:

The Department of Ecology (Ecology) Air Quality Program has approved construction and operation of the 17 engine/generators at the Riker Data Center located at 2101 M Street NE, Quincy, Washington, in Grant County. Ecology's approval is based on the Notice of Construction application and supplemental information submitted on August 10 and November 16, 2016. The thirty day public comment period required per Washington Administrative Code (WAC) 173-400-171, has been completed. Enclosed is Approval Order No. 16AQ-E026.

Thank you for your patience while we processed your application. If you have any questions, please contact me at rkos461@ecy.wa.gov or (509) 329-3493.

Ecology is committed to streamlining our permitting procedures and to maintaining a high level of staff responsiveness and assistance to permit applicants. We encourage you to provide us with feedback. To help us provide better service to you and our other applicants, please complete the short survey online at: www.ecy.wa.gov/programs/air/permit_register/Permitting_Feedback.htm

Sincerely,

Robert Koster
Commercial/Industrial Unit
Regional Air Quality Section

RK:jab

Certified Mail: 7015 1520 0000 8727 5046

Enclosure: Approval Order No. 16AQ-E026
Technical Support Document



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF APPROVING A)
NEW AIR CONTAMINANT SOURCE)
FOR VANTAGE DATA CENTERS)
VANTAGE-QUINCY DATA CENTER)

Approval Order No. 16AQ-E026

TO: Mr. Mark Johnson
Site Operations Manager
Vantage Data Centers
2101 M Street NE
Quincy, WA 98848

EQUIPMENT

The list of equipment that was evaluated for this approval order consists of 17 MTU Model 20V4000 diesel engines used to power emergency electrical generators, Model MTU 3000. The seventeen 3.0 megawatt (MWe) generators will have a combined capacity of 51 MWe. Following initial commissioning testing, build-out annual operations and emissions will be restricted to 158,355 gallons per year of fuel consumption and up to 45 hours per year of operation per engine (both on a rolling 36 month basis). The generators will be installed in up to four phases. Phase 1 is in place and consists of five 3.0 MWe generators that were installed within 18 months of approval. Two additional phase 1 engines are not yet installed. Phases 2, 3, and 4 will consist of a total of ten additional 3.0 MWe generators. These generators will be installed at the facility, as independent companies' contract for tenant space at the Vantage-Quincy Data Center (Vantage).

Table 1.1: 3.0 MWe Engine & Generator Serial Numbers

Project Phase	DC BLDG	Unit ID	Capacity MWe	Engine SN	Generator SN	Build date
1	DC1	1	3.0	34487-1-1	28420-01	9/1/2013
	DC1	2	3.0	34487-1-2	28420-0	9/1/2013
	DC1	3	3.0	34487-1-3	28420-0	9/1/2013
	DC1	4	3.0	34487-1-4	34571-01	9/1/2014
	DC1	5	3.0	34487-1-5	34707-01	9/1/2014
	DC1	6	3.0			
	DC1	7	3.0			
2	DC2	8	3.0			
	DC2	9	3.0			
	DC2	10	3.0			
	DC2	11	3.0			
3	DC3	12	3.0			
	DC3	13	3.0			
	DC3	14	3.0			
	DC3	15	3.0			
4	ETC	16	3.0			
	ETC	17	3.0			

Vantage will utilize indirect evaporative cooling units to dissipate heat from electronic equipment at the facility, thus eliminating evaporative cooling tower emissions from the project.

PROJECT SUMMARY

Vantage's Phase 1 construction will consist of Building 1 with the five engine-generators already in place, and two additional engine generators yet to be installed. Phase 2, 3, and 4 construction will consist of Buildings 2, 3, and 4 (etc.) with up to 10 additional engines total. The data center will be leased for occupancy by companies that require a fully supported data storage and processing facility. Vantage will own and operate the generators. Air contaminant emissions from the Data Center project have been estimated based on build-out operation of the 17 emergency generator engines. Table 2a contains criteria pollutant potential-to-emit for the Vantage Data Center project. Table 2b contains toxic air pollutant potential-to-emit for the Vantage-Quincy Data Center.

Table 2a: Criteria Pollutant Potential to Emit for Vantage Data Center Project			
Pollutant	Emission Factor (EF) Reference	Emission Factors	17 Engines Facility Emissions
Criteria Pollutant		Lb/hr/engine	tons/yr
2.1.1 NOx Total	Landau Calculation	61	24
2.1.1a NO2	MTU Not to exceed	6.1	2.4
2.1.2 CO Total	MTU Not to exceed	11	4.4
2.1.3 SO2	Mass Balance	0.043	0.017
2.1.4 DEEP Total	MTU Not to exceed	0.79	0.229
2.1.4.a PM2.5	Landau Calculation	2.84	1.09
2.1.5 VOC 10% Load	MTU Not to exceed	1.91	0.75

Table 2b: Toxic Air Pollutant Potential to Emit for Vantage-Quincy Data Center		
Pollutant	AP-42 Section 3.4 EF	Facility Emissions
Organic Toxic Air Pollutants	Lbs/MMbtu	tons/yr
2.1.6 Propylene	2.79E-03	3.1E-02
2.1.7 Acrolein	7.88E-06	8.7E-05
2.1.8 Benzene	7.76E-04	8.6E-03
2.1.9 Toluene	2.81E-04	3.1E-03
2.1.10 Xylenes	1.93E-04	2.1E-03
2.1.11 Napthalene	1.30E-04	1.4E-03
2.1.11 1,3 Butadiene	3.91E-05	4.4E-04
2.1.12 Formaldehyde	7.89E-05	8.7E-04
2.1.13 Acetaldehyde	2.52E-05	2.8E-04
2.1.14 Benzo(a)Pyrene	2.57E-07	2.9E-06
2.1.15 Benzo(a)anthracene	6.22E-07	6.9E-06
2.1.16 Chrysene	1.53E-06	1.7E-05
2.1.17 Benzo(b)fluoranthene	1.11E-06	1.2E-05
2.1.18 Benzo(k)fluoranthene	2.18E-07	2.4E-06
2.1.19 Dibenz(a,h)anthracene	3.46E-07	3.9E-06
2.1.20 Ideno(1,2,3-cd)pyrene	4.14E-07	4.6E-06
2.1.21 PAH (no TEF)	3.88E-06	4.3E-05
2.1.22 PAH (apply TEF)	4.98E-07	5.5E-06
State Criteria Pollutant Air Toxics		
2.1.23 DEEP	Landau Calculation	0.229
2.1.24 Carbon monoxide	Landau Calculation	4.4
2.1.25 Sulfur dioxide	Mass Balance	0.02
2.1.26 Primary NO ₂ *	Landau Calculation	2.4

DETERMINATIONS

In relation to this project, the State of Washington Department of Ecology (Ecology), pursuant to Revised Code of Washington (RCW) 70.94.152, Washington Administrative Code (WAC) 173-460-040, and WAC 173-400-110, makes the following determinations:

1. The project, if constructed and operated as herein required, will be in accordance with applicable rules and regulations, as set forth in Chapter 173-400 WAC, and Chapter 173-460 WAC, and the operation thereof, at the location proposed, will not emit pollutants in concentrations that will endanger public health.
2. The proposed project, if constructed and operated as herein required, will utilize best available control technology (BACT) as defined:

Table 3: Best Available Control Technology Requirements	
Pollutant(s)	BACT Determination
Particulate matter (PM), carbon monoxide and volatile organic compounds (VOC)	a. Use of EPA Tier 2 certified engines if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219. Compliance with the operation and maintenance restrictions of this Approval and 40 CFR Part 60, Subpart III; and
Nitrogen oxides (NOx)	a. Use of EPA Tier 2 certified engines if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; b. Compliance with the operation and maintenance restrictions of this Approval and 40 CFR Part 60, Subpart III; and
Sulfur dioxide	Use of ultra-low sulfur diesel fuel containing no more than 15 parts per million by weight of sulfur.

3. The proposed project, if constructed and operated as herein required, will utilize best available control technology for toxic air pollutants (tBACT) as defined below:

Table 4: Best Available Control Technology for Toxics Requirements	
Toxic Air Pollutant(s)	tBACT Determination
Acetaldehyde, carbon monoxide, acrolein, benzene, benzo(a)pyrene, 1,3-butadiene, diesel engine exhaust particulate, formaldehyde, propylene, toluene, total PAHs, xylenes	Compliance with the VOC, CO, PM BACT requirement.
Nitrogen dioxide	Compliance with the NOx BACT requirement.
Sulfur dioxide	Compliance with the SO ₂ BACT requirement.

4. The modeled ambient concentration of two toxic air pollutants – diesel engine exhaust particulate matter and nitrogen dioxide – exceed the Acceptable Source Impact Level (ASIL) for these pollutants, as defined in Chapter 173-460 WAC. Ecology has reviewed the health risks associated with diesel engine exhaust particulate and nitrogen dioxide from the proposed project, in accordance with WAC 173-460-090. Ecology has concluded that the health risks from the project are acceptable as defined in WAC 173-460-090(7). A summary of the technical analysis supporting this determination is hereby incorporated into this Notice of Construction Approval Order.

THEREFORE, IT IS ORDERED that the project as described in the Notice of Construction application and more specifically detailed in plans, specifications, and other information submitted to Ecology is approved for construction and operation, provided the following are met:

APPROVAL CONDITIONS

1. ADMINISTRATIVE CONDITIONS

- a. The engine generators approved for operation by this order are to be used solely for those purposes described in application materials as further limited by the conditions of this Order. There shall be no operation of this equipment to produce power for demand-response arrangements, peak shaving arrangements, nor to provide power as part of a financial arrangement with another entity, nor to supply power to the grid.
- b. Upon issuance of this Approval Order, Approval Order No. 12AQ-E450 is rescinded and replaced entirely by the evaluations and conditions of this approval.

2. EQUIPMENT RESTRICTIONS

- a. Any engine used to power the electrical generators shall be certified by the manufacturer to meet 40 CFR 60 Tier II emission levels or other more restrictive specifications required by the EPA at the time the engines are installed. Each engine to be installed must be permanently labeled by the manufacturer as an emergency engine in accordance with 40 CFR § 60.4210(f). Each engine approved in this Order must operate as an emergency engine as defined at 40 CFR 60, Subpart IIII or 40 CFR 63, Subpart ZZZZ and as limited by the other conditions of this approval.
- b. The only engines and electrical generating units approved for operation at the Vantage Data Center are those listed by serial number in Table 1.
- c. Replacement of failed engines with identical engines (same manufacturer and model) requires notification prior to installation but will not require new source review unless there is an increase in emission rates or ambient impacts.
- d. The installation of any new engines after January 1, 2019, will require notification to Ecology that includes engine manufacturer's specification sheets. Ecology will determine whether new source review is required based on various factors including whether the new engines will have either an increased emission rate or result in an emission concentration that may increase impacts over those evaluated for this Approval Order, or if an update to the current BACT analysis is necessary.
- e. The five existing (Phase 1) MTU Model 20V4000 engine exhaust stack heights shall be greater than or equal to 43 feet above ground level. The remaining 12 MTU Model 20V4000 engines exhaust stack heights shall be greater than or equal to 48 feet above ground level for engines providing power to Buildings 1, 2, and 3, and ETC. The stacks shall be no more than 26 inches in diameter. Vantage Data Centers shall verify that, for the phases of the Quincy project, exhaust stack parameters such as diameter, height, and exhaust rate and velocity do not result in ambient impacts greater than what was evaluated for this project.
- f. The manufacture and installation of the seventeen engine/generator sets proposed for Building 1, Building 2, Building 3, and Building ETC of the project shall occur by January 1, 2019. If the manufacture and installation of the engines has not been completed by the above date, new source review may be required prior to additional

installation, and ambient air quality impacts will be re-evaluated if new source review is required. Vantage may request an extension of this time schedule, and Ecology may approve an extension without revision to this Order.

- g. This Order only applies to the 17 MTU Model 20V4000 engines, each with a rated full standby capacity of 4678 hp that were evaluated in the Notice of Construction application and second tier toxics review. On a case-by-case basis, Ecology may require additional ambient impacts analyses prior to installation of engines not listed in Table 1.

3. OPERATING LIMITATIONS

- a. The fuel consumption at the Vantage Data Center facility at build-out (four buildings with a total of 17 engines) shall be limited to a total of 158,355 gallons per year of diesel fuel equivalent to on-road specification No. 2 distillate fuel oil (less than 0.00150 weight percent sulfur). Total annual fuel consumption by the facility may be averaged over a three year period using monthly rolling totals.
- b. Except as provided in Approval Condition 3.5, the 17 Vantage Data Center engines are limited to the following average hours of operation, and averaging periods:
 - i. Each engine shall not exceed 45 hours of operation (at any load, for any purpose, including commissioning) per year, on a rolling monthly three-year average, and averaged over all engines in service.
 - ii. Each engine shall not exceed an annual fuel consumption of 9,315 gallons, averaged over a three year period using monthly rolling totals, and averaged over all engines in service.
- c. A load bank will be used for electrical energy dissipation whenever prescheduled monthly maintenance testing, corrective testing or annual load bank testing occurs above idle.
- d. The 17 MTU Model 20V4000 engines at the Vantage Data Center require periodic scheduled operation. To mitigate engine emission impacts, Vantage Data Center will perform all scheduled engine maintenance testing, bypass operations, and load testing during daylight hours. The Vantage Data Center shall develop an operating schedule that shall be available for review by Ecology upon request. Changes to the operating schedule will not trigger revision or amendment of this Order if approved in advance by Ecology.
- e. During a site integration test, no more than seven generator engines may operate concurrently for no more than ten continuous hours.
- f. All startup and commissioning testing shall be conducted during daylight hours.
- g. Following start-up and commissioning testing and the initial certification testing of one engine of each batch of engines installed, the number of hours each engine has run, the fuel consumed during the testing, and the date shall be recorded. This data shall be provided to Ecology on request.

4. GENERAL TESTING AND MAINTENANCE REQUIREMENTS

- a. The Vantage Data Center will follow engine-manufacturer's recommended diagnostic testing and maintenance procedures to ensure that each engine will conform to the emission limits in Condition 5 of this approval throughout the life of each engine.
- b. Following installation and commissioning, but prior to the transfer of a batch of engines to Vantage ownership, to demonstrate the engines are commissioned and programmed to run within the Tier 2 emission limits in Condition 5.2, PM (filterable only), NO, NO₂, NMHC, and CO emissions measurement shall be conducted for one engine from each batch of engines installed. Testing shall be conducted at the loads of 100%, 75%, 50%, 25% and 10% using weighted averaging according to Table 2 of Appendix B to Subpart E of 40 CFR 89. Testing may be conducted using 40 CFR 1065.
- c. Within 60 months of the first engine installation of each phase of installation, and every 60 months thereafter, the Vantage Data Center shall measure emissions of particulate matter (PM), Volatile Organic Compounds (VOC), nitric oxide (NO), nitrogen dioxide (NO₂), carbon monoxide (CO), and oxygen (O₂) from at least one representative engine from each batch of engines installed, in accordance with Approval Condition 4.4.2 and 4.4.3. This testing will serve to demonstrate compliance with the emission limits contained in Condition 5.3, confirm that the engine's emissions remain within the EPA Tier 2 certification specifications, and as an indicator of proper operation of the engines. The selection of the engine(s) to be tested shall be subject to prior approval by Ecology and shall be defined in the source test protocol submitted to Ecology no less than 30 days in advance of any compliance-related stack sampling conducted by Vantage. Each engine tested shall be the engine from each batch of engines installed with the most operating hours since an engine of that batch was last tested.
- d. The following procedures shall be used for each test for the engines required by Approval Condition 4.3 unless an alternate method is proposed by the Vantage Data Center and approved in writing by Ecology prior to the test:
 - i. Periodic emissions testing should be combined with other pre-scheduled maintenance testing and annual load bank engine testing. Additional operation of the engines for the purpose of emissions testing beyond the operating hours allowed in this Order must be approved by Ecology in writing.
 - ii. To demonstrate the engines are commissioned and programmed to run within Tier 2 emission limits, PM (filterable only), NO, NO₂, NMHC, and CO emissions measurement shall be conducted for one engine of each batch of engines installed in accordance with Condition 5.2. This certification testing shall be conducted once after commissioning work, but before the engines are placed into service for Vantage.
 - iii. To demonstrate that the engines satisfy the engine manufacturer's not to exceed emissions rates, PM (filterable and condensable), non-methane hydrocarbons (NMHC), NO, NO₂, and CO emission measurement shall be conducted on a representative engine(s) from each phase of installation. This testing shall utilize EPA Reference Methods from 40 CFR 60, 40 CFR 51, and

/or 40 CFR 1065 and shall be conducted at the single load point the engines have operated at during the preceding five year period (e.g. for first five engines of Phase 1, 33 percent), and at the highest load the engines have supported or at 100 percent, if the highest load is less than 90 percent.. Emission limits are contained in Condition 5.3.

- iv. The F-factor method, as described in EPA Method 19, may be used to calculate exhaust flow rate through the exhaust stack. The fuel meter data, as measured according to Approval Condition 4.6, shall be included in the test report, along with the emissions calculations.
- v. In the event that any stack test indicates non-compliance with the emission limits in Condition 5, Vantage shall repair or replace the engine and repeat the test on the same engine plus two additional engines from the same phase of installation as the engine showing non-compliance. Test reports shall be submitted to Ecology within 60 days of the final day of testing. Test reports shall be submitted to the address in Condition 7.
- e. Each engine shall be equipped with a properly installed and maintained non-resettable meter that records total operating hours.
- f. Each engine shall be connected to a properly installed and maintained fuel flow monitoring system that records the amount of fuel consumed by that engine.
- g. Concurrent operation of all generators in service for more than three hours shall not exceed one day per calendar year, averaged over three years. Additionally, concurrent operation of all generators in service for three hours or less shall not exceed three days per calendar year.
- h. In addition to operation in accordance with Condition 4.7, concurrent operation of generators shall be limited to a maximum of seven generators located in a single building. These engines may be operated no more than four hours per day and for no more than six days per calendar year. Concurrent operation of generators physically located in two or more buildings is not allowed under this condition.

5. EMISSION LIMITS

- a. The 17 engines shall meet the emission rate limitations contained in this section. The limits are for an engine operating in a steady-state mode (warm) and do not include emission rates during initial commissioning testing of the engines. The annual limits may be averaged over a rolling monthly three year period. Unless otherwise approved by Ecology in writing, compliance with emission limits for those pollutants that are required to be tested under Approval Conditions 4.2 and 4.3 shall be based on emissions test data determined according to those approval conditions.
- b. To demonstrate compliance with the g/kW-hr EPA Tier II average emission limits through stack testing, the Vantage Data Center shall conduct exhaust stack testing and averaging of emission rates for five individual operating loads (10%, 25%, 50%, 75% and 100%) according to 40 CFR §89.410, Table 2 of Appendix B, 40 CFR Part 89, Subpart E, and/or 40 CFR Part 60, Subpart IIII, or any other applicable EPA requirement in effect at the time the engines are installed. The Tier 2 emission limits for the MTU 20V4000 model engine-generators in 2017 are as follows:
 - i. NMHC and NOx: 6.4 g/kW-hr

- ii. CO: 3.5 g/kW-hr
- iii. PM (filterable): 0.20 g/kw-hr
- c. Emissions from each of the seventeen (17) MTU Model 20V4000 engines rated at 4678 brake horse power shall not exceed the following emission rates at the stated loads, based on not-to-exceed emission rates stated in application materials:

EMISSION RATES					
Fraction of Full Engine Power	1	0.75	0.50	0.25	0.10
Engine Power [kWm]	3490	2618	1745	872	349
Nox – g/kWh	8	6.5	5.6	4.9	9
NO2 – g/kWh	0.9	0.8	0.6	0.6	1.1
CO – g/kWh	1.4	1.3	1.6	3.4	6.6
HC – g/kWh	0.2	0.29	0.44	0.68	2.48
PM (f) – g/kWh	0.06	0.08	0.19	0.41	1.03

- d. Diesel Engine Exhaust Particulate (DEEP: filterable only) emissions from all 17 engines shall not exceed 0.229 tons per year averaged over a rolling monthly three year period.
- e. Total Particulate Matter (PM=PM2.5) emissions from all 17 engines combined shall not exceed 1.06 tons/yr averaged over a rolling monthly three year period.
- f. Nitrogen Oxides emissions from all 17 engines combined shall not exceed 24 tons per year averaged over a rolling monthly three year period.
- g. Nitrogen dioxide (NO2) emissions from all 17 engines combined shall not exceed 2.4 tons/yr averaged over a rolling monthly three year period.
- h. Volatile organic compound (VOC) emissions from all 17 engines combined shall not exceed 0.73 tons/yr averaged over a rolling monthly three year period.
- i. Carbon Monoxide (CO) emissions from all 17 engines combined shall not exceed 4.4 tons per year averaged over a rolling monthly three year period.
- j. Sulfur dioxide emissions from all 17 engines combined shall not exceed 0.02 tons/yr averaged over a rolling monthly three year period.
- k. Visual emissions from each diesel electric generator exhaust stack shall be no more than 5 percent, with the exception of a five minute period after unit start-up. Visual emissions shall be measured by using the procedures contained in 40 CFR 60, Appendix A, Method 9.

6. OPERATION AND MAINTENANCE MANUALS

- a. A site-specific O&M manual for the Vantage Data Center facility equipment shall be developed and followed. Manufacturers' operating instructions and design specifications for the engines, generators, and associated equipment shall be included in the manual. The O&M manual shall be updated to reflect any modifications of the

equipment or its operating procedures. Emissions that result from failure to follow the operating procedures contained in the O&M manual or manufacturer's operating instructions may be considered proof that the equipment was not properly installed, operated, and/or maintained. The O&M manual for the diesel engines and associated equipment shall at a minimum include:

- i. Manufacturer's testing and maintenance procedures that will ensure that each individual engine will conform to the EPA Tier Emission Standards appropriate for that engine throughout the life of the engine.
- ii. Normal operating parameters and design specifications.
- iii. Operating and maintenance schedules.

7. SUBMITTALS

All notifications, reports, and other submittals shall be sent to:

Washington State Department of Ecology
Air Quality Program
4601 N. Monroe Street
Spokane, WA 99205-1295

8. RECORDKEEPING

- a. All records, Operations and Maintenance Manual, and procedures developed under this Order shall be organized in a readily accessible manner and cover a minimum of the most recent 60-month period. Any records required to be kept under the provisions of this Order shall be provided within 30 days to Ecology upon request. The following records are required to be collected and maintained:
 - i. Fuel receipts with amount of diesel and sulfur content for each delivery to the facility.
 - ii. Monthly and annual hours of operation for each diesel engine.
 - iii. Purpose, electrical load and duration of runtime for each diesel engine during any periods of operation.
 - iv. Annual gross power generated by or for each independent tenant at the facility and total annual gross power generated by the facility.
 - v. Upset condition log for each engine and generator that includes date, time, duration of upset, cause, and corrective action.
 - vi. Any recordkeeping required by 40 CFR Part 60 Subpart IIII.
 - vii. Air quality complaints received from the public or other entity, and the affected emissions units.

9. REPORTING

- a. Within 10 business days after entering into a binding agreement with a new tenant, Vantage shall notify Ecology of such agreement. The serial number, manufacturer make and model, standby capacity, and date of manufacture of engines proposed will be submitted prior to installation of engines in any of the phases of this project.

- b. The following information will be submitted to the AQP at the address listed in Condition 7 by January 31 of each calendar year. This information may be submitted with annual emissions information requested by the AQP.
 - i. Monthly rolling annual total summary of air contaminant emissions,
 - ii. Monthly rolling hours of operation for each engine with annual total,
 - iii. Monthly rolling gross power generation with annual total as specified in Approval Condition 8.1.4,
 - iv. A log of each start-up of each diesel engine that shows the date, the purpose, fuel usage, and duration of each period of operation.
- c. Any air quality complaints resulting from operation of the emissions units or activities shall be promptly assessed and addressed. Vantage shall maintain a record of the action taken to investigate the validity of the complaint and what, if any, corrective action was taken in response to the complaint. Ecology shall be notified within three days of receipt of any such complaint.
- d. Vantage shall notify Ecology by e-mail or in writing within 24 hours of any engine operation of greater than 60 minutes if such engine operation occurs as the result of a power outage or other unscheduled operation. This notification does not alleviate Vantage from annual reporting of operations contained in any section of Approval Condition 9.

10. GENERAL CONDITIONS

- a. **Commencing/Discontinuing Construction and/or Operations:** The portion(s) of this approval regulating future phases of construction shall become void if construction of the planned phase of the facility is not begun within 18 months of permit issuance or if facility operation is discontinued for a period of eighteen months or more. In accordance with WAC 173-400-111(7)(c), each phase of construction must commence within eighteen months of the projected and approved construction dates in this Order.
- b. **Compliance Assurance Access:** Access to the source by representatives of Ecology or the EPA shall be permitted upon request. Failure to allow such 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 Approval Order.
- c. **Availability of Order and O&M Manual:** Legible copies of this Order and the O&M manual shall be available to employees in direct operation of the diesel electric generation station, and be available for review upon request by Ecology.
- d. **Equipment Operation:** Operation of the 17 MTU Model 20V4000 diesel engines used to power emergency electrical generators and related equipment shall be conducted in compliance with all data and specifications submitted as part of the NOC application and in accordance with the O&M manual, unless otherwise approved in writing by Ecology.
- e. **Modifications:** Any modification to the generators or engines and their related equipment's operating or maintenance procedures, contrary to information in the NOC application, shall be reported to Ecology at least 60 days before such

modification. Such modification may require a new or amended NOC Approval Order.

- f. **Activities Inconsistent with the NOC Application and this Approval Order:** Any activity undertaken by the permittee or others, in a manner that is inconsistent with the NOC application and this determination, shall be subject to Ecology enforcement under applicable regulations.
- g. **Obligations under Other Laws or Regulations:** Nothing in this Approval Order shall be construed to relieve the permittee of its obligations under any local, state or federal laws or regulations.

All plans, specifications, and other information submitted to the Department of Ecology relative to this project and further documents and any authorizations or approvals or denials in relation thereto shall be kept at the Eastern Regional Office of the Department of Ecology in the "Air Quality Controlled Sources" files, and by such action shall be incorporated herein and made a part thereof.

Nothing in this approval shall be construed as obviating compliance with any requirement of law other than those imposed pursuant to the Washington Clean Air Act and rules and regulations thereunder.

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

- a. Violation of any terms or conditions of this authorization;
- b. Obtaining this authorization by misrepresentation or failure to disclose fully all relevant fact.

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, shall not be affected thereby.

YOUR RIGHT TO APPEAL

You have a right to appeal this Approval Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this 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 the following within 30 days of the date of receipt of this Approval Order:

- File your appeal and a copy of this 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 Approval Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail 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

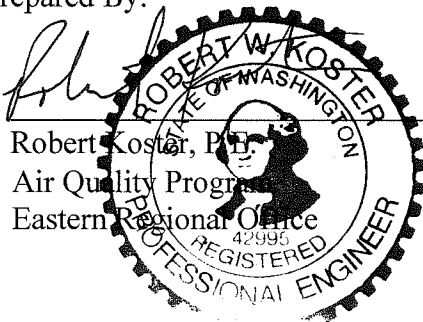
Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 Pollution Control Hearings Board 1111 Israel RD SW, STE 301 Tumwater, WA 98501	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 Pollution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

For additional information visit the Environmental Hearings Office Website: <http://www.eho.wa.gov>

To find laws and agency rules visit the Washington State Legislature Website:
<http://www1.leg.wa.gov/CodeReviser>

DATED this 13th day of December, at Spokane, Washington.

Prepared By:



Robert Kostar, P.E.
Air Quality Program
Eastern Regional Office

Approved By:

A handwritten signature of David T. Knight.

David T. Knight
Section Manager
Air Quality Program
Eastern Regional Office

Technical Support Document (TSD)

Notice of Construction Approval Order No. 16AQ-E026

Vantage data centers management company, LLC

VANTAGE-Quincy Data center

2017

1. BACKGROUND

Starting in about 2006, internet technology companies became interested in the City of Quincy in Grant County as a good place to build data centers. Data centers house the servers that provide e-mail, manage instant messages, and run applications for our computers. Grant County has a low-cost, dependable power supply and an area-wide fiber optic system. During 2007 and 2008, the Ecology Air Quality Program (AQP) issued approval orders to Microsoft Corporation, Sabey Intergate Inc., and Intuit Inc. that allowed them to construct and operate data centers.

In 2010, the Washington State Legislature approved a temporary sales tax exemption for data centers building in Grant County and other rural areas. To qualify for the tax exemption, the data center must have at least 20,000 square feet dedicated to servers and must have started construction before July 1, 2011. The AQP has received and approved permit applications from Microsoft Corporation and Sabey Intergate Inc. for expansion of their existing data centers in Quincy. Dell Marketing, LP and Sabey Intergate Quincy, LLC have also submitted applications for new data centers in Quincy that have been approved for construction and operation.

To build or expand, a data center company must first apply to the Washington Department of Ecology (Ecology) for a permit called a “notice of construction approval order” (NOC). Its purpose is to protect air quality. The NOC is needed because data centers use large, diesel-powered backup generators to supply electricity to the servers during power failures. Diesel engine exhaust contains both criteria and toxic air pollutants. As part of the permit review process, Ecology carefully evaluates whether the diesel exhaust from a data center’s backup generators cause health problems or contribute to national ambient air quality standard exceedances.

2. EXECUTIVE SUMMARY

Vantage Data Centers Management Company, LLC submitted a Notice of Construction (NOC) application received by Ecology on August 10, 2016, for the phased installation of the Vantage-Quincy Data Center, to be sited North West of the junction of Road 11 NW and Road O NW, Quincy, in Grant County. A legal description of the parcel is the SE 1/16 of Section 4 and the SW 1/16 of Section 3, Township 20 North, Range 24 East, Willamette Meridian. The Vantage-Quincy Data Center will be leased to independent tenants. The primary air contaminant sources at the facility consist of 17-3000 kilowatt (kWe) electric generators powered by diesel engines.

The generators will have a power capacity of up to 51 MWe, and will provide emergency backup power to the facility during infrequent disruption of Grant County PUD electrical power service. The project construction will be phased (up to 4 phases, phase 1 with 7 generators) over several years depending on customer demand.

Review of the August 10, 2016 NOC application began in August and continued through December, when the toxics Tier 2 review was completed. Before the Ecology toxicologists can issue their recommendation, a preliminary determination of approval must be prepared and provided to them. Upon their agreement that BACT and t-BACT and the conditions of approval that confirm emission estimates used for the toxics and NAAQS modeling are in place, their recommendation is added to this TSD and the documents placed out for public comment. It is expected that a public hearing will be held on data center approvals in Quincy. The final draft Preliminary Determination (i.e., Proposed Decision) was forwarded to Ecology HQ for review and to facilitate completion of the second tier review. Public notice of the availability of the Preliminary Determination was published on June 8, 2017 in the *Quincy Valley Post Register* and *Columbia Basin Herald*, and in the *Wenatchee World* on June 4, 2017. Public review began on approximately June 8, 2017, and will end on July 17, 2017.

3. PROJECT DESCRIPTION

The Ecology Air Quality Program (AQP) received a Notice of Construction (NOC) application for the Vantage-Quincy Data Center on August 10, 2016. The Vantage-Quincy Data Center, hereafter referred to as Vantage, consists of phased construction of 4 data center buildings, 3 smaller structures housing generators, and a future substation. Construction will occur in phases with the first phase to be construction of a center with 5 primary generators and 2 originally described as 'reserve'. The project was previously approved with Tier 4 emission limits and five of the seven engines of phase 1 were installed with third party (i.e. not built by the engine manufacturer) tail-pipe emission controls. Vantage found that the engines with the ELM controls could not be operated in compliance with the Tier 4 emission limits and has submitted this application to evaluate the 17 engines without the Tier 4 controls. During the original permitting, Ecology agreed that the only control that did not significantly exceed Ecology thresholds for t-BACT cost-effectiveness for these engines was an engine that satisfied Tier 2 emission limits. The cost of controlling emissions with add-on controls exceeded (and still does exceed) any cost-effectiveness criteria we have used even for t-BACT and even using the Hanford approach to estimating cost effectiveness. The cost of control beyond Tier 2 engines is prohibitive for the short run times required for power outages and maintenance and reliability testing at data centers. In addition, Vantage found their system could not meet the Tier 4 emission limits in their permit. Operating hours increased in order to test the exhaust of engines which were not achieving the limits established in the approval conditions. The timing of installation of Phases 2-4 of this data center depends on customer demand and is not yet determined. Phase 1 was operational around the end of 2013 and includes the 5 MTU 3000, three 3.0 Megawatt (MWe) electric generators powered by 4678 brake horse power MTU Model 20V4000 diesel engines. Phase 2, 3, and 4 construction are identified as Data Center 2 (phase 2 - 4 primary engine generators), Data Center 3 (phase 3 - 4 primary engine generators), and a Building described as 'ETC' (phase 4 - 2 engine generators). The sequence of expected construction has not been provided to Ecology. The Vantage-Quincy generators will have a total combined capacity of approximately 51 MWe upon final build out of the four Phases. The Vantage-Quincy Data Center will be leased for occupancy by independent tenant companies that require fully

supported data storage and processing space although all engine/generators are expected to be owned and operated by Vantage.

Vantage has requested operational limitations on the Vantage-Quincy facility to reduce emissions below major source thresholds and to minimize air contaminant impacts to the community. Vantage has indicated that diesel fuel usage at Vantage-Quincy will be less than 158,355 gallons of ultra-low sulfur diesel fuel. Individual engine operating limits of 45 hours per year for the engines serving Building 1 are also implied in the application materials.

Air contaminant emissions from the Vantage-Quincy Data Center project have been calculated based entirely on operation of the emergency generators. Table 1a contains criteria pollutant potential to emit for all phases of the Vantage-Quincy Data Center project. Table 1b contains toxic air pollutant potential to emit for all phases of the Vantage-Quincy Data Center project.

Table 1a: Criteria Pollutant Maximum Year Potential to Emit for Vantage-Quincy Data Center (excluding commissioning as modeled by applicant)

Pollutant	Emission Factor (EF) Reference	Facility Emissions 17 Engines Total
Criteria Pollutant		tons/yr
2.1.1 NO _x Total	Landau Calculation	24
2.1.2 CO	Engine Not to Exceed	1.46
2.1.3 SO ₂	Mass Balance	0.017
2.1.4 PM _{2.5}	Landau Calculation	1.06
2.1.5 VOC	Engine Not to Exceed	0.73
2.1.6 Primary NO ₂	Engine Not to Exceed	2.4

Table 1b: Toxic Air Pollutant Maximum Year Potential to Emit for Vantage-Quincy Data Center

Pollutant	AP-42 Section 3.4 EF	Facility Emissions 17 Engines Total
Organic Toxic Air Pollutants	Lbs/MMbtu	tons/yr
2.1.7 Propylene	2.79E-03	3.1E-02
2.1.8 Acrolein	7.88E-06	8.7E-05
2.1.9 Benzene	7.76E-04	8.6E-03
2.1.10 Toluene	2.81E-04	3.1E-03
2.1.11 Xylenes	1.93E-04	2.1E-03
2.1.12 Naphthalene	1.30E-04	1.4E-04
2.1.13 1,3 Butadiene	3.91E-05	4.4E-04
2.1.14 Formaldehyde	7.89E-05	8.7E-04
2.1.15 Acetaldehyde	2.52E-05	2.8E-04
Poly Aromatic Hydrocarbons (PAH)		

Pollutant	AP-42 Section 3.4 EF	Facility Emissions 17 Engines Total
2.1.16 Benzo(a)Pyrene	2.57E-07	2.9E-06
2.1.17 Benzo(a)anthracene	6.22E-07	6.9E-06
2.1.18 Chrysene	1.53E-06	1.7E-05
2.1.19 Benzo(b)fluoranthene	1.11E-06	1.2E-05
2.1.20 Benzo(k)fluoranthene	2.18E-07	2.4E-06
2.1.21 Dibenz(a,h)anthracene	3.46E-07	3.9E-06
2.1.22 Ideno(1,2,3-cd)pyrene	4.14E-07	4.6E-06
2.1.23 PAH (no TEF)	3.88E-06	4.3E-05
2.1.24 PAH (apply TEF)	4.98E-07	5.5E-06
State Criteria Pollutant Air Toxics		
2.1.25 DEEP/PM _{2.5}	Landau Calculation	0.229
2.1.26 Carbon monoxide	Landau Calculation	3.4
2.1.27 Sulfur dioxide	Mass Balance	0.02
2.1.28 Primary NO ₂ *	10% total NO _x	2.4

*Assumed to be equal to 10% of the total NO_x emitted.

The Vantage Center will rely on cooling systems to dissipate heat from electronic equipment at the facility. Cooling systems will be limited by conditions of approval to those emitting no air contaminants (indirect evaporative).

4. APPLICABLE REQUIREMENTS

The proposal by Vantage Data Center qualifies as a new source of air contaminants as defined in Washington Administrative Code (WAC) 173-400-110 and WAC 173-460-040, and requires Ecology approval. The installation and operation of the Vantage-Quincy Data Center is regulated by the requirements specified in:

- 4.1 Chapter 70.94 Revised Code of Washington (RCW), Washington Clean Air Act,
- 4.2 Chapter 173-400 Washington Administrative Code (WAC), General Regulations for Air Pollution Sources,
- 4.3 Chapter 173-460 WAC, Controls for New Sources of Toxic Air Pollutants, and
- 4.4 Title 40 CFR Part 60 Subpart IIII

All state and federal laws, statutes, and regulations cited in this approval shall be the versions that are current on the date the final approval order is signed and issued.

5. BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology (BACT) is defined¹ as “*an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under chapter 70.94 RCW emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of the "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard under 40 CFR Part 60 and Part 61....*”

For the first approval, Vantage proposed installation of engines with diesel particulate filters (DEEP Control) treated to also serve as oxidation catalysts (VOC and CO control) and selective catalytic reduction (NOx Control). With these proposed controls, Vantage avoided the formal process of a “top-down” approach for determining BACT for the proposed diesel engines. After having found the filter and catalytic controls could not be made to work as advertised, Vantage is requesting that Ecology review the project again with the 17 engines with just Tier 2 controls.

The proposed diesel engines will emit the following regulated pollutants which are subject to BACT review: nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), particulate matter (PM, PM₁₀ and PM_{2.5}) and sulfur dioxide.

5.1 BACT ANALYSIS FOR NOx

- 5.1.1 **Selective Catalytic Reduction.** The SCR system functions by injecting a liquid reducing agent, such as urea, through a catalyst into the exhaust stream of the diesel engine. The urea reacts with the exhaust stream converting nitrogen oxides into nitrogen and water. The use of ultra-low sulfur (10-15 ppmw S) fuel is required to achieve good NOx destruction efficiencies. SCR can reduce NOx emissions by up to 90-95 percent.

For SCR systems to function effectively, exhaust temperatures must be high enough (about 200 to 500°C) to enable catalyst activation. For this reason, SCR control efficiencies are expected to be relatively low during the first 20 to 30 minutes after engine start up, especially during maintenance, and testing loads. There are also complications of managing and controlling the excess ammonia (ammonia slip) from SCR use.

This application suggests a cost per ton of \$370,000 for SCR, which is considerably higher than the \$12,000 cost per ton that would allow Ecology to require it as BACT.

5.1.6 **BACT determination for NOx**

Ecology determines that BACT for NOx is:

- a. Use of EPA Tier 2 certified engines, if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; and

¹ RCW 70.94.030(7) and WAC 173-400-030(12)

- b. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.

5.2 BACT ANALYSIS FOR PARTICULATE MATTER, CARBON MONOXIDE AND VOLATILE ORGANIC COMPOUNDS

- 5.2.1 ***Diesel particulate filters (DPFs)***. These add-on devices include passive and active DPFs, depending on the method used to clean the filters (i.e., regeneration). Passive filters rely on a catalyst while active filters typically use continuous heating with a fuel burner to clean the filters. The use of DPFs to control diesel engine exhaust particulate emissions has been demonstrated in multiple engine installations worldwide. Particulate matter reductions of up to 85% or more have been reported. Therefore, this technology was identified as the top case control option for diesel engine exhaust particulate emissions from the proposed engines.

Vantage initially proposed installation and operation of DPFs on each of the proposed diesel engines as BACT. The July 16, 2012 supplemental analysis of BACT retracted this proposal, and instead proposed that Tier 2 engines should be considered BACT for these engines. Ecology accepts this option as BACT for these engines.

- 5.2.2 ***Diesel oxidation catalysts***. This method utilizes metal catalysts to oxidize carbon monoxide, particulate matter, and hydrocarbons in the diesel exhaust. Diesel oxidation catalysts (DOCs) are commercially available and reliable for controlling particulate matter, carbon monoxide and hydrocarbon emissions from diesel engines. While the primary pollutant controlled by DOCs is carbon monoxide (approximately 90% reduction), DOCs have also been demonstrated to reduce up to 30% of diesel engine exhaust particulate emissions, and more than 50% of hydrocarbon emissions.

- 5.2.4 **BACT Determination for Particulate Matter, Carbon Monoxide and Volatile Organic Compounds**

Ecology determines BACT for particulate matter, carbon monoxide and volatile organic compounds is:

- a. Use of EPA Tier 2 certified engines if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; and
- b. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.

5.3 BACT ANALYSIS FOR SULFUR DIOXIDE

- 5.3.1 Vantage/Landau did not find any add-on control options commercially available and feasible for controlling sulfur dioxide emissions from diesel engines. Vantage Quincy's proposed BACT for sulfur dioxide is the use of ultra-low sulfur diesel fuel (maximum of 15 ppm by weight of sulfur). Using this control measure, sulfur dioxide emissions would be limited to 0.020 tons per year.

5.3.2 BACT Determination for Sulfur Dioxide

Ecology determines that BACT for sulfur dioxide is the use of ultra-low sulfur diesel fuel containing no more than 15 parts per million by weight of sulfur.

5.4 BEST AVAILABLE CONTROL TECHNOLOGY FOR TOXICS

Best Available Control Technology for Toxics (tBACT) means BACT, as applied to toxic air pollutants.² The procedure for determining tBACT follows the same procedure used above for determining BACT. Under state rules, tBACT is required for all toxic air pollutants for which the increase in emissions will exceed de minimis emission values as found in WAC 173-460-150.

For the proposed project, tBACT must be determined for each of the toxic air pollutants listed in Table 2 below. As indicated in Table 2, Ecology has determined that compliance with BACT, as determined above, satisfies the tBACT requirement.

Table 2. tBACT Determination

Toxic Air Pollutant	tBACT
Acetaldehyde	Compliance with the VOC BACT requirement
Acrolein	Compliance with the VOC BACT requirement
Benzene	Compliance with the VOC BACT requirement
Benzo(a)pyrene	Compliance with the VOC and PM BACT requirement
1,3-Butadiene	Compliance with the VOC BACT requirement
Carbon monoxide	Compliance with the CO BACT requirement
Diesel engine exhaust particulate	Compliance with the PM BACT requirement
Formaldehyde	Compliance with the VOC BACT requirement
Nitrogen dioxide	Compliance with the NO _x BACT requirement
Sulfur dioxide	Compliance with the SO ₂ BACT requirement
Toluene	Compliance with the VOC BACT requirement
Total PAHs	Compliance with the VOC an PM BACT requirement
Xylenes	Compliance with the VOC BACT requirement

² WAC 173-460-020

6. AMBIENT IMPACTS ANALYSIS

Vantage obtained the services of Landau Consultants to conduct air dispersion modeling for Vantage Data Center's generators to demonstrate compliance with ambient air quality standards and acceptable source impact levels. Each generator was modeled as a point source. Landau used EPA's AERMOD dispersion model to determine ambient air quality impacts caused by emissions from the proposed generators at the property line and beyond, and at the rooftops of the proposed data center buildings to be occupied by tenants. The ambient impacts analysis indicates that no National Ambient Air Quality Standards (NAAQS) are likely to be exceeded.

6.1 AERMOD Dispersion Modeling Methodology

AERMOD is an EPA "preferred" model (40 CFR Part 51, Appendix W, Guideline on Air Quality Models) for simulating local-scale dispersion of pollutants from low-level or elevated sources in simple or complex terrain.

The following data and assumptions were used in the application of AERMOD:

- Input data for for the AERMET meteorological processor included five years of sequential hourly surface meteorological data (2004–2008) from Moses Lake, WA and twice-daily upper air data from Spokane.
- Digital topographical data for the vicinity were obtained from the Micropath Corporation.
- The five (5) existing generator stacks were set at a height of 43 feet above local finished grade. The remaining Building 1 generator stacks (two) and the ten additional engines generator stacks (Buildings 2, 3, and ETC) were set at a height of 48 feet above local finished grade.
- The planned data center buildings were included to account for building downwash. EPA's PRIME algorithm was used for simulating building downwash.
- For this application, Ecology required that emissions be estimated using worst-case conditions for each pollutant, so that the engine load during any hour need not be known and so that compliance could be determined from the hours operated. An exception was made for DEEP which has highest emissions at loads lower than Vantage will run (below 30%). For purposes of modeling compliance with the NAAQS and to conservatively model for the ASILs, it was assumed the entire three year amount of worst case emissions occurred in a single year.
- 1-hour NO₂ concentrations were modeled using the Plume Volume Molar Reaction Model (PVMRM) module, with the following default concentrations: 40 parts per billion (ppb) of ozone, and a NO₂/NO_X ambient ratio of 90%. For purposes of modeling NO₂ impacts, the primary NO_X emissions were assumed to be 10% NO₂ and 90% nitric oxide (NO) by mass.
- Emissions from commissioning testing and stack emission testing are equal to 27% of the emissions from full-buildout routine testing plus power outages. The worst-year annual-

average impacts were estimated by manually scaling the previous annual-average AERMOD results by a factor of 1.27.

- For the Health Impacts Assessment modeling conducted for DEEP, the emissions from all modes of operation other than power outages were assumed to occur between 7 am to 7 pm.
- A Cartesian, rectangular receptor grid whose density diminished with distance, was used to model the property line and beyond for all AERMOD applications. In addition, fenceline receptors (10-meter spacing) and discrete receptors where rooftop air intakes are located, were also used. The receptor categories and number of receptors for each category are as follows:

Fenceline receptors in 10 meter (m) spacing	237
Receptors in 10 m spacing out to 350 m from the sources	6,765
Receptors in 25 m spacing out to 800 m from the sources	4,176
Receptors in 50 m spacing out to 2000 m from the sources	5,952
Rooftop receptors	25
Total number of the receptors	17,155

6.2 Assumed Background Concentrations

Background concentrations for all species were obtained from Ecology's Air Monitoring Network website (WSU website 2015). These are:

PM10 (24-hour average)	62 $\mu\text{g}/\text{m}^3$
PM2.5 (98th percentile 24-hour average)	21 $\mu\text{g}/\text{m}^3$
NO2 (98th percentile 1-hour value)	16 $\mu\text{g}/\text{m}^3$

These regional values do not include "local background" caused by industrial facilities near the proposed Vantage data center, namely the existing Sabey, Yahoo, and Intuit data centers and the Imrys manufacturing plant. The local background impacts were modeled separately, assuming a mixture of permit limits, a full area-wide power outage or maximum emitting test modes. The predicted total ambient impact at the receptor that is maximally impacted by Vantage-only emissions are:

PM10 (24-hour average)	139 $\mu\text{g}/\text{m}^3$	National Ambient Air Quality Standard: 150 $\mu\text{g}/\text{m}^3$
PM2.5 (24-hour average)	33 $\mu\text{g}/\text{m}^3$	National Ambient Air Quality Standard: 35 $\mu\text{g}/\text{m}^3$
NO2 (1-hour average)	149 $\mu\text{g}/\text{m}^3$	National Ambient Air Quality Standard: 188 $\mu\text{g}/\text{m}^3$

The Vantage engines in Building 1 are certified to a very high reliability standard (Tier 3 Uptime Certificate). To achieve this reliability rating, the initial commissioning testing includes significant and enhanced testing not necessary at less critical data centers. Table 3 lists the run-time required for this level of reliability. It is unknown if this certification will be desired for Buildings after Building 1, and because Building 1 has only two more engines (6 of 7 and 7 of 7) the 40 hours of commissioning are included in the 45 hours allowed per engine generator per year. Future phases of the Vantage project will likely require new source review to examine emissions and necessary runtime for the desired level of reliability.

Table 3. Runtime Scenario for Initial Startup and Commissioning Tests

Day of Test	Test Description	No. of Typical Hours	Average Load
Manufacturer Tests			
Day 1	8 hours at full load, 1 generator any given day	8	100%
Day 2	12 hours at 75%, 1 generator any given day	12	75
Functional Performance Tests			
Day 3	20 hours, Full (100%) Load, 1 generator any given day	20	100%
Summary of Per-Engine Startup Quantities			
Calendar Days of Testing (Each Generator)			3-4
Runtime Hours Each Generator			40
kWm-hrs During Testing (Each Generator)			111,000
Fuel Usage During Testing (Each Generator- gals)			8,692
NOx Emissions Each Generator			614 lbs
DPM Emissions During Testing (Each Generator)			18.6 lbs

Table 4: Modeled Concentrations of Criteria Pollutants (with background) and comparison to Ambient Air Quality Standards

Pollutant and Time Frame	Background plus Modeled Concentration – ug/m³	National Ambient Air Quality Standard - ug/m³	Percent of Standard
PM ₁₀ 24 Hour	139	150	93%
PM ₁₀ Annual	1.3	50	3%
PM _{2.5} 24 Hour	33	35	94%
PM _{2.5} Annual	8	15	53%
NO ₂ 1- Hour	149	188	79.3%
CO 1-Hour	7,775	40,000	19.4%
CO 8-Hour	4,381	10,000	43.8%
SO ₂ 1-Hour	18.8	200	9.4%
SO ₂ 3-Hour	14.3	1310	1.1%
SO ₂ 24 Hour	7.5	-	-
SO ₂ Annual	0.27	-	-

Table 5: Modeled Concentrations of Toxic Air Pollutants and Comparison to Acceptable Source Impact Levels (ASILs)

Pollutant and Time Frame	Modeled Concentration – ug/m³	Acceptable Source Impact Level – ASIL ug/m³	Comparison of Modeled to ASIL
DEEP Annual	0.24	0.0033	7272%
NO ₂ 1-Hour	1,410	470	300%

As is indicated in Tables 4 and 5, Diesel Engine Exhaust Particulate (DEEP) and NO₂ exceeded the regulatory trigger level (the ASIL) for that pollutant. At these concentrations, DEEP and NO₂ are required to be further evaluated in a Second Tier Toxics Review in accordance with WAC 173-460-90.

7. SECOND TIER REVIEW FOR DIESEL ENGINE EXHAUST PARTICULATE AND NITROGEN DIOXIDE EMISSIONS

Proposed emissions of diesel engine exhaust particulate (DEEP) and nitrogen dioxide (NO₂) from the seventeen (17) Vantage engines exceed the regulatory trigger level for toxic air pollutants (also called an Acceptable Source Impact Level, (ASIL)). A second tier review is required for DEEP and NO₂ in accordance with WAC 173-460-090.

Large diesel-powered backup engines emit DEEP, which is a high priority toxic air pollutant in the state of Washington. In light of the potential rapid development of other data centers in the Quincy

area, and recognizing the potency of DEEP emissions, Ecology evaluated Vantage's proposal on a community-wide basis. The community-wide evaluation approach considers the cumulative impacts of DEEP emissions resulting from Vantage's project, and includes consideration of prevailing background emissions from existing permitted data centers and other DEEP sources in Quincy. This evaluation was conducted under the second tier review requirements of WAC 173-460-090.

Under WAC 173-460-090, Vantage was required to prepare a health impact assessment. The HIA presents an evaluation of both non-cancer hazards and increased cancer risk attributable to Vantage's increased emissions of DEEP and NO₂. Vantage also reported the cumulative risks associated with Vantage and prevailing sources in their HIA document. This cumulative DEEP related risk estimate was based on the latest cumulative air dispersion modeling work performed by Ecology. The Vantage HIA document along with a brief summary of Ecology's review will be available on Ecology's website.

8. CONCLUSION

Based on the above analysis, Ecology concludes that operation of the seventeen (17) generators at Vantage will not have an adverse impact on local air quality. Ecology finds that Vantage has satisfied all requirements for NOC approval.

Response to Comments

Ecology accepted public comments on the draft revisions to Vantage Data Center's air permit for its Riker facility, Approval Order No. 16AQ-E026, from June 8, 2017 through July 17, 2017. A public hearing was held at the Quincy Community Center on July 12, 2017.

Table 1 below lists the commenters, the topics, and their associated comment numbers. Comments from the hearing that warranted a response are included. Attached in Appendix A of this document are the referenced exhibits submitted by some of the commenters, and the complete transcript of the public hearing.

We thank the commenters for their participation.

Table 1: List of commenters and topics

Affiliation	Commenter Name	Topics	Associated comment numbers
Individual			
	Dal Porto, Danna	DEEP	I-4-4 , I-4-10 , I-4-11 , I-4-13
		Engines	I-4-9
		General	I-2-1
		Health Standards	I-4-8
		Monitoring	I-4-12
		NAAQS	I-6-1
		Permit Conditions	I-4-3
		Tier 4 Controls	I-4-1 , I-4-2 , I-4-5 , I-4-6 , I-4-7 , I-4-14
	Highland, Carl	General	I-1-1
	Koehnen, Debbie	Health Risk Impact Assessment	I-5-2 , I-5-3 , I-5-4
		Modeling	I-5-1
	Martin, Patricia	General	I-3-15
		Climate/Weather	I-3-8
		DEEP	I-3-13
		Engines	I-3-4 , I-3-5 , I-3-6 , I-3-9 , I-3-12
		Health Standards	I-3-14
		Modeling	I-3-7
		NAAQS	I-3-1 , I-3-3 , I-3-10 , I-3-11
		Permit Conditions	I-3-2
Agency			
Port of Quincy	Boss, Patrick	General	A-2-1
Port of Quincy	Kuest, Brian	General	A-1-1

Business			
ELM Energy, LLC	Richmond, James	Engines	B-2-1 , B-3-1
Qualls Agricultural Laboratory, Inc.	Qualls, Mick	General	B-1-1
Vantage Data Centers	Johnson, Mark	Permit Conditions	B-4-1

Carl Highland

I-1-1: General

Backup generation systems are necessary for large data centers and other industries requiring 24 hour power. In geographic areas where electrical power failures are common, the use of diesel based back up systems may cause long term health and pollution concerns. In Grant County, the Public Utility District has a long record of reliability; minimizing the length of time diesel powered generators will run.

I support the application if the State believes the data center will meet state requirements.

Ecology Response

Thank you for your comment.

Patricia Martin

I-3-1: NAAQS

We were led to believe that the controls installed on the Vantage Data Center were not "BACT", but were required because Vantage's emissions would fail the NAAQS. (See attached Wilder declaration (under oath).) How is it that Vantage can now remove the controls and not fail the NAAQS?

Ecology Response

Vantage has reduced hours of operation of the engines from 82 hours per year to 45 hours per year. The hourly operational limits have been evaluated and modeled for NAAQS compliance determination.

I-3-2: Permit Conditions

The NOC Application indicates that the "annual fuel usage and hour limitations (will) be based on a 3-year period using monthly rolling totals" (page 3-2). Please provide citations/regulations or other authority allowing for the use of a "3-year monthly rolling totals".

Ecology Response

EPA has determined that compliance with several of the National Ambient Air Quality Standards (NAAQS) is to be based on 3 year averages: NOx primary 1-hour standard, PM2.5 primary and secondary annual standards, PM2.5 primary and secondary 24-hour standard, PM10 primary and secondary annual standards, SO2 primary 1-hour standard. For several other NAAQS, such as the NO2 annual standard, compliance is based on more immediate measurements rather than on 3-year averages.

The Vantage permit allows operational limits to be met as a 3-year rolling average. These limits track compliance with the NAAQS for those pollutants for which compliance is determined via a 3-year average. For those NAAQS for which compliance is not based on a 3-year average, to ensure that the maximum emissions that could occur during the 3-year averaging period would be taken into consideration, Vantage provided a worst-case scenario where 3-years' worth of emissions were assumed to be emitted in just one year. This analysis demonstrated that under the 3-year average operational limits in the permit, the Vantage project would comply with the NAAQS.

I-3-3: NAAQS

Is it appropriate to use the peak hourly rate and multiply it by the corresponding hours to demonstrate compliance with NAAQS and TAPs as suggested on page 4-1? If so, please provide the specific regulation/citation or other authority provided by federal regulation/statute.

For comparison of emission rate standards of short-term durations, such as 1-hour, 8-hour, or 24-hour averaging periods, the peak hourly rate will be multiplied by the corresponding number of hours (i.e., the maximum duration of a particular runtime activity).

Ecology Response

Emission rates evaluated for this project were a composite 'worst-hour' regardless of the engine load at which it occurs (except for PM, which was at loads greater than 10%, at and below which the engines can't be run). This creates an artificial and very conservative emission rate for comparison to the NAAQS and TAPs criteria. Real or actual impacts will be lower than those calculated in this manner.

I-3-4: Engines

Landau makes a statement that the controls caused an increase in particulate matter, without clarifying that the increase is NOT the more toxic diesel particulate matter. The increase in particulate is not quantified, the performance test results are not included, and there is no evidence in the record to support claims made at the Public Hearing that the vendor was unwilling or unable to help resolve the problem with the controls. For the sake of an informed consent by the public, please quantify the change in emissions of all pollutants when the controls are removed. It would seem to me that any reduction is better than having Tier 2 engines operated without controls. Please offer proof that the Tier 2 MTU engines afford more health protections than if the inefficient controls were left place.

The latest compliance tests performed on the five installed engines (April 2015) indicate that particulate matter (PM) emissions are higher with the Tier 4 control units than they would be without the Tier 4 controls (page 1).

Ecology Response

Ecology has reviewed the project as proposed by the applicant. Based upon that review, we determined that the proposal for operations with Tier 2 controls, limited operating hours and limits in fuel usage, will meet all applicable requirements for permit approval, including NAAQS compliance and Best Available Control Technologies (BACT) requirements. In accordance with [WAC 173-400-113](#) *New sources in attainment or unclassifiable areas - Review for compliance with regulations*: "The permitting authority....shall issue an order of approval if it determines that the proposed project satisfies the legal requirements."

We have no evidence of the vendor's unwillingness to fix the problem, other than multiple stack tests that require otherwise unnecessary run time as Vantage attempted to make the equipment work. To the health impacts, operation of the engines with Tier 2 engines without additional controls was considered as a new project, with all emissions estimates based on a worst load emission factor. Impacts were evaluated

against the same health criteria as the original Tier 4 project, so the impacts of the Tier 2 engines are more conservatively estimated than were the original. Allowable run hours are adjusted downward in this preliminary determination to satisfy the same health criteria used for both.

I-3-5: Engines

We have already determined that the manufacturers' guarantee for emissions is inaccurate. As discussed in earlier permits, the manufacturer's guarantee is based on performance testing required under 40 CFR 89, that require warming the engine for 30 minutes prior to testing; averaging and weighting the loads, and excluding emissions malfunctions and shut down. (See 40 CFR 89.406 and .407) Relying on manufacturers' guarantees is not appropriate.

The proposed generators will be guaranteed by the manufacturer to meet EPA Tier 2 emission standards for non road diesel engines. The manufacturer-reported "not to exceed" generator emission rates for carbon monoxide (CO), nitrogen oxides (NOx), and PM will be used to estimate these criteria pollutant emissions (page2).

And,

It will be conservatively assumed that the emission factors for diesel engine exhaust particulate matter (DEEP) are equal to the reported emission rates provided by the manufacturers' not-to-exceed (NTE) emission value for PM (page 3).

Ecology Response

Ecology routinely relies on the manufacturers' guarantees for evaluating maximum emissions from emissions units unless better information is available. We are not aware of any information regarding the performance of a diesel engine that is more accurate than the manufacturers' certified maximum emissions rates. While we rely on guarantees for pre-construction permitting purposes, engine testing requirements are included in the approval order to ensure that those estimated emissions are not exceeded.

I-3-6: Engines

Cold start factors for other data centers have been applied to the first 15 minutes of engine operation, not just the first minute as in the Vantage Data Center permit. (see attached Landau Permit Revisions: Microsoft Oxford Data Center page 7) Please provide documentation, including performance test results that support Landau's conclusion that elevated cold start emissions on a MTU 3.0 MW engine should be restricted to only 1 minute.

Emission estimates for criteria pollutants (PM, CO, NOx, and total VOCs) and volatile TAPs associated with cold startup will be scaled up using a "black-puff" emission factor in order to account for slightly higher cold-start emissions during the first minute of each scheduled cold start (page 3).

Ecology Response

The data centers have all used the same information as the basis for the 'cold start' emissions. Some have used lower extreme emission spike heights but averaged them over longer periods (15 minutes in some cases). The duration of the spikes found in the underlying research is less than 60 seconds. Use of the higher value for the extreme spike with a shorter duration is also acceptable.

The cold start information can be found within this document from the California Energy Commission Sacramento: www.energy.ca.gov/research/notices/2004-10-06_seminar/2004-10-06_MILLER.PDF. This is the same information that the Microsoft MWH cold start factors were based on. As shown in the

document, cold start spikes occur within a 60 second timeframe.

The Yahoo! 60-second cold start estimates are higher than those used for MWH because of how each facility extrapolated information from the document. MWH calculated lower cold start factors but implemented them over a longer period of time. If Yahoo! extrapolated its cold start estimates over the MWH cold start timeframe, the cold start factors would be approximately the same as the ones used for the MWH facility. Both approaches are acceptable.

An additional reference which contains the cold start spike information can be found here:
<http://infohouse.p2ric.org/ref/46/45596.pdf> (see page 16).

I-3-7: Modeling

Washington State defines "ambient air" as the surrounding outside air, not the air at the fence line. Landau has inappropriately relied upon an EPA Air Quality Model that is less stringent than Washington State's air quality laws.

Guideline on Air Quality Models (Federal Register 2005) to estimate ambient pollutant concentrations beyond the project property boundary, assumed to be the fence line for the purposes of this analysis (pages 3-4)

Ecology Response

Compliance with the NAAQS is determined as required by the federal definition of ambient air in 40 CFR 50.1 (e), which states that ambient air is the air that is outside the restricted and controlled area of the facility to which there is no public access.

I-3-8: Climate/Weather

Appendix W is required for demonstrating compliance with the NAAQS. It is suggested that modeling use the most recent 5-year meteorological data, or one year of site specific data. Why does Ecology continue to allow the use of outdated data for something as critical as our air quality? If using the 2001-2005 is more protective, prove it to us. In the meantime, please rule out that the use of this data is less stringent and therefore less protective, but using more recent data.

National Weather Service (NWS) hourly surface observations from the Grant County International Airport in Moses Lake, Washington located approximately 24 miles from the Vantage site. Five years (January 1, 2001 through December 31, 2005) of hourly surface data will be processed in AERMET (page 4).

Likewise, with all the growth in the Quincy area over the past 25 years, including diversity in crops, why is USGS data from 1992 being used? Is more recent data regarding land cover available?

Land cover data from the US Geological Survey (USGS) National Land Cover Data 1992 archives will be used as an input to AERSURFACE (USGS 1992).

Ecology Response

AERSURFACE requires surface characteristics data over a 1km radius around the meteorological station, not the area being modeled. Since Ecology uses airport met data, substantial changes to the land use are unlikely within this small radius as they interfere with aviation operations.

It does not matter whether the modeling uses meteorological data from the 2001-2005 time period or the 2005-2009 time period. This is because the inter-annual variation of meteorology is sufficiently consistent

that data from the same station for any five year period meeting quality assurance and completeness requirements will provide substantially the same results. In addition, the equipment and procedures for taking and reporting weather observations at airports have changed little since the installation of automated (ASOS) equipment. The requirement for a contiguous five year period reduces the possibility of cherry-picking, and the choice of a particular five year period for the analysis cannot be depended on to confer an advantage to the applicant.

I-3-9: Engines

Please explain how the following statement is justified, including citing to regulations supporting this method of calculating the per-hour emission rate for use in AERMOD:

Since testing will generally occur from 7 a.m. to 7 p.m. (during daylight hours), the total PM_{2.5} emissions estimated for that daily period will be divided by 12 hours per day to identify the per-hour emission rate input in AERMOD

Ecology Response

The described methodology produces a more conservative value (two times the alternative) than would dividing the daily emissions by a full day or 24 hour period.

I-3-10: NAAQS

The default NO₂/NO_x in-stack ratio is 50% without prior EPA approval (see Dave Bray email).

The ambient NO₂ concentrations will be modeled using the plume volume molar ratio method option to demonstrate compliance with the 1-hour and annual NAAQS for NO₂ and ASIL. This AERMOD option will calculate ambient NO₂ concentrations surrounding the site by applying a default NO₂/NO_x equilibrium ratio of 0.90 and an NO₂/NO_x in-stack ratio of 0.1 (page10).

Ecology Response

EPA concurrence is needed if deviating from their default of 0.5, only if this were a PSD permit. It is not. Ecology followed EPA's recommendations (No. 40 CFR 51.160(f)(1) and (2)) regarding NO₂/NO_x ratios, so EPA review and approval is not required. Stack test data indicates that 10% is a more accurate ratio than 50%.

I-3-11: NAAQS

I am disturbed by the following statement. It implies to me that the Monte Carlo model was developed to circumvent National Ambient Air Quality Standard exceedences. Please explain in detail how this is not a prohibited dispersion technique or circumvention, in order to avoid failing the NAAQS. Please provide supporting authority for its use.

In the event that AERMOD predicts the 8th-highest ranked runtime scenario (in the screening-level analysis for evaluating the NO₂ 1-hour NAAQS) could contribute to an exceedance, the probability of occurrence will be evaluated using Ecology's Monte Carlo simulation technique (page 10).

The generator runtime scenarios to be used in the analysis will be determined at a later date, once it is determined that the Monte Carlo simulation is necessary and final runtime hour limitations are identified. Landau Associates assumes that the requirements for statistical evaluation will be equivalent and consistent with Monte Carlo simulations required for other recent data center permit applications (page 11).

Ecology Response

The Monte Carlo technique is not a dispersion technique nor could it be considered circumvention. Instead, it is a statistical method for determining if the ultra-conservative worst-case impacts will ever occur. See also Ecology Response to I-3-10.

I-3-12: Engines

Please provide the numerical "cold-start" factor that was relied upon for the PTE and BACT analysis? A formula was provided, but not solved (see page 73 attached). Please identify the cold-start factor derived from the formula on page 73.

Ecology Response

Please refer to Appendix B of the August 10, 2016 [Notice of Construction Application](#) where the cold start emissions adjustment calculations are presented (see page B-1 or 73). The emission rate per hour, in an hour with a cold start, then, is one minute of 'cold start' rate and 59 minutes of warm steady state emissions. This is presented in Table 2 below:

Table 2: Emission rates per hour

Full-variable Load (≤100% Load) Emissions			
Single Hour Emissions (lbs/hr)			
Pollutant	Warm	Cold-start ^a	Sum Total
HC	1.9	0.14	2.0
Carbon monoxide	11	1.6	12
DEEP ^b	0.78	0.056	0.83
PM (FH+BH)	2.7	0.19	2.8
Notes:			
BH = "Back-half" condensable emissions			
FH = "Front-half" filterable emissions			
HC = Hydrocarbons			
lbs/hr = Pounds per hour			
NA = Not applicable			
NTE = Not to exceed			
PM = Particulate matter			
ppm = Parts per million			
^a Cold-start emission factor applies to the first 60 seconds of emissions after engine startup.			
^b DEEP (diesel engine exhaust particulate matter) is assumed equal to front-half NTE particulate			

I-3-13: DEEP

DEEP is carcinogenic, but Ecology requires only the front filterable particulate to be considered for the purposes of carcinogenicity. How does Ecology reconcile this decision with the requirements found under WAC 173-400's New Source Review and the definition of PM2.5 under those regulations?

(71) "PM-2.5 emissions" means finely divided solid or liquid material, including condensable particulate matter, with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers emitted to the ambient air as measured by an applicable reference method, or an equivalent or alternate method,

specified in 40 C.F.R. Part 51 or by a test method specified in the SIP.

WAC 173-400-040 (6) Emissions detrimental to persons or property. No person shall cause or allow the emission of any air contaminant from any source if it is detrimental to the health, safety, or welfare of any person, or causes damage to property or business.

Ecology Response

For the purpose of determining compliance with PM_{2.5} NAAQS, both filterable and condensable portions of diesel exhaust were considered.

DEEP, however, is a specific subset of PM_{2.5} emissions. Ecology concurs with California Air Resources Board (CARB) judgment that the measure of the filterable component of diesel exhaust best represents diesel engine exhaust, particulate because it is consistent with the methodologies used to estimate exposure concentrations used in deriving quantitative unit risk values. CARB asserts that because the key epidemiological studies of railroad workers and truck drivers focused on “fresh” diesel exhaust or elemental carbon, the front half of measured diesel particulate emissions is consistent with the techniques used to establish diesel particulate as a toxic air contaminant. As a result, CARB defines Diesel Particulate Matter (PM) in the Airborne Toxic Control Measure (ATCM) for compression ignition (CI) engines as “the particles found in the exhaust of diesel-fueled CI engines as determined in accordance with the test methods in section 93115.14.”

Section 93115.14 specifies that PM is to be measured in one of three ways including ARB Method 5 using only measurements captured by the probe catch and filter catch (i.e., filterable) and shall not include PM captured in the impinge catch or solvent extract (i.e., condensable).

Appendix G of CARBs Staff Report: Initial Statement of Reasons for Proposed Rulemaking (available at www.arb.ca.gov/regact/statde/appg.pdf) includes a brief discussion of this rationale.

I-3-14: Health Standards

Once again there is no consideration for ground level ozone. Please explain why and cite the regulation that exempts its consideration.

Ecology Response

Ambient ground level ozone analysis is not typically conducted for minor new source review projects, especially in ozone attainment areas.

[WAC 173-400-113](#) addresses new source compliance requirements in attainment or unclassifiable areas. The rule specifies that if allowable emissions from the proposed new source are below certain threshold values, the proposed source will not be considered to contribute to a violation of an ambient air quality standard. The rule does not specify an ozone threshold implying that minor sources do not need to use modeling to demonstrate ozone impacts in attainment areas.

I-3-15: General

I want to request that the comment period be extended because the performance tests -- on which the decision to abandon the controls is based -- are not included in the record for review during the comment period. Also, the Hanford Method Report which uses higher costs for controls for toxic air pollutants was also not included in the public record available online.

Ecology Response

The request to extend the comment period was received after the comment period had closed. Additional documents can be obtained by a formal public records request.

Danna Dal Porto

I-4-1: Tier 4 Controls

[Note: Comments I-4- 1, 2, 5, 6, 7, & 14 are about Tier 4 Controls. They have been grouped together, followed by Ecology's response.]

In the newsletter about the Vantage changes to their permit, mention is made of removing controls because of insufficient "capture" of pollutants. What specific pollutants are not being captured? How were these facts determined? If the controls are removed, what other pollutants will be allowed into the air?

I-4-2: Tier 4 Controls

I want to know the specific emissions levels being challenged. Vantage must prove to ECY and the Public that removing these Tier 4 controls is protecting the Public and the Environment. Vantage should not be allowed to present information requesting a permit adjustment based on different data points. Vantage needs to provide the public with information that is based on the same data as the original permit to prove to the public that the Tier 4 controls do, in fact, elevate the level of particulate matter in the environment. It is not logical that engine emissions would be raised with the addition of emission controls, controls that have specifically designed to lower emissions.

I-4-5: Tier 4 Controls

The Vantage Information Fact Sheet states "Emission testing later revealed that the Tier 4-equivalent emission controls were unable to meet ELM Energy's performance guarantee." The issue at hand is not the guarantee of the manufacturer of the emission controls; the issue is the emission rates in relation to EPA standards for emissions. I want to know if the Vantage emissions, with controls, meet EPA standards? If toxic emissions are lowered by the ELM controls, these devices should remain on the stacks at Vantage. Any reduction in emissions is a positive for Quincy residents.

I-4-6: Tier 4 Controls

The 11/16/16 Landau/Palcisko letter, page 2: "The EPA Tier 4 emission control vendor was unable to make system adjustments that would allow for a passing performance test." If only TWO performance tests were completed at "Riker Data Center", explain to me how you could determine first, that the emissions exceeded the Approval Order, as well as make adjustments the systems to see if emission rates had improved by only conducting a total of two tests.

I-4-7: Tier 4 Controls

Another document regarding Vantage, February 25, 2016, Christel Olsen & Mark Brunner (Landau)/Ranil Dhammapala & Clint Bowman (ECY), page 1; "The latest compliance tests performed on the engines in April 2015 indicate that particulate matter (PM) emissions are higher with the Tier 4 controls installed than they would be without the Tier 4 controls...Multiple attempts to repair and/or optimize the Tier 4 emissions controls have failed." Does this letter document the same performance tests referenced in the 11/16/16 letter and the same efforts to improve emissions results? Is this a mistake in this letter to list the dates of the tests as April 2015? Is the PM mentioned in this letter a diesel particulate? Is it pm 2.5?

What specific efforts were made to improve emission outcomes? What steps did ELM take to improve the emission rates at Vantage?

I-4-14: Tier 4 Controls

My conclusion after reading the Vantage permit documents is that Vantage does not want to pay for the Tier 4 Controls on their diesel engines. Vantage is making an economic decision rather than a decision favoring public health. They have not been successful in showing that the current engines are not working properly to control emissions but they would like to be released from their first permit in order to save money. I do not believe that Ecology should allow a company to lower the protections that have been placed on their diesel engines. I want Ecology to deny the permit application from Vantage and hold Vantage to the original permit for all 17 engines.

Ecology Response

That the Tier 4 controls were not working was determined during performance tests where compliance with guaranteed emission rates was not achieved. Ecology was not party to the interactions between the Tier 4 equipment vendor and Vantage, nor were we made aware of the costs Vantage incurred to remedy the compliance issue. Instead, we have reviewed the project as proposed by the applicant, as a new project. We required more conservative evaluation techniques for this permitting effort than were used in the Tier 4 permitting. Based upon that review, we determined that the proposal for operations with Tier 2 controls, limited operating hours and limits in fuel usage, will meet all applicable requirements for permit approval, including NAAQS compliance and Best Available Control Technologies (BACT) requirements. In accordance with [WAC 173-400-113](#) *New sources in attainment or unclassifiable areas - Review for compliance with regulations*: "The permitting authority....shall issue an order of approval if it determines that the proposed project satisfies the legal requirements."

I-4-3: Permit Conditions

The November 16, 2016 Landau/Palcisko letter, page 2, cites TWO PERFORMANCE TESTS that were completed at the Riker Data Center. I have not been notified that Riker Data Center is a new name for Vantage. Did ownership of the Vantage Data Center change? Is new management responsible for this apparent change in their commitment to quality air protection for Quincy? I want this issue clarified by Vantage.

Ecology Response

Vantage Data Center is the name of the owner. Riker Data Center is the name of the facility. Ownership of the facility has not changed.

I-4-4: DEEP

The 11/16/16 Landau/Palcisko letter goes on to state that the "measured emission rates of total particulate matter (PM), nitrogen dioxide (NO₂), and ammonia exceeded Approval Order limits in one or both tests." Are these actual physical tests? I want to know the method of testing, the dates of the tests and to see the results of the tests. I want to know who administered the tests and what device was used for these tests. All of the emission information on the original permit application was based on modeling. If Vantage is using physical testing instead of modeling for emission levels, they are mixing two different types of data for their permit revision and that should not be allowed. I would be delighted if all data center emissions were actually physical tested but they are not. Modeling is the way air quality is determined, not actual, real, factual, quantifiable information.

Ecology Response

In their notice of construction application, Vantage used emission rates provided by the engine manufacturer. Vantage used the worst-case emission rate for each pollutant regardless of which load the engines will actually operate.

The cited information was provided to Ecology as background information related to the need for Vantage to revise the Approval Order. The referenced "test" are source tests which are routinely required to verify estimated emission rates from the permitted equipment. Based upon the test results, Vantage has requested modification to their Air Quality Approval Order to modify control equipment and operational limits. Ecology has evaluated this project as required as proposed by Vantage. The proposal is to modify previously permitted controls and operating parameters. Ecology has reviewed the project as proposed and determined that it will meet all applicable requirements for issuance of a revised approval order. The results of source testing the previously permitted control equipment is not relevant to this proposal and beyond the scope for Ecology review of the proposed modification.

The commenter has confused emission rates of pollutants with modeled concentrations of the pollutant in ambient air. Emission rates are not modeled, but rather are estimated for permitting purposes based on best available technical information, such as manufacturer's guaranteed not to exceed emission rates. Those emission rates are then input to the dispersion model to predict the ambient concentration of pollutants. It should also be noted that Ecology has recently begun to monitor ambient air quality in Quincy for some of the pollutants.

I-4-8: Health Standards

Explain to me the reference to ammonia in the emission control discussion, 11/16/16 Landau, page 2. What are the Washington State standards for ammonia emissions and how is Vantage in violation of these standards? Is the ammonia reference related to the installed urea-injection selective catalytic reduction system? Are the increased particulates a result of diesel emissions or other emissions from the controls?

Ecology Response

There are no ambient air quality standards for ammonia, however, section 5.12 of the 2013 Vantage approval order specifies that ammonia emissions from any of the 17 engines at Vantage Data Center shall not exceed 15 ppmvd at 15% O₂, nor 0.64 pounds per hour. Also, ammonia emissions are associated with the technology of Tier 4 add on controls. Ammonia will not be emitted during operation of the proposed Tier 2 engines.

I-4-9: Engines

Referencing the Landau/Palcisko letter, page 4: I am commenting on this statement; "In order to account for the slightly higher emissions during the first minute of each engine cold startup, the estimated emission rates of pollutants associated with cold-startup were scaled-up using a "black-puff" emission factor." My knowledge of cold start is that three minutes and 15 minutes have been used to account for the initial heavy emissions as well as the initial 30 minutes that EPA recognizes as exempt from emissions testing for the engine operation. Using only one minute for cold start does not account for the large, not slight, black puff emission at cold start. I have added a photo of a Microsoft Columbia engine to illustrate my comment. (Exhibit 1) Using one minute for the test does not appear consistent with other air quality permits.

Ecology Response

Use of one minute for the cold start duration is consistent with data contained in the 'Riverside' document (citation below). Spikes in emissions generally are of shorter duration than one minute, particularly for

these engines equipped with continuously operating block heaters. One minute of a high spike of emissions, followed by 59 minutes of steady state rates is essentially the same value per hour as an averaged spike over 15 minutes followed by 45 minutes of steady state rates. Either analytical procedure is acceptable.

The cold start information can be found within this document from the California Energy Commission Sacramento: www.energy.ca.gov/research/notices/2004-10-06_seminar/2004-10-06_MILLER.PDF. This is the same information that the Microsoft MWH cold start factors were based on. As shown in the document, cold start spikes occur within a 60 second timeframe.

An additional reference which contains the cold start spike information can be found here: <http://infohouse.p2ric.org/ref/46/45596.pdf> (see page 16).

I-4-10: DEEP

Landau has presented maps, Figures 4-1 to Figure 4-7 to give visual information on the emissions from Vantage. With the exception of Figure Map 4-4, Hours exceeding the ASIL, none of the other maps reference the emissions in relation to the ASIL, limit of 0.0033 ug/m3. ASIL is the Acceptable Source Impact Level: the concentration of a toxic air contaminant in the outdoor atmosphere in any area that does not have restricted or controlled public access that is used to evaluate the air quality impacts of a single source. Other maps included in other data center air permitting documents list the concentration of emissions in relation to the ASIL, or the amount the ASIL is exceeded. The ASIL concentration can relate to the number of cancers. I have included an Ecology map from the May 2012 permit response showing the Cumulative Diesel Particulate Concentration relation to the Post Vantage construction (Exhibit 2) as well as a map showing the Diesel PM concentrations of the Microsoft Columbia data center (Exhibit 3) in relation to the ASIL. Exhibit 2 illustrates the center of Quincy as having concentration of 63 to 100 times the ASIL in diesel particulate concentration. Comparing these maps to the Landau Figure 4-1n(Exhibit 4), the legend of the relationship to the ASIL (and public health) is more understandable to the public. I want Vantage to resubmit their maps Figure 4-1 to Figure 4-7 to reflect the Vantage data in relation to the ASIL.

Ecology Response

Figures 2 and 4 in [Ecology's Revised Health Impact Assessment](#) from May 11, 2017, show project-related DEEP impacts (Figure 2), and cumulative DEEP impacts (Figure 4) relative to the DEEP ASIL. Figure 3 shows maximum 1-hr NO2 concentrations. Note that the NO2 ASIL is 470 ug/m3 averaged over 1-hr. (See pages 20-22.)

I-4-11: DEEP

Throughout the Landau/Vantage documents many qualifiers have been added to statements. Uncertainty Characterization in the 2016 Second-Tier Risk Analysis for DEEP and N02 is the title of an entire section of documentation. Details of Emission Factor and Exposure Uncertainty and Air Dispersion Modeling Uncertainty are other titles of sections of the documents. Add to those titles the Toxicity Uncertainty, the DEEP Toxicity Uncertainty and the N02 Toxicity Uncertainty. The entire document is full of uncertainty. As a member of the general public, I would have a hard time relying on the accuracy of any statements with these uncertain statements. Part of my problem with air quality in Quincy is the reliance by Ecology on modeling air quality verses actual facts. Although there has been air monitors installed, briefly, in Quincy, the public has never been able to see the results. During the heavy smoke of recent fires, air monitoring was installed but, yet again, the public could not see the results.

Ecology Response

Uncertainty refers to a lack of complete knowledge. EPA defines uncertainty as "our inability to know for sure." Additional study is the only way to reduce uncertainty, and still uncertainty can never completely be eliminated. Decisions often must be made in spite of uncertainty. For that reason, Ecology typically relies on "conservative" assumptions to reduce the chances that exposures and risks are not underestimated.

I-4-12: Monitoring

I have requested on-site air monitors for at least the past ten years. The reply from Ecology is a lack of funding. At the same time, the State of Washington has given huge tax breaks to the data center operators, some of the most successful in America, to encourage building data centers in Quincy. Placing over 200 locomotive sized diesel emergency engines within the City of Quincy must be a public health hazard but we cannot be certain without on-site air monitors. I believe it is time to know what is happening to Quincy air quality. I am requesting, again, air monitoring in Quincy.

Ecology Response

Ecology has purchased and installed equipment for a monitoring study in Quincy. This study will consist of PM2.5 (via a correlated nephelometer), NOx, black carbon (a diesel marker), and meteorological parameters (wind speed, wind direction, and ambient temp). As of early August 2017, the monitoring equipment is in operation and will continue for at least one year.

I-4-13: DEEP

I am requesting Ecology to provide a current over-view map of Quincy showing the cumulative Diesel Particulate Concentrations as per the ASIL.

Ecology Response

Figure 4 in [Ecology's Revised Health Impact Assessment](#) from May 11, 2017, shows the cumulative DEEP concentrations, reported as the number of times greater than the ASIL. (See page 22.)

I-6-1: NAAQS

If they used physical monitoring on the revision to determine emissions and yet they used computer modeling in the initial permit; how can they compare those 2 kinds of data? Because they didn't explain to me how they arrived at the numbers that they arrived at in this revised permit. So if you enter different data you are gonna get different results. So based on what I read in the documents they used only 2 performance reviews to determine their emissions. Apparently that is really not true; they did quite a bit more. But if I were a scientist I would certainly use more than just 2 tests to determine what my outcome would be. And I don't believe that 2 tests would be appropriate for determining the emissions on this facility. It explains in the documents that Vantage complained that the EPA Tier 4 emission control vendor was unable to meet the EOM Energy Performance guarantee. The issue at hand is not the guarantee of the manufacturer of the emission controls. The issue at hand is how do these emissions really relate to EPA standards and the standards of the state of Washington? Did the controls lower the emissions? And if so, if they lowered the emissions then those controls should stay in place. The documents didn't explain to me - unless - I could not read and understand the charts because I just don't do that. But the documents themselves did not explain to me that what wasn't fixed. Tonight I visited with people in the Vantage group and they explained to me that yes they could meet the NOx levels. Yes, they could meet the other levels but not diesel particulate.

Ecology Response

The commenter has confused emission rates of pollutants with modeled concentrations of the pollutant in ambient air. Emission rates are not modeled, but rather are estimated for permitting purposes based on

best available technical information, such as manufacturer's guaranteed not to exceed emission rates. The estimated emission rates are then input to the dispersion model to predict the ambient concentration of pollutants. The emission rates are tested during source testing after issuance of the approval order.

Ecology has reviewed the project as proposed by the applicant. Based upon that review, we determined that the proposal for operations with Tier 2 controls, limited operating hours and limits in fuel usage, will meet all applicable requirements for permit approval, including NAAQS compliance and Best Available Control Technologies (BACT) requirements. In accordance with [WAC 173-400-113](#) *New sources in attainment or unclassifiable areas - Review for compliance with regulations*: "The permitting authority....shall issue an order of approval if it determines that the proposed project satisfies the legal requirements."

I-2-1: General

This comment from Danna Dal Porto is the last in a series of comments from the Public Hearing in Quincy, July 12, 2017. Before the July 12, 2017 meeting, I read the documents presented by Vantage and Landau for consideration for this air operating permit. The Landau documents were misleading and unclear. I arrived at the conclusions I typed ahead of the meeting based on those flawed documents. At the Public Hearing, I listened to more specific details about the Vantage problems with their Tier 4 added controls. The information presented by Mark Johnson and Justin Harp created enough doubt in my mind that I have reconsidered my typed and verbal comments at the Quincy meeting.

As a resident of Quincy, I am unhappy, confused and mystified at the inability of intelligent and educated engineers to solve some of the technical problems relating to the emissions from these very large generators installed as backup for the data centers. The investment by companies in technology to backup their data is huge and, yet, it some of the technology does not seem to work. Must be very frustrating for everyone involved.

I have concluded that I do not know enough about the difficulties at Vantage to have an informed opinion on this permit. If Vantage is not able to lower diesel particulate from their engines using the Tier 4 add-ons, I have to reluctantly conclude that Tier 2 engine operation is better than uncontrolled emissions. Knowing that, I retract my earlier statements and conclude that the Vantage permit be approved using Tier 2 engines.

Ecology Response

Thank you for your comment.

Debbie Koehnen

I-5-1: Modeling

One of the questions that I had was I understand that buildings really affect air flow and the plumes. And so I have a question about when they modeled what was - the model where the generators were going to be with the buildings already in the place it would be when they were installed - or was it 12 generators where the first building is. I think - I'm concerned that we might have a different model or plume based on how that was modeled.

Ecology Response

Air flow around all buildings was properly considered when modeling all generators. The model BPIP PRIME - an essential part of the AERMOD modeling system - was correctly supplied with building dimensions associated with all 17 generators when AERMOD was run.

I-5-2: Health Risk Impact Assessment

The next question I have is in the presentation we had from Gary [Palcisko] it said that all east side stations in the worst case scenario would be, you know - it would be okay. It would be non-significant. My concern is that we do have a lot of centers with overlapping plumes so was that taken into consideration for this project? Not just all east side stations in the worst case scenario but everybody. We did have a fire in the transformer station in Ephrata this year during the winter and we had no power and it took them quite a while to fix that. So I presume the generators were running so this could be a problem where everybody would be using their generators.

Ecology Response

In the Health Impact Assessment submitted on behalf of Vantage, Landau Associates evaluated the short-term NO₂ impacts that could result from emergency engine operation during a system-wide power outage affecting Intuit Data Center, Yahoo! Data Center, Sabey Data Center, and Vantage Data Center. Only the east side centers were modeled because Grant County PUD reported that power is served to the east and west sides of Quincy by separate feeder lines. This minimizes the likelihood of an outage affecting both sides at the same time.

For previous data center permits, Ecology evaluated impacts from outages that impacted both east and west Quincy data centers at the same time. Generally, the highest and most frequent impacts tend to be at or near the data center properties.

I-5-3: Health Risk Impact Assessment

Another concern I have is that the cap is 10 million but we're at 9.9 and that's pretty darn close so if there's another problem that arises - what's going to happen? That seems a little too close for comfort, that we're right there at the limit. When other problems have occurred that we weren't anticipating with the Tier 4 scrubbers and add-ons that weren't working - I'm very concerned about that. What are we going to do about that? How are we going to fix it? What if it happens? These are a lot of "what ifs" but that's really a little close for comfort, to be that close. Number 5 - okay - there was the proposal is based on higher stacks for I presume the 12 filters - or the 12 new generators that are going to be placed. But it didn't say anything about the first 5 that were there with the shorter stacks - aren't really doing what we had planned. Maybe that's a place that they could get that 9.9 a little lower. Maybe if they did something with those stacks - is there any plans for that? And are the stacks sufficient as a air quality control?

Ecology Response

The permit limits that result in the 9.9 in a million excess cancer risk are based on very conservative assumptions that err on the side of overstating the emissions and the operations of the engines. Therefore, in reality, the actual excess cancer risk is likely considerably less than 9.9 in one million. Washington rules allow an increased cancer risk of 10 in one million per new source of toxic air pollutants. Because several new sources of toxic air pollutants have been proposed in the Quincy area, Ecology developed a goal to prevent cumulative risk from diesel engine exhaust exposures from exceeding 100 in one million while not allowing individual new sources to cause a risk greater than 10 in one million.

I-5-4: Health Risk Impact Assessment

Health assessment. I'm just really curious about where they're getting that info because I've been living here for quite a while and I'm really close. I'm now - my residence is in an area of - a house of concern - a residence of concern when they have the overlapping plumes. And nobody's come to me and asked about my health. So I'm curious about that. What's going on with that? And how are we going to be included in that? Number 7. Every time I come I question if we're really seeing what's the best for us. I know we have cheap power here in Quincy but there are other options that maybe would be better for our health. Better

for our environment, for the future of our community and the kids that are living here. Are we doing battery storage and wind and solar? Okay, we have a lot of wind. We have a lot of solar. Those would work really well here. Are people exploring this - these options instead of using the diesel generators? The smog that's in our area is just atrocious. You look out - we don't have a blue sky anymore. We have grey brown awful ugly and yeah we have a lot of fires and we have a lot of dust but those are always there so that has to be accounted for. So are there other options that we could use besides these diesel generators. Besides diesel is non-renewable and it would be nice if we went to a more green - more let's save the world possibility here. Because this is just going to keep going. I really appreciate you taking the time to answer these questions. And, well, speak now or forever hold your peace. That's what I'm doing. I'm speaking now and saying can we please make it a better place? I appreciate all the companies helping us out here. Instead of just using the back - I know these guys tried to use the Tier 4 which didn't work which is - we really appreciate but wow maybe we just need to get off that diesel generator if we can. Is that a possibility?

[Ecology Response](#)

Thank you for your comments. Ecology has no authority to direct a facility to install specific equipment. We rely on the process of risk assessment to help inform decisions. Risk assessment uses information about the toxicity and health effects of air pollutants and how people might be exposed.

Risk assessment in the air permitting process differs from a health study in that it does not survey the prevalence of various diseases in a community at a point in time, but tries to quantify the future increased risks posed by exposure to pollutants in the environment. If the risks of a new source of toxic air pollutants are sufficiently low, then a project can be approved.

Port of Quincy – Brian Kuest

A-1-1: General

I am a Quincy Port District Commissioner and was in attendance at last night's hearing. Pat Boss spoke on behalf of the Port. Pat is the Port Districts Public Affairs Director. There were a couple of points that I wanted to comment on in light of what I heard last night. First of all the Quincy Port District is a strong supporter of the Data Center Industry. The Data Centers have been strong supporters of the Quincy Community and have contributed much to the local economy. It is also my understanding that generator usage is down based on increased PUD substations and increased availability of power in the community. If power goes down in one area-power can be delivered from another area reducing the need for testing generators as often. To my knowledge Ecology has not previously been concerned with air quality in the Quincy Valley. Now that an air quality monitor is going to be installed that should help in regulating future air quality. The Port of Quincy is very supportive of Vantage's requested permitting change.

[Ecology Response](#)

Thank you for your comment.

Port of Quincy – Patrick Boss

A-2-1: General

I appreciate the passion that the other people who testified [at the public hearing] tonight showed. I think everybody cares about their community. I think we all want to do the best for our community. But the

Port believes this is not a big issue in the bigger scheme of things. There's other bigger issues here that we need to be tackling. As I said before we greatly support Vantage and their proposal. Great company. We want to see more of the Vantage types of companies in our community.

[Ecology Response](#)

Thank you for your comment.

Qualls Agricultural Laboratory, Inc. – Mick Qualls

B-1-1: General

Emissions from Diesel engines is a simple "fact of life" in Central Washington and there are no documented reports of anyone's health being affected from Diesel Smoke. We have the cleanest air in the state due to our low population, wind currents and open skies while Seattle, Olympia and Spokane have the dirtiest in both winter and summer. Diesel Trains, Trucks, Tractors and etc. are constantly travelling through Quincy emitting emissions that do not harm anyone. I think Quincy is the best place in the world for our Data Centers for many reasons but especially for the subject of "Human Health" to our resident population. Please allow Vantage to proceed with their plans for revisions to their Data Center.

[Ecology Response](#)

Thank you for your comment.

ELM Energy, LLC – James Richmond

B-2-1: Engines

[Note: Comments B-2-1 and B-3-1 have been grouped together, followed by Ecology's response.]

ELM Energy, LLC, which provided the DPF/SCR emissions aftertreatment systems for Generators 1 through 5 at the facility, would offer the following comments:

The systems supplied by ELM in 2013 & 2014 to the Vantage-Riker Data Center (Vantage) do operate and reduce emissions of NOx by nearly 90% and PM by 85% over base Tier 2 engine emissions levels contrary to what is being reported in the permit application documents prepared on behalf of Vantage by Landau & Associates (Landau).

Vantage, their facilities management company and Pacific Power have been negligent in maintaining the systems in proper operating conditions. Furthermore, condensable particulate matter (CPM) emissions are not available from any engine manufacturers (OEMs) or listed on any engine data sheets. Landau is making assumptions in the new permit as to the amount of CPM that will be produced but they have no credible way to get the predictable CPM nor is there a field test method that can consistently and accurately test for CPM from diesel exhaust gas. We believe representatives from Landau and/or Vantage have been told by more than one engine OEM that PM test results can vary 10x from EPA field test methods when measuring all PM.

ELM notified Vantage that the diesel emission fluid (DEF) used in the dosing systems during emissions testing conducted in 2015 was not to spec which was causing ammonia salts to form thus creating the

high level of total PM in the last 2 of three test results due to our system increasing injections to adjust for the degraded ammonia. Please see white paper describing how improper atomization can increase pm by 400%:

[www.researchgate.net/publication/292774563_The_effect_of_diesel_exhaust_fluid_dosing_on_particle_number_emissions_from_a_modern_diesel_engine]

The shelflife of UREA is 1 to 3 years. The ammonia slip was tested during the testing and was within compliance contrary to Landau's statements in the supporting documentation.

Finally, Landau has taken corrupt test results for the sake of their client to create a false narrative of cost and safety. \$2.9M per ton of emission reduced compared to the original permit assessment of \$42,500 is ridiculous, an embarrassment and unprofessional to the industry to even put on paper in public view. It is an EPA requirement for these systems for non-emergency use and becoming the requirement for several states even for emergency use. EPA would not have been capable of passing TIER 4 legislation if those cost are anywhere near true and accurate. This permit is an attempt to save a few thousand dollars to the detriment of air quality and public health. ELM stands behind our product and will defend them in any court with existing test reports from systems operating in the field.

B-3-1: Engines

To be clear, the emission systems at Vantage are reducing emissions over 85%, [w]ell below any Tier 2 certified engine emission levels. The increase in PM from testing is NOT diesel particulate and the NOx did pass testing. ELM proposed solving the issue at Vantage and they chose to head down a permit change and remove the systems using flawed testing analysis from an improperly maintained system.

The new testing loads being proposed would also help the aftertreatment system run more efficient thus eliminating any issues due to temperature. While the permit change may be acceptable by the department of ecology, the fact is Quincy will have more air pollution as a result. This is also a departure from many other states which are requiring the use of controls at data centers including retrofitting existing engines when adding engines to existing sites.

ELM has these systems running at other data centers and have passed all testing. The cost per ton of emissions removed is between \$25,000 and \$40,000, nowhere near the ridiculous numbers being cited by Landau. The regulatory use of emergency Tier 2 engines in these concentrations on 1 site is a major pollution source by federal standards using the 500 run hours as required.

Allowing permit limits for the purpose of avoiding title V to get a permit in the case of data centers providing 24x7x365 uptime is gaming the system. Why do they need more fuel onsite than they have run hours? The bet for them is the engines will be allowed to exceed the permit run limits in a real outage. Given today's reliance on cloud data, a very safe bet to the detriment of the health of Quincy residents. Our systems will reduce emissions and does not allow for ammonia crystals formation in the lines as indicated. Our use of patented return flow injectors that continuously keep the urea circulating even when not injecting, eliminate crystal formation from the system. If there are crystals in the lines, our systems will alarm the panel due to return flow sensors and a filter. Bad urea and not using 100% low ash oil are the cause of systems non-performance. Data Centers will always have onsite power generation to meet their contractual obligations and will run them regardless of what the permit says in an emergency.

Ecology Response

Thank you for your comments. Ecology has no authority to direct a facility to install specific equipment. We have reviewed the project as proposed by the applicant. Based upon that review, we determined that

the proposal for operations with Tier 2 controls, limited operating hours and limits in fuel usage, will meet all applicable requirements for permit approval, including NAAQS compliance and Best Available Control Technologies (BACT) requirements. In accordance with [WAC 173-400-113](#) *New sources in attainment or unclassifiable areas - Review for compliance with regulations*: “The permitting authority....shall issue an order of approval if it determines that the proposed project satisfies the legal requirements.”

Vantage Data Centers – Mark Johnson

B-4-1: Permit Conditions

We appreciate all the time and effort that Washington Department of Ecology (Ecology) representatives have spent reviewing and processing Vantage Data Centers' (VDC) Notice of Construction (NOC) air quality permit amendment application and carrying out the public engagement requirements. We do note, however, that the Preliminary Determination (PD) does not include some of the flexibility that we requested in order to meet our operational needs.

There were two requests included in the NOC application that Ecology has not accepted, but we believe are necessary to meet operational needs for the facility:

1. Condition 3.5 of the PD restricts a site integration test, which is carried out as the last stage of emergency generator startup and commissioning, to no more than four continuous hours. VDC requested an allowance of 10 hours for a site integration test for each emergency generator for three reasons:

- a. Four hours is the minimum amount of time needed for a site integration test assuming that all the wiring is connected perfectly the first time. However, due to the high complexity of wiring a data center with VDC's design and reliability needs, it is rarely done perfectly the first time. In those circumstances, the first site integration test fails, troubleshooting is required, and a second site integration test is necessary.
- b. When emergency generators for a single building are installed in multiple phases, a generator may have to undergo two separate site integration tests. For example, a site integration test was completed for VDC's existing 5 generators, but once the remaining two generators are installed in that same building in the next phase of installation, a site integration test will need to be completed for all seven generators in that building.
- c. Our reliability certification process requires that a representative from the Uptime Institute observe a site integration test for each building. This site integration test must be completed separately from the site integration test completed by our electrical contractor.

2. The PD does not allow VDC to average the fuel use and annual runtime limits over all generators in service. This flexibility was requested so that if, due to technical problems with an emergency generator, it became necessary to run it for extra hours for troubleshooting and/or multiple rounds of stack testing, VDC would not be at risk of exceeding the operating limit for that generator (i.e., the unused allowable hours for one of the other emergency generators could act as a buffer). This would be especially concerning if that extra operation was required in the same 3-year period that the generator was commissioned and multiple power outages occurred.

In an effort to work with Ecology to 1) comply with applicable regulations, and 2) develop permit conditions that align with actual operating needs so that the data center does not unnecessarily at risk of

compliance violations, VDC's NOC application intentionally included technical evaluations to demonstrate compliance with the conditions described above. We're concerned that in certain circumstances, not having this additional flexibility puts VDC at greater risk of a permit violation. Therefore, we request that this flexibility be integrated into the final Approval Order.

[Ecology Response](#)

Ecology will agree to the requested 10 hours for site integration testing of each engine. We will also agree to the request to allow averaging of fuel use and annual runtime limits over all generators, although we note that there are currently 5 engines 'in-service' at Vantage, with an understood need for 3 (2N+1 with a single 3 MW client). This is the reason the requested allowance was not provided in the Preliminary Determination. We will rewrite the conditions to reflect averages over the engines in service.

Appendix A

- Dal Porto Exhibits: 4 pages plus cover sheet
- Martin Exhibits: 7 pages
- Vantage Public Hearing Transcript: 6 pages

List of Exhibits

Danna Dal Porto
Quincy, WA

Vantage Public Hearing
July 12, 12017

1. Exhibit 1...Photograph, Microsoft Columbia, May 2015, Black Puff Cold Start.
2. Exhibit 2...Map, Post Vantage (May 2012) Cumulative Diesel Particulate Concentrations, map courtesy Washington State Department of Ecology response to Comment 43.
3. Exhibit 3...Map, Third Tier Review Recommendation, Figure 3, Estimated annual average off-site DEEP concentrations attributable to proposed Microsoft emissions (expansion project only).
4. Map, Project- only DEEP Concentration Contour Map, Figure 4-1, Vantage Data Centers, Quincy, WA



MICROSOFT COLUMBIA, MAY 2015

EXHIBIT 1

Reference for Ecology response to Comment 43:

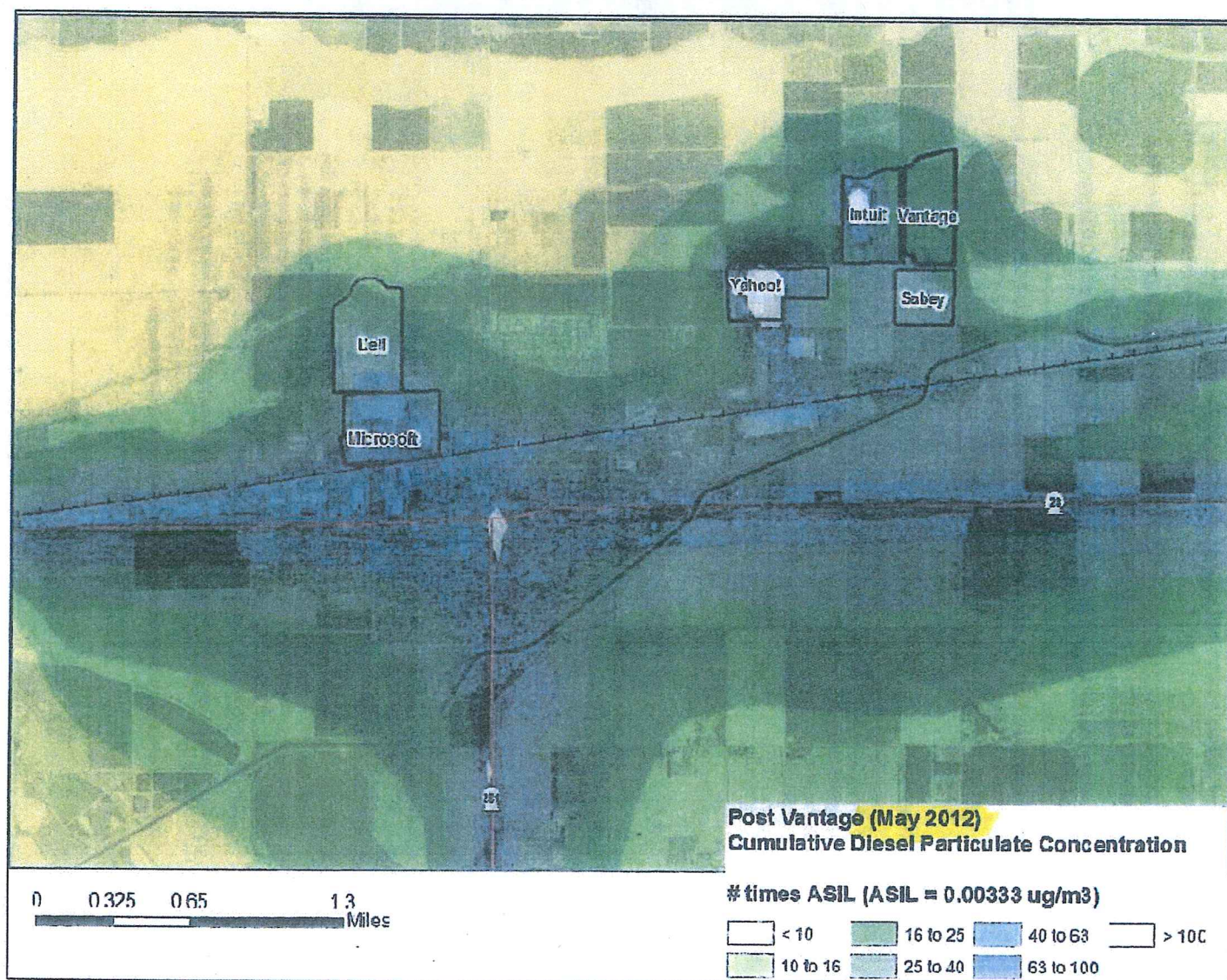


EXHIBIT 2

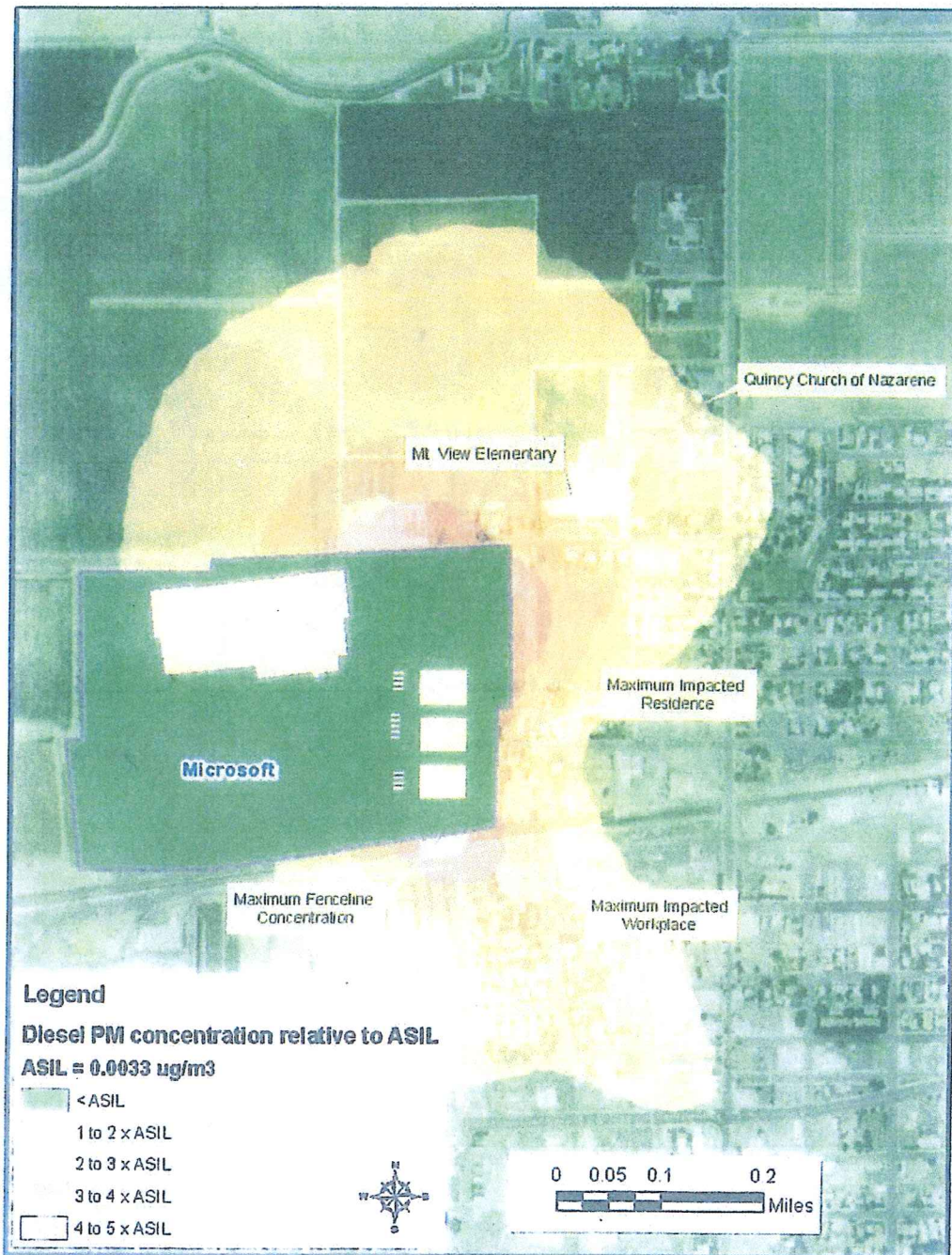
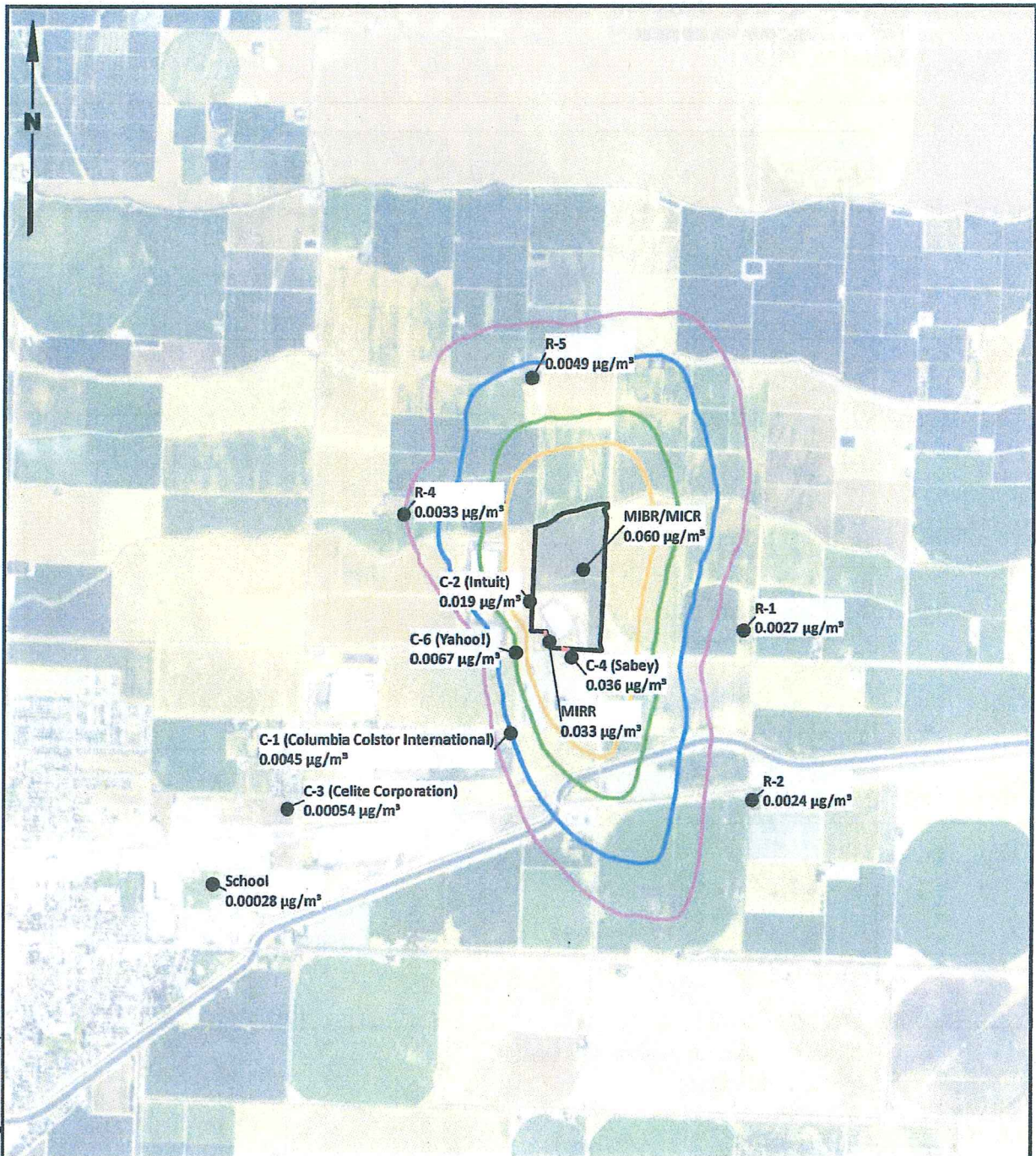


Figure 3. Estimated annual average off-site DEEP concentrations attributable to proposed Microsoft emissions (expansion project only).

This is the expansion



Legend

Property Boundary

DEEP Concentrations

- 0.0025 µg/m³
- 0.0033 µg/m³
- 0.005 µg/m³
- 0.007 µg/m³
- 0.033 µg/m³

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 2,500 5,000

Scale in Feet

EXHIBIT 4

Data Source: Esri World Imagery.

Vantage Data Centers
Quincy, Washington

**Project-Only DEEP Concentration
Contour Map**

Figure
4-1

G:\Projects\1489\001\010\011\F04-1\ProjectDEEP_revised.mxd 11/9/2016



POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON

MYTAPN,

Appellant,

and

PATRICIA A. MARTIN,

Appellant Intervenor,

v.

WASHINGTON STATE DEPARTMENT
OF ECOLOGY; DELL MARKETING
LP,

Respondents.

No. PCHB No. 11-135

THIRD DECLARATION OF JAMES
WILDER IN SUPPORT OF
RESPONDENT DELL
MARKETING'S SECOND MOTION
FOR SUMMARY JUDGMENT

James Wilder declares as follows:

1. I am a citizen of the United States and am over the age of 18. I make this declaration based on my personal knowledge and am competent to testify to the facts set forth herein.

2. Until October 26, 2012 I was employed by ICF International and now am employed by Landau Associates, Inc.

3. In addition to serving as the project consultant for Dell's Quincy Data Center, I have served as project consultant for the Intergate Quincy Data Center, the Titan

THIRD DECLARATION OF JAMES WILDER IN
SUPPORT OF RESPONDENT DELL
MARKETING'S SECOND MOTION FOR
SUMMARY JUDGMENT - 1

K&L GATES LLP
925 FOURTH AVENUE
SUITE 2900
SEATTLE, WASHINGTON 98104-1158
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

1 Data Center, the Olympia DIS Data Center, the Vantage Data Center and the Microsoft
2 Data Center.

3 4. Attached hereto as Exhibit A is a true copy of the draft Vantage Permit,
4 dated November 8, 2012.

5 5. Attached hereto as Exhibit B is a true copy of the October 1990 Draft EPA
6 New Source Review Workshop Manual.

7 6. Attached hereto as Exhibit C is a true copy of ICF's April 27, 2011 Notice
8 of Construction Support Document, with page numbers added after page 43.

9 7. Attached hereto as Exhibit D is a true copy of Ecology's June 9, 2011
10 Technical Support Document for Approval Order No. 11AQ-E4XX.

11 8. Attached hereto as Exhibit E is a true copy of 40 CFR §89.410 (Engine
12 Test Cycle) and Appendix B to Subpart E of Part 89 – Tables.

13 9. The Vantage data center voluntarily proposed using engines equipped with
14 catalyzed diesel particulate filters (DPFs) and urea-based selective catalytic reduction
15 (SCR) for NOx and NO2 removal because air quality dispersion modeling showed that if
16 the facility had used conventional EPA Tier 2 generators (without supplemental DPFs or
17 SCR) then the higher emissions from the facility would likely cause the modeled
18 downwind ambient concentrations to exceed the NO2-NAAQS and the NO2-ASIL during
19 a power outage, and the annual-average DEEP cancer risk would likely exceed 10-per-
20 million at the closest residential property line. This decision to voluntarily install
21 emission controls was not based on a BACT analysis, but was instead made in order to
22 comply with the NAAQS. Therefore, installation of DPFs and SCR is not the "BACT
23 determination" for the Vantage data center.

24 10. Table 3 and Table 4 of the pending permit application for the Vantage data
25 center, attached at Exhibit A, clearly state that BACT and tBACT consist of Tier 2

THIRD DECLARATION OF JAMES WILDER IN
SUPPORT OF RESPONDENT DELL
MARKETING'S SECOND MOTION FOR
SUMMARY JUDGMENT - 2

K&L GATES LLP
925 FOURTH AVENUE
SUITE 2900
SEATTLE, WASHINGTON 98104-1158
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

The “Single Load” emission limits in Table 4 should be revised to specify the maximum emission rate at each maximum load for each pollutant.

Condition 5.2: Facility-Wide Annual Emission Limits

As described in Appendix B, the flexibility to run engines at any load between 10 and 100 percent, combined with the use of Caterpillar’s new emissions data, requires adjustments to the facility-wide annual emission limits in Condition 5.2. The revised facility-wide limits are now “ultra-worst-case” values that assume the maximum possible operating conditions for each pollutant. For example, the revised DEEP emission rate now assumes that each of the 45 generators operates at the allowable hours per year exclusively at 10 percent load, which is the load at which the PM emission rate is highest. For another example, the revised NO_x emission rate now assumes that each of the 37 primary generators operates for 86 hours per year and the eight new reserve generators operate for 40 hours per year exclusively at 100 percent load, which is the load at which the NO_x emission rate is highest.

Condition 5.2 should be revised to specify the annual emission limits as 3-year rolling averages, to reflect the 3-year rolling runtime limit specified by Condition 3.2.1. The revised ambient impact assessment provided in Appendix B evaluates the theoretical-maximum annual-average impacts assuming that all of the allowable emissions during any 3-year rolling period could occur during a single year (except for the 70-year average DEEP cancer risk, which continues to be modeled based on the 3-year rolling average DEEP emission rate).

The revised facility-wide annual emission limits presented in this resubmittal account for the revised assumption that all cold-start conditions last for 15 minutes, and account for inclusion of the “black-puff” factors for CO and volatile organic compounds (VOCs).

Appendix B shows the derivation of the revised annual limits. It then models the worst-case emission rates permitted by the proposed emission limits and operating hour restrictions to demonstrate that NAAQS and Chapter 173-460 WAC health impact thresholds are protected.

Proposed New Condition 5.5: Facility-Wide 1-Hour NO_x Emission Limit

This proposed new condition sets an allowable facility-wide NO_x emission limit of 575 lbs/hr. That is the facility-wide NO_x emission rate calculated for the first hour of an unplanned outage when all 37 primary generators activate with a cold start to 100 percent load for 1 hour, while all 8 reserve generators activate with a cold start to 10 percent load for 30 minutes. Detailed emission calculations for this scenario are provided in Appendix B. The revised second-tier risk assessment for NO₂ uses AERMOD³ modeling based on that facility-wide NO_x emission rate of 575 lbs/hour. The second-tier risk analysis demonstrates that the NO₂ human health risks would be acceptable at the NO_x emission rate of 575 lbs/hour.

³ American Meteorological Society (AMS)/US Environmental Protection Agency (EPA) regulatory model.

TABLE 1
CATERPILLAR LOAD-SPECIFIC EMISSION RATES FOR DIESEL GENERATORS
MICROSOFT OXFORD DATA CENTER
QUINCY, WASHINGTON

Pollutant	Condition	lbs/hour at 100% Load	lbs/hour; Maximum Between 10%-75% Loads	lbs/hour at 10% Load
2.5-MW Generators				
NO _x	Cold	50.6	31.1	7.02
	Warm	9.11	3.73	1.26
CO Including Black Puff Cold-Start Factor	Cold incl. 1.56 black puff factor	9.38	4.62	4.62
	Warm	1.4	1.11	1.109
NMHC Including Black Puff Cold-Start Factor	Cold incl. 1.26 black puff factor	1.1	1.2	1.21
	Warm	0.198	0.346	0.346
PM Including Black Puff Cold-Start Factor, Front Half Plus Back Half	Cold incl. 1.26 black puff factor on front half	0.407	0.635	0.635
	Warm	0.272	0.401	0.401
2.0-MW Generators				
NO _x	Cold	42.1	22.5	6.46
	Warm	4.04	7.75	7.75
CO Including Black Puff Cold-Start Factor	Cold incl. 1.56 black puff factor	3.45	3.95	6.16
	Warm	0.8	0.95	0.948
NMHC Including Black Puff Cold-Start Factor	Cold incl. 1.26 black puff factor	0.93	1.13	1.23
	Warm	0.167	0.353	0.353
PM Including Black Puff Cold-Start Factor, Front Half Plus Back Half	Cold incl. 1.26 black puff factor on front half	0.373	0.661	0.661
	Warm	0.209	0.434	0.434
750-kW Generator				
NO _x	Cold	15.8	9.2	2.89
	Warm	1.33	3.47	3.47
CO Including Black Puff Cold-Start Factor	Cold incl. 1.56 black puff factor	1.15	1.51	1.9
	Warm	0.3	0.44	0.439
NMHC Including Black Puff Cold-Start Factor	Cold incl. 1.26 black puff factor	0.12	0.22	0.28
	Warm	0.022	0.106	0.106
PM Including Black Puff Cold-Start Factor, Front Half Plus Back Half	Cold incl. 1.26 black puff factor on front half	0.349	0.608	0.608
	Warm	0.04	0.136	0.136
Color-highlighted cells indicate worst-case load-specific values used for emission calculations and ambient air quality impact modeling.				

Subject: RE: NO2/NOx ratio

From: "Bray, Dave" <Bray.Dave@epa.gov>

Date: 6/9/2017 7:43 AM

To: Patty Martin <martin@nwi.net>

Hi Patty,

It's not clear whether you're asking about the ratio of NO2 to NOx in the stack emissions or the ratio of NO2 to NOx in the ambient air.

Modeling compliance with the NO2 NAAQS requires an initial in stack NO/NOx ratio and an in-stack ratio of 0.1 (10%) for Tier 3 NO2 modeling may be appropriate if there is sufficient reference to stack test data. Otherwise, the EPA default in stack ratio is 0.5 (50%). Note, any use of Tier 3 NO2 modeling methods requires consultation with the Regional Office and our Region Modeler says that Ecology has not consulted with him.

Dave

-----Original Message-----

From: Patty Martin [<mailto:martin@nwi.net>]

Sent: Wednesday, June 07, 2017 3:45 PM

To: Bray, Dave <Bray.Dave@epa.gov>

Subject: NO2/NOx ratio

Dave,

What is the accepted NO2/NOx ratio? The data centers are saying that only 10% of the NOx is converted to NO2.

Patty

APPENDIX B

Diesel Generator "Cold-Start Spike" Adjustment Factors

Short-term concentration trends for emissions of volatile organic compounds (VOC), carbon monoxide (CO), and oxides of nitrogen (NO_x) immediately following a cold-startup of a large diesel backup generator were measured by the California Energy Commission (CEC) in its document entitled Air Quality Implications of Backup Generators in California (Lents et al. 2005)¹. CEC used continuous monitors to measure the trends shown in the attached figure (Figure B-1), which are discussed below.

As shown on Figure B-1, during the first 14 seconds after a cold start, the VOC concentration spiked to a maximum value of 900 parts per million (ppm) before dropping back to the steady-state exhaust concentration of 30 ppm. The measured (triangular) area under the 14-second concentration-vs-time curve represents emissions during a "VOC spike," which is 6,300 ppm-seconds.

Unlike VOC emissions, the NO_x exhaust concentration did not "spike" during cold-start. It took 8 seconds for the exhaust concentration of NO_x to rise from the initial value of zero to its steady-state concentration of 38 ppm. The measured area under the concentration-vs-time curve represents the "NO_x deficit" emissions of 160 ppm-seconds.

The CEC was unable to measure the time trend of diesel engine exhaust particulate matter (DEEP) concentrations during the first several seconds after a cold start. Therefore, for the purpose of estimating the DEEP trend, it was assumed that DEEP would exhibit the same concentration-vs-time trend as VOC emissions.

The numerical value of the Cold-start Spike Adjustment Factor was derived by dividing the area under the "cold-start spike" by the area under the steady-state concentration profile for the 1-minute averaging period.

Example: Cold-Start Spike Factor for VOCs, first 1-minute after cold-start at low load.

The "VOC spike" was observed 14 seconds after cold-start and reached a concentration of 6,300 ppm-seconds. The triangular area under the curve is $\frac{14 \text{ seconds} \times 900 \text{ ppm}}{2} = 6,300 \text{ ppm-seconds}$.

The steady-state VOC concentration is 30 ppm. For the 1-minute (60-seconds) steady-state period the area under the curve is $(60 \text{ seconds} - 14 \text{ seconds}) \times 30 \text{ ppm} = 1,380 \text{ ppm-seconds}$.

Therefore, the cold-start emission factor (to be applied to the warm-emission rate estimate for the first 1-minute after cold-start) was estimated by $\frac{6,300 \text{ ppm-seconds} + 1,380 \text{ ppm-seconds}}{30 \text{ ppm} \times 60 \text{ seconds}}$.

¹ Lents, J.M., L. Arth, M. Boretz, M. Chitjian, K. Cocker, N. Davis, K. Johnson, Y. Long, J.W. Miller, U. Mondragon, R.M. Nikkila, M. Omary, D. Pacocha, Y. Quin, S. Shah, and G. Tonnesen. 2005. Air Quality Implications of Backup Generators in California - Volume One: Generation Scenarios, Emissions and Atmospheric Modeling, and Health Risk Analysis. Publication No. CEC-500-2005-048. California Energy Commission, PIER Energy-Related Environmental Research. March.

**Complete Transcript of Vantage Data Center Public Hearing
Quincy Community Center, July 12, 2017**

- 0:00:02 Erika Bronson: OK. I'm the hearings officer Erika Bronson. This evening we are conducting a hearing on the draft permit for the Vantage Data Center's Riker Facility in Quincy. Let the record show that it is 7:01 on July 12, 2017 and this hearing is being held at the Quincy Community Center at 115 F Street SW in Quincy, WA.
- 0:00:29 Legal notice of this hearing was published in 3 area newspapers including the Quincy Valley Post Register, which published it on June 8, 2017. Display ad reminders were published in 3 area newspapers including the Quincy Valley Post Register on July 6. Spanish language display ads were placed in the El Mundo newspaper on June 29 and July 6. A press release was published in English and Spanish on June 8, 2017.
- 0:01:00 ListServ emails were sent to the Quincy Data Center Interested Party's distribution list on June 8, July 7, and July 11, 2017. Notices were also sent via Twitter in both English and Spanish. It is now the formal comment time for anyone who would like to comment. I'll be calling you to testify in the order in which you signed in. When I call your name please step up to the table and state your name and the company or organization you represent, if any.
- 0:01:34 Please remember to limit your comments to about 10 minutes and audience: please, no extra noise. When you have 30 seconds left to complete your testimony Kari Johnson will hold up a card. When your time is up I will call the next person up to testify. So we'll begin with Debbie Koehnen who will be followed by Danna DalPorto.
- 0:02:07 Debbie Koehnen: I'm Debbie Koehnen and I represent myself, my family, the community. I'm a teacher so I also represent all the children and the future of our community. So I'm trying to make sure we have quality air and a quality living space so that everybody's safe. I appreciate – I want to say thank you to Vantage for trying to fix the problem.
- 0:02:33 As to putting all that money into testing those Tier 4 scrubbers and add-ons that apparently didn't work. I'm rather horrified that we were exposed to extra toxins but hopefully we're wiser now and we'll see when we have the health monitoring – hopefully they can show us that that's okay. One of the questions that I had was I understand that buildings really affect air flow and the plumes.
- 0:03:08 And so I have a question about when they modeled what was – the model where the generators were going to be with the buildings already in the place it would be when they were installed – or was it 12 generators where the first building is. I

think – I’m concerned that we might have a different model or plume based on how that was modeled.

0:03:37 The next question I have is in the presentation we had from Gary it said that all east side stations in the worst case scenario would be, you know – it would be okay. It would be non-significant. My concern is that we do have a lot of centers with overlapping plumes so was that taken into consideration for this project?

0:04:04 Not just all east side stations in the worst case scenario but everybody. We did have a fire in the transformer station in Ephrata this year during the winter and we had no power and it took them quite a while to fix that. So I presume the generators were running so this could be a problem where everybody would be using their generators.

0:04:29 Another concern I have is that the cap is 10 million but we’re at 9.9 and that’s pretty darn close so if there’s another problem that arises – what’s going to happen? That seems a little too close for comfort, that we’re right there at the limit. When other problems have occurred that we weren’t anticipating with the Tier 4 scrubbers and add-ons that weren’t working – I’m very concerned about that.

0:04:59 What are we going to do about that? How are we going to fix it? What if it happens? These are a lot of “what ifs” but that’s really a little close for comfort, to be that close. Number 5 – okay – there was the proposal is based on higher stacks for I presume the 12 filters – or the 12 new generators that are going to be placed. But it didn’t say anything about the first 5 that were there with the shorter stacks – aren’t really doing what we had planned.

0:05:30 Maybe that’s a place that they could get that 9.9 a little lower. Maybe if they did something with those stacks – is there any plans for that? And are the stacks sufficient as a air quality control? Health assessment. I’m just really curious about where they’re getting that info because I’ve been living here for quite a while and I’m really close.

0:05:59 I’m now – my residence is in an area of – a house of concern – a residence of concern when they have the overlapping plumes. And nobody’s come to me and asked about my health. So I’m curious about that. What’s going on with that? And how are we going to be included in that? Number 7. Every time I come I question if we’re really seeing what’s the best for us. I know we have cheap power here in Quincy but there are other options that maybe would be better for our health.

0:06:34 Better for our environment, for the future of our community and the kids that are living here. Are we doing battery storage and wind and solar? Okay, we have a lot of wind. We have a lot of solar. Those would work really well here. Are people exploring this – these options instead us using the diesel generators? The smog that’s in our area is just atrocious.

- 0:06:59 You look out – we don’t have a blue sky anymore. We have grey brown awful ugly and yeah we have a lot of fires and we have a lot of dust but those are always there so that has to be accounted for. So are there other options that we could use besides these diesel generators. Besides diesel is non-renewable and it would be nice if we went to a more green – more let’s save the world possibility here.
- 0:07:29 Because this is just going to keep going. I really appreciate you taking the time to answer these questions. And, well, speak now or forever hold your peace. That’s what I’m doing. I’m speaking now and saying can we please make it a better place? I appreciate all the companies helping us out here. Instead of just using the back – I know these guys tried to use the tier 4 which didn’t work which is – we really appreciate but wow maybe we just need to get off that diesel generator if we can. Is that a possibility? Thank you very much.
- 0:08:03 Erika: Thank you Debbie. So next up is Danna DalPorto and following her will be Patrick Boss.
- 0:08:23 Danna DalPorto: My name’s Danna DalPorto. I live at 16651 Road 3 NW, Quincy. I’ve lived in Quincy since 1980. That’s a long time. I want to thank everybody for the opportunity to comment on the Vantage Data Center for revised permit. And I’m really pleased tonight with the amount of interest shown in this particular meeting. We’ve had very little interest in some of our meetings and it’s kind of disappointing. My printed statement is actually 4 pages of comments and I will spare you the details of that by having a shorter speaking format.
- 0:09:01 Tonight’s meeting was kind of unnerving because the Vantage people presented new and different information than what was available to me to read on line regarding this permit revision. And so now I have to kind of reconsider my comments -- which are basically very negative. I initially believed that Vantage was asking to remove these emission controls on their data center facilities and they did not convince me in the material provided that these controls were not operating properly.
- 0:09:37 And it occurred to me tonight as well “how could this company spend that kind of money on equipment that they didn’t know worked?” I find that just almost unbelievable. So in reading the documents that were provided online it looked to me like somebody must have fiddled with the numbers to arrive at the conclusions that they did.
- 0:10:04 If they used physical monitoring on the revision to determine emissions and yet they used computer modeling in the initial permit – how can they compare those 2 kinds of data? Because they didn’t explain to me how they arrived at the numbers that they arrived at in this revised permit. So if you enter different data you are gonna get different results. So based on what I read in the documents they used

only 2 performance reviews to determine their emissions. Apparently that is really not true – they did quite a bit more.

0:10:45 But if I were a scientist I would certainly use more than just 2 tests to determine what my outcome would be. And I don't believe that 2 tests would be appropriate for determining the emissions on this facility. It explains in the documents that Vantage complained that the EPA Tier 4 emission control vendor was unable to meet the EOM Energy Performance guarantee. The issue at hand is not the guarantee of the manufacturer of the emission controls.

0:11:19 The issue at hand is how do these emissions really relate to EPA standards and the standards of the state of Washington? Did the controls lower the emissions? And if so – if they lowered the emissions then those controls should stay in place. The documents didn't explain to me – unless – I could not read and understand the charts because I just don't do that. But the documents themselves did not explain to me that what wasn't fixed. Tonight I visited with people in the Vantage group and they explained to me that yes they could meet the knocks levels. Yes, they could meet the other levels but not diesel particulate.

0:12:04 So that's a real specific issue. I was prepared with my visual aids tonight to describe to the audience my frustration with the Department of Ecology and the modeling issue. So now that I know there is a monitor coming I probably don't need to do this but I went ahead and brought this muffin and I'm gonna use it.

0:12:31 Let us assume that I have a severe peanut allergy and I have this muffin and I want to eat it. Now how can I determine if this muffin has peanuts in it? I can model it based on the various components of most muffins. You guys aren't going to take my picture with this muffin? No! [laughter]

0:12:58 Anyway so most muffins have uniform ingredients. Flour, sugar, oil, eggs, salt, baking soda -- but what about peanuts? How will I be able to tell if this muffin had peanuts if I only used a model? I would have to look at the ingredient list. In other words, I would have to take the muffin and inspect whether or not it had peanuts on it and that would be an important factor if I have a severe peanut allergy.

0:13:31 So I want to make that point – that modeling to figure out what's going on here with our data centers is inappropriate and ineffective and I don't like it. We need to know what's going on. We need to be able to have that machine take the air and test it. So I'd be delighted to know that Ecology is providing us with apparently a quality air monitoring device and that will help with what we're doing.

0:14:02 I don't know how to end my comments about Vantage. I was very disappointed in the Landau documents. I don't think they gave me enough information at all. And actually in some cases misdirected me. I'm sorry for them that they made this

huge investment but I really don't think that Ecology should allow them to reduce the emission controls. So that's my comment. Thank you.

- 0:14:32 Erika: Thank you, Danna. Enjoy your muffin. Next up we have Patrick Boss followed by anyone else who has decided they want to testify.
- 0:14:48 Patrick Boss: Thank you. Hi everybody. I'm Patrick Boss. I'm here on behalf of the Port of Quincy and here to strongly testify in support of Vantage's proposed air permit change. As we discussed earlier and as you heard in the conversation earlier many of the data centers here are permitted for much more generators than they actually have. In the case of Vantage I think we heard that they are permitted for 17 but only have 5. And as a result – and there's many other issues we could talk about but I don't want to get into those tonight.
- 0:15:29 But as a result – given the difference between the hypothetical amount of generators and the actual amount the Port believes there is no risk here and this whole proposal proposes absolutely no risk. And then frankly Vantage – you know when you – this company has been in this community for many years. Great corporate citizen, do a lot for the community, never had any issues out there before. They've done some great things down in California.
- 0:16:00 Try to be as state of the art as they can be with their technology and have got some great tenants in their building – really help the economy here so we want more companies like that in the community that are doing these types of things. I didn't want to get in – I'm going to have my own visual aid here. I didn't want to get into hypothetical vs. reality here. I mean this is the permitted amount of diesel generators in Quincy and this is the actual amount.
- 0:16:29 And once again there's just not an issue with hypothetical. And frankly EPA Ecology over the years – and they have to plan for worst-case scenario but in this case there's no worst-case scenario because none of these generators are even installed. And so I understand the worst-case scenario of planning but the actual risk is infinitesimal compared to what the theoretical or hypothetical risk is.
- 0:16:57 The other thing I want to say too is there's been a number of statements made over the years by Ecology and by other agencies that when they looked at comparable air quality between Quincy and other communities Quincy still is ranked very highly in the top 2 or 3 communities in terms of very clear clean air quality. When you compare that – and I think the EPA – I'm sorry – Ecology even went on the record here I saw an article here a couple years ago. I don't know if it was Gary or somebody was quoted or somebody was quoted that said that the air quality here was much better than Seattle, Tacoma, Yakima, Wenatchee.
- 0:17:41 And a lot of it is just where we're located. A lot of it too is that we're in an area where we don't have huge amounts of manufacturers or emitters here and the

Data Centers don't emit anything related to major manufacturers. So I think we kind of need to step back and take a look at that and just make sure that we're looking comparably at how we rank against other communities. I appreciate the passion that the other people who testified tonight showed. I think everybody cares about their community. I think we all want to do the best for our community. But the Port believes this is not a big issue in the bigger scheme of things. There's other bigger issues here that we need to be tackling.

0:18:28 As I said before we greatly support Vantage and their proposal. Great company. We want to see more of the Vantage types of companies in our community. Thank you.

0:18:39 Erika: Thank you, Patrick. Okay is there anyone else who has decided they would like to testify? All right, so all testimony received at this hearing, along with any written comments received by the end of the comment period which I believe is –

0:18:57 Kari Johnson: Monday at 5pm.

0:18:58 Erika: Monday at 5pm. Will be responded to in a report. If you would like to send Ecology written comments – well, I skipped ahead on the script here – but just let's reiterate they are due by 5pm on Monday July 17th. We do accept written comments here at the hearing but that is actually now over except for on the forms by mail, by email or on the web using our online comment form.

0:19:27 To get instructions on how to comment by mail, email or online please pick up a fact sheet on the table. The next step is for Ecology to consider the comments and make a determination whether to issue the permit. Ecology will then compose a response to comments report and other required documentation. The response to comments will be posted on Ecology's web page noted on the fact sheet. If you are signed up for the Quincy Interested Parties list serve email you will be notified when it's available. On behalf of the Department of Ecology I thank you all for coming tonight. Let the record show that this hearing is adjourned at 7:21pm.

[end of file]