DEPARTMENT OF
ECOLOGY
State of Washington

Response to Comments

Draft Air Quality Permit for Vantage Data Centers 12AQ-E450

Public Comment Period:
July 30, 2012 – Sept. 10, 2012 &

Public Comment Period:
Dec. 10, 2012– Jan. 11, 2013

Summary of a public comment period and responses to comments on a new permit

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For more information contact:

Beth Mort
Community Outreach and Environmental Education Specialist
Eastern Regional Office
4601 N Monroe Street
Spokane, WA 99205-1295
Phone: 509-329-3502
Email: beth.mort@ecy.wa.gov
Washington State Department of Ecology - www.ecy.wa.gov

1.	Headquarters, Lacey	360-407-6000
2.	Northwest Regional Office, Bellevue	425-649-7000
3.	Southwest Regional Office, Lacey	360-407-6300
4.	Central Regional Office, Yakima	509-575-2490
5.	Eastern Regional Office, Spokane	509-329-3400

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Response to Public Comments

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Vantage Data Centers
12AQ-E450

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Department of Ecology
Air Quality Program
Eastern Regional Office
4601 N Monroe Street
Spokane, WA 99205-1295

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Table of Contents

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Introduction

Any new air pollutant source must meet emissions standards set by the federal Environmental Protection Agency (EPA) and meet the requirements of the Washington State Clean Air Act. The Washington State Department of Ecology's (Ecology) Air Quality Program (AQP) manages air pollution within the state and is responsible for ensuring that those federal and state standards are met. The AQP does this by writing permits to regulate emissions from various sources. The AQP's goal is to safeguard public health and the environment by preventing and reducing air pollution.

Before construction can begin on a new or changed air source pollution project, the applicant must apply to Ecology for an air quality permit. This permit is called a Notice of Construction approval order (NOC). The application for the NOC requires the applicant describe all air contaminant emissions from the project, identify the federal air regulations that apply, describe the project's emission control technology, and prove that air quality standards won't be violated. If emissions of toxic air pollutants exceed levels set in state regulations, a Health Impact Assessment must also be conducted to prove that there is minimal health risk to the community. Ecology reviews applications for projects and develops conditions of approval to ensure that the project will comply with the Washington Clean Air Act, Revised Code of Washington (RCW) 70-94 and the Washington Administrative Codes (WAC) developed to implement RCW 70-94.

If the project meets these requirements, Ecology must approve the Notice of Construction application.

This Response to Comments is prepared for:

Proposed permit:	Vantage Data Centers Quincy, Grant County, WA
First Comment period:	July 30, 2012 – Sept. 10, 2012
Public hearing date:	September 6, 2012
Second Comment period	December 10, 2012 – January 11, 2013
Date final permit issued:	March 18, 2013

This document can be viewed online at: https://fortress.wa.gov/ecy/publications/SummaryPages/1302001.html. To view other documents related to Ecology's final action on this draft permit please visit our website: http://www.ecy.wa.gov/programs/air/quincydatacenter/.

To see more information related to air quality in Washington, please visit the air program's website: http://www.ecy.wa.gov/programs/air/airhome.html.

Reasons for Issuing the Permit

Vantage has applied to the Washington Department of Ecology (Ecology) for a permit called a Notice of Construction approval order (NOC). The purpose of a NOC is to protect air quality and it is required before a new source of air contaminants can be built or modified. The NOC is needed because data centers use large, diesel-powered backup generators to supply electricity to the servers during power failures. Some data centers contain cooling towers or other pollution sources as well. The primary air contaminant sources at the facility are 17 electric generators powered by diesel engines. Each generator has a power capacity of 3 megawatts. Four of the proposed center's five buildings will house generators and will be phased in over several years.

Ecology requires the applicant, Vantage in this case, to apply for a permit to comply with federal and state air quality standards. These standards are intended to limit the amount of emissions released into the air and maintain air quality at or below the health based standards. The applicant must use "Best Available Control Technology" (BACT) to ensure that their emissions are controlled to the best degree they can be, in a cost-effective manner.

Vantage's proposed data center facility is to be located at the intersection of Road O NW and 11 Road NW. Data centers house the servers that provide e-mail, manage instant messages, and run applications for our computers.

Public Involvement Actions

Ecology Air Quality Program encouraged comment on the Vantage Data Centers draft air quality permit and supporting documents during a public hearing and two 30-day comment periods. Below are the public involvement actions for each comment period. The first comment period was held July 30, 2012 through September 10, 2012. The public hearing was held September 6, 2012. The second comment period was held December 10, 2012 through January 11, 2013. See Appendix A for copies of public involvement documents mentioned below and Appendix C for the transcripts and agenda from the public hearing.

First Public Comment Period: July 30, 2012 – September 10, 2012

1. Several public notice legal classified advertisements were placed in the Columbia Basin Herald. A legal notice was run accidentally on June 27, 2012 advertising the public hearing date as July 31, 2012. This date was incorrect and the notice was withdrawn on July 16, 2012. The correct and final public notice was run on July 30, 2012 advertising the correct public hearing date on September 6, 2012. The ad stated the following information: where the project documents were available for review; the date, time and location of the public hearing; information on how to submit public comment; and beginning and end dates of the comment period.
2. Information about the public hearing and public comment period was submitted incorrectly to Ecology's Public Involvement Calendar at: http://apps.ecy.wa.gov/pubcalendar/calendar.asp. The hearing and public comment period did not show up online as intended.
3. On July 30, 2012 two emails were sent to 70 individuals on the Quincy interested parties distribution list (interested parties) notifying them of the details for the public hearing and public comment period.
4. On July 30, 2012, Ecology issued a press release to all news media – radio, TV, and newspapers – in Grant, Adams, Kittitas, and Douglas counties.
5. Display ads inviting the public to the hearing were published in the following publications:
    a. Quincy Valley Post Register on August 16th, 23rd, and 30th, 2012
    b. Wenatchee World on August 24th, 29th, 31st, and September 3rd, 2012
    c. Columbia Basin Herald on August 24th, 29th, 31st, and September 3rd, 2012
6. Spanish display ads advertising the public hearing were placed in the following publications:
    a. Quincy Valley Post Register Shopper on August 28th and September 4th, 2012
    b. El Mundo on August 30th, 2012
7. English and Spanish Flyers advertising the September 6, 2012 public hearing for the Vantage draft air quality permit and copies of Ecology's publication "Focus on Exhaust Health Risks" (publication number: 11-02-005) were distributed at the following locations on August 21, 2012 in Quincy, WA:

a. St. Pius X Catholic Church
b. First Baptist Church
c. Citizens at the Lazy Acres Trailer Park
d. El Mercado de Quincy Supermarket
e. Harrington's Drive-In
f. Church of Jesus Christ of Latter Day Saints
g. Quincy Community Health Center and Dental Offices
h. Central Market
i. Quincy Valley Medical Center
j. Tijuana Mexican Restaurant
k. Casa Jalisco Mexican Restaurant
l. Tacos Jalisco
m. Thrifty Villa Shopping Center
n. La Michoacana Paleteria
o. Tacos Mi Pueblo
p. Andaluz Night Club
q. Quincy School District
r. Migrant Headstart
s. Habitat for Humanity
t. The Grape Quincy Wine Cellar
u. Quincy Library

8. A Notice of Public Hearing (publication 12-02-015) was distributed to the Quincy Community Health Center and Dental Offices on August 21, 2012.
9. On August 29, 2012 an email reminder of the hearing and comment period was sent to the listserv of interested parties for this project – approximately 70 people.
10. The July 30, 2012 press release is known to have generated at least three articles: one on the Columbia Basin Herald website on August 10, 2012, and articles in the Quincy Valley Post Register on August 2, 2012 and August 20, 2012.
11. A Spanish language PSA was sent to Adelante Media Group on September 4, 2012 for play on radio station 95.9 which has coverage in the Quincy area.

Second Public Comment Period: December 10, 2012 – January 11, 2013

Ecology set an additional 30-day public comment period for the Vantage Data Centers draft air quality permit. The public comment period was extended because Vantage notified Ecology that Vantage needed to make changes to the draft air quality permit.This information was learned just before the public hearing on September 6, 2012. Vantage announced this at the public hearing and Ecology responded that once changes had been submitted, reviewed, and made available for the public, a second comment period would be held.

1. On October 11, 2012 an email was sent to the interested parties notifying them that the dates for the additional public comment period had not yet been set and the process that needed to happen before they could be set.

2. Information about the second public comment period was submitted to Ecology's Public Involvment Calendar: http://ecyapps3/pubcalendar/calendar.asp.
3. On December 11, 2012 an email was sent to the interested parties notifying them of the extended public comment period.
4. On December 11, 2012 Ecology issued a press release to news media – radio, TV, and newspapers – in Grant, Adams, Kittitas, and Douglas counties.
5. On December 17, 2012 a Spanish translation of the press release was sent out to the following Spanish media outlets whose coverage extends over the Quincy area:
    a. El Mundo
    b. KBSN/ KDRM Radio
    c. KWWX and Sunbrook Affiliates
    d. Washington State Commission on Hispanic Affairs
6. Display ads inviting the public to the hearing were published in the following publications:
    a. Quincy Valley Post Register on December 13, 2012 and January 3, 2013
    b. Quincy Valley Post Register Shopper on December 18, 2012
    c. Wenatchee World on December 16 and 28, 2012
    d. Columbia Basin Herald on December 16 and 26, 2012, and January 6, 2013
7. Spanish display ads advertising the public comment period were placed in the following publications:
    a. Quincy Valley Post Register Shopper on December 18,2012 and January 1, 2013 and January 8, 2013
    b. El Mundo on December 20, 2012 and January 3, 2013
8. The December 11, 2012 press release is known to have generated at least two articles: one in the Quincy Valley Post Register on December 13, 2012 and one in The Royal Register on December 18, 2012.
9. A Spanish language PSA and Spanish version of the press release was sent to Adelante Media Group on December 31, 2012 for play on radio station 95.9 which has coverage in the Quincy area.
10. On January 2, 2013 a Spanish translation of the press release was sent out to the Mexican radio station Juan at KWWX AM 1370, which covers the Quincy area.
11. On January 9, 2013 an email reminder of the comment period was sent to the listserv of interested parties for this project – approximately 70 people.

Note: Ecology received two requests to hold a second public hearing in conjunction with the second comment period. Ecology determined that the changes to the application and permit were not significant and a second hearing was not scheduled.

The public information repositories located at Quincy City Hall in Quincy, WA and Spokane, WA Department of Ecology Office, received the following:

- Legal public notice
- Application materials

- Preliminary Determination (Draft Permit)
- Second Tier Risk Analysis Technical Support Document, Revised Final
- Second Tier Review Recommendation
- Second Tier Petition

The following announcements for both comment periods are in Appendix A of this document:

1. Public notices
2. Display advertisements
3. Notices sent to the Interested Parties email list
4. Spanish and English versions of Ecology's publication "Focus on Exhaust Health Risks" (publication number: 11-02-005)
5. Notice of Public Hearing (publication 12-02-015)
6. Event posted on Public Involvement Calendar page: http://ecyapps3/pubcalendar/calendar.asp
7. Press release for public hearing and first comment period
8. English and Spanish version of the press release for second comment period

Response to Comments

Ecology accepted comments between July 30, 2012, and January 11, 2013. In this section, Ecology staff responds to questions received. Some of what was received was provided as a statement on the topic and did not generate a response. You can see the original content of the written comments we received (either by mail or email) in Appendix B and the transcription of testimony from the September 6, 2012 public hearing in Appendix C. Any documents or additional information provided by commenters is available in Appendix D. Ecology's responses follow each comment.

Five persons submitted a total of 46 comments on the draft permit. Table 1 below lists each commenter, the reference number(s) for each person's comments, and the pages where those comments can be found. All comments along with Ecology's responses follow Table 1. The text in the comments responded to in this section is exactly as it was submitted to Ecology.

Thank you to everyone who provided comment for the public record on this topic.

Table 1. Comment Identifier Table

COMMENTER	ORGANIZATION	COMMENT NUMBER	PAGE NUMBER
Leonard Bauhs	Citizen	1-4	8-9
Danna Dal Porto	MYTAPN	5-7	9-10
Debbie Koehmen	Citizen	8-10	10-12
Patty Martin	MYTAPN	11-16	12-14
Danna Dal Porto	MYTAPN	17-18	15-16
Kris Miller	Citizen	19	17
Patty Martin	MYTAPN	20-32	18-26
Danna Dal Porto	MYTAPN	33-46	26-34

Comments and Responses

Leonard Bauhs, comments 1-4, sent by email. The original email is provided in Appendix B.

Comment 1, Leonard Bauhs:
I am surprised that diesel generators remain the standard backup power source. Are other options considered and encouraged by DOE?

Ecology Response:
The Ecology Air Quality Program (AQP or Ecology) appreciates your concern and is aware of other options for backup power. However, Ecology cannot dictate how a project is proposed or require an applicant to use specific equipment. We can only approve, condition an approval, or deny projects or equipment, see Revised Code of Washington (RCW) 70.94.152. Our authority is limited to making sure that the air contaminant emissions from a project or equipment meets state and federal air quality requirements. Best Available Control Technology (BACT) is defined as an emission limit, and we can require an applicant to submit technical information on how they plan to meet a specific emission limit, RCW 70.94.030(6). Ecology has not asked the applicants to consider other options for providing back up electrical power because we do not have that authority.

Comment 2, Leonard Bauhs:
Hydrogen fuel cell technology has been around for more than a decade. Is the difference in cost so significant that it easily outweighs the difference in impact on the environment?

Ecology Response:
As noted above, we appreciate your concern. However, because we cannot dictate the technology used in a project, we have neither requested nor seen any information on the difference in cost for alternative sources of back up emergency power at the data centers.

Comment 3, Leonard Bauhs:
By themselves, seventeen diesel engines don't seem all that many, but will the thorough evaluation mentioned in the attached story* take into account that these are added to 141 others? Chances are a power outage for one facility will mean there is a power outage at others in the area at the same time. *[*The attachment sent with this email was the July 30, 2012 Ecology Press Release which is included in Appendix A.]*

Ecology response:
Yes. Ecology conducted cumulative modeling of diesel engine exhaust particulate (DEEP) and nitrogen dioxide (NO_2) emissions from data centers and other known sources in Quincy. Cumulative modeling was conducted to determine the chronic and acute risk posed by multiple existing and proposed sources of diesel engine emissions in Quincy. The models and results were updated when new projects were proposed, and when new information was available . The results of these modeling efforts were used to inform permit decisions as well as to provide information to the local government and interested citizens.

Ecology evaluated the long-term health risk associated with exposure to DEEP from all known sources in the Quincy area. The analysis showed that exposure to the highest levels of DEEP is most likely to occur near Quincy's transportation corridors, but is also possible near the borders of Quincy's data centers. The cumulative risk from DEEP emissions in Quincy is less than the cumulative maximum risk threshold established by Ecology for permitting data centers in Quincy.

Ecology also determined that Vantage adequately demonstrated compliance with the fine particulate matter ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS). The 24-hr $PM_{2.5}$ NAAQS was set by EPA to protect people from short-term exposure to small particles (which include DEEP). Vantage's emissions added to background levels of $PM_{2.5}$ did not exceed the NAAQS, therefore, short-term impacts from DEEP exposure were considered and found to be protective of health.

To evaluate possible short-term health effects from a system-wide outage in which all Quincy data center emergency engines operate at the same time. Ecology considered both the probability of a system-wide power outage and the probability of unfavorable air dispersion conditions. Ecology's analysis concluded that coincidental worst-case meteorological and system-wide power outage conditions are extremely unlikely to occur. Although extremely improbable, we cannot completely rule out the possibility of having such a scenario. If such an event were to occur, people with asthma who might be cumulatively exposed to NO_2 and DEEP from emergency engines and other sources may experience respiratory symptoms such as wheezing, shortness of breath, and reduced pulmonary function with airway constriction.

Comment 4, Leonard Bauhs:
Will there come a time and diesel engine count that prompts DOE to say "no" to yet another *[data center application]*?

Ecology Response:
Ecology cannot anticipate whether there will be any additional proposed projects in Quincy that will include diesel engines for power or back up emergency generation. If we do receive any such projects, we will evaluate the project as required in our laws and regulations. There are enforceable state and federal ambient air quality standards that limit the amount of air pollutants in any area. The Air Quality Program could not approve any project that would cause a violation of any ambient air quality standard as stated in the Revised Code of Washington (RCW) 70.94.152(3), and the Washington State Administrative Code (WAC) 173-400-113(3).

Danna Dal Porto, comments 5-7, are from her testimony given at the September 6, 2012 public hearing. The transcription of the hearing in full is provided in Appendix C.

Comment 5, Danna Dal Porto:
I would like to encourage and explain the necessity for the public to be able to see the operations log of these data centers. I was told by a high level Ecology employee that the operating permit is only as good as the operator, so if we are to say that there is going to only be 8 hours per year of emergency operation, the only way we can determine if that in fact is followed, is to be able to look at the operational log. That's a need for that.

Ecology Response:
Ecology can include reasonably necessary conditions in a Notice of Construction (NOC) approval order to assure compliance with applicable air quality rules and regulations, RCW 70.94.152(3). The Air Quality Program places both recordkeeping and reporting requirements into each NOC approval order. The requirement to both record and report specific operational conditions is included in each one of the data center permits. The Vantage order, for example, requires Vantage to report annual hours of operation to Ecology. See requirement 9.2 on page 14 in the Preliminary Determination (availabl in Appendix D). The operational information submitted by the facility, or collected by Ecology during the course of conducting compliance assurance activities, is available for review upon request by the public.

Comment 6, Danna Dal Porto:
I will continue to complain about Ecology using Moses Lake's weather representing Quincy. It is not the same. It is not the same place geographically. It has not got the same issues. We have continued inversions during the spring and summer. Moses Lake does not have that because they do not have the surrounding and elevated areas of the Monument/Beasley Hills which contain the emissions in our valley, because it really is a valley.

Ecology Response:
The similarity of meteorological observations from Moses Lake and Ephrata and the lack of any significantly different topographical features near Quincy are sufficient to conclude that the meteorology from either location is representative of the Quincy area.

Comment 7, Danna Dal Porto:
And the other thing I would like to speak to right now, is 8 hours per year of emergency operation is, in my opinion, woefully inadequate. I have compiled a very long list of outages in our county. We've had navy jets strike voltage lines and put them out of service. We've had very large wind storms putting 6500 people in Quincy out of power. Last fall REC Silicon was out for 13 hours due to material on electrical equipment. I just don't see that this 8 hours per year is adequate to protect our community.

Ecology Response:
Currently, BACT for these data centers includes emission controls on the engines and reducing hours of operation to only those necessary. The PUD and these applicants have evaluated the history of outages for PUD customers and have determined that 8 hours per year on a 3 year average will be adequate to cover potential outages.

Debbie Koehmen, comments 8-10, are from her testimony given at the September 6, 2012 public hearing. The transcription of the hearing in full is provided in Appendix C.

Comment 8, Debbie Koehmen:
We still don't know what it is doing to the soil. They approached my family, cuz I am really right there, and said, "Can we buy our land?" And I said, "Are you kidding? This is agricultural land". We don't want to pave it over and put up computer closets. Put it someplace where you know, if I had known about the diesel generators, I would have fought harder. I was just fighting for the

agricultural land. Now I'm kind of suspicious about the agricultural land. We still don't have a soil test; what's it doing to the soil? When that wind blows, it's not staying inside those little fences. It's going everywhere and we have wind problems here.

Ecology Response:
Although some diesel exhaust particles will deposit on the surfaces of objects, soils, etc., near the data center, the evidence available indicates that most will not. A literature search yielded very little information relevant to the fate of diesel exhaust particles deposited in terrestrial and aquatic environmental compartments. Because of this, Ecology doesn't have enough information to fully assess the possibility the diesel generator exhausts could significantly contaminate the land and crops near the data center. However, the limited evidence that's available suggests such contamination will not be a problem: Groups of scientists have studied polycyclic aromatic hydrocarbons (PAHs) contamination of soil and plants. PAHs are the main toxic chemical contaminant in diesel exhaust particles that are capable of settling on surfaces. Scientists have studied how diesel PAHs settle near roadways that have heavy diesel traffic. One group of scientists tested PAH contamination near a high traffic roadway and found that PAH contamination of leaf litter, soil, and vegetation declined exponentially (rapidly decreased) with the distance from the roadway, as well as with soil depth, and with vegetation height.[1] Another group of scientists found higher PAH concentrations in soil samples taken 1 to 8 meters from a highway, but found that soil 12 to 24 meters further from this road contained only background levels of PAHs.[2] These scientists concluded there is a potential for some of the more toxic PAHs to increase in soil near roads over time, but this is likely to be of low biological significance because the PAHs are tightly stuck to soil particles. It is possible people will swallow dust and plants contaminated with diesel exhaust particles but there is no published reference dose for diesel exhaust particles to compare to the amounts swallowed. Ecology believes inhalation (*i.e.,* breathing) is the main way people will be exposed to engine exhaust from the data centers, and we have assessed the potential for resulting health risks.

1 Pathirana, et al. Ecotoxicol Environ Saf. 1994 Aug;28(3):256-69

2 Johnsen, et al. Environ Sci Technol. 2006 May 15;40(10):3293-8

A similar question was asked during the Sabey public comment period and answered in the Responsiveness Summary document (now called a Response to Comments document). The Responsiveness Summary for Sabey can be viewed online at:
https://fortress.wa.gov/ecy/publications/publications/1102033.pdf.

Comment 9, Debbie Koehmen:
Here's my questions: I'm very worried about the data. Finding about it while 3 years ago, well ya know it's not as good as we thought it was, to me, that is not in this day and age, really good. I really wonder why we can't get more accurate data, especially when we know how many hours the inter-modal is running. Seems like if we have computer system, stick it in and it will be able to tell us.

Ecology Response:
The comment relates to Ecology's use of on-road and railway emissions estimates to evaluate cumulative exposures to diesel engine exhaust particulate (DEEP). The commenter perceives these data to be outdated or not current. Ecology prepares a comprehensive emissions inventory

every three years. This is only required every three years because EPA acknowledges that developing and updating the inventory is time-consuming. While the data used to estimate emissions from Quincy's roadways and railroads in the cumulative air dispersion model are from 2008, they reflect the most recent inventory that was available at the time the analysis was completed. Ecology recently compiled the 2011 comprehensive emissions inventory and submitted it to EPA for their review.

Comment 10, Debbie Koehmen:

The weather, when I called and asked about all this and they said, "oh it is the buildings and this and we do air flow and it depends. And it is just an estimate", but our weather here is completely different than what's being used for the data, so why aren't we using this updated stuff.

Ecology Response:

The similarity of meteorological observations from Moses Lake and Ephrata and the lack of any significantly different topographical features near Quincy are sufficient to conclude that the meteorology from either location is representative of the Quincy area.

Patty Martin, comments 11-16, are from her testimony given at the September 6, 2012 public hearing. The transcription of the hearing in full is provided in Appendix C.

Comment 11, Patty Martin:

I do have to add concerns because we do have appeals before the Pollution Control Hearings Board and some of the information that Ecology is not bringing to the table in the formation of $PM_{2.5}$ which is required under the law and the consideration of precursors to ozone formation, which is also required by the law, is a necessary part to know whether Quincy, the valley, the area that surrounds our community is in compliance with the National Ambient Air Quality Standards. Unless somebody factors that in and looks at that, there is no way that Ecology can make a statement of safety with any of these data centers.

I brought an article regarding what's recently being found out about the danger of ozone; on heart and cardio vascular and cerebral disease. I also brought the federal registers that talk about the need for minor new source review to include the secondary formation of $PM_{2.5}$. The state is aware of this. EPA has advised them in their rule making that they need to assure EPA that they are considering secondary formation of $PM_{2.5}$. Additionally, I have, I think it's the same federal register, talking about for any pollutant for which there is a NAAQS, a National Ambient Air Quality Standard, you have to also consider any precursor to it. So this one is dealing with the issue of ozone. [*See Appendix D for documents submitted by Patty Martin*]

Ecology Response:

Ecology did consider both the precursors to ozone and the secondary formation of $PM_{2.5}$. The precursors to ozone are NO_x and VOCs. Ecology determined that Vantage's potential emissions of these pollutants are so small (5.83 tons per year for NO_x and 0.25 tons per year for VOCs) that they would not produce appreciable ozone levels. Ecology also determined that the levels of $PM_{2.5}$ in Quincy are not high enough to require further analysis of the formation of secondary $PM_{2.5}$. Furthermore, emissions from local sources in Quincy would travel far outside the Quincy urban growth area before secondary PM and ozone could form. Because the nearest $PM_{2.5}$ non-attainment area (Tacoma) and ozone maintenance area (Puget Sound) are sufficiently distant

from Quincy, there is no regulatory or scientific requirement for considering the "secondary formation of $PM_{2.5}$ or the precursors to ozone formation".

Comment 12, Patty Martin:
So I'm also questioning Ecology's claim that the $PM_{2.5}$ annual level here in the Basin is 0.056 micrograms per meter cubed [$\mu g/m^3$]. That's inconsistent with the modeling, the monitoring excuse me, the monitoring the actual hands on ground modeling that they did in January through April, of this year. Those levels were much higher for the $PM_{2.5}$ on an average daily basis.

Ecology Response:
The commenter is confusing the monitored $PM_{2.5}$ levels in Quincy with the modeled DEEP background concentrations. $PM_{2.5}$ is made up of many different kinds of fine particles such as those that come from wood smoke and other sources. DEEP is expected to make up only a small portion of the measured levels of $PM_{2.5}$ in Quincy. The monitoring picked up all $PM_{2.5}$ without separating out the DEEP. The modeling, on the other hand, included only DEEP.

Comment 13, Patty Martin:
The one hour NO_2 would change in this technical support document because of the chemical transformation when $PM_{2.5}$ or excuse me, when the precursor to ozone is considered.

Ecology Response:
The commenter is correct. The one-hour NO_2 concentration would be reduced by any chemical reaction that converted NO_2 to $PM_{2.5}$, e.g., ammonium nitrate (NH_4NO_3). The reactions involved in ozone production are complicated, anddepend on the mix of organic compounds, nitrogen oxides, and oxidizing compounds available.Calculating the resulting NO_2 concentration is time and resource intensive, and was not warranted for this project.

Comment 14, Patty Martin:
I'm inserting Clint Bowman's testimony supporting the fact that AERMOD and we talked about this, but just to put this into the record, AERMOD does not consider secondary formation of $PM_{2.5}$ and it is an inappropriate model to have been used. I took the liberty of having contacted Vantage's engineer in advance of the release of their permit to advise them that secondary formation of $PM_{2.5}$ was considered and had not been done and AERMOD was not the appropriate model.

Ecology Response:
AERMOD is the appropriate model for calculating NO_2 and $PM_{2.5}$ concentrations. It contains a method to account for the conversion of NO emissions to NO_2 but does not compute any secondary production of $PM_{2.5}$. The commenter is correct that AERMOD would not be the appropriate model to calculate the secondary production of $PM_{2.5}$. However, the secondary formation of $PM_{2.5}$ from pollutants emitted by local sources is not an issue in the Quincy area (see Ecology's response to Comment 11). The nearest $PM_{2.5}$ non-attainment area (Tacoma) is sufficiently distant from Quincy that there is no regulatory or scientific requirement for considering the "secondary formation of $PM_{2.5}$.

Comment 15, Patty Martin:

I would like to add a little complaint: I noticed coming up, as I was running late to this meeting, that the hearing time had been changed to 5:15. I was not aware of that and I don't believe that anyone else in the community would have known until they got to the base of the stairs that the hearing time had been changed.

Ecology Response:

The hearing time was not changed. 5:15pm was the time of the meet and greet and this was consistent with the advertisements in papers and flyers posted in Quincy (see Appendix A for copies of display ads posted in newspapers and posted around town in Quincy). A hand written sign stated "Public Hearing 5:15pm" placed outside the Quincy City Hall the evening of the hearing was intended to direct people to the upstairs meeting room where the hearing was located. The agenda for the public hearing followed closely to what was advertised. The start times were a bit later to accommodate for presenters and questions from the audience. Formal hearing also started later – at 6:40pm.The transcripts and agenda for the public hearing are included in Appendix C.

Comment 16, Patty Martin:

And finally at least at one church in town, all of Ecology's fliers and for the people who took the time to put them out, I am sad to tell you that someone walked off with all of them and that they were replaced and they disappeared for a second time. I was the recipient of these. They sent them with a very nasty note to me. Because Ecology is distributing something that is dated February of 2011, has nothing about the upcoming hearing on it. And in the case of the flier that references Maria Peeler, who by the way was a neighbor of mine growing up. There is no phone number for her. So for a Hispanic, non-English speaking member of our community, have had any contact without a computer, it would have been an impossibility.

Ecology Response:

The document described (see Appendix D for documents submitted by Patty Martin) is the Spanish translation of the 2011 "Focus on Diesel Exhaust Health Risks" Ecology publication, number 11-02-005. Both English and Spanish versions of this were distributed in Quincy, WA along with display ads in English and Spanish. Although the display ads and the focus sheet were distributed to locations together they were not attached to each other.

The Spanish version of the focus sheet (11-02-005), had a typo on the contact number for Maria Peeler as can be seen in Patty's submitted version. The last four digits of the number are missing. Below this number, however, is a second number for Richelle Perez who is also part of the translation team and this phone number is complete. Although this does not excuse the typo, a Hispanic, non-English speaking member of the community could have gotten in contact with an appropriate member of Ecology. This typo was corrected as soon as we learned about it and posted on the web with an updated 2012 date. The corrected versions were also brought to the public hearing. See corrected version in Appendix A.

Comment 17, Danna Dal Porto (sent by email October 11, 2012):

Beth,

I am requesting new (second) public meeting regarding the Vantage Data Center permit in order to question both Ecology and Vantage. Vantage has taken their permit back in order to make changes. Since this is, in effect, a revision of their earlier permit application, I believe that the letter of the law must be followed and that the public have an opportunity to ask questions from both parties to this revision. Apparently the revision is significant because of the time Vantage has taken to revise the document (incomplete) that was inappropriately presented to the public in September. The data center developments in Quincy have become a focus even as far away as the New York Times. Quincy Citizens deserve a complete document (accurate)to review because, in effect, this is a totally new application.

I want the time necessary to compare both permit applications, focus on the changes and ask questions of Ecology and Vantage as to the nature and reasons for their adjustments. These are large and complex documents and I want to do my review carefully and then ask my questions in a public forum.

I am sure that another public meeting will be an annoying addition to everyone's time and to the Ecology budget. However, the focus of Ecology (the state agency charged to protect me) must be to present to the public, in a legal and fair manner, the proposal to add, yet another, dangerous diesel source to our already filthy air shed. To deny this request for another public meeting could be seen as an effort to skirt the Washington State regulations regarding air quality permit applications. I trust that Ecology leadership will make every effort, in a public forum, to inform Quincy citizens about the revised Vantage permit.

I look forward to seeing the notification of the Vantage public meeting in the Quincy newspaper. I will be looking for the advertisements of the public meeting that will be posted in Spanish.

Sincerely,
Danna Dal Porto
Quincy

Ecology Response:

Dear Danna,

Thank you for contacting me. I have received your request for a public hearing and shared it with Karen Wood and Greg Flibbert. Your request will be used to help determine if another public hearing will be held.

Please remember that regardless of the public hearing, you will have the same thirty-day public comment period to review the new information and make comparisons to the previous draft. Any comments you submit will go on record. The current draft permit and supporting documents are still available at Quincy City Hall or at our website **HERE** if you would like to continue to review them.

When the new information is submitted for review, we will notify the public that it is available, notify whether or not a public hearing will be held, and provide the dates of the public comment period.

Thank you and please look for my updates as we get information.

Sincerely,

Beth Mort / Community Outreach & Environmental Education
Air Quality Program / Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov / 509.329.3502
Office Hours: M-Th 7am-4pm
For smoke info: http://wasmoke.blogspot.com/

Comment 18, Danna Dal Porto (sent by email January 2, 2013):
Beth,
I would like clarification on the closing time and date of the Vantage public comments. I need you to send me the specific time and date for my comments to be accepted for the Vantage permit. I have attached a listing of the various communications I have seen from your desk. I am sure this is easy to explain but I think you can see how I have become confused.

I am requesting another public hearing to have Ecology and Vantage clarify the documents that are on file in the Quincy City Hall. Your Publc Notice of December 10, 2012, references Vantage changes to the NOC application on October 19, 2012 and November 28, 2012. My confusion is that the Quincy set of documents contains a document headed TSD, December amendment to May, 2012 TSD. This document has specific comments I need clarified. For example, what document is the final determination for Vantage? The various documents have a series of references to the BACT decision. Which one is the actual approval order? How can I identify the finish product? This is just one of the clarifying points I need answered and the basis for my public hearing request. I can continue to email questions if that is what Ecology prefers. I do have a concern however. I have emailed Ecology this past Holiday week and I have had no answers. Is everyone on vacation?

I look forward to your answers.
Danna Dal Porto
Quincy, WA

Ecology Response:
Hello Danna,

Thank you again for your message. We are accepting public comments on the draft air permit for Vantage Data Centers until midnight January 11, 2013. I felt that extending public comment past the 30 days required by law would be appropriate, due to the fact that the comment period included holidays.

Your email and the list of various communications you attached will be submitted in our Response to Comments document. Ecology's response and a detailed list of outreach actions will be included in the Response to Comments as well.

Regarding your questions about the documents available for review:

Vantage submitted revised NOC applications on 10/19/12 and 11/28/12. The Technical Support Document (TSD) contains Ecology's analysis based on the NOC applications. The revised TSD is identified on the last line of the title on the first page. The last line states "December Amendment to May 2012 TSD". This revised TSD was available for public review during the comment period that began December 10, 2012.

There has been no final determination or approval order issued for the Vantage project. The revised Preliminary Determination (PD) available for public review during the comment period that began December 10, 2012, contains the permit conditions that resulted from the review of the revised NOC applications. BACT for the project is contained in the revised PD and in more detail in the revised TSD. The PD is not the "finished product". The final approval order cannot be issued before the end of the public comment period, and Ecology's review and consideration of all comments received.

I am forwarding your request to Ecology management for a second public hearing on the Vantage project.

Ecology has no preference on how you decide to submit your comments. Email comments are treated the same as comments received through the mail. Some Ecology staff were on leave during the holiday season. Ecology coordinated leave times to make sure that staff familiar with the Vantage project were available through the holidays.

Beth
509.329.3502

Comment 19, Kris Miller (sent by email on December 13, 2013):
Thinking about the emissions from the Vantage Data Center. We have so many data centers here in Quincy now. Does anyone look at the total emissions from **ALL** the centers as to adverse effects on the citizens of Quincy? Looking at each data center individually does not really capture the whole picture.

Ecology Response:
This question was answered in response to Comment 3, Leonard Bauhs above. Yes. Ecology conducted cumulative modeling of diesel engine exhaust particulate and nitrogen dioxide emissions from data centers and other known sources in Quincy. Cumulative modeling was conducted to determine the chronic and acute risk posed by multiple existing and proposed sources of diesel engine emissions in Quincy. The models and results were updated when new projects were proposed, and when new information was available . The results of these modeling efforts were used to inform permit decisions as well as to provide information to the local government and interested citizens.

Ecology evaluated the long-term health risk associated with exposure to DEEP from all known sources in the Quincy area. The analysis showed that exposure to the highest levels of DEEP is most likely to occur near Quincy's transportation corridors, but is also possible near the borders of Quincy's data centers. The cumulative risk from diesel engine exhaust particulate emissions in Quincy is less than the cumulative maximum risk threshold established by Ecology for permitting data centers in Quincy.

Ecology also determined that Vantage adequately demonstrated compliance with the PM2.5 NAAQS. The 24-hr PM2.5 NAAQS was set by EPA to protect people from short-term exposure to small particles (which include DEEP). Vantage's emissions added to background levels of PM2.5 did not exceed the NAAQS, therefore, short-term impacts from DEEP exposure were considered and found to be protective of health.

To evaluate possible short-term health effects from a system-wide outage in which all Quincy data center emergency engines operate at the same time,, Ecology considered both the probability of a system-wide power outage and the probability of unfavorable air dispersion conditions. Ecology's analysis concluded that coincidental worst-case meteorological and system-wide power outage conditions are extremely unlikely to occur. Although extremely improbable, we cannot completely rule out the possibility of having such a scenario. If such an event were to occur, people with asthma who might be cumulatively exposed to nitrogen dioxide (NO2) and diesel engine exhaust particulate (DEEP) from emergency engines and other sources may experience respiratory symptoms such as wheezing, shortness of breath, and reduced pulmonary function with airway constriction.

Comment 20, Patty Martin (sent by email to Ecology December 28, 2012):
Greg,

Is Vantage going to use DPFs, DOCs and SCRs as we have been told? Or is it Tier 2 engines as BACT?

Thank you.

Patty

Ecology Response:
Hello Patty,
Greg forwarded me your email and asked that I send his response as well as let you know that your question and this response will be included in the Vantage Response to Comments document. Below is Greg's answer to your questions.

Patty:
There are two separate questions. BACT has been determined to be Tier 2 engines, AND Vantage will be installing Diesel Particulate Filter (DPF), Diesel Oxidation Catalyst (DOC), and Selective Catalytic Reduction (SCR) on the their engines.

Vantage decided to install Tier 4 engines, which are equipped with DPF, DOC, and SCR to reduce emissions beyond BACT. In the Preliminary Determination Section 5, Vantage is required to limit air contaminant emissions to the Tier 4 engine manufacturer's specified not-to-exceed emissions rates. The final approval order will contain the same requirement. Vantage can only achieve the required emission rates if the engines are equipped with DPF, DOC, and SCR. The BACT determination is contained in the revised TSD Sections 5.1.6 and 5.2.4. The revised NOC application dated 11/28/12, that becomes a condition of the NOC Approval Order, states that DPF, DOC, and SCR will be installed on all engines. In the Preliminary Determination Section 4, Vantage is required to conduct testing to verify the emission limits contained in Section 5
Greg

Comment 21, Patty Martin (sent by email to Ecology on January 4, 2013):
So does that mean that Vantage's controls are BACT?

Ecology Response:
Hello Patty,

Greg asked me to pass on his response from your last question in this thread. I will include this into the Vantage Data Center Response to Comments as well. Other questions that you have we will respond to in our Response to Comments document the same way we are for others who submit comments via email or by mail. I will keep you posted when the Response to Comments is finished and ready for review. Below is your question and Greg's response:

Patty's Question:

So does that mean that Vantage's controls are BACT?

Greg's Response:

We answered your latest question in Beth's message of 1/3/13 at 3:54 PM [which is below in this email thread]. To reiterate, Tier 2 engines are BACT for the Vantage project.

Greg

Thank you,

Beth

509.329.3502

Patty Martin, comments 22-32, sent in pdf attachement by email with attachments. The comment in full is provided in Appendix B and additional reference documents are available in Appendix D.

Comment 22, Patty Martin:

Please accept these comments on behalf of MYTAPN and me regarding the permitting of the Vantage Data Center. I have many concerns about the addition of this source of pollution into our air shed, and I object to the issuance of voluntary emission limits. Ecology did not notify the public, as required by 40 CFR 52.2495, of their intent to issue voluntary emission limits to the Vantage Data Center. The legal notice published in the Moses Lake, WA newspaper, did not identify voluntary emission limits as a permit term open for public comment; the agency did not explain "voluntary emission limits" or solicit input on them at the public hearing; and the agency did not in any way during the comment period seek "public involvement" on the agency's plan to issue them.

> § 52.2495
> Voluntary Limits on Potential to Emit
> Terms and conditions of regulatory orders issued pursuant to WAC 173-400-091 "Voluntary limits on emissions" and in accordance with the provisions of WAC 173-400-091, WAC 173-400-105 "Records, monitoring, and reporting," and WAC 173-400-171 "Public involvement," shall be applicable requirements of the federally-approved Washington SIP and Section 112(l) program for the purposes of section 113 of the Clean Air Act and shall be enforceable by EPA and by any person in the same manner as other requirements of the SIP and Section 112(l) program. Regulatory orders issued pursuant to WAC 173-400-091 are part of the Washington SIP and shall be submitted to EPA Region 10 in accordance with the requirements of §§ 51.104(e) and 51.326. (emphasis added)

Ecology has failed to comply with this federally enforceable provision of the Clean Air Act (CAA) when it issued permits to Microsoft, Yahoo!, Sabey, Dell and Intuit. Ecology has never solicited comment on voluntary emission limits, nor advised the public that comment was required in

issuing them. Additionally, Ecology has never discussed with the public the difference between Title V permitting and voluntary emission limits, or more importantly the difference in protections provided, or monitoring required, by them.

Ecology Response:
Ecology provided public notice for and conducted two public comment periods and a public hearing on the Vantage project. Both the public notice and the public process exceeded the requirements of WAC 173-400-171, providing for greater public participation than required. 40 C.F.R. § 52.2495 does not apply to the approval orders issued by Ecology to the data centers in Quincy. By its terms, 40 C.F.R. § 52.2495 applies to orders issued by Ecology pursuant to WAC 173-400-091. Ecology has not issued orders to any of the data centers in Quincy under WAC 173-400-091.

EPA has issued guidance determining that the potential for emergency generator engines to emit pollutants should be based on (1) the number of hours the engines would need to run because power would be expected to be unavailable and (2) the number of hours the engines would need to run for maintenance activities. To the extent the emission limits in the permits issued for data centers in Quincy are based on the number of hours power is expected to be unavailable and the number of hours required for maintenance and testing activities, those limits are not voluntary limits. Nor are the limits voluntary limits if they are required to meet other legal requirements, such as the requirement to employ BACT, the requirement to meet the national ambient air quality standards, or the requirements associated with toxic air pollutants.

The approval order for Vantage limits the number of hours the engines can run to the number of hours during which power is expected to be unavailable plus the number of hours required for maintenance and testing. These limits are not voluntary. The Vantage approval order also includes limits on emissions through the installation of add-on emission control technology. These limits are voluntary because they will reduce emissions of pollutants beyond those required by law. However, these limits are not necessary to keep the Vantage facility from being a major source.

A Title V permit is required for major sources. None of the data centers, Vantage included, proposed operation at major source emission levels that would trigger the need for a Title V permit. Furthermore, to the extent the conditions in the data center permits are required to meet state and federal law, or are based on the number of hours power is expected to be unavailable and the number of hours required for maintenance and testing activities, the sources have not taken voluntary limits to avoid being subject to Title V.

In Washington State Title V permits are referred to as Air Operating Permits or AOP. More information on Ecology's AOP program can be found at our website: http://www.ecy.wa.gov/programs/air/AOP_Permits/AOP_permits.html. More information on Title V permits can be found online at http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr70_main_02.tpl.

Comment 23, Patty Martin:

I am also objecting to Ecology's insistence that Vantage's use of controls is not BACT. BACT is a legal term -- as stated by Robert Koster at the Public Hearing held in July. BACT implies "control technology", and by its very definition is "technology forcing." Ecology's attempt to remove it and relegate BACT to Tier 2 engines isn't supported by statute, or by the emissions known to be released by these large engines. In fact, Mr. Wilder cites to a study that clearly demonstrates that the emissions from large diesel engines are 2 to 5 times higher than guaranteed by manufacturers. The discrepancy is in the difference between the weighted average testing required under 40 CFR 89 (ISO 8178) and EPA's Method 5. Air Quality Implications of Backup Generators in California, p.34. EPA Method 5 includes the "front" and "back" half (filterable and condensable, respectively) of particulate released by the engine. Emissions from Vantage's engines are therefore more closely aligned with those presented by ELM, than the nominal numbers used by ICF to undermine the BACT cost effectiveness numbers and health risk.

Ecology Response:

By definition, BACT: "*means an emission limitation based on the maximum degree of reduction for each air pollutant ..., 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...*" See WAC 173-400-030(12) available online http://apps.leg.wa.gov/WAC/default.aspx?cite=173-400&full=true#173-400-030.

Ecology proposed emission limits implementing the ELM (ELM is the pollution controls manufacturer) efficiency 'guarantee'. Ultimately, Vantage was able to justify that neither diesel particulate filters nor selective catalytic reduction were economically justifiable for meeting BACT emission limits for their specific emergency generators. Regardless, Vantage decided to install control technology that went beyond what was required to meet BACT. Ecology noted, in the amended TSD, that it is misleading to retain the ELM 'guarantee' in the application documents for the reason that Vantage is unwilling or unable to accept those levels as conditions of this approval.

Comment 24, Patty Martin:

My third objection involves Ecology's failure to use Washington's more stringent standard for $PM_{2.5}$. The WAQA for PM2.5 is 20 ug/m3. According to Ecology and/or ICF, the background value for PM2.5 in Quincy is 21 ug/m3, which exceeds the WAQA standard of 20 ug/m3. See TSD, 6.2 Assumed Background Concentrations, and Final Draft 2012 Wild Fires Smoke – BoH, Matt Kadlec, PhD, BDAT, Ecology Air Quality Program. Ecology recognizes that levels exceeding 20 ug/m3 are not protective of sensitive individuals, and studies have found that chronic exposure to even low levels of PM2.5 increase premature mortality. Please explain how Ecology can justify their decision to allow levels of PM2.5 to increase beyond levels the agency knows to be harmful.

Ecology Response:
Washington State does not have a standard for fine particle pollution ($PM_{2.5}$). Washington State must adhere to the federal standards for $PM_{2.5}$. There are two federal standards: a 24-hour (calendar day) standard of 35 $\mu g/m^3$, and an annual standard of 12 $\mu g/m^3$. These standards, commonly called the NAAQS (National Ambient Air Quality Standards), are adopted into federal rules by the US EPA (40 CFR part 50) then incorporated into Washington's rules for permitting new sources, WAC 173-400-113 (3).

The Washington State Department of Ecology (Ecology) has a goal of keeping 24-hour fine particle pollution concentrations below 20 $\mu g/m^3$. Ecology developed the Washington Air Quality Advisory (WAQA) as a public information tool, not a standard, and it is used to inform the public about the health threats associated with air pollution. Ecology's goal is non-regulatory and is not used to determine compliance with federal air pollution standards. The WAQA incorporates Ecology's $PM_{2.5}$ goal at the Moderate/Unhealthy for Sensitive Groups breakpoint. The WAQA is not a regulatory tool and is used primarily for outreach and education regarding health effects and, in the case of $PM_{2.5}$, primarily during smoke events.

Ecology thoroughly reviewed the Vantage project and its proposed emissions and believes if the project is built and managed as described in the application and permit, it will not exceed the health based NAAQS for particulate matter.

Comment 25, Patty Martin:
Every monthly test, every maintenance check, storm avoidance or power outage, is a "cold start", so the emission factor must be adjusted accordingly. Please identify all engine operations to which "cold start" factors were applied, and how many hours of each engine operation included a "cold start" factor.

Ecology Response:
Cold start factors were applied to all generator runtime modes with durations ranging from 30 minutes to 8 hours. The cold-start adjustment factors can be found in the Revised – Final Notice of Construction Support Document for Second Tier Review document, section 3.2.2, p. 15 and Appendix A. The document can be reviewed on our website at http://www.ecy.wa.gov/programs/air/quincydatacenter/docs/F-Revised-Final-NOC-Support-Document_11-28-2012.pdf.

Comment 26, Patty Martin:
ICF's reliance on the "cold start" factor of 1.12 for 30 minutes appears to be in error.
A review of the literature relied upon by ICF shows that over the course of the first 30 minutes particulate matter was 17.7 g/kW-hr. Air Quality Implications of Backup Generators in California, pp.31-32 (See attachment "Cold start is 17.7 g/kW-hr averaged over 30 minutes" excerpted from this document). Please back calculate using this value (17.7 g/kW-hr) to demonstrate how a 1.12 cold start factor was derived for 30 minutes and how 1.058 was derived for 1 hour.

Ecology Response:
Vantage's proposal appears to address cold start emissions appropriately. The cold-start adjustment factors can be found in the Revised – Final Notice of Construction Support Document for Second Tier Review document, section 3.2.2, p. 15 and Appendix A. The document can be reviewed on our website at http://www.ecy.wa.gov/programs/air/quincydatacenter/docs/F-Revised-Final-NOC-Support-Document_11-28-2012.pdf.

Comment 27, Patty Martin:
Vantage based its background concentrations on the 98th percentile 24-hr average for $PM_{2.5}$ and NO_2, rather than on the maximum background level. My understanding of the modeling would require the worst case scenario modeling be conducted, then the maximums of those numbers compared against the standard. If more than 7 days in one year (98^{th} percentile) exceed the standard, then compliance is not met. It seems logical to me that by using the 7^{th} highest day for the assumed background concentration, Vantage will be allowed to violate the standard more frequently. Please provide evidence that the 1st through 7^{th} day 24-hour background values (for each of the 5 years modeled) for $PM_{2.5}$ and NO_2, and the 1_{st} through 7_{th} day 24-hour values (for each of the 5 years modeled) for emissions from Vantage for $PM_{2.5}$ and NO_2 were used to determine compliance with $PM_{2.5}$ NAAQS.

Ecology Response:
There are 7 exceedances of the daily $PM_{2.5}$ NAAQS that are legally allowed each year. Vantage modeled a scenario that corresponsds to their 7^{th} highest projected daily emission rate. This scenario would occur during annual maintenance. By entering the 7_{th} highest emitting day into the model and considering the MAXIMUM modeled daily impacts for that year, Vantage essentially is considering its 98_{th} percentile for each modeled year. Adding this value to the independently-established 98_{th} percentile of the background concentration results in a number that is, for > 99.5% of time, greater than and therefore more protective of public health than the more accurate estimate of the facility + background 98_{th} percentile, calculated using the "paired-in-time" approach. i.e. Pairing the background concentrations with the modeled facility impacts hour by hour. The paired-in-time approach requires hourly on-site background pollutant data- which we do not have. If 98_{th} percentiles of background and facility impacts are established independently and added together, they do not allow for the possibility that the 98_{th} percentiles of the independent data sets could occur on different days of the year. As such the "unpaired in time" approach which Vantage followed when adding modeled and background 98_{th} percentile concentrations, is more protective of public health.

Comment 28, Patty Martin:
In the real world, all $PM_{2.5}$ is also PM_{10}, however, for Vantage's local background concentration impact at the same receptor, the PM_{10} and $PM_{2.5}$ 24-hour averages are different numbers. Because $PM_{2.5}$ is a subset of PM_{10} (and therefore is PM_{10}), the PM_{10} concentration cannot be lower than the $PM_{2.5}$ concentration (0.002 ug/m^3 and 0.08 ug/m^3 respectively). See TSD, 6.2 Assumed Background Concentrations. Please explain how this is possible.

Ecology Response:
The commenter is correct in identifying $PM_{2.5}$ as a subset of PM_{10}, however, the forms of the PM_{10} and $PM_{2.5}$ NAAQS are different. The PM_{10} NAAQS is a 24-hr concentration that is not to be exceeded more than once per year (e.g., 2nd highest value) and the $PM_{2.5}$ is based on the 98th percentile 24-hr concentration (averaged over a 3 year period). The modeling showed that the meteorological day on which Vantage's 2nd highest PM10 impact occurs is not the same as the meteorological day on which Vantage's 7th highest PM2.5 impact will occur. On the meteorological day in which Vantage's 2nd highest PM_{10} impact occurred, other local sources contributed an additional 0.002 ug/m^3 PM_{10}. On a different day in which Vantage's 7th highest $PM_{2.5}$ impact occurred, other local sources contributed an additional 0.08 ug/m^3 $PM_{2.5}$.

Comment 29, Patty Martin:
Vantage claims that the background plus modeled annual concentration of PM10 and PM2.5 are the same. Please explain how this is possible when the 24-hour concentrations are not the same.

Ecology Response:
The modeled annual average concentration of PM_{10} and $PM_{2.5}$ attributed to Vantage's emissions are the same because $PM_{2.5}$ is a subset of PM_{10}. As described in the response to comment 24, the 24-hr concentrations of PM_{10} and $PM_{2.5}$ used to determine NAAQS compliance could be different because the form of the PM_{10} and $PM_{2.5}$ standards are different.

Comment 30, Patty Martin:
The $PM_{2.5}$ 24-hr background of 21 ug/m3 was based on the 7th highest concentration. It seems possible that emissions from Vantage when combined with background may approach, or exceed, the 35 ug/m3 NAAQS. Ecology has provided no proof that Vantage's emissions comply with NAAQS. Please provide evidence that NAAQS is met for 24-hr $PM_{2.5}$.

Ecology Response:
Ecology determined that Vantage followed acceptable statistical methodology in its NAAQS evaluation and that the project will not exceed the NAAQS. See Ecology Response to Comment 27.

Comment 31, Patty Martin:
ICF's assumption that the worst-year annual emission impacts could be scaled by a factor of 1.27 because commission testing and stack testing are 27% of the emissions from full-build out routine testing plus power outages, is inappropriate. Commission testing involves only loads at 100% and 75% and will result in more than 27% of the NOx emission. Commission testing should be properly accounted for in modeling, not by manipulation. Since 1-hr NO2 was close to exceeding the NAAQS (166 ug/m3) the commission modeling must be conducted to assure compliance. Start-up operations are not allowed to be excluded from permitting under the CAA.

Ecology Response:
Ecology determined that Vantage's evaluation of commissioning overestimated the emissions and impacts. The draft approval further requires stack testing to be conducted during otherwise

approved hours of operation. In the applications, a block of hours was designated for commissioning and periodic stack testing. The requirement, in the draft approval, that testing be done during hours otherwise approved, then leaves the block of run-time for commissioning. Commissioning will likely take less time. Commissioning (and stack testing) is, thus, adequately addressed by this applicant. See condition 4.3.1, p. 9, of the Preliminary Determination which can be found online at our website at:
http://www.ecy.wa.gov/programs/air/quincydatacenter/docs/D-Vantage_Order_PD_11-8-2012.pdf or see page 9 in Appendix D.

Comment 32, Patty Martin:
Other complaints and concerns include:
ICF used control estimates from 2000-2500 kW engines and adjusted the cost using the "0.6 factor." ICF provides no support for the "0.6 factor", or 60% increase in cost. To the contrary, information from the Manufactures Emission Control Association (MECA) indicates that costs stay the same or go down with increasing engine size. See EPA-HQ-OAR-2008-0708-DRAFT-0309[1]

Ecology Response:
Ecology determined that ICF used standard and acceptable methodology in their analysis of this project's economics. For an outline of accepted cost estimating techniques see EPA Air Pollution Control Cost Manual (EPA/452/B-02-001 online at http://www.epa.gov/ttncatc1/dir1/c_allchs.pdf) Section 1, Chapter 2. For the 6/10 Rule that appears to be the source of this comment, see Plant Design and Economics for Chemical Engineers, 3rd Edition, page 166 (available in Appendix D).

Continued Comment 32a
ICF used a cost estimate of $188,745/generator for DPFs. MECA indicates that the total installed cost should be between $90,000-100,000 on a 3 MW engine. See EPA-HQ-OAR-2008-0708-DRAFT-0307[1] CARB estimated the cost for DPFs – using a regression approach – to be $38/hp. See Cost Analysis – Basis for Calculations, I-2.

Ecology Response:
The controls Vantage proposes for particulate are a catalyzed diesel particulate filter. The cost presented for that system is based on its manufacturer's quotation and so, is the best possible source for that data. These systems are considerabley more costly than a DPF designed exclusively to filter particulate matter.

Continued Comment 32b
The annual cost of operation of control technology decreases with engine size (cost/hp), it is not expected to increase as ICF suggests. A "Control Costs for Existing Stationary CI RICE" produced by Bradley Nelson, EC/R, Inc. is included for comparison purposes against the assumptions made by ICF.

Ecology Response:
ICF used standard and acceptable methodology in their analysis of this project's economics.

Continued Comment 32c

Finally, ICF relies on source testing from "previous testing on the same engine with controls." This is not acceptable. The front half and back half particulate matter must be captured on the same engine. Capturing the back half on the same engine with controls will result in less particulate matter. The source tests are worthless; they have no chain of command or quality assurance, and they have been pieced together by a party with a vested interest. Ecology should not rely on the source tests for these reasons

Ecology Response:

ICF's emission estimates are primarily the engine manufacturer's "not-to-exceed" (NTE) values. The NTE values include the reduction for pollution controls (though they don't satisfy the ELM [ELM is the manufacturer of the pollution controls] guarantees). These NTE values are included in the preliminary determination as conditions of approval and have been used in the impact analyses.

Danna Dal Porto, comments 33-45, sent packet of comments and reference documents by mail. The packet cover letter is provided in Appendix B and the packet in its entirety, containing comments throughout, is provided in Appendix D.

Comment 33, Danna Dal Porto:

One focus of my comments is I believe public notification was awkward and somewhat disorganized. I believe the statutes require a more direct public out-reach for the air permitting process.

1. Public Notice.
   A. Ecology continues to advertise the Public Notice in the Moses Lake Columbia Basin Herald and not the Quincy newspaper, the Quincy Valley Post Register. I am requesting public notice in the Quincy Valley Post Register. Not only is the Official Public Notice in the wrong paper, for this Hearing so many changes were made I would have missed the meeting if I were not watching very carefully.
   B. No Public Hearing notices were posted in Spanish in the newspaper of record or the local newspaper. I am requesting Spanish outreach in Quincy newspaper.
   C. Ecology held the September 6, 2012 meeting without having the permit materials complete. I believe Ecology was not in compliance with WAC 173-400-171 (4) when the meeting was scheduled. (Exhibit 17) [*See Appendix D for documents submitted by Danna Dal Porto*]

Specific comment for the public comment period: I want Ecology to print Public Notices in the Quincy newspaper. I want Ecology to present public notices in Spanish.

Ecology Response:

We appreciate your concern for the outreach process used to notify the public. Ecology realizes that the public involvement process can always be enhanced. Each new data center proposal has provided an opportunity to better inform the public and provide opportunity for public comment on these projects. Ecology aimed to include more outreach based on input from previous data center permitting processes in Quincy.

We follow the requirements for public notice specified in the Washington Administrative Code (WAC) 173-400-171. A copy of this section of the WAC is provided in Appendix D. Ecology submitted legal notice for the Vantage project to the Columbia Basin Herald because it has the

largest daily circulation in the area (Grant County). The legal notice is placed in the legal classified section of the paper. Because we understand that not everyone reads this section of the paper, Ecology placed English display ads, advertising the public hearing and comment period, in the Quincy Valley Post Register (QVPR), Wenatchee World, Columbia Basin Herald and Spanish display ads in El Mundo and the QVPR Shopper. The WAC does not require display ads however Ecology felt it necessary to ensure the public knew of the opportunity to review the project and provide comment.

Email notifications were sent to the Quincy interested parties list which includes approximately 70 recipients. Interested parties emails were sent on Mon 7/30/2012 11:39 AM, Mon 7/30/2012 1:10 PM, Wed 8/29/2012 3:32 PM, Thu 10/11/2012 12:33 PM, Tue 12/11/2012 2:04 PM, and Wed 1/9/2013 4:54 PM. These emails notified recipients of the comment period and submitting comments, details of the public hearing, the legal notice that was withdrawn prior to the first comment period (July 30, 2012 – September 10,2012),and information on the additional comment period. Press releases about the comment periodswere sent out to the areas media outlets on July 30, 2012, December 11, 2012 and a Spanish version of the press release for the second comment period was sent out on December 31, 2012.

During the first comment period, Ecology posted English and Spanish flyers of the display ads and English and Spanish versions of Ecology's publication "Focus on Exhaust Health Risks" (publication number: 11-02-005) at several locations in Quincy. Please see the Public Involvement Actions section of this document.

Ecology is currently reviewing its public notice process in an effort to be more media neutral. The rule pertaining to industrial air pollution sources, WAC 173-400, was recently updated and the Air Quality Program is reviewing its policy and procedures to enhance our notification process.

Comment 34, Danna Dal Porto:
Vantage using emission controls or are they constructing without controls? I want Ecology to show me, using the documents on file, how I could know the final status of the emission controls.

Ecology Response:
Vantage's proposal includes engine exhaust controls. As indicated in the revised Techinical Support Document (TSD) for this approval, pages 1 and 2, the not-to-exceed emission factors used for this project represent approximately 60 percent reduction in emissions of an uncontrolled Tier 2 engine. The ELM (ELM is the manufacturer of the pollution controls) 'guarantee' in the application documents is discussed on page 2 in the TSD. Review this document online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/docs/E-NOC_Technical_Support_Document_5dec2012.pdf or see page 2 in Appendix D.

Comment 35, Danna Dal Porto:
Why is Ecology insisting on a lower level of emission control than proposed by Vantage?

Ecology Response:
Ecology did not insist on a lower level of emission control. Vantage originally proposed control levels that weren't documented and that they couldn't accept. Ecology originally set approval limits in a draft permit that required Vantage meet the ELM (ELM is the pollution controls

manufacturer) control levels. Vantage responded that meeting the ELM control levels was prohibitively costly. Ecology revised the limits to the MTU (MTU is the diesel generator manufacturer) not-to-exceed values representing 60 percent control efficiency.

Comment 36, Danna Dal Porto:
I want Ecology to demonstrate (in detail) how Tier 2 engines alone can constitute BACT and control emissions to satisfy State and EPA standards.

Ecology Response:
The Vantage engines with Tier 2 emission levels satisfy BACT at currently accepted cost-effectiveness thresholds. Vantage's proposal includes control beyond what Ecology was able to require through BACT in order to satisfy State and Federal standards (NAAQS and WAC 173-460).

Comment 37, Danna Dal Porto:
Exhibit 13 is a letter from Vantage to Karen Wood (ECY). On page 2 is Table 1, Comparison of DEEP Emission from Quincy Data Centers. The list of Quincy Data Centers does not include the DEEP emissions from Intuit. I know this Table 1 is from Vantage but I want Ecology to provide me the Intuit DEEP emission numbers in the same format as Table 1 in this letter. This data is public knowledge but I do not where to find it myself.

Ecology Response:
The public comments Ecology has invited are specific to the Vantage project. Your comment addresses issues that are outside the scope of the action we are considering. We would still like to use this opportunity to respond. Intuit Data Center was permitted in 2008 prior to reviewing diesel engine exhaust particulate (DEEP) as a toxic air pollutant. WAC 173-460 was revised in 2009 to include DEEP. The projects Vantage included in their table are those permitted after the revision was made. Ecology estimated DEEP from Intuit which is available in the response to Comment 43. Ecology did not develop the table that you referenced and will not develop new records for this Response to Comments document. Although this comment is requesting information about Intuit not Vantage, Ecology does have some information regarding DEEP emissions from Intuit and this can be provided upon request.

Comment 38, Danna Dal Porto:
ICF documents cite the reason the emission controls will be dropped is because of the low Ecology cost estimates for instillation. If I read this properly, Ecology has a cost-effectiveness price per ton of $10,000 for NOX, $23.200 for TOTAL PM, $5,000 for CO and $10,000 for VOC. If I added properly, the Department of Ecology has a per ton base cost of $48,200 allowed for emission reduction. How long has Ecology operated with these low numbers?

Ecology Response:
BACT cost-effectiveness criteria are re-evaluated with each case-by-case BACT determination. Ecology's review of these criteria for data centers resulted in almost doubling of the cost criteria previously in use. The higher values were used in review of the Vantage project.

Continued Comment 38a
These data centers cost bazillions to build and operate. For Ecology to have such a low limit on "acceptable cost" for emission controls is unreasonable. I would have to spend that

much money to have my household fireplace remodeled. I believe Ecology has established very low cost-effective standards that would exclude any controls.

A. Cost estimates for Vantage (Exhibit 31, page 2) (Exhibit 14)

B. Hanford calculations (Exhibit 32)

I want Ecology to explain these low BACT cost-effectiveness Evaluations. How long has Ecology had this low cost-effectiveness price range? The Hanford document illustrates a method to determine cost for controls.

[*See Appendix D for documents submitted by Danna Dal Porto*]

Ecology Response:

The high cost effectiveness thresholds for tBACT for the Hanford double shell tanks were proposed by WRPS and have not been adopted or endorsed by Ecology. They also were not determinative of tBACT for those tanks, because all the emission control technology evaluated had costs that were higher than those thresholds. The criteria Ecology uses (the ranges we can agree are cost-effective) increase over time and thus, are 'technology forcing'.

Continuation of comment 38b

Did Ecology apply this Hanford method to determine cost of controls?

Ecology Response:

No, Ecology did not apply the Hanford method to determine cost of controls.

Continuation of comment 38c

How did Ecology arrive at the current cost-effectiveness values?

Ecology Response:

See previous answers above in Comment 38.

Comment 39, Danna Dal Porto:

All of the documents from both Ecology and Vantage cite pages of numbers regarding emissions and controls. After all the back-and-forth, it is totally unclear if these numbers are with or without emission controls. Ecology needs to clarify the status of the documents to allow the public to determine the safety of the proposed permit. Most of these questions could have been answered in a second public hearing but those requests have been denied. This method of writing-out all questions makes for much labor for me and for Ecology.

Ecology Response:

New Source Review requires complete documentation of the project, and we appreciate how complicated the Notice of Construction (NOC) applications are. A careful reading of the NOC application is necessary to fully understand the project. The purpose of the Technical Support Document (TSD) is to summarize the project analysis, and a careful reading of the TSD will help you to understand both the project and Ecology's decisions. Providing comments in writing is the best way to ensure that we understand your questions and respond appropriately. Your comment does not include specific references to the numbers you find confusing. Therefore, Ecology has no way of answering your specific question. However, the final revised NOC application from Vantage presents emissions after the application of facility wide emission controls.

Comment 40, Danna Dal Porto:
Maneuvering was made by Ecology to "decouple" Vantage emission controls from the BACT recommendations for this facility. (Exhibit 15)

Specific question for the public comment period: I want to know why Ecology "decoupled" Vantage controls from BACT. (Exhibit 15, page 14) To attain BACT and legal emission limits for Vantage are the Tier 4 controls necessary?

BACT is the level of controls necessary to meet safety standards. To decouple the emission controls and just leave Tier 2 engines does not meet the safety level for the permit. I believe Tier 4 emission controls determine BACT for the Vantage facility because the levels of DEEP and NO2 (and perhaps other TAPS) is very high. Is this correct? If this is correct, why are Vantage Tier 4 emission controls being dropped as a function of the permit?

Ecology Response:
Vantage's emission controls are not being dropped from the Vantage permit. The controls are included in the permit, but are not required as BACT. By definition, BACT: "*means an emission limitation based on the maximum degree of reduction for each air pollutant ..., 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...*" See WAC 173-400-030(12) available online http://apps.leg.wa.gov/WAC/default.aspx?cite=173-400&full=true#173-400-030.

The 60 percent control levels proposed for this project likely satisfy EPA Tier 4 engine standards. However, Ecology has not been provided data to support the ELM control efficiencies (called a guarantee in this application) so has instead accepted Tier 2 engines as BACT, and limited the facility to the approximate 60 percent control levels that were proposed (beyond what we could insist was BACT).

Comment 41, Danna Dal Porto:
Are the levels of diesel particulate and N02/N0x reported in the November Ecology documents reported with or without controls?

Ecology Response:
The levels of diesel particulate and NO_2/NO_x reported in the November Ecology documents are with controls (ie 60 percent control level proposed by Vantage). See Preliminary Determination, Condition 5, p. 10 http://www.ecy.wa.gov/programs/air/quincydatacenter/docs/D-Vantage_Order_PD_11-8-2012.pdf or see in Appendix D.

Continued Comment 41a
Is Ecology recommending the permit knowing the toxics levels are marginally safe?

Ecology Response:
Ecology determined that the health risks posed by toxic air pollutants emitted from this project are permissible according to our rule WAC 173-460.

Continued Comment 41b

Would the Vantage facility be safer to the public with the Tier 4 levels they initially proposed to install?

Ecology Response:

There is no change in proposed controls (from January of last year) on the Vantage engines. The only change that Vantage has proposed, is to increase some low load emission levels.

Continued Comment 41c

Why is Ecology pushing Vantage to drop their emission controls?

Ecology Response:

Ecology is not pushing Vantage to drop their emission controls. See response to 41b above.

Comment 42, Danna Dal Porto:

Ecology continues to use the weather from Moses Lake, WA and Spokane, WA to represent weather in Quincy. (Exhibit 25, page 9) There are closer weather stations that would represent local weather more accurately. We have frequent inversions that impact the operation and safety of these 158 diesel generators. I am requesting more accurate local weather forecasts for air quality permit purposes.

Ecology Response:

The similarity of meteorological observations from Moses Lake and Ephrata and the lack of any significantly different topographical features near Quincy are sufficient to conclude that the meteorology from either location is representative of the Quincy area.

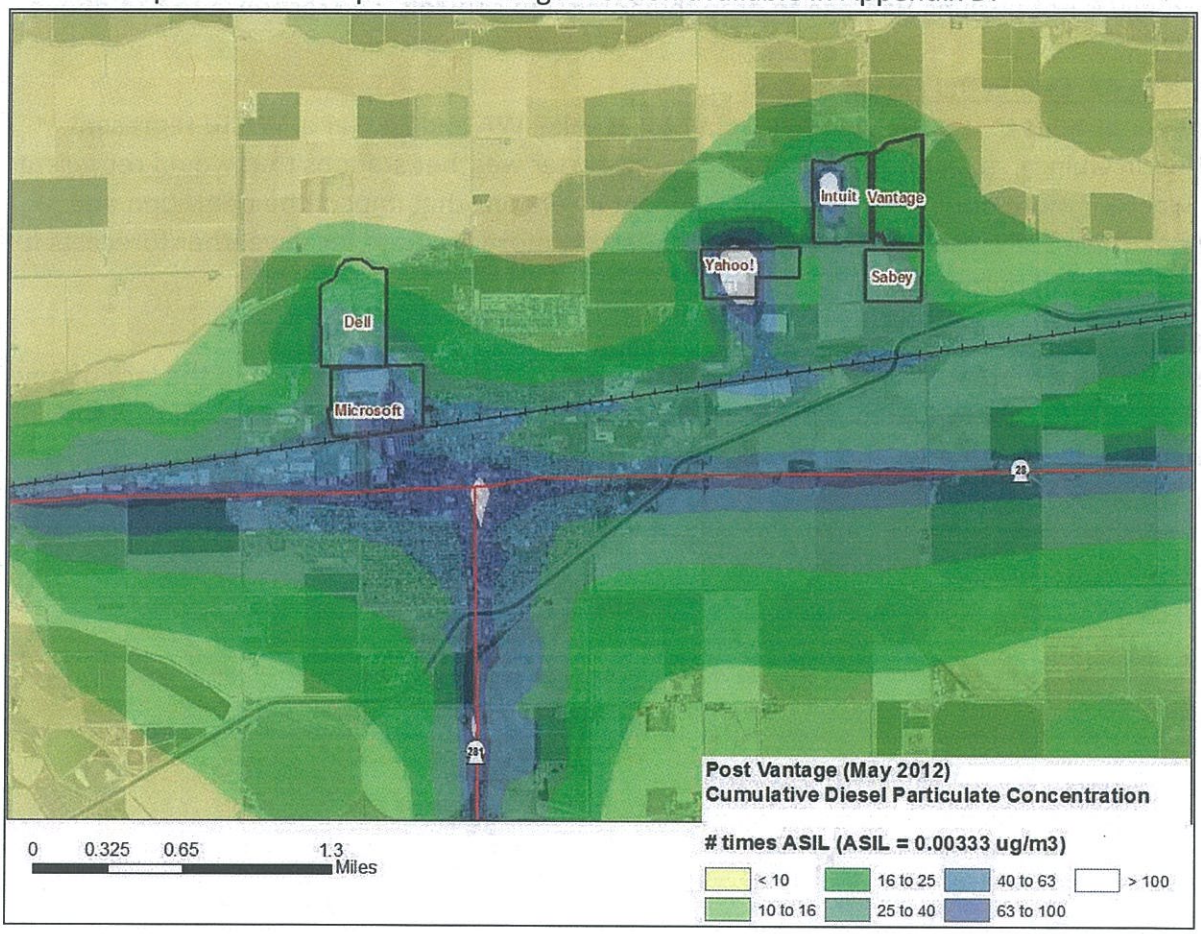
Comment 43, Danna Dal Porto:

Ecology has prepared visual aids (maps) in the past to represent the plumes of air emissions from facilities. (Exhibit 28, Exhibit 29, Exhibit 30)

I am requesting a current map (similar to the examples I provided in this document) to represent cumulative air quality from all sources over the Quincy City limits as well as the Quincy UGA.

Ecology Response:

This map shows the 2012 cumulative concentrations of DEEP. The estimated concentrations were derived from a model that used 2008 transportation data and allowable emissions from all data centers and proposed emissions from the Vantage Data Centers. This is the most current map that we have produced. Larger version available in Appendix D.



Comment 44, Danna Dal Porto:

Ecology has been working on air quality in Quincy since the construction of the Microsoft expansion in 2010. One constant factor in the permitting of facilities is the air quality, including background. Enough questions have been raised about ACTUAL air quality that Ecology must install at least two year-round air quality monitors in Quincy. One is to be located at Mountain View Elementary school and the other at the Lazy Acres low-income housing site on the east end of town. The residents of Quincy deserve actual information on air quality. This summer the Forest Service installed a temporary monitor on the roof of the medical clinic because of an inversion and the smoke from the forest fires. Air quality needs to be monitored daily, not just in an emergency. A five-month +/- air monitoring survey was done in early 2012. The December

17, 2011 to January 6, 2012 a monitor was at Mountain View School. The monitor was moved to the Quincy well site and collected data from January to sometime in May. These emission numbers do not appear to be validated and were never reported to the EPA. This short study has no validity and should not be reported as an accurate example of Quincy air quality.
I am requesting permanent air monitoring equipment be installed at Mountain View School and at Lazy Acres, east of town, to provide accurate information on 24/7 air quality levels. I want the emission records be kept on file with Ecology, validated, reported to the EPA and available to the public in a format that can be reviewed.

Ecology Response:
The public comments Ecology has invited are specific to the Vantage project. Your comment addresses issues that are outside the scope of the action we are considering. We would still like to use this opportunity to respond.

The monitor placed in Quincy in 2012 was a trailer mounted fine particle pollution ($PM_{2.5}$) monitor. Since 2008 Ecology has used these portable monitors in nearly 20 small communities throughout Eastern and Central Washington. We generally site these trailers in locales for 2- 6 months to get a snapshot of the $PM_{2.5}$, primarily smoke, impacts in a community. We have used them extensively to evaluate whether we have a wood smoke issue from home heating devices or from smoke coming from prescribed forest burning or agricultural burning. We also move these trailers to communities being impacted by smoke from wildfires and the local health agencies use the data from them in evaluating the public health risk and providing health advisories. We do not consider the siting of these trailers in communities a "study" but more simply a tool to see if we need to launch a study, place a permanent monitor in the community, or study the sources of $PM_{2.5}$ we observe.

The monitor had to be moved from its original location at the Mountain View School as that site did not meet EPA siting criteria for monitoring $PM_{2.5}$. In January of 2012, the The monitor was moved to the City Well site location. The City Well location met EPA's criteria for $PM_{2.5}$ monitoring, the monitor was operated according to Ecology's Quality Assurance Plan and Standard Operating Procedures, and the data was validated through a quality assurance review. The validated data from the City Well site was reported to EPA, the data is kept on file at Ecology, and is available upon request.

It should be noted that the type of monitor used in Quincy is a nephelometer that has been correlated to report $PM_{2.5}$ concentrations. While the monitor measures $PM_{2.5}$ in the outdoor air, it does not provide information that can be used to identify or differentiate between pollution sources (i.e., diesel smoke versus wood smoke). A nephelometer is not a Federal Reference Method or Federal Equivalent Method instrument for monitoring $PM_{2.5}$. Therefore, the data recorded from it cannot be used for compliance with federal standards.

Comment 45, Danna Dal Porto:
One of my confusions is the two documents that are titled the same, TSD May 2012, but have different dates. (Item 8 and 9 in list of Exhibits) This is an important document in that this is the final document in the Vantage permit exhibits "December Amendment to May 2012, TSD" (Exhibit 25) and is referenced by ECY as the TSD for the project. (Exhibit 9) Which copy of the May 2012 document was used for the Amendment?

Ecology Response:
Ecology apologizes for not putting the appropriate dates in the headers of the two versions of the final technical support document (TSD). The TSD document that is labeled December Amendment to May 2012, TSD is the final TSD for the project. You can view the TSD online at our website: http://www.ecy.wa.gov/programs/air/quincydatacenter/docs/E-NOC_Technical_Support_Document_5dec2012.pdf.

Comment 46, Danna Dal Porto (sent by email to Ecology January 1, 2013):
Greg/Karen, I am requesting an electronic copy of a document referenced in the paper work for the Vantage comment period. I am requesting a "BACT supplemental submittal" received by Ecology July 16, 2012. This document is referenced on page 14 of a July 2012 packet titled:
Technical Support Document
Notice of Construction Approval Order
Vantage Data Centers Management Company, LLC Vantage-Quincy Data Center July, 2012
Page 14 is the Conclusion Page, section #9. Is is marked as follows: ****END OF VANTAGE JULY TSD****I am giving all of this information because there were a bewildering number of documents that looked similar. Thank you for this assistance. Because the deadline for comment is approaching and the comment period bracketed the Holiday period, I need this document to complete my comments. At this time is an opportunity to request another public hearing to answer the questions I have. The Vantage document present at the September public hearing was not complete. The public is entitled to an opportunity to comment on a complete application. An important question: Is Vantage putting controls on their diesel generators? I would like an answer to this important question.
Sincerely, Danna Dal Porto
Quincy, WA

Ecology Response:
Hello Danna,
Thank you for your comments and questions below. Attached is the document you requested to help you complete your review and make further comments.
Your comments will be included in full along with Ecology's response in the Vantage Response to Comments document. I have forwarded your request to Ecology management for a second public hearing on the Vantage project.
Thank you,
Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm
[The document requested by Danna is available at the end of Appendix D]

List of Commenters

The table below lists the names of organizations or individuals who submitted a comment on the Draft Vantage Data Centers Air Quality Permit and where you can find Ecology's response to the comment(s).

Table 1. Comment Identifier Table

COMMENTER	ORGANIZATION	COMMENT NUMBER	PAGE NUMBER
Leonard Bauhs	Citizen	1-4	8-9
Danna Dal Porto	MYTAPN	5-7	9-10
Debbie Koehmen	Citizen	8-10	10-12
Patty Martin	MYTAPN	11-16	12-14
Danna Dal Porto	MYTAPN	17-18	15-16
Kris Miller	Citizen	19	17
Patty Martin	MYTAPN	20-32	18-26
Danna Dal Porto	MYTAPN	33-46	26-34

This page is purposely left blank.

Appendix A:
Copies of all public notices

Public notices for this comment period:

1. Public notices
2. Display advertisements
3. Notices sent to the Interested Parties email list
4. Spanish and English versions of Ecology's publication "Focus on Exhaust Health Risks" (publication number: 11-02-005)
5. Notice of Public Hearing (publication 12-02-015)
6. Event posted on Public Involvement Calendar page: http://ecyapps3/pubcalendar/calendar.asp
7. Press release for public hearing and first comment period
8. English and Spanish version of the press release for second comment period

First Public Comment Period: July 30, 2012 – September 10, 2012

This announcement was run by mistake.

www.columbiabasinherald.com

LEGAL NOTICES Your right to know

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY
NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,
ANNOUNCEMENT OF PUBLIC HEARING,
& SECOND TIER PETITION APPROVAL RECOMMENDATION

The State of Washington Department of Ecology (Ecology) has received application to construct a new air pollution source. Vantage Data Centers Management Company, LLC, 2625 Walsh Avenue, Santa Clara, CA 95051, has proposed to build Vantage Data Centers located at the northwest corner of the intersection of Road 11 NW and Road O NW, Quincy in Grant County. The mailing address for the Vantage Data Centers in Quincy is 2101 M Street, Quincy, WA 98848. Vantage Data Centers will contain four main data center buildings once it is fully constructed, and will install and operate up to 17 diesel engines that will power 3.0 megawatt electrical generators for a total of 51 megawatts of emergency backup electrical power. Diesel engines generate criteria and toxic air contaminants which have been evaluated. Diesel engine exhaust particulate (DEEP) emissions were reviewed under a Second Tier Health Impact Assessment to evaluate health risks posed by the project. After review of the completed Notice of Construction application and other information on file with the agency, Ecology has decided that this project proposal will conform to all requirements as specified in Chapter 173-400 WAC. After review of the Second Tier Health Impact Assessment, Ecology concluded that impacts to the community due to the Vantage Data Centers will meet the protective requirements contained in Chapter 173-460 WAC. Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, and supporting application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848. A public hearing has been scheduled to start at 5:15 PM on July 31, 2012 in the upstairs meeting room at the Quincy City Hall located at 104 B Street SW in Quincy. The public hearing will include presentations followed by a question and answer session starting at 5:30 PM. Public comment will be taken starting promptly at 6:30 PM. In addition to public comments taken at the public hearing, the public is invited to comment on this project proposal by submitting written comments no later than August 6, 2012 to Beth Mort (509 329-3502) at the above Spokane address or at beth.mort@ecy.wa.gov.

#06074/2453469
Pub.: June 27, 2012

LEGAL NOTICE

Moses Lake Irrigation and Rehabilitation District, Department of Natural Resources, Grant County Noxious Weed Board, Washington State Parks, Department of Ecology, Washington State Department of Transportation, and Washington State Department of Fish & Wildlife, are working together to control riparian noxious weeds in the Moses Lake/Grand Coulee waterway areas. Noxious weeds are required to be controlled by state law. Public access areas will be posted prior to treatment.

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STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,

ANNOUNCEMENT OF PUBLIC HEARING,

& SECOND TIER PETITION APPROVAL RECOMMENDATION

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THIS NOTICE HAS BEEN WITHDRAWN

#07040/2488145
Pub.: July 16, 2012

Notice of Application
Date of Notice: July 16, 2012

Notice is hereby given that a Preliminary Short Subdivision application received by Grant County on July 2, 2012 from Richard B. Hansen (Designated Contact: Gilbert O. Bailey

This announcement was the correct and final announcement.

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,

ANNOUNCEMENT OF PUBLIC HEARING,

& SECOND TIER PETITION APPROVAL RECOMMENDATION

Comments accepted July 30 through September 10, 2012

The State of Washington Department of Ecology (Ecology) has received application to construct a new air pollution source. Vantage Data Centers Management Company, LLC, 2625 Walsh Avenue, Santa Clara, CA 95051, has proposed to build Vantage Data Centers located at the northwest corner of the intersection of Road 11 NW and Road O NW, Quincy in Grant County. The mailing address for the Vantage Data Centers in Quincy is 2101 M Street, Quincy, WA 98848.

Vantage Data Centers will contain four main data center buildings once it is fully constructed, and will install and operate up to 17 diesel engines that will power 3.0 megawatt electrical generators for a total of 51 megawatts of emergency backup electrical power. Diesel engines generate criteria and toxic air contaminants which have been evaluated. Diesel engine exhaust particulate (DEEP) emissions were reviewed under a Second Tier Health Impact Assessment to evaluate health risks posed by the project. After review of the completed Notice of Construction application and other information on file with the agency, Ecology has decided that this project proposal will conform to all requirements as specified in Chapter 173-400 WAC. After review of the Second Tier Health Impact Assessment, Ecology concluded that impacts to the community due to the Vantage Data Centers will meet the protective requirements contained in Chapter 173-460 WAC.

Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, and supporting application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848.

The public is invited to attend a public hearing that has been scheduled to start at 5:15 PM on September 6, 2012 in the upstairs meeting room at the Quincy City Hall located at 104 B Street SW in Quincy. The public hearing will include presentations followed by a question and answer session starting at 5:30 PM. Public comment will be taken starting promptly at 6:30 PM. In addition to public comments taken at the public hearing, the public is invited to comment on this project proposal prior to the public hearing. **Comments accepted July 30 through September 10, 2012.** Submit comments to Beth Mort at Ecology's Spokane Office, 4601 N. Monroe, Spokane, WA 99205-1295, or email beth.mort@ecy.wa.gov, or 509 329-3502.

This notice supersedes the notice published on June 27, 2012.

#07052/2510401
Pub.: July 30, 2012

Mort, Beth (ECY)

From: Mort, Beth (ECY)
Sent: Monday, July 30, 2012 11:39 AM
Subject: Vantage Data Centers Public Hearing on September 6th

Hello Interested Parties!

Department of Ecology has scheduled a public hearing starting at 5:15pm on September 6, 2012, on the draft air quality permit for the Vantage Data Centers in Quincy, WA. Save the date and please attend if you can – we want to hear from you! If you are unable to attend in person, you are still welcome to review permit documents and submit comments. Comments on the Vantage Data Centers will be accepted from July 30th through September 10th, 2012. A Spanish translator will be present at the hearing and we have a translation team that can answer questions submitted in languages other than English.

Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, and supporting application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848.

Comments can be sent to me at beth.mort@ecy.wa.gov, or mailed to me at our Spokane office at 4601 N. Monroe St., Spokane, 99205. All comments must be received by midnight on Monday, September 10, 2012.

Regarding an earlier withdrawal notice:
On June 27, 2012, in the Columbia Basin Herald newspaper, a public notice was accidentally published for a public hearing regarding the Vantage Data Centers to be held on July 31st, 2012. In order to provide the adequate time for public review of all documents associated with Vantage's permit, we withdrew that public notice on July 16, 2012. A new notice with the correct date of the public hearing was run in the Columbia Herald on July 30th advertising the current and correct public hearing scheduled for September 6, 2012.

For more information, or to see the documents via the web, please visit our website at http://www.ecy.wa.gov/programs/air/quincydatacenter. Please contact me if you have any questions and thank you for your participation!

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502

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Mort, Beth (ECY)

From: Mort, Beth (ECY)
Sent: Monday, July 30, 2012 1:10 PM
Subject: Location of Public Hearing on September 6th

Hello again Interested Parties!

It was pointed out that I neglected to mention the location of the hearing. It will be held at Quincy City Hall, 104 B Street SW, Upper Meeting Room.

Please let me know if you have other questions.
Thank you!

Beth

From: Mort, Beth (ECY)
Sent: Monday, July 30, 2012 11:39 AM
Subject: Vantage Data Centers Public Hearing on September 6th

Hello Interested Parties!

Department of Ecology has scheduled a public hearing starting at 5:15pm on September 6, 2012, on the draft air quality permit for the Vantage Data Centers in Quincy, WA. Save the date and please attend if you can – we want to hear from you! If you are unable to attend in person, you are still welcome to review permit documents and submit comments. Comments on the Vantage Data Centers will be accepted from July 30th through September 10th, 2012. A Spanish translator will be present at the hearing and we have a translation team that can answer questions submitted in languages other than English.

Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, and supporting application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848.

Comments can be sent to me at beth.mort@ecy.wa.gov, or mailed to me at our Spokane office at 4601 N. Monroe St., Spokane, 99205. All comments must be received by midnight on Monday, September 10, 2012.

Regarding an earlier withdrawal notice:
On June 27, 2012, in the Columbia Basin Herald newspaper, a public notice was accidentally published for a public hearing regarding the Vantage Data Centers to be held on July 31st, 2012. In order to provide the adequate time for public review of all documents associated with Vantage's permit, we withdrew that public notice on July 16, 2012. A new notice with the correct date of the public hearing was run in the Columbia Herald on July 30th advertising the current and correct public hearing scheduled for September 6, 2012.

For more information, or to see the documents via the web, please visit our website at http://www.ecy.wa.gov/programs/air/quincydatacenter. Please contact me if you have any questions and thank you for your participation!

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502

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DEPARTMENT OF ECOLOGY
State of Washington

http://www.ecy.wa.gov

Ecology home > News > News Release

Department of Ecology News Release - July 30, 2012

12-244

Ecology seeking comment on new Vantage Data Center permit

SPOKANE — The Washington State Department of Ecology (Ecology) invites the public to comment on a proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers and places conditions on the operation to protect public health. The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

In developing the draft permit, Ecology toxicologists consider the cumulative health effects on the residential community of Quincy from all the diesel generators at all the area data centers. Ecology's toxicological and computer modeling experts have completed a review of the Health Impact Assessment submitted by the company's consultant, ICF International, in support of the Vantage Data Center application.

Because diesel engine exhaust particulate is a toxic air pollutant, Ecology required a thorough evaluation of the health risks posed by the project.

A public hearing is scheduled for Thursday, Sept. 6, 2012, to gather formal comments about the proposal. The hearing will be held in the upstairs meeting room at Quincy City Hall, 104 B Street SW. A brief presentation and question and answer period will begin at 5:30 p.m., preceding the formal hearing that starts promptly at 6:30 p.m.

In addition to public comments taken at the public hearing, the public is invited to provide written comments on this proposal from July 30 through Sept. 10, 2012. Submit comments to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public at:

- **Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA. Or contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov**
- **City of Quincy, 104 B St. SW, Quincy, WA**
- **Online at: http://www.ecy.wa.gov/programs/air/quincydatacenter**

Each of the generators will be capable of producing three megawatts of emergency backup electrical power for a total of 51 megawatts. The Vantage facility will use the most current and effective air pollution control equipment on the market today for controlling both particulate matter and nitrogen dioxide.

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Media Contact: Jani Gilbert, Communications, 509-329-3495; cell, 509-990-9177; jani.gilbert@ecy.wa.gov

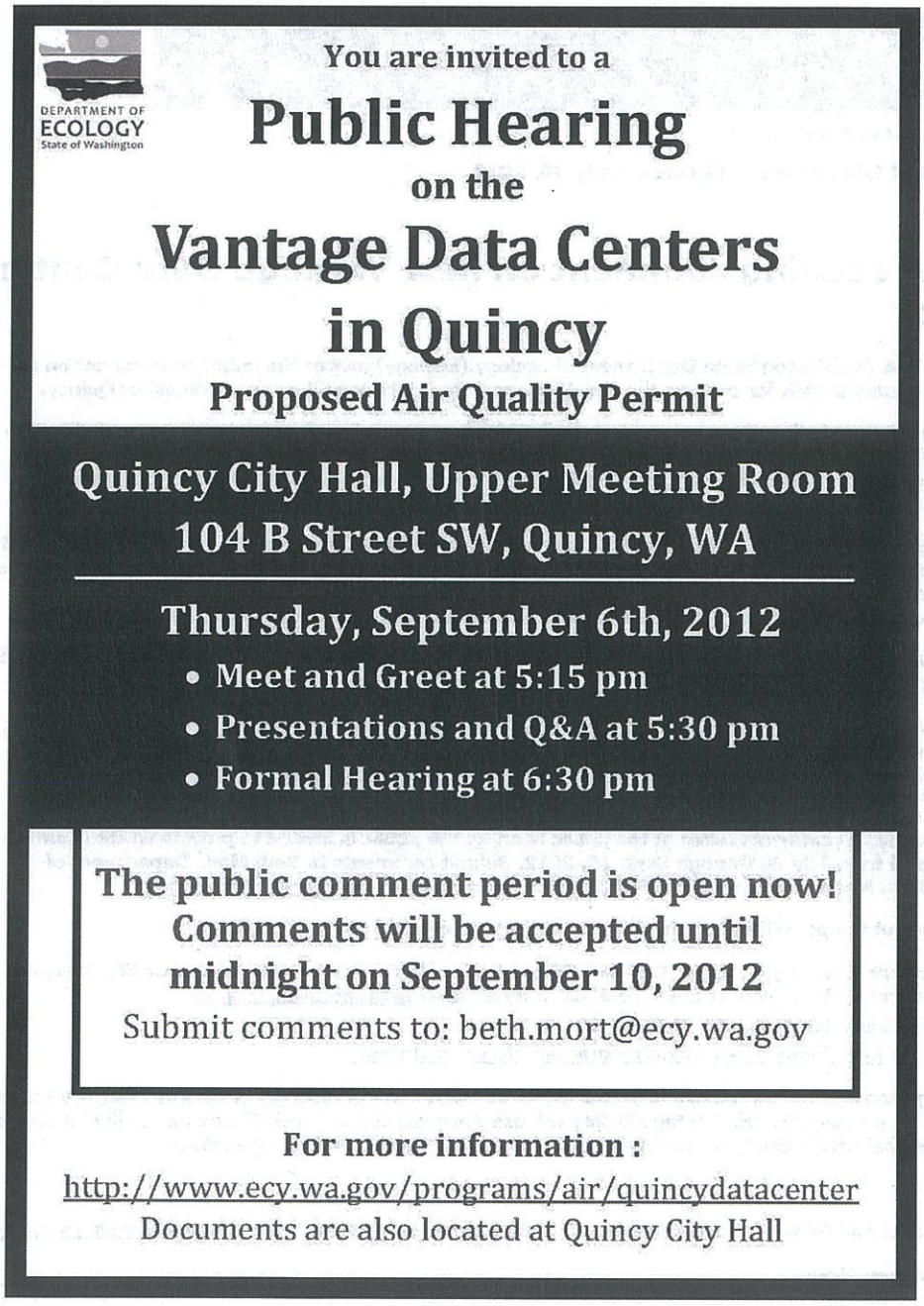
For more information:

Air Quality Program (www.ecy.wa.gov/programs/air/airhome.html)

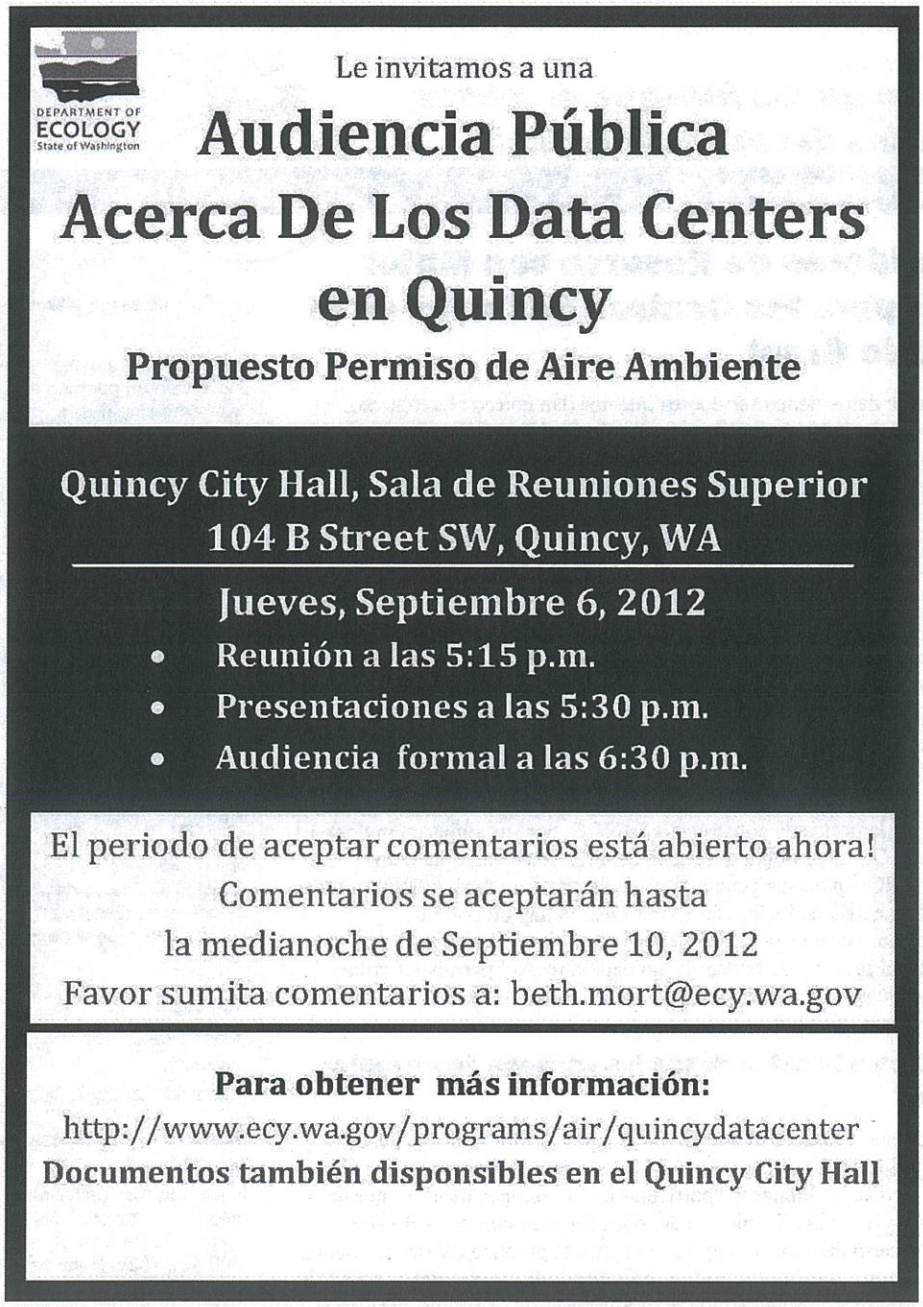
Draft permit (www.ecy.wa.gov/programs/air/quincydatacenter)

Ecology's social media (www.ecy.wa.gov/about/newmedia.html)

Display advertisement placed in local papers:



Spanish display advertisement placed in local papers:



The Spanish version below was distributed in Quincy and had a typo on the contact phone number as shown below. Patty Martin pointed this out in an email to Ecology and the typos were fixed. The corrected version was updated to the web. There was also issue taken with the date at the top of the document. See Ecology Response to Comment 16.

Enfoque en los Riesgos de Salud Desde los Escapes de Diesel

DEPARTMENT OF ECOLOGY
State of Washington

Programa de Calidad de Aire | **Febrero 2011**

Generadores de Reserva con Motor Diesel para los Centros de Datos en el Condado Grant

Los centros de datos tienen servidores que nos dan correo electrónico, manejan mensajes instantes, y ejecutan "software" para nuestras computadoras. En 2006, las compañías de los centros de datos se interesaron a tener interés en construir sus instalaciones en el Condado Grant. El condado Grant tiene una fuente de electricidad seguro y de bajo costo. También, en 2010, la legislatura del estado de Washington aprobó una exención de impuestos de poca duración para centros de datos que construyeran en el condado de Grant y otras áreas rurales. Para calificar para la exención de impuestos el centro de datos tenía que dedicar por lo menos 20,0000 pies cuadros de espacio a servidores y empezar construcción antes del 1 de julio de 2011.

Para construir o expandirse, la compañía de un centro de datos tiene que aplicar para un permiso de aire ambiente antes de empezar la construcción. El departamento de Ecología del Estado de Washington (Ecología) administra los permisos de aire ambiente. El permiso se llama "una orden de aprobación de la notica de construcción" (NOC, por sus siglas en ingles). El objetivo del NOC es proteger la calidad de aire. Los centros de datos necesitan un NOC para sus generadores de reserva con motor diesel grandes para proveer electricidad a los servidores cuando hay un corte de electricidad. Los escapes de diesel tienen contaminantes tóxicos del aire. Como parte del proceso de revisar la aplicación para el permiso, Ecología evalúa si los escapes de diesel desde los generadores de reserva pueden causar problemas de salud.

Los efectos a la salud desde los escapes de un motor de diesel

Los contaminantes tóxicos al aire en los escapes de un motor de diesel incluyen dióxido de nitrógeno, monóxido de carbono, compuestos orgánicos y pequeñas partículas llamadas "partículas de los escapes de un motor de diesel". Ecología evalúa los niveles de todos los contaminantes de aire durante el proceso de revisar la aplicación para el permiso de aire ambiente. Los contaminantes que los centros de datos tienen la mayor probabilidad de emitir en cantidades suficiente altas para afectar la salud son las partículas de los escapes de diesel y el dióxido de nitrógeno (NO_2). Este documento explicas los posibles efectos a la salud de estos contaminantes.

¿Por qué es Importante?

Los centros de datos necesitan un permiso del aire ambiente desde Ecología para instalar sus generadores de reserva que emita escapes de diesel.

A niveles altas, los escapes de motores de diesel son un contaminante toxico de aire que puede causar problema de salud

Como parte del proceso de evaluar una aplicación para un permiso de aire ambiente, Ecología revisa si las emisiones de los escapes de motores de diesel causan problemas de salud

Este documento tiene información sobre los efectos a la salud de los escapes de diesel y como Ecología evalúa el riesgo de salud.

Contacto:

Maria Peeler

360-407-

maria.peeler@ecy.wa.gov

Acomodaciones Especiales:

Si usted necesita este documento en un formato alternativo, favor de llamar a Richelle Pérez a 360 407 7528. Para los que son sordos llaman a 711, para los que tengan impedimentos del hablado, llama, 877-833-6341 (servicios sol en ingles).

Publication Number: 11-02-005

Corrected Spanish version:

Enfoque en los Riesgos de Salud Desde los Escapes de Diesel

DEPARTMENT OF ECOLOGY
State of Washington

Programa de Calidad de Aire **Augosto 2012**

Generadores de Reserva con Motor Diesel para los Centros de Datos en el Condado Grant

Los centros de datos tienen servidores que nos dan correo electrónico, manejan mensajes instantes, y ejecutan "software" para nuestras computadoras. En 2006, las compañías de los centros de datos se interesaron a tener interés en construir sus instalaciones en el Condado Grant. El condado Grant tiene una fuente de electricidad seguro y de bajo costo. También, en 2010, la legislatura del estado de Washington aprobó una exención temporaria de impuestos sobre la venta para los centros de datos que construyeran en el condado de Grant y otras áreas rurales. Para calificar para la exención de impuestos sobre la venta el centro de datos tenía que dedicar por lo menos 20,000 pies cuadrados de espacio a servidores y empezar construcción antes del 1 de julio de 2011.

Para construir o expandirse, la compañía de un centro de datos tiene que aplicar para un permiso de aire ambiente antes de empezar la construcción. El departamento de Ecología del Estado de Washington (Ecología) administra los permisos de aire ambiente. El permiso se llama "una orden de aprobación del aviso de construcción" (NOC, por sus siglas en inglés). El objetivo del NOC es proteger la calidad de aire. Los centros de datos necesitan un NOC para sus generadores de reserva con motor diesel grandes para proveer electricidad a los servidores cuando hay un corte de electricidad. Los escapes de diesel tienen contaminantes tóxicos del aire. Como parte del proceso de revisar la aplicación para el permiso, Ecología evalúa si los escapes de diesel desde los generadores de reserva pueden causar problemas de salud.

Los efectos a la salud desde los escapes de un motor de diesel

Los contaminantes tóxicos al aire en los escapes de un motor de diesel incluyen dióxido de nitrógeno, monóxido de carbono, compuestos orgánicos y pequeñas partículas llamadas "partículas de los escapes de un motor de diesel". Ecología evalúa los niveles de todos los contaminantes de aire durante el proceso de revisar la aplicación para el permiso de aire ambiente. Los contaminantes que los centros de datos tienen la mayor probabilidad de emitir en cantidades suficiente altas para afectar la salud son las partículas de los escapes de diesel y el dióxido de nitrógeno (NO_2). Este documento explicas los posibles efectos a la salud de estos contaminantes.

¿Por qué es importante?

Los centros de datos necesitan un permiso del aire ambiente desde Ecología para instalar sus generadores de reserva que emita escapes de diesel.

A niveles altas, los escapes de motores de diesel son un contaminante toxico de aire que puede causar problema de salud

Como parte del proceso de evaluar una aplicación para un permiso de aire ambiente, Ecología revisa si las emisiones de los escapes de motores de diesel causan problemas de salud.

Este documento tiene información sobre los efectos a la salud de los escapes de diesel y como Ecología evalúa el riesgo de salud.

Contacto:

Maria Peeler
360 407 6704
maria.peeler@ecy.wa.gov

Acomodaciones Especiales:

Si usted necesita este documento en un formato alternativo, favor de llamar a Richelle Pérez a 360-407-7528. Para los que son sordos llaman a 711, para los que tengan impedimentos del hablado, llama, 877 833 6341 (servicios sal en ingles).

Publication Number: 11-02-005-ES

English version:

Diesel-powered Backup Generators for Data Centers in Grant County

Data centers house the servers that provide e-mail, manage instant messages, and run applications for our computers. In 2006, data center companies started to become interested in Grant County as a good place to build. Grant County has a low-cost, dependable power supply. Also, 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 start construction before July 1, 2011.

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 exhaust contains 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.

Health effects of diesel engine exhaust

The toxic air pollutants in diesel engine exhaust include nitrogen dioxide, carbon monoxide, organic compounds and tiny particles called diesel engine exhaust particles. Ecology evaluates the levels of all these pollutants during the permit review process. The ones most likely to be produced in high enough amounts to potentially affect health are diesel exhaust particles and nitrogen dioxide (NO_2). The possible health issues caused by these pollutants are discussed in this document.

When Ecology staff review the permit application for a data center, they look very carefully at how much the project will add to the air pollutants in the area. Ecology cannot approve a permit that allows pollutants to be emitted often enough or in high enough levels to cause health problems.

Diesel exhaust particles

The tiny particles in diesel exhaust are too small for our noses and upper respiratory systems to filter from the air we breathe. The particles go deep into our lungs, where they can cause damage and chemical changes. Studies show that certain levels of these particles can cause immediate health problems, including inflamed and irritated lungs and breathing passages, which may lead to coughing, chest tightness, wheezing, and difficulty breathing in some people.

WHY IT MATTERS

Data centers need an Ecology permit to install diesel-powered generators that emit diesel exhaust.

Diesel engine exhaust is a toxic air pollutant that, at high enough levels, can cause health problems.

As part of the permit process, Ecology reviews emissions of diesel engine exhaust and other air pollutants to see if they are a health concern.

This focus sheet gives information about the health effects of diesel exhaust, and how Ecology assesses health risk.

Contact information:

Greg Flibbert
509-329-3452
gregory.flibbert@ecy.wa.gov

Special accommodations:

If you need this publication in an alternate format, call the Air Quality Program at 360-407-6800. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

Notice of Public Hearing

DEPARTMENT OF ECOLOGY
State of Washington

Air Quality Program **August 2012**

Vantage Data Center Project

Vantage has applied to the Department of Ecology (Ecology) for an air quality permit to build a data center with back-up generator engines in Quincy, Washington. Ecology is holding a public hearing to hear from Quincy-area residents about this proposal.

Data centers house the servers that provide e-mail, manage instant messages, and run applications for our computers. The Vantage Data Center is proposed for 63 acres just northeast of Quincy, near the existing Sabey and Intuit data centers.

The permit

Vantage applied to Ecology for a permit called a "notice of construction approval order" (NOC) because their proposed data center includes back-up generator engines. The engines are fueled by diesel, which emits air pollution when burned. An NOC is required when facilities plan to use equipment that will have air emissions. As part of the permit process, Ecology reviews emissions of diesel engine exhaust and other air pollutants to see if they are a health concern.

Vantage proposes to have 17 diesel generators capable of producing a total of 51 megawatts of emergency back-up electrical power. The NOC, if issued, will include conditions that protect the public from air pollution, such as:

- limits on the amount of fuel that can be burned;
- limits on the amount of hours diesel engines can operate; and
- requirements for advanced air pollution control equipment.

Health risks of diesel pollution

Diesel engine exhaust is a toxic air pollutant that, at high enough levels, can cause health problems. As part of the permit process, Ecology reviews emissions of diesel engine exhaust and other air pollutants to see if they are a health concern.

For detailed information about the health risks of diesel exhaust and how Ecology evaluates risks, see Ecology publication 11-02-005, "Diesel-powered Backup Generators for Data Centers in Grant County." This publication is available online at https://fortress.wa.gov/ecy/publications/SummaryPages/1102005.html .

DATES AND LOCATIONS

PUBLIC HEARING
Vantage Data Centers
Proposed Air Quality Permit

Thursday, Sept. 6th, 2012
5:15 p.m.
Quincy City Hall,
104 B Street SW,
Upstairs meeting room

If you are unable to attend the public meeting:
The public is also invited to provide written comments on this proposal from
July 30 through Sept. 10, 2012

Submit comments to:

Beth Mort,
Department of Ecology,
4601 N. Monroe,
Spokane, WA 99205-1295,
or by email at:
beth.mort@ecy.wa.gov.

Special accommodations

If you need this document in a format for the visually impaired, call the Air Quality Program at (360) 407-6800.

Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

If you need special accommodations at the hearing, please call Beth Mort at (509) 329-3502 by August 30.

Mort, Beth (ECY)

From: Mort, Beth (ECY)
Sent: Wednesday, August 29, 2012 3:32 PM
Subject: Vantage Public Hearing Reminder

Hello Interested Parties,

This is a reminder that, on Thursday, September 6th at 5:15pm, Ecology will be holding a hearing on the draft permit for Vantage Data Center. Please attend if you can! The hearing will be held in the upstairs meeting room at Quincy City Hall. If you are unable to attend in person, however, you are still welcome to submit comments. These comments can be sent to me at beth.mort@ecy.wa.gov, or mailed to our office:

Department of Ecology
Eastern Regional Office
4601 N. Monroe St.
Spokane, 99205.

All comments must be received by midnight on Monday, September 10, 2012. Thank you for your participation!

For your reference, I have included the press release related to this hearing (see below). For more information or to see any of the documents via the web, please visit our website at http://www.ecy.wa.gov/programs/air/quincydatacenter.

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm

Washington Department of Ecology news
FOR IMMEDIATE RELEASE - July 30, 2012
12-244

Ecology seeking comment on new Vantage Data Center permit

SPOKANE - The Washington State Department of Ecology (Ecology) invites the public to comment on a proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers and places conditions on the operation to protect public health. The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

In developing the draft permit, Ecology toxicologists consider the cumulative health effects on the residential community of Quincy from all the diesel generators at all the area data centers. Ecology's toxicological and computer modeling experts have completed a review of the Health Impact Assessment submitted by the company's consultant, ICF International, in support of the Vantage Data Center application.

Because diesel engine exhaust particulate is a toxic air pollutant, Ecology required a thorough evaluation of the health risks posed by the project.

A public hearing is scheduled for Thursday, Sept. 6, 2012, to gather formal comments about the proposal. The hearing will be held in the upstairs meeting room at Quincy City Hall, 104 B Street SW. A brief presentation and question

and answer period will begin at 5:30 p.m., preceding the formal hearing that starts promptly at 6:30 p.m.

In addition to public comments taken at the public hearing, the public is invited to provide written comments on this proposal from July 30 through Sept. 10, 2012. Submit comments to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public at:

* Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA. Or contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov .

* City of Quincy, 104 B St. SW, Quincy, WA.

* Online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/

Each of the generators will be capable of producing three megawatts of emergency backup electrical power for a total of 51 megawatts. The Vantage facility will use the most current and effective air pollution control equipment on the market today for controlling both particulate matter and nitrogen dioxide.

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Media Contact: Jani Gilbert, Communications, 509-329-3495; cell, 509-990-9177; e-mail jani.gilbert@ecy.wa.gov.

For more information: http://www.ecy.wa.gov/air.html

To see the draft permit: http://www.ecy.wa.gov/programs/air/quincydatacenter/

Ecology's website: http://www.ecy.wa.gov
Ecology's social media: http://www.ecy.wa.gov/about/newmedia.html

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Broadcast version

The Washington Department of Ecology invites the public to comment on a proposed air quality permit for building the new Vantage Data Center in Quincy.

A public hearing on the draft permit and health evaluation is scheduled for Thursday, Sept. 6th, and public comments must be received by September 10th.

The permit would allow the company to install seventeen diesel powered backup generators for use during power failures to support the facility's data servers.

Diesel engine exhaust particulate is a toxic air pollutant. Because of this, Ecology required a thorough evaluation of the health risks posed by the expansion project.

Contact Ecology for details.

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm

Articles generated from press release:

Quincy, WA
(Grant Co.)
Quincy Valley Post
Register
(Cir. W. 2,010)

AUG 0 2 2012

Allen's P. C. B Est. 1888

Public hearing announced for new data center

2373

The Washington State Department of Ecology (Ecology) invites the public to comment on a proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy. The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers and places conditions on the operation to protect public health. The generators are powered by diesel engines.

A public hearing is scheduled for Thursday, Sept. 6, 2012, to gather formal comments about the proposal. The hearing will be held in the upstairs meeting room at Quincy City Hall, 104 B St. SW. A brief presentation and question and answer period will begin at 5:30 p.m., preceding the formal hearing that starts promptly at 6:30 p.m.

In addition to public comments taken at the public hearing, the public is invited to provide written comments on this proposal from July 30 through Sept. 10, 2012. Submit comments to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public at the Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA. Or contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov. The documents are also available at the City of Quincy, 104 B St. SW, and online at www.ecy.wa.gov/programs/air/quincydatacenter.

Quincy, WA
(Grant Co.)
Quincy Valley Post
Register
(Cir. W. 2,010)

AUG 3 0 2012

Allen's P. C. B Est. 1888

Public hearing scheduled for data center

2375

The Washington State Department of Ecology invites the public to comment on a proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers, and places conditions on the operation to protect public health. The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

Because diesel engine exhaust particulate is a toxic air pollutant, Ecology required a thorough evaluation of the health risks posed by the project.

A public hearing is scheduled for Thursday, Sept. 6, 2012, in the upstairs meeting room at Quincy City Hall, 104 B St. SW. A brief presentation and question and answer period will begin at 5:30 p.m., preceding the formal hearing that starts promptly at 6:30 p.m.

The public is invited to provide written comments on this proposal from July 30 through Sept. 10, 2012. Submit comments to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public online at http://www.ecy.wa.gov/programs/air/quincydatacenter/.

For more information, contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov.

Web article generated from press release:

Comment sought on new Vantage Data Center permit

Posted: Friday, August 10, 2012 9:00 am

QUINCY - The Washington State Department of Ecology (Ecology) is seeking public comment on a proposed air quality permit for the planned Vantage Data Centers server farm.

The server farm is planned for 63 acres northeast of Quincy. The permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers.

The permit places conditions on the operation to protect public health, according to Ecology. The generators are powered by diesel engines.

Ecology's toxicological and computer modeling experts have completed a review of the Health Impact Assessment submitted by the company's consultant, ICF International, in support of the Vantage Data Center application.

Because diesel engine exhaust particulate is a toxic air pollutant, Ecology required a thorough evaluation of the health risks posed by the project.

A public hearing is scheduled for Thursday, Sept. 6, to gather formal comments about the proposal. It will be held at 6 p.m. in the upstairs meeting room at Quincy City Hall, 104 B Street SW.

The public may submit written comments on this proposal through Sept. 10 to Beth Mort, Department of Ecology, 4601 N. Monroe Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov

The Quincy server farm is the second for Vantage Data Centers (VDC). The first was built at Santa Clara, Calif.

VDC is backed by the private equity firm Silver Lake Partners, based in Palo Alto, Calif. At Quincy it will develop nearly 500,000 square feet of enterprise data center space.

Vantage will build the project in several phases, starting with a six megawatt, one-story 133,000-square-foot center that has been fully leased to an undisclosed Fortune 100 technology company. The first phase could be completed next year.

Future phases of the Quincy campus will include a 105,000-square foot Enterprise Technology Center and capacity for an additional 235,000 square feet of data center space.

The enterprise technology center will combine corporate office and data center space, with the office space housing up to 100 employees in executive offices, conference rooms and meeting areas.

Vantage selected Quincy primarily because of Grant County's ample supply of hydroelectric power. The company is tapping into a market described by some analysts as the most attractive for investors in all of commercial real estate at the moment.

- Staff report

Second Public Comment Period: December 10, 2012 – January 11, 2013

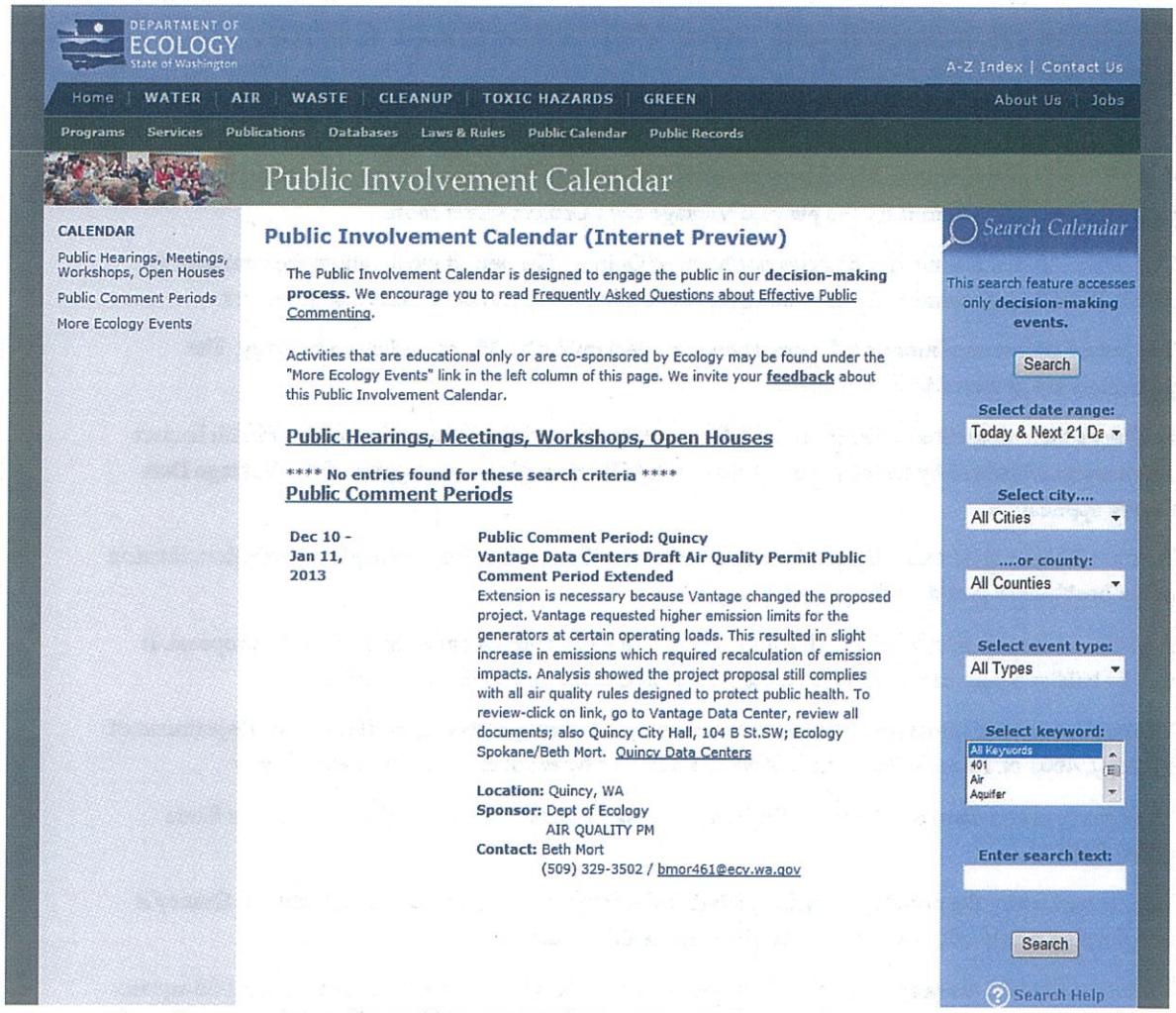

Image taken from website http://ecyapps3/pubcalendar/calendar.asp.

Mort, Beth (ECY)

From: Mort, Beth (ECY)
Sent: Thursday, October 11, 2012 12:33 PM
Subject: Vantage Data Centers: Additional Public Comment Period

Dear Interested Parties,

There will be an additional public comment period on the draft air quality permit for Vantage Data Centers but the start and close of the extension has not been set.

Vantage notified the Ecology Air Quality Program that changes needed to be made to Vantage's Notice Of Construction application. Once Ecology receives Vantage's information to request the changes, Ecology will review the information, revise the draft permit as needed, and release the updated draft for public review and comment.

Once Ecology updates the draft and it is available for review, we will notify the public of the new comment period dates. You are still welcome and encouraged to submit comments on the information presented at the Sept. 6, 2012 hearing.

You can email comments to me at beth.mort@ecy.wa.gov or mail them to me at:

Beth Mort
Department of Ecology
Eastern Regional Office
4601 N Monroe St.
Spokane, WA 99205-1295

For more information and to view documents related to Vantage, please visit our website:
http://www.ecy.wa.gov/programs/air/quincydatacenter/

Thank you!!

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm

For smoke info: http://wasmoke.blogspot.com/

1

Mort, Beth (ECY)

From: Mort, Beth (ECY)
Sent: Tuesday, December 11, 2012 2:04 PM
Subject: Vantage Data Center - NEW Public Comment Period

Dear Interested Parties,

The new public comment period on the draft air quality permit for Vantage Data Centers is now open! Comments will be accepted through midnight January 11, 2013.

This new comment period is needed because Vantage has made changes to the proposed project. Vantage requested higher emission limits for the generators at certain operating loads. This resulted in a slight increase in emissions. Because of this they had to recalculate their emission impacts. The results of this analysis showed that the project proposal still complies with all air quality rules designed to protect public health.

Documents about the permit and the health assessment are available for the public at:

- City of Quincy, City Hall, 104 B St. SW, Quincy, WA
- Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA
- Online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/ scroll down to Vantage Data Centers and you will find the updated documents

You can email comments to me at beth.mort@ecy.wa.gov or mail them to me at:

Beth Mort
Department of Ecology
Eastern Regional Office
4601 N Monroe St.
Spokane, WA 99205-1295

Thank you!!

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm

Department of Ecology News Release - December 11, 2012

12-396

Ecology extending comment period on new Vantage Data Center permit

SPOKANE - The Washington State Department of Ecology (Ecology) has extended the comment period for the proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy.

This new comment period is needed because the data center made changes to the proposed project that resulted in a slight increase in emissions. The analysis that recalculated their emissions also showed that the project proposal still complies with all air quality rules designed to protect public health.

The due date for comments is now Jan. 11, 2013.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers and places conditions on the operation to protect public health. The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

Submit comments and/or questions to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public at:

- Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA. Or contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov .
- City of Quincy, 104 B St. SW, Quincy, WA.
- Online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/

The original public comment period began on July 30, 2012. Ecology held a public hearing on Sept. 6, 2012.

Each of the generators will be capable of producing three megawatts of emergency backup electrical power for a total of 51 megawatts. The Vantage Data Center will use the most current and effective air pollution control equipment for controlling both particulate matter and nitrogen dioxide.

###

Media Contact: Brook Beeler, Communications, 509-329-3478; cell, 509-290-0855; e-mail brook.beeler@ecy.wa.gov.

Protecting our Air Quality (http://www.ecy.wa.gov/air.html)

See the draft permit (http://www.ecy.wa.gov/programs/air/quincydatacenter/)

Ecology's social media (www.ecy.wa.gov/about/newmedia.html)

Noticiero del Departamento de Ecología del Estado de Washington
PARA DISEMINACIÓN INMEDIATA – 17 de diciembre, 2012
12-401

Ecología extiende el periodo de comentarios públicos referente al permiso para el nuevo Repositorio de Data de Vantage (Vantage Data Center)

SPOKANE – El Departamento de Ecología del Estado de Washington (Ecología) ha extendido el periodo de comentarios públicos referente al propuesto permiso de aire ambiental para la construcción del nuevo Repositorio de Data de Vantage (Vantage Data Center) en 63 acres al noreste de Quincy.

Este nuevo periodo de comentarios es necesario debido a los varios cambios hechos al propuesto proyecto que resultaron en un aumento pequeño en la cantidad de emisiones. Un análisis que recalculó la cantidad de emisiones demuestra que el propuesto proyecto todavía cumple con todas las reglas de aire ambiental que protegen la salud pública.

La última fecha para entregar los comentarios públicos ahora es el 11 de enero, 2013.

El permiso preliminar ahora permite que la empresa instalar 17 generadores de electricidad reserva para utilizar durante los fallos del suministro de electricidad. La electricidad reserva mantendrá activa los servidores de data. El permiso también establece condiciones para proteger la salud pública durante el uso de los generadores. Los generadores están conectados a motores de diesel. Los 17 nuevos generadores están en adición a los otros 141 generadores ya permitidos en los 5 centros de data existentes en el área de Quincy.

Debe entregar sus comentarios y/o preguntas a Beth Mort, Departamento de Ecología, 4601 N. Monroe, Spokane, WA 99205-1295, o por correo electrónico a beth.mort@ecy.wa.gov.

El público puede revisar los documentos sobre el permiso y la salud pública en las siguientes locaciones:

- Departamento de Ecología, Oficina de la Región Este, Programa de Calidad de Aire, 4601 N. Monroe St., Spokane, WA. También puede comunicarse con Beth Mort a 509-329-3502 o por correo electrónico a beth.mort@ecy.wa.gov.
- Municipalidad de Quincy, 104 B St. SW, Quincy, WA.
- En el internet a: http://www.ecy.wa.gov/programs/air/quincydatacenter/

El periodo de comentarios públicos original comenzó el 30 de julio, 2012. Ecología patrocinó una reunión pública en el 6 de septiembre, 2012.

Cada generador es capaz de producir 3 megavatios de electricidad reserva para emergencias para un total de 51 megavatios. El Repositorio de Data de Vantage utilizará el equipo más nuevo

NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,

& SECOND TIER PETITION APPROVAL RECOMMENDATION

The State of Washington Department of Ecology (Ecology) has received application to construct a new air pollution source. Vantage Data Centers Management Company, LLC, 2625 Walsh Avenue, Santa Clara, CA 95051, has proposed to build Vantage Data Centers located at the northwest corner of the intersection of Road 11 NW and Road O NW, Quincy in Grant County. The mailing address for the Vantage Data Centers in Quincy will be 2101 M Street, Quincy, WA 98848.

Vantage Data Centers will contain four main data center buildings once it is fully constructed, and will install and operate up to 17 diesel engines that will power 3.0 megawatt electrical generators for a total capacity of 51 megawatts of emergency backup electrical power. The diesel engines generate criteria and toxic air contaminants which have been fully evaluated, and found to be significantly below major source thresholds. The primary emissions of concern are nitrogen oxides and particulate matter, including diesel engine exhaust particulate (DEEP). DEEP emissions were reviewed under a Second Tier Health Impact Assessment to evaluate health risks posed by the project. After review of the completed Notice of Construction application and other information on file with the agency, Ecology has decided that this project proposal will conform to all requirements as specified in Chapter 173-400 WAC. After review of the Second Tier Health Impact Assessment, Ecology concluded that impacts to the community due to the Vantage Data Centers will meet the protective requirements contained in Chapter 173-460 WAC.

Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, application information, and other application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848. A public hearing on this project was held on September 6, 2012 at the Quincy City Hall. This new public comment period is due to the changes Vantage made to their NOC application on October 19 and November 28, 2012. The public is invited to comment on this project proposal. Comments should be submitted to Beth Mort, and will be accepted for a period of thirty days after this notice has been published in the Columbia Basin Herald. For additional information please contact Beth Mort at Ecology's Spokane Office, 4601 N. Monroe, Spokane, WA 99205-1295, or email beth.mort@ecy.wa.gov, or 509 329-3502.

This notice supersedes the notice published on July 30, 2012.

#12032/2780681
Pub.: December 10, 2012

Mort, Beth (ECY)

From: hispanic@cha.wa.gov
Sent: Monday, December 17, 2012 12:06 PM
To: Mort, Beth (ECY)
Subject: Washington Dept. of Ecology News - 12/17/2012

Categories: Vantage

WASHINGTON STATE Commission on Hispanic Affairs NEWSLETTER

12/17/2012

Ecology Extending Comment Period on New Vantage Data Center Permit

SPOKANE – The Washington State Department of Ecology (Ecology) has extended the comment period for the proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy.

This new comment period is needed because the data center made changes to the proposed project that resulted in a slight increase in emissions. The analysis that recalculated their emissions also showed that the project proposal still complies with all air quality rules designed to protect public health.

The due date for comments is now Jan. 11, 2013.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers and places conditions on the operation to protect public health.

The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

Submit comments and/or questions to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public at:

- **Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA. Or contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov .**
- **City of Quincy, 104 B St. SW, Quincy, WA.**
- **Online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/**

The original public comment period began on July 30, 2012. Ecology held a public hearing on Sept. 6, 2012.

Each of the generators will be capable of producing three megawatts of emergency backup electrical power for a total of 51 megawatts. The Vantage Data Center will use the most current and effective air pollution control equipment for controlling both particulate matter and nitrogen dioxide.

Media Contact: Brook Beeler, Communications, 509-329-3478; cell, 509-290-0855; e-mail brook.beeler@ecy.wa.gov.
For more information: http://www.ecy.wa.gov/air.html
To see the draft permit:
http://www.ecy.wa.gov/programs/air/quincydatacenter/
Ecology's website: http://www.ecy.wa.gov
Ecology's social media: http://www.ecy.wa.gov/about/newmedia.html

Ecología extiende el periodo de comentarios públicos referente al permiso para el nuevo Repositorio de Data de Vantage (Vantage Data Center)

SPOKANE – El Departamento de Ecología del Estado de Washington (Ecología) ha extendido el periodo de comentarios públicos referente al propuesto permiso de aire ambiental para la construcción del nuevo Repositorio de Data de Vantage (Vantage Data Center) en 63 acres al noreste de Quincy.

Este nuevo periodo de comentarios es necesario debido a los varios cambios hechos al propuesto proyecto que resultaron en un aumento pequeño en la cantidad de emisiones. Un análisis que recalculó la cantidad de emisiones demuestra que el propuesto proyecto todavía cumple con todas las reglas de aire ambiental que protegen la salud pública.

La última fecha para entregar los comentarios públicos ahora es el 11 de enero, 2013.

El permiso preliminar ahora permite que la empresa instalar 17 generadores de electricidad reserva para utilizar durante los fallos del suministro de electricidad. La electricidad reserva mantendrá activa los servidores de data. El permiso también establece condiciones para proteger la salud pública durante el uso de los generadores. Los generadores están conectados a motores de diesel. Los 17 nuevos generadores están en adición a los otros 141 generadores ya permitidos en los 5 centros de data existentes en el área de Quincy.

Debe entregar sus comentarios y/o preguntas a Beth Mort, Departamento de Ecología, 4601 N. Monroe, Spokane, WA 99205-1295, o por correo electrónico a beth.mort@ecy.wa.gov.

El público puede revisar los documentos sobre el permiso y la salud pública en las siguientes locaciones:

- Departamento de Ecología, Oficina de la Región Este, Programa de Calidad de Aire, 4601 N. Monroe St., Spokane, WA. También puede comunicarse con Beth Mort a 509-329-3502 o por correo electrónico a beth.mort@ecy.wa.gov.
- Municipalidad de Quincy, 104 B St. SW, Quincy, WA.
- En el internet a: http://www.ecy.wa.gov/programs/air/quincydatacenter/

El periodo de comentarios públicos original comenzó el 30 de julio, 2012. Ecología patrocinó una reunión pública en el 6 de septiembre, 2012.

Cada generador es capaz de producir 3 megavatios de electricidad reserva para emergencias para un total de 51 megavatios. El Repositorio de Data de Vantage utilizará el equipo más nuevo y efectivo para controlar la contaminación de aire específicamente las partículas sólidas y el dióxido de nitrógeno.

Contacto de Media: Brook Beeler: 509-329-3478; teléfono celular: 509-290-0855; o correo electrónico: brook.beeler@ecy.wa.gov.

Para obtener más información: http://www.ecy.wa.gov/air.html

Para ver el permiso preliminar:
http://www.ecy.wa.gov/programs/air/quincydatacenter/

Sitio del internet de Ecología: http://www.ecy.wa.gov

Sitio de Ecología de media social:
http://www.ecy.wa.gov/about/newmedia.html

Display advertisement run in local papers:

We need your input!

Public Comment Period Now Open!

VANTAGE DATA CENTERS

Proposed Air Quality Permit

Comments accepted until midnight January 11, 2013

DEPARTMENT OF ECOLOGY
State of Washington

Submit your comments to:

Beth Mort
Department of Ecology
4601 N Monroe St.
Spokane, WA 99205-1295
beth.mort@ecy.wa.gov

Review documents at these locations:

- **Quincy City Hall, 104 B Street SW, Quincy, WA 98848**
- **Department of Ecology, 4601 N. Monroe, Spokane, WA 99205**

For more information and documents online:
http://www.ecy.wa.gov/programs/air/quincydatacenter

Spanish display advertisement run in local papers:

Articles generated from press release:

Quincy, WA
(Grant Co.)
Quincy Valley Post
Register
(Cir. W. 2,010)

DEC 1 3 2012

Allen's P. C. B Est. 1888

Vantage Data Center public comment period open

2373

The Washington State Department of Ecology (Ecology) has extended the comment period for the proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy. This new comment period is needed because the data center made changes to the proposed project that resulted in a slight increase in emissions. The analysis that recalculated their emissions also showed that the project proposal still complies with all air quality rules designed to protect public health.

The due date for comments is now Jan. 11, 2013.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers and places conditions on the operation to protect public health. The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

Submit comments and/or questions to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public at the Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA. Or contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov; the City of Quincy, 104 B St. SW, Quincy; or online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/.

Each of the generators will be capable of producing three megawatts of emergency backup electrical power. The Vantage Data Center will use the most current and effective air pollution control equipment for controlling particulate matter and nitrogen dioxide.

Moses Lake, WA
(Grant Co.)
The Royal Register
(Cir. W. 4,100)

DEC 1 8 2012

Allen's P.C.B. Est. 1888

Comment period extended on Quincy Vantage Data Center

2373

By Ted Escobar
The Royal Register editor

QUINCY — The Washington State Department of Ecology (Ecology) has extended the comment period for the proposed air quality permit for building the new Vantage Data Center northeast of Quincy.

This new comment period is needed because the data center made changes to the proposed project. However, the analysis that recalculated emissions showed that the project proposal still complies with all air quality rules.

The due date for comments is now Jan. 11, 2013.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers. It places conditions on the operation to protect public health.

The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

You may submit comments and/or questions to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov

Documents about the permit and the health assessment are available for the public at Quincy City Hall or online at: www.ecy.wa.gov/programs/air/quincydatacenter/

Each of the generators will be capable of producing three megawatts of emergency backup electrical power for a total of 51 megawatts.

The Vantage Data Center will use the most current and effective air pollution control equipment for controlling both particulate matter and nitrogen dioxide.

> The new comment period is needed because the data center made changes to the proposed project.
>
> The due date for comments is now Jan. 11, 2013.

Mort, Beth (ECY)

From: Mort, Beth (ECY)
Sent: Wednesday, January 09, 2013 4:54 PM
Subject: REMINDER: Comment Period - Vantage Data Center Draft Air Permit

Importance: High

Hello Interested Parties,

This is a reminder to submit your comments for the Draft Vantage Data Centers Air Permit by **midnight on January 11, 2013**. Documents are available for review at the Quincy City Hall, Ecology's Spokane Office, or online: http://www.ecy.wa.gov/programs/air/quincydatacenter (scroll down to the "Vantage Data Center" heading for document list).

You can send your comments to me at beth.mort@ecy.wa.gov or mail them to our office:

Department of Ecology
Eastern Regional Office
4601 N. Monroe St.
Spokane, 99205.

As a member of Ecology's Quincy Interested Parties group, I thought you might also be interested in some other work regarding Quincy air quality. Below is a link to an article from the Columbia Basin Herald about a settlement with Imerys (formerly Celite). Imerys will provide money for the Quincy School District to install diesel reduction equipment on their buses. Link to article:
http://www.columbiabasinherald.com/business/article_8291ae70-59do-11e2-89ae-001a4bcf887a.html

Thank you for your participation!

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm

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Appendix B:
Copies of all written comments

From: Mick Qualls [mailto:mqualls@qa-lab.com]
Sent: Monday, July 30, 2012 1:31 PM
To: Mort, Beth (ECY)
Subject: Vantage Data Centers Public Hearing on September 6th Quincy City Hall

Beth: I just forwarded this to the "Fiberactive Group" of Grant County. There are over 100 people in our group that are in favor of our Data Centers and want to support them in every way. Thanks for all of your professional work for our county. Mick Qualls

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From: Bauhs, Leonard (DSHS)
Sent: Thursday, August 02, 2012 10:29 AM
To: Mort, Beth (ECY)
Subject: Vantage Data Center

I am surprised that diesel generators remain the standard backup power source. Are other options considered and encouraged by DOE? Hydrogen fuel cell technology has been around for more than a decade. Is the difference in cost so significant that it easily outweighs the difference in impact on the environment?
By themselves, seventeen diesel engines don't seem all that many, but will the thorough evaluation mentioned in the attached story take into account that these are added to 141 others? Chances are a power outage for one facility will mean there is a power outage at others in the area at the same time.
Will there come a time and diesel engine count that prompts DOE to say "no" to yet another?
Thanks - Leonard

Leonard Bauhs
State of Washington
Department of Social and Health Services
IT Specialist
Economic Service Administration / Information Technology Solutions / Field Operations
360-39(7-9630)
Leonard.Bauhs@dshs.wa.gov

From: Patty Martin [mailto:martin@nwi.net]
Sent: Friday, August 31, 2012 10:42 AM
To: Mort, Beth (ECY)
Subject: handouts at the Catholic Church

Beth,

I wanted to let you know that every time a stack of your flyers is put out in the Catholic, they are removed by one of the church members. Additionally, I was sent a letter today accusing me of distributing the information.

It would probably have helped if Ecology had distributed a flyer with a current date on it. The date on the flyer is Feb. 2011.

Also, while you are correcting the flyer please provide a contact phone number for Maria Peeler. You list her as a contact but provide no phone number. An email address isn't going to help a person who does not have a computer.

Thank you.

Patty

From: Danna Dal Porto [mailto:ddalporto@smwireless.net]
Sent: Thursday, October 11, 2012 2:22 PM
To: Mort, Beth (ECY)
Subject: Re: Vantage Data Centers: Additional Public Comment Period

October, 10, 2012

Beth,

I am requesting new (second) public meeting regarding the Vantage Data Center permit in order to question both Ecology and Vantage. Vantage has taken their permit back in order to make changes. Since this is, in effect, a revision of their earlier permit application, I believe that the letter of the law must be followed and that the public have an opportunity to ask questions from both parties to this revision. Apparently the revision is significant because of the time Vantage has taken to revise the document (incomplete) that was inappropriately presented to the public in September. The data center developments in Quincy have become a focus even as far away as the New York Times. Quincy Citizens deserve a complete document (accurate)to review because, in effect, this is a totally new application.

I want the time necessary to compare both permit applications, focus on the changes and ask questions of Ecology and Vantage as to the nature and reasons for their adjustments. These are large and complex documents and I want to do my review carefully and then ask my questions in a public forum.

I am sure that another public meeting will be an annoying addition to everyone's time and to the Ecology budget. However, the focus of Ecology (the state agency charged to protect me) must be to present to the public, in a legal and fair manner, the proposal to add, yet another, dangerous diesel source to our already filthy air shed. To deny this request for another public meeting could

be seen as an effort to skirt the Washington State regulations regarding air quality permit applications. I trust that Ecology leadership will make every effort, in a public forum, to inform Quincy citizens about the revised Vantage permit.

I look forward to seeing the notification of the Vantage public meeting in the Quincy newspaper. I will be looking for the advertisements of the public meeting that will be posted in Spanish.

Sincerely,

Danna Dal Porto
Quincy

From: Miller, Kristin / Ext. 3700
Sent: Thursday, December 13, 2012 11:02 AM
To: Mort, Beth (ECY)
Subject: FW: Vantage Data Center - NEW Public Comment Period

Thinking about the emissions from the Vantage Data Center. We have so many data centers here in Quincy now. Does anyone look at the total emissions from **ALL** the centers as to adverse effects on the citizens of Quincy? Looking at each data center individually does not really capture the whole picture.

Kris Miller
Administrative Assistant
Quincy High School
509-787-3501

From: Patty Martin [mailto:martin@nwi.net]
Sent: Friday, December 28, 2012 9:51 AM
To: Flibbert, Gregory S. (ECY)
Subject: Vantage

Greg,

Is Vantage going to use DPFs, DOCs and SCRs as we have been told? Or is it Tier 2 engines as BACT?

Thank you.

Patty

From: Patty Martin [martin@nwi.net]
Sent: Friday, January 04, 2013 10:11 AM
To: Flibbert, Gregory S. (ECY); Mort, Beth (ECY)
Cc: Wood, Karen K. (ECY); Bowman, Clint (ECY); Koster, Robert (ECY); Johnston, Jeff (ECY)
Subject: Re: Vantage

So does that mean that Vantage's controls are BACT?

From: Danna Dal Porto [mailto:ddalporto@smwireless.net]
Sent: Wednesday, January 02, 2013 9:07 AM
To: Mort, Beth (ECY)
Cc: Flibbert, Gregory S. (ECY); Pfeifer, Grant D. (ECY)
Subject: Question on public comments, Vantage

January 2, 2013

Beth,

I would like clarification on the closing time and date of the Vantage public comments. I need you to send me the specific time and date for my comments to be accepted for the Vantage permit.

I have attached a listing of the various communications I have seen from your desk. I am sure this is easy to explain but I think you can see how I have become confused.

I am requesting another public hearing to have Ecology and Vantage clarify the documents that are on file in the Quincy City Hall. Your Public Notice of December 10, 2012, references Vantage changes to the NOC application on October 19, 2012 and November 28, 2012. My confusion is that the Quincy set of documents contains a document headed TSD, December amendment to May, 2012 TSD. This document has specific comments I need clarified. For example, what document is the final determination for Vantage? The various documents have a series of references to the BACT decision. Which one is the actual approval order? How can I identify the finish product? This is just one of the clarifying points I need answered and the basis for my public hearing request. I can continue to email questions if that is what Ecology prefers. I do have a concern however. I have emailed Ecology this past Holiday week and I have had no answers. Is everyone on vacation?

I look forward to your answers.

Danna Dal Porto
Quincy, WA

-----Original Message-----
From: Tom Flint [mailto:tom1flint@yahoo.com]
Sent: Wednesday, January 09, 2013 7:05 PM
To: Mort, Beth (ECY)
Cc: Mick Qualls
Subject: Support Vantage Air Permit

I would like to go record as supporting the Vantage Data Center Air Quality Permit. I also would like to thank you for all the detailed analysis you have provided as well.

Tom Flint
5842 Rd 2 NW
Ephrata, Wash
98823

From: Mick Qualls [mailto:mqualls@qa-lab.com]
Sent: Thursday, January 10, 2013 6:23 AM
To: Mort, Beth (ECY)
Subject: RE: REMINDER: Comment Period - Vantage Data Center Draft Air Permit

Beth: Thanks for including me on your e-mail list for comments. Please include my name on the list of "Person's that are in favor" of the Vantage Data Center's air quality permit. I am not at all concerned about emissions from data centers on the air quality in the Quincy area. Quincy has some of the cleanest air in the state and with our winds and other weather patterns, data centers are not a threat to our health.

[Entire packet submitted with Danna Dal Porto's cover letter below is available in Appendix D.]

January 10, 2013

Dear Greg,

This is my comment on the Vantage air quality permit, January 11, 2013.

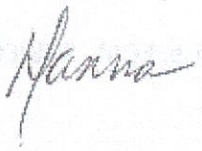
This document is disjointed and the organization of materials was complicated by the volume of material and the diversity of issues. I have numbered pages within the individual files but that was the best I could accomplish.

I criticized the public notification process but I do feel badly about that as Beth Mort is new to this position and in a learning process. That said, I do think it was disorganized and I am compelled to say that as the "process" needs to be clear and fluid.

I know that the repeated criticism is irritating to the hard working members of the Ecology staff. However, I am compelled to continue my close reading of permit documents because I want these major, huge diesel-emitting industries to have controls on the diesel engines. These data center developers can afford to protect this community, any community, from the unsafe operation of their industries.

Thank you for considering these documents.

Danna Dal Porto
Quincy



[Attachements submitted with Patty Martin's following emails are available in Appendix D.]

From: Patty Martin [mailto:martin@nwi.net]
Sent: Friday, January 11, 2013 11:11 PM
To: Mort, Beth (ECY)
Subject: Cost for controls

Beth,

Please find attached documents which contain cost information on emission controls for existing stationary diesel engines. These documents were taken from the regulatory docket for the U.S. EPA's National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines rulemaking (Docket ID No. EPA-HQ-OAR-2008-0708, www.regulations.gov/#!docketDetail;dct=FR%252BPR%252BN%252BO%252BSR;rpp=10;po=0;D=EPA-HQ-OAR-2008-0708):

1. - Letter from Bradley Nelson, EC/R Incorporated to Melanie King, USEPA; Control Costs for Existing Stationary Compression Ignition (CI) Reciprocating Internal Combustion Engines (RICE) (January 29, 2010)
2. - Email from Antonio Santos, MECA (Manufacturers of Emission Controls Association) to Tanya Parise, EC/R. MECA Cost of Aftertreatment (January 21, 2010)
3. - Email from Joe Suchecki, EMA (Engine Manufacturers Association) to Tanya Parise, EC/R. Cost of Aftertreatment (January 12, 2010)
4. - Email from Antonio Santos, MECA to Tanya Parise, EC/R. SUBJECT: Cost of Aftertreatment. October 2, 2009

Also, see MECA's June 2009 written testimony to EPA on the NESHAP for stationary CI RICE: http://meca.org/galleries/default-file/MECA%20comments%20on%20EPA%20stationary%20engine%20NPRM%20060309.pdf.

I would like these documents inserted into the record to dispute Mr. Wilder's claim of a "0.6" factor for increased costs of controls for larger engines, and to dispute his cost estimates used for BACT determination.

My narrative is still being written and I will have it to you beforemidnight.

Thank you.

Patricia Martin
MYTAPN
These

Mort, Beth (ECY)

From: Patty Martin [martin@nwi.net]
Sent: Friday, January 11, 2013 11:10 PM
To: Mort, Beth (ECY)
Subject: Vantage comments
Attachments: Final Draft 2012 Wildfires Smoke - BoH.pptx; Final Draft 2012 Wildfires Smoke - BoH - 20 ugm3 is WAQA standard for PM2.5.pdf; Debunking_BACT.pdf; D2 Test Cycle for EPA.pdf; vantage comments.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Vantage

Please accept my comments.

http://www.energy.ca.gov/2005publications/CEC-500-2005-049/CEC-500-2005-049.PDF

1

January 11, 2013

Beth Mort
Department of Ecology
4601 N. Monroe
Spokane, WA 99205-1295

RE: VANTAGE DATA CENTER

Dear Ms. Mort,

Please accept these comments on behalf of MYTAPN and me regarding the permitting of the Vantage Data Center. I have many concerns about the addition of this source of pollution into our air shed, and I object to the issuance of voluntary emission limits. Ecology did not notify the public, as required by 40 CFR 52.2495, of their intent to issue voluntary emission limits to the Vantage Data Center. The legal notice published in the Moses Lake, WA newspaper, did not identify voluntary emission limits as a permit term open for public comment; the agency did not explain "voluntary emission limits" or solicit input on them at the public hearing; and the agency did not in any way during the comment period seek "public involvement" on the agency's plan to issue them.

> § 52.2495
> Voluntary Limits on Potential to Emit
> Terms and conditions of regulatory orders issued pursuant to WAC 173-400-091 "Voluntary limits on emissions" and in accordance with the provisions of WAC 173-400-091, WAC 173-400-105 "Records, monitoring, and reporting," and WAC 173-400-171 "Public involvement," shall be applicable requirements of the federally-approved Washington SIP and Section 112(l) program for the purposes of section 113 of the Clean Air Act and shall be enforceable by EPA and by any person in the same manner as other requirements of the SIP and Section 112(l) program. Regulatory orders issued pursuant to WAC 173-400-091 are part of the Washington SIP and shall be submitted to EPA Region 10 in accordance with the requirements of §§ 51.104(e) and 51.326. (emphasis added)

Ecology has failed to comply with this federally enforceable provision of the Clean Air Act (CAA) when it issued permits to Microsoft, Yahoo!, Sabey, Dell and Intuit. Ecology has never solicited comment on voluntary emission limits, nor advised the public that comment was required in issuing them. Additionally, Ecology has never discussed with the public the difference between Title V permitting and voluntary emission limits, or more importantly the difference in protections provided, or monitoring required, by them.

I am also objecting to Ecology's insistence that Vantage's use of controls is not BACT. BACT is a legal term -- as stated by Robert Koster at the Public Hearing held in July. BACT implies "control technology", and by its very definition is "technology forcing." Ecology's attempt to remove it and relegate BACT to Tier 2 engines isn't supported by statute, or by the emissions known to be released by these large engines. In fact, Mr. Wilder cites to a study that clearly demonstrates that the emissions from large diesel engines are 2 to 5 times higher than guaranteed by manufacturers. The discrepancy is in the difference between the weighted average testing required under 40 CFR 89 (ISO 8178) and EPA's Method 5. *Air Quality Implications of Backup Generators in California*, p.34. EPA Method 5 includes the "front" and "back" half (filterable and condensable, respectively) of particulate released by the engine. Emissions from Vantage's engines are therefore more closely aligned with those presented by ELM, than the nominal numbers used by ICF to undermine the BACT cost effectiveness numbers and health risk.

My third objection involves Ecology's failure to use Washington's more stringent standard for PM2.5. The WAQA for PM2.5 is 20 ug/m3. According to Ecology and/or ICF, the background value for PM2.5 in Quincy is 21 ug/m3, which exceeds the WAQA standard of 20 ug/m3. See TSD, 6.2 Assumed Background Concentrations, and *Final Draft 2012 Wild Fires Smoke – BoH*, Matt Kadlec, PhD, BDAT, Ecology Air Quality Program. Ecology recognizes that levels exceeding 20 ug/m3 are not protective of sensitive individuals, and studies have found that chronic exposure to even low levels of PM2.5 increase premature mortality. Please explain how Ecology can justify their decision to allow levels of PM2.5 to increase beyond levels the agency knows to be harmful.

The fourth issue deals with the underestimation of risk through faulty modeling assumptions.

1. Every monthly test, every maintenance check, storm avoidance or power outage, is a "cold start", so the emission factor must be adjusted accordingly. Please identify all engine operations to which "cold start" factors were applied, and how many hours of each engine operation included a "cold start" factor.
2. ICF's reliance on the "cold start" factor of 1.12 for 30 minutes appears to be in error. A review of the literature relied upon by ICF shows that over the course of the first 30 minutes particulate matter was 17.7 g/kW-hr. *Air Quality Implications of Backup Generators in California*, pp.31-32 (See attachment "Cold start is 17.7 g/kW-hr averaged over 30 minutes" excerpted from this document). Please back calculate using this value (17.7 g/kW-hr) to demonstrate how a 1.12 cold start factor was derived for 30 minutes and how 1.058 was derived for 1 hour.
3. Vantage based its background concentrations on the 98th percentile 24-hr average for PM2.5 and NO2, rather than on the maximum background level. My understanding of the modeling would require the worst case scenario modeling be conducted, then the maximums of those numbers compared against the standard. If more than 7 days in one year (98th percentile) exceed the standard, then compliance is not met. It seems logical to me that by using the 7th highest day for the assumed background concentration, Vantage will be allowed to violate the standard more frequently. Please provide evidence that the 1st through 7th day 24-hour background values (for each of the 5 years modeled) for PM2.5 and NO2, and the 1st through 7th day 24-hour

values (for each of the 5 years modeled) for emissions from Vantage for PM2.5 and NO2 were used to determine compliance with PM2.5 NAAQS.

4. In the real world, all PM2.5 is also PM10, however, for Vantage's local background concentration impact at the same receptor, the PM10 and PM2.5 24-hour averages are different numbers. Because PM2.5 is a subset of PM10 (and therefore is PM10), the PM10 concentration cannot be lower than the PM2.5 concentration (0.002 ug/m3 and 0.08 ug/m3 respectively). See TSD, 6.2 Assumed Background Concentrations. Please explain how this is possible.
5. Vantage claims that the background plus modeled annual concentration of PM10 and PM2.5 are the same. Please explain how this is possible when the 24-hour concentrations are not the same.
6. The PM 2.5 24-hr background of 21 ug/m3 was based on the 7th highest concentration. It seems possible that emissions from Vantage when combined with background may approach, or exceed, the 35 ug/m3 NAAQS. Ecology has provided no proof that Vantage's emissions comply with NAAQS. Please provide evidence that NAAQS is met for 24-hr PM2.5.
7. ICF's assumption that the worst-year annual emission impacts could be scaled by a factor of 1.27 because commission testing and stack testing are 27% of the emissions from full-build out routine testing plus power outages, is inappropriate. Commission testing involves only loads at 100% and 75% and will result in more than 27% of the NOx emission. Commission testing should be properly accounted for in modeling, not by manipulation. Since 1-hr NO2 was close to exceeding the NAAQS (166 ug/m3) the commission modeling must be conducted to assure compliance. Start-up operations are not allowed to be excluded from permitting under the CAA.

Other complaints and concerns include:
ICF used control estimates from 2000-2500 kW engines and adjusted the cost using the "0.6 factor." ICF provides no support for the "0.6 factor", or 60% increase in cost. To the contrary, information from the Manufactures Emission Control Association (MECA) indicates that costs stay the same or go down with increasing engine size. See EPA-HQ-OAR-2008-0708-DRAFT-0309[1]

ICF used a cost estimate of $188,745/generator for DPFs. MECA indicates that the total installed cost should be between $90,000-100,000 on a 3 MW engine. See EPA-HQ-OAR-2008-0708-DRAFT-0307[1] CARB estimated the cost for DPFs – using a regression approach – to be $38/hp. See Cost Analysis – Basis for Calculations, I-2.

The annual cost of operation of control technology decreases with engine size (cost/hp), it is not expected to increase as ICF suggests. A "Control Costs for Existing Stationary CI RICE" produced by Bradley Nelson, EC/R, Inc. is included for comparison purposes against the assumptions made by ICF.

Finally, ICF relies on source testing from "previous testing on the same engine with controls." This is not acceptable. The front half and back half particulate matter must be captured on the same engine. Capturing the back half on the same engine with controls will result in less particulate matter. The source tests are worthless; they have no chain of command or quality

assurance, and they have been pieced together by a party with a vested interest. Ecology should not rely on the source tests for these reasons.

Thank you for considering my comments.

Sincerely,

Patricia Martin
MYTAPN

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Appendix C:
Transcripts from public hearing

Quincy, WA – September 6, 2012

Ecology held a public hearing at the Quincy City Hall on September 6, 2012. Thirteen members of the public attended the hearing. Three attendees testified.

September 5, 2012 Vantage Data Centers Draft Air Quality Permit Hearing in Quincy, Washington
Department of Ecology
4601 N Monroe Street
Spokane, WA 99205-1295
Mary Ausburn, Ecology Hearings Officer
Transcribed by Ecology's Air Quality Program, Spokane, Washington. Um's and er's were not included in this transcription.

Mary Ausburn: Okay, so this is going to probably duplicate some things I've already talked about, so thanks for listening.

Let the record show that it is 6:40 pm on September 6, 2012 and this hearing on the proposed Air Quality Permit for the new Vantage Data Center is being held in Quincy, Washington at the City of Quincy, 104 B Street SW, 98848.

Legal notice of the hearing was placed in the Columbia Basin Herald. A legal notice was run accidentally on June 27, 2012 advertising the public hearing date as July 31, 2012. This notice was withdrawn on July 16, 2012 the correct and final public notice was run on July 30, 2012 advertising the correct public hearing date on September 6, 2012.

A press release including information for public broadcast was distributed to radio, TV and newspapers on July 30, 2012. Information about the hearing was placed on the Department of Ecology's online public calendar.

Display ads advertising the public hearing were placed in the following publications:

Quincy Valley Post Register: August 16, 23, and 30th, 2012.
Wenatchee World: August 24, 29, 31st & September 3, 2012, and
Columbia Basin Herald: August 24, 29, 31st & Sept 3, 2012.

Spanish Display ads advertising the public hearing were placed in the following publications:

Quincy Valley Post Register Shopper on August 28th and September 4, 2012 and El Mundo on August 30, 2012.

In addition, flyers advertising the hearing and Ecology's publication "Focus on Exhaust Health Risks" (publication # 11-02005) in English and Spanish, were distributed at 21 locations in Quincy. A list of these publications is available upon request. A Spanish language PSA was sent to Adelante Media Group on 9/4 for play on local Quincy radio station 95.9.

Any testimony received at this hearing or submitted during the comment period, will be part of the official hearing record for this proposal.

Now it's your turn. The first person on my list is Danna, if you would like to come up.

If you would state your name and affiliation and address of record.

Danna Dalporto: My name is Danna Dal Porto, spelled D-A-L-P-O-R-T-O. I live at 16651 Road 3 NW, Quincy, WA 98848. I represent a group called MYTAPN, Microsoft-Yes; Toxic Air Pollution-No.

I'm not entirely sure about speaking at this meeting, since it sounds like they are going to be changes made to this permit and there will be another public hearing, so I will just make a few comments. I would like to encourage and explain the necessity for the public to be able to see the operations log of these data centers. I was told by a high level Ecology employee that the operating permit is only as good as the operator, so if we are to say that there is going to only be 8 hours per year of emergency operation, the only way we can determine if that in fact is followed, is to be able to look at the operational log. That's a need for that.

I will continue to complain about Ecology using Moses Lake's weather representing Quincy. It is not the same. It is not the same place geographically. It has not got the same issues. We have continued inversions during the spring and summer. Moses Lake does not have that because they do not have the surrounding and elevated areas of the Monument/Beasley Hills which contain the emissions in our valley, because it really is a valley.

And the other thing I would like to speak to right now, is 8 hours per year of emergency operation is, in my opinion, woefully inadequate. I have compiled a very long list of outages in our county. We've had navy jets strike voltage lines and put them out of service. We've had very large wind storms putting 6500 people in Quincy out of power. Last fall REC Silicon was out for 13 hours due to material on electrical equipment. I just don't see that this 8 hours per year is adequate to

protect our community. I will follow this comment up with written statements at a later time. Thank you.

Mary Ausburn: Thank you. Okay, next is Debbie. State name and address and if you are affiliated with anybody.

Debbie Koehmen: I'm Debbie Koehmen, K-O-E-H-M-A-N. Address: 11443 Road P NW, Quincy.

I'm really here as a community member. I'm a mom; I've got kids I worry about. I'm a wife. I'm a sister. I'm a teacher. My husband said, "why do you even bother going to these meetings? Nobody ever listens to you", but I am a stakeholder in this. And I'm going to be that burr under your saddle or your moral conscience or the squeaky wheel saying something and hopefully people will start to listen. I am a true stakeholder. I am a life-timer. You talk about 70 years; that's nothing. My family has lived here for over 100 years. My closest neighbor is now Intuit. I am in the heart of this computer generator problem. The next closest neighbor except for the neighbors on the other side of Intuit is Yahoo. I had to laugh at the comment about the schools. I am a teacher. I work at Mountain View now. I used to work at the high school. So I would spend 24 hours of my day in these exposure areas that aren't supposed to be a problem. I have a pre-existing respiratory problem. Gosh, it all adds up. I'm going to get it; I'm going to be the one going down. If not me, you know somebody I really love. After the last one, I was so depressed. I went home and told my husband, "honey, when the kids go off to college, were going to encourage them never to come home and we are going to put it in our will that we burn the farm down upon our death, because I don't want anybody I know and love that closely living with this potential risk". We still don't know what it is doing to the soil. They approached my family, cuz I am really right there, and said, "Can we buy our land?" And I said, "Are you kidding? This is agricultural land". We don't want to pave it over and put up computer closets. Put it someplace where you know, if I had known about the diesel generators, I would have fought harder. I was just fighting for the agricultural land. Now I'm kind of suspicious about the agricultural land. We still don't have a soil test; what's it doing to the soil? When that wind blows, it's not staying inside those little fences. It's going everywhere and we have wind problems here.

Here's my questions: I'm very worried about the data. Finding about it while 3 years ago, well ya know it's not as good as we thought it was, to me, that is not in this day and age, really good. I really wonder why we can't get more accurate data, especially when we know how many hours the inter-modal is running. Seems like if we

have computer system, stick it in and it will be able to tell us. The weather, when I called and asked about all this and they said, "oh it is the buildings and this and we do air flow and it depends. And it is just an estimate", but our weather here is completely different than what's being used for the data, so why aren't we using this updated stuff. I really appreciate Vantage's comment that maybe they're going to use the diesel 4 because it is a better engine and it is the right thing to do. I really appreciate that, but I am very worried about this. I came in a little bit late so I missed the extra, we're gonna, the systems changing, we're gonna do something else, and I hope to hear more information about that. If possible, I would like to be involved with that so that I can further look into this and make some comments.

Gosh, where do we go from here? I heard somebody say once, that if you came back to a community, to try to help your community, it was one of the best things that you could do. And I thought, wow, that is so cool, kind of like being a teacher; it's the noble thing to do. And I would hope that our community would be a place that my children would like to come back to. It would be worthwhile. Every parent wants their children to do better and have the best. And if I give up on Quincy and the quality of life that I feel like we had here, and I don't want my kids to come back, that's not a great thing. I want Quincy to be valuable place to live. I wanna, you know, not have to burn my farm down, because nobody else would be stupid enough to buy this land when you're in that blue zone. Why, why would you do that? So I wish I would have screamed harder the first time and encouraged them to be farther away from town and so that we could all be safer, but we have this problem now and I really hope we're more proactive otherwise, there will not be a community of Quincy anymore. It will just be data storages and all the children will have left because their parents said, hey you're not going to be a life-timer here. I don't want you to have this problem. I guess that's my comment. Thank you.

Mary Ausburn: Thank you. If you could state your name and address of record that would be great.

Patricia Martin: Patricia Martin, 617 H St SW, Quincy 98848.

Like Debbie who just spoke before us, I too live awfully close to data centers, in fact I am 600 yards due south of Microsoft and Dell, and I share concerns over the impacts on the community.

First, I'd like to thank Vantage for stepping up to the plate and using what amounts to a tier 4 engine, which means a reduction in diesel

particulate matter of 90%. That's something that all of the data centers could have done. They can eliminate an option based on cost, but they can always include an option; it's always their prerogative to do that. And I appreciate the conscience and sense of community that Vantage brings in being a good citizen and good neighbor.

I do have to add concerns because we do have appeals before the Pollution Control Hearings Board and some of the information that Ecology is not bringing to the table in the formation of $PM_{2.5}$ which is required under the law and the consideration of precursors to ozone formation, which is also required by the law, is a necessary part to know whether Quincy, the valley, the area that surrounds our community is in compliance with the National Ambient Air Quality Standards . Unless somebody factors that in and looks at that, there is no way that Ecology can make a statement of safety with any of these data centers.

I brought an article regarding what's recently being found out about the danger of ozone; on heart and cardio vascular and cerebral disease. I also brought the federal registers that talk about the need for minor new source review to include the secondary formation of $PM_{2.5}$. The state is aware of this. EPA has advised them in their rule making that they need to assure EPA that they are considering secondary formation of $PM_{2.5}$. Additionally, I have, I think it's the same federal register, talking about for any pollutant for which there is a NAAQS, a National Ambient Air Quality Standard, you have to also consider any precursor to it. So this one is dealing with the issue of ozone.

We've had an issue, well, let me finish that thought. So I'm also questioning Ecology's claim that the $PM_{2.5}$ annual level here in the Basin is 0.056 micrograms per meter cubed [$\mu g/m^3$]. That's inconsistent with the modeling, the monitoring excuse me, the monitoring the actual hands on ground modeling that they did in January through April, of this year. Those levels were much higher for the $PM_{2.5}$ on an average daily basis. Also, the one hour NO_2 would change in this technical support document because of the chemical transformation when $PM_{2.5}$ or excuse me, when the precursor to ozone is considered.

I'm inserting Clint Bowman's testimony supporting the fact that AERMOD and we talked about this, but just to put this into the record, AERMOD does not consider secondary formation of $PM_{2.5}$ and it is an inappropriate model to have been used. I took the liberty of having contacted Vantage's engineer in advance of the release of

their permit to advise them that secondary formation of $PM_{2.5}$ was considered and had not been done and AERMOD was not the appropriate model.

I would like to add a little complaint: I noticed coming up, as I was running late to this meeting, that the hearing time had been changed to 5:15. I was not aware of that and I don't believe that anyone else in the community would have known until they got to the base of the stairs that the hearing time had been changed.

After 5 years of and knowledge that we were going to get more of these data centers, Ecology has an obligation, in my opinion, to stop the modeling and start the monitoring to find out what the real impact is on this community. To show those pictures of the diesel emissions around Puget Sound, is not the same as Quincy. Diesel from trucks and cars falls 300 yards, or 100 yards. It is a very short travel distance and so people who live along the corridors, yes, they have higher exposure. These engines emit and move, you know, push this stuff out, miles away. And depending on weather and structures, bring it back to the ground and people should be concerned about it impacting their land.

One other misnomer that happens, we always are talking about cancer. All the review for cancer impacts or other impacts in our community has been limited to diesel, to you know this $PM_{2.5}$; and not to the synergistic or additive effects from other toxins that we have in the environment. I'm also inserting the emissions for Celite to show that there is a concentration of nitrogen oxides, carbon monoxide and particulate matter in view we see that it will be in that area.

And finally at least at one church in town, all of Ecology's fliers and for the people who took the time to put them out, I am sad to tell you that someone walked off with all of them and that they were replaced and they disappeared for a second time. I was the recipient of these. They sent them with a very nasty note to me. Because Ecology is distributing something that is dated February of 2011, has nothing about the upcoming hearing on it. And in the case of the flier that references Maria Peeler, who by the way was a neighbor of mine growing up. There is no phone number for her. So for a Hispanic, non-English speaking member of our community, have had any contact without a computer, it would have been an impossibility.

Again, I thank Vantage for being responsible, whether or not they were required to. It is my opinion that you were required to, because the State of Washington does not distinguish between minor and

major sources of air pollution and requires BACT on all air pollution sources. Thank you.

Mary Ausburn: Thank you. Okay at this point, I think if there is anyone else that wants to say anything, please let me know, otherwise I will just read the closing statements:

This is a statement that's related to the additional information that Vantage will need to provide to Ecology. Vantage notified the Ecology air quality program last week that they need to make changes to their NOC application, which is Notice of Construction. Vantage will need to submit information to request the changes to the draft permit that they spoke of earlier. Ecology must then review this information and revise the draft permit as necessary. There will be an extension to the comment period for this project. We are required by law to allow the public 30 days to review the new information. We don't know when the information will be available, so we can't speculate when the additional 30 day comment period will begin or end. Once all documents are submitted, reviewed and changes made to the draft permit, Ecology will notify the public that the comment period extension has begun and announce the closing date for comments to be submitted. You are still welcome and encouraged to submit comments from this hearing now, but you will still have an opportunity to comment on new information once it is available for review.

At this point, the information will be sent to people who gave us their address. Are you also doing email? *[question to someone else in background]. [Speaking to staff in room]* To the link where this information will be located on our website... *[staff in background notes information available in the Quincy City Hall building that hearing is happening]*.

Unless there are any other questions, I think we can adjourn. Thank you very much for coming. And by the way, I was very impressed by your level of knowledge about this situation.

Thanks so much. Let the record show that this hearing ended at 7:00 pm.

[End of Audio]

DEPARTMENT OF ECOLOGY
State of Washington

Sept. 6, 2012

Vantage Data Centers Proposed Air Quality Permit Public Hearing Agenda

5:20 – 5:30	*Introductions* **Hearings Officer:** **Mary Ausburn, Environmental Planner, Ecology**
5:30 – 5:35	*Presentation: Project Overview* **Mike Duffy, Vantage Data Centers**
5:35 – 5:42	*Presentation: Ecology's Process* **Robert Koster, Senior Air Quality Engineer, Ecology**
5:42 – 6:00	*Presentation: Air Quality and Human Health* **Gary Palcisko, Toxicologist, Air Quality, Ecology**
6:00 – 6:30	*Question and Answer Session* **This will be an open forum for you to ask questions you may have. During the formal hearing, Ecology and Vantage will not able to respond to comments made for the record, so please ask any questions requiring an immediate response during this time.** **Panel members:** **Karen Wood, Air Quality Program Section Manager, Ecology** **Gary Palcisko, Toxicologist, Air Quality, Ecology** **Robert Koster, Senior Air Quality Engineer, Ecology** **Mike Duffy, Vantage Data Centers** **Maria Peeler, Spanish Interpreter, Ecology**
6:30pm	*Formal Hearing* **During the formal hearing, we will be taking comments for the formal record. No response can be given tonight, but a written responsiveness summary will be available on our website 30 days after closing date.**

Ecology will be taking comments for this project until Sept 10th, 2012. Please send all comments to Beth Mort at 4601 N. Monroe, Spokane, WA 99205. Comments may also be faxed to (509) 329-3529 or emailed to Beth at beth.mort@ecy.wa.gov.

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Appendix D:
Additional Reference Documents

- Documents submitted by Patty Martin with testimony at September 6, 2012 Public Hearing
- Documents submitted by Patty Martin with written comments
- Documents submitted by Danna Dal Porto with written comments
- Reference documents submitted by Ecology staff

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Documents submitted by Patty Martin with testimony at September 6, 2012 Public Hearing

Patty Martin submitted the following 13 pages along with her testimony at the September 6, 2012 public hearing. See the transcripts from the public hearing in Appendix C.

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Ozone: Heart of the matter

Surprise: Lungs aren't the most vulnerable tissue

By Janet Raloff
Web edition : Tuesday, June 26th, 2012

As reported this week, breathing elevated ozone levels can mess with the cardiovascular system, potentially putting vulnerable populations — such as the elderly and persons with diabetes or heart disease — at heightened risk of heart attack, stroke and sudden death from arrhythmias. Is this really new?

Turns out it is, says Robert Devlin, the Environmental Protection Agency toxicologist who led the new study. Among the chief priority air pollutants affecting human health that his agency regulates are ozone and near-nano-scale particles called PM (for particulate matter). Although air pollution can affect the heart, there has been a longstanding question about which constituents deserve the blame.

In urban areas especially, many different pollutants are produced by the same or similar processes, so they tend to show up as a mix. Teasing out the role of any individual element can prove challenging.

A little more than 20 years (SN: 4/6/91, p. 212), studies emerged showing that airborne PM levels below the federal limit were killing people in many U.S. cities. An ambitious hunt immediately commenced to find out how and why. Data on the *why* are still emerging and a bit equivocal. But clearly, this pollution can damage the lungs, heart and brain.

Ozone, by contrast, had for years appeared fairly wimpy. Sure, it could aggravate asthma. But for decades there were no data indicating this pollutant would kill people without pre-existing lung disease. And to this day, Devlin notes, data on non-lung impacts from ozone tend to be quite thin.

So until ozone mortality data started to come out around 2004 (SN: 12/11/04, p. 372), his team had little motivation to probe for cardiovascular impacts. But it's probed them now — and found plenty of potentially adverse changes in a trial involving 23 healthy young men and women. Some of the more compelling observations involve markers of inflammation, the scientists report in a paper published ahead of print June 25 in *Circulation*.

Tracy Stevens finds them compelling, anyway. The reason: "The big theory about cardiovascular disease centers around inflammation," notes this cardiologist at St. Luke's Mid America Heart Institute in Kansas City, Mo.

"I think of plaque in the arteries like pimples," she says. Yes — she's talking about zitz.

As pimples become inflamed, they fill with pus, eventually rupturing and then scabbing over. "And that's essentially what happens in a sudden heart attack or sudden stroke," she argues.

Beginning in childhood, fatty plaque deposits can begin to accumulate along the interior walls of arteries. Various agents of the body's immune system (such as the interleukins and tumor necrosis factor elevated in the new study) can inflame this plaque. And when they do, the fatty deposits can engorge with immunity-driven materials, eventually to the point of bursting.

The body will interpret a rupture as the equivalent of a cut — something that needs immediate repair, Stevens explains. In an attempt to seal the breach, a clot forms — "and it's the clot that obstructs the blood flow and triggers the sudden crisis." This, in fact, explains why some people survive a stress test in the doctor's office only to drop dead a day later from a heart attack. It's not that the stress test failed to find a problem, she says, but that "the patient, for whatever reason, had a spontaneous plaque rupture the next day."

The elderly may be especially vulnerable to ozone's inflammatory impacts, she worries, because they tend to have the most plaque and the longest exposure to this pollutant.

In addition, Stevens points out that some of the inflammatory chemicals that rose in the new study following ozone inhalation "can trigger inappropriate artery constriction and cause spasms."

Cardiologist Wayne Cascio, who heads a division on environmental public health at EPA's National Health and Environmental Effects Laboratory, noted that his scientists' new study also identified provocative signs of an elevated risk of clotting after the volunteers had breathed in ozone-enriched air.

The pollutant altered levels of several clot-related proteins, including plasminogen, tissue plasminogen activator and plasminogen activator inhibitor. Concentrations of some went up, others down. Based on the pattern of changes, notes Cascio, "one might predict that [high ozone] would slow the dissolving of clots." That suggests clots might propagate or enlarge, he says — "or potentially block up a vessel, causing a heart attack or stroke."

Keep in mind, Devlin notes, many different conditions spawn clots. But once they form, he says, his group's data are now "suggesting that exposure to ozone might inhibit the body's ability to dissolve them."

When EPA is charged with imposing or revising health-related pollution standards, it's not enough to have good epidemiology — observations and survey data suggesting associations between events (like disease) and possible predisposing factors, explains air pollution epidemiologist Douglas Dockery of the Harvard School of Public Health. Although epidemiology can point to associations, he explains, it can't establish causes. Yet to set federal health-protecting pollutant

limits, "you really need to know that there is a true causal link between this pollutant and a health effect."

"And that's what makes the new study so remarkable," he says. The EPA scientists carried out controlled exposures in people and then conducted electrocardiograms and blood sampling over a prolonged followup period. Through this intensive probing, he maintains, those researchers have at last demonstrated that ozone "is causally linked" to adverse cardiovascular changes.

regulations, is addressed in detail in the referenced sections of this preamble.

NSR program element	Final action	Section
Applicability to $PM_{2.5}$ precursors	SO_2—Must be regulated as precursor, NO_X—Presumed regulated, VOC—Presumed not regulated, Ammonia—Presumed not regulated.	V.A
PSD major source threshold	100/250 tons per year (tpy)	V.B
NA NSR major source threshold	100 tpy	V.B
Significant emissions rate	Direct $PM_{2.5}$ emissions—10 tpy, SO_2 precursor—40 tpy, NO_X precursor—40 tpy, if regulated.	V.C & V.D
Condensable $PM_{2.5}$ emissions	Included in direct $PM_{2.5}$ emissions for major NSR applicability determinations after the end of the transition period (changed based on comments received).	V.E
Control technology: BACT and LAER	Applies for direct $PM_{2.5}$ emissions, SO_2, and other precursors if regulated.	V.F.1 & V.G
Prevention of significant deterioration	Increments, SILs and SMCs covered in a separate rulemaking	V.F.2
Air quality impact analysis	Applies for $PM_{2.5}$	V.F.3
Preconstruction monitoring	Applies for $PM_{2.5}$ (finalizing options 1 & 3)	V.F.4
NA NSR Statewide compliance and alternative siting analyses.	Applies for direct $PM_{2.5}$ emissions and precursors, if regulated	V.G
NA NSR offsets	Applies for direct $PM_{2.5}$ emissions and precursors, if regulated	V.G.1–3
Interpollutant offsetting	Allowed on a regional or statewide basis; EPA is issuing guidance with recommended regional hierarchies and trading ratios (changed based on comments received).	V.G.4
Transition for PSD	Continues to use PM_{10} as a surrogate	V.H
Transition for NA NSR	Applies through an approved SIP or through 40 CFR part 51, appendix S	V.I
SIP development period	Clarifies that major NSR does not apply to precursors during the SIP development period in attainment areas (changed based on comments received).	V.J
Tribal concerns	Cross references to proposed NSR rules for Indian country	V.K
Minor NSR	Clarifies that State and local regulatory programs must include $PM_{2.5}$ requirements for minor sources.	V.L
NSR transport option	Transport classification not available	V.M

The provisions of the $PM_{2.5}$ major NSR program finalized in this action are codified as revisions in the previously existing regulatory text. The revisions to NA NSR are codified in 40 CFR 51.165 and appendix S to 40 CFR part 51. The PSD revisions are codified in 40 CFR 51.166 and 52.21.

V. Rationale for Final Actions

In this section we discuss each element of our proposal for this rulemaking, explain our final action, discuss the rationale for our final action, and summarize the major public comments we received. The full summary of public comments on the proposal, along with our responses, can be found in the docket for this rulemaking.[7]

A. Applicability of NSR to Precursors of $PM_{2.5}$ in the Ambient Air

Scientific research has shown that various pollutants can contribute to ambient $PM_{2.5}$ concentrations. In addition to direct $PM_{2.5}$ emissions, these include the following precursors:

- Sulfur dioxide (SO_2);
- Oxides of nitrogen (NO_X);
- Volatile organic compounds (VOC); and
- Ammonia.

These gas-phase precursors undergo chemical reactions in the atmosphere to form secondary PM. Formation of secondary PM depends on numerous factors including the concentrations of precursors; the concentrations of other gaseous reactive species; atmospheric conditions including solar radiation, temperature, and relative humidity; and the interactions of precursors with preexisting particles and with cloud or fog droplets. Several atmospheric aerosol species, such as ammonium nitrate and certain organic compounds, are semi-volatile and are found in both gas and particle phases. Given the complexity of PM formation processes, new information from the scientific community continues to emerge to improve our understanding of the relationship between sources of PM precursors and secondary particle formation.

Precursors contribute significantly to ambient $PM_{2.5}$ concentrations, producing approximately half of the concentration nationally. In most areas of the country, $PM_{2.5}$ precursor emissions are major contributors to ambient $PM_{2.5}$ concentrations. The relative contribution to ambient $PM_{2.5}$ concentrations from each of these pollutants varies by area. The relative effect of reducing emissions of these pollutants is also highly variable.

Some $PM_{2.5}$ precursors are already subject to major NSR under other NAAQS, as shown in the following table:

$PM_{2.5}$ precursor	Existing program coverage for major NSR applicability
NO_X	NA NSR and PSD for NO_2 and Ozone.
SO_2	NA NSR and PSD for SO_2.
VOC	NA NSR and PSD for Ozone.
Ammonia	No coverage for NSR.

In the subsections that follow, we first discuss our legal authority under the Act for regulating precursors to the formation of criteria pollutants, and then discuss our final action for each of the $PM_{2.5}$ precursors.

1. What is EPA's legal authority to regulate precursors?

As we discussed in the November 1, 2005 proposal, we interpret the Act to not only provide explicit authority for EPA to regulate precursors, but also to grant us discretion to determine how to address precursors for particular regulatory purposes. This reading is based on section 302(g) of the Act, which defines the term "air pollutant" to include "any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used." The first clause of this second sentence in section 302(g) explicitly authorizes the Administrator

[7] See "Implementation of the New Source Review (NSR) Program for Particulate Matter Less Than 2.5 Micrometers in Diameter ($PM_{2.5}$); Response to Comments," U.S. Environmental Protection Agency. It can be viewed or downloaded at *www.regulations.gov*, Docket ID No. EPA–HQ–OAR–2003–0062.

§ 51.166 Prevention of significant deterioration of air quality.

* * * * *

(b) * * *

(23)(i) *Significant* means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates:

Pollutant and Emissions Rate

Carbon monoxide: 100 tons per year (tpy)
Nitrogen oxides: 40 tpy
Sulfur dioxide: 40 tpy
Particulate matter: 25 tpy of particulate matter emissions. 15 tpy of PM_{10} emissions
$PM_{2.5}$: 10 tpy of direct $PM_{2.5}$ emissions; 40 tpy of sulfur dioxide emissions; 40 tpy of nitrogen oxide emissions unless demonstrated not to be a $PM_{2.5}$ precursor under paragraph (b)(49) of this section
Ozone: 40 tpy of volatile organic compounds or nitrogen oxides
Lead: 0.6 tpy
Fluorides: 3 tpy
Sulfuric acid mist: 7 tpy
Hydrogen sulfide (H_2S): 10 tpy
Total reduced sulfur (including H_2S): 10 tpy
Reduced sulfur compounds (including H_2S): 10 tpy
Municipal waste combustor organics (measured as total tetra-through octa-chlorinated dibenzo-p-dioxins and dibenzofurans): 3.2×10^{-6} megagrams per year (3.5×10^{-6} tons per year)
Municipal waste combustor metals (measured as particulate matter): 14 megagrams per year (15 tons per year)
Municipal waste combustor acid gases (measured as sulfur dioxide and hydrogen chloride): 36 megagrams per year (40 tons per year)
Municipal solid waste landfill emissions (measured as nonmethane organic compounds): 45 megagrams per year (50 tons per year)

* * * * *

(49) * * *

(i) Any pollutant for which a national ambient air quality standard has been promulgated and any pollutant identified under this paragraph (b)(49)(i) as a constituent or precursor to such pollutant. Precursors identified by the Administrator for purposes of NSR are the following:

(*a*) Volatile organic compounds and nitrogen oxides are precursors to ozone in all attainment and unclassifiable areas.

(*b*) Sulfur dioxide is a precursor to $PM_{2.5}$ in all attainment and unclassifiable areas.

(c) Nitrogen oxides are presumed to be precursors to $PM_{2.5}$ in all attainment and unclassifiable areas, unless the State demonstrates to the Administrator's satisfaction or EPA demonstrates that emissions of nitrogen oxides from sources in a specific area are not a significant contributor to that area's ambient $PM_{2.5}$ concentrations.

(*d*) Volatile organic compounds are presumed not to be precursors to $PM_{2.5}$ in any attainment or unclassifiable area, unless the State demonstrates to the Administrator's satisfaction or EPA demonstrates that emissions of volatile organic compounds from sources in a specific area are a significant contributor to that area's ambient $PM_{2.5}$ concentrations.

* * * * *

(v) [Reserved.]

(vi) Particulate matter (PM) emissions, $PM_{2.5}$ emissions, and PM_{10} emissions shall include gaseous emissions from a source or activity which condense to form particulate matter at ambient temperatures. On or after January 1, 2011 (or any earlier date established in the upcoming rulemaking codifying test methods), such condensable particulate matter shall be accounted for in applicability determinations and in establishing emissions limitations for PM, $PM_{2.5}$ and PM_{10} in PSD permits. Compliance with emissions limitations for PM, $PM_{2.5}$ and PM_{10} issued prior to this date shall not be based on condensable particular matter unless required by the terms and conditions of the permit or the applicable implementation plan. Applicability determinations made prior to this date without accounting for condensable particular matter shall not be considered in violation of this section unless the applicable implementation plan required condensable particular matter to be included.

* * * * *

(i) * * *

(5) * * *

(ii) The concentrations of the pollutant in the area that the source or modification would affect are less than the concentrations listed in paragraph (i)(5)(i) of this section; or

(iii) The pollutant is not listed in paragraph (i)(5)(i) of this section.

* * * * *

■ 4. Appendix S to Part 51 is amended as follows:

■ a. By revising paragraphs II.A.10(i) and II.A.31;

■ b. By revising paragraph IV.A, Condition 3;

■ c. By redesignating paragraphs IV.G.1 through IV.G.3 as paragraphs IV.G.2 through IV.G.4, new paragraph IV.G.1,

■ d. By removing from newly redesignated paragraph IV.G.3 the reference to "paragraph IV.G.1" and adding in its place "paragraph IV.G.2"; and

■ e. By adding paragraph IV.G.5.

Appendix S to Part 51—Emission Offset Interpretative Ruling

* * * * *

II. * * *

A. * * *

10. (i) *Significant* means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates:

Pollutant and Emissions Rate

Carbon monoxide: 100 tons per year (tpy)
Nitrogen oxides: 40 tpy
Sulfur dioxide: 40 tpy
Ozone: 40 tpy of volatile organic compounds or nitrogen oxides
Lead: 0.6 tpy
Particulate matter: 25 tpy of particulate matter emissions
PM_{10}: 15 tpy
$PM_{2.5}$: 10 tpy of direct $PM_{2.5}$ emissions; 40 tpy of sulfur dioxide emissions

* * * * *

31. *Regulated NSR pollutant*, for purposes of this Ruling, means the following:

(i) Nitrogen oxides or any volatile organic compounds;

(ii) Any pollutant for which a national ambient air quality standard has been promulgated;

(iii) Any pollutant that is identified under this paragraph II.A.31(iii) as a constituent or precursor of a general pollutant listed under paragraph II.A.31(i) or (ii) of this Ruling, provided that such constituent or precursor pollutant may only be regulated under NSR as part of regulation of the general pollutant. Precursors identified by the Administrator for purposes of NSR are the following:

(*a*) Volatile organic compounds and nitrogen oxides are precursors to ozone in all ozone nonattainment areas.

(*b*) Sulfur dioxide is a precursor to $PM_{2.5}$ in all $PM_{2.5}$ nonattainment areas; or

(iv) Particulate matter (PM) emissions, $PM_{2.5}$ emissions and PM_{10} emissions shall include gaseous emissions from a source or activity which condense to form particulate matter at ambient temperatures. On or after January 1, 2011 (or any earlier date established in the upcoming rulemaking codifying test methods), such condensable particulate matter shall be accounted for in applicability determinations and in establishing emissions limitations for PM, $PM_{2.5}$ and PM_{10} in permits issued under this ruling. Compliance with emissions limitations for PM, $PM_{2.5}$ and PM_{10} issued prior to this date shall not be based on condensable particulate matter unless required by the terms and conditions of the permit or the applicable implementation plan. Applicability determinations made prior to this date without accounting for condensable particulate matter shall not be

another facility that was in the area, at least in some of the later permits.

Q And Microsoft's -- well, let's go back a minute to NOx. Okay?

A Yes.

Q NOx forms the NO2, which then in turn can form secondary PM 2.5?

A We don't have a tool for doing that on the very local level that you would be interested in.

Q Right. So my question, and I guess you answered my question, is that the secondary formation of PM 2.5 was not a consideration in the background for modeling purposes?

A Not from sources that are being considered here.

Q Which would include the cooling tower drift from Microsoft's existing towers. Was that included in modeling purposes for background?

A Boy, I don't remember seeing any cooling tower emissions.

Q Okay. Thank you.

And AERMOD, is AERMOD the appropriate model to determine secondary formation of PM 2.5?

A No. AERMOD doesn't have any mechanism for doing it.

Q Okay. Thank you.

2009 REVISIONS

This permit revision is done to consolidate the various air quality permits in which the facility is regulated and to incorporate federally enforceable permit conditions to limit facility potential emissions below levels that would require a Title V Air Operating Permit (AOP).

ADDITIONAL FINDINGS:

1. LAWS AND REGULATIONS

Celite Corporation ("the permittee") shall comply with all requirements as specified in:

- Chapter 70.94 Revised Code of Washington (RCW) {Washington Clean Air Act}
- Chapter 173-400 Washington Administrative Code (WAC) {General Regulations for Air Pollution Sources}
- Chapter 173-460 WAC {Controls for New Sources of Toxic Air Pollutants}

Specifically, the handling and drying equipment within the facility qualify as sources of air contaminants as allowed under:

- WAC 173-400-113,
- WAC 173-460-040,
- RCW 70.94.152

Further, the Notice of Construction Application is processed under authorities and requirements of WAC 173-400-091, Voluntary Limits on Emissions.

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.

2. EMISSIONS

2.1 The permittee has requested limits on emissions from all its control devices, including 14 fabric filters and the main wet end processing scrubber. The limits requested by Celite are, for some devices, too low to be sustainable (fabric filters with requested limits less than 0.005 grains per dscf) and for others, high enough to violate applicable regulations (the scrubber at 0.06 grains per dscf is nearly 50% higher than the NSPS limit of 0.040 grains/dscf). Emission rates in the following table are estimated with the scrubber particulate matter concentration at 0.040 grains per dscf; the fabric filters at either 0.010 gr/dscf (older filters without test data) or 0.005 gr/dscf (filters with test data or new filters). Facility production is limited in this approval to 104,832 tons per rolling 12 month period. Wet end ore processing is limited to 7488 hours per year, and fuel use is limited to ensure the following emissions are not exceeded.

2.2 Emissions estimated for the facility:

	Potential
Criteria Pollutants	**Tons/yr**
2.4.1 Nitrogen Oxides (NO_x)	38
2.4.2 Carbon Monoxide (CO)	66

2.4.3 Sulfur Oxides (SO_x)	0.2
2.4.4 Particulate Matter < 10 ug (PM_{10})	69.47
2.4.5 Volatile Organic Compounds (VOC)	2.8
2.4.6 Toxic Air Pollutants (TAPS)	
Key Toxic Pollutants (TAPs)	**Pounds/yr**
Benzene	1.03
Formaldehyde	37
Arsenic	0.1
Chromium(total)	0.7

3. ADDITIONAL FINDINGS

3.1 The proposed project, when operated in accordance with conditions of this Approval Order, will operate without exceeding the State of Washington Air Quality Standards.

3.2 The proposed project, when operated in accordance with conditions of this Approval Order, will operate without exceeding the public health criteria in WAC 173-460.

4. FOCUSSED APPLICABILITY FOR NSPS 40 CFR 60 SUBPART UUU

In 1992 the preheater dryer was replaced with a larger one (9mmBTU/hr up to 15 mmBTU/hr), triggering applicability of 40 CFR 60, Subpart OOO, which contains limits for emissions from the wet end scrubber at this facility. Celite was unaware of the requirements of the NSPS and has operated at an emission concentration of about 150% of the limit since the NSPS was triggered.

The scrubber controlling emissions from the kiln and the rest of the wet end equipment was defined to handle a 35,000 cfm maximum airflow in the 1997 burner replacement application. The scrubber now appears to handle up to 62,000 cfm. Application materials and the February 12, 2010, supplement indicate Celite believes the limit on this scrubber should be based on the average flow from recent source tests: 39,000 dscf/min. This value and the NSPS particulate concentration limit are made limits in the synthetic minor Order.

Enfoque en los Riesgos de Salud Desde los Escapes de Diesel

DEPARTMENT OF ECOLOGY
State of Washington

Programa de Calidad de Aire | **Febrero 2011**

Generadores de Reserva con Motor Diesel para los Centros de Datos en el Condado Grant

Los centros de datos tienen servidores que nos dan correo electrónico, manejan mensajes instantes, y ejecutan "software" para nuestras computadoras. En 2006, las compañías de los centros de datos se interesaron a tener interés en construir sus instalaciones en el Condado Grant. El condado Grant tiene una fuente de electricidad seguro y de bajo costo. También, en 2010, la legislatura del estado de Washington aprobó una exención de impuestos de poca duración para centros de datos que construyeran en el condado de Grant y otras áreas rurales. Para calificar para la exención de impuestos el centro de datos tenía que dedicar por lo menos 20,0000 pies cuadros de espacio a servidores y empezar construcción antes del 1 de julio de 2011.

Para construir o expandirse, la compañía de un centro de datos tiene que aplicar para un permiso de aire ambiente antes de empezar la construcción. El departamento de Ecología del Estado de Washington (Ecología) administra los permisos de aire ambiente. El permiso se llama "una orden de aprobación de la notica de construcción" (NOC, por sus siglas en ingles). El objetivo del NOC es proteger la calidad de aire. Los centros de datos necesitan un NOC para sus generadores de reserva con motor diesel grandes para proveer electricidad a los servidores cuando hay un corte de electricidad. Los escapes de diesel tienen contaminantes tóxicos del aire. Como parte del proceso de revisar la aplicación para el permiso, Ecología evalúa si los escapes de diesel desde los generadores de reserva pueden causar problemas de salud.

Los efectos a la salud desde los escapes de un motor de diesel

Los contaminantes tóxicos al aire en los escapes de un motor de diesel incluyen dióxido de nitrógeno, monóxido de carbono, compuestos orgánicos y pequeñas partículas llamadas "partículas de los escapes de un motor de diesel". Ecología evalúa los niveles de todos los contaminantes de aire durante el proceso de revisar la aplicación para el permiso de aire ambiente. Los contaminantes que los centros de datos tienen la mayor probabilidad de emitir en cantidades suficiente altas para afectar la salud son las partículas de los escapes de diesel y el dióxido de nitrógeno (NO_2). Este documento explicas los posibles efectos a la salud de estos contaminantes.

¿Por qué es Importante?

Los centros de datos necesitan un permiso del aire ambiente desde Ecología para instalar sus generadores de reserva que emita escapes de diesel.

A niveles altas, los escapes de motores de diesel son un contaminante toxico de aire que puede causar problema de salud

Como parte del proceso de evaluar una aplicación para un permiso de aire ambiente, Ecología revisa si las emisiones de los escapes de motores de diesel causan problemas de salud.

Este documento tiene información sobre los efectos a la salud de los escapes de diesel y como Ecología evalúa el riesgo de salud.

Contacto:

Maria Peeler
360-407-
maria.peeler@ecy.wa.gov

Acomodaciones Especiales:

Si usted necesita este documento en un formato alternativo, favor de llamar a Richelle Pérez a 360-407-7528. Para los que son sordos llaman a 711, para los que tengan impedimentos del hablado, llama, 877-833-6341 (servicios sol en ingles).

Cuando Ecología revisa la aplicación para un permiso de aire ambiente para un centro de datos, examina cuidadosamente la cantidad de contaminantes de aire el proyecto va a acumular en el área. Ecología no puede aprobar un proyecto que subiría la cantidad o frecuencia de emisiones de contaminantes a nivel suficiente alta para causar problemas de salud.

Las partículas de los escapes de diesel

Las partículas de los escapes de diesel son tan pequeñas que nuestras narices y sistemas respiratorios superiores no pueden filtrarlos del aire que respiramos. Las partículas viajan profundamente a dentro de nuestros pulmones, donde pueden hacer daño y cambios químicos. Estudios muestran que algunos niveles de estas partículas pueden causar problemas inmediatos de salud, incluso inflamar e irritar los pulmones y vías respiratorias. Esto puede causar tos, opresión en el pecho, sibilancias, y dificultad para respirar en algunas personas.

Las partículas suben la posibilidad que una persona se infecte en los pulmones, como neumonía o bronquitis. También las partículas causan ataques de asma más frecuentes y más serias en personas que ya tienen asma. En personas con alergias, las partículas pueden causar reacciones alérgicas que son peores de lo normal y pueden causar enfermedad del corazón. En personas que tienen enfermedad del corazón pueden causar ataques fulminantes. Las partículas pueden causar otras condiciones como infertilidad en hombres, defectos de nacimiento, y crecimiento reducido en niños. Cantidades pequeñas de partículas respiradas sobre un tiempo largo, pueden causar cáncer de los pulmones y otros tipos de cáncer.

Dióxido de nitrógeno (NO_2)

Exposiciones cortas (entre 30 minutos y 24 horas) de NO_2 sobre un nivel seguro pueden causar problemas de respiración para algunas personas. Adicionalmente, NO_2 puede crear dificultad de a personas que tienen problemas de pulmones, como aquellos que tienen asma.

Cuando NO_2 se combina con otros gases y la luz del sol, se forma ozono a nivel del suelo. Los efectos a la salud de ozono a nivel del suelo son similares a los de las partículas de los escapes de diesel. Los efectos incluyen inflamar e irritar los pulmones y las vías respiratorias. Esto puede causar tos, opresión en el pecho, sibilancias, y dificultad de respirar. La reducción del funcionamiento de los pulmones puede limitar la capacidad en que una persona puede hacer ejercicio. Ozono también puede causar reacciones alérgicas que pueden ser peores de lo normal. Si una persona está expuesta a ozono a nivel del suelo todos los días por un tiempo largo, el ozono puede dañar a los pulmones permanentemente. NO_2 hace daño al medio ambiente porque contribuye a la lluvia acida y el "smog".

El proceso usado por Ecología para evaluar los escapes de un motor diesel

La manera de la evaluación

1. Los expertos de calidad de aire de Ecología dependen de modelos de computador para estimar donde el viento va a traer los escapes de un generador de reserva con motor de diesel. Ellos predican la cantidad de contaminantes tóxicos que puede estar en el aire.
2. Los toxicólogos de Ecología revisan la información de los modelos de la computadora. (Los toxicólogos se especializan en entender como los contaminantes y los productos químicos afectan la salud de una persona.)

3. Los toxicólogos usan una evaluación de riesgo (Vea el parágrafo titulado "La evaluación del riesgo" abajo) para estimar los posibles problemas de salud. Ellos hacen sus estimaciones en las cantidades de contaminantes tóxicas del aire predicados para las áreas estudiadas.

La evaluación de riesgo

Los toxicólogos usan la evaluación de riesgo como una herramienta para estimar el riesgo elevado a la salud humana. El objetivo es identificar cualquier efecto a la salud para poder prevenir enfermedades. La mejor forma de usar la evaluación de riesgo es como medida para ayudarnos a decidir la mejor forma de proteger la salud humana. La evaluación de riesgo no puede predicar cantidades exactas de enfermedades en una comunidad. Es una herramienta buena para estimar el riesgo potencial según el conocimiento medico contemporánea.

La evaluación de los resultados

La evaluación de riesgo se divide el riesgo de salud en dos categorías grandes: riesgo de cáncer y riesgo que no es cáncer. Evaluamos las dos categorías de una forma diferente. Cuando evaluamos los escapes de un motor de diesel, miramos el riesgo de cáncer por la exposición de partículas de escapes de diesel. También miramos a los riesgos de salud que no son cáncer que están causados por la respiración de partículas por un tiempo largo y la respiración del dióxido de nitrógeno sobre tiempos más cortos.

Riesgo de cáncer

Cuando evaluamos riesgo de cáncer, asumimos que cualquier exposición a un producto químico que causa cáncer resulta en algún grado de riesgo. El nivel de riesgo más alto aceptado en las reglas del estado de Washington permite un riesgo de 10 canceres adicionales en un millón de persones por un proyecto. El nivel de riesgo más alto aceptado por la Agencia de Protección Ambiental de Estados Unidos (EPA, por sus siglas en inglés) por productos químicos que causan cáncer es el riesgo de 100 canceres en un millón de personas expuestas.

Riesgo a la salud que no sea de cáncer

Para los riesgos a la salud que no son cáncer, los toxicológicos calculan un "cociente de riesgos." Esto es una manera matemática de estimar el daño potencial de un producto químico a la salud humana en un cierto periodo de tiempo. El cociente de riesgos es la comparación de la concentración estimada con algo que los toxicológicos nombran "concentración de referencia." La concentración de referencia es la cantidad de un producto químico donde los problemas de salud no tienen mucha posibilidad de ocurrir. Un cociente de riesgos mayor de uno significa que el producto químico tiene la posibilidad de causar problemas de salud. No significa que definitivamente causará problema de salud. Lo más alto el cociente de riesgo, lo más probable que causará los efectos a salud.

Para NO_2, la base del cociente de riesgo es la cantidad de NO_2 que puede causar problemas respiratorios para algunas (pero no todas) personas con asma. La evaluación de riesgo toma en cuenta el tamaño del cociente de riesgo, severidad, y posibilidad de un efecto a la salud más la posibilidad de exposición a NO2.

¿Qué significa riesgo a la salud?

Varios factores aparte de contaminación afectan los problemas de salud, como estilo de vida, edad, y exposición a los virus. Eso no significa que cuando los niveles de contaminación están a niveles aceptables que no hay riesgo a la salud. Hay varias incertidumbres involucradas con la ciencia evaluaciones de riesgo y la estimación del riesgo a la salud que hace Ecología, que no son exactas. Para tomar en cuenta los incertidumbres designamos nuestras evaluaciones del riesgo con supuestos prudentes – tenemos cuidado de no predicar un riesgo menos del riesgo actual a la salud humana. Los riesgos a la salud actuales desde los escapes de diesel de cualquier centro de datos pueden ser más bajos de nuestras estimaciones, pero queremos asegurar que no subestimamos el riesgo cuando hacemos decisiones en base del riesgo a la salud.

Para más información (en inglés), favor revise el reportaje de Ecología "Concerns about Adverse Health Effects of Diesel Engine Emissions" disponible en internet a http://www.ecy.wa.gov/pubs/0802032.pdf. Información (en inglés) sobre la calidad del aire y los centros de datos de Washington está disponible en http://www.ecy.wa.gov/programs/air/quincydatacenter/.

Table 6:
Modeled Concentrations of Criteria Pollutants (with background) and comparison to Ambient Air Quality Standards

Pollutant and Time Frame	Background plus Modeled Concentration – ug/m^3	National Ambient Air Quality Standard - ug/m^3	Percent of Standard
PM_{10} 24 Hour	82.2	150	55%
PM_{10} Annual	0.056	50	0.1%
$PM_{2.5}$ 24 Hour	26.1	35	74%
$PM_{2.5}$ Annual	0.056	15	0.4%
NO_2 1- Hour	166	188	88.3%
CO 1-Hour	203	40,000	0.5%
CO 8-Hour	113	10,000	1.1%
SO_2 1-Hour	3.6	319	1.1%
SO_2 3-Hour	2.9	1300	0.2%
SO_2 24 Hour	1.5	365	0.4%
SO_2 Annual	2.3E-8	80	3E-8%

Table 7: Modeled Concentrations of Toxic Air Pollutants and Comparison to Acceptable Source Impact Levels (ASILs)

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Documents submitted by Patty Martin with written comments

Patty Martin submitted the following 58 pages as her written testimony.

Mort, Beth (ECY)

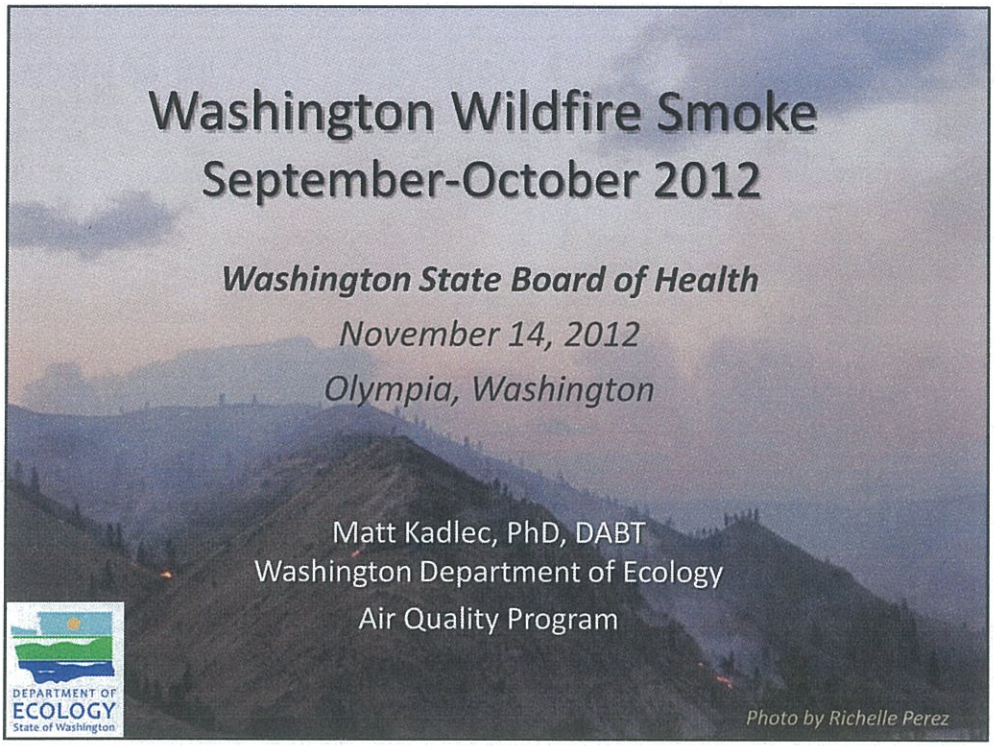
From: Patty Martin [martin@nwi.net]
Sent: Friday, January 11, 2013 11:10 PM
To: Mort, Beth (ECY)
Subject: Vantage comments
Attachments: Final Draft 2012 Wildfires Smoke - BoH.pptx; Final Draft 2012 Wildfires Smoke - BoH - 20 ugm3 is WAQA standard for PM2.5.pdf; Debunking_BACT.pdf; D2 Test Cycle for EPA.pdf; vantage comments.pdf

Follow Up Flag: Follow up
Flag Status: Completed

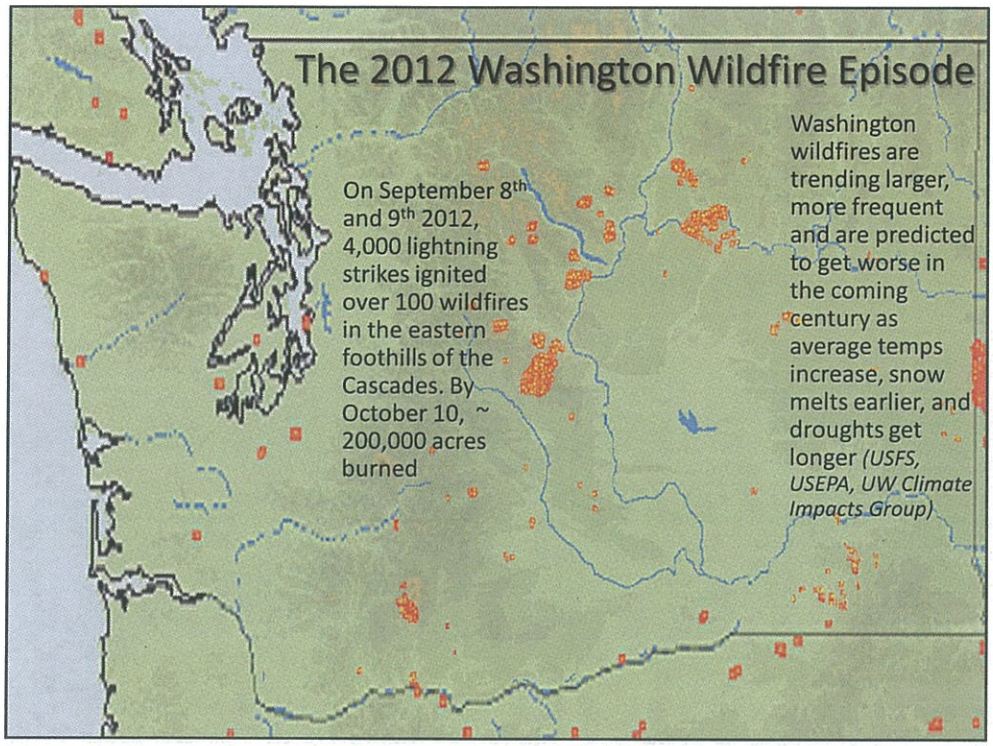
Categories: Vantage

Please accept my comments.

http://www.energy.ca.gov/2005publications/CEC-500-2005-049/CEC-500-2005-049.PDF



COVER SLIDE
Richelle Perez took this picture on a visit to Wenatchee during the episode



USFS PNW Research Station, UW Climate Impacts Group, and USEPA

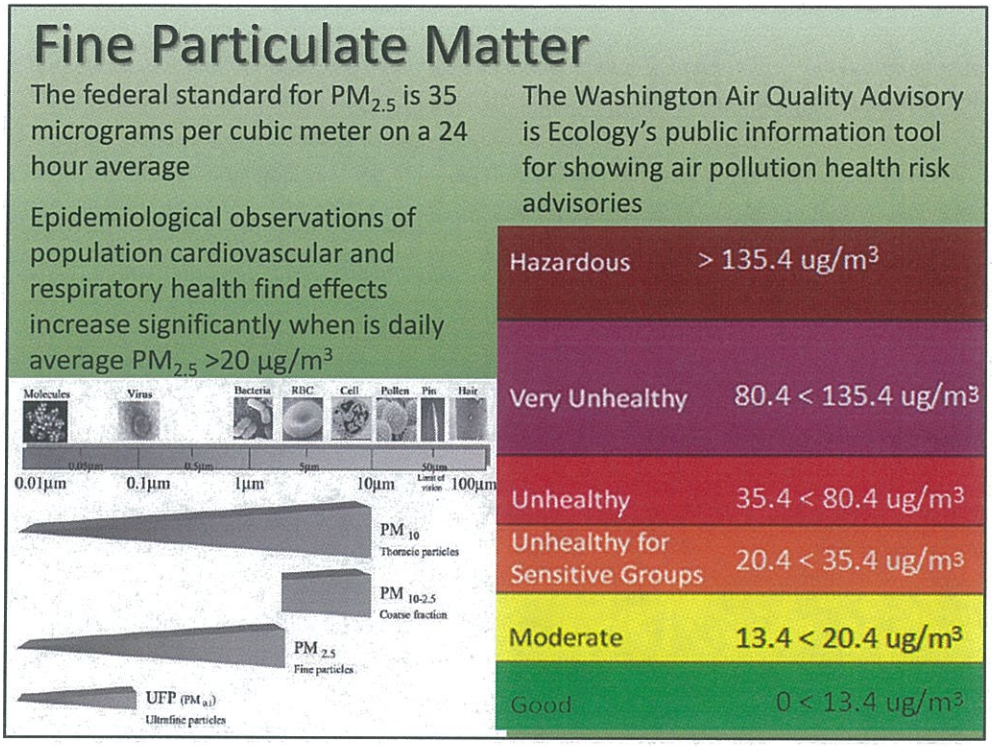
Background

- Dept. of Ecology and others operate > 50 Fine PM monitors around the state
- US Forest Service put eight temporary monitors at other impacted communities during the wildfires
- PIOs and Ecology CRO and HQ worked round the clock on forecasting and public messages
- From Sept. 12 to Oct. 10, Ecology issued daily smoke forecasts by 8:00 AM
- Local health districts used the information to advise schools and issue public health advisories

Each morning Ecology produced an air quality assessment, in partnership with the USFS, National Weather Service and others, containing PM2.5 hazard levels and a smoke forecast for the day.

The State Department of Health update public info to help with understanding the health effects of smoke and assisting people in making personal choices.

USFS installed temporary monitors in schools and other locations at the request of local governments. This helped to fill in gaps in Ecology's monitoring network, and enabled locally tailored decision making.

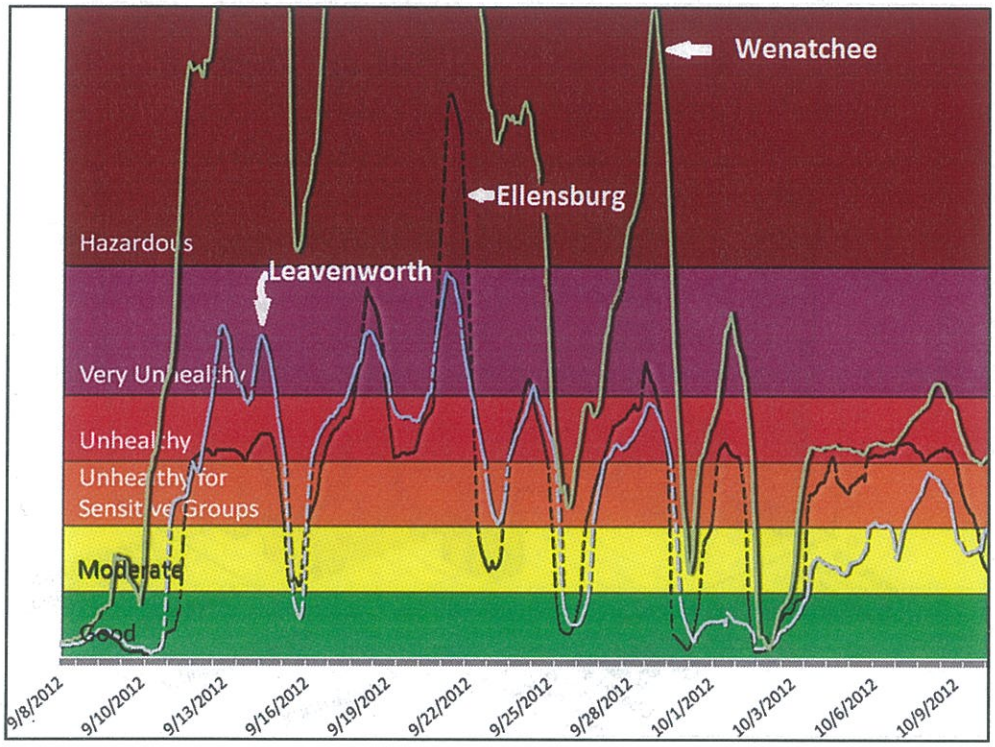


The WAQA PM concentration-health advisories scale is not arbitrary. To develop it, we reviewed epidemiological literature. The scale is directly concordant to the effects observed in populations exposed to the range of concentrations it covers. It uses the same color-coded categories as the EPA AQI, but the WAQA fine PM categories are set at lower levels to be more protective of health. School activity recommendations are based on the WAQA Index

Ecology looked at many health studies, considered recommendations from EPA staff and EPA's Clean Air Scientific Advisory Committee, and examined Canada's PM2.5 standards. Based on this information, Ecology set a goal to keep PM2.5 24-hour concentrations below 20 micrograms per cubic meter. The pollution levels in WAQA's color-coded categories are based on this Ecology goal, the new federal PM2.5 standard, and recommendations from scientific and health professionals. The NAAQS would have been 25-µg/m3 24-h twa but OMB crossed it out and put 35 w/o providing justification.

The Joint Fire Sciences Program (JFSP) is a national organization that provides funding each year for research and development that is relevant to fire managers. The RRFP below closes NOV 16 -----

13-1-02 Health impairment from exposure to fire smoke: Relationships among the National Ambient Air Quality Standards (NAAQS) and industrial health guidelines


Wenatchee
Ellensburg
Leavenworth
Hazardous
Very Unhealthy
Unhealthy
Unhealthy for Sensitive Groups
Moderate
Good
9/8/2012
9/10/2012
9/13/2012
9/16/2012
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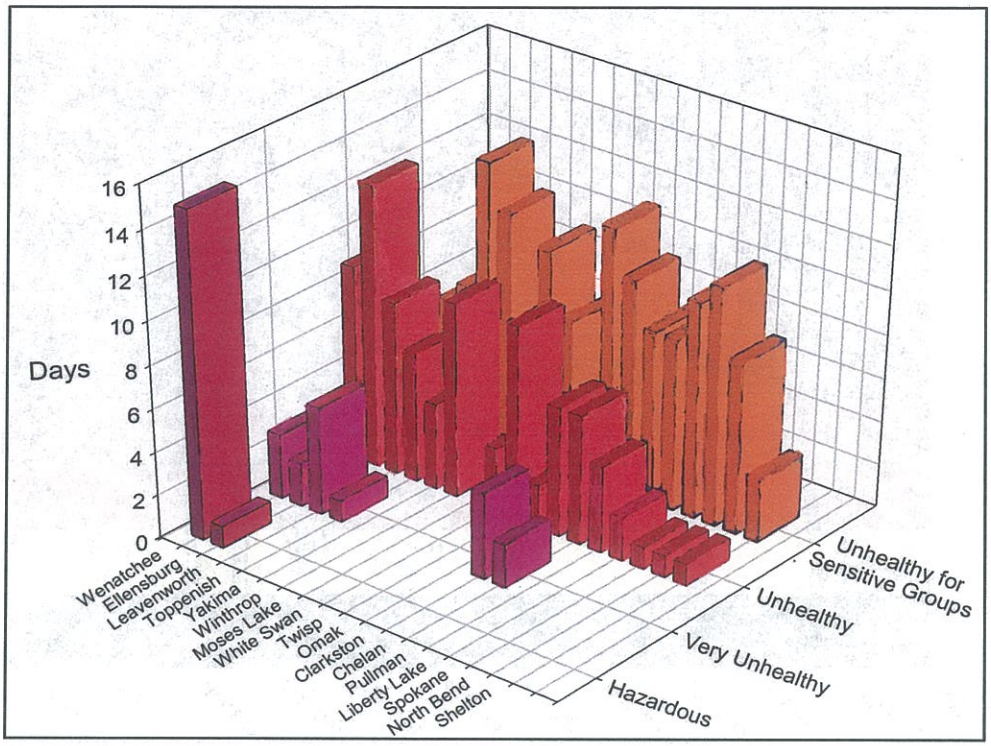
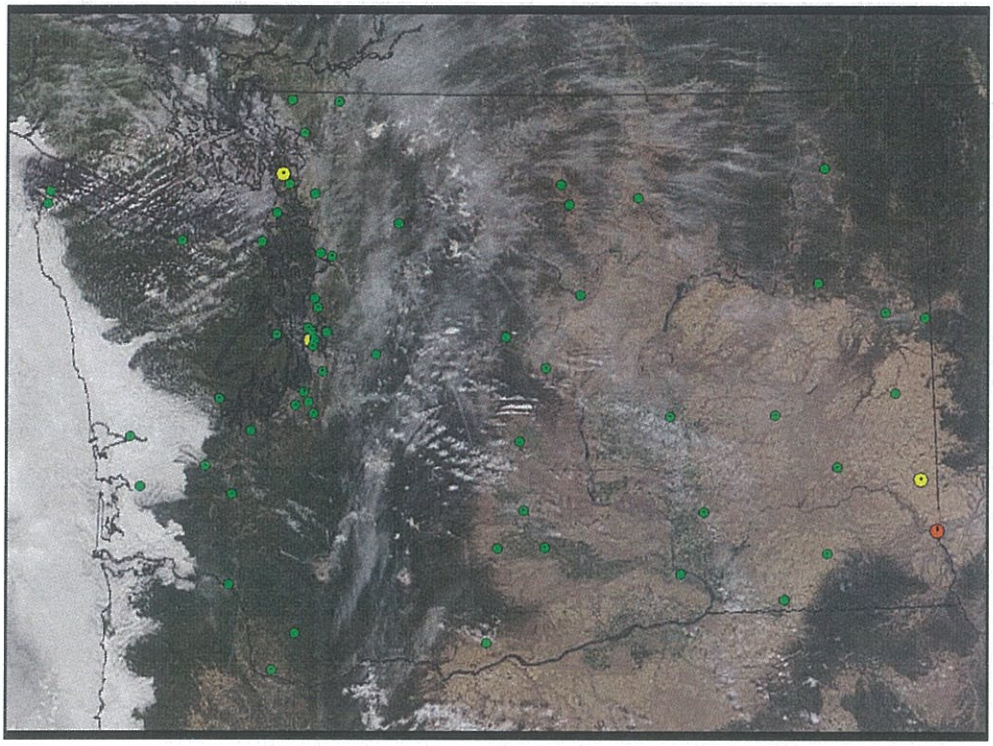
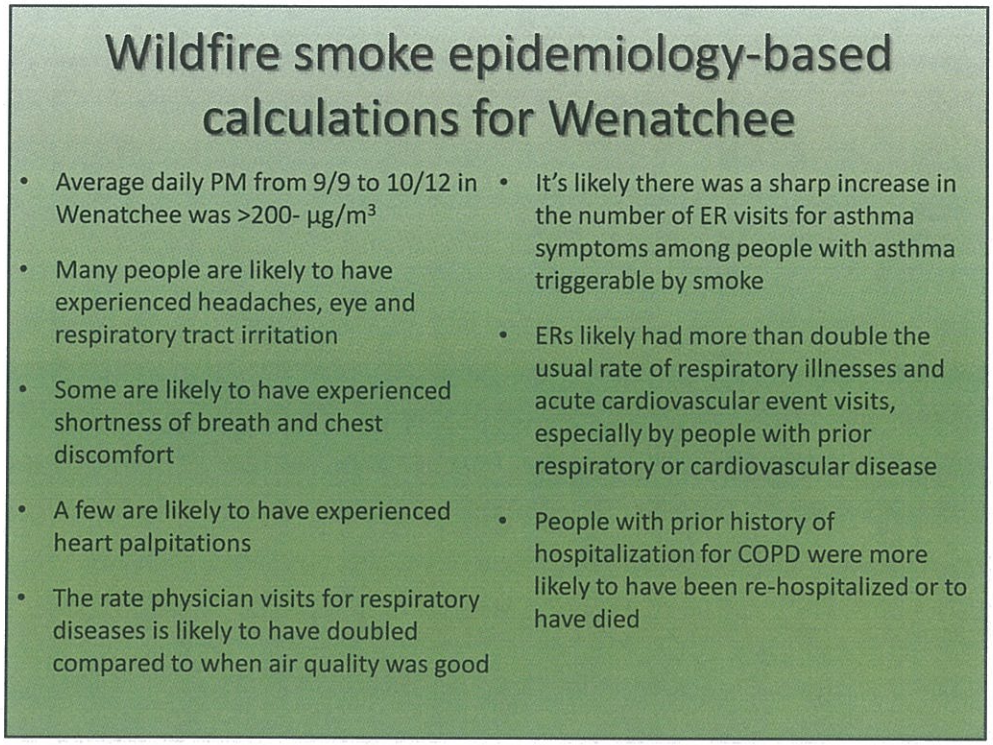
10/6/2012
10/9/2012

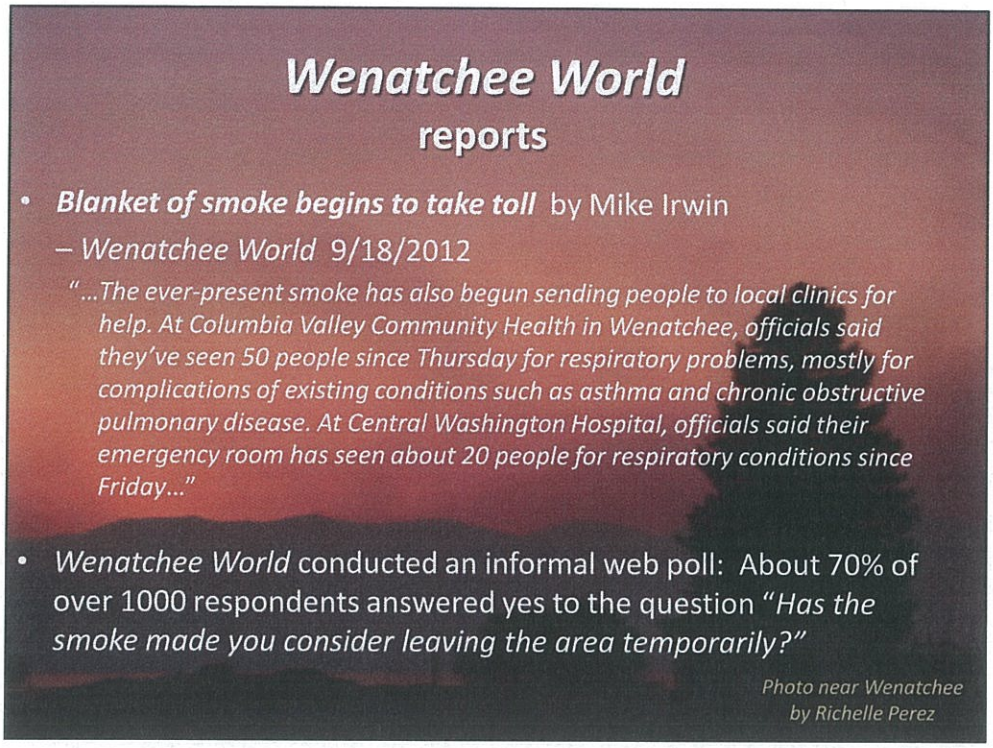

Days
16
14
12
10
8
6
4
2
0
Wenatchee
Ellensburg
Leavenworth
Toppenish
Yakima
Winthrop
Moses Lake
White Swan
Twisp
Omak
Clarkston
Chelan
Pullman
Liberty Lake
Spokane
North Bend
Shelton
Unhealthy for Sensitive Groups
Unhealthy
Very Unhealthy
Hazardous



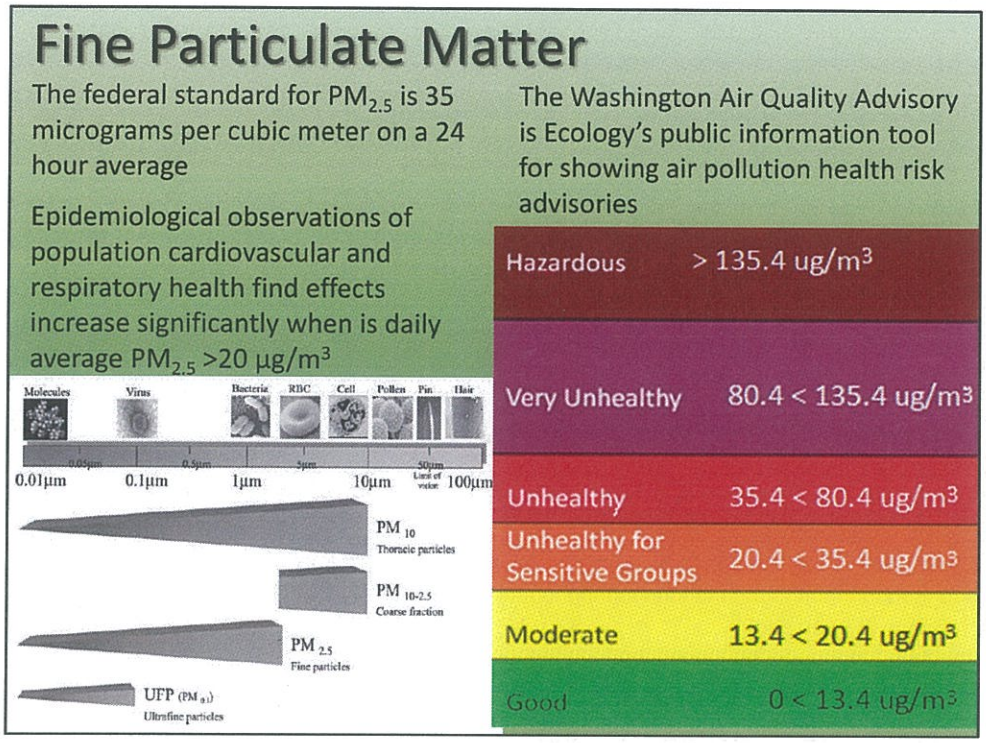
Lance modis satellite photos and PM2.5 monitor points



respiratory or cardiovascular disease such as COPD and ischemic heart disease



This story ran three days before the worst part of the episode: The mean for the period up to then was [336-ug/m3]



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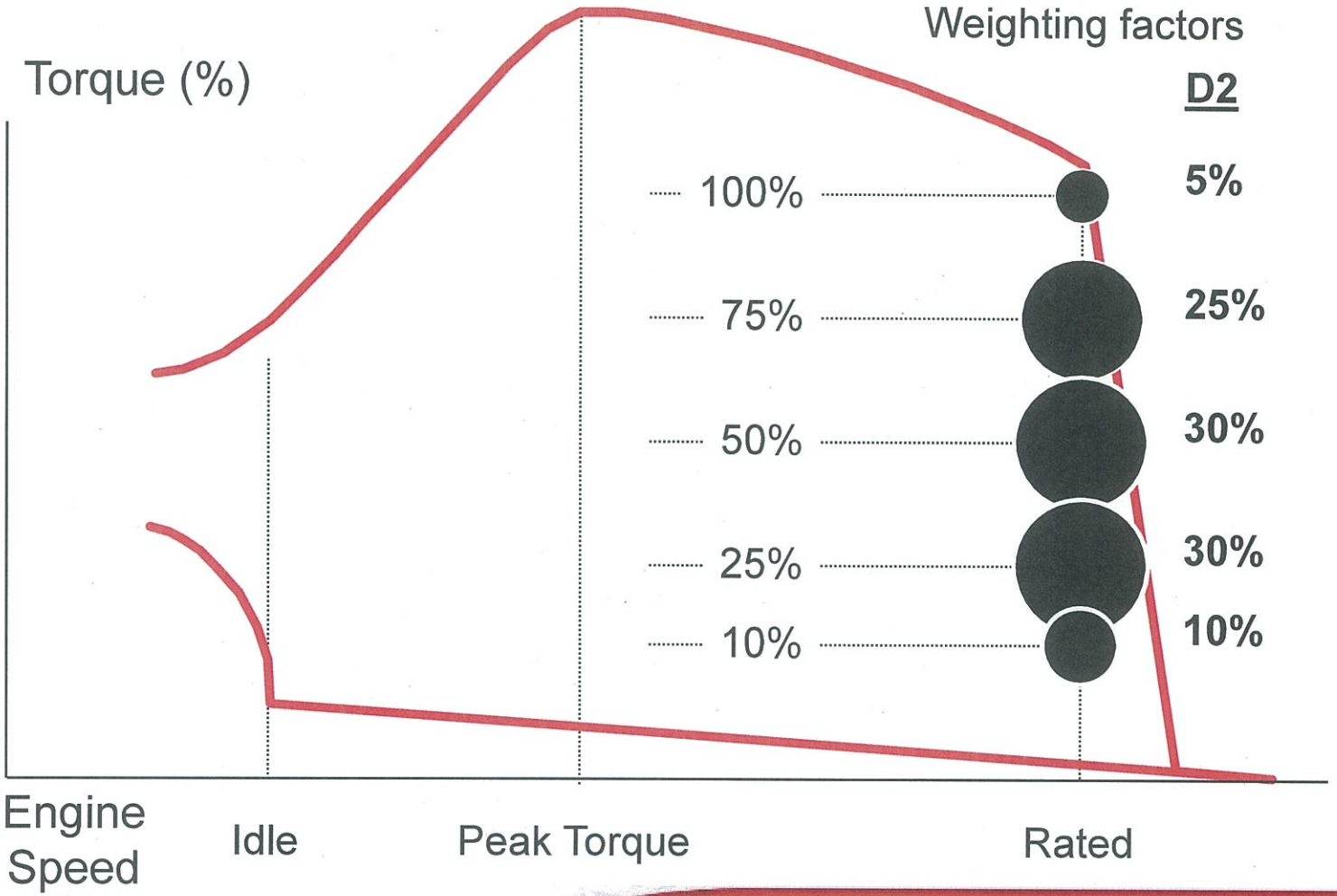
13-1-02 Health impairment from exposure to fire smoke: Relationships among the National Ambient Air Quality Standards (NAAQS) and industrial health guidelines

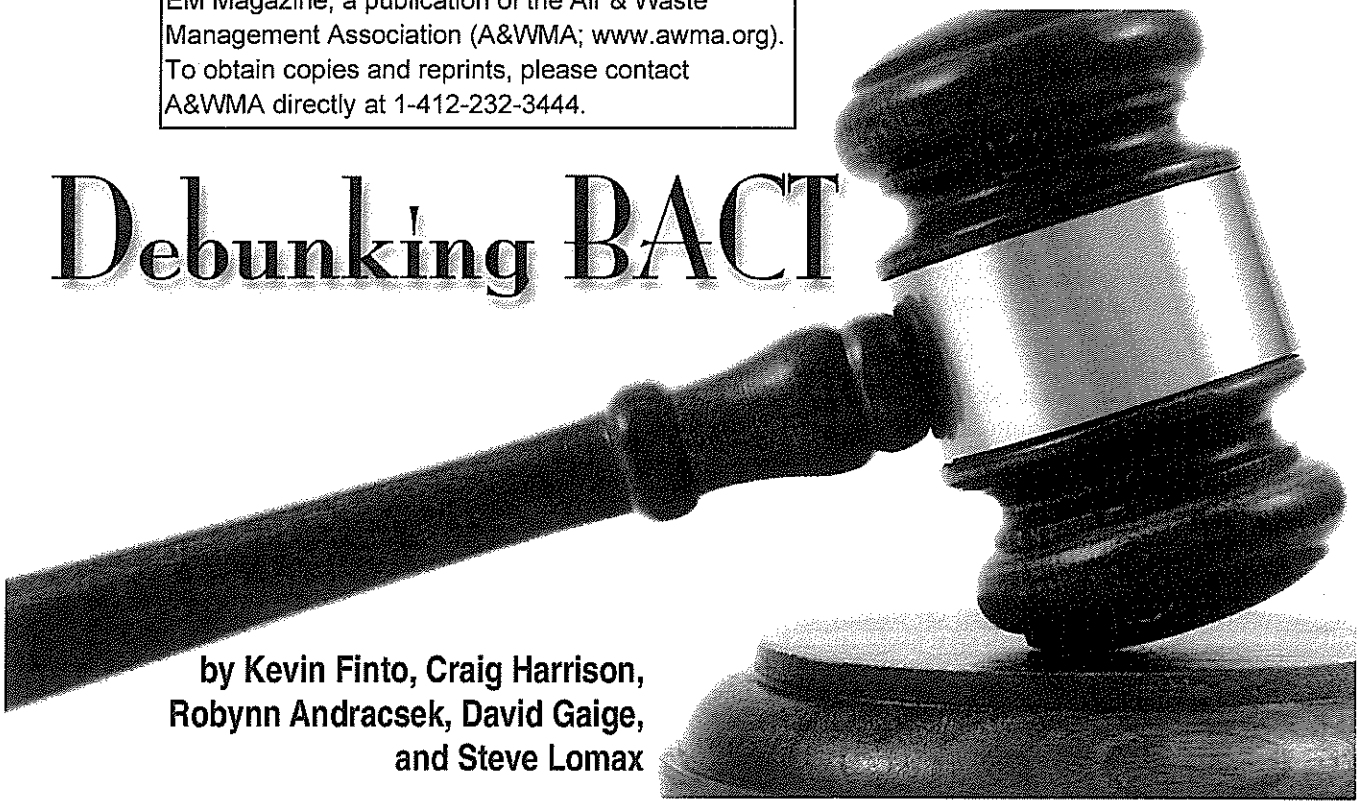
Power Generation

ISO 8178 D2 5-mode Test Cycle



This article appears in the November 2006 issue of EM Magazine, a publication of the Air & Waste Management Association (A&WMA; www.awma.org). To obtain copies and reprints, please contact A&WMA directly at 1-412-232-3444.

Debunking BACT



by Kevin Finto, Craig Harrison, Robynn Andracsek, David Gaige, and Steve Lomax

The Clean Air Act's provisions for the Prevention of Significant Deterioration (PSD) of air quality require a new major stationary source to obtain a preconstruction permit that specifies the Best Available Control Technology (BACT) for each regulated pollutant that may be emitted in amounts greater than major source thresholds. The PSD regulations also impose BACT requirements on modifications to existing major sources that result in significant net emissions increases. Rather than a specific technology, BACT is an achievable emissions limitation (or work practice) determined by the permitting authority on a case-by-case basis, taking into account available technologies and energy, environmental, and economic impacts. BACT determinations are generally made by a state environmental agency after an opportunity for public comment.

Increasingly, advocacy groups are challenging BACT decisions in administrative and judicial proceedings. As a result, the permitting process has been substantially delayed—even for facilities that have agreed to install state-of-the-art emissions control technology. This article outlines the key statutory and regulatory elements of BACT, how to analyze alternative technologies and emissions limitations, and prepare an application for an appropriate—and final—BACT determination. It is based largely on the regulatory definition of BACT and recent Environmental Appeals Board (EAB) decisions.[1]

Kevin J. Finto is partner and Craig S. Harrison is counsel, both with Hunton & Williams, Washington, DC. Robynn Andracsek is senior environmental engineer and David Gaige is environmental project manager, both with Burns & McDonnell, Kansas City, MO. Steve Lomax is manager of air quality programs with Edison Electric Institute, Washington, DC. E-mail: kfinto@hunton.com.

KEY ELEMENTS OF BACT

BACT Is an Emissions Limit or Work Practice

The definition of BACT has been the subject of significant dispute. The regulatory definition is:

"...an **emissions limitation** (including a visible emission standard) based on the **maximum degree of reduction** for **each pollutant subject to regulation** under the Act which would be emitted from any **proposed** major stationary **source** or major modification which the Administrator, 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 or available methods, systems, and techniques, including **fuel cleaning** or treatment **or innovative fuel combustion techniques** for control of such pollutant...."[**Emphasis added.**][2]

Each of the highlighted words above has been the subject of guidance or litigation regarding BACT determinations. Several of these key principles are discussed below.

BACT Is a Case-by-Case Analysis

In conducting a case-by-case BACT analysis, the permitting agency must consider site- and source-specific characteristics, such as the type of fuel that will be used, the type of source, and geographic considerations. Consequently, case-by-case BACT analyses do not necessarily yield a single, objectively correct BACT determination.[3] The permitting agency must exercise a high degree of technical judgment in any BACT analysis, particularly for coal-fired plants, which use a wide variety of coals, combustion techniques, and other site-specific factors.

BACT Limit Must Be 'Achievable'

The permitting agency determines what is achievable for a source, exercising its technical judgment on a case-by-case basis. An "achievable" emissions limit is one that the source can meet on a continual basis over each averaging period for the lifetime of the facility. The penalties for noncompliance with a permitted BACT limit are severe. BACT limits are therefore not established based on what a source can achieve on its best possible day. BACT limits should reflect what the source could achieve throughout its lifetime under all reasonably foreseeable conditions. The EAB has indicated that it is appropriate to include "safety factors" or "cushions" (e.g., emissions averaging times) to ensure that BACT limits are achievable at all times:

"When the region prescribes an emissions limitation representing BACT, the limitation does not necessarily reflect the highest possible control efficiency achievable by the technology on which the limitation is based. Rather, *the region has discretion to base the emissions limitation on a control efficiency that is somewhat lower than the optimal level. ... To account for these possibilities, a permitting authority must be allowed a certain degree of discretion to set the emissions limitation at a level that does not necessarily reflect the highest possible control efficiency, but will allow the permittee to achieve compliance consistently.*"[*Emphasis added.*][4]

BACT is an achievable emissions limitation determined by the permitting authority on a case-by-case basis.

For emissions from operating facilities to be demonstrated as achievable and thus applicable to a new facility, there must be sufficient data to gauge whether those emissions rates are achievable over the long term. For example,

limited stack test data are insufficient to form the basis of what is achievable for new facilities and to establish BACT.[5] The concept of "achievability" does not mean that an applicant cannot volunteer to accept lower limits than previously demonstrated, but that such limits cannot be involuntarily imposed on the applicant.

Control Technology Must Be 'Available'

A control technology must be "available" to be considered in a BACT determination. This means that the technology has progressed beyond the conceptual stage and pilot testing phase and must have been demonstrated successfully on full-scale operations for a sufficient period. Theoretical, experimental, or developing technologies are not "available" under BACT. A control technology is neither demonstrated nor available if government subsidies are required to fund evaluations of the technology. In many cases, a technology is not "available" for all sizes of a unit. A control technology must also be "commercially available." This means that the technology must be offered for sale through commercial channels with commercial terms.[6]

BACT Does Not Redefine the Source

Under the plain language of the Clean Air Act, the BACT analysis focuses on the determination of an emissions limitation for the applicant's "proposed facility."[7] Consistent with this language, the U.S. Environmental Protection Agency (EPA) has long observed that the BACT requirements are "not intended to redefine the source."[8] EPA reconfirmed that it "does not consider the BACT requirement as a means to redefine the basic design of the source or change the fundamental scope of the project when considering available control alternatives."[9] Accordingly, BACT does not require evaluation of different processes to generate electricity. For instance, BACT does not require a proposed coal-fired facility to consider generation of electricity using wind, gas, or hydroelectric processes as BACT. Likewise, BACT does not require a source to change the type of boiler or fuel proposed for the project.[10]

BACT Considers Multipollutant Effects

When establishing BACT for individual pollutants, the permitting agency must also consider possible interactions among the pollutants. Reducing emissions of one pollutant may inadvertently increase emissions of another pollutant. The relationship between emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) is one example of this type of interaction. Similarly, some techniques to lower emissions of one pollutant may have deleterious effects on downstream equipment. For example, increasing the injection of ammonia to reduce NO_x emissions can produce unacceptable levels of sulfur trioxide and ammonium bisulfates. These substances can cause serious maintenance and reliability problems in downstream equipment. These types of multipollutant effects must be considered in a BACT analysis for two reasons. First, BACT limits must represent "achievable" levels of emissions from the regulated pollutants considering the operation and maintenance costs. Second, BACT requires consideration of such collateral "environmental impacts" when establishing limits.

ROLE OF A BACT ANALYSIS IN THE BACT DETERMINATION

The applicant prepares a BACT analysis on the various emissions control options that are available and applicable to the proposed project. The analysis provides a detailed rationale and supporting documentation to the agency to support the BACT decision. The BACT determination is made by the permit-issuing agency based on the information provided in the applicant's analysis and its own independent review of the available information, including the applicant's analysis and public comments.

Collecting Information and Identifying Available Technologies

The first step in preparing a BACT analysis includes collecting information about the source and identifying all control options and their achievable limits for that source. The best sources of information about what is BACT are existing permits issued for similar facilities. These permits show what permitting authorities have concluded is BACT for such sources.

Permit applications from other sources can also provide useful information when establishing BACT limits since they tend to show what applicants believe is achievable. They must be considered carefully and are not as reliable as actual permits. Applications do not necessarily reflect limits that have been demonstrated in practice; the proposed limits have yet to be determined to be BACT, and are often adjusted during the permitting process.

In deciding what is available as BACT, permitting agencies will often take into account whether or not the source can obtain a guarantee for the emissions rate in question. Vendor guarantees for other sources can be relevant, but should be used cautiously because they are sometimes not met in practice and the specific contractual terms can limit their usefulness to a BACT analysis. Such guarantees, however, can be useful in justifying a particular limit for the source being permitted.

Continuous emissions monitoring system (CEMS) data from existing sources can also be relevant to a BACT analysis, particularly in determining what is achievable. Such data should also be used cautiously, however, as they may not necessarily reflect the worst-case operating conditions of the other source. Additionally, a source is expected to operate under normal conditions with emissions levels safely below its permit limit to avoid violations (e.g., with a safety margin). Therefore, a permitting authority would expect to see CEMS readings below permitted limits.

Finally, experience with control technologies by companies outside the United States can be a source of information for a BACT analysis. However, information from

REFERENCES

1. See, for example, *In re Newmont Nevada Energy Investment, LLC*, PSD Appeal No. 05-04 (EAB 2005); *In re Prairie State Generating Co.*, PSD Appeal No. 05-05 (EAB 2006).
2. 40 C.F.R. § 52.21(b)(12).
3. *Alaska Department of Environmental Conservation vs. EPA*, 540 U.S. 461, 488 (2004).
4. *In re Masonite Corp.*, 5 E.A.D. 551, 560-561 (EAB 1994) (*emphasis added*); accord *In re Knauf Fiber Glass, GmbH*, 9 E.A.D. 1, 15 (EAB 2000); *In re Three Mountain Power, LLC*, 10 E.A.D. 39, 53 (EAB 2001).
5. See, for example, *In re Prairie State Generating Co.*, slip op. at 72 (EAB 2006).
6. *In re Prairie State Generating Co.*, PSD Appeal No. 05-05 at 45 (EAB 2006).
7. CAA § 164(a)(4).
8. *In the Matter of Pennsauken County, New Jersey Resource Recovery Facility*, PSD Appeal No. 88-8 at 11 (Nov. 10, 1988); *In re Spokane Regional Waste-to-Energy*, PSD Appeal No. 88-12, at 5 n.7 (June 9, 1989).
9. *In re Prairie State Generating Co.*, PSD Appeal No. 05-05 at 26 (EAB 2006).
10. *Best Available Control Technology Requirements for Proposed Coal-Fired Power Plant Projects*; EPA Memorandum; Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, December 15, 2005. [Authors' Note: While the memorandum outlines EPA's position on the issue, as reflected in a recent settlement, EPA has stated that the memorandum is not a rule.]
11. *In re Newmont Nevada Energy Investment, LLC*, PSD Appeal No. 05-04 at 34-36 (EAB 2005)
12. *OAQPS Control Cost Manual (Fourth Edition)*; EPA 450/3-90-006; Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, 1990.

foreign countries can be unreliable or incomplete.[11] Also, foreign fuel characteristics, especially for coal, are frequently different from those in the United States.

Eliminating Infeasible Technologies

Decisions concerning technical feasibility are the responsibility of the review authority. A control technology that is "available" or "demonstrated" for a given type or class of sources is assumed to be technically feasible unless source-specific factors exist and are documented to justify technical infeasibility. It is relatively easy to prove that a technology will work when it has been demonstrated. It is more difficult to determine whether or not it will not work when it has not been demonstrated. If a technology is not demonstrated, it should still be considered if it is "applicable." A technology is "applicable" if it can reasonably be installed and operated on the source type under consideration. This is a matter of technical judgment for the permitting agency, but identifying suitable technologies based on physical, chemical, and engineering principles and/or empirical data can be a challenge. There are a wide variety of potentially irresolvable technical difficulties that could preclude the successful deployment of a technology in a new application.

Ranking Technologies

For each regulated pollutant emitted from each emissions unit under review, the control alternatives are ranked by a "top-down" approach, in order from the most to the least effective in terms of emission reduction potential. This is not simply an assessment of maximum control efficiency; it considers the compatibility of the technology with controls selected for other pollutants and ranks the alternatives from lowest to highest emissions.

Evaluating Economic, Environmental, and Energy Impacts

If the top alternative control technology in the listing is selected as BACT, then nothing further needs to be done. If the applicant chooses instead to reject the top technology and select an alternative technology lower down on the list, additional information will need to be provided to the agency to support the decision. As part of this evaluation the applicant can consider cost, collateral energy, and environmental impacts to justify the selection. Energy impacts can be direct or indirect and can be expressed in terms of economic impact (i.e., cost). The environmental impacts often are more subjective and often cannot be quantified as economic impacts.

In most cases, actual costs of control technology are not publicly available; cost information submitted by equipment vendors for a specific project is generally confidential business information. The basis for equipment cost estimates should be documented, either with data supplied by an equipment vendor (i.e., budget estimates) or by a referenced source, such as the EPA's Office of Air Quality Planning and Standards Control Cost Manual.[12] EPA has also indicated that the total cost estimates of options developed for BACT analyses should be accurate to within ± 30%, and that cost options that are "within ± 20–30% of each other should generally be considered to be indistinguishable when comparing options."[12] In the case of coal-fired boilers, for example, a difference of 20–30% can be significant in terms of total costs (i.e., tens, if not hundreds, of millions of dollars).

When the economic cost estimates cannot provide a clear distinction between the top technology choices, the environmental differences may receive greater scrutiny (e.g., the ability to control sulfuric acid mist and the potential impacts of land-filling vs. sale of combustion byproducts). Energy impacts (e.g., the loss of coal from washing or parasitic load) also can be a factor in determining BACT.

Selecting BACT

It is the responsibility of the permit agency to review the documentation and rationale presented to ensure that the applicant has addressed all of the most effective control options that could be applied and determine that the applicant has adequately demonstrated that energy, environmental, or economic impacts justify any proposal to eliminate the potentially more effective control options.

CONCLUSION

The statutory and regulatory requirements of the PSD permit program outline, in part, the process for determining BACT. EPA guidance, prior decisions by permitting agencies, and source-specific considerations fill in the remaining blanks. As industry looks to the future and sees increasing demand for energy and consumer products, the need to construct new facilities and expand existing production capacity is clear. A better understanding of the BACT determination process—by industry, regulators, and the public—should facilitate timely decisions that appropriately consider the availability and achievability, as well as energy, environmental, and economic impacts, of various control technologies and emissions limits. em

January 11, 2013

Beth Mort
Department of Ecology
4601 N. Monroe
Spokane, WA 99205-1295

RE: VANTAGE DATA CENTER

Dear Ms. Mort,

Please accept these comments on behalf of MYTAPN and me regarding the permitting of the Vantage Data Center. I have many concerns about the addition of this source of pollution into our air shed, and I object to the issuance of voluntary emission limits. Ecology did not notify the public, as required by 40 CFR 52.2495, of their intent to issue voluntary emission limits to the Vantage Data Center. The legal notice published in the Moses Lake, WA newspaper, did not identify voluntary emission limits as a permit term open for public comment; the agency did not explain "voluntary emission limits" or solicit input on them at the public hearing; and the agency did not in any way during the comment period seek "public involvement" on the agency's plan to issue them.

> § 52.2495
> Voluntary Limits on Potential to Emit
> Terms and conditions of regulatory orders issued pursuant to WAC 173-400-091 "Voluntary limits on emissions" and in accordance with the provisions of WAC 173-400-091, WAC 173-400-105 "Records, monitoring, and reporting," and WAC 173-400-171 "Public involvement," shall be applicable requirements of the federally-approved Washington SIP and Section 112(l) program for the purposes of section 113 of the Clean Air Act and shall be enforceable by EPA and by any person in the same manner as other requirements of the SIP and Section 112(l) program. Regulatory orders issued pursuant to WAC 173-400-091 are part of the Washington SIP and shall be submitted to EPA Region 10 in accordance with the requirements of §§ 51.104(e) and 51.326. (emphasis added)

Ecology has failed to comply with this federally enforceable provision of the Clean Air Act (CAA) when it issued permits to Microsoft, Yahoo!, Sabey, Dell and Intuit. Ecology has never solicited comment on voluntary emission limits, nor advised the public that comment was required in issuing them. Additionally, Ecology has never discussed with the public the difference between Title V permitting and voluntary emission limits, or more importantly the difference in protections provided, or monitoring required, by them.

I am also objecting to Ecology's insistence that Vantage's use of controls is not BACT. BACT is a legal term -- as stated by Robert Koster at the Public Hearing held in July. BACT implies "control technology", and by its very definition is "technology forcing." Ecology's attempt to remove it and relegate BACT to Tier 2 engines isn't supported by statute, or by the emissions known to be released by these large engines. In fact, Mr. Wilder cites to a study that clearly demonstrates that the emissions from large diesel engines are 2 to 5 times higher than guaranteed by manufacturers. The discrepancy is in the difference between the weighted average testing required under 40 CFR 89 (ISO 8178) and EPA's Method 5. *Air Quality Implications of Backup Generators in California*, p.34. EPA Method 5 includes the "front" and "back" half (filterable and condensable, respectively) of particulate released by the engine. Emissions from Vantage's engines are therefore more closely aligned with those presented by ELM, than the nominal numbers used by ICF to undermine the BACT cost effectiveness numbers and health risk.

My third objection involves Ecology's failure to use Washington's more stringent standard for PM2.5. The WAQA for PM2.5 is 20 ug/m3. According to Ecology and/or ICF, the background value for PM2.5 in Quincy is 21 ug/m3, which exceeds the WAQA standard of 20 ug/m3. See TSD, 6.2 Assumed Background Concentrations, and *Final Draft 2012 Wild Fires Smoke – BoH*, Matt Kadlec, PhD, BDAT, Ecology Air Quality Program. Ecology recognizes that levels exceeding 20 ug/m3 are not protective of sensitive individuals, and studies have found that chronic exposure to even low levels of PM2.5 increase premature mortality. Please explain how Ecology can justify their decision to allow levels of PM2.5 to increase beyond levels the agency knows to be harmful.

The fourth issue deals with the underestimation of risk through faulty modeling assumptions.

1. Every monthly test, every maintenance check, storm avoidance or power outage, is a "cold start", so the emission factor must be adjusted accordingly. Please identify all engine operations to which "cold start" factors were applied, and how many hours of each engine operation included a "cold start" factor.
2. ICF's reliance on the "cold start" factor of 1.12 for 30 minutes appears to be in error. A review of the literature relied upon by ICF shows that over the course of the first 30 minutes particulate matter was 17.7 g/kW-hr. *Air Quality Implications of Backup Generators in California*, pp.31-32 (See attachment "Cold start is 17.7 g/kW-hr averaged over 30 minutes" excerpted from this document). Please back calculate using this value (17.7 g/kW-hr) to demonstrate how a 1.12 cold start factor was derived for 30 minutes and how 1.058 was derived for 1 hour.
3. Vantage based its background concentrations on the 98th percentile 24-hr average for PM2.5 and NO2, rather than on the maximum background level. My understanding of the modeling would require the worst case scenario modeling be conducted, then the maximums of those numbers compared against the standard. If more than 7 days in one year (98th percentile) exceed the standard, then compliance is not met. It seems logical to me that by using the 7th highest day for the assumed background concentration, Vantage will be allowed to violate the standard more frequently. Please provide evidence that the 1st through 7th day 24-hour background values (for each of the 5 years modeled) for PM2.5 and NO2, and the 1st through 7th day 24-hour

values (for each of the 5 years modeled) for emissions from Vantage for PM2.5 and NO2 were used to determine compliance with PM2.5 NAAQS.

4. In the real world, all PM2.5 is also PM10, however, for Vantage's local background concentration impact at the same receptor, the PM10 and PM2.5 24-hour averages are different numbers. Because PM2.5 is a subset of PM10 (and therefore is PM10), the PM10 concentration cannot be lower than the PM2.5 concentration (0.002 ug/m3 and 0.08 ug/m3 respectively). See TSD, 6.2 Assumed Background Concentrations. Please explain how this is possible.
5. Vantage claims that the background plus modeled annual concentration of PM10 and PM2.5 are the same. Please explain how this is possible when the 24-hour concentrations are not the same.
6. The PM 2.5 24-hr background of 21 ug/m3 was based on the 7th highest concentration. It seems possible that emissions from Vantage when combined with background may approach, or exceed, the 35 ug/m3 NAAQS. Ecology has provided no proof that Vantage's emissions comply with NAAQS. Please provide evidence that NAAQS is met for 24-hr PM2.5.
7. ICF's assumption that the worst-year annual emission impacts could be scaled by a factor of 1.27 because commission testing and stack testing are 27% of the emissions from full-build out routine testing plus power outages, is inappropriate. Commission testing involves only loads at 100% and 75% and will result in more than 27% of the NOx emission. Commission testing should be properly accounted for in modeling, not by manipulation. Since 1-hr NO2 was close to exceeding the NAAQS (166 ug/m3) the commission modeling must be conducted to assure compliance. Start-up operations are not allowed to be excluded from permitting under the CAA.

Other complaints and concerns include:

ICF used control estimates from 2000-2500 kW engines and adjusted the cost using the "0.6 factor." ICF provides no support for the "0.6 factor", or 60% increase in cost. To the contrary, information from the Manufactures Emission Control Association (MECA) indicates that costs stay the same or go down with increasing engine size. See EPA-HQ-OAR-2008-0708-DRAFT-0309[1]

ICF used a cost estimate of $188,745/generator for DPFs. MECA indicates that the total installed cost should be between $90,000-100,000 on a 3 MW engine. See EPA-HQ-OAR-2008-0708-DRAFT-0307[1] CARB estimated the cost for DPFs – using a regression approach – to be $38/hp. See Cost Analysis – Basis for Calculations, I-2.

The annual cost of operation of control technology decreases with engine size (cost/hp), it is not expected to increase as ICF suggests. A "Control Costs for Existing Stationary CI RICE" produced by Bradley Nelson, EC/R, Inc. is included for comparison purposes against the assumptions made by ICF.

Finally, ICF relies on source testing from "previous testing on the same engine with controls." This is not acceptable. The front half and back half particulate matter must be captured on the same engine. Capturing the back half on the same engine with controls will result in less particulate matter. The source tests are worthless; they have no chain of command or quality

assurance, and they have been pieced together by a party with a vested interest. Ecology should not rely on the source tests for these reasons.

Thank you for considering my comments.

Sincerely,

Patricia Martin
MYTAPN

Mort, Beth (ECY)

From: Patty Martin [martin@nwi.net]
Sent: Friday, January 11, 2013 11:11 PM
To: Mort, Beth (ECY)
Subject: Cost for controls
Attachments: EPA-HQ-OAR-2008-0708-0493.pdf; EPA-HQ-OAR-2008-0708-0380.pdf; EPA-HQ-OAR-2008-0708-0376.pdf; EPA-HQ-OAR-2008-0708-0328.pdf; Cost analysis basis for calculation.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Vantage

Beth,

Please find attached documents which contain cost information on emission controls for existing stationary diesel engines. These documents were taken from the regulatory docket for the U.S. EPA's National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines rulemaking (Docket ID No. EPA-HQ-OAR-2008-0708, www.regulations.gov/#!docketDetail;dct=FR%252BPR%252BN%252BO%252BSR;rpp=10;po=0;D=EPA-HQ-OAR-2008-0708):

- Letter from Bradley Nelson, EC/R Incorporated to Melanie King, USEPA; Control Costs for Existing Stationary Compression Ignition (CI) Reciprocating Internal Combustion Engines (RICE) (January 29, 2010)
- Email from Antonio Santos, MECA (Manufacturers of Emission Controls Association) to Tanya Parise, EC/R. MECA Cost of Aftertreatment (January 21, 2010)
- Email from Joe Suchecki, EMA (Engine Manufacturers Association) to Tanya Parise, EC/R. Cost of Aftertreatment (January 12, 2010)
- Email from Antonio Santos, MECA to Tanya Parise, EC/R. SUBJECT: Cost of Aftertreatment. October 2, 2009

Also, see MECA's June 2009 written testimony to EPA on the NESHAP for stationary CI RICE: http://meca.org/galleries/default-file/MECA%20comments%20on%20EPA%20stationary%20engine%20NPRM%20060309.pdf.

I would like these documents inserted into the record to dispute Mr. Wilder's claim of a "0.6" factor for increased costs of controls for larger engines, and to dispute his cost estimates used for BACT determination.

My narrative is still being written and I will have it to you beforemidnight.

Thank you.

Patricia Martin
MYTAPN
These

EPA-HQ-OAR-2008-0708-DRAFT-0309[1]

From: Antonio Santos [asantos@meca.org]
Sent: Thursday, January 21, 2010 1:26 PM
To: Tanya Parise
Subject: RE: FW: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment

Hi, Tanya. Sorry for the delay. I passed along your question to MECA member companies two weeks ago and just received responses this week.
Below are the two responses I received.

Hope this helps.

Antonio

Response #1:

Generally, you will not find any information for DPFs and DOCs for engines over 2000 ekW. The systems themselves become quite costly and cumbersome when applied to very large engines. I ran some numbers just to get some idea as to the cost for a 2500 ekW engine and found that, for the DPF alone (our system incorporates both the DPF and DOC in the same housing), the price would be in excess of $125,000. We find that, when a site requires power in excess of 2000 ekW, they will install multiple gen sets to accomplish their needs. The main issue with these devices is the back pressure they impart on the engine. Once the exhaust flow exceeds a certain rate, the number of filters and catalyst elements required for safe engine operation increases dramatically along with the size of the housings. The result is units that become extremely large in size and weight, making both shipping and installation both costly and challenging.

Response #2:

In our experience, there is no off-the shelf solution for engines applications of this size due to the site specific details for every project. These engines normally have site specific emission permits, which will vary greatly according to operating specification and emission standards for the jurisdiction. The design and configuration of the existing exhaust system (ducting, bellows, silencers, stacks,
etc.) in some cases allow for easy retrofit of emission controls and, in other cases, pose significant challenges in cost and complexity.

That said, the emission control technology for these engines are generally scaled-up versions of existing DOC and DPF technology. The cost of this technology per unit horsepower tends to remain the same or decrease as the engine size increases. Our experience is that this rule continues to apply on lean-burn engines above 3000 hp. Therefore, following this rule, the estimated cost for a DOC on a 3000 hp engine is approximately 3x$8500 = $25,500. The installation cost can vary significantly -- approximately $1000 to $10,000 depending on the complexity of the exhaust system retrofit.

-----Original Message-----
From: Tanya Parise [mailto:parise.tanya@ecrweb.com]
Sent: Tuesday, December 22, 2009 7:39 AM

To: Antonio Santos
Subject: RE: FW: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment

Antonio,

I wanted to follow-up on the question I asked below. I apologize if you've already sent a response, but I haven't received anything. Does MECA have a response?

Tanya

-----Original Message-----
From: Tanya Parise [mailto:parise.tanya@ecrweb.com]
Sent: Wednesday, October 14, 2009 11:18 AM
To: 'Antonio Santos'
Subject: RE: FW: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment

Antonio,

Thanks. I really appreciate the information. It's very helpful for our rulemaking.
One follow-up question. In the comments, MECA cited California's information on costs for applying DOC and DPFs to diesel engines. As far as I know, those costs were mostly applicable to engines less than about 3,000 HP. Is that right?

Does MECA have any information on the costs of applying DOC and DPF to larger stationary diesel engines, say about 3,000 HP? We've heard that catalysts and associated equipment would be more expensive for larger engines than what EPA estimated for proposal and want to get an estimate of what such costs would be.

Tanya

-----Original Message-----
From: Antonio Santos [mailto:asantos@meca.org]
Sent: Friday, October 02, 2009 5:06 PM
To: parise.tanya@ecrweb.com
Subject: RE: FW: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment

Hi, Tanya. Per your request, MECA staff surveyed its member companies to assess the the validity of the emission control costs for stationary IC engines shown in your e-mail. (Note: I also provided the member companies with a copy of your February 25, 2009 cost memo that was posted in the EPA docket.) We received two responses from our member companies. I've summarized the responses below.

Hope this helps. Please feel free to contact me (asantos@meca.org) if you have any questions.

If I receive any additional input from our members, I will forward the responses along to you.

Antonio

Response #1:

I have reviewed the comments in Tanya's email and feel that the NSCR capital cost are overestimated. We would expect the total capital cost to be in the range of $5,000.00 to about $15,000.00. These numbers assume converter costs and installation. It does not take into consideration silencing. Properly sized catalyst should not require any maintenance for at least 3 years. The only cost that should be needed during that time would be the annual certification. We would estimate this to be about $2,000.00 per engine per year. Catalyst cleaning would be the only other cost involved; we would estimate that to be about
$500.00 per catalyst element.

For 4SLB engines, we would expect the total cost to be in the range of $3,000.00 to $12,000.00 without considering any silencing. As for annual operating costs, they also seem to be high. As above, properly sized catalyst should not require any maintenance for at least 3 years.
The only cost that should be needed during that time frame would be the annual certification. We would estimate this to be about $2,000.00 per engine per year. Catalyst cleaning would be the only other cost involved; we would estimate that to be about $500.00 per catalyst
element.

2SLB engine are a little more difficult to estimate. Major contributing factors are the percent reduction needed, exhaust temperatures, and the maximum allowable back pressure on the engine. Typically, the requirement calls for CO reduction. At times, we have seen that to meet the back pressure requirement it requires additional catalyst to be installed. Also, these engines typically have a rated horsepower greater than 500. With all that said, our estimate for engines of 500 hp or less: the capital cost would be about $20,000.00 to $45,000.00 per engine and once again no silencing. The annual operating cost should be the same as the only yearly cost will be for the annual certification (about $2,000.00 per engine). Catalyst cleaning, when needed, will be about the same at $500.00 per catalyst element. For example, if there are eight elements in the converter, we would assume $4,000.00 per engine.

Response #2:

To assess the validity of the cost estimates in the report, I provide a few pricing examples below.

The prices for the catalysts are directly based on our current price list. We are not suppliers of A/F controllers and do not conduct installation, but I have provided estimates for those items as well.
All prices take into account the mark-ups for our dealers and re-sellers.

Based on these examples, I would say the capital cost component given in the report (Section 3.1 in the cost memo) is quite realistic, and perhaps even overly conservative.

500 hp, rich burn:
Catalytic converter - $5,500
A/F Controller - $4,000
Installation - ~$1,500

1,000 hp, rich burn:
Catalytic converter - $11,000
A/F Controller - $4,000
Installation - ~$2,000

1,000 hp, lean burn:
Catalytic converter - $8,500
A/F Controller - N/A
Installation - ~$1,000

We are only manufacturers and don't get involved in the service side of the business. However, the operating costs presented in the report look realistic in my view.

-----Original Message-----
From: Tanya Parise [mailto:parise.tanya@ecrweb.com]
Sent: Thursday, September 03, 2009 2:27 PM
To: Joe Kubsh
Subject: Re: FW: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment

Josh,

I appreciate it. Please note my new email address (I've left the company I was previously with when I emailed you originally, but I am still working with EPA on this project): parise.tanya@ecrweb.com.
Please use this address when you send MECA's response.

Thanks so much.
Tanya
>
>
>
> -----Original Message-----
> From: Joe Kubsh [mailto:jkubsh@meca.org]
> Sent: Tue 9/1/2009 10:45 AM
> To: Tanya Parise
> Subject: RE: EPA Proposed Existing RICE NESHAP - Cost of
> Aftertreatment
>
> Tanya, MECA is reaching out to our members to get some input to your
> cost questions. We will be back to you soon with our input.
>
> Joe Kubsh
> MECA
>
> _____
>
> From: Tanya Parise [mailto:tparise@alpha-gamma.com]
> Sent: Fri 8/28/2009 10:35 AM
> To: Joe Kubsh
> Subject: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment
>
>

> Joseph,
>
> I am a contractor working with Ms. Melanie King of the US EPA on the
> existing RICE NESHAP. We are hoping MECA can assist EPA in providing
> additional cost information on adding aftertreatment to existing
> stationary engines and verifying some available aftertreatment costs.
>
> In MECA's comments on the proposal, MECA cited some information on the

> cost of retrofitting DOC and DPF to existing stationary diesel engines

> from the CA ARB. In terms of retrofitting gas engines with oxidation
> catalyst for lean burn engines and NSCR for rich burn engines, does
> MECA have any information on the total costs of these controls that
> you could share with EPA?
>
> Comments received on the proposal suggested that EPA's costs were
> underestimated and some commenters indicated that total capital costs
> were on the order of $8,000-$25,000 for adding NSCR to engines below
> 500 HP with annual operating costs of $3,000-$11,000. For 4SLB
> engines, industry indicated that capital costs would be in ballpark of

> $10,000-$25,000 with annual costs of $5,000-$7,000 with an oxidation
> catalyst. For 2SLB engines, industry indicated that costs would be
> higher at $64,000 in capital costs and $20,000 in annual costs to add
> oxidation catalyst. Does MECA feel that these estimates are
> reasonable and representative of the actual costs to retrofit engines?

> Any information you can send us to either support or refute these
numbers would be greatly appreciated.
>
> I appreciate any guidance and information MECA can provide on this
> matter and look forward to your response.
>
> Thanks,
> Tanya
>
> Tanya Parise
> Senior Chemical Engineer
> Alpha-Gamma Technologies, Inc.
> 3301 Benson Drive, Suite 535
> Raleigh, NC 27609
> Phone : (919) 954-0033 ext: 109
> Fax : (919) 954-0379
> Email : tparise@alpha-gamma.com
> URL : http://www.alpha-gamma.com
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MEMORANDUM

DATE: January 29, 2010

SUBJECT: Control Costs for Existing Stationary CI RICE

FROM: Bradley Nelson, EC/R, Inc.

TO: Melanie King, EPA OAQPS/SPPD/ESG

1.0 PURPOSE

The purpose of this memorandum is to present information on the costs of control technology options for reducing hazardous air pollutants (HAP) emissions from stationary compression ignition (CI) reciprocating internal combustion engines (RICE). These estimates will be used for the above-the-floor maximum achievable control technology (MACT) analysis and generally available control technology (GACT) regulatory alternatives for RICE at major and area sources. This memorandum presents the cost of retrofitting control technology on existing engines.

2.0 INTRODUCTION

EPA has determined that diesel oxidation catalysts (DOC), catalyzed diesel particulate filters (CDPF), closed crankcase ventilation (CCV) and open crankcase ventilation (OCV) are applicable controls for HAP reduction from stationary CI RICE. To determine the capital and annual costs for these control technologies, equipment cost information was obtained from a cost study[1] performed by the California (CA) Air Resources Board (ARB) and cost data obtained from vendors. The annualized cost and capital cost equations were used to estimate the national impacts of controlling emissions from existing stationary CI engines.

[1] Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, California Environmental Protection Agency, Air Resources Board, Stationary Source Division, Mobile Source Control Division, October 2000. http://www.arb.ca.gov/diesel/documents/rrpapp.htm

3.0 METHODOLOGY FOR DETERMINING COST EQUATIONS

The following section describes the methodology used to derive the capital and annual costs for each of these control technologies. The capital and annual costs were determined using the costing methodology in the EPA Control Cost Manual.[2] A summary of the methodologies, equations, and assumptions used to estimate the capital and annual cost are described in the following sections.

3.1 Total Capital Costs

The total capital cost includes the direct and indirect costs of purchasing and installing the control equipment. The direct cost includes the cost of purchasing the equipment and instrumentation, cost of shipping, and the cost of installing the control equipment. The indirect cost includes the costs for engineering, contractor fees, testing costs, and also includes costs for contingencies, such as additional modifications, or delays in startup. The total capital cost equation can be summarized as follows;

Total Capital Cost (TCC) = Direct Costs (DC) + Indirect Costs (IC)

The direct costs include the costs of purchasing and installing the control equipment and can be summarized using the following equation;

DC = Purchased Equipment Cost (PEC) + Direct Installation Costs (DIC).

A summary of the cost assumptions for PEC includes the following:

- Control Device and Auxiliary Equipment (EC);
- Instrumentation (10% of EC);
- Sales Tax (3% of EC);
- Freight (5% of EC);

and can be summarized as:

PEC = 118% EC.

A summary of the cost assumptions for DIC includes the following:

- Foundations and Supports (8% of PEC);
- Handling and Erection (14% of PEC);
- Electrical (4% of PEC);
- Piping (2% of PEC);
- Insulation for Ductwork (1% of PEC);

[2] EPA Air Pollution Control Cost Manual, Sixth Edition, January 2002, EPA/452/B-02-001.

- Painting (1% of PEC);

and can be summarized as:

DIC = 30% PEC = 0.3 PEC.

Therefore, the direct costs can be simplified using the following equation:

DC = PEC + 0.3 PEC = 1.3 PEC.

The indirect costs include the costs of engineering and contractor fees and contingencies and can be summarized using the following equation:

IC = Indirect Installation Costs (ICC) + Contingencies (C).

A summary of the cost assumptions for ICC includes the following:

- Engineering (10% of PEC);
- Construction and Field Expenses (5% of PEC);
- Contractor Fees (10% of PEC);
- Startup (2% of PEC);
- Performance Test (1% of PEC);

and can be summarized as:

IIC = 28% PEC = 0.28 PEC.

A summary of the cost assumptions for C includes the following:

- Equipment Redesign and Modifications;
- Cost Escalations;
- Delays in Startup;

and is assumed to be:

C = 3% PEC = 0.03 PEC.

Therefore, the IC can be summarized using the following equation:

IC = 0.28 PEC + 0.03 PEC = 0.31 PEC,

and the simplified TCC equation can be expressed as:

TCC = 1.3 PEC + 0.31 PEC = 1.61 PEC = 1.61 (1.18 EC) = 1.9 EC

3.2 Total Annual Costs

The total annual cost includes the direct and indirect annual costs of operating and maintaining the control equipment. The direct annual cost includes the cost of the utilities, operating labor, and control device cleaning and maintenance. The indirect annual cost includes the overhead costs such as spare parts for the control equipment, administrative charges, and the capital recovery of the control technology. The total annual cost equation can be summarized as follows:

Total Annual Cost (TAC) = Direct Annual Costs (DAC) + Indirect Annual Costs (IAC).

A summary of the cost assumptions for DAC includes the following:

- Utilities;
- Operating Labor;
- Maintenance;
- Annual Compliance Test;
- Catalyst Cleaning;
- Catalyst Replacement;
- Catalyst Disposal.

A summary of the cost assumptions for DAC includes the following:

- Overhead (60% of operating labor and maintenance costs);
- Fuel Penalty;
- Property Tax (1% of TCC);
- Insurance (1% of TCC);
- Administrative Charges (2% of TCC);
- Capital Recovery = $\{I(1+I)^n/((1+I)^n-1)*TCC\}$ where I is the interest rate, and n is the equipment life.

The DAC and fuel penalty costs will be estimated using information obtained for each of the control technologies. The other annual costs will be calculated using the assumed percentages.

4.0 CONTROL COST EQUATIONS

4.1 Diesel Oxidation Catalysts

The cost of retrofitting a DOC to an existing CI engine was estimated using cost data obtained from a diesel engine control technology study performed by the California ARB.[3] The study provided equipment cost ranges for 40, 100, 275, 400, and 1,400 horsepower (HP) diesel engines. The average cost in the cost range for each of the engine sizes was used to develop the capital and annual cost for each of the engines. The capital cost was calculated using the EPA Control Cost methodology and includes the direct, indirect, and contingency costs of installation of the DOC. The total annual cost was also calculated using the EPA Control Cost methodology and includes the direct and indirect annual costs of operating and maintaining the DOC. Maintenance costs were estimated using the average of the cost range provided in the California ARB study. The study estimated the maintenance costs to range from $64 to $712 per year; $50 to $100 for thermal cleaning and 1 hour labor ($78) once every other year to 4 times a year. For estimating the annual maintenance cost, the thermal cleaning was estimated to cost $153 ($75 for cleaning + $78 for 1 hour labor) and the thermal cleaning would occur twice a year for a total maintenance cost of $306 per year. An equipment life of 10 years and an interest rate of 7 percent were used to estimate the indirect annual costs. The 10 year equipment life is consistent with the average life of control equipment. The fuel penalty associated with operating a DOC was assumed to be negligible. The capital and annual costs were adjusted to 2008 dollars using the Marshall & Swift Equipment Cost Index.

The calculated annual cost was plotted against the engine HP and the resulting graph showed a straight line relationship between the annual cost and engine HP. Therefore a linear regression was performed using the calculated annual cost and the engine HP to develop an equation that estimates annual costs when an engine HP is input into the equation. A summary of the calculated annual costs, graph, and linear regression analysis is presented in Appendix A of this memorandum. The annualized cost equation for retrofitting a DOC on a CI engine was estimated to be:

$$\text{DOC Annual Cost} = \$4.99*HP + \$480$$

where;

HP = engine size in HP.

The linear equation has a correlation coefficient of 0.9938, which shows the data fit the equation very closely. Therefore, this equation was used to estimate annualized cost for DOC for RICE at major and area sources.

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[3] Appendix IX, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, California Environmental Protection Agency, Air Resources Board, Stationary Source Division, Mobile Source Control Division, October 2000. http://www.arb.ca.gov/diesel/documents/rrpapp9.PDF

For capital cost, a graph of the calculated capital cost and the engine HP showed a straight line relationship between the two variables. Therefore a linear regression was performed using the calculated capital cost and the engine HP to develop an equation that estimates capital costs when an engine HP is input into the equation. A summary of the calculated capital costs, graph, and linear regression analysis is presented in Appendix A of this memorandum. The capital cost equation for retrofitting a DOC on a CI engine was estimated to be:

DOC Capital Cost = $27.4*HP - $939

where;

HP = engine size in HP.

The linear equation has a correlation coefficient of 0.9938, which shows the data fit the equation very closely. Therefore, this equation was used to estimate capital cost for DOC for RICE at major and area sources.

4.2 Catalyzed Diesel Particulate Filters

The CDPF is a control technology that reduces the emissions of HAP from CI engines. However, it is primarily installed on engines for the reduction of PM from the CI engine exhaust. The catalyst element in the CDPF is also effective in reducing the emissions of CO and volatile organic compounds (VOC). The filter system of the CDPF can be either active or passive. The passive CDPF uses heat from the engine to regenerate the filter media, whereas the active filter uses an electric heater or fuel burners to regenerate the filter media. The catalyzed coating in each of the two systems reduces emissions of CO, VOC, and HAP emissions.

The cost of retrofitting an active or passive CDPF to an existing CI engine was estimated using cost data obtained from a diesel engine control technology study performed by the California ARB.[4] The cost study did not distinguish equipment costs between the active and passive CDPF, therefore the equipment costs were assumed to be the same for both technologies. The study provided equipment cost ranges for 40, 100, 275, 400, and 1,400 HP diesel engines. The average cost in the cost range for each of these engine HPs and the EPA Control Cost methodology were used to develop the capital and annual cost for each of the engines. An equipment life of 10 years and an interest rate of 7 percent were used to estimate the indirect annual costs. The 10 year equipment life is consistent with the average life of control equipment. The fuel penalty associated with operating a CDPF was assumed to be negligible. The capital and annual costs were adjusted to 2008 dollars using the Marshall & Swift Equipment Cost Index.

The calculated annual cost for the CDPF was plotted against the engine HP and the resulting graph showed a straight line relationship between the annual cost and engine HP.

[4] Appendix IX, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, California Environmental Protection Agency, Air Resources Board, Stationary Source Division, Mobile Source Control Division, October 2000. http://www.arb.ca.gov/diesel/documents/rrpapp9.PDF

Therefore a linear regression was performed using the calculated annual cost and the engine HP to develop an equation that estimates annual costs when an engine HP is input into the equation. A summary of the calculated annual costs, graph, and linear regression analysis is presented in Appendix A of this memorandum. The annualized cost equation for retrofitting a CDPF on a CI engine was estimated to be:

$$\text{CDPF Annual Cost} = \$11.6*HP + 1414$$

where;

HP = engine size in HP.

The linear equation has a correlation coefficient of 0.9897, which shows the data fit the equation very closely. Therefore, this equation was used to estimate annualized cost for retrofitting CDPF for CI at major and area sources.

For capital cost, a graph of the calculated capital cost and the engine HP showed a straight line relationship between the two variables. Therefore a linear regression was performed using the calculated capital cost and the engine HP to develop an equation that estimates capital costs when an engine HP is input into the equation. A summary of the calculated capital costs, graph, and linear regression analysis is presented in Appendix A of this memorandum. The capital cost equation for retrofitting a CDPF on a CI engine was estimated to be:

$$\text{CDPF Capital Cost} = \$63.4*HP + \$5699$$

where;

HP = engine size in HP.

The linear equation has a correlation coefficient of 0.9897, which shows the data fit the equation very closely. Therefore, this equation was used to estimate capital cost for CDPF for RICE at major and area sources.

4.3 Open and Closed Crankcase Ventilation

In diesel engines, the crankcase exhaust is either exhausted to the atmosphere (open crankcase) or routed to the air intake to be used as combustion air (closed crankcase). Crankcase ventilation systems use filtration or centrifugal force to remove oil mist and particulates from the crankcase exhaust stream in both open and closed crankcase diesel engines. The OCV system is installed on diesel engines with open crankcases, whereas the CCV system is installed on diesel engines with closed crankcases. The filtration or separator units used for both OCV and CCV are the same and have essentially the same cost. Therefore for this analysis, it is assumed that the capital and annual cost of OCV and CCV are the same.

The cost of retrofitting an OCV on an existing CI engine was estimated based on information obtained from a distributor of the OCV technology (see Appendix B). The distributor sells and installs three different models of the OCV system and provided information on the installation costs and maintenance required. These models were applied to engine sizes of 100, 150, 200, 300, 500, 750, 1,000, 1,250, and 1,500 HP to estimate capital and annual costs using the EPA Control Cost methodology. An equipment life of 10 years and an interest rate of 7 percent were used to estimate the indirect annual costs. The 10 year equipment life is consistent with the average life of control equipment. The calculated annual cost and engine size were graphed and a straight line relationship was observed. A linear regression analysis was done on the data set and the linear equation for annualized cost was;

$$\text{OCV Annual Cost} = \$0.065*HP + \$254$$

where;

HP = engine size in HP.

The linear equation has a correlation coefficient of 0.8154, which is due to the same annual cost being calculated for several different sized CI engines. This is due to the fact that the same model OCV can be retrofit on several different engine sizes, because the OCV are based on the flow rate of the crankcase exhaust. However, it is believed that the equation represents a representative average annual cost of retrofitting an OCV on a CI engine.

For capital cost, a graph of the calculated capital cost and the engine HP showed a straight line relationship between the two variables. Therefore a linear regression was performed using the calculated capital cost and the engine HP to develop an equation that estimates capital costs when an engine HP is input into the equation. A summary of the calculated capital costs, graph, and linear regression analysis is presented in Appendix A of this memorandum. The capital cost equation for retrofitting a OCV on a CI engine was estimated to be:

$$\text{OCV Capital Cost} = \$0.26*HP + \$997$$

where;

HP = engine size in HP.

The linear equation has a correlation coefficient of 0.7920, where again the capital cost was calculated to be the same for several different sized CI engines. However, it is believed that the cost equation provides a representative estimate of the average capital cost of retrofitting an OCV on a CI engine.

5.0 SUMMARY

The following table presents a summary of the costs for control devices to reduce HAP emissions from stationary CI engines.

Table 1. Summary of Annual and Capital Costs Equations for CI HAP Controls

HAP Control Device	Annual Cost ($)	Capital Cost ($)
DOC	$4.99*HP + $480	$27.4*HP - $939
CDPF	$11.6*HP + $1414	$63.4*HP + $5699
OCV	$0.065*HP + $254	$0.26*HP + $997

Appendix A

Control Cost Summary and Linear Regression Statistics

Diesel Oxidation Catalyst Cost

Data obtained from CARB Appendix IX, Diesel PM Control Technologies

Capital and Annual Cost Equations are from EPA Air Pollution Control Cost Manual, Sixth Edition (EPA/452/B-02-001)

			Direct Costs		Indirect Costs									
Engine Size (HP)	Equipment Cost ($2000)	Equipment Cost ($2008)	PEC	DIC	IIC	C	Total Capital Cost	Regression Capital Cost		Direct Annual Cost	Indirect Annual Cost	Total Annual Cost	Regression Annual Cost	Annual Cost/Hp
40	$500	$665	$785	$236	$220	$24	$1,264	$156		$407	$475	$882	680	$22.05
100	$1,018	$1,355	$1,599	$480	$448	$48	$2,574	$1,798		$407	$714	$1,121	979	$11.21
275	$2,350	$3,128	$3,690	$1,107	$1,033	$111	$5,942	$6,587		$407	$1,328	$1,735	1,853	$6.31
400	$3,250	$4,325	$5,104	$1,531	$1,429	$153	$8,217	$10,008		$407	$1,743	$2,150	2,477	$5.38
1400	$15,000	$19,963	$23,556	$7,067	$6,596	$707	$37,925	$37,374		$407	$7,161	$7,568	7,468	$5.41
														$10.07

Assumptions:

PEC = 118% of purchased equipment cost (PEC).

DIC = 30% of purchased equipment cost (PEC) and includes cost of installation.

IIC = 28% of purchased equipment cost (PEC).

C = 3% of purchased equipment cost (PEC).

Direct Annual Cost = 0, equipment certified by engine manufacturer.

Indirect Annual Cost = 60% of direct annual cost + 4% of total capital cost + capital recovery.

Capital Recovery assumes equipment life of 10 years and 7% interest rate. 0.1423775

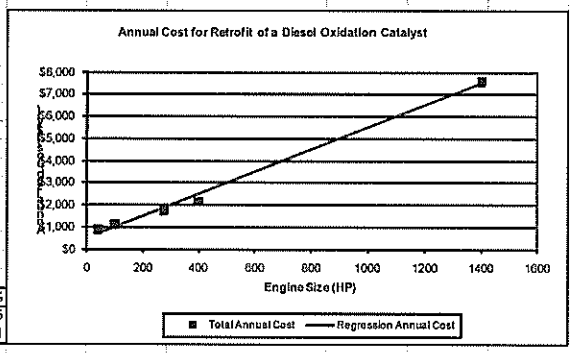
SUMMARY OUTPUT - Annual Cost

Regression Statistics	
Multiple R	0.99687955
R Square	0.99376884
Adjusted R S	0.99169179
Standard Er	252.645997
Observations	5

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	30539570.1	30539570.1	478.45167	0.00020915
Residual	3	191490	63830		
Total	4	30731060.1			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*
Intercept	480.351703	151.603431	3.16847514	0.05053998	-2.1180765	962.821482	-2.1180765
Engine Size	4.99102525	0.2281764	21.8735381	0.00020915	4.2648661	5.7171844	4.2648661



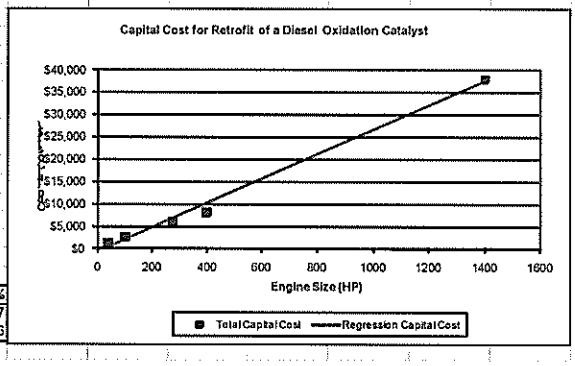
SUMMARY OUTPUT - Capital Cost

Regression Statistics	
Multiple R	0.99687955
R Square	0.99376884
Adjusted R S	0.99169179
Standard Er	1385.29146
Observations	5

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	918164273	918164273	478.45167	0.00020915
Residual	3	5757097.3	1919032.43		
Total	4	923921370			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*
Intercept	-938.90096	831.26169	-1.129489	0.34084422	-3584.3467	1706.54473	-3584.3467
Engine Size	27.3664524	1.25112143	21.8735381	0.00020915	23.3848256	31.3480792	23.3848256



Catalyzed Diesel Particulate Filter Cost
Data obtained from CARB Appendix IX, Diesel PM Control Technologies
Capital and Annual Cost Equations are from EPA Air Pollution Control Cost Manual, Sixth Edition (EPA/452/B-02-001)

Engine Size (HP)	Equipment Cost ($2000)	Equipment Cost ($2008)	Direct Costs PEC	DIC	Indirect Costs IIC	C	Total Capital Cost	Regression Capital Cost	Direct Annual Cost	Indirect Annual Cost	Total Annual Cost	Regression Annual Cost	Annual Cost/Hp
40	$4,150	$5,523	$6,517	$1,955	$1,825	$196	$10,493	$8,237	$234	$2,054	$2,288	1,877	$57.20
100	$6,250	$8,318	$9,815	$2,945	$2,748	$294	$15,802	$12,043	$234	$3,022	$3,256	2,571	$32.56
275	$7,950	$10,580	$12,485	$3,745	$3,496	$375	$20,100	$23,146	$234	$3,806	$4,040	4,596	$14.69
400	$10,500	$13,974	$16,489	$4,947	$4,617	$495	$26,548	$31,076	$234	$4,982	$5,216	6,042	$13.04
1400	$38,000	$50,572	$59,675	$17,903	$16,709	$1,790	$96,078	$94,518	$234	$17,663	$17,897	17,612	$12.78
													$26.06

Assumptions:
PEC = 118% of purchased equipment cost (PEC).
DIC = 30% of purchased equipment cost (PEC) and includes cost of installation.
IIC = 28% of purchased equipment cost (PEC).
C = 3% of purchased equipment cost (PEC).
Direct Annual Cost = 0, equipment certified by engine manufacturer.
Indirect Annual Cost = 60% of direct annual cost + 4% of total capital cost + capital recovery.
Capital Recovery assumes equipment life of 10 years and 7% interest rate. 0.1423775

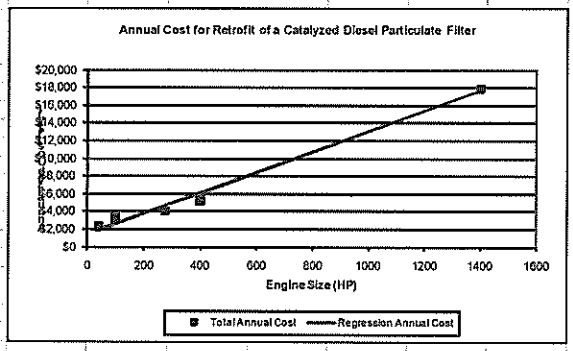
SUMMARY OUTPUT - Annual Cost

Regression Statistics	
Multiple R	0.99482924
R Square	0.98968521
Adjusted R S	0.98624695
Standard Er	755.115259
Observations	5

ANOVA

	df	SS	MS	F	Significance F
Regression	1	164128740	164128740	287.844638	0.00044599
Residual	3	1710597.16	570199.054		
Total	4	165839337			

	Coefficients	Standard Erro	t Stat	P-value	Lower 95%	Upper 95%
Intercept	1413.79818	453.116477	3.12016501	0.0524648	-28.22068	2855.81703
Engine Size	11.57046	0.68197987	16.9659847	0.00044599	9.40009569	13.7408243



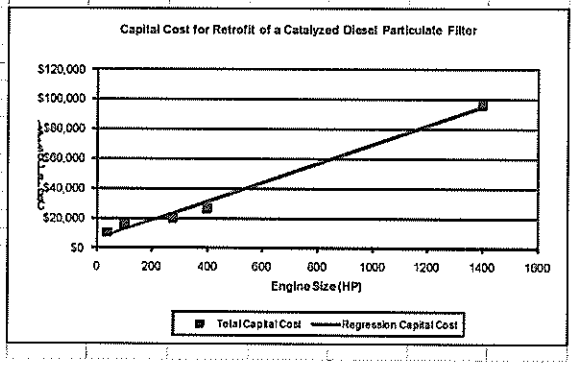
SUMMARY OUTPUT - Capital Cost

Regression Statistics	
Multiple R	0.99482924
R Square	0.98968521
Adjusted R S	0.98624695
Standard Er	4140.39697
Observations	5

ANOVA

	df	SS	MS	F	Significance F
Regression	1	4934488108	4934488108	287.844638	0.00044599
Residual	3	51428661.1	17142887		
Total	4	4985916769			

	Coefficients	Standard Erro	t Stat	P-value	Lower 95%	Upper 95%
Intercept	5699.15785	2484.49765	2.2938874	0.10557881	-2207.6225	13605.9382
Engine Size	63.4423645	3.73938592	16.9659847	0.00044599	51.5419696	75.3427594



Crankcase Filtration Cost Equations

Data obtained from Telephone Communications with Mid-Atlantic Engine Supply Corporation

Capital and Annual Cost Equations are from EPA Air Pollution Control Cost Manual, Sixth Edition (EPA/452/B-02-001)

		Direct Costs			Indirect Costs							
Engine Size (HP)	Equipment Cost ($2008)	PEC	DIC	IIC	C	Total Capital Cost	Regression Capital Cost	Direct Annual Cost	Indirect Annual Cost	Total Annual Cost	Regression Annual Cost	Annual Cost/Hp
100	$500	$590	$177	$165	$18	$950	$1,022	$45	$200	$245	260	$2.45
150	$500	$590	$177	$165	$18	$950	$1,035	$45	$200	$245	264	$1.63
200	$600	$708	$212	$198	$21	$1,140	$1,048	$50	$238	$288	267	$1.44
300	$600	$708	$212	$198	$21	$1,140	$1,074	$50	$238	$288	273	$0.96
500	$600	$708	$212	$198	$21	$1,140	$1,125	$50	$238	$288	286	$0.58
750	$600	$708	$212	$198	$21	$1,140	$1,190	$50	$238	$288	302	$0.38
1000	$700	$826	$248	$231	$25	$1,330	$1,254	$60	$279	$339	319	$0.34
1250	$700	$826	$248	$231	$25	$1,330	$1,318	$60	$279	$339	335	$0.27
1500	$700	$826	$248	$231	$25	$1,330	$1,382	$60	$279	$339	351	$0.23
												$0.92

Assumptions:

PEC = 118% of purchased equipment cost (PEC).

DIC = 30% of purchased equipment cost (PEC) and includes cost of installation.

IIC = 28% of purchased equipment cost (PEC).

C = 3% of purchased equipment cost (PEC).

Direct Annual Cost = 0, equipment certified by engine manufacturer.

Indirect Annual Cost = 60% of direct annual cost + 4% of total capital cost + capital recovery.

Capital Recovery assumes equipment life of 10 years and 7% interest rate. 0.1423775

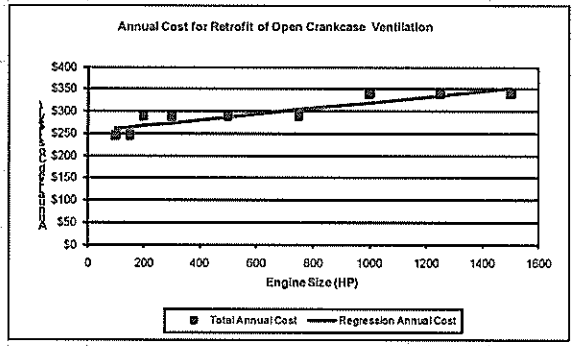
SUMMARY OUTPUT - Annual Cost

Regression Statistics	
Multiple R	0.90297617
R Square	0.81536597
Adjusted R S	0.78898958
Standard Er	16.909021
Observations	9

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	8838.44377	8838.44377	30.9128379	0.00085098
Residual	7	2001.40494	285.914991		
Total	8	10839.8487			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	253.982196	9.3261336	27.233386	2.3087E-08	231.929395	276.034998
Engine Size	0.06466166	0.01162994	5.55993147	0.00085098	0.03716122	0.09216209



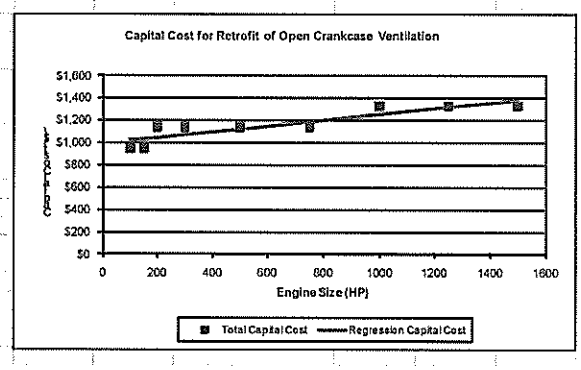
SUMMARY OUTPUT - Capital Cost

Regression Statistics	
Multiple R	0.88999704
R Square	0.79209473
Adjusted R S	0.76239398
Standard Er	72.3930199
Observations	9

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	139766.49	139766.49	26.6691805	0.00130337
Residual	7	36685.2453	5240.74934		
Total	8	176451.735			

	Coefficients	*Standard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	996.708476	39.928212	24.9625121	4.2234E-08	902.293257	1091.12369
Engine Size	0.25713456	0.04979155	5.16422119	0.00130337	0.13939626	0.37487286



Appendix B

Contact Report

CONTACT REPORT

Date/Time	Project Name	Project Number
November 20, 2009 10:00pm	RICE NESHAP	MME-304
EC/R Originator	**Contact**	**Phone Number**
Bradley Nelson	Chuck Cook – Mid-Atlantic Engine Supply	(800) 257-8133

General Subject

The purpose of the telephone call was to discuss the feasibility of retrofitting existing stationary diesel engines with an open or closed crankcase ventilation system, and obtain equipment and installation costs for the retrofit. I spoke with General Manager of the company who stated that their company had installed numerous open and closed crankcase ventilation systems on both stationary and nonroad engines. He stated that the OCV and CCV systems are the same products with the only difference being the installation kit needed to retrofit the unit. The OCV system is installed in the open crankcase ventilation port, whereas the CCV is installed somewhere along the crankcase exhaust line before it reaches the intake manifold. He noted that engines that are enclosed in a housing or other shelter emit an oil mist from the crankcase that accumulates on the radiator and reduces the radiators effectiveness in cooling the engine. He noted that the Racor systems they sell reduce oil mist emissions by 95% using a filtration system. The equipment costs for the systems are;

CCV4500 Series – Maximum Flow 10 CFM (< 160 HP diesel engines) $500

CCV6000 Series – Maximum Flow 20 CFM (160-800 HP diesel engines) $600

CCV8000 Series – Maximum Flow 40 CFM (> 800 HP diesel engines) $700

The filter needs to be replaced every 750 hours and the replacement cost is $45 for the 4500, $50 for the 6000, and $60 for the 8000. The contact also stated it takes roughly 1-2 hours for installation, therefore at $80 per hour, installation would cost roughly $160.

http://www.maesco.com/products/racor/r_ccv_intro/r_ccv_intro.html

EPA-HQ-OAR-2008-0708-DRAFT-0307[1]

From: Suchecki, Joe [JSuchecki@ngelaw.com]
Sent: Tuesday, January 12, 2010 9:36 AM
To: Tanya Parise
Subject: RE: Existing RICE NESHAP - Cost of Aftertreatment

Tanya,

Sorry it has taken a little while to get back to you.

After reviewing the background documents on the costs of aftertreatment, we would agree with the comment that the costs that were used are on the low side. In particular, the costs for addition of a DPF are very low - one would not expect the costs of adding a DPF to be less than adding a DOC.

Here are a couple of comments that I received from EMA members.

The costs for installation/construction appear to be low. The background document assumes a construction/field cost of 5%. We believe it is more in the range of 10-15%. Also, the installation costs of a DOC or DPF on an existing engine should be higher than the cost of including those technologies on a new engine. You have to retrofit and incorporate the control technology onto an engine that was not designed with that in mind, so costs are likely to be higher than to purchase an engine where the aftertreatment is designed into the engine configuration.

Regarding DPF costs, using the regression equation for retrofitting a 3000 hp engine comes to around $23,700. One member provided information to indicate that a DPF installed on a 3000 hp engine would be around $90,000 - $100,000 (complete cost to the customer).
Again, one would not expect a DPF to cost less than a OC, so we would agree that the numbers are low and something is way off on those capital cost estimates.

Joe

Joe Suchecki
Director, Public Affairs
Engine Manufacturers Association
Two North LaSalle Street, Suite 1700
Chicago, IL 60602
Tel: 312-827-8734
Fax: 312-827-8737
jsuchecki@emamail.org
www.enginemanufacturers.org

From: Tanya Parise [mailto:parise.tanya@ecrweb.com]
Sent: Monday, January 04, 2010 1:30 PM
To: Suchecki, Joe; WINKLEMAN_BRADY_L@cat.com
Subject: Existing RICE NESHAP - Cost of Aftertreatment
Joe and Brady,

I'm hoping one or both of you can help us answer this question. We got some comments on the proposed existing RICE NESHAP indicating that catalysts and associated equipment would be more expensive for larger diesel engines than what EPA estimated for proposal. Would you agree or disagree ? Does EMA or Caterpillar have any information on the costs of applying DOC and DPF to larger stationary diesel engines, say 3,000 HP and above?

Thanks again for your help on this rulemaking,
Tanya

Tanya Parise
EC/R Incorporated
501 Eastowne Drive, Suite 250
Chapel Hill, NC 27514
(919) 484-0417

From:•Antonio Santos [asantos@meca.org]
Sent:•Friday, October 02, 2009 5:06 PM
To:•parise.tanya@ecrweb.com
Subject:•RE: FW: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment

Hi, Tanya. Per your request, MECA staff surveyed its member companies to assess the the validity of the emission control costs for stationary IC engines shown in your e-mail. (Note: I also provided the member companies with a copy of your February 25, 2009 cost memo that was posted in the EPA docket.) We received two responses from our member companies. I've summarized the responses below.

Hope this helps. Please feel free to contact me (asantos@meca.org) if you have any questions.

If I receive any additional input from our members, I will forward the responses along to you.

Antonio

Response #1:

I have reviewed the comments in Tanya's email and feel that the NSCR capital cost are overestimated. We would expect the total capital cost to be in the range of $5,000.00 to about $15,000.00. These numbers assume converter costs and installation. It does not take into consideration silencing. Properly sized catalyst should not require any maintenance for at least 3 years. The only cost that should be needed during that time would be the annual certification. We would estimate this to be about $2,000.00 per engine per year. Catalyst cleaning would be the only other cost involved; we would estimate that to be about
$500.00 per catalyst element.

For 4SLB engines, we would expect the total cost to be in the range of $3,000.00 to $12,000.00 without considering any silencing. As for annual operating costs, they also seem to be high. As above, properly sized catalyst should not require any maintenance for at least 3 years.
The only cost that should be needed during that time frame would be the annual certification. We would estimate this to be about $2,000.00 per engine per year. Catalyst cleaning would be the only other cost involved; we would estimate that to be about $500.00 per catalyst
element.

2SLB engine are a little more difficult to estimate. Major contributing factors are the percent reduction needed, exhaust temperatures, and the maximum allowable back pressure on the engine. Typically, the requirement calls for CO reduction. At times, we have seen that to meet the back pressure requirement it requires additional catalyst to be installed. Also, these engines typically have a rated horsepower greater than 500. With all that said, our estimate for engines of 500 hp or less: the capital cost would be about $20,000.00 to $45,000.00 per engine and once again no silencing. The annual operating cost should be the same as the only yearly cost will be for the annual certification (about $2,000.00 per engine). Catalyst cleaning, when needed, will be about the same at $500.00 per catalyst element. For example, if there are eight elements in the converter, we would assume $4,000.00 per engine.

Response #2:

To assess the validity of the cost estimates in the report, I provide a few pricing examples below.

The prices for the catalysts are directly based on our current price list. We are not suppliers of A/F controllers and do not conduct installation, but I have provided estimates for those items as well.
All prices take into account the mark-ups for our dealers and re-sellers.

Based on these examples, I would say the capital cost component given in the report (Section 3.1 in the cost memo) is quite realistic, and perhaps even overly conservative.

500 hp, rich burn:
Catalytic converter - $5,500
A/F Controller - $4,000
Installation - ~$1,500

1,000 hp, rich burn:
Catalytic converter - $11,000
A/F Controller - $4,000
Installation - ~$2,000

1,000 hp, lean burn:
Catalytic converter - $8,500
A/F Controller - N/A
Installation - ~$1,000

We are only manufacturers and don't get involved in the service side of the business. However, the operating costs presented in the report look realistic in my view.

-----Original Message-----
From: Tanya Parise [mailto:parise.tanya@ecrweb.com]
Sent: Thursday, September 03, 2009 2:27 PM
To: Joe Kubsh
Subject: Re: FW: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment

Josh,

I appreciate it. Please note my new email address (I've left the company I was previously with when I emailed you originally, but I am still working with EPA on this project): parise.tanya@ecrweb.com.
Please use this address when you send MECA's response.

Thanks so much.
Tanya
>
>
>
> -----Original Message-----
> From: Joe Kubsh [mailto:jkubsh@meca.org]
> Sent: Tue 9/1/2009 10:45 AM
> To: Tanya Parise
> Subject: RE: EPA Proposed Existing RICE NESHAP - Cost of
> Aftertreatment
>
> Tanya, MECA is reaching out to our members to get some input to your
> cost questions. We will be back to you soon with our input.
>
> Joe Kubsh
> MECA
>
> _____
>
> From: Tanya Parise [mailto:tparise@alpha-gamma.com]
> Sent: Fri 8/28/2009 10:35 AM
> To: Joe Kubsh
> Subject: EPA Proposed Existing RICE NESHAP - Cost of Aftertreatment
>
>
>
> Joseph,
>
> I am a contractor working with Ms. Melanie King of the US EPA on the
> existing RICE NESHAP. We are hoping MECA can assist EPA in providing
> additional cost information on adding aftertreatment to existing
> stationary engines and verifying some available aftertreatment costs.
>
> In MECA's comments on the proposal, MECA cited some information on the

> cost of retrofitting DOC and DPF to existing stationary diesel engines

> from the CA ARB. In terms of retrofitting gas engines with oxidation
> catalyst for lean burn engines and NSCR for rich burn engines, does
> MECA have any information on the total costs of these controls that
> you could share with EPA?
>
> Comments received on the proposal suggested that EPA's costs were
> underestimated and some commenters indicated that total capital costs
> were on the order of $8,000-$25,000 for adding NSCR to engines below
> 500 HP with annual operating costs of $3,000-$11,000. For 4SLB
> engines, industry indicated that capital costs would be in ballpark of

> $10,000-$25,000 with annual costs of $5,000-$7,000 with an oxidation
> catalyst. For 2SLB engines, industry indicated that costs would be
> higher at $64,000 in capital costs and $20,000 in annual costs to add
> oxidation catalyst. Does MECA feel that these estimates are
> reasonable and representative of the actual costs to retrofit engines?

> Any information you can send us to either support or refute these
numbers would be greatly appreciated.

> I appreciate any guidance and information MECA can provide on this
> matter and look forward to your response.
>
> Thanks,
> Tanya
>
> Tanya Parise
> Senior Chemical Engineer
> Alpha-Gamma Technologies, Inc.
> 3301 Benson Drive, Suite 535
> Raleigh, NC 27609
> Phone : (919) 954-0033 ext: 109
> Fax : (919) 954-0379
> Email : tparise@alpha-gamma.com
> URL : http://www.alpha-gamma.com
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Appendix I

Cost Analysis - Basis for Calculations

I. Capital Cost Estimates of Diesel Emission Controls and Purchase of New Engines

The estimated capital costs ($/hp) for installation of a DPF was derived from actual costs for DPF installations in California. Table I-1 lists 16 of the 49 known installations of DPFs on emergency generators in California. These 16 were chosen because cost information was available. Most of this information was used to develop equations relating the size of the generator to the cost of the DPF. However, four of these 16 installations (indicated in italics in Table I-1 below) were not used in the development of the equations due to questionable cost data, or because the cost included additional equipment not related to the DPF. Table I-2 lists the 12 emergency diesel engines with a DPF actually used to relate engine size to DPF costs. Figures I-1 graphically represents this relationship and the resulting trend line and equation in terms of total DPF costs and installation costs. These equations are used to calculate the values presented in Chapter IX, Tables IX-4, IX-5, IX-9, IX-11, IX-13, IX-14, and IX-16.

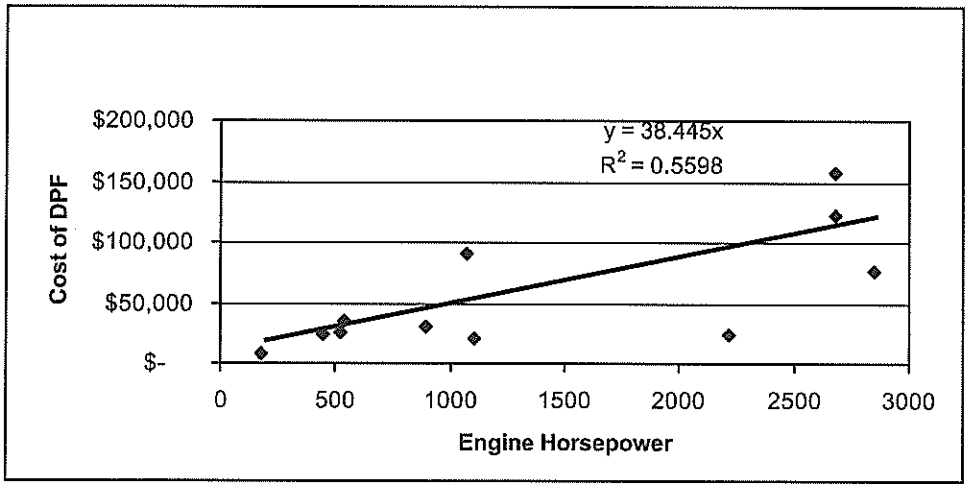
Table I-1: List of Emergency Generators with Installed Diesel Particulate Filters and Available Cost Information

		Engine			DPF			Engine
Obs	Facility Type	Make	Model	HP	Age	Capital	Install	Price
1	Public Works	Caterpillar	3516B	2848	2001	$ 76,000		$317,002
2	Medical Center	Caterpillar		2680	2001	$121,750	$ 35,000	$616,250
3	Candy Company	Caterpillar	3516 B	2680	2001	$ 74,500	$ 47,000	$288,000
4	*Communication*	*Caterpillar*	*3516*	*2479*	*1993*	*$100,000*		
5	*Communication*	*Caterpillar*	*3516*	*2479*	*1993*	*$100,000*		
6	*Communication*	*Caterpillar*	*3516*	*2479*	*1993*	*$100,000*		
7	Data	Cummins	KTTA 50-G2	2220	1997	$ 24,000		
8	*Communication*	*Cummins*	*KTA50-G9*	*2200*	*2001*	*$ 10,000*		
9	Brewery	Caterpillar	3412 DISTA	1100	1999	$ 20,000		
10	Data	Caterpillar		1072	2001	$ 90,000		
11	Communication	Caterpillar	3412C	896	2000	$ 20,000	$ 10,000	$ 90,000
12	Data	Caterpillar		536	2001	$ 35,000		
13	Medical Center	Caterpillar	3406	519	2002	$ 26,000		
14	Communication	Caterpillar	3406	449	2000	$ 20,000	$ 3,600	$ 50,000
15	Hotel	Caterpillar		175	Soon	$ 8,500		
16	Hotel	Caterpillar		175	Soon	$ 8,500		

Table I-2: List of Emergency Generators with Installed Diesel Particulate Filters and Useful Cost Information

Obs	Facility Type	Engine			DPF			
		Make	Model	HP	Age	Capitol	Install	Total
1	Public Works	Caterpillar	3516B	2848	2001	$ 76,000		$ 76,000
2	Medical Center	Caterpillar		2680	2001	$121,750	$ 35,000	$156,750
3	Candy Company	Caterpillar	3516 B	2680	2001	$ 74,500	$ 47,000	$121,500
7	Data	Cummins	KTTA 50-G2	2220	1997	$ 24,000		$ 24,000
9	Brewery	Caterpillar	3412 DISTA	1100	1999	$ 20,000		$ 20,000
10	Data	Caterpillar		1072	2001	$ 90,000		$ 90,000
11	Communication	Caterpillar	3412C	896	2000	$ 20,000	$ 10,000	$ 30,000
12	Data	Caterpillar		536	2001	$ 35,000		$ 35,000
13	Medical Center	Caterpillar	3406	519	2002	$ 26,000		$ 26,000
14	Communication	Caterpillar	3406	449	2000	$ 20,000	$ 3,600	$ 23,600
15	Hotel	Caterpillar		175	Soon	$ 8,500		$ 8,500
16	Hotel	Caterpillar		175	Soon	$ 8,500		$ 8,500

Figure I-1: Existing California DPF Total Costs



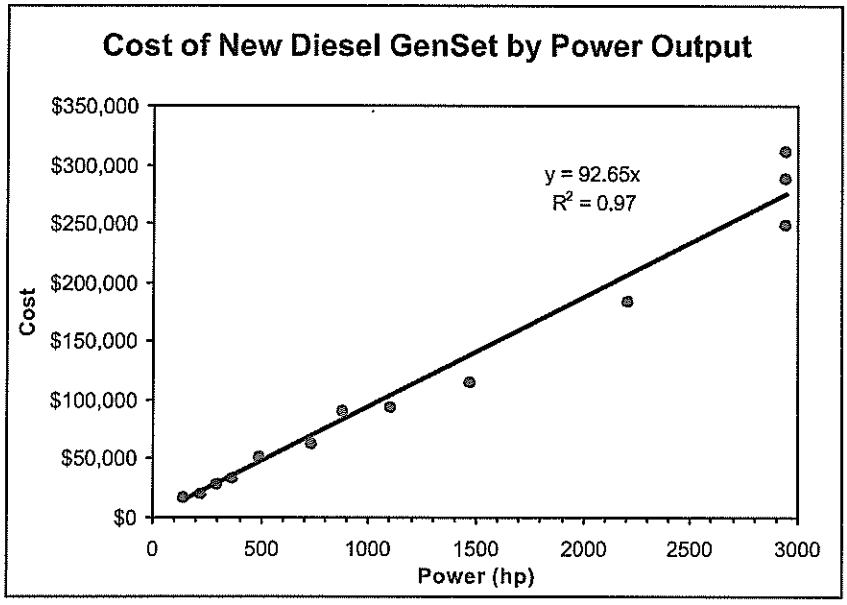
Based on this regression, we estimate the costs for DPFs to be approximately $38 dollars per horsepower.

The estimated capital costs ($/hp) for a the purchase of new diesel engine was derived from actual costs for diesel generators installed in California and calling dealerships. Table I-3 lists costs of diesel generators of various sizes in California. This information was used to develop an equation relating the size of the generator to the cost. Figure I-2 graphically represents this relationship and the resulting trend line and equation in terms of total generator costs versus power output. These equations are used to calculate the values presented in Chapter IX.

Table I-3: List of New Diesel Generators Costs

Manufacturer	kW	HP	Price
Cummins	100	147	$ 16,000
Cummins	150	221	$ 20,000
Cummins	200	295	$ 28,000
Cummins	250	368	$ 33,000
Caterpillar	335	493	$ 50,000
Cummins	500	736	$ 62,000
Caterpillar	600	884	$ 90,000
Cummins	750	1104	$ 93,000
Cummins	1000	1473	$ 115,000
Cummins	1500	2209	$ 183,000
Cummins	2000	2945	$ 248,000
Caterpillar	2000	2945	$ 288,000
Caterpillar	2000	2945	$ 311,380

Figure I-2: New Generator Costs in California



Based on this regression, we estimate the costs for new diesel generators to be approximately $92.65 dollars per horsepower.

II. Summary of In-use Diesel Fueled Stationary Engine Population and Costs

Table I-4 summarizes the stationary in-use diesel engine statistics and associated costs. Data for both private and public engine ownership is provided. The public engines are further subcategorized by local, State, and federal owned. The numbers in this table with parenthesis around them are negative values representing cost savings. All the values are combined emergency standby (E/S) and prime engines unless otherwise indicated.

Table I-4: Population and Cost for In-Use Diesel-Fueled Engines

Category	Summary of Total In-Use Engines					
	All	Private	Public	Local	State	Federal
State Wide Installation Cost ($)	$ 45,990,000	$ 35,950,000	$ 10,740,000	$ 6,350,000	$ 750,000	$ 3,640,000
Annual Maintenance & Fuel Cost ($)	$ (52,000)	$ 691,000	$ (32,000)	$ 4,000	$ (100,000)	$ 41,000
Annualized Cost ($)	$ 7,757,000	$ 6,672,000	$ 1,511,000	$ 1,025,000	$ 13,000	$ 632,000
Annualized E/S Cost ($)	$ (679,000)	$ 33,000	$ (99,000)	$ (36,000)	$ (97,000)	$ 14,000
Annualized Prime Cost ($)	$ 8,437,000	$ 6,640,000	$ 1,610,000	$ 1,062,000	$ 109,000	$ 619,000
# of Engines retrofitted	1,559	1,211	348	212	26	109
# of E/S Engines retro	232	167	65	45	9	12
# of Prime Engines retro	1,327	1,044	283	167	17	98
Population of Engines	20,987	10,796	10,191	5,600	899	3,692
Pop. of E/S Engines	19,660	9,752	9,908	5,432	882	3,594
Pop. of Prime Engines	1,327	1,044	283	167	17	98
Local Ann. Cost Inspect	$ 378,500	$ 226,300	$ 152,100	$ 84,600	$ 12,800	$ 54,700

III. Statewide Annual and Total Costs for Businesses

Table I-5 presents the estimated statewide costs to business having prime and emergency standby engines. The categories are in-use emergency standby and prime, new emergency standby and prime, and new agriculture.

Table I-5: Statewide Annual Costs

Equipment Category		Total Capital Cost ($)	Annualized Capital Cost ($)	Annual Recurring Costs ($)	Total Annualized Cost ($)
In-use	Prime	$ 33,652,844	$ 5,965,565	$ 674,066	$ 6,639,630.00
	E/S	$ 2,296,060	$ 162,911	$ -130,132	$ 32,779
New	Prime	$ 529,765	$ 75,427	$ 417	$ 75,844
	E/S			$ 7,431	$ 7,431
	Agriculture			$ 2,120	$ 2,120
Total		$ 36,478,669	$ 6,203,902	$ 553,902	$ 6,757,805

IV. Stationary Prime Diesel Engines Assumptions

Table I-6 lists the statewide in-use prime engine information used as the basis for calculating the costs and PM emissions. For in-use prime engines, 80% of the engine

population is assumed to be retrofitted with an 85% emission reduction device, while the remaining 20% are assumed to retrofit their engines to meet a 30% emission reduction and then purchase a new engine meeting Tier IV requirements in 2011. For example, for 50-175 horsepower, low use engines shown in Table I-6 below, 169 of 211 engines are expected to be retrofitted to achieve an 85% reduction, and 42 are expected to be retrofitted to achieve a 30% reduction, with and engine replacement in 2011.

Table I-6: Statewide In-use Prime Engine Size, Use, and PM Emissions Rate Characteristics

State Inventory =	1327	2002 inventory DEPICT						
Prime Engines								
HP Range	0-500 hrs =Low Use or 500+ =High use	# Engines	Avg. Size (hp)	Load	Avg. Annual Hours	Current PM (g/bhp-hr)	New PM (g/bhp-hr)	Reduction Required
50-175	Low Use	169	127	0.50	103	0.55	0.0825	85%
50-175	Low Use	42	127	0.50	103	0.55	0.385	30%
50-175	Low Use	42	127	0.50	103	0.55	0.01	New Eng after 2011
50-175	High Use	115	118	0.32	1246	0.5	0.075	85%
50-175	High Use	29	118	0.32	1246	0.5	0.35	30%
50-175	High Use	29	118	0.32	1246	0.5	0.01	New Eng after 2011
175-750	Low Use	230	321	0.61	132	0.38	0.057	85%
175-750	Low Use	57	321	0.61	132	0.38	0.266	30%
175-750	Low Use	57	321	0.61	132	0.38	0.01	New Eng after 2011
175-750	High Use	264	413	0.45	1519	0.38	0.057	85%
175-750	High Use	66	413	0.45	1519	0.38	0.266	30%
175-750	High Use	66	413	0.45	1519	0.38	0.01	New Eng after 2011
750+	Low Use	47	1187	0.49	71	0.3	0.045	85%
750+	Low Use	12	1187	0.49	71	0.3	0.21	30%
750+	Low Use	12	1187	0.49	71	0.3	0.01	New Eng after 2011
750+	High Use	237	1492	0.60	2168	0.3	0.045	85%
750+	High Use	59	1492	0.60	2168	0.3	0.21	30%
750+	High Use	59	1492	0.60	2168	0.3	0.01	New Eng after 2011

V. Stationary Emergency Standby Diesel Engines Assumptions

Table I-7 lists the statewide in-use emergency standby engine information used as the basis for calculating the costs and PM emissions. As shown, the estimated PM emission rate varies with the age of the engine, and its horsepower rating.

Table I-7: Statewide In-use Emergency Standby Engine Population, Size, and PM Emissions Rate Characteristics

Model Year Range	Horsepower Range	# Engines	Average HP	Existing PM Emission Rate (g/bhp-hr)
Pre 1987	<=250	2597	140	0.55
Pre 1987	>250	3883	613	0.53
1988-2002	<=250	5177	131	0.38
1988-1995	250<=750	2456	416	0.38
1988-1999	>750	3149	1224	0.38
1996-2001	250<=750	1624	423	0.15
2000-2002	>750	709	1674	0.15
2002	250<=750	66	409	0.12

VI. Annual Cost Effectiveness

Table I-8 lists the estimated statewide annual costs, PM emissions reduced (based on the ARB emissions inventory), and resulting cost effectiveness. The figures are provided for 2005 through 2020, and vary with the implementation of the various regulatory provisions for different types of stationary diesel engines.

Table I-8: Statewide Annual Costs, PM Reduced, and Resulting Cost Effectiveness

Year	Sum Annual Costs ($)	Inventory Based PM Reduced	Cost Effectiveness	
		(tons/yr)	($/tons)	($/lb)
2005	$ 1,354,316	145	$ 8,043	$ 4.02
2006	$ 3,108,844	125	$ 20,391	$ 10.20
2007	$ 4,693,204	114	$ 32,388	$ 16.19
2008	$ 6,119,622	103	$ 44,179	$ 22.09
2009	$ 5,842,752	93	$ 44,416	$ 22.21
2010	$ 5,578,374	73	$ 51,459	$ 25.73
2011	$ 5,409,320	76	$ 45,996	$ 23.00
2012	$ 5,159,407	68	$ 46,636	$ 23.32
2013	$ 4,135,495	61	$ 39,895	$ 19.95
2014	$ 3,197,399	54	$ 33,069	$ 16.53
2015	$ 2,358,752	51	$ 24,349	$ 12.17
2016	$ 1,592,726	42	$ 19,248	$ 9.62
2017	$ 1,336,349	36	$ 17,636	$ 8.82
2018	$ 1,100,777	32	$ 15,999	$ 8.00
2019	$ 900,639	27	$ 14,566	$ 7.28
2020	$ 717,067	23	$ 12,874	$ 6.44
		Weighted Average =	$ 30,821	$ 15.41

Table I-9 presents another cost effectiveness based on the reduction in reactive organic gases (ROG) and oxides of nitrogen (NOx) combined. The total statewide annual costs were split evenly between PM and ROG+NOx, such that half of the total statewide annual costs were used along with the associated ROG+NOx reductions. As shown in Table I-9, the resulting cost effectiveness value of the years 2005-2020 is $0.92 per pound of ROGF+NOx reduced. The resulting PM cost effectiveness (which is not shown in Table I-9) is simply half the value presented in Table I-8, or $7.70 per pound of PM reduced.

Table I-9: Statewide Annual Costs, ROG and NOx Reduced, and Resulting Cost Effectiveness

Year	Sum Annual Costs ($)	Inventory Reduced			ROG+NOx Cost Effectiveness	
		ROG (tons/yr)	NOx (tons/yr)	ROG+NOx (tons/yr)	($/ton)	($/lb)
2005	$ 677,158	165	418	583	$ 1,162	$ 0.58
2006	$ 1,554,422	157	306	463	$ 3,358	$ 1.68
2007	$ 2,346,602	149	389	538	$ 4,360	$ 2.18
2008	$ 3,059,811	141	455	596	$ 5,131	$ 2.57
2009	$ 2,921,376	133	530	663	$ 4,407	$ 2.20
2010	$ 2,789,187	126	352	478	$ 5,839	$ 2.92
2011	$ 2,704,660	118	679	796	$ 3,396	$ 1.70
2012	$ 2,579,704	110	753	863	$ 2,989	$ 1.49
2013	$ 2,067,748	102	828	930	$ 2,224	$ 1.11
2014	$ 1,598,699	94	902	997	$ 1,604	$ 0.80
2015	$ 1,179,376	87	897	983	$ 1,199	$ 0.60
2016	$ 796,363	79	1,051	1130	$ 705	$ 0.35
2017	$ 668,174	71	1,126	1197	$ 558	$ 0.28
2018	$ 550,388	63	1,200	1263	$ 436	$ 0.22
2019	$ 450,320	55	1,275	1330	$ 339	$ 0.17
2020	$ 358,533	48	1,485	1532	$ 234	$ 0.12
Weighted Average =					$ 1,834	$ 0.92

VII. Impacts on Business

To comply with State law, ARB staff evaluated the impacts to a typical business and a typical small businesses. Our analysis is presented below.

Estimated Typical Business Impacts

Many businesses do not own any diesel-fueled stationary engines. Based on the ARB Survey, for those businesses that do have stationary diesel-fueled engines, the average business owns 2.5 emergency standby engines of 700 horsepower, or three prime engines of 560 horsepower.[1] The ARB survey of prime engines had a low response rate. The State inventory average prime engine size is 590 horsepower. Since the survey data and State inventory data are very close, the State inventory average prime engine size was used for the cost calculations.

[1] We believe this may be an overestimate of the number of engines owned by a typical business. Some of the telecommunication businesses own hundreds of engines, which may have biased the average.

According to the data collected, most businesses that own an emergency standby engine will not need to install DECS, and for those that do, the majority can use the less expensive diesel oxidation catalyst. The costs to a business with a typical size emergency standby engine could range from $250 to $16,750. The low end of the cost range reflects businesses that will not have to install retrofits (ie., no equipment cost). The upper end reflects businesses that will retrofit emergency standby engines with DOCs at an average capital cost $6,700 each. Because the average private business that owns an emergency standby stationary diesel-fueled CI engine has 2.5 engines, the potential capital cost to a business is estimated to be $16,750.

If a business owns a prime engine, that doesn't already meet the ATCM requirements, then retrofit with a DPF or DOC would be necessary. According to our survey, the average prime engine owned by a small business is approximately the same horsepower rating (540 hp) as a prime engine owned by a typical business (560 hp). Because this average is fairly close to the average horsepower of a prime engine owned by a small business, we used the overall average horsepower of 590 to simplify our cost analyses. This results in a conservative cost estimate. Therefore, the average capital cost to retrofit a prime engine ($19,200) is approximately the same for a typical business owning a prime engine or a small business owning a prime engine. Since a typical business owning a prime engine owns 3 of them and a small business owning prime engines has 1.75, the cost ranges from $57,600 to $33,600.

The annual ongoing costs are based on a reporting cost of $100 per engine per year and an estimated per-engine annualized cleaning cost of $1.33/hp engine size every 1,500 hours. This results in annual ongoing costs averaging $100 for emergency standby and $650 for prime per engine per year. Because the average business owns 2.5 emergency standby engines or 3 prime engines, the estimated recurring costs are $250 to $1,950 for businesses that own an emergency standby or prime stationary diesel engine(s).

Estimated Small Business Impacts

The cost to a typical small business is derived from the average size and number of engines owned. Most small businesses in California do not own any diesel-fueled stationary engines. Based on the ARB Survey, for those small businesses that do have stationary diesel-fueled engines, the average small business owns 1.5 emergency standby engines with an average horsepower of 500, and 1.75 prime engines, with an average horsepower of 540. The overall average horsepower for all prime engines reported in the ARB Survey was 590 bhp. Because this average is fairly close to the average horsepower of a prime engine owned by a small business, we used the overall average horsepower of 590 to simplify our cost analyses. Therefore, the average capital cost to retrofit a prime engine ($19,200) is approximately the same for a typical business owning a prime engine or a small business owning a prime engine. This results in a conservative cost estimate.

As with all businesses, most small businesses that own emergency standby diesel-fueled CI engines will not need to install DECS. However, the ARB Survey revealed that small businesses have a higher percentage of older and dirtier engines that may require a control device such as a DOC. Even though a small business emergency standby engine is slightly smaller than a typical business emergency standby engine, the increased age and emission rate may require a slightly more expensive DOC. Staff assumed that the average capital cost to retrofit an emergency standby engine is approximately the same for a typical business owning an emergency standby engine or a small business owning an emergency standby engine. This results in a conservative cost estimate. The costs to a small business with a typical size emergency standby engine could range from $150 to $10,200. The lower end of the range given for "emergency standby" reflects the small businesses with engines not requiring installation of DECS (no equipment cost, only reporting cost). The upper end of the range reflects capital and associated recurring costs for small businesses needing to retrofit 1.5 engines at a cost of $10,200 (average capital cost of $6,700 per engine plus $100 for reporting).

Any prime engine operated by a small business ,that doesn't already meet the ATCM requirements, would require installation of a DECS. Capital costs would range from $11,000 to $147,000. The average small business with a prime engine is expected to have initial costs of about $33,600 based on the average size and number of prime engines owned.

The annual ongoing costs are based on a reporting cost of $100 per engine per year and an estimated annualized DPF cleaning cost of $1.33 per horsepower engine size conducted every 1,500 hours. This results in reporting and cleaning costs averaging $100 for emergency standby engines and $650 for prime engines per engine per year. Because the average small business owns 1.5 emergency standby engines or 1.75 prime engines, the estimated costs range from $150 to $1,134 for small businesses that own an engine or engines. Table I-9 lists the costs identified in sections VII and VIII.

Table I-9: Estimated Typical and Small Business Retrofit Costs

Stationary Engine Category		Typical # of engines	Average Size	Recurring Costs	Capital Costs per Engine	Total Recurring Costs	Total Capital Costs
Typical Business	E/S	2.5	700	$ 100	$ 6,700	$ 250	$ 16,750
	Prime	3	590	$ 650	$ 30,100	$ 1,950	$ 90,300
Small Business	E/S	1.5	500	$ 100	$ 6,700	$ 150	$ 10,050
	Prime	1.75	590	$ 650	$ 30,100	$ 1,138	$ 52,675

Documents submitted by Danna Dal Porto with written comments

Danna Dal Porto submitted the following 126 pages as her written comments.

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Please submit these photos for public comment for Vantage data center. Photographic evidence of air pollution from data center construction in Quincy, WA

TAKEN from Rd 3NW Quincy MAY 2012 - NOT A FIRE
Data centers need emission controls to protect the public.

Photo taken in Quincy (Microsoft) Oct 11, 2012

Submitted by Danna DeCorto, 16651 Rd 3NW, Quincy, WA

January 10, 2013

Dear Greg,

This is my comment on the Vantage air quality permit, January 11, 2013.

This document is disjointed and the organization of materials was complicated by the volume of material and the diversity of issues. I have numbered pages within the individual files but that was the best I could accomplish.

I criticized the public notification process but I do feel badly about that as Beth Mort is new to this position and in a learning process. That said, I do think it was disorganized and I am compelled to say that as the "process" needs to be clear and fluid.

I know that the repeated criticism is irritating to the hard working members of the Ecology staff. However, I am compelled to continue my close reading of permit documents because I want these major, huge diesel-emitting industries to have controls on the diesel engines. These data center developers can afford to protect this community, any community, from the unsafe operation of their industries.

Thank you for considering these documents.

Danna Dal Porto
Quincy

Danna

VANTAGE PUBLIC COMMENTS...FILE #1of 5.....Dal Porto

January 10, 2013

This document is from Danna Dal Porto, Quincy resident, to be submitted for the extended Public Comment Period for the Vantage-Quincy Data Center. I will list my concerns and then expand on them using various documents to illustrate the details of my concern.

One focus of my comments is I believe public notification was awkward and somewhat disorganized. I believe the statutes require a more direct public out-reach for the air permitting process.

A second focus of my concern is the complexity of the documents on file in the Quincy City Hall. I needed a second Public Hearing to answer several questions. I could have avoided much of this paperwork if I knew the answers to just a few questions.

1. Public Notice.
    A. Ecology continues to advertise the Public Notice in the Moses Lake Columbia Basin Herald and not the Quincy newspaper, the Quincy Valley Post Register. I am requesting public notice in the Quincy Valley Post Register. Not only is the Official Public Notice in the wrong paper, for this Hearing so many changes were made I would have missed the meeting if I were not watching very carefully.
    B. No Public Hearing notices were posted in Spanish in the newspaper of record or the local newspaper. I am requesting Spanish outreach in Quincy newspaper.
    C. Ecology held the September 6, 2012 meeting without having the permit materials complete. I believe Ecology was not in compliance with WAC 173-400-171 (4) when the meeting was scheduled. (Exhibit 17)

    Specific comment for the public comment period: I want Ecology to print Public Notices in the Quincy newspaper. I want Ecology to present public notices in Spanish.

2. BACT determination appears to be the focus of the documents on file for public comment. Careful reading of these documents leaves serious questions about the final determination of emission controls on the Vantage facility.

    This is a specific question for the public comment period: Is Vantage using emission controls or are they constructing without controls? I want Ecology

to show me, using the documents on file, how I could know the final status of the emission controls.

3. Documents on file illustrate the corporate intent of Vantage to install environmental controls at all of its corporate-wide facilities. (Exhibit 13) The Vantage State Environmental Policy Act (SEPA) checklist submitted to the City of Quincy in August 2011 committed that every diesel generator installed at the (Quincy) facility would comply with EPA Tier-4 emission standards. (Exhibit 14) In the successive public documents, Vantage proposes emissions controls on their engines in their submissions and the subsequent Ecology documents remove those controls. After all the requests for emission controls, (Exhibit 25), December Amendment to May, 2012 TSD, page 1, bullet 1, Ecology writes "Vantage has insisted that Tier 2 engines (no add-on control) are the highest level of control Ecology can require as BACT."

   I do not find any evidence of Vantage insisting on Tier 2 engines as BACT. On the contrary, I find that Vantage, from the beginning, has insisted on constructing a safe and environmentally safe facility. Vantage has requested, strongly, extended operational hours be added for storm avoidance operation, citing adverse weather in Quincy as the reason for this request. (Exhibit 13) Document after document from Vantage has listed emission controls on the operation of their data center. They request controls and the reply from Ecology is to drop the controls. The latest document on file in the Quincy City Hall is a December Amendment to the May 2012 TSD. Ecology has dropped Vantage controls, again, and that is the end of materials for public review. The public needs to know why these dynamics are happening.

   This is a specific question for the public comment period: Why is Ecology insisting on a lower level of emission control than proposed by Vantage?

   This is a specific question for the public comment period: I want Ecology to demonstrate (in detail) how Tier 2 engines alone can constitute BACT and control emissions to satisfy State and EPA standards.

   This is a specific question for the public comment period: Exhibit 13 is a letter from Vantage to Karen Wood (ECY). On page 2 is Table 1; Comparison of DEEP Emission from Quincy Data Centers. The list of Quincy Data Centers does not include the DEEP emissions from Intuit. I know this Table 1 is from Vantage but I want Ecology to provide me the Intuit DEEP emission numbers in the same format as Table 1 in this letter. This data is public knowledge but I do not where to find it myself.

4. ICF documents cite the reason the emission controls will be dropped is because of the low Ecology cost estimates for instillation. If I read this properly, Ecology has a cost-effectiveness price per ton of $10,000 for NOX, $23.200 for TOTAL PM, $5,000 for CO and $10,000 for VOC. If I added

properly, the Department of Ecology has a per ton base cost of $48,200 allowed for emission reduction. How long has Ecology operated with these low numbers? These data centers cost bazillions to build and operate. For Ecology to have such a low limit on "acceptable cost" for emission controls is unreasonable. I would have to spend that much money to have my household fireplace remodeled. I believe Ecology has established very low cost-effective standards that would exclude any controls.

A. Cost estimates for Vantage (Exhibit 31, page 2) (Exhibit 14)
B. Hanford calculations (Exhibit 32)

Specific question for the public comment period: I want Ecology to explain these low BACT cost-effectiveness Evaluations. How long has Ecology had this low cost-effectiveness price range? The Hanford document illustrates a method to determine cost for controls. Did Ecology apply this Hanford method to determine cost of controls? How did Ecology arrive at the current cost-effectiveness values?

All of the documents from both Ecology and Vantage cite pages of numbers regarding emissions and controls. After all the back-and-forth, it is totally unclear if these numbers are with or without emission controls. Ecology needs to clarify the status of the documents to allow the public to determine the safety of the proposed permit. Most of these questions could have been answered in a second public hearing but those requests have been denied. This method of writing-out all questions makes for much labor for me and for Ecology.

5. Maneuvering was made by Ecology to "decouple" Vantage emission controls from the BACT recommendations for this facility. (Exhibit 15)

Specific question for the public comment period: I want to know why Ecology "decoupled" Vantage controls from BACT. (Exhibit 15, page 14) To attain BACT and legal emission limits for Vantage are the Tier 4 controls necessary?

BACT is the level of controls necessary to meet safety standards. To decouple the emission controls and just leave Tier 2 engines does not meet the safety level for the permit. I believe Tier 4 emission controls determine BACT for the Vantage facility because the levels of DEEP and NO2 (and perhaps other TAPS) is very high. Is this correct? If this is correct, why are Vantage Tier 4 emission controls being dropped as a function of the permit?

6. Ecology documents write that Vantage exceeds emission limits with diesel particulate and NO2.

Diesel.....

June 20, 2012 Ecology (Exhibit 27, page 4, 2.2.2) "The HIA focused mainly on health risks attributable to Deep exposure as this was the only TAP with a Modeled Concentration in ambient air that exceeded the ASIL."

November 2012, Ecology (Exhibit 24, page 5 (4)) November 2012, Ecology " The modeled ambient concentration of one toxic air pollutant-diesel engine exhaust particulate matter-exceeds the Acceptable Source Impact Level (ASIL) for that pollutant...."

NO2.....

June 20, 2012 Ecology (Exhibit 27) Discussion of the "level of concern" for NO2 which Ecology found that "the likelihood of occurrence is relatively low throughout Quincy." If Vantage uses EPA Tier 4 emission controls, the highest 1 hour NOx emission rate from Vantage is much lower than any of the other 5 existing data centers. Concern expressed over the any possible additional data center development.

August 29, 2012 Wilder (ICF) email to Flibbert (ECY) and others. (Exhibit 16) "As we discussed yesterday, we recently discovered that Vantage cannot meet the primary NO2 emission limit at 10% load, that is currently listed on Table 5.4 of the Draft." The email continues to discuss technical details of the operational loads and the emission rates.

August 30, 2012 Wilder (ICF) to Flibbert (ECY) and others. (Exhibit 17) Subject of the email is "Wilder educated guess about Vantage PD numerical values 8-30-2012.pdf The content is a discussion of the options for manipulating the loads, the load on engines and alteration of the allowable runtime for generator idling. Quoting the document: We cannot complete the revised AERMOD modeling before the hearing. SO GIVEN THESE EDUCATED GUESSES ON THE TRENDS, SHOULD WE HOLD THE PUBLIC HEARING ON SEPT 6? (Emphasis in email)

November 30, 2012 Ecology (Exhibit 23) Emission during a system-wide (electrical) outage could potentially cause NO2 levels to be a health concern. Again, Ecology found the likelihood of (outage) occurrence relatively low throughout Quincy.

November 30, 2012 Letter from Jeff Johnson (ECY) to Karen Wood (ECY) (Exhibit 26) This letter declares that Ecology has completed their review of the health risks from diesel exhaust particulate emissions from the proposed Vantage Data Center. The increased cancer risk is up to 9 in one million at the maximally impacted residential location. The letter continues to discuss cancer risk and Ecology declares the project acceptable. The cumulative impacts of DEEP are discussed under the community-wide approach. Ecology recommends approval of the proposed project because the related

health risks are permissible under WAC 173-460-090. Ecology recommends that Vantage be required to communicate health risks to current residents and potential new homeowners at adjacent properties.

HIA provided results of cumulative emissions of multiple emergency engines at other data centers that could combine to create short-term NO2 levels of concern. Ecology's evaluation of simultaneous emergency engine emissions in Quincy indicate that elevated NO2 levels could occur, but the likelihood of a system-wide outage coinciding with unfavorable meteorology is very low.

Mr. Johnson declares: "This project has satisfied all requirements of a second tier analysis. Ecology recommends that you incorporate our findings as part of your ambient air impacts and you may begin the public comment period when you are ready to do so."

The documents cited in the discussion of the diesel and NO2/NOx do not clearly indicate if these emission decisions were made with or without the Tier 4 emission controls. My reading of these materials concludes that Ecology is proposing to approve the Vantage operational permit knowing level of toxins are not exactly right, not exactly legal or, most importantly, safe. If Ecology is supposed to make their determination on the worst –case-scenario, I would say this did not happen.

Specific questions for the public comment period: Are the levels of diesel particulate and NO2/NOx reported in the November Ecology documents reported with or without controls? Is Ecology recommending the permit knowing the toxics levels are marginally safe? Would the Vantage facility be safer to the public with the Tier 4 levels they initially proposed to install? Why is Ecology pushing Vantage to drop their emission controls?

7. Ecology continues to use the weather from Moses Lake, WA and Spokane, WA to represent weather in Quincy. (Exhibit 25, page 9) There are closer weather stations that would represent local weather more accurately. We have frequent inversions that impact the operation and safety of these 158 diesel generators.

   Specific comment for the pubic comment period: I am requesting more accurate **local weather** forecasts for air quality permit purposes.

8. Ecology has prepared visual aids (maps) in the past to represent the plumes of air emissions from facilities. (Exhibit 28, Exhibit 29, Exhibit 30)

   Specific comment for the public comment period: I am requesting a current map (similar to the examples I provided in this document) to represent cumulative air quality from all sources over the Quincy City limits as well as the Quincy UGA.

9. Ecology has been working on air quality in Quincy since the construction of the Microsoft expansion in 2010. One constant factor in the permitting of facilities is the air quality, including background. Enough questions have been raised about ACTUAL air quality that Ecology must install at least two year-round air quality monitors in Quincy. One is to be located at Mountain View Elementary school and the other at the Lazy Acres low-income housing site on the east end of town. The residents of Quincy deserve actual information on air quality. This summer the Forest Service installed a temporary monitor on the roof of the medical clinic because of an inversion and the smoke from the forest fires. Air quality needs to be monitored daily, not just in an emergency. A five-month +/- air monitoring survey was done in early 2012. The December 17, 2011 to January 6, 2012 a monitor was at Mountain View School. The monitor was moved to the Quincy well site and collected data from January to sometime in May. These emission numbers do not appear to be validated and were never reported to the EPA. This short study has no validity and should not be reported as an accurate example of Quincy air quality.

   Comment for the pubic comment period: I am requesting permanent air monitoring equipment be installed at Mountain View School and at Lazy Acres, east of town, to provide accurate information on 24/7 air quality levels. I want the emission records be kept on file with Ecology, validated, reported to the EPA and available to the public in a format that can be reviewed.

VANTAGE PUBLIC COMMENT ...FILE # 2 of 5.....Dal Porto

January 9, 2013

Public Comment for Vantage Data Center Air Quality Permit

Danna Dal Porto
16651 Road 3 NW
Quincy. WA 98848

This is one section of my Public Comments for the extended comment period from the September 6, 2012 pubic meeting. The first section outlined my comments and this section is a detailed set of statements with numbered exhibits. (Exhibit 1)

My first comments concern Public Notice. The first Public Notice I saw was in the Columbia Basin Herald, the newspaper in Moses Lake, WA, (Exhibit 2). The June 27, 2012 notice was followed by a Withdrawal Notice, July 16, 2012. (Exhibit 3). Beth Mort of Ecology sent me a message regarding this Withdrawal Notice. (Exhibit 4) I have a letter from Greg Flibbert (ECY) that shows the scheduling of a July 31, public hearing. (Exhibit 4A)

July 30, 2012 (Exhibit 5) is another Legal Notice in the Moses Lake newspaper calling for the Public Meeting September 6, 2012 in Quincy. At the Public Hearing, the audience was informed that Vantage was adjusting their documents and that the application materials were not complete. Members of the public were encouraged to continue their written comments until such a time as the documents were complete and the comment period closed. WAC 173-400-171 (4) is the part of the statute that refers to the publication of notices only after all the information required by the permitting authority has been submitted and after the applicable preliminary determination, if any have been made. I believe that this September 6, 2012, Hearing was not done within the letter of the law. I have made several requests for another Public Hearing but those requests have been denied.

On December 10, 2012 (Exhibit 6) another Legal Notice was placed in the Moses Lake newspaper. This Notice closes the public comment period because Vantage and Ecology have made their changes to the documents. The public can read the documents on-line or view them at the Quincy City Hall or the Spokane Ecology Office. No opportunity was made available to ask clarifying questions. All questions had to be done on-line or over the phone. I had problems determining the end date for comments as the notice said "thirty days after this notice has been published in the Columbia Basin Herald." Counting the days was interesting so I emailed for clarification. (Exhibit 7)

Advertisements were placed in the Quincy Newspaper December 13, 2012 (Exhibits 8A-8B) One article writes that "Vantage Data Center will use the most current and effective air pollution control equipment for controlling both particulate matter and

nitrogen dioxide." The community has been told from the very beginning of the Vantage project that "state-of-the-art" controls would be part of construction. After I have read the project materials, I am not sure that is true any more.

January 3, 2013, (Exhibit 9, Exhibit 10) Email and Newspaper clarifications were sent to verify the public comment period concludes at midnight, January 11, 2013.

Two email requests were made requesting a second public hearing. (Exhibit 9, Exhibit 11) No response has been received regarding the meeting requests.

The problems encountered with this Ecology compliance with WAC 173-400-171 are numerous. The Moses Lake newspaper, the Columbia Basin Herald, might be the county paper of record but, as I have testified before, this is not the primary newspaper read by the citizens of Quincy. If Ecology wanted to do a public outreach about this permit, Ecology would print notices in the local paper.

Spanish language outreach was not published or posted in Quincy, to my knowledge. Because 74% of this community is Hispanic, not posting Spanish language notices it to ignore the best percentage of residents.

The public was invited to a Public Hearing even though Ecology and Vantage knew the materials were incomplete. This is a violation of the spirit of the law regarding public involvement. After the documents were finalized Ecology could have instituted a second public hearing but chose not to exercise that option. I have really worked hard to understand these documents. In all honesty, I cannot tell which emission numbers are being posted with or without emission controls. I believe almost all of my confusion could have been cleared up by having an opportunity to ask questions in a public forum.

I read and divided the documents for the September 6, 2012, Public Hearing into piles. (Exhibit 12) Nineteen (19) documents were on file with the City of Quincy related to the Air Quality permit for Vantage. Eleven (11) of these documents list BACT as specific emission controls added onto the engines. Three (3) items list BACT as Tier 2 engines with no add-on specific emission control devices. One of my confusions is the two documents that are titled the same, TSD May 2012, but have different dates. (Item #8 and Item #9 in the list of exhibits) This is an important document in that this is the final document in the Vantage permit exhibits "December Amendment to May 2012, TSD" (Exhibit 25) and is referenced by Ecology as the TSD for the project. (Exhibit 9) Which copy of the May 2012 document was used for the Amendment?

VANTAGE PUBLIC COMMENT.....FILE # 3 of 5.....Dal Porto

Exhibit 1.....Public Notices for Vantage Public Hearing Regarding Air Quality Permit

These are the various notifications from Ecology for the Public Hearing on Air Quality permit actions for Vantage Data Center.

WAC 173-400-171 is the source of the specific requirements for notifying the public about air quality permits

Exhibit 2.....June 27, 2012 Legal Notice in the Moses Lake Columbia Basin Herald, Moses Lake, WA. Ecology has received the Vantage Data Center Application to construct a new air pollution source. Public Hearing set for July 31, 2012 at the Quincy City Hall. Meeting to start at 5:15 with public comments taken at 6:30 pm.

Exhibit 3.....July 16, 2012 Legal Notice in the Moses Lake Columbia Basin Herald, Moses Lake, WA. **WITHDRAWAL NOTICE** is the headline over the same notice of the July 31, 2012 meeting. An email inquiry was sent to Beth Mort at Ecology and her reasons for the withdrawal of the notice is a miscommunication with the newspaper and the paper was to blame for publishing without permission. She writes: "Ecology then received from Vantage additional information on BACT. (sic) This new information needed to be reviewed, assessed and approved by Ecology, and then submitted to the public for review." Beth Mort cites WAC 173-400-171 (7)(a) and that is the statute that refers to the thirty-day public comment period. WAC 173-400-171 (4) is the part of the statute that refers to the publication of notices only after all the information required by the permitting authority has been submitted and after the applicable preliminary determinations, if any have been made.

Exhibit 4.....July 20, 2012 Email correspondence from Danna Dal Porto, Quincy, to Beth Mort (ECY) questioning the Withdrawal Notice of the Vantage Public Hearing.

Exhibit 4 A.....June 22, 2012 Letter from Gregory Flibbert (ECY) to Jeff Kane (Vantage) Enclosures: NOC Preliminary Determination, TSD and Public Notice for July 31, 2012, Public Hearing in Quincy

Exhibit 5.....July 30, 2012 Legal Notice in the Moses Lake Columbia Basin Herald, Moses Lake, WA. Ecology has received application to construct a new air pollution source. Public Meeting to convene September 6, 2012, in the Quincy City Hall. Comments accepted July 30 through September 10, 2012. During this meeting the representatives from Ecology and Vantage declared that the documents presented to the public were not complete. There will be new materials to consider beyond the materials that have been on file for the

public at the Quincy City Hall. Members of the public were invited to comment but the permit materials are going to be adjusted.

Exhibit 6.....December 10, 2012 Legal Notice in the Moses Lake Columbia Basin Herald, Moses Lake, WA. Ecology has received application to construct a new air pollution source. According to the Public Notice, Vantage made changes to their NOC application on October 19, 2012 and November 28, 2012. Although there are new numbers and information regarding this permit, the public was denied our request for a public hearing to ask questions and to compare information with representatives of Ecology and Vantage. The public comments will be taken up thirty days from this notice. (If day one is December 10, counting thirty days is January 8, 2013. If day one in counting is December 11, counting thirty days is January 9, 2013. This Legal Notice did not state a specific time and day for the end of the second comment period.

Exhibit 7.....December 11, 2012 Email messages were sent out from Beth Mort, Community Outreach and Environmental Education, Air Quality Program, Ecology Eastern Office. These email messages announced the new, second public comment period on the draft air quality permit for Vantage Data Centers. Ms. Mort's message states the comment period is open "through midnight January 11, 2013". That January 11, 2013 date is not the same as the "thirty day comment period" on the Official Public Notice in the newspaper.

Exhibit 8 A.....December 13, 2012 The Department of Ecology (Beth Mort) placed an advertisement in the Quincy Valley Post Register regarding the Vantage Data Center proposed permit. This advertisement lists comments accepted until midnight January 11, 2013, QVPR, 12/13/12, Page A5.

Exhibit 8 B.....December 13, 2012 An additional small article was placed in the same newspaper announcing the extended comment period for the Vantage Air Quality permit with the due date of January 11, 2013. This article in the newspaper states: "The Vantage Data Center will use the most current and effective air pollution control equipment for controlling both particulate matter and nitrogen dioxide." QVPR, 12/13/12, page A2.

The Quincy and Moses Lake newspapers did not print any meeting notices for the Vantage comment period or public hearings in Spanish. Members of the community have repeatedly requested Spanish language outreach on the basis of the 74% of the Quincy community that is Hispanic.

Exhibit 9.....January 3, 2013 Email clarification of the date for the conclusion of the Vantage Public Comment Period. Email provides answers to clarify some of the Vantage and Ecology documents for the pubic comment.

Exhibit 10..... January 3, 2013 Newspaper article in the Quincy Valley Post Register posting the public comment period as January 11, 2013.

Exhibit 11.....January 3, 2013 Email request for a specific Ecology document plus a request for a second public hearing. Note: a previous request was made for a second public hearing in Exhibit 9, January 2, 2013 email to Ecology.

www.columbiabasinherald.com

LEGAL NOTICES Your right to know

6/27

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE, ANNOUNCEMENT OF PUBLIC HEARING, & SECOND TIER PETITION APPROVAL RECOMMENDATION

The State of Washington Department of Ecology (Ecology) has received application to construct a new air pollution source. Vantage Data Centers Management Company, LLC, 2625 Walsh Avenue, Santa Clara, CA 95051, has proposed to build Vantage Data Centers located at the northwest corner of the intersection of Road 11 NW and Road O NW, Quincy in Grant County. The mailing address for the Vantage Data Centers in Quincy is 2101 M Street, Quincy, WA 98848. Vantage Data Centers will contain four main data center buildings once it is fully constructed, and will install and operate up to 17 diesel engines that will power 3.0 megawatt electrical generators for a total of 51 megawatts of emergency backup electrical power. Diesel engines generate criteria and toxic air contaminants which have been evaluated. Diesel engine exhaust particulate (DEEP) emissions were reviewed under a Second Tier Health Impact Assessment to evaluate health risks posed by the project. After review of the completed Notice of Construction application and other information on file with the agency, Ecology has decided that this project proposal will conform to all requirements as specified in Chapter 173-400 WAC. After review of the Second Tier Health Impact Assessment, Ecology concluded that impacts to the community due to the Vantage Data Centers will meet the protective requirements contained in Chapter 173-460 WAC. Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, and supporting application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848. A public hearing has been scheduled to start at 5:15 PM on July 31, 2012 in the upstairs meeting room at the Quincy City Hall located at 104 B Street SW in Quincy. The public hearing will include presentations followed by a question and answer session starting at 5:30 PM. Public comment will be taken starting promptly at 6:30 PM. In addition to public comments taken at the public hearing, the public is invited to comment on this project proposal by submitting written comments no later than August 6, 2012 to Beth Mort (509 329-3502) at the above Spokane address or at beth.mort@ecy.wa.gov.

#06074/2453469
Pub.: June 27, 2012

LEGAL NOTICE

Moses Lake Irrigation and Rehabilitation District, Department of Natural Resources, Grant County Noxious Weed Board, Washington State Parks, Department of Ecology, Washington State Department of Transportation, and Washington State Department of Fish & Wildlife, are working together to control riparian noxious weeds in the Moses Lake/Grand Coulee waterway areas. Noxious weeds are required to be controlled by state law. Public access areas will be posted prior to treatment.

This is an opportunity for landowners to allow the control of noxious weeds on their properties at no cost through grant funding. Pu[illegible] Iris and Phragmites will be treated on identified properties as fund[illegible] weeds can be easily identified at www.nwcb.wa.gov.

Exhibit 2

For more information regarding these projects go to www.lakelandrs.com, click on projects, click

7/16

WITHDRAWAL NOTICE

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,

ANNOUNCEMENT OF PUBLIC HEARING,

& SECOND TIER PETITION APPROVAL RECOMMENDATION

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THIS NOTICE HAS BEEN WITHDRAWN

#07040/2488145
Pub.: July 16, 2012

Notice of Application
Date of Notice: July 16, 2012

Notice is hereby given that a Preliminary Short Subdivision application received by Grant County on July 2, 2012 from Ri[illegible]d Contact: Gilbert C. Bailey, Columbia NW Engineering, 249 No[illegible] WA 98837, 509-766-1226), was found to be technically complete [illegible]ECT: A Short Subdivision of approximately 141.5 acres in ord[illegible]rom one existing parcel in the Agriculture zoning district of Grant County. As proposed, Lot [illegible] will be approximately 2.32 acres in size, with no current development on the site. Lot 2 will be approximately 2.50 acres in size, with an existing manufactured home, garage, storage building and [illegible]

Exhibit 3

"Mort, Beth (ECY)" <BMOR461@ECY.WA.GOV>
Vantage permit withdrawal
July 20, 2012 8:33:11 AM PDT
"ddalporto@smwireless.net" <ddalporto@smwireless.net>
"Flibbert, Gregory S. (ECY)" <GFLI461@ECY.WA.GOV>

Dear Danna,

Thank you for connecting with us about the withdrawal notice for the Vantage Data Centers public hearing. I hope I can clarify why the withdrawal occurred.

Ecology is responsible for submitting a public notice for the Vantage permit which announces a public hearing date. We had a miscommunication with the Columbia Basin Herald newspaper and they accidentally ran the notice on June 27, 2012, before we had given the okay. Ecology then received from Vantage additional information on BACT (Best Available Control Technology). This new information needed to be reviewed, assessed and approved by Ecology, and then submitted for public record.

Our requirements under the Washington Administrative Code (WAC) - specifically WAC 173.400.171(4) - state: *"The public notice can be published only after all of the information required by the permitting authority has been submitted and after the applicable preliminary determinations, if any, have been made."* It is necessary to provide the thirty day required comment period, WAC 173.400.171(7)(a), for the entirety of documentation submitted to the public for review.

In order to provide the adequate time for public review of all documents associated with Vantage's permit, I recommended that we withdraw our public notice and reschedule the comment period including the public hearing. Ecology has begun the rescheduling process.

I hope that this addresses your questions Danna. Please do not hesitate to contact me if you have further questions or need additional clarification. We appreciate your time and concern for your community on this issue.

Sincerely,

[redacted]

-----Original Message-----
From: Danna Dal Porto [mailto:ddalporto@smwireless.net]
Sent: Wednesday, July 18, 2012 3:19 PM
To: Flibbert, Gregory S. (ECY)
Subject: Vantage permit withdrawal

Greg,

The Columbia Basin Herald newspaper of July 16, 2012, featured a Notice of Withdrawal for the Vantage Data Center. I am asking for the background information and reasons that caused this public notice and the next steps that Vantage will pursue for this facility. This was certainly a surprise because the construction of this facility has been motoring along. Are they going to submit a different document to support their application for an air quality permit?

I appreciate the information that you can share with me.

Danna Dal Porto
16651 Road 3 NW

Exhibit 4

June 22, 2012

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

June 22, 2012

Jeff Kane, Vice President
Vantage Data Centers Management Company, LLC
2625 Walsh Avenue
Santa Clara, CA 95051

Re: Vantage Data Centers Preliminary Determination

Dear Mr. Kane:

The Ecology Air Quality Program (AQP) has processed the Notice of Construction (NOC) application submitted on January 30, 2012, by Vantage Data Centers Management Company, LLC (Vantage) for the Vantage Data Centers in Quincy. Enclosed are the preliminary determination (PD) and the NOC technical support document (TSD). The Second Tier Review Summary and Second Tier Recommendation letter for your project were sent to you from our Lacey Office. Please review the PD carefully, and submit comments before the end of the 30-day public notification period. Ecology reserves the right to make editorial changes and revisions to the PD prior to final issuance. Vantage will be notified of any substantive changes to the preliminary determination after the public comment period closes. A second public review will be necessary if substantive changes trigger additional public notice.

Washington Administrative Code (WAC) 173-400-171 requires public notification prior to approval of any NOC permit for a new source of air contaminants. You are requested to publish the enclosed public notice in the Columbia Basin Herald. The public notice should be published by June 26, 2012, but no later than June 30, 2012. Ecology requires a one-time placement of the public notice in the legal classified advertisements. Upon publication, return the **original** Affidavit of Publication to Ecology. A permit cannot be issued until the original Affidavit of Publication has been received by our office.

A public hearing has been scheduled for July 31, 2012 at Quincy City Hall. The public notice contains additional information on the public hearing. A representative from Vantage will be required to give a 10 minute presentation describing the project during the public hearing. The public comment period will close on August 6, 2012. At that time, all public comments submitted in writing or provided at the public hearing will be reviewed and responded to by Ecology. After all comments have been addressed, Ecology can make the final decision on issuing approval for the Vantage Data Centers project.

Exhibit 4 A

COPY

As specified under WAC 173-455-120(2)(b), and as stated in the May 29, 2012 message to Jennifer Fraser through Jim Wilder, review of the Notice of Construction application for the project is subject to additional fees. The Ecology Cashiering Office will issue a final invoice to Vantage as soon as all work is complete. Payment for the invoice must be received prior to final permit issuance.

Thank you for working so diligently with Ecology during the review of the NOC application and the Second Tier Risk Assessment. Your patience, as well as your availability for discussion, is also appreciated. If you have any questions, please contact me at (509) 329-3452.

Sincerely;

Gregory S. Flibbert, Unit Manager
Ecology Air Quality Program

GSF:lc

Enclosures:
NOC Preliminary Determination
NOC Technical Support Document (TSD)
Public notice

cc: Jim Wilder, ICF International, 710 2nd Avenue, Suite 550, Seattle, WA 98104 w/enclosure,
Penalty Desk

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY
NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,
ANNOUNCEMENT OF PUBLIC HEARING,
& SECOND TIER PETITION APPROVAL RECOMMENDATION

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Pub.: July 30 & August 20, 2012

1/30

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,

ANNOUNCEMENT OF PUBLIC HEARING,

& SECOND TIER PETITION APPROVAL RECOMMENDATION

Comments accepted July 30 through September 10, 2012

The State of Washington Department of Ecology (Ecology) has received application to construct a new air pollution source. Vantage Data Centers Management Company, LLC, 2625 Walsh Avenue, Santa Clara, CA 95051, has proposed to build Vantage Data Centers located at the northwest corner of the intersection of Road 11 NW and Road O NW, Quincy in Grant County. The mailing address for the Vantage Data Centers in Quincy is 2101 M Street, Quincy, WA 98848.

Vantage Data Centers will contain four main data center buildings once it is fully constructed, and will install and operate up to 17 diesel engines that will power 3.0 megawatt electrical generators for a total of 51 megawatts of emergency backup electrical power. Diesel engines generate criteria and toxic air contaminants which have been evaluated. Diesel engine exhaust particulate (DEEP) emissions were reviewed under a Second Tier Health Impact Assessment to evaluate health risks posed by the project. After review of the completed Notice of Construction application and other information on file with the agency, Ecology has decided that this project proposal will conform to all requirements as specified in Chapter 173-400 WAC. After review of the Second Tier Health Impact Assessment, Ecology concluded that impacts to the community due to the Vantage Data Centers will meet the protective requirements contained in Chapter 173-460 WAC.

Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, and supporting application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848.

The public is invited to attend a public hearing that has been scheduled to start at 5:15 PM on September 6, 2012 in the upstairs meeting room at the Quincy City Hall located at 104 B Street SW in Quincy. The public hearing will include presentations followed by a question and answer session starting at 5:30 PM. Public comment will be taken starting promptly at 6:30 PM. In addition to public comments taken at the public hearing, the public is invited to comment on this project proposal prior to the public hearing. **Comments accepted July 30 through September 10, 2012.** Submit comments to Beth Mort at Ecology's Spokane Office, 4601 N. Monroe, Spokane, WA 99205-1295, or email beth.mort@ecy.wa.gov, or 509 329-3502.

This notice supersedes the notice published on June 27, 2012.

#07052/2510401
Pub.: July 30, 2012

City of Moses Lake
Notice of Application and Public Hearing

Benny's Tires, submitted an application for a Site Plan Review on July 20, 2012. The application was determined to be complete and ready for review on July 27, 2012. The proposal is a 2,400 square foot tire store and service bay, in the C-2, General Business & Commercial Zone. The site is located at 611 Penn Street legally described as Lot 3, of the Commercial Plat. The project has been determined to be consistent with the City's Comprehensive Plan, and the following development regulations are applicable to the project: Moses Lake Municipal Code (MLMC) Title 16: Buildings and Construction, Title 18: Zoning, and Title 20: Development Review Process.

The Planning Commission will conduct a public hearing on August 30, 2012 at 7:00 p.m. in the Civic Center located at 401S. Balsam Street. All interested persons are encouraged to attend and provide comment.

Written comments on this proposal will be accepted until 5:00 p.m. on the date of the public hearing. Persons who want to be informed of future actions, or the final decision, on this proposal should provide their name and address to the project planner. The final decision on this proposal will be made within 120 days of the date of the notice of completeness and may be appealed according to the City appeal provisions specified in MLMC 20.11, Appeals. For more information call Billie Jo Muñoz at 764-3751 or bmunoz@cityofml.com. Submit written comments by mail to City of Moses Lake Community Development Department, P.O. Box 1579, Moses Lake, WA 98837. Copies of the information related to this application are available for review at City Hall, 321 S. Balsam, Moses Lake.

Date of Notice: July 27, 2012

Exhibit 5

#07056/2514302
Pub.: July 30, 2012

written notice in accordance with RCW 61.24.040. The trustee's rules of auction may be accessed at www.northwesttrustee.com and are incorporated by this reference. You may also access sale status at www.northwesttrustee.com and www.USA-Foreclosure.com. EFFECTIVE: 9/4/2012 Northwest Trustee Services, Inc., Trustee Authorized Signature P.O. BOX 997 Bellevue, WA 98009-0997 Contact: Kathy Taggart (425) 586-1900. (TS# 7886.24701) 1002.224191-File No.

12/10

#12020/2774965
Pub.: December 10 & 31, 2012

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

NOTICE TO CONSTRUCT A NEW AIR POLLUTION SOURCE,

& SECOND TIER PETITION APPROVAL RECOMMENDATION

The State of Washington Department of Ecology (Ecology) has received application to construct a new air pollution source. Vantage Data Centers Management Company, LLC, 2625 Walsh Avenue, Santa Clara, CA 95051, has proposed to build Vantage Data Centers located at the northwest corner of the intersection of Road 11 NW and Road O NW, Quincy in Grant County. The mailing address for the Vantage Data Centers in Quincy will be 2101 M Street, Quincy, WA 98848.

Vantage Data Centers will contain four main data center buildings once it is fully constructed, and will install and operate up to 17 diesel engines that will power 3.0 megawatt electrical generators for a total capacity of 51 megawatts of emergency backup electrical power. The diesel engines generate criteria and toxic air contaminants which have been fully evaluated, and found to be significantly below major source thresholds. The primary emissions of concern are nitrogen oxides and particulate matter, including diesel engine exhaust particulate (DEEP). DEEP emissions were reviewed under a Second Tier Health Impact Assessment to evaluate health risks posed by the project. After review of the completed Notice of Construction application and other information on file with the agency, Ecology has decided that this project proposal will conform to all requirements as specified in Chapter 173-400 WAC. After review of the Second Tier Health Impact Assessment, Ecology concluded that impacts to the community due to the Vantage Data Centers will meet the protective requirements contained in Chapter 173-460 WAC.

Copies of the Notice of Construction Preliminary Determination, the Second Tier Petition Recommendation, application information, and other application documents are available for public review at Department of Ecology, Eastern Regional Office, 4601 N. Monroe, Spokane, WA 99205-1295, and at the City of Quincy, 104 B Street SW, Quincy, WA 98848. A public hearing on this project was held on September 6, 2012 at the Quincy City Hall. This new public comment period is due to the changes Vantage made to their NOC application on October 19 and November 28, 2012. The public is invited to comment on this project proposal. Comments should be submitted to Beth Mort, and will be accepted for a period of thirty days after this notice has been published in the Columbia Basin Herald. For additional information please contact Beth Mort at Ecology's Spokane Office, 4601 N. Monroe, Spokane, WA 99205-1295, or email beth.mort@ecy.wa.gov, or 509 329-3502.

This notice supersedes the notice published on July 30, 2012.

#12032/2780681
Pub.: December 10, 2012

Exhibit 6

30 days is Jan 9

From: "Mort, Beth (ECY)" <BMOR461@ECY.WA.GOV>
Subject: **Vantage Data Center - NEW Public Comment Period**
Date: December 11, 2012 2:04:16 PM PST

Dear Interested Parties,

The new public comment period on the draft air quality permit for Vantage Data Centers is now open! Comments will be accepted through midnight January 11, 2013.

This new comment period is needed because Vantage has made changes to the proposed project. Vantage requested higher emission limits for the generators at certain operating loads. This resulted in a slight increase in emissions. Because of this they had to recalculate their emission impacts. The results of this analysis showed that the project proposal still complies with all air quality rules designed to protect public health.

Documents about the permit and the health assessment are available for the public at:

- City of Quincy, City Hall, 104 B St. SW, Quincy, WA
- Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA
- Online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/ scroll down to Vantage Data Centers and you will find the updated documents

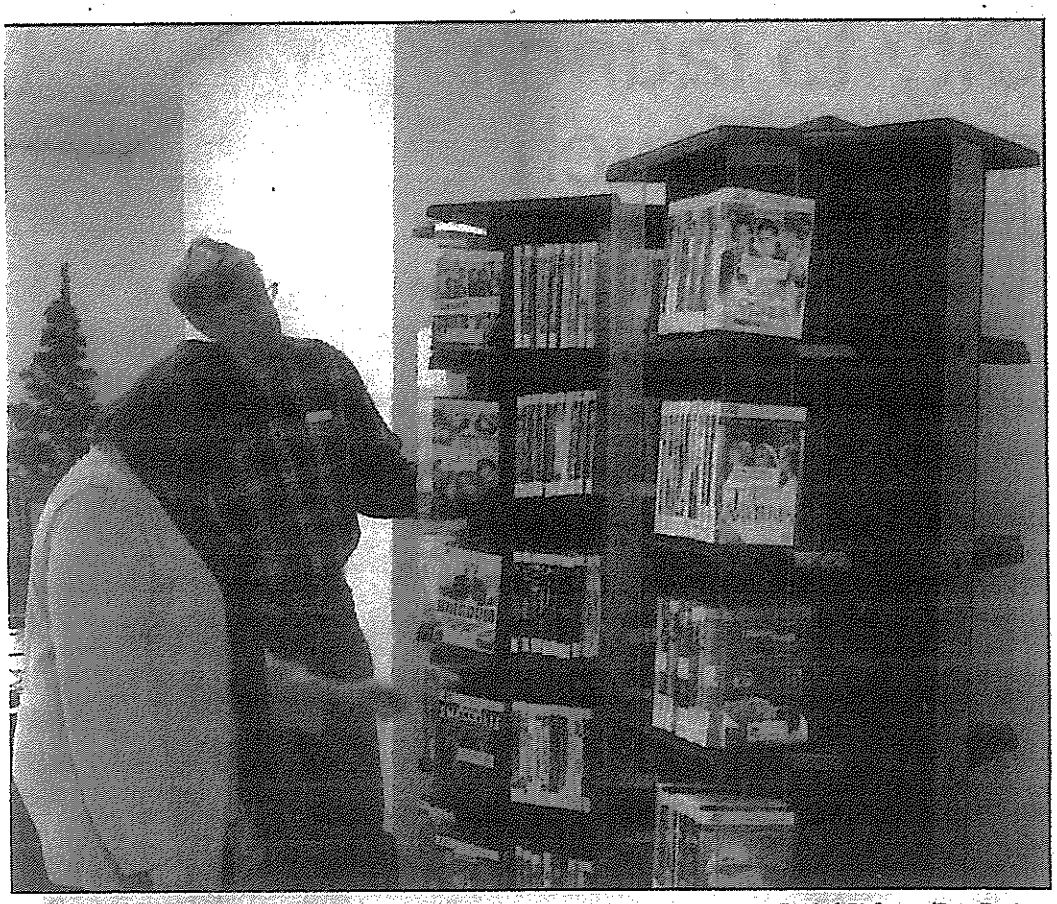
You can email comments to me at beth.mort@ecy.wa.gov or mail them to me at:

Beth Mort
Department of Ecology
Eastern Regional Office
4601 N Monroe St.
Spokane, WA 99205-1295

Thank you!!

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm

Exhibit 7



Rachal Pinkerton/Post-Register

ınd his wife, Debby, browse the DVD collection at the George Public Library on Saturday.

According to Schons, the new library has already seen a lot of use by the children.

"Kids were lined up to get library cards," said Schons. "It's been great. And to think it started on a lawnmower making two phone calls. It really was that easy."

The new George Public Library can be reached at 785-7043.

News in Brief

Senior Center News

It's beginning to look a lot like Christmas at the Senior Center! Jeanne Coady will be singing Christmas songs on Dec. 15, with a bowl of chili at 5 p.m., all for the cost of just $5. It's cozy and happy here; come join us!

Monday bridge winners were: Dick Bennett, first; Nancy

Vantage Data Center public comment period open

The Washington State Department of Ecology (Ecology) has extended the comment period for the proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy. This new comment period is needed because the data center made changes to the proposed project that resulted in a slight increase in emissions. The analysis that recalculated their emissions also showed that the project proposal still complies with all air quality rules designed to protect public health.

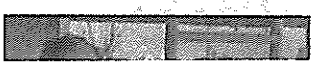
The due date for comments is now Jan. 11, 2013.

The draft permit would allow the company to install 17 backup generators for use during power failures to support the facility's data servers and places conditions on the operation to protect public health. The generators are powered by diesel engines. The 17 new generators would be in addition to 141 generators already permitted at five other Quincy-area data centers.

Submit comments and/or questions to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Documents about the permit and the health assessment are available for the public at the Department of Ecology, Eastern Regional Office, Air Quality Program, 4601 N. Monroe St., Spokane, WA. Or contact Beth Mort at 509-329-3502 or by email at beth.mort@ecy.wa.gov; the City of Quincy, 104 B St. SW, Quincy; or online at: http://www.ecy.wa.gov/programs/air/quincydatacenter/.

Each of the generators will be capable of producing three megawatts of emergency backup electrical power. The Vantage Data Center will use the most current and effective air pollution control equipment for controlling both particulate matter and nitrogen dioxide.



LeiVan, O'Brien

Growi

BY TAMMARA GREEN
writer@qvpr.com

Jim Fleming, of Fleming's Valley View Orchards in

When Fleming took charge of the new orchard project in 1980, he planted 500 acres of the 1,000 with apples.

"We planted some of the first commercial Granny Smiths and Gala apples in the area in 1980 and 1983," said Fleming.

It was a desolate area, which once was a little known and forgotten place called Levering. Winters proved to be hard there, as Fleming had to maintain and

Disabi

The Grant County Law Enforc Board (LEOFF) is seeking an ind position on the Grant County LE years. This person must be a re serve without compensation.

New E1

A recent survey by the Am (AAA) finds a strong likelihood potential for voided warranties a the Environmental Protection A

Exhibit 8 B

rding to a surveyed h d that cont lion out of duty vehicles on the roads today to use E15 gasoline, based on conducted by AAA. AAA autom

Jan 3, 2013

From: "Mort, Beth (ECY)" <BMOR461@ECY.WA.GOV>
Subject: **RE: Question on public comments, Vantage**
Date: January 3, 2013 4:35:29 PM PST
To: Danna Dal Porto <ddalporto@smwireless.net>
Cc: "Flibbert, Gregory S. (ECY)" <GFLI461@ECY.WA.GOV>, "Wood, Karen K. (ECY)" <KWOO461@ECY.WA.GOV>

Hello Danna,

Thank you again for your message. We are accepting public comments on the draft air permit for Vantage Data Centers until midnight January 11, 2013. I felt that extending public comment past the 30 days required by law would be appropriate, due to the fact that the comment period included holidays.

Your email and the list of various communications you attached will be submitted in our Response to Comments document. Ecology's response and a detailed list of outreach actions will be included in the Response to Comments as well.

Regarding your questions about the documents available for review:

Vantage submitted revised NOC applications on 10/19/12 and 11/28/12. The Technical Support Document (TSD) contains Ecology's analysis based on the NOC applications. The revised TSD is identified on the last line of the title on the first page. The last line states "December Amendment to May 2012 TSD". This revised TSD was available for public review during the comment period that began December 10, 2012.

There has been no final determination or approval order issued for the Vantage project. The revised Preliminary Determination (PD) available for public review during the comment period that began December 10, 2012, contains the permit conditions that resulted from the review of the revised NOC applications. BACT for the project is contained in the revised PD and in more detail in the revised TSD. The PD is not the "finished product". The final approval order cannot be issued before the end of the public comment period, and Ecology's review and consideration of all comments received.

I am forwarding your request to Ecology management for a second public hearing on the Vantage project.

Ecology has no preference on how you decide to submit your comments. Email comments are treated the same as comments received through the mail. Some Ecology staff were on leave during the holiday season. Ecology coordinated leave times to make sure that staff familiar with the Vantage project were available through the holidays.

Beth
509.329.3502

From: Danna Dal Porto [mailto:ddalporto@smwireless.net]
Sent: Wednesday, January 02, 2013 9:07 AM
To: Mort, Beth (ECY)
Cc: Flibbert, Gregory S. (ECY); Pfeifer, Grant D. (ECY)
Subject: Question on public comments, Vantage

January 2, 2013

Beth,

I would like clarification on the closing time and date of the Vantage public comments. I need you to send me the specific time and date for my comments to be accepted for the Vantage permit.

Exhibit 9

Page 2 DalPorto to Mort JAN 2, 2013

I have attached a listing of the various communications I have seen from your desk. I am sure this is easy to explain but I think you can see how I have become confused.

I am requesting another public hearing to have Ecology and Vantage clarify the documents that are on file in the Quincy City Hall. Your Public Notice of December 10, 2012, references Vantage changes to the NOC application on October 19, 2012 and November 28, 2012. My confusion is that the Quincy set of documents contains a document headed TSD, December amendment to May, 2012 TSD. This document has specific comments I need clarified. For example, what document is the final determination for Vantage? The various documents have a series of references to the BACT decision. Which one is the actual approval order? How can I identify the finish product? This is just one of the clarifying points I need answered and the basis for my public hearing request. I can continue to email questions if that is what Ecology prefers. I do have a concern however. I have emailed Ecology this past Holiday week and I have had no answers. Is everyone on vacation?

I look forward to your answers.

Danna Dal Porto
Quincy, WA

VALL

News in Brief

Senior Center News

Happy New Year to you all! May you prosper, be merry, receive much, give more, and always have a smile that comes easily to your face. May there be no losses in facing cooperatives, agriculture and rural America as participants in the recent CHS New Leaders Forum sponsored by CHS Inc., the nation's leading farmer—owned cooperative and a global energy, grains and foods company. They were among 300 young producers from across the U.S. participating in the early December program.

Participants heard from experts on agriculture, leadership and precision technology, including Carl Casale, president and CEO, CHS Inc. and others.

Change of property value notices mailed

The Grant County Assessor mailed all change of value notices on Thursday, Dec. 27. Over 29,950 Real Property Change of Value Notices and 4,000 Personal Property Change of Value Notices were placed in the mail. All property in Grant County is revalued every year. The assessed value is to reflect 100 percent of the true and fair value. Anyone with questions on the value should contact the Assessor's Office at 754-2011 ext. 325. Anyone who disagrees with the true and fair value, current use value or senior frozen value may appeal to the Board of Equalization.

Petition forms are available from the Clerk of the Board of Equalization, Jill Hammond, at (509) 754-2011 ext. 331. They must be filed within 30 days from the date of this notice or by July 1 of the assessment year. Questions regarding the appeal process should contact the Clerk of the Board of Equalization.

Public comment period on new Vantage Data Center permit

The Washington State Department of Ecology has extended the comment period for the proposed air quality permit for building the new Vantage Data Center on 63 acres northeast of Quincy. The comment period is needed because the data center made changes to the proposed project that resulted in a slight increase in emissions.

The due date for comments is now Jan. 11, 2013. Submit comments and/or questions to Beth Mort, Department of Ecology, 4601 N. Monroe, Spokane, WA 99205-1295, or by email at beth.mort@ecy.wa.gov.

Exhibit 10

From: "Mort, Beth (ECY)" <BMOR461@ECY.WA.GOV>
Subject: **RE: Need documents for Vantage comment period.**
Date: January 3, 2013 3:45:58 PM PST
To: Danna Dal Porto <ddalporto@smwireless.net>
Cc: "Flibbert, Gregory S. (ECY)" <GFLI461@ECY.WA.GOV>, "Wood, Karen K. (ECY)"<KWOO461@ECY.WA.GOV>
1 Attachment, 1.0 MB

Hello Danna,

Thank you for your comments and questions below. Attached is the document you requested to help you complete your review and make further comments.

Your comments will be included in full along with Ecology's response in the Vantage Response to Comments document. I have forwarded your request to Ecology management for a second public hearing on the Vantage project.

Thank you,

Beth Mort | Community Outreach & Environmental Education
Air Quality Program | Dept of Ecology Eastern Office
beth.mort@ecy.wa.gov | 509.329.3502
Office Hours: M-Th 7am-4pm

-----Original Message-----
From: Danna Dal Porto [mailto:ddalporto@smwireless.net]
Sent: Tuesday, January 01, 2013 1:46 PM
To: Flibbert, Gregory S. (ECY); Wood, Karen K. (ECY)
Subject: Need documents for Vantage comment period.

January 1, 2013

Greg/Karen,

I am requesting an electronic copy of a document referenced in the paper work for the Vantage comment period.

I am requesting a "BACT supplemental submittal" received by Ecology July 16, 2012. This document is referenced on page 14 of a July 2012 packet titled:

Technical Support Document
Notice of Construction Approval Order
Vantage Data Centers Management Company, LLC Vantage-Quincy Data Center July, 2012

Page 14 is the Conclusion Page, section #9. Is is marked as follows: ****END OF VANTAGE JULY TSD****

I am giving all of this information because there were a bewildering number of documents that looked similar.

Thank you for this assistance. Because the deadline for comment is approaching and the comment period bracketed the Holiday period, I need this document to complete my comments.

At this time is an opportunity to request another public hearing to answer the questions I have. The Vantage document present at the September public hearing was not complete. The public is entitled to an opportunity to comment on a complete application. An important question: Is Vantage putting controls on their diesel generators? I would like an answer to this important question.

Sincerely,

Danna Dal Porto
Quincy, WA

BACT-vs-NT....pdf (1.1 MB)

Exhibit 11

VANTAGE PUBLIC COMMENT.....FILE #4 of 5.....Dal Porto

Exhibit 12.....19 Documents on file with the City of Quincy related to the air Quality permit for Vantage Data Center 2012. These nineteen documents were contained in the box of materials to be considered for the required public hearing scheduled September 6, 2012.

11 of these documents list BACT as specific emission controls added onto the engines. Three items, #14, July 11-12 ICF letter and Responses to Ecology Supplemental Data Request, item #16 Ecology Preliminary Determination and item #17 Ecology Technical Support Document (NOC) list BACT as the Tier 2 engines with no add-on specific emission control devices.

Item #8 and item #9 have the same title: Technical Support Document, Notice of Construction Approval Order, Vantage Data Center Management Company, LLC, Vantage-Quincy Data Center, May 2012. The documents look the same but they are different. They are impossible to identify by the cover page, however, inspection shows that one document has all pages labeled "May, 2012", while the other document has pages 1, 12-14, labeled "May, 2012", and pages 2-11 labeled "June, 2012".

1. **January 18, 2012 ICF**, Notice of Construction Support Document Second Tier Review . **BACT: Page 21**, Emission Controls, Air Clarity ™ 3000 Emission Controls.

2. **March 7, 2012 ICF**, Notice of Construction Support Document for Second Tier Review, Response to Ecology Data Requests. **BACT: Page 22**, Emission Controls, Air Clarity ™ Emission Controls.

3. **March 15, 2012 ICF** Second Tier Risk Analysis Technical Support Document (Responds to Ecology Questions), **BACT: Page 15**, EPA Tier 4 Combustions Controls.

4. **May 14, 2012 ICF** Notice of Construction Support Document for Second Tier Review (Includes Ammonia Slip), **BACT: Page 22**, Emission Controls, Air Clarity ™ Emission Controls.

5. **May 21, 2012 ICF** Second Tier Risk Analysis Technical Support Document (Includes Ammonia Slip), **BACT: Page 15** Emission Controls, Tier 4 Combustion Controls.

6. **May 25, 2012 ICF** Final Second Tier Risk Analysis Technical Support Document, **BACT: Page 15**, Emission Controls, EPA Tier 4 Combustion Controls.

EXHIBIT 12

7. **May 29, 2012 ICF** Final Notice of Construction Support Document for Second Tier Review (Includes Ammonia Slip) **BACT: Page 22**, Emission Controls, Air Clarity ™ 2055 DPF Controls, EviCat ®2055 DPF Filter.

8. **May 2012 ECOLOGY** Technical Support Document, Notice of Construction Approval Order, Vantage Data Centers Management Company, LLC, Vantage-Quincy Data Center, May 2012, **BACT page 4-7**, Emission Controls. All pages labeled May, 2012. Exhibit 8 and Exhibit 9 are very close to being the same.

9. **May 2012 - June 2012 ECOLOGY** Technical Support Document, Notice of Construction Approval Order, Vantage Data Centers Management Company, LLC, Vantage-Quincy Data Center, May 2012, **BACT: page 4-7**, Emission Controls. Page 1, 12-14 labeled May, 2012. Pages 2-11 labeled June, 2012. Includes 16 hours of storm avoidance operational hours as per Vantage request. Exhibit 8 and Exhibit 9 are very close to being the same.

10. **Exhibit 13.....June 11, 2012 Vantage letter to Karen Wood, Ecology,** request for "storm avoidance" hours at Vantage. References Tier 4 emission controls and cites the quality of controls as the basis for requesting extra operational hours beyond the other data centers permitted in Quincy.

11. **Exhibit 27.....June 20, 2012 Ecology** Second Tier Review Recommendation Document for Vantage data Center, Quincy, WA. **BACT: page 3-4**, Tier 4 engines with emission controls. N02 concern with Tier 4 Emission Controls.

12. **Exhibit 4 A.....June 22, 2012** Ecology Letter from Gregory Flibbert (ECY) to Jeff Kane (Vantage). Ecology processed the Notice of Construction and Ecology has scheduled a public hearing for July 31, 2012.

13. **June 22, 2012** Ecology Preliminary Determination in the Matter of Approving a New Air Contaminant Source for Vantage Data Centers Management Company, LLC, Vantage-Quincy Data Center. **BACT: pages 4-5** Tier 2 engines. Additionally, in section 2.1 under Approval Conditions the statement: Each engine...must be equipped with CO, VOC, PM, and NOX control equipment at least as effective as that evaluated in the NOC approval. (Does this mean that emission controls are required on the engines?) Diesel engine exhaust particulate matter exceeds the Acceptable Source Impact Level (ASIL) as defined in Chapter 173-460 WAC, page 4. "...a system wide (power) outage could potentially cause NO2 levels to be a health concern.", page 7.

14. **Exhibit 31.....July 10-11, 2012 ICF** Vantage Responds to Ecology's Supplemental Data Request, Vantage Data Center, Quincy, WA, Responses Prepared July 11, 2012. Top-Down BACT Assessment Vantage-Quincy Data Center, Quincy, WA A section of this document concerns the FOB purchase

price information for controls designed for either 2,000 kWe or 2,500 kWe generators as opposed to the Vantage generators which are 3.000kWe generators. Cost effectiveness criteria based on Sabey-Intergate data center air quality permit. (Is this permit finalized?) This document details extensive cost-effectiveness evaluation. A specific point in the document is that Ecology has very low cost effective numbers for controls. Table 1 Comparison of Cost-Effectiveness Evaluations, page 2.

15. **Exhibit 14.....July 11-12, 2012, 2012 pages 1-5 ICF** letter from Jim Wilder (Vantage) to Greg Flibbert and Robert Koster (Ecology). Cover letter for a supplemental Top-Down BACT Assessment containing information specific to the emissions cost effectiveness. According to Mr. Wilder, the low Ecology cost effectiveness numbers makes the emission controls proposed by Vantage not cost effective. On the first page is this statement: "Because all of the feasible add-on technologies failed the cost-effectiveness criterion, ICF recommends that none of them...should be defined as BACT. Instead, ICF recommends that BACT for each pollutant should be use of EPA Tier-2 certified engines..." **In the SEPA checklist, August 2011, Vantage committed that every diesel generator installed at the facility will comply with EPA Tier-4 emissions standards.** For this permit, there is a conflict in the Ecology Vantage load-specific hourly emissions rates being substantially lower that the ELM Energy's vendor-guaranteed NTE controlled rates. Concern over future testing and that Vantage's load-specific emission limits be set at ELM's vendor-guaranteed NTE rates. Not included in Exhibit 14 is the packet of documents: Vantage Response was stapled to June 22, 2012 Vantage data center's comments and requested changes to public draft preliminary determination comments dated 7-11-12.

16. **July 2012 Ecology** Preliminary Determination, In the Matter of Approving A New Air Contaminant Source for Vantage Data Centers Management Company, LLC, Vantage –Quincy Data Center. **BACT: Page 4-5**, Tier 2 engines, **no controls**. A point of confusion is the statement page 6, Equipment Restrictions (2.1) (engines) must be equipped with CO, VOC, PM and NOX control equipment at least as effective as that evaluated in this NOC approval. Is Vantage using emission control equipment or are they not using controls?

17. **Exhibit 15 pages 2-5-7-14..... July 2012 Ecology** Technical Support Document, Notice of Construction Approval Order, Vantage Data Center Management Company, LLC, Vantage-Quincy Data Center, July 2012, **BACT: Page 5-7**, Tier 2 engines, **no controls.** On page 14 of this document, a lengthy paragraph is devoted to a discussion of the BACT issue and the NTE (not to exceed) numbers in their emission levels that Ecology has accepted as voluntary limits not connected to the BACT determination. A reference is made to a BACT supplemental submittal dated July 16, 2012. Page 14 "...by

decoupling the BACT determination from the controls required for this project, the issue of what is guaranteed or not does no need resolution."

18. **Exhibit 16.....August 29, 2012 ICF** Email from Jim Wilder to Greg Flibbert (Ecology), Mike Duffy (Vantage), Robert Koster and Clint Bowman (Ecology) Discovery that Vantage cannot meet the primary N02 emission limit at 10%. "Can we convene a teleconference ASAP to discuss this, and develop a plan?"

19. **Exhibit 17.....August 30, 2012 ICF** Email from Jim Wilder to Greg Flibbert, (ECY), Robert Koster (ECY), Karen Wood (ECY) Mike Duffy (Vantage) Clint Bowman (ECY) Gary Palcisko (ECY) Subject: Vantage and Wilder educated guesses about how Vantage PD numerical values will change. The miscalculation about the numerical values in the emissions will cause up and down value changes in the percentage of emission numbers.

    In this email, Wilder states:

    "SO GIVEN THESE EDUCATED GUESSES ON THE TRENDS, SHOULD WE HOLD THE PUBLIC HEARING ON SEPT 6?" (Emphasis in the document.)

June 11, 12

VANTAGE DATA CENTERS

2625 Walsh Avenue Santa Clara CA 95051 415.233.5630P 408.884.2441F

June 11, 2012

Karen Wood
Washington State Department of Ecology
4601 N. Monroe Street
Spokane, WA 99205

Subject: Storm Avoidance at Vantage Data Center, Quincy, WA

Dear Karen:

As you requested during our teleconference on May 31, 2012, this letter clarifies Vantage Data Centers' request to include a specific, measurable and limited amount of storm avoidance as a permitted non-emergency generator activity for our facility in Quincy, WA. Our justification for including storm avoidance is broken into several parts, each of which is described below.

Storm avoidance is a mission-critical activity for Vantage's tenant. As you requested, Vantage discussed the issues of storm avoidance with our tenant (referred to as "Riker"). They adamantly request to maintain the storm avoidance hours requested in our application. Any outage at the Quincy data center will have severe internal and business partner impacts to the tenant. Under the "storm avoidance" operating mode, generators will be started to minimize risk of business disruption just prior to impending periods of severe weather. Severe weather in Quincy is expected to potentially include, but not be limited to, ice storms and high winds. This same "storm avoidance" action would also be taken in the event that the facility's continuous sensors indicate impending electrical problems caused by internal problems within the facility (e.g., fire, or transformer malfunctions). Vantage is able to diligently track and report occasional use of its generators for storm avoidance. We expect Ecology to include provisions in our Approval Order that requires us to rigorously track and report the reasons for every generator runtime event. Any time Vantage elects to activate the generators for storm avoidance, the specific time, duration, and reason for that event will be recorded and reported to Ecology.

Vantage's generators will be exceptionally clean-burning. Vantage is the only data center in Washington state that has offered to install Tier-4 emission controls on its generators. As a result, even with Vantage's proposed use of occasional storm avoidance, our emissions will be lower than any other data center. Table 1 compares the proposed potential-to-emit from each of the data centers in Quincy, expressed as DEEP emissions per megawatt of installed generator capacity. Vantage's emissions will be about ½ those of the next-cleanest data center, even with our proposed storm avoidance activity.

Exhibit 13

VANTAGE DATA CENTERS

2625 Walsh Avenue Santa Clara CA 95051 415.233.5630P 408.884.2441F

Table 1. Comparison of DEEP Emissions from Quincy Data Centers

Facility	Generator Description	Installed Generator Capacity (Mwe)	Generator Emission Controls	Permitted DEEP Emissions Excluding Commissioning and Stack Emission Testing (tons/yr)	DEEP Emissions Per Installed Mwe (lbs/Mwe)
Vantage	17 @ 3 Mwe	51	Tier-4 Including DPF, SCR, and DOC	0.221	8.7
Sabey-Intergate	44 @ 2 Mwe	88	Tier-2	0.809	18.4
Dell	28 @ 3 Mwe	84	Tier-2	0.71	16.9
Yahoo-1	13 @ 2.28 Mwe	29.6	Tier-2	1.2	81.1
Yahoo-2	10 @ 2.28 Mwe	22.8	Tier-2	0.35	30.7
MSFT-1 (After 3rd-Tier Reductions)	27 @ 2.5 MW	67.5	Tier-2	0.58	17.2
MSFT-2	13 @ 2.5 Mwe	32.5	Tier-2	0.45	27.7

Storm avoidance is an allowable non-emergency activity that satisfies federal regulations for "emergency generators". Emergency diesel generators are regulated by two federal regulations: the New Source Performance Standard (NSPS) Subpart IIII, and the National Emission Standard For Hazardous Air Pollutants (NESHAP) Subpart ZZZZ. Both of those federal regulations allow "emergency generators" to be used for up to 100 hours per year for discretionary non-emergency activity while utility power is available to the facility. The NSPS Subpart IIII was updated in June, 2011 to clarify which types of discretionary non-emergency activities are prohibited. Section 40 CFR 60.4211 specifies the limited number of discretionary non-emergency activities that are prohibited: peak shaving, electricity sale to the grid, or provide power as part of a financial arrangement with another entity (i.e, demand response for rolling brownouts). Vantage proposes none of those prohibited activities. Storm avoidance is not included in the small list of prohibited actions, so Vantage concludes storm avoidance is allowed under federal regulations.

Because Vantage is using Tier-4 generators, storm avoidance will not cause public health impacts. As reported in our Second Tier Risk Analysis (May 25, 2012), the forecast DEEP cancer risk at the closest home caused by Vantage's combined generator activity (including storm avoidance) are low. Furthermore, Vantage's forecast annual DEEP emissions caused by maximum-allowable storm avoidance are only about 22% of our requested facility-wide total, so prohibiting storm avoidance would reduce the ambient Vantage-only DEEP impacts by only 22%. Therefore, the Vantage-only DEEP impacts are only a small fraction of existing background concentration, so as shown in Table 2 prohibiting storm avoidance at Vantage would have only a minor affect on the cumulative DEEP impact at the closest home. Vantage's currently-proposed generator operating conditions (including storm avoidance) would cause a cumulative DEEP cancer risk of 27-per-million at the closest dwelling. If storm avoidance was prohibited at Vantage, then the cumulative risk would decrease very slightly, down to 26-per-million.

Table 2. Overall Cumulative DEEP Impacts If Storm Avoidance Was Prohibited.

VANTAGE DATA CENTERS
2625 Walsh Avenue Santa Clara CA 95051 415.233.5630P 408.884.2441F

DEEP Risk	As Proposed Including Storm Avoidance	Storm Avoidance Prohibited
Vantage-Only DEEP Impact (risk-per-million)	3.5	2.7
Background DEEP (risk-per-million)	23.7	23.7
Total Cumulative DEEP (risk-per-million)	**27.2**	**26.4**

Based on the factors described in this letter, Vantage Data Centers concludes that occasional storm avoidance is an important factor to protect the security and ongoing business operations of our tenant, and we believe it is appropriate for Ecology to approve our request for limited amounts of storm avoidance, as requested in all of our application submittals to date.
We thank you for your prompt actions to resolve this matter. Please contact me at 206/406-9148 if you have any questions regarding the information in this letter.

Sincerely,

MJ Duffy

Mike Duffy
Vantage Data Centers
mduffy@vantagedatacenters.com
(206) 406-9148

ICF July 12, 2012
ECY July 11, 2012

July 12, 2012

Greg Flibbert and Robert Koster
Washington State Department of Ecology, Eastern Regional Office
4601 N. Monroe Street
Spokane, WA, 99205
509/329-3400

Subject: Summary Response for BACT vs. Vendor-Guaranteed Not To Exceed Emission Rates
Vantage Data Center, Quincy, WA

Dear Greg and Robert:

On behalf of Vantage Data Centers, ICF is pleased to submit this summary response to the supplemental information requested by Ecology on July 5, 2012. This summary response is divided into five parts:

- Signed certification form (see Attachment A)
- Submit comments to the public-review Draft PD (see Attachment B)
- Provide a supplemental Top-Down BACT assessment, using "Nominal-Uncontrolled" and "Nominal-Controlled" emission rates.
- Explain why Vantage proposes emission controls that go beyond BACT.
- Explain why Ecology should revise Vantage's emission limits to match the vendor-guaranteed NTE

We trust this response letter provides the information Ecology needs to revise the Draft Proposed Determination to reflect Vantage's requests. Please do not hesitate to call either Mike Duffy of Vantage Data Centers at 206/406-9148 or me at 206/801-2832 if you have any questions about this letter.

Sincerely,

James Wilder

James Wilder
Managing Consultant

Exhibit 14

VANTAGE RESPONSES TO ECOLOGY'S SUPPLEMENTAL DATA REQUEST
VANTAGE DATA CENTER, QUINCY, WA
RESPONSES PREPARED JULY 11, 2012

PROVIDE A SUPPLEMENTAL TOP-DOWN BACT ASSESSMENT

A thorough supplemental Top-Down BACT assessment, including detailed information and cost calculations, is enclosed with this response letter. A brief summary is provided below. As requested by Ecology, this supplemental top-down BACT assessment used "Nominal-Uncontrolled" and "Nominal-Controlled" emission rates, which are substantially lower than the "Not-to-Exceed (NTE) Vendor-Guaranteed Emission Rates" that ICF used for our original BACT assessment, AERMOD modeling, and risk assessment used for our permit application package.

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 PM2.5) and sulfur dioxide.

Generators equipped with EPA Tier-2 certified engines were considered the base case for the BACT assessment. The following add-on technologies were considered for the top-down BACT assessment:

- AirClarity System (Catalyzed DPF and SCR) proposed by Vantage
- Catalyzed Diesel Particulate Filter
- Urea-Selective Catalytic Reduction
- Three-Way Catalyst
- Diesel Oxidation Catalyst

All of the add-on technologies are technically feasible. They are commercially available, and offer substantial pollutant removal efficiencies. None of them would pose unreasonable operational difficulties.

However, all of the add-on technologies failed the cost-effectiveness criteria by a wide margin, for the individual pollutants and for the multi-pollutant reasonableness test. The forecast cost-effectiveness values for each technology are listed in Table 1 below.

Because all of the feasible add-on technologies failed the cost-effectiveness criterion, ICF recommends that none of them (not even the AirClarity system proposed by Vantage) should be defined as BACT. Instead, ICF recommends that BACT for each pollutant should be defined as use of EPA Tier-2 certified engines, with diligent annual operation and maintenance requirements required under New Source Performance Standards Subpart IIII.

Table 1. Comparison of BACT Cost-Effectiveness Evaluations for Feasible Control Technologies

Control Device	Cost-Effectiveness ($/ton)				
	NOX	Total PM	CO	VOC	Combined Pollutants
MTU AirClarity System (Catalyzed DPF + SCR) proposed by Vantage	$81,000	$700,000	$434,000	$1,645,000	$60,000
Catalyzed DPF Alone	Ineffective	$252,000	$152,000	$578,000	$81,000
SCR Alone	$40,300	$1,519,000	$216,000	$820,000	$32,000
3-Way Catalyst	$37,500	$125,000	$71,000	$296,000	$19,200
Diesel Oxidation Catalyst	Ineffective	$310,000	$55,000	$314,000	$41,000
Ecology Cost-Effectiveness Criterion	$10,000	$23,200	$5,000	$10,000	N/A

EXPLAIN WHY VANTAGE HAS ALWAYS PROPOSED TO VOLUNTARILY INSTALLTHE AIRCLARITY EMISSION CONTROL SYTEM, WHICH GOES BEYOND THE RECOMMENDED BACT REQUIREMENT

As described in the previous section, ICF concludes that none of the identified add-an control technologies satisfy BACT because they all fail the cost-effectiveness criterion by a wide margin. Regardless, ever since the inception of this project Vantage has proposed installing the AirClarity emission control system on all of the generators at the Vantage-Quincy data center. The AirClarity system is a modular system designed for the MTU generators, that includes a catalyzed DPF and a urea-based SCR. The reasons Vantage has voluntarily elected to voluntarily install expensive add-on controls are as follows:

SEPA

SEPA Checklist. For the State Environmental Policy Act (SEPA) Checklist, which was submitted to the City of Quincy in August 2011, Vantage committed that every diesel generator installed at the facility will comply with EPA Tier-4 emission standards. Vantage did this to reflect its corporate commitment to install environmental controls at all of its corporate-wide facilities that go beyond all minimum regulatory requirements.

NAAQS Compliance. Vantage recognized that background air quality in the northeastern industrial area of Quincy has already been affected by permitted emissions from the existing (or permitted) emergency generators at the Yahoo Data Center, Intuit Data Center, and Sabey-Intergate Data center. In order to comply with the federal National Ambient Air Quality Standards (NAAQS) for particulate matter and NO2, Vantage recognized its generators would have to be equipped with emission controls that are more efficient than the EPA Tier-2 controlled engines that have been installed at every other data center in Quincy. For the Notice of Construction air quality application package, Vantage used the AERMOD dispersion model to include the "vendor-guaranteed NTE emission rates" provided by ELM Energy LLC, Vantage's supplier for the generators and the AirClarity system. Based on the vendor-guaranteed NTE emission rates, Vantage demonstrated the controlled emissions comply with the NAAQS for all pollutants, even after using Ecology's mandated screening-level modeling requirements.

ASIL for NO2. Vantage recognized that emissions of toxic air pollutants are a valid concern for local citizens. To demonstrate compliance with Ecology's Acceptable Source Impact Levels (ASILs) for all pollutants including NO2 (but not including DEEP), Vantage used the AERMOD model to account for the vendor-guaranteed NTE emission rate for NO2. By doing so, Vantage demonstrated the controlled worst-case NO2 impact caused solely by the facility's emissions achieved the ASIL by a comfortable margin.

Second-Tier Cancer Risk for DEEP. Vantage recognized that DEEP emissions are a valid concern for local citizens. Vantage modeled carcinogenic DEEP emissions as being identical to ELM's vendor-guaranteed NTE controlled emission rates for total particulate (front-half plus back-half). Even with the vendor-guaranteed controlled emission rate the modeled DEEP impact at the maximum boundary receptor exceeded the ASIL, so Vantage was required to comply with Ecology's Second Tier risk assessment standard for DEEP. By accounting for ELM Energy's vendor-guaranteed NTE controlled emission rates for DEEP, Vantage was able to demonstrate that the DEEP cancer risks at all receptor locations (at onsite tenant space and at all offsite locations) achieved Ecology's Second-Tier standard of 10-per-million by a comfortable margin.

EXPLAIN WHY VANTAGE REQUESTS THAT ALL HOURLY EMISSION LIMITS BE SET EQUAL TO ELM'S VENDOR-GUARANTEED NTE CONTROLLED EMISSION RATES

As described above, all of Vantage's AERMOD dispersion modeling used for NAAQS compliance, ASIL compliance, and Second-Tier DEEP risk assessment used Elm Energy's conservatively high vendor-guaranteed NTE controlled emission rates at each generator load. Vantage's air quality permit application package clearly indicated that process, and clearly requested that the Ecology permit should specify hourly emission rates for all pollutants and all generator loads equal to Elm Energy's vendor-guaranteed NTE emission rates.

However, the Preliminary Determination air quality permit, which has been distributed by Ecology for public review and comment, sets Vantage's load-specific hourly emission rates to

values that are substantially lower than Elm Energy's vendor-guaranteed NTE controlled rates. Instead of specifying the vendor-guaranteed rate for each generator load, Ecology staff did their own manual calculations to specify lower emission limits based on Elm Energy's "nominal-uncontrolled" rates. Those reduced allowable emission limits are listed in Section 5 of the Preliminary Determination.

Vantage requests that Ecology should revise the emission limits set in Section 5 of the PD to match Elm Energy's vendor-guaranteed NTE controlled rates that were requested in Vantage's permit application package. A marked-up copy of Section 5 of the PD is attached, showing the requested corrections. Vantage's reasons for requesting this change are listed below.

Vantage Presented the Vendor-Guaranteed NTE Rates in Its AERMOD Modeling and Second-Tier Risk Assessment. Vantage worked closely with Ecology's modelers and risk assessment specialists to conduct the AERMOD modeling used for the NAAQS compliance demonstration and the Second Tier risk assessment. We all agreed to use the conservatively high emission rates set by Elm's vendor-guaranteed NTE limits. That conservatively high AERMOD modeling showed compliance with the NAAQS and the Second-Tier cancer risk limit (10-per-million) with a comfortable safety margin. Therefore, Vantage believes it is reasonable to set the permitted hourly emission limits to the same values that were used for the AERMOD modeling (i.e., Elm Energy's vendor-guaranteed NTE rates).

There is a Reasonable Likelihood Of Future Stack Testing Requirement. Given the current litigious climate for air quality permitting in Quincy, Vantage believes it is prudent to assume they will eventually be required to conduct multi-load stack testing on many, if not all, of their installed generators. Therefore, it is crucial that Vantage's load-specific emission limits be set at Elm's vendor-guaranteed NTE rates.

Ecology's Reduced Limits Are Unacceptably Close To (Or Even Below) Elm Energy's Measured Stack-Tested Values. Vantage's permit application package presented Elm Energy's stack test data for the AirClarity system installed on a similar MTU diesel generator. In at least one case Ecology's reduced emission limit is actually less than the stack-tested value. On June 21, 2011 ICF submitted an email to Ecology staff identifying at least one "fatal flaw" condition whereby Ecology's permit limit was actually less than Elm Energy's stack-test value:

> Requested NTE NOx rate at 10% load: 1.9 lbs/hr
> Elm's stack-tested value (NOx, 10% load): 1.7 lbs/hr
> Ecology limit (NOx, 10% load): 0.57 lbs/hr

Ecology's reduced emission limits for Total PM are higher than Elm's stack-tested values, but their reduced PM limit unacceptably reduces the "safety-factor" that Elm originally applied when they developed the vendor-guaranteed NTE rates. For example, the values for PM at 100% load are as follows:

Elm's stack-tested value (PM, 100% load): 0.36 lbs/hr
Requested NTE for PM rate at 100% load: 0.484 lbs/hr (34% safety factor)
Ecology limit (PM, 100% load): 0.42 lbs/hr (safety factor reduced to 17%)

Given the variability in the stack-tested PM rates that were recently measured by Microsoft on their generators, Vantage questions the rationale for Ecology choosing to reduce Vantage's safety factor for PM.

"Nominal-Uncontrolled" Rates Used By Ecology Are Not Vendor-Guaranteed, and Do Not Apply to Individual Generators. Elm Energy's NTE rates are vendor-guaranteed for each individual generator, and at each individual engine load. Therefore, if Ecology's required stack testing indicates an exceedance of Elm's NTE rate for any engine or any generator load, then Elm Energy and Vantage will have the contractual flexibility to promptly undertake corrective measures. However, Ecology's reduced emission limits relied on Elm Energy's "Nominal-Uncontrolled" rates. Those "nominal" values are Elm's engineering judgment about the "typical, average" performance for MTU's entire engine family. Those "nominal-uncontrolled" rates are not vendor-guaranteed, and they do not apply to any individual generator, nor to any individual engine load. Therefore, we question Ecology's use of those "Nominal-Uncontrolled" rates to derive load-specific emission limits that will apply to the stack tests for every individual generator.

Ecology's Reduced Emission Limits Put Vantage At Unacceptable Business Risk. For all of the reasons stated above, Ecology's specification of permit limits lower than Elm Energy's vendor-guaranteed NTE rates will put Vantage at an unacceptable business risk. If Ecology's required stack testing shows tested emissions for any individual generator and load that exceed Ecology's limit but are less than Elm's vendor-guaranteed rate, then Ecology will be required to issue a Notice of Violation to require Vantage to correct the violation. However, in that case the measured emissions would satisfy Elm Energy's vendor guarantee, so Vantage would have no contractual ability to require Elm to correct the problem. That constitutes a severe business risk to Vantage, that is unacceptable to Vantage's senior management.

Ecology's Reduced Emission Limits Are Inconsistent With Ecology's Recent Precedents for Permitting Vantage's Business Competitors. In 2011 Ecology issued air quality permits to other computer data centers in Quincy, some of which are Vantage's business competitors. Those other data centers requested load-specific emission limits that were at least as high as their suppliers' vendor-guaranteed rates, and for some pollutants considerably higher than their vendor-guaranteed rates. In those recent cases Ecology granted their request. Therefore, Vantage questions Ecology's decision to change its recent precedents, and to impose arbitrarily low reduced emission limits, but only for the Vantage Data Center.

July 2012 after ICF Adjust decouple BACT

TECHNICAL SUPPORT DOCUMENT
NOTICE OF CONSTRUCTION APPROVAL ORDER
VANTAGE DATA CENTERS MANAGEMENT COMPANY, LLC
VANTAGE-QUINCY DATA CENTER
JULY, 2012

1. BACKGROUND

Starting in 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 start construction before July 1, 2011. The AQP has received 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.

2. EXECUTIVE SUMMARY

Vantage Data Centers Management Company, LLC submitted a Notice of Construction (NOC) application received by Ecology on February 10, 2012, 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 February 10, 2012 NOC application began on February 11, 2012, and a notification that more information was necessary was issued on February 22, 2012 by the Department of Ecology under the supervision of the Eastern Regional Office Section Manager (Wood). Partial response to the request for additional information was received by Ecology on

March 19, 2012. The NOC application was considered complete as of May 1, 2012. 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 27, 2012 in the Columbia Basin Herald. Vantage and its consultant, ICF, found that the emission limits resulting from use of the BACT analyses in the application submittals (the stack test emission limits in Condition 5 of the Preliminary Determination) would be difficult to achieve, and submitted a supplemental BACT analysis received by Ecology on July 16, 2012. Ecology's evaluation of this BACT submittal follows at the end of this TSD. Public review began on approximately , and ended on .

3. PROJECT DESCRIPTION

The Ecology Air Quality Program (AQP) received a Notice of Construction (NOC) application for the Vantage-Quincy Data Center on February 10, 2012. 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 described as 'reserve'. The timing of Phases 2-4 depends on customer demand and is not yet determined. Phase 1 is expected to be operational around the end of 2012 and includes the 5 primary and 2 reserve generators all of which are to be 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 - 3 primary engine generators, plus 1 reserve), Data Center 3 (phase 3 - 3 primary engine generators, plus 1 reserve), and a Building described as 'ETC' (phase 4 - 1 primary engine generator plus 1 reserve). The sequence of expected construction was not described. 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 169,500 gallons of ultra-low sulfur diesel fuel. Individual engine operating limits of 85 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. It should be noted that some of the emissions included in Tables 1a and 1b are not approved by this preliminary determination: the preliminary determination requires that stack testing be included in with other approved run-times, and that 'storm avoidance' hours be approved prior to each of phases 2-4 of this project. Table 1b contains toxic air pollutant potential to emit for all phases of the Vantage-Quincy Data Center project.

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 this project, 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. Vantage also established a control cost criteria for future data center diesel engines at a budget-level estimate of $47,714 per ton of combined pollutants controlled.

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, PM_{10} 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.

5.1.6 **BACT determination for NOx**
Ecology determines that BACT for NOx is:

a. Use of EPA Tier 2 certified engines, pre-control, if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; and
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 pre-control if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; 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/ICF 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 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 NOx BACT requirement
Sulfur dioxide	Compliance with the SO_2 BACT requirement
Toluene	Compliance with the VOC BACT requirement
Total PAHs	Compliance with the VOC BACT requirement
Xylenes	Compliance with the VOC BACT requirement

6. AMBIENT IMPACTS ANALYSIS

Vantage obtained the services of ICF 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. ICF 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:

[2] WAC 173-460-020

9. 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.

******END OF VANTAGE JUNE TSD ******

In Federal guidance regarding the process of determining BACT-level control, the applicant is assigned responsibility for presenting and defending a preferred control system (see, for instance, BNA Policy and Practice Series, Air Pollution Control, 10-91, Page 181:152). When Ecology indicated to Vantage and ICF that the BACT proposal in the application materials submitted on February 10, 2012, was incomplete, Vantage/ICF forwarded a cost-effectiveness summary for the catalysed DPF and SCR systems they propose to use. The application materials also indicated that those systems were guaranteed to reduce uncontrolled engine emissions of PM by 87%, and NOx, VOC, and CO by 90%. Ecology accepted this proposal as BACT for the Vantage project engines, and then calculated emission limits using uncontrolled engine emission data provided in the application, and using the above emission reduction percentages. These limits were significantly lower than those proposed by Vantage/ICF, for reasons that the applicant has not explained. Instead, Vantage/ICF forwarded a more comprehensive BACT analysis proposing that Tier 2 engines be considered BACT, and that the not-to-exceed (NTE) values (they suggest these are guaranteed, but provide no documentation) were proposing as emission limits be considered voluntary limits not connected to the BACT determination. This is acceptable to Ecology, in part because the higher values proposed were used in the health impacts assessment, and because these higher emission rates appear to satisfy the Tier IV emission levels Vantage indicated they would achieve in their SEPA documents. Without substantial additional information (including specific details and documentation of the guarantees referenced in the application), the elevated emission rates do not appear to reflect the control levels also indicated to be guaranteed in the application materials. The control levels stated as guarantees in the application appear to be the low end of ranges to be expected from equipment of the type proposed. In this case, by de-coupling the BACT determination from the controls required for this project, the issue of what is guaranteed or not does not need resolution. The preceding section on BACT in this technical support document has been modified to reflect the BACT supplemental submittal received July 16, 2012.

******END OF VANTAGE JULY TSD ******

"decoupling the BACT determination from the controls required for this project, the issue of what is guaranteed or not does not need resolution"

NO_2 August 29,

Flibbert, Gregory S. (ECY)

From: Wilder, James [James.Wilder@icfi.com]
Sent: Wednesday, August 29, 2012 11:57 AM
To: Flibbert, Gregory S. (ECY)
Cc: Wilder, James; Mike Duffy; Koster, Robert (ECY); Bowman, Clint (ECY)
Subject: Vantage-Quincy: Request to increase NO2 emission limit at 10% load.
Attachments: NO2 Requested Revised Permit Limits.doc

Hi Greg -

As we discussed yesterday, we recently discovered that Vantage cannot meet the primary NO2 emission limit at 10% load, that is currently listed in Table 5.4 of the Draft . That draft Table 5.4 has what appears to be a typo, and the listed NO2 limit at 10% load should have been 0.183 lbs/hr instead of 0.02 lbs/hr.

But Vantage can't meet even the 0.183 lbs/hr limit at 10% load, because at low load the catalyzed DPF converts a lot of the primary NO to primary NO2 (this is not a problem at high load). Based on Vantage's stack tests on a similar unit, we need to increase the NO2 limit at 10% load up to 1.5 lbs/hr. The attached Word file shows a series of tables that explain the reason and show the ramifications.

Increasing the primary NO2 limit at 10% load would increase the permitted facility-wide NO2 emission rate during a power outage. To compensate for this, Vantage proposes to reduce the NO2 emission limits at high load, so the facility-wide hourly NO2 emissions for the data center remains unchanged compared to our AERMOD modeling back in May-2012 (we modeled a facility-wide total of 18.1 lbs/hr, and the requested new limits correspond to a new facility-wide value of 18.2 lbs/hr).

Can we convene a teleconference ASAP to discuss this, and to develop a plan?

Thanks!

Jim Wilder, P.E. | Environmental Engineer | Direct 206/801-2832 | james.wilder@icfi.com | icfi.com

ICF INTERNATIONAL | 710 2nd Avenue, Suite 550, Seattle, WA 98104 | Main Office 206/801-2800

Exhibit 16

Flibbert, Gregory S. (ECY)

From: Wilder, James [James.Wilder@icfi.com]
Sent: Thursday, August 30, 2012 12:30 PM
To: Flibbert, Gregory S. (ECY); Koster, Robert (ECY); Wood, Karen K. (ECY)
Cc: Wilder, James; Mike Duffy; Bowman, Clint (ECY); Palcisko, Gary (ECY)
Subject: Vantage: Wilder educated guesses about how Vantage PD numerical values will change
Attachments: Wilder educated guess about Vantage PD numerical values 8-30-2012.pdf

Hello folks - thank you for teleconferencing with us to discuss Vantage's proposal to do the following:
1) Increase the primary NO2 emission limit at 10% load;
2) Reduce the allowable NO2 emission limits at high load;
3) Reduce the allowable runtime for generator idling during scheduled testing and outages.

The attached file shows the numerical values in the Draft PD that would have to be changed, after ICF submits new emission calculations and AERMOD results to demonstrate compliance with the NO2 ASIL and the NO2-NAAQS. For each item I show a qualitative "up arrow" or "down arrow" to indicate whether I anticipate the new value will increase or decrease. In general, here are my educated guesses:

Allowable runtime for idling would be restricted by numerous permit conditions, and would decrease by maybe 50%.
Facility-wide PTE for primary NO2 might increase a bit, or maybe stay the same, or maybe decrease a bit.
Facility-wide fuel usage would decrease by maybe 10%
Facility-wide PTE for all other regulated pollutants (other than primary NO2) would decrease by maybe 10%.
AERMOD 1-hr NO2 during an outage might increase by 10%, but would be less than the ASIL
AERMOD 1-hr NO2 values for NAAQS compliance might increase by 10%, but in all cases would be less than the NAAQS
AERMOD 24-hr PM10 and PM2.5 concentrations would decrease, maybe by 10% to 50%
DEEP cancer risk would decrease by maybe 10%.

We cannot complete the revised AERMOD modeling before the hearing.

SO GIVEN THESE EDUCATED GUESSES ON THE TRENDS, SHOULD WE HOLD THE PUBLIC HEARING ON SEPT 6?

After you review these educated guesses, please let Mike Duffy and I know the steps by which Ecology will decide about the future path forward...

Again, thanks for your patience and thanks for your help with this issue.

Jim Wilder, P.E. | Environmental Engineer | Direct 206/801-2832 | james.wilder@icfi.com | icfi.com

ICF INTERNATIONAL | 710 2nd Avenue, Suite 550, Seattle, WA 98104 | Main Office 206/801-2800

In January 2010, ICF Jones & Stokes became ICF International.
Check out icfi.com/evolution.

Exhibit 17

EMISSION RATES FOR REQUESTED REVISED NO2 EMISSION LIMITS
VANTAGE-QUINCY DATA CENTER

Table A. Stack Test Safety Factors for Current vs. Revised NO2 Emission Limits

Load	NO2 Stack Test (lbs/hr)	NO2 Current Permit Limit (lbs/hr)	Current NO2 Safety Factor (Permit Limit Divided by Stack Test)	NO2 Requested Revised Limit (lbs/hr)	Revised NO2 Safety Factor (Permit Limit Divided by Stack Test)
81%	0.07	0.76	11	0.4	5.7
90%	0.07	0.88	12	0.4	5.7
93%	0.07	0.93	13	0.4	5.7
10%	0.94	0.18	0.2 (Stack test exceeds permit limit)	1.5	1.6

Table 5.3: Nitrogen oxide (NOx) emission rate limits			
	Operating Scenario	Operating Load	Emission limit per engine, lbs/hr
5.3.1	Annual Step Testing	100%	10.3
5.3.2	Corrective Maintenance	100%	10.3
5.3.3	Building 1 outage, Storm Avoidance	81% 10%	~~8.83~~ 7.58 ~~1.83~~ 1.9
5.3.4	Buildings 2 and 3 Outage	90%	~~7.58~~ 8.83
5.3.5	Building ETC Outage	93%	9.3

Table 5.4: Nitrogen dioxide (NO2) emission rate limits			
	Operating Scenario	Operating Load	Emission limit per engine, lbs/hr
5.4.1	Annual Step Testing	100%	~~1.03~~ 0.4
5.4.2	Corrective Maintenance	100%	~~1.03~~ 0.4
5.4.3	Building 1 outage, Storm Avoidance	81% 10%	~~0.88~~ 0.4 ~~0.02~~ 1.5
5.4.4	Buildings 2 and 3 Outage	90%	~~0.76~~ 0.4 ~~0.02~~ 1.5
5.4.5	Building ETC Outage	93%	~~0.93~~ 0.4 ~~0.02~~ 1.5

PRIMARY NO2 EMISSIONS ACCOUNTING FOR DELAY IN SCR ACTIVATION TIME

Table B. Original May-2012 Modeling With Current Permit Limits
NO2 Emissions (lbs/hr) Accounting For Catalyst Delay Time

Load	Tot Run Time Min	Warm Up time	Untreated NO2 lbs/hr	Subtotal Time x NO2	Treated Time Min	Treated NO2 lbs/hr	Subtotal Time x NO2	Wt. Average NO2 lbs/hr
81	60	10	3.72	0.62	50	0.758	0.631667	1.25
90	60	10	4.36	0.727	50	0.883	0.735833	1.46
93	60	10	4.61	0.768	50	0.93	0.775	1.54
Idle	60	20	0.57	0.19	40	0.183	0.12	0.312

Table C. Proposed Permit Limits
NO2 Emissions (lbs/hr) Accounting For Catalyst Delay Time

Load	Tot Run Time Min	Warm Up time	Untreated NO2 lbs/hr	Subtotal Time x NO2	Treated Time Min	Treated NO2 lbs/hr	Subtotal Time x NO2	Wt. Average NO2 lbs/hr
81	60	10	3.72	0.62	50	0.4	0.333333	0.95
90	60	10	4.36	0.727	50	0.4	0.333333	1.06
93	60	10	4.61	0.768	50	0.4	0.333333	1.10
Idle	60	20	0.57	0.19	40	1.5	1	1.19

FACILITY-WIDE NOX EMISSIONS DURING A POWER OUTAGE

Table D. Changes to Facility-Wide NOx

FACILITY-WIDE NOX W/ CURRENT LIMITS AS MODELED, MAY-2012							
Gen #	Gen Area	Engine Load	No. Gens	Worst Case Emission Hours	Each Genset NOX lbs/hr	Facility Wide NOX lbs/hr	
Unplanned Outage + Storm Avoidance			Outage + Storm Avoidance				
1-1 to 1-5	Bldg 1	81%	5	1	12.5	62.5	
2-1 to 2-3	Bldg 2	90%	3	1	14.6	43.8	
3-1 to 3-3	Bldg 3	90%	3	1	14.6	43.8	
ETC-1	ETC	93%	1	1	15.4	15.4	
Zero Idle			Zero Idle				
1-6 and 1-7 Reserve	Bldg 1	10%	2	1	3.12	6.24	
2-4 Reserve	Bldg 2	10%	1	1	3.12	3.12	
3-4 Reserve	Bldg 3	10%	1	1	3.12	3.12	
ETC-2 Reserve	ETC	10%	1	1	3.12	3.12	
				Facility-Wide Emissions		181.1	NOX lbs/HR

Facility-Wide NOX with 10% load adjusted from 1.83 lbs/hr to 1.9 lbs/hr							
Gen #	Gen Area	Engine Load	No. Gens	Worst Case Emission Hours	Each Genset NOX lbs/hr	Facility Wide NOX lbs/hr	
Unplanned Outage + Storm Avoidance			Outage + Storm Avoidance				
1-1 to 1-5	Bldg 1	81%	5	1	12.5	62.5	
2-1 to 2-3	Bldg 2	90%	3	1	14.6	43.8	
3-1 to 3-3	Bldg 3	90%	3	1	14.6	43.8	
ETC-1	ETC	93%	1	1	15.4	15.4	
Zero Idle			Zero Idle				
1-6 and 1-7 Reserve	Bldg 1	10%	2	1	3.17	6.34	
2-4 Reserve	Bldg 2	10%	1	1	3.17	3.17	
3-4 Reserve	Bldg 3	10%	1	1	3.17	3.17	
ETC-2 Reserve	ETC	10%	1	1	3.17	3.17	
				Facility-Wide Emissions		181.4	NOX lbs/HR

PRIMARY NO2 (FACILITY-WIDE EMISSIONS DURING A POWER OUTAGE)

Table E. Changes to Facility-Wide Primary NO2

PRIMARY NO2 AS INCORRECTLY MODELED, MAY-2012 (CURRENT LIMITS)							
Gen #	Gen Area	Engine Load	No. Gens	Worst Case Emission Hours	Each Genset NOX lbs/hr	Facility Wide NOX lbs/hr	
Unplanned Outage + Storm Avoidance			Outage + Storm Avoidance				
1-1 to 1-5	Bldg 1	81%	5	1	1.25	6.25	
2-1 to 2-3	Bldg 2	90%	3	1	1.46	4.38	
3-1 to 3-3	Bldg 3	90%	3	1	1.46	4.38	
ETC-1	ETC	93%	1	1	1.54	1.54	
Zero Idle			Zero Idle				
1-6 and 1-7 Reserve	Bldg 1	10%	2	1	0.312	0.624	
2-4 Reserve	Bldg 2	10%	1	1	0.312	0.312	
3-4 Reserve	Bldg 3	10%	1	1	0.312	0.312	
ETC-2 Reserve	ETC	10%	1	1	0.312	0.312	
				Facility-Wide Emissions		18.1	NO2 lbs/HR

PRIMARY NO2, REQUESTED NO2 EMISSION LIMITS (AUG-2012)							
Gen #	Gen Area	Engine Load	No. Gens	Worst Case Emission Hours	Each Genset NOX lbs/hr	Facility Wide NOX lbs/hr	
Unplanned Outage + Storm Avoidance			Outage + Storm Avoidance				
1-1 to 1-5	Bldg 1	81%	5	1	0.95	4.75	
2-1 to 2-3	Bldg 2	90%	3	1	1.06	3.18	
3-1 to 3-3	Bldg 3	90%	3	1	1.06	3.18	
ETC-1	ETC	93%	1	1	1.1	1.1	
Zero Idle			Zero Idle				
1-6 and 1-7 Reserve	Bldg 1	10%	2	1	1.19	2.38	
2-4 Reserve	Bldg 2	10%	1	1	1.19	1.19	
3-4 Reserve	Bldg 3	10%	1	1	1.19	1.19	
ETC-2 Reserve	ETC	10%	1	1	1.19	1.19	
				Facility-Wide Emissions		18.2	NO2 lbs/HR

VANTAGE PUBLIC COMMENT.....FILE #5 of 5.....Dal Porto

Exhibit 18 through Exhibit 26.....Documents on file in the Quincy City Hall specific to the extended comment period, ending January 11, 2013, for the Vantage-Quincy Data Center Air Quality permit.

Exhibit 27 through 32 are additional documents used for this Public Comment.

These documents are on file for the extended comment period from the September 6, 2012 public hearing and the comments are due to Ecology on January 11, 2013 by midnight. A second Public Hearing has been requested to have questions answered regarding the various documents presented for the consideration of the air quality permit for Vantage-Quincy Data Center. The requested second Public Hearing has been denied.

There are seven (7) operational documents on file for the extended comment period for Vantage. The question of emissions and emission controls is the primary focus of these documents.

October 10-20, 2012, ICF documents Exhibit 19 and Exhibit 20 list emission controls. October 21 IFC Revised NOC lists no controls under BACT but the report continues that generators will have emission controls. Exhibit 22 Second Tier Risk TSD (increased DEEP at 10%) has emission controls. Exhibit 23 Ecology lists Tier 4 engines as "more than satisfied BACT and t-BACT requirement for diesel engines powering backup generators at Vantage." Page 4. The footnote #4 on page 4 declares BACT as Tier 2 engines if these engines are installed and operated as emergency engines... Exhibit 24 Ecology lists Tier 2 engines as BACT but the Engine Restrictions page 6 lists controls.

Exhibit 25, December Amendment to May, 2012, TSD, This document is the most confusing of the Ecology documents. Ecology says: " Vantage has insisted that Tier 2 engines (no add-on controls) are the highest level of control Ecology can require as BACT." Page 1. I find no evidence that Vantage has "insisted" on Tier 2 as BACT. I find to the contrary that Vantage has, from the beginning, requested and offered to provide a high level of assurance to Quincy residents about the safe operation of their data center. Vantage asked for extra "storm avoidance hours" (Exhibit 13) as well as offered a series of emission control equipment to reduce all emissions from the facility (look at ICF documents to see efforts to provide emission reduction). I believe Exhibit 25 to be a complicated and confusing conclusion to these many efforts to site the Vantage Data Center.

Exhibit 25 has consecutive pages dated June, 2012 and some dated May 2012. There is a ****END OF VANTAGE June TSD**** and a ***** END OF VANTAGE JULY TSD***** when the title of the document is an amendment to a May document.

EXHIBIT 18

Page 16 of Exhibit 25 has this comment: "...Vantage/ICF forwarded a more comprehensive BACT analysis proposing that Tier 2 engines be considered BACT, and the not-to-exceed (NTE) values they were proposing as emission limits be considered voluntary limits not connected to the BACT determination. This is acceptable to Ecology. The preceding section on BACT in this technical support document has been modified to reflect the BACT supplemental submittal received July 16, 2012." As a member of the public I did not see a document labeled in a manner I could determine arrived at Ecology July 16, 2012. When I requested Ecology send me this July 16, 2012 document, they sent me the May 2012, material. BACT is supposed to be the best available emission controls for a project. I want to know if Ecology is proposing to Vantage that they abandon the emission controls they prefer in order that Vantage not set a high standard (precedent) for BACT emission controls and therefore set the high bar that will require all other air permit projects meet this standard.

<u>These are two specific questions I am addressing to the public comment period.</u> Why is Ecology asking Vantage to step away from their emission control standards? Can Vantage satisfy the emission limits without controls?

Exhibit 25 page 9.....Description of the input data source for AERMET meteorological data coming from Moses Lake and Spokane. Quincy weather is not like Moses Lake weather, 37 miles from Quincy, or Spokane weather, 135 miles from Quincy. All sections of the state have microclimates. I submit that closer weather stations would be the Ephrata airport, 18 from Quincy and Wenatchee, 27 miles from Quincy. Quincy weather is unique because Quincy is in a shallow valley with the highest point in Grant County, Monument Mountain, to the north and weather patterns coming down the Columbia River from the north. I believe we have many more inversions than locations around us. It is not honest to have weather data be used in air quality permits that does not represent the location of the project.

<u>This is a specific comment for the public hearing</u>: I am requesting a local weather data source to represent Quincy for air quality permits.

1. **Exhibit 19.....October 19, 2012 ICF** Revised-Final Second Tier Risk Analysis Technical Support Document (Increased DEEP Emission Limit at 10% Load). **BACT: Page 14**, Tier 4 emission controls. Operation from 7am to 7pm.

2. **Exhibit 20.....October 19, 2012 ICF** Revised- Final Notice of Construction Support Document for Second Tier Review (Increased Emission Limits). **BACT: Page 20-21**, Emission Controls, including EnviCat® 2055 DPF Filter.

3. **October 26, 2012** Letter from James Wilder to Mike Duffy (Vantage), Paul Manzer, Erika Britney, Sharon Douglas, Kailing Kuo, Gregory Flibbert (ECY), Clint Bowman (ECY), Gary Palcisko (ECY), Karen Wood (ECY). James Wilder,

the ICF manager of the Vantage project, is leaving ICF and moving to Landau Associates effective October 27, 2012.

4. **Exhibit 21.....November 28, 2012 ICF** Revised-Final Notice of Construction Support Document for Second Tier Review (Increased Emission Limits). **BACT: pages 20-21.** The document states: The top-down BACT assessment concluded **BACT should use EPA Tier -2 certified engines** with rigorous generator maintenance as required by the Federal New Source Performance Standards (NSPS) Subpart llll. **The report continues that for the Vantage Data Center project all generators will be equipped with emission controls.** Complete list of controls on page 20 of document. The controls include the diesel emission control strategy AirClarity as well as the EnviCat® 2055 DPF.

5. **Exhibit 22.....November 28, 2012, ICF** Revised-Final Second Tier Risk Analysis, Technical Support Document (Increased DEEP Emission Limit at 10% Load), **BACT: Page 16.** Air Clarity™ 3000, Emission controls for 3000-XC6DT2 engine.

6. **Exhibit 23.....November 30, 2012 Ecology** Updated Second Tier Review Recommended Document for Vantage Data Center, Quincy, Washington. **BACT: page 4 of 8.** Tier 4 engines equipped with diesel particulate filters, diesel oxidation catalysts and selective catalytic reduction ("more than satisfies the BACT and t-BACT requirement for diesel engines powering backup generators at Vantage") This statement in section 2.2.1 of the document has a footnote: BACT was determined to be met through use of EPA Tier 2 certified engines if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model year or later engines are installed and operated as non-emergency engines; ... NO2 page 7 of 8. "While NO2 levels could indeed rise to levels of concern at various locations across town, the outage would have to occur at a time when the dispersion conditions were optimal for concentrating NO2 at a given location. Ecology found that the likelihood of this occurrence is relatively low throughout Quincy."

7. **Exhibit 24.....November 2012 Ecology** Preliminary Determination, IN THE MATTER OF APPROVING A NEW AIR CONTAINANT SOURCE FOR VANTAGE DATACENTERS MANAGEMENT OMPANY, LLC, VANTAGE-QUINCY DATA CENTER. **BACT: page 4-5 Tier 2 engines** Determination #4. The modeled ambient concentration of one toxic air pollutant-diesel engine exhaust particulate matter-exceed the Acceptable Source Impact Level (ASIL) for that pollutant, as defined in Chapter 173-460 WAC. Ecology has reviewed the health risks associated with diesel engine exhaust particulate 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).

Equipment Restrictions page 6 of 17, November, 2012, (2.1) Any engine used to power the electrical generators shall be certified by the manufacturer to meet 40 CFA 60 Tier II emission levels or other specifications as required by the EPA at the tie the engines are installed. Each engine to be installed must be permanently labeled by the manufacturer as and emergency engine in accordance with 40 CFR § 60.4210(f), and must be equipped with CO, VOC, PM, and NOX control equipment at least as effective as that evaluated in this NOC approval.

8. **Exhibit 25.....DECEMBER AMENDMENT TO MAY, 2012 TSD Ecology** Technical Support Document (TSD), Notice of Construction Approval Order, Vantage Data Centers Management Company, LLC, Vantage-Quincy Data Center. This document is numbered consecutively but page 2 -13 is labeled June, 2012. Pages 14-16 are labeled May 2012.

BACT is mentioned several times in this document. **BACT: Page 1, first bullet.** Ecology states: "There is no analysis in the application demonstrating EPA Tier 4 emission levels will be satisfied. The last sentence (in the May 2012 TSD) suggests some connection of the proposed control equipment to BACT. "Vantage has insisted that Tier 2 engines (no add-on control) are the highest level of control Ecology can require as BACT. The reference to Tier 4 and BACT should be removed from this paragraph."

5.1.1 and 5.1.6 **BACT: pages 6-7** (note that this page is labeled June, 2012, not May, 2012) Listing of the BACT for NOx is urea-based SCR with ammonia slip no greater than 15 ppmv at 15% O2 as well as ultra-low sulfur fuel.

5.2.1 **BACT: page 7** (note that this page is labeled June, 2012 not May,2012) Diesel particulate filers were listed as BACT but the July 16, 2012 supplemental analysis of BACT retracted this proposal, instead proposed that Tier 2 engines should be considered BACT for these engines. Ecology accepts this option as BACT for these engines.

5.2.4 **BACT page 7-8** (This page is labeled June, 2012, not May, 2012) Use of EPA Tier 2 certified engines is determined to be BACT for particulate matter, carbon monoxide and volatile organic compounds.

5.3.2 **BACT page 8** (This page is labeled June 2012, not May, 2012) BACT for sulfur Dioxide is the use of ultra-low sulfur diesel fuel

BACT May, 2012, page 16 of the document labeled December Amendment to May, 2012 TSD. Disparity in the emission numbers between Vantage and Ecology. "Vantage/ICF forwards a more comprehensive BACT analysis

proposing that Tier 2 engines be considered BACT, and that the not-to-exceed (NTE) values they were proposing as emission limits be considered voluntary limits not connected to the BACT determination. This is acceptable to Ecology. The proceeding section on BACT in this technical support document has been modified to reflect the BACT supplemental submittal received July 16, 2012."

Weather: Input data 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. Page 9

Assumed Background Concentrations: Two lists on page 10 (6.2) give background centration for emissions. One list is without "local background" and one is with the combined contributions of Sabey, Yahoo, Intuit and Celite. This list has not included the railroad both the mainline and the Cold Train facility that has numerous idling trains per day. Any cumulative impact should include Microsoft, Dell and ConAgra. All the industrial activity in Quincy is within the city UGA, about a 2.5 square mile distance.

Storm Avoidance Hours: 16 hours per year have been assigned for operating engine generators in 'storm avoidance' mode.

This document has a section on page 16, May 2012 that discusses the calculated emission rates and the limits proposed by ICF/Vantage. This paragraph states: "...Vantage/ICF forwarded a more comprehensive BACT analysis proposing that Tier 2 engines be considered BACT, and that the not-to-exceed (NTE) values they were proposing as emission limits be considered voluntary limits not connected to the BACT determination. This is acceptable to Ecology. The preceding section on BACT in this technical support document has been modified to reflect the BACT supplemental submittal received July 16, 2012."

9. **Exhibit 26.....November 30, 2012 Ecology** Letter from Jeff Johnston (ECY) to Karen Wood (ECY) Page 2 "Although Vantage was not required to evaluate short-term impacts of nitrogen dioxide (NO2), the HIA provided a brief evaluation of acute non-cancer hazards. Generally, Vantage's emission by themselves are not expected to result in acute non-cancer hazards, but cumulative emission of multiple emergency engines at other data centers could combine to create short-term NO2 levels of concern. Ecology's evaluation of simultaneous emergency engine emissions in Quincy indicate that evaluated NO2 levels could occur, but the likelihood of a system-wide outage coinciding with unfavorable meteorology is very low."

This is a list of the additional information used for this presentation.

10. **Exhibit 27.....June 20, 2012 Ecology** Second Tier Review Recommendation Document. BACT: page 3-4 Tier 4 emission controls. Information on DEEP emissions on page 4. Information on NO2 emissions on page 7.

11. **Exhibit 28.....Ecology** Map of Microsoft (Expansion Only) illustrating the Diesel PM concentration relative to ASIL.

12. **Exhibit 29.....Ecology** Map showing Quincy data center Microsoft, Yahoo and Intuit and the diesel plumes.

13. **Exhibit 30.....ICF** Map illustrating the DPM Cancer Risk for Expansion Generators at Permits. Plus Existing... (remaining words missing).

14. **Exhibit 31.....ICF July 11, 2012** Letter from Jim Wilder (ICF) to Greg Flibbert and Robert Koster (ECY-Spokane) Top-Down BACT Assessment Vantage-Quincy Data Center, Quincy, WA Table 1, page 2, Comparison of Cost-effectiveness Evaluations.

15. **Exhibit 32.....Columbia Nuclear International LLC/Washington River Protection Solutions,** Carolyn C. Haass, J. Louis Kovach/ Steve E. Kelly, David A. Turner. Evaluation of Best Available Control Technology for Toxics (tBACT) Page 5 writes out the options in tBACT evaluations and describes methods to determine emission cost factors.

Revised-Final Second Tier Risk Analysis Technical Support Document (Increased DEEP Emission Limit at 10% Load)

Vantage Data Center
Quincy, Washington

October 19, 2012

Prepared for

Vantage Data Centers
2625 Walsh Avenue
Santa Clara, CA 95051

Prepared by

ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104
Contact: Jim Wilder
206.810.2832

Exhibit 19

disclosure of risk at a public hearing, and related factors associated with the facility and the surrounding community.

3.2. BACT and tBACT for the Vantage Data Center Project

Ecology is responsible for establishing BACT and tBACT for controlling criteria and TAPs emitted from the new diesel generators. The proposed generators will use EPA Tier 4 combustion controls to reduce emissions of particulate matter, oxides of nitrogen (NO_X), including nitrogen dioxide (NO_2), unburned hydrocarbons, and other pollutants. Ecology's BACT and tBACT determinations are summarized in Tables 3-1 and 3-2, respectively.

Table 3-1. Summary of BACT Determination

Pollutant(s)	BACT Determination
Particulate matter (PM)	Use of good combustion practices; Use of a catalyzed, diesel particulate filter (DPF) on each engine; and Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.
Nitrogen oxides (NOX)	Use of good combustion practices; Use of a urea selective catalytic reduction (SCR) scrubber on each engine; and Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.
Carbon monoxide (CO) and volatile organic compounds (VOC)	Use of good combustion practices; Use of a catalyzed diesel particulate filter on each engine; and Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.
Sulfur dioxide	Use of ultra-low sulfur diesel fuel containing no more than 15 parts per million by weight of sulfur.

Table 3-2. Summary of tBACT Determination for Air Toxics

Toxic Air Pollutant(s)	tBACT Determination
DEEP	Compliance with the PM BACT requirement
Acetaldehyde, carbon monoxide, acrolein, benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, propylene, toluene, total PAHs, xylenes	Compliance with the VOC BACT requirement
Nitrogen dioxide	Compliance with the NOX BACT requirement
Sulfur dioxide	Compliance with the SO2 BACT requirement

Additional restrictions proposed in the NOC include:

- Limits on the total amount of hours that engines operate.
- Limits on the total amount of hours the generators are allowed to operate during each category of testing and maintenance.
- Use of ultra-low sulfur diesel fuel (15 parts per million sulfur content).

Revised-Final Notice of Construction Support Document for Second Tier Review (Increased Emission Limits)

Vantage Data Center
Quincy, Washington

October 19, 2012

Prepared for

Vantage Data Centers
2625 Walsh Avenue
Santa Clara, CA 95051

Prepared by

ICF International
710 Second Avenue, Suite 550
Seattle, WA 98104
Contact:: Jim Wilder
206.801.2832

10-009

Exhibit 20

4. Best Available Control Technology Assessment

As requested by Ecology, a detailed top-down BACT assessment was conducted in July 2012. The full report on this assessment is provided in Appendix D. The top-down BACT assessment concluded that BACT should use EPA Tier-2 certified engines, with rigorous generator maintenance as required by the federal New Source Performance Standards (NSPS) Subpart IIII.

For this October 2012 resubmittal, the calculated BACT cost-effectiveness values are unchanged from the previous July 2012 values, because the previous July 2012 BACT assessment used emission rates that were based on the "nominal-uncontrolled" and "nominal-controlled" emission rates, neither of which have been revised for this update.

For the Vantage Data Center project, all generators will be equipped with diesel particulate filters (DPFs), SCR systems for control of emissions of NO_x, and diesel oxidation catalysts for control of emissions of CO and VOC using the AirClarity™ 3000 Emissions Control System for 3000-XC6DT2 engines. The controlled emissions are expected to be lower than uncontrolled emissions by more than 87% for PM, and by more than 90% for NO_x, CO, and VOC. This proposed equipment for the Vantage Data Center is more costly and provides better emission control than is required for BACT for the proposed generators.

4.1. Overview of the AirClarity Control Equipment

The diesel emission control strategy the AirClarity utilizes highly oxidizing precious metal particulate matter filters to control PM, VOC, and CO and a Selective Catalytic Reducer coupled with an airless DEF injection system. The injection system includes reductant tank level monitoring, return and supply flow metering, DPF temperature, SCR temperature (pre and post), DPF backpressure, system backpressure, and SCR outlet NOx sensor. All parameters are logged and will produce alarms should the system operate out of specifications. A relative humidity sensor will also be utilized in the system, as humidity has been known to affect engine-out NO_x by as much as 15% depending on ambient conditions.

The EnviCat® 2055 DPF is a wall-flow ceramic Diesel Particulate Filter coated with a Süd-Chemie proprietary precious metal based coating on a cordierite ceramic substrate. The device is designed to filter and passively reduce >95% diesel particulate matter mass found in diesel engine exhaust. Furthermore, carbon monoxide and hydrocarbon emissions in the exhaust are reduced by means of catalytic oxidation in the catalyzed DPF. This device does not employ zone coating. The catalyzed DPF is also responsible for reducing hydrocarbons by almost 96%, as well as carbon monoxide reductions of greater than 99% (reductions based on engine baseline and emissions testing at 5-mode average). The EnviCat® 20019 SCR is a flow through ceramic substrate coated with a Süd-Chemie proprietary SCR coating. The SCR is designed to reduce engine out NO_x emissions across a broad range of engine operating conditions.

Vendor-guaranteed removal efficiencies are as follows:

- NOx >90%

- CO >90%
- VOC >90%
- PM >87%

Information on how the DPF will be passively regenerated is provided in Appendix D. The passive regeneration will be accomplished during the routinely-scheduled quarterly generator testing. No special generator runtime is required to regenerate the DPFs.

Stack test data are provided in Appendix D, and CARB certification is in progress.

The vendor-estimated purchase price of emission control equipment is estimated to be $400,000 per generator more than Tier 2 equipment. A detailed BACT cost-effectiveness analysis for Vantage's proposed emission control system is provided in Appendix D.

Oct. 26, 12 Jim Wylder Leaving ICF

Flibbert, Gregory S. (ECY)

From: Wilder, James [James.Wilder@icfi.com]
Sent: Friday, October 26, 2012 12:57 PM
To: Mike Duffy; Paul Manzer; Britney, Erika; Douglas, Sharon
Cc: Wilder, James; Kuo, Kailing; Flibbert, Gregory S. (ECY); Bowman, Clint (ECY); Palcisko, Gary (ECY); Wood, Karen K. (ECY)
Subject: Vantage Data Center: new ICF project manager

Hello folks - Effective on Saturday October 27, Jim Wilder is leaving ICF. Jim is moving to Landau Associates, beginning November 1.

The scope of work to complete this project is as follows:
ICF respond to Ecology data requests about Oct-2012 application
ICF assist Vantage to prepare for public hearing (this is unlikely to happen)
ICF review and comment on revised Draft Preliminary Determination by Ecology
ICF review and comment on final Order (final air permit)

The communication for completion of this project is as follows:

Owner = Vantage Data Centers – Mike Duffy
206/406-9148
mduffy@vantagedatacenters.com

Contract manager = Paul Manzer, Pacland
pmanzer@pacland.com
425/453-9501 x 1539

New ICF Project Mgr = Erika Britney
206/801-2802
Erika.britney@icfi.com

ICF Technical lead = Sharon Douglas, ICF San Rafael CA
Sharon.douglas@icfi.com
415/507-7108

Jim Wilder's new home = Landau Associates
130 2nd Avenue S.
Edmonds, WA
425/778-0907; cel phone = 206/579-3083

Jim Wilder, P.E. | Environmental Engineer | Direct 206/801-2832 | james.wilder@icfi.com | icfi.com
ICF INTERNATIONAL | 710 2nd Avenue, Suite 550, Seattle, WA 98104 | Main Office 206/801-2800

Revised – Final Notice of Construction Support Document for Second Tier Review (Increased Emission Limits)

Vantage Data Center
Quincy, Washington

November 28, 2012

Submitted to:
Vantage Data Center
2625 Walsh Avenue
Santa Clara, CA 95051

Prepared by
ICF International
101 Lucas Valley Road, Suite 260
San Rafael, CA 94903
Contact: Sharon Douglas
+1.415.507.7108

Exhibit 21

12-056

4 Best Available Control Technology Assessment

As requested by Ecology, a detailed top-down BACT assessment was conducted in July 2012. The full report on this assessment is provided in Appendix D. The top-down BACT assessment concluded that BACT should use EPA Tier-2 certified engines, with rigorous generator maintenance as required by the federal New Source Performance Standards (NSPS) Subpart IIII.

For this November 2012 resubmittal, the calculated BACT cost-effectiveness values are unchanged from the previous July 2012 values, because the previous July 2012 BACT assessment used emission rates that were based on the "nominal-uncontrolled" and "nominal-controlled" emission rates, neither of which have been revised for this update.

For the Vantage Data Center project, all generators will be equipped with diesel particulate filters (DPFs), SCR systems for control of emissions of NO_x, and diesel oxidation catalysts for control of emissions of CO and VOC using the AirClarity™ 3000 Emissions Control System for 3000-XC6DT2 engines. The controlled emissions are expected to be lower than uncontrolled emissions by more than 87% for PM, and by more than 90% for NO_x, CO, and VOC. This proposed equipment for the Vantage Data Center is more costly and provides better emission control than is required for BACT for the proposed generators.

1.1. Overview of the AirClarity Control Equipment

The diesel emission control strategy the AirClarity utilizes highly oxidizing precious metal particulate matter filters to control PM, VOC, and CO and a Selective Catalytic Reducer coupled with an airless DEF injection system. The injection system includes reductant tank level monitoring, return and supply flow metering, DPF temperature, SCR temperature (pre and post), DPF backpressure, system backpressure, and SCR outlet NOx sensor. All parameters are logged and will produce alarms should the system operate out of specifications. A relative humidity sensor will also be utilized in the system, as humidity has been known to affect engine-out NO_x by as much as 15% depending on ambient conditions.

The EnviCat® 2055 DPF is a wall-flow ceramic Diesel Particulate Filter coated with a Süd-Chemie proprietary precious metal based coating on a cordierite ceramic substrate. The device is designed to filter and passively reduce >95% diesel particulate matter mass found in diesel engine exhaust. Furthermore, carbon monoxide and hydrocarbon emissions in the exhaust are reduced by means of catalytic oxidation in the catalyzed DPF. This device does not employ zone coating. The catalyzed DPF is also responsible for reducing hydrocarbons by almost 96%, as well as carbon monoxide reductions of greater than 99% (reductions based on engine baseline and emissions testing at 5-mode average). The EnviCat® 20019 SCR is a flow through ceramic substrate coated with a Süd-Chemie proprietary SCR coating. The SCR is designed to reduce engine out NO_x emissions across a broad range of engine operating conditions.

Vendor-guaranteed removal efficiencies are as follows:

- NOx >90%
- CO >90%
- VOC >90%
- PM >87%

Revised – Final Second Tier Risk Analysis Technical Support Document (Increased DEEP Emission Limit at 10% Load)

Vantage Data Center
Quincy, Washington

November 28, 2012

Submitted to:
Vantage Data Center
2625 Walsh Avenue
Santa Clara, CA 95051

Prepared by
ICF International
101 Lucas Valley Road, Suite 260
San Rafael, CA 94903
Contact: Sharon Douglas
+1.415.507.7108

Exhibit 22

12-056

3.2 BACT and tBACT for the Vantage Data Center Project

Ecology is responsible for establishing BACT and tBACT for controlling criteria and TAPs emitted from the new diesel generators. Ecology's BACT and tBACT determinations are summarized in Tables 3-1 and 3-2, respectively.

Table 3-1. Summary of BACT Determination

Pollutant(s)	BACT Determination
Particulate matter (PM)	• Use of good combustion practices; • Use of a catalyzed, diesel particulate filter (DPF) on each engine; and • Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.
Nitrogen oxides (NOX)	• Use of good combustion practices; • Use of a urea selective catalytic reduction (SCR) scrubber on each engine; and • Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.
Carbon monoxide (CO) and volatile organic compounds (VOC)	• Use of good combustion practices; • Use of a catalyzed diesel particulate filter on each engine; and • Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII.
Sulfur dioxide	• Use of ultra-low sulfur diesel fuel containing no more than 15 parts per million by weight of sulfur.

Table 3-2. Summary of tBACT Determination for Air Toxics

Toxic Air Pollutant(s)	tBACT Determination
DEEP	Compliance with the PM BACT requirement
Acetaldehyde, carbon monoxide, acrolein, benzene, benzo(a)pyrene, 1,3-butadiene, formaldehyde, propylene, toluene, total PAHs, xylenes	Compliance with the VOC BACT requirement
Nitrogen dioxide	Compliance with the NOX BACT requirement
Sulfur dioxide	Compliance with the SO2 BACT requirement

For the Vantage Data Center project, all generators will be equipped with diesel particulate filters (DPFs), SCR systems for control of emissions of NO_x, and diesel oxidation catalysts for control of emissions of CO and VOC using the AirClarity™ 3000 Emissions Control System for 3000-XC6DT2 engines. The controlled emissions are expected to be lower than uncontrolled emissions by more than 87% for PM, and by more than 90% for NO_x, CO, and VOC. This proposed equipment for the Vantage Data Center is more costly and provides better emission control than is required for BACT for the proposed generators. Additional detail is provided in the NOC document.

DEPARTMENT OF
ECOLOGY
State of Washington

Updated Second Tier Review Recommendation Document for

Vantage Data Center
Quincy, Washington

November 30, 2012

Exhibit 23

2.2.1. tBACT Determination

Ecology's Eastern Regional Office Engineer determined that Vantage's proposed pollution control equipment (i.e., Tier 4 engines equipped with diesel particulate filters, diesel oxidation catalysts, and selective catalytic reduction) more than satisfies the BACT and t-BACT requirement for diesel engines powering backup generators at Vantage.[4]

2.2.2. HIA Review

As described above, the applicant is responsible for preparing the HIA under WAC 173-460-090. Ecology's project team consisting of an engineer, a toxicologist, and a modeler review the HIA to determine if the methods and assumptions are appropriate for assessing and quantifying surrounding community's risk from a new project.

The HIA focused mainly on health risks attributable to DEEP exposure as this was the only TAP with a modeled concentration in ambient air that exceeded an ASIL. ICF briefly described emissions and exposure to other TAPs (nitrogen dioxide, ammonia,[5] and acrolein) because these pollutants exceeded a small quantity emission rate (SQER), and Ecology requested that acute health hazards from exposure to these pollutants be quantified.

While Vantage is located in an industrially zoned area, air dispersion modeling indicated that Vantage's DEEP emissions resulted in concentrations in excess of the ASIL at approximately three residences. Two residences, one located to the southwest and the other to the southeast, are located very near the Vantage facility. Another residential parcel is located about ½ mile south near the BNSF railroad tracks, but ICF reports that the site is occupied by a company, and therefore, the site could be considered commercial. Regardless, estimated Vantage-related DEEP concentrations at this location are much lower than the other two properties adjacent to Vantage. Other nearby land use includes other data centers (Intuit and Sabey) and agricultural properties.

For the purposes of assessing increased cancer risk and non-cancer hazards, ICF identified receptor locations where the highest exposure to project-related air pollutants could occur: at the project boundary, nearby residences, and on-site and off-site commercial areas.[6] ICF calculated both non-cancer hazards and cancer risks for each of these receptors, and they also estimated long-term cumulative risks attributable to and other known sources of DEEP.[7] Vantage's risk assessment also evaluated the combined cancer risk caused by numerous other carcinogens

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[4] BACT was determined to be met through the use of EPA Tier 2 certified engines if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII; and Use of ultra-low sulfur diesel fuel containing no more than 15 parts per million by weight of sulfur.

[5] Some ammonia is released from the selective catalytic reduction equipment designed to reduce NO_X emissions.

[6] ICF also identified sensitive receptor areas, but these were located outside the area of impact (i.e., ASIL was not exceeded in these locations).

[7] Ecology modeled cumulative emissions from existing data centers, railway, and highways. Results were provided to ICF to include in their HIA.

center's emissions during a system-wide outage could potentially cause NO_2 levels to be a health concern. In a separate analysis, Ecology evaluated the short-term NO_2 impacts that could result from emergency engine operation during a system-wide power outage. While NO_2 levels could indeed rise to levels of concern[11] at various locations across town, the outage would have to occur at a time when the dispersion conditions were optimal for concentrating NO_2 at a given location. Ecology found that the likelihood of this occurrence is relatively low throughout Quincy.

4. Conclusions and Recommendation

The project review team has reviewed the HIA and determined that:

a) The TAP emissions estimates presented by ICF represent a reasonable estimate of the project's future emissions.

b) Emission controls for the new and modified emission units meet or exceed the tBACT requirement.

c) The ambient impact of the emissions increase of each TAP that exceeds acceptable source impact levels has been quantified using refined air dispersion modeling techniques as approved in the HIA protocol.

d) The HIA submitted by ICF on behalf of Vantage adequately assesses project-related increased health risk attributable to TAP emissions.

The project review team concludes that the HIA to represent an appropriate estimate of potential increased health risks posed by Vantage's TAP emissions. The risk manager may recommend approval of the proposed project because project-related health risks are permissible under WAC 173-460-090 and the cumulative risk from DEEP emissions in Quincy is less than the cumulative additional cancer risk threshold established by Ecology for permitting data centers in Quincy (100 per million or 100×10^{-6}).

The project review team also recommends that Vantage be required to communicate any health risks posed by their emissions to current residents near the Vantage Data Center, and potential buyers of undeveloped parcels adjacent to the data center, or to the local regulatory agency responsible for zoning and development in the affected area. This recommendation is also stated in Vantage's HIA.

[11] The level of concern in this case is 441 $\mu g/m^3$. This represents California OEHHA's acute reference exposure level of 470 $\mu g/m^3$ minus an estimated regional background concentration of 29 $\mu g/m^3$.

Nov 2012 QC

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF APPROVING A NEW)
AIR CONTAMINANT SOURCE FOR)
VANTAGE DATA CENTERS)
MANAGEMENT COMPANY, LLC)
VANTAGE-QUINCY DATA CENTER) .

Preliminary Determination

TO: Jeff Kane, Vice President
Vantage Data Centers Management Company, LLC
2625 Walsh Ave
Santa Clara, CA 95051

EQUIPMENT

The list of equipment that was evaluated for this order of approval 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 167,205 gallons per year of fuel consumption and up to 82 hours per year of operation per engine. Each primary engine will operate for approximately 72.5 hours per year for required maintenance testing and outage operation and an additional 9.5 hours per year of no-load idle cool down. The generators will be installed in up to four phases. Phase 1 will consist of seven 3.0 MWe generators that will be installed upon approval. Phases 2, 3, and 4 will consist of a total of ten additional 3.0 MWe generators, which will be installed at the facility as independent tenant companies contract for space at the Vantage-Quincy Data Center (hereafter "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	DC1-1P	3.0			
"	DC1	DC1-2P	3.0			
"	DC1	DC1-3P	3.0			
"	DC1	DC1-4P	3.0			
"	DC1	DC1-5P	3.0			
"	DC1	DC1-6R	3.0			
"	DC1	DC1-7R	3.0			
2	DC2	DC2-1P	3.0			
"	DC2	DC2-2P	3.0			
"	DC2	DC2-3P	3.0			
"	DC2	DC2-4R	3.0			
3	DC3	DC3-1P	3.0			
"	DC3	DC3-2P	3.0			
"	DC3	DC3-3P	3.0			
"	DC3	DC3-4R	3.0			
4	ETC	ETC-1P	3.0			

Exhibit 24

"	ETC	ETC-2R	3.0			

The Vantage Data Center will utilize non-evaporative cooling units to dissipate heat from electronic equipment at the facility, thus eliminating evaporative cooling tower emissions from the project.

PROJECT SUMMARY

The Vantage Data Center Phase 1 construction will consist of Building 1 with 5 primary engine-generators and 2 reserve engines. Phases 2, 3, and 4 construction will consist of Buildings 2, 3, and 4 ('ETC') with 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 Vantage 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 excluding emissions due to commissioning of each engine. Table 2b contains toxic air pollutant potential-to- emit for the Vantage-Quincy Data Center project excluding emissions due to commissioning of each engine.

Table 2a: Criteria Pollutant Potential to Emit for Vantage Data Center			
Pollutant	**Emission Factor (EF) Reference**	**Emission Factors**	**Facility Emissions**
Criteria Pollutant		Lb/hr	tons/yr
2.1.1 NOx Total			5.83
2.1.1a NOx 10% load	MTU Guarantee	3.73	na
2.1.1b NOx 93.3% load	MTU Guarantee	15.4	na
2.1.1c NOx 100% load	MTU Guarantee	17.2	na
2.1.2 CO Total	MTU Guarantee	na	1.22
2.1.2a CO 10% load	MTU Guarantee	1.41	na
2.1.2b CO 81% load	MTU Guarantee	1.93	na
2.1.2c CO 93.3% load	MTU Guarantee	2.17	na
2.1.2d CO 100% load	MTU Guarantee	2.39	na
2.1.3 SO_2	MTU Guarantee	na	0.02
2.1.4 $PM_{2.5}$/DEEP Total	MTU Guarantee	na	0.22
2.1.4a DEEP 10% load	MTU Guarantee	0.400	na
2.1.4b DEEP 81% load	MTU Guarantee	0.396	na
2.1.4c DEEP 93.3% load	MTU Guarantee	0.47	na
2.1.4d DEEP 100% load	MTU Guarantee	0.512	na
2.1.5 VOC 10% Load	MTU Guarantee	0.25	0.25

Table 2b: Toxic Air Pollutant Potential to Emit for Vantage 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	6.8E-03
2.1.7 Acrolein	7.88E-06	1.92E-05
2.1.8 Benzene	7.76E-04	1.89E-03
2.1.9 Toluene	2.81E-04	6.85E-4
2.1.10 Xylenes	1.93E-04	4.71E-04
2.1.11 Napthalene	1.30E-04	1.96E-03
2.1.11 1,3 Butadiene	1.96E-05	4.77E-05
2.1.12 Formaldehyde	7.89E-05	1.92E-04
2.1.13 Acetaldehyde	2.52E-05	6.14E-05
2.1.14 Benzo(a)Pyrene	1.29E-07	2.98E-07
2.1.15 Benzo(a)anthracene	6.22E-07	1.44E-06
2.1.16 Chrysene	1.53E-06	3.55E-06
2.1.17 Benzo(b)fluoranthene	1.11E-06	2.58E-06
2.1.18 Benzo(k)fluoranthene	1.09E-07	2.53E-07
2.1.19 Dibenz(a,h)anthracene	1.73E-07	4.02E-07
2.1.20 Ideno(1,2,3-cd)pyrene	2.07E-07	4.81E-07

2.1.21 PAH (no TEF)	3.88E-06	9.01E-06
2.1.22 PAH (apply TEF)	4.98E-07	1.16E-06
State Criteria Pollutant Air Toxics		
2.1.23 DEEP/$PM_{2.5}$	MTU Guarantee	0.19
2.1.24 Carbon monoxide	MTU Guarantee	1.13
2.1.25 Sulfur dioxide	MTU Guarantee	0.02
2.1.26 Primary NO_2*	10% total NOx	0.6
2.1.27 Ammonia	15 ppmv at 15%O_2	0.36

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

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 below:

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; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; b. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII; 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; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; b. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII; 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 one toxic air pollutant – diesel engine exhaust particulate matter – exceeds the Acceptable Source Impact Level (ASIL) for that pollutant, as defined in Chapter 173-460 WAC. Ecology has reviewed the health risks associated with diesel engine exhaust particulate 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 CONDITION

1.1. 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.

2. EQUIPMENT RESTRICTIONS

2.1. 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 specifications as 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), and must be equipped with CO,VOC, PM, and NOX control equipment at least as effective as that evaluated in this NOC approval. 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.

2.2. The only engines and electrical generating units approved for operation at the Vantage Data Center are those listed by serial number in Table 1 above.

2.3. 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 community impacts.

2.4. The installation of any new engines after July 1, 2014 will require notification to Ecology that includes engine manufacturer's specification sheets. Ecology will decide 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.

2.5. The seventeen (17) MTU Model 20V4000 engines exhaust stack heights shall be greater than or equal to 41 feet above ground level for engines providing power to Buildings 1,2, and 3, and 43.8 feet for engines serving Building ETC, and will be no more than 26 inches in diameter. All engines that may be used for this project shall be required to verify that exhaust stack parameters such as diameter, height, and exhaust rate and velocity do not result in community emissions impacts greater than what was evaluated for this project.

2.6. The manufacture and installation of the seventeen (17) engine/generator sets proposed for Building 1, Building 2, Building 3, and Building ETC of the project shall occur by July 1, 2014. 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 community impacts will be re-evaluated if new source review is required. Vantage may request an extension of this time schedule, and Ecology may approve of an extension without revision to this Order.

2.7. This Order only applies to the seventeen (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 review. New source review will not be required for engines with a rated full standby capacity of less than 4678 hp that comply with the engine certification requirements and control equipment requirements contained in Approval Condition 2.1 unless there is an increase in community emission impacts. On a case-by-case basis, Ecology may require additional ambient impacts analyses prior to installation of smaller engines.

3. OPERATING LIMITATIONS

3.1. Following commissioning/start-up testing, the fuel consumption at the Vantage Data Center facility at build-out (4 buildings with a total of 12 primary and 5 reserve engines) shall be limited to a total of 167,205 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 (3) year period using monthly rolling totals.

3.2. Except as provided in Approval Condition 3.5, the seventeen (17) Vantage Data Center engines are limited to the following average hours of operation, and averaging periods:

3.2.1. Each primary engine serving Building 1 shall not exceed 82 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average.

3.2.2. Each reserve engine serving Building 1 shall not exceed 62 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average.

3.2.3. Following start-up and commissioning, the engines serving Building 1 shall not exceed an annual fuel consumption of 65,907 gallons, averaged over a 3 year period using monthly rolling totals.

3.2.4. Operation of the two Building 1 reserve engines shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing. The reserve engines may also provide outage (8 hours) or storm avoidance (16 hours) power in the event of the failure of a primary engine. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.5. Operation of the five primary engines serving Building 1 shall not exceed 10% load except for 8.5 hours per year at 100% load for step testing and corrective maintenance, and 41 hours per year at 81.3% load for building transformer maintenance, storm avoidance, and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.6. Each primary engine serving Building 2, 3 and ETC shall not exceed 66 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average. A total of 16 hours per year of 'storm avoidance' operation may be added to the above total without amendment of this approval upon satisfactory demonstration to Ecology that these hours are a necessity for the tenants of these buildings.

3.2.7. Operation of each of the Building 2 and Building 3 and ETC Building reserve engines (one at each building) shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing. The reserve engines may also provide outage power in the event of the failure of a primary engine. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.8. Operation of the six primary engines serving Building 2 (3) and Building 3 (3) shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing, and 25 hours per year at 90% load for building transformer maintenance and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.9. Operation of the primary engine serving Building ETC shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing, and 25 hours per year at 93% load for building transformer maintenance and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.3. 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.

3.4. The seventeen (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.

3.5. Initial start-up (commissioning) testing for the seventeen (17) MTU Model 20V4000 engines at the Vantage Data Center shall not exceed an average of 40 hours per generator and 8,692 gallons of fuel per generator, averaged over all generators installed during any consecutive 3 year period.

3.5.1. Except during site integration testing as specified below, only one engine shall be operated at any one time during start-up testing.

3.5.2. During a site integration test, no more than seven (7) generator engines may operate concurrently for no more than four continuous hours.

3.5.3. All startup and commissioning testing shall be conducted during daylight hours.

3.5.4. Fuel use limits contained in Approval Conditions 3.1 and emission limits contained in Approval Conditions 5, are not applicable to initial commissioning testing of each engine.

3.5.5. Following start-up and conditioning testing, the number of hours each engine has run, the fuel consumed during the testing, and the date shall be recorded. These data shall be provided to Ecology on request.

4. GENERAL TESTING AND MAINTENANCE REQUIREMENTS

4.1. 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.

4.2. Within 12 months of the first engine installation and every 36 months thereafter, the Vantage Data Center shall measure emissions of particulate matter (PM), Volatile Organic Compounds (VOC), nitric oxide (NO), nitrogen dioxide (NO_2), carbon monoxide (CO), Ammonia (NH_3), and oxygen (O_2) from at least one representative engine's exhaust stack in accordance with Approval Condition 4.3. This testing will serve to demonstrate compliance with the emission limits contained in Section 5, 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.

4.3. The following procedure shall be used for each test for the engines as required by Approval Condition 4.2 unless an alternate method is proposed by the Vantage Data Center and approved in writing by Ecology prior to the test:

4.3.1. 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.

4.3.2. PM including the condensible fraction, NO, NO_2, VOC, CO and ammonia emissions measurement shall be conducted for each engine tested at the proposed maximum engine load that corresponds to scheduled engine operating scenarios in Approval Conditions 3.2.

4.3.3. EPA Reference Methods from 40 CFR 60, 40 CFR 51, BAAQMD ST-1B (for ammonia) and/or 40 CFR 89 as appropriate for each pollutant shall be used for at least one (representative) engine at this data center. A test plan will be submitted for Ecology approval at least 30 days before any testing is conducted and must include the criteria used to select the engine for testing, as well as any modifications to the standard test procedures contained in the above references.

4.3.4. 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 4.5, shall be included in the test report, along with the emissions calculations.

4.4. Each engine shall be equipped with a properly installed and maintained non-resettable meter that records total operating hours.

4.5. 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 during operation.

5. EMISSION LIMITS

5.1. The seventeen (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.

5.2. If required to demonstrate compliance with the g/kW-hr EPA Tier IV average emission limits through stack testing, the Vantage Data Center shall conduct exhaust stack testing and average emission rates for 5 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.

5.3. Nitrogen oxide (NOx) 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:

Table 5.3: Nitrogen oxide (NOx) emission rate limits

	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.3.1	Annual Step Testing	100%		10.3
5.3.2	Corrective Maintenance	100%		10.3
5.3.3	Building 1 Outage, Storm Avoidance	81% 10%		7.58 2.6
5.3.4	Buildings 2 and 3 Outage	90%		8.83
5.3.5	Building ETC Outage	93%		9.3

5.4. Nitrogen dioxide (NO_2) 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:

Table 5.4: Nitrogen dioxide (NO_2) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.4.1	Annual Step Testing	100%		1.50
5.4.2	Corrective Maintenance	100%		1.50
5.4.3	Building 1 Outage, Storm Avoidance	81% 10%		0.40 1.50
5.4.4	Buildings 2 and 3 Outage	90% 10%		0.40 1.50
5.4.5	Building ETC Outage	93% 10%		0.40 1.50

5.5. Carbon monoxide 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:

Table 5.5: Carbon monoxide (CO) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.5.1	Annual Step Testing	100%		1.35
5.5.2	Corrective Maintenance	100%		1.35
5.5.3	Building 1 Outage, Storm Avoidance	81% 10%		1.05 0.60
5.5.4	Buildings 2 and 3 Outage	90% 10%		1.19 0.60
5.5.5	Building ETC Outage	93% 10%		1.24 0.60

5.6. Diesel Engine Exhaust Particulate (DEEP) emissions (Total PM after control on these engines) 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:

Table 5.6: Diesel Engine Exhaust Particulate (DEEP) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.6.1	Annual Step Testing	100%		0.484
5.6.2	Corrective Maintenance	100%		0.484
5.6.3	Building 1 Outage, Storm Avoidance	81% 10%		0.374 0.400
5.6.4	Buildings 2 and 3 Outage	90% 10%		0.425 0.400
5.6.5	Building ETC Outage	93% 10%		0.444 0.400

5.7. Volatile Organic Compound (VOC) 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:

Table 5.7: Volatile Organic Compound (VOC) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.7.1	Annual Step Testing	100%		0.22
5.7.2	Corrective Maintenance	100%		0.22
5.7.3	Building 1 Outage, Storm Avoidance	81% 10%		0.22 0.25
5.7.4	Buildings 2 and 3 Outage	90% 10%		0.22 0.25
5.7.5	Building ETC Outage	93% 10%		0.22 0.25

5.8. Total Particulate Matter (PM) emissions from all 17 engines combined shall not exceed 0.22 tons/yr (440 lbs/yr). All PM emissions shall be considered diesel engine exhaust particulate (DEEP) and $PM_{2.5}$ emissions.

5.9. Nitrogen dioxide (NO_2) emissions from all 17 engines combined shall not exceed 18.1 lbs/hr and 0.6 tons/yr.

5.10. Volatile organic compound (VOC) emissions from all 17 engines combined shall not exceed 0.37 tons/yr (740 lbs/yr).

5.11. Carbon Monoxide (CO) emissions from all 17 engines combined shall not exceed 1.22 tons per year (2440 lbs/yr).

5.12. Ammonia emissions from any of the 17 engines at the Vantage Center shall not exceed 15 ppmvd at 15%O2, nor 0.64 pounds per hour.

5.13. Sulfur dioxide emissions from all 17 engines combined shall not exceed 0.020 tons/yr (40 lbs/yr).

5.14. Visual emissions from each diesel electric generator exhaust stack shall be no more than 5 percent, with the exception of a two (2) 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

6.1. 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:

6.1.1. 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.

6.1.2. Normal operating parameters and design specifications.

6.1.3. 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

8.1. 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:

8.1.1. Fuel receipts with amount of diesel and sulfur content for each delivery to the facility.

8.1.2. Monthly and annual hours of operation for each diesel engine.

8.1.3. Purpose, electrical load and duration of runtime for each diesel engine during any periods of operation.

8.1.4. Annual gross power generated by or for each independent tenant at the facility and total annual gross power for the facility.

8.1.5. Upset condition log for each engine and generator that includes date, time, duration of upset, cause, and corrective action.

8.1.6. Any recordkeeping required by 40 CFR Part 60 Subpart IIII.

8.1.7. Air quality complaints received from the public or other entity, and the affected emissions units.

9. REPORTING

9.1. 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 the Building 2, 3, and ETC phases of this project.

9.2. The following information will be submitted to the AQP at the address in Condition 7 above by January 31 of each calendar year. This information may be submitted with annual emissions information requested by the AQP.

9.2.1. Monthly rolling annual total summary of air contaminant emissions,
9.2.2. Monthly rolling hours of operation with annual total,
9.2.3. Monthly rolling gross power generation with annual total as specified in Approval Condition 8.1.4,
9.2.4. A log of each start-up of each diesel engine that shows the purpose, fuel usage, and duration of each period of operation.

9.3. 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 (3) days of receipt of any such complaint.

9.4. 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

10.1. **Commencing/Discontinuing Construction and/or Operations:** This approval shall become void if construction of the facility is not begun within 18 months of permit issuance or if facility operation is discontinued for a period of eighteen (18) months or more. In accordance with WAC 173-400-111(7)(c), each phase must commence construction within 18 months of the projected and approved construction dates in this Order.

10.2. **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.

10.3. **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.

10.4. **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.

10.5. **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.

10.6. **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.

10.7. **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 th day of December, 2012, at Spokane, Washington.

Prepared By:

Robert Koster, P.E.
Eastern Regional Office
Department of Ecology
State of Washington

Approved By:

Karen K. Wood, Section Supervisor
Eastern Regional Office
Department of Ecology
State of Washington

QC

TECHNICAL SUPPORT DOCUMENT (TSD)
NOTICE OF CONSTRUCTION APPROVAL ORDER
VANTAGE DATA CENTERS MANAGEMENT COMPANY, LLC
VANTAGE-QUINCY DATA CENTER
DECEMBER AMENDMENT TO MAY, 2012 TSD

On October 22, 2012, Vantage resubmitted application materials to correct errors in its low load emission rates. Emission limits presented previously for the operating condition of 'idle to 10% load' were lower than those determined from emission testing conducted following the original submittal and original preliminary determination Ecology made available to the public. This amendment describes the October 22, 2012 submittal and Ecology's review of those materials. The unmodified May 2012 TSD follows this amendment.

The determination that emission rates were higher than proposed at low loads resulted in modifications to the Vantage proposal including reducing allowable hours of operation at low load, and removing some of the 'safety factor' in emission limits and run times for high loads. The application materials were incompletely revised, retaining or generating a number of inconsistencies as follows:

- Page 3, Paragraph 4, 3rd, 4th, and 5th sentences: "The proposed generators will use EPA Tier 4 certified equipment. Each generator will be equipped with MTU's AirClarity emission control system that includes a catalyzed diesel particulate filter (DPF) for particulate matter control and destruction of CO and unburned hydrocarbons, and a Selective Catalytic Reduction (SCR) catalyst with urea injection for control of NOx. This combination of controls represents the highest level of available control equipment, and thereby satisfies BACT as summarized in Section 4."

  These sentences are misleading. There is no analysis in the application demonstrating EPA Tier 4 emission levels will be satisfied. The last sentence suggests some connection of the proposed control equipment to BACT. Vantage has insisted that Tier 2 engines (no add-on control) are the highest level of control Ecology can require as BACT. The references to Tier 4 and BACT should be removed from this paragraph. X

- Page 7, 6th bullet: "Vantage will not install any other diesel engines larger than 500 horsepower for use as fire pumps or for building safety generators."

  The 500 horsepower New Source Review (NSR) exemption alluded to by this statement is not applicable to this project. Only the MTU 3,000 kWe engines have been reviewed and approved (preliminarily). Project equipment not identified in this application must be approved by Ecology prior to installation. Additional diesel engines of any size supporting this project are subject to NSR.

- Page 8, 'Compliance Emission Testing', Paragraph 2: "Vantage requests that the run-time required for Ecology-required compliance emission testing should (sic) not be counted against the facility's allowable run-time limits for routine operations."

  Ecology has limited all run-time hours in the preliminary determination. Compliance emission testing will be accomplished without additional run-time hours.

- Pages 11 and 12, Table 3-1: These run-time hours are not consistent with Table AA2. Table AA2, apparently used as modeling inputs, has been used to establish run-time limits in the current preliminary determination.

- Page 14, Table 3-2: This Table is not consistent with Table BB2 and Table BB2 is not consistent with Table AA2. Again, Table AA2 was used to establish run-time limits in the current preliminary determination.

- Consistent with the first bullet above, Page 20, 21: " Vendor-guaranteed removal efficiencies are as follows:
    - NOx > 90%
    - CO > 90%
    - VOC > 90%
    - PM > 87%"

  Vantage has provided no documentation of these control efficiencies. It is misleading to include them in this document. Actual control levels are closer to an average of 60%.

The present preliminary determination includes run-times and emission limits using the lowest of those presented where there are inconsistencies. Other determinations remain as outlined in the original TSD as follows:

1. BACKGROUND

Starting in 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 start construction before July 1, 2011. The AQP has received 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.

2. EXECUTIVE SUMMARY

Vantage Data Centers Management Company, LLC submitted a Notice of Construction (NOC) application received by Ecology on February 10, 2012, 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 February 10, 2012 NOC application began on February 11, 2012, and a notification that more information was necessary was issued on February 22, 2012 by the Department of Ecology under the supervision of the Eastern Regional Office Section Manager (Wood). Partial response to the request for additional information was received by Ecology on March 19, 2012. The NOC application was considered complete as of May 1, 2012. 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 27, 2012 in the Columbia Basin Herald. Vantage and its consultant, ICF, found that the emission limits resulting from use of the BACT analyses in the application submittals (the stack test emission limits in Condition 5 of the Preliminary Determination) would be difficult to achieve, and submitted a supplemental BACT analysis received by Ecology on July 16, 2012. Ecology's evaluation of this BACT submittal follows at the end of this TSD. Public review began on approximately , and ended on .

3. PROJECT DESCRIPTION

The Ecology Air Quality Program (AQP) received a Notice of Construction (NOC) application for the Vantage-Quincy Data Center on February 10, 2012. 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 described as 'reserve'. The timing of Phases 2-4 depends on customer demand and is not yet determined. Phase 1 is expected to be operational around the end of 2012 and includes the 5 primary and 2 reserve generators all of which are to be 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 - 3 primary engine generators, plus 1 reserve), Data Center 3 (phase 3 - 3 primary engine generators, plus 1 reserve), and a Building described as 'ETC' (phase 4 - 1 primary engine generator plus 1 reserve). The sequence of expected construction was not described. 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 169,500 gallons of ultra-low sulfur diesel fuel. Individual engine operating limits of 85 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. It should be noted that some of the emissions included in Tables 1a and 1b are not approved by this preliminary determination: the preliminary determination requires that stack testing be included in with other approved run-times, and that 'storm avoidance' hours be approved prior to each of phases 2-4 of this 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 (including commissioning and stack testing as modeled by applicant)

Pollutant	**Emission Factor (EF) Reference**	**Facility Emissions**
Criteria Pollutant		tons/yr
2.1.1 NOx Total	Engine NTE* + PC** Vendor Guarantee	7.58
2.1.2 CO	Engine NTE* + PC** Vendor Guarantee	1.46
2.1.3 SO_2	Engine NTE* + PC** Vendor Guarantee	0.023
2.1.4 $PM_{2.5}$/DEEP	Engine NTE* + PC** Vendor Guarantee	0.280
2.1.5 VOC	Engine NTE* + PC** Vendor Guarantee	0.40
2.1.6 Primary NO_2	Assumed 10% of NOx	0.76

Table 1b: Toxic Air Pollutant Maximum Year 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
2.1.7 Propylene	2.79E-03	8.6E-03
2.1.8 Acrolein	7.88E-06	2.12E-04
2.1.9 Benzene	7.76E-04	2.09E-03
2.1.10 Toluene	2.81E-04	7.58E-04
2.1.11 Xylenes	1.93E-04	5.21E-04

2.1.12 Napthalene	1.30E-04	4.01E-04
2.1.13 1,3 Butadiene	1.96E-05	5.28E-05
2.1.14 Formaldehyde	7.89E-05	2.12E-04
2.1.15 Acetaldehyde	2.52E-05	6.79E-05
Poly Aromatic Hydrocarbons (PAH)		
2.1.16 Benzo(a)Pyrene	1.29E-07	3.77E-07
2.1.17 Benzo(a)anthracene	6.22E-07	1.82E-06
2.1.18 Chrysene	1.53E-06	4.49E-05
2.1.19 Benzo(b)fluoranthene	1.11E-06	3.26E-06
2.1.20 Benzo(k)fluoranthene	1.09E-07	3.20E-07
2.1.21 Dibenz(a,h)anthracene	1.73E-07	5.09E-07
2.1.22 Ideno(1,2,3-cd)pyrene	2.07E-07	6.09E-07
2.1.23 PAH (no TEF)	3.88E-06	1.14E-05
2.1.24 PAH (apply TEF)	4.98E-07	1.47E-06
State Criteria Pollutant Air Toxics		
2.1.25 DEEP/$PM_{2.5}$	NTE + PC Guarantee	0.280
2.1.26 Carbon monoxide	NTE + PC Guarantee	1.46
2.1.27 Sulfur dioxide	NTE + PC Guarantee	0.023
2.1.28 Primary NO_2***	10% total NOx	0.76
2.1.29 Ammonia	Maximum 10 ppmv	0.36

* Engine Manufacturer 'Not To Exceed'
** Pollution Control Equipment Vendor Guarantee
***Assumed to be equal to 10% of the total NOx 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 (non-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 defined[1] 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 this project, 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. Vantage also established a control cost criteria for future data center diesel engines at a budget-level estimate of $47,714 per ton of combined pollutants controlled.

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, PM_{10} 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.

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

5.1.6 **BACT determination for NOx**
Ecology determines that BACT for NOx is:

a. Use of urea-based SCR with ammonia slip no greater than 15 ppmv at 15% O_2;
b. Use of EPA Tier 2 certified engines, pre-control, if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; and
c. 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 pre-control if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102

Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; 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/ICF 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 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 NOx BACT requirement
Sulfur dioxide	Compliance with the SO_2 BACT requirement
Toluene	Compliance with the VOC BACT requirement
Total PAHs	Compliance with the VOC BACT requirement
Xylenes	Compliance with the VOC BACT requirement

[2] WAC 173-460-020

6. AMBIENT IMPACTS ANALYSIS

Vantage obtained the services of ICF 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. ICF 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.

- All 17 generator stacks at Building 1, Building 2 and building 3 were set at a height of 41 feet above local finished grade. The generator stacks on the ETC building were set at a height of 43.8 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 purposes of modeling compliance with the NAAQS, it was assumed the entire data
- center would experience a total 24 hours of power outage or storm avoidance per year
- (nominally 8 hours of power outage and 16 hours of storm avoidance) and that this would be spread over 5 calendar days per year, during which time all backup engines were assumed to operate for their assigned times and at their assigned loads for power outage conditions.

- 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/NOX ambient ratio of 90%. For purposes of modeling NO2 impacts, the primary NOX 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 DPM, 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 provided by Ecology (Bowman, 2010). These are:

PM10 (24-hour average)	60 $\mu g/m^3$
PM2.5 (98th percentile 24-hour average)	21 $\mu g/m^3$
NO2 (98th percentile 1-hour value)	29 $\mu g/m^3$
DEEP (annual average)	0.103 $\mu g/m^3$

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 Celite 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. Their combined contributions at the receptor that is maximally impacted by Vantage-only emissions are:

PM10 (24-hour average)	0.002 $\mu g/m^3$
PM2.5 (24-hour average)	0.08 $\mu g/m^3$
NO2 (1-hour average)	0.02 $\mu g/m^3$

Table 3 provides a summary of the modes of operation of the diesel engines proposed by Vantage. Table 4 is a summary of annual emissions after full buildout of the Vantage project. It should be noted that not all of these hours or emissions have been approved. Stack testing is required to be performed during periods when the engines are run for other testing unless approved by Ecology. Storm avoidance run-time is not pre-approved for any but the phase 1 generators. When each engine is installed, a commissioning test sequence occurs, described in Table 5. The impacts of the emissions anticipated from this project were modeled using worst case scheduling of these activities. The results of the modeling and a comparison to the NAAQS are shown in Table 6 for criteria pollutants. Table 7 provides the impacts modeled for Toxic Air

Pollutants (TAPs) whose emission rates exceeded the Small Quantity Emission Rate (SQER) in WAC 173-460. TAPs with emission rates that exceed the SQER must be evaluated further and trigger a Tier 2 Health Impact Assessment if modeling shows the emission rates result in impacts above the ASIL.

Table 3. Summary of Diesel Generator Operating Modes

Generator		Weekly Testing			Monthly Testing			Quarterly Testing			Annual Full Building			Annual Step			Unscheduled Maintenance				Outage and Storm Avoidance		
3000 kWe MTU																	Corrective Generator Maintenenace		Transformer Maintenance			Storm Avoid-ance	Outage
Gen #	Gen Bldg	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/yr	% Load	Hrs/yr	% Load	Hrs/yr	Hrs/yr
DC1-1P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-2P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-3P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-4P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-5P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-6R	DC1	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
DC1-7R	DC1	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
DC2-1P	DC2	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC2-2P	DC2	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC2-3P	DC2	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC2-4R	DC2	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
DC3-1P	DC3	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC3-2P	DC3	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC3-3P	DC3	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC3-4R	DC3	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
ETC-1P	ETC	10	0.5	20	10	1	6	93.3	0.5	3	93.3	6	6	100	0.5	0.5	100	8	93.3	8	93.3	16	8
ETC-2R	ETC	10	0.5	20	10	1	6	10	0.5	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
Cool Down at 10% Load, Each Engine, Primary and Reserve:									0.5	2		0.5	0.5		0.5	0.5		1		0.5		4	1

Table 4. Summary of Facility-Wide Emission Rates for Full Buildout Scenario

Pollutant	Weekly, Monthly, Quarterly Testing & Cool Down (ton/yr)	Annual Facility-wide and Step Tests (ton/yr)	Storm Avoidance & Unplanned Outage (24 hrs/yr) (ton/yr)	De-energized Building and Transformer and CorrectiveTesting (ton/yr)	Total Emissions (ton/yr)
PM2.5 (DPM) Normal Year	0.07	0.021	0.07	0.025	0.19
NOX	1.2	0.71	2.17	1.89	5.97
CO	0.36	0.1	0.38	0.29	1.13
VOC	0.19	0.02	0.1	0.06	0.37
SO2	0.0	0.0	0.0	0.0	0.02
Primary Nitrogen Dioxide (NO2)	0.12	0.07	0.22	0.189	0.6

Table 5. 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 6:
Modeled Concentrations of Criteria Pollutants (with background) and comparison to Ambient Air Quality Standards

Pollutant and Time Frame	Background plus Modeled Concentration – ug/m^3	National Ambient Air Quality Standard - ug/m^3	Percent of Standard
PM_{10} 24 Hour	82.2	150	55%
PM_{10} Annual	0.056	50	0.1%
$PM_{2.5}$ 24 Hour	26.1	35	74%
$PM_{2.5}$ Annual	0.056	15	0.4%
NO_2 1- Hour	166	188	88.3%
CO 1-Hour	203	40,000	0.5%
CO 8-Hour	113	10,000	1.1%
SO_2 1-Hour	3.6	319	1.1%
SO_2 3-Hour	2.9	1300	0.2%
SO_2 24 Hour	1.5	365	0.4%
SO_2 Annual	2.3E-8	80	3E-8%

Table 7: 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/m^3	Comparison of Modeled to ASIL
DEEP	Annual	0.0335	0.0033	1015%
NO_2	1-Hour	334.5	470	71.2%
Acrolein	24 Hour	0.0016	0.06	3%
Ammonia	24 Hour	23	70.8	32%

As is indicated in Tables 6 and 7, only Diesel Engine Exhaust Particulate (DEEP) exceeded the regulatory trigger level (the ASIL) for that pollutant. At this concentration, DEEP is required to be further evaluated in a Second Tier Toxics Review in accordance with WAC 173-460-90.

7. STORM AVOIDANCE HOURS

As indicated in Table 3, there are 16 hours per year assigned for operating the engine generators in 'storm avoidance' mode. This is a mode of operation not allowed for the four data centers already approved in the Quincy area. Vantage has proposed to demonstrate the necessity of these hours for its first of four buildings (first seven engine-generators). This demonstration will be required for each new tenant at the data center facility. The approval order allows these hours for the first building, but eliminates them for the following phases of the project without demonstration satisfactory to Ecology that these run-time hours are a necessity.

8. SECOND TIER REVIEW FOR DIESEL ENGINE EXHAUST PARTICULATE EMISSIONS

Diesel

Proposed emissions of diesel engine exhaust particulate (DEEP) 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 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 decided to evaluate 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. 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.

9. 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.

****END OF VANTAGE JUNE TSD ****

In Federal guidance regarding the process of determining BACT-level control, the applicant is assigned responsibility for presenting and defending a preferred control system (see, for instance, BNA Policy and Practice Series, Air Pollution Control, 10-91, Page 181:152). When Ecology indicated to Vantage and ICF that the BACT proposal in the application materials submitted on February 10, 2012, was incomplete, Vantage/ICF forwarded a cost-effectiveness summary for the catalysed DPF and SCR systems they propose to use. The application materials also indicated that those systems were guaranteed to reduce uncontrolled engine emissions of PM by 87%, and NOx, VOC, and CO by 90%. Ecology accepted this proposal as BACT for the Vantage project engines, and then calculated emission limits using uncontrolled engine emission data provided in the application, and using the above emission reduction percentages. These limits were significantly lower than those proposed by Vantage/ICF, for reasons that the applicant has not explained. Instead, Vantage/ICF forwarded a more comprehensive BACT analysis proposing that Tier 2 engines be considered BACT, and that the not-to-exceed (NTE) values they were proposing as emission limits be considered voluntary limits not connected to the BACT determination. This is acceptable to Ecology. The preceding section on BACT in this technical support document has been modified to reflect the BACT supplemental submittal received July 16, 2012.

****END OF VANTAGE JULY TSD ****

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

November 30, 2012

Ms. Karen Wood
Air Quality Program
Eastern Regional Office
4601 N. Monroe Street
Spokane, WA 99205-1295

RE: Second Tier Petition by Vantage Data Centers Management Company, LLC (Quincy)

Dear Ms. Wood:

The Washington State Department of Ecology's Air Quality Program (Ecology) has completed their review of health risks from diesel engine exhaust particulate (DEEP) emissions from the proposed Vantage Data Centers Management Company, LLC. (Vantage) Data Center in Quincy, Washington.

Ecology's review indicates that the proposed project could result in an increased cancer risk of up to nine in one million (9×10^{-6}) at the maximally impacted residential location, which occurs along the residential property boundary immediately to the southwest of Vantage. A lower risk of about five in one million was estimated at the location of an existing structure on the same property. Ecology's review of non-cancer hazards indicates that the chronic non-cancer hazard quotient attributable to Vantage's DEEP emissions is much lower than unity (1) meaning that chronic non-cancer adverse health effects are unlikely. Because the increase in cancer risk attributable to the new data center alone is less than the maximum risk allowed by a second tier review of 10 in one million, and the non-cancer hazard is acceptable, the project is approvable under WAC 173-460-090.

As part of the community-wide approach in Quincy, Ecology also considered the cumulative impacts of DEEP emissions in the area. Emissions from Vantage and other local sources of DEEP could result in lifetime increased cancer risk of up to approximately 30 in one million (30×10^{-6}) at a location directly to the southwest of Vantage. The cumulative non-cancer hazard quotient at this location is much lower than unity (1) meaning that non-cancer adverse health effects are unlikely.

Ecology recommends approval of the proposed project because project related health risks are permissible under WAC 173-460-090 and the cumulative risk from diesel engine exhaust

particulate emissions in Quincy is less than the cumulative maximum risk threshold established by Ecology for permitting data centers in Quincy (100 per million or 100 x 10^{-6}). Ecology recommends that Vantage be required to communicate health risks posed by their emissions to current residents near Vantage and potential new homeowners at undeveloped parcels adjacent to Vantage or to the local regulatory agency responsible for zoning and development in the affected area.

Although Vantage was not required to evaluate short-term impacts of nitrogen dioxide (NO_2), the HIA provided a brief evaluation of acute non-cancer hazards. Generally, Vantage's emissions by themselves are not expected to result in acute non-cancer hazards, but cumulative emissions of multiple emergency engines at other data centers could combine to create short-term NO_2 levels of concern. Ecology's evaluation of simultaneous emergency engine emissions in Quincy indicate that elevated NO_2 levels could occur, but the likelihood of a system-wide outage coinciding with unfavorable meteorology is very low.

This project has satisfied all requirements of a second tier analysis. Ecology recommends that you incorporate our findings as part of your ambient air impacts analysis and you may begin the public comment period when you are ready to do so.

If you would like to discuss this project further, please contact Gary Palcisko at (360) 407-7338 or gary.palcisko@ecy.wa.gov.

Sincerely,

Jeff Johnston, Ph.D.
Science and Engineering Section Manager
Air Quality Program

jj/te

Enclosure

cc: Erika Britney, ICF International
Sharon Douglas, ICF International
Mike Duffy, Vantage
Greg Flibbert, Ecology
Robert Koster, Ecology

DEPARTMENT OF
ECOLOGY
State of Washington

Second Tier Review Recommendation Document for

Vantage Data Center
Quincy, Washington

June 20, 2012

Exhibit 27

1. SUMMARY AND PURPOSE

Vantage Data Centers Management Company, LLC (Vantage) proposes to install and operate 17 diesel-powered generators, each rated at 3,000 kWe electricity output,[1] to provide backup power to their servers. The proposed engines emit diesel engine exhaust particulate (DEEP) at an estimated rate that cause ambient impacts in excess of a regulatory trigger level called an acceptable source impact level (ASIL). Vantage was therefore required to submit a second tier petition under WAC 173-460-090. A second tier petition requires Vantage to prepare a health impact assessment (HIA) quantifying the health risks posed by their emissions of DEEP.

Vantage hired ICF International (ICF) to prepare a HIA (ICF, 2012a). In this assessment, ICF estimated lifetime increased cancer risks attributable to Vantage's DEEP emissions and found them to be approximately **seven in one million** at the maximally impacted residential receptor to the southeast of Vantage's property. This risk was quantified at the location where the residential parcel shares it property boundary with Vantage. A lower risk of about **four in one million** was estimated at the location of an existing structure on the same property. Chronic and acute non-cancer hazards attributable to Vantage's DEEP and NO_2 emissions respectively were lower than unity (one) indicating that Vantage's emissions by themselves were not likely to result in adverse non-cancer health effects.

ICF also assessed the cumulative health risk by adding estimated concentrations attributable to Vantage's emissions to an estimated background DEEP concentration. The cumulative risk of residents living in the vicinity of Vantage was approximately **19 and 28 in one million** for the residents living immediately to the southeast and southwest of Vantage, respectively. Chronic non-cancer hazard quotients were much lower than one indicating that long-term exposure to DEEP in the area is not likely to result in non-cancer health effects.[2] These DEEP-related health risks in the vicinity of Vantage are generally much lower than those estimated in urban areas of Washington.

Because the increase in cancer risk attributable to the new data center alone is less than the maximum risk allowed by a second tier review, which is 10 in one million, and the non-cancer hazard is acceptable, the project could be approvable under WAC 173-460-090. Furthermore, the cumulative risks to residents living near Vantage are below the cumulative risk threshold established by Ecology for permitting data centers in Quincy (100 per million or 100 x 10^{-6}).

This summary document presents Ecology's review of the proposed Vantage Data Center's HIA and other requirements under WAC 173-460.

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[1] MTU engine specifications maximum power of 3,490 kWm or 4,678 bhp.

[2] Previous analyses demonstrated that NO_2 levels could reach or exceed a level of concern in many areas of Quincy during a system-wide outage, although this likelihood is very low. The addition of Vantage's emissions is not expected to change that conclusion. However, Ecology is updating cumulative NO_2 emissions from all data centers to help inform communications with local government and Quincy residents regarding potential acute risks in the event of a system-wide outage.

2. SECOND TIER REVIEW PROCESSING AND APPROVAL CRITERIA

2.1. Second Tier Review Processing Requirements

In order for Ecology to review the second tier petition, each of the following regulatory requirements under Chapter 173-460-090 must be satisfied:

(a) The permitting authority has determined that other conditions for processing the NOC Order of Approval (NOC) have been met, and has issued a preliminary approval order.

(b) Emission controls contained in the preliminary NOC approval order represent at least tBACT.

(c) The applicant has developed a HIA protocol that has been approved by Ecology.

(d) The ambient impact of the emissions increase of each TAP that exceed ASILs has been quantified using refined air dispersion modeling techniques as approved in the HIA protocol.

(e) The second tier review petition contains a HIA conducted in accordance with the approved HIA protocol.

Ecology provided comments to ICF's HIA protocol (item (c)) on November 22, 2011. These comments were addressed as part of the submittal of the draft and final health impact assessments (item (e)) received by Ecology on March 20, 2012, May 22, 2012, and May 25, 2012. Ecology's air dispersion modeler found the refined modeling conducted by Vantage to be acceptable.

Acting as the "permitting authority" for this project, Ecology's Eastern Regional Office (ERO) satisfied items (a) and (b) above on June 15, 2012, and April 30, 2012, respectively. The applicant has therefore satisfied all of the five requirements above.

2.2. Second Tier Review Approval Criteria

As specified in WAC 173-460-090(7), Ecology may recommend approval of a project that is likely to cause an exceedance of ASILs for one or more TAPs only if it:

(a) Determines that the emission controls for the new and modified emission units represent tBACT.

(b) The applicant demonstrates that the increase in emissions of TAPs is not likely to result in an increased cancer risk of more than one in one hundred thousand.

(c) Ecology determines that the non-cancer hazard is acceptable.

2.2.1. tBACT Determination

Ecology's ERO engineer determined that Vantage's proposed pollution control equipment (i.e., Tier 4 engines equipped with diesel particulate filters, diesel oxidation catalysts, and selective catalytic reduction) satisfies the BACT and t-BACT requirement for diesel engines powering backup generators at Vantage.

2.2.2. HIA Review

As described above, the applicant is responsible for preparing the HIA under WAC 173-460-090. Ecology's project team consisting of an engineer, a toxicologist, and a modeler review the HIA to determine if the methods and assumptions are appropriate for assessing and quantifying surrounding community's risk from a new project. ICF modeled TAP emissions from Vantage's proposed data center.

ICF used a combination of EPA emission factors, manufacturer emission guarantees, and manufacturer test data to estimate emission rates of TAPs from Vantage's diesel-powered generators (ICF, 2012b). Ecology determined that these derived emission rates represent a reasonable estimate of the project's future emissions.[3] The air quality analysis was determined to be appropriate as comments were addressed as part of the submittal of the final NOC document (ICF, 2012b) and HIA (item (e)) received on May 25, 2012.[4]

The HIA focused mainly on health risks attributable to DEEP exposure as this was the only TAP with a modeled concentration in ambient air that exceeded an ASIL. ICF briefly described emissions and exposure to other TAPs (nitrogen dioxide, ammonia,[5] and acrolein) because these pollutants exceeded a small quantity emission rate (SQER), and Ecology requested that acute health hazards from exposure to these pollutants be quantified.

While Vantage is located in an industrially zoned area, air dispersion modeling indicated that Vantage's DEEP emissions resulted in concentrations in excess of the ASIL at approximately three residences. Two residences, one located to the southwest and the other to the southeast, are located very near the Vantage facility. Another residential parcel is located about ½ mile south near the BNSF railroad tracks, but ICF reports that the site is occupied by a company, and therefore, the site could be considered commercial. Regardless, estimated Vantage-related DEEP concentrations at this location are much lower than the other two properties adjacent to Vantage. Other nearby land use includes other data centers (Intuit and Sabey) and agricultural properties.

For the purposes of assessing increased cancer risk and non-cancer hazards, ICF identified receptor locations where the highest exposure to project-related air pollutants could occur: at the

[3] Robert Koster, "Vantage Data Centers status," e-mail message, addressed to Gary Palcisko, April 30, 2012.
[4] Ranil Dhammapala, "RE: Vantage-Quincy: Itemized responses to Ecology Comments Dated May 2-3, 2012," e-mail message, addressed to Gary Palcisko, June 1, 2012.
[5] Some ammonia is released from the selective catalytic reduction equipment designed to reduce NO_X emissions.

project boundary, nearby residences, and on-site and off-site commercial areas.[6] ICF calculated both non-cancer hazards and cancer risks for each of these receptors, and they also estimated long-term cumulative risks attributable to and other known sources of DEEP.[7] Vantage's risk assessment also evaluated the combined cancer risk caused by numerous other carcinogens known to be emitted from diesel generators, and their analysis concluded that the vast majority of the cancer risk was caused by DEEP.

Ecology's review of the HIA found that ICF identified appropriate receptors to capture the highest exposures for residential, commercial, and fence line receptors. ICF also identified other potential sensitive receptor areas, but these areas were well outside the area impacted at levels above the ASIL, so Ecology did not require risks to be quantified at these locations.

Ecology's review also found that ICF used appropriate exposure assumptions and toxicity values to quantify and characterize non-cancer hazards and cancer risks. ICF also identified key areas of uncertainty regarding exposure assumptions, emissions estimates, modeling, and the chronic toxicity of DEEP. These uncertainties combined may result in an over—or under—estimate of actual health risk. For the purpose of protecting public health while making decisions, overestimates of risk are preferred over underestimates. Generally, the assumptions used in the HIA probably overestimate risk more than underestimate risk. One exception is that the non-cancer hazards of DEEP may be underestimated primarily due to the uncertainty surrounding the non-cancer toxicity of DEEP for sensitive individuals.

2.2.3. Increased Cancer Risk

Table 4-10 below, copied from the HIA, shows the estimated Vantage-specific and cumulative cancer risk per million at each of the receptors evaluated. The highest increase in risks attributable to Vantage's emissions of DEEP is 6.6 per million and occurs at the southwest residential property boundary. This property is directly adjacent to Vantage's southwest property boundary. The land use at that location consists of commercial farm outbuildings. The property is currently planned as industrial zoning, so it is unlikely that a residential structure will be built at this location in the future. Therefore, the risk reported for a residential receptor at this location represents a conservatively high estimate of risk. The estimated risk at the current house on the same parcel is approximately 3.5 per million. For non-residential exposure scenarios, tenants of the Vantage Data Center may have increased risks of about 1.3 per million and workers at the nearby Sabey Data Center may have increased risks of about 0.8 per million. Increased cancer risks to potential bystanders exposed near the point of maximum impact (i.e., fence line receptor) may be about 0.2 per million.

The cumulative risk of all known sources of DEEP emissions in the vicinity of Vantage (listed in Table 4-10) is highest for the two nearby residences. The cumulative DEEP risk at these two

[6] ICF also identified sensitive receptor areas, but these were located outside the area of impact (i.e., ASIL was not exceeded in these locations).
[7] Ecology modeled cumulative emissions from existing data centers, railway, and highways. Results were provided to ICF to include in their HIA.

hazard indices for all receptors' exposures were below one indicating that acute adverse effects are not likely to be caused solely by Vantage's emissions during a power outage.[10]

3. OTHER CONSIDERATIONS

3.1. Cumulative Short-Term NO_2 Hazard

While Vantage's emissions by themselves were not likely to result in adverse non-cancer health effects, Ecology recognizes that it is possible that the cumulative impacts of multiple data center's emissions during a system-wide outage could potentially cause NO_2 levels to be a health concern. As part of previous data center permit applications in Quincy, Ecology evaluated the short-term NO_2 impacts that could result from emergency engine operation during a system-wide power outage. While NO_2 levels could indeed rise to levels of concern[11] at various locations across town, the outage would have to be system-wide and it would have to occur at a time when the dispersion conditions were optimal for concentrating NO_2 at a given location. Ecology found that the likelihood of this occurrence is relatively low throughout Quincy.

Vantage's generators will use EPA Tier-4 emission controls, including selective catalytic reduction for NO_x control. Therefore, relative to other data centers in Quincy, the highest 1-hour NO_X emission rate from Vantage during a power outage is much lower than that of any of the other five existing data centers. Assuming all Quincy data centers required maximum permitted loads during a system-wide outage, Vantage's 1-hour NO_X emission rate would represent less than five percent of all Quincy data centers' combined 1-hour NO_X emission rate. Vantage's emissions are therefore not likely to significantly alter previous conclusions. That said, it is not clear how many more data centers (if any) are planned for Quincy, and if the use of diesel-powered emergency engines will increase. Ecology staff are currently refining this model to include finer grid spacing to help inform our potential discussions with the city and port of Quincy regarding future data center development and the need to consider the potential short-term impacts of data center's emergency outages. Ecology should continue to update this analysis to inform emergency planning considerations and/or communications in Quincy during a possible system-wide outage.

4. CONCLUSIONS AND RECOMMENDATION

The project review team has reviewed the HIA and determined that:

(a) The TAP emissions estimates presented by ICF represent a reasonable estimate of the project's future emissions.

(b) Emission controls for the new and modified emission units represent tBACT.

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[10] The highest acute hazard quotient of 0.7 occurred at the fence line receptor location (i.e., maximum impacted boundary receptor).

[11] The level of concern in this case is 441 $\mu g/m^3$. This represents California OEHHA's acute reference exposure level of 470 $\mu g/m^3$ minus an estimated regional background concentration of 29 $\mu g/m^3$.

(c) The ambient impact of the emissions increase of each TAP that exceeds acceptable source impact levels has been quantified using refined air dispersion modeling techniques as approved in the HIA protocol.

(d) The HIA submitted by ICF on behalf of Vantage adequately assesses project-related increased health risk attributable to TAP emissions.

The project review team concludes that the HIA to represent an appropriate estimate of potential increased health risks posed by Vantage's TAP emissions. The risk manager may recommend approval of the proposed project because project-related health risks are permissible under WAC 173-460-090 and the cumulative risk from DEEP emissions in Quincy is less than the cumulative additional cancer risk threshold established by Ecology for permitting data centers in Quincy (100 per million or 100×10^{-6}).

The project review team also recommends that Vantage be required to communicate any health risks posed by their emissions to current residents near the Vantage Data Center, and potential buyers of undeveloped parcels adjacent to the data center, or to the local regulatory agency responsible for zoning and development in the affected area. This recommendation is also stated in Vantage's HIA.

Finally, Ecology should evaluate the pending results of updated hourly cumulative 1-hour NO_2 modeling to help inform communications with local government and Quincy residents regarding potential acute risks in the event of a system-wide outage.

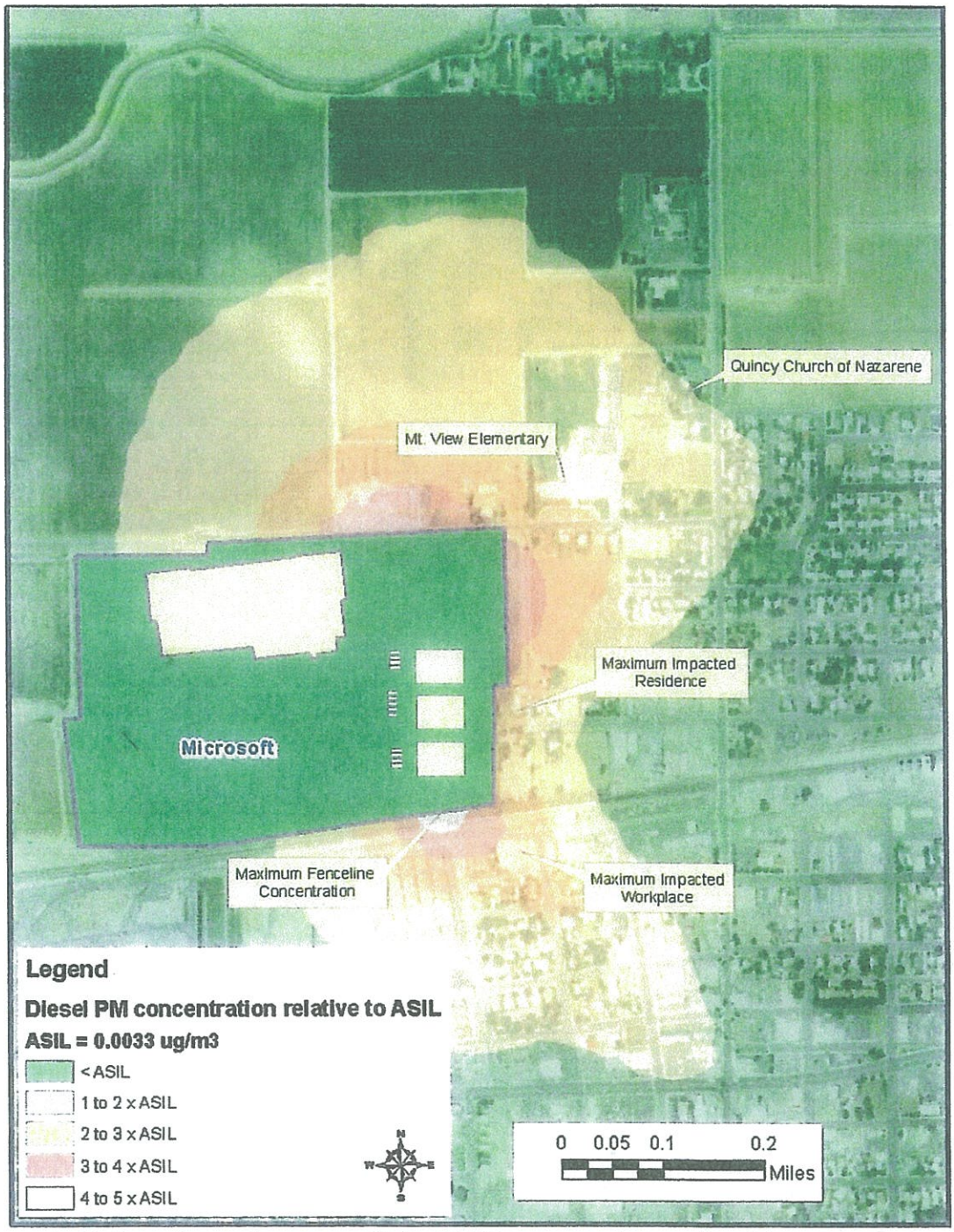
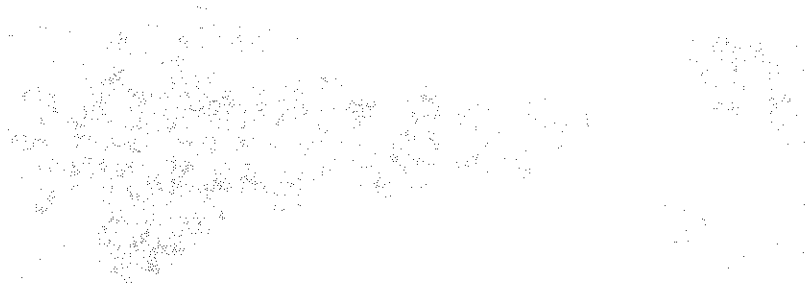


Figure 3. Estimated annual average off-site DEEP concentrations attributable to proposed Microsoft emissions (expansion project only).

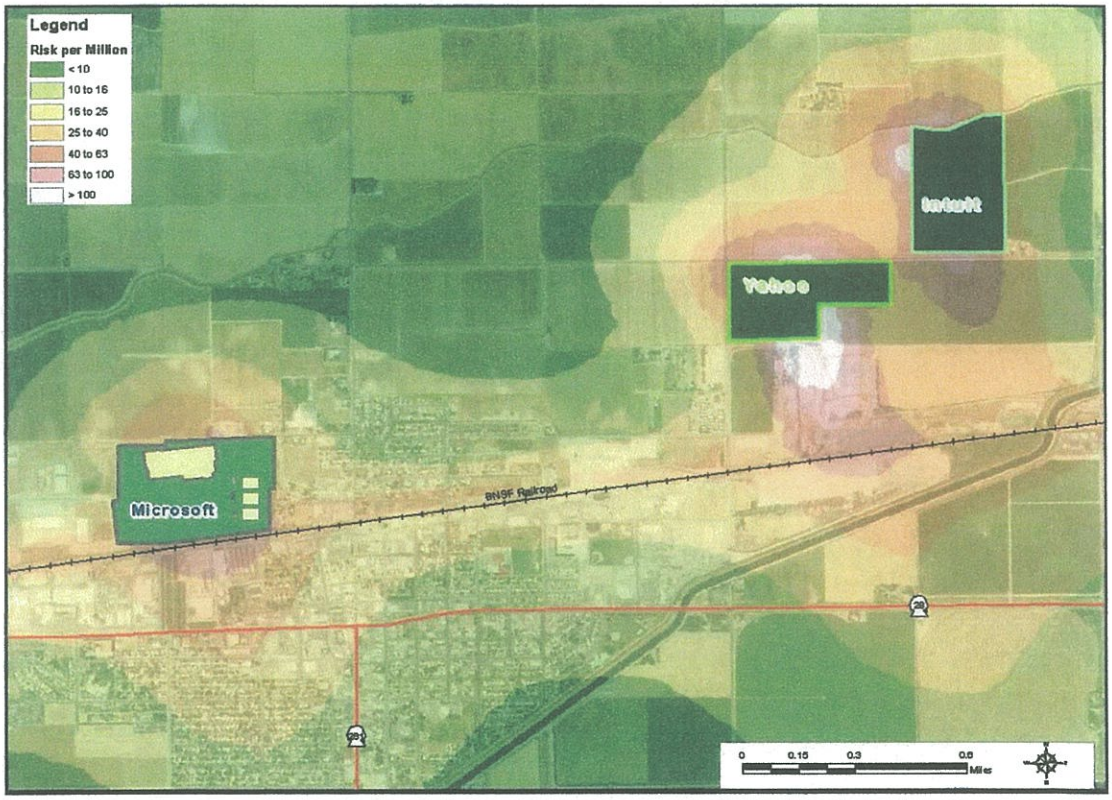
This is the expansion only - not all



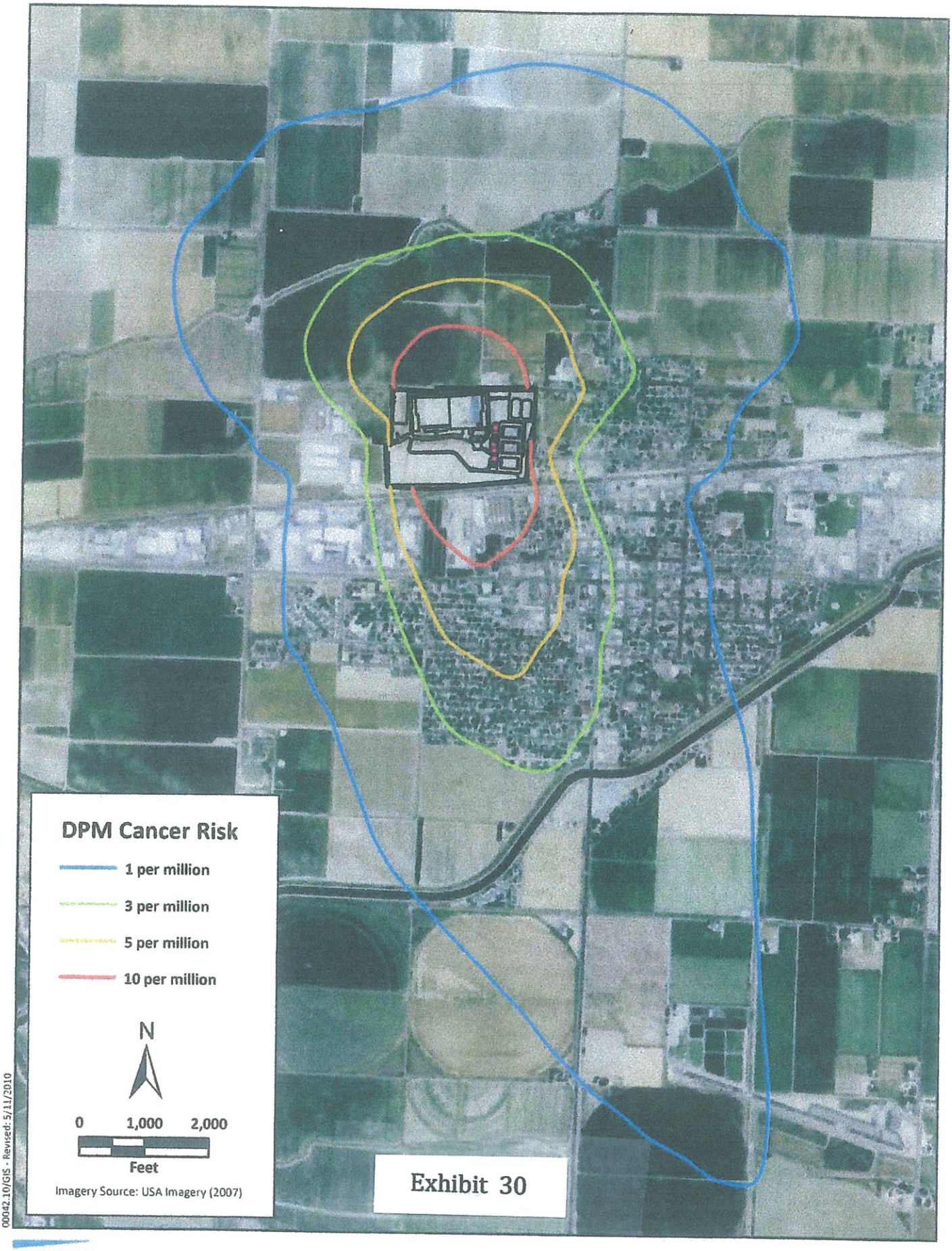
Ecology Response:

As the map of cumulative impacts in Figure 1 demonstrates, the main portion of the diesel engine exhaust from Microsoft's Columbia Data Center does not intersect with the diesel engine exhaust from other data centers. Because the diesel engine exhaust particulate is evaluated as an annual average, its plume is composed of many individual plumes (more than 8000--one for each hour of the year) produced by the annual distribution of wind directions and wind speeds. This temporal averaging spreads the pattern out as shown.

Figure 1.



The concentration pattern for one-hour average NO_2 will consist of relatively narrow plumes that move around from hour to hour according to the wind direction. Although the plumes will be widened by the affects of air flowing over and around the buildings, the range of directions that are required for Microsoft emissions to interact with plumes from the other data centers is limited. The relevant metrics are the 98th percentile of the daily maximum (for the NAAQS) and the maximum 1-hour concentration in each year (toxics). As such, each hour's concentration field is evaluated independently and the concentrations of the preceding and following hours have little influence on the evaluation at a specific location.



00042.10/GIS - Revised: 5/11/2010

ICF

Microsoft

Figure 7-2
DPM Cancer Risk for Expansion Generators at Permit Limits, Plus Existing

ICF INTERNATIONAL

Memorandum

Date: July 11, 2012

To: Greg Flibbert and Robert Koster, Dept. of Ecology Eastern Regional Office

cc: Mike Duffy, Vantage Data Centers

From: Jim Wilder, P.E.

Subject: **Top-Down BACT Assessment**
Vantage-Quincy Data Center, Quincy, WA

Introduction

This top-down Best Available Control Technology (BACT) assessment for the Vantage-Quincy Data Center was conducted at the request of Department of Ecology, to supplement the BACT calculations that were submitted with the May 29, 2012 Notice of Construction permit application package. The BACT calculations in the permit application package were limited to evaluating only Vantage's proposed AirClarity emission control system that includes a catalyzed diesel particulate filter (DPF) and a urea-based selective catalytic reduction system (SCR). Ecology requested the supplemental top-down BACT assessment to evaluate the full range of commercially available control technologies. Note, Vantage's proposed AirClarity emission control system is more efficient than any other emission control technology that has been considered for use on data centers in Washington state.

Summary and Conclusion

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, PM_{10} and $PM_{2.5}$) and sulfur dioxide.

Generators equipped with EPA Tier-2 certified engines were considered the base case for the BACT assessment. The following add-on technologies were considered for the top-down BACT assessment:

- AirClarity System (Catalyzed DPF and SCR) proposed by Vantage
- Catalyzed Diesel Particulate Filter
- Urea-Selective Catalytic Reduction
- Three-Way Catalyst

Exhibit 31

- Diesel Oxidation Catalyst

All of the add-on technologies are technically feasible. They are commercially available, and offer substantial pollutant removal efficiencies. None of them would pose unreasonable operational difficulties.

However, all of the add-on technologies failed the cost-effectiveness criteria, for the individual pollutants and for the multi-pollutant reasonableness test. The cost-effectiveness values for each technology are listed in Table 1.

Table 1. Comparison of Cost-Effectiveness Evaluations

	Cost-Effectiveness ($/ton)				
Control Device	**NOX**	**Total PM**	**CO**	**VOC**	**Combined Pollutants**
MTU AirClarity System (Catalyzed DPF + SCR) proposed by Vantage	$81,000	$700,000	$434,000	$1,645,000	$60,000
Catalyzed DPF Alone	Ineffective	$252,000	$152,000	$578,000	$81,000
SCR Alone	$40,300	$1,519,000	$216,000	$820,000	$32,000
3-Way Catalyst	$37,500	$125,000	$71,000	$296,000	$19,200
Diesel Oxidation Catalyst	Ineffective	$310,000	$55,000	$314,000	$41,000
Ecology Cost-Effectiveness Criterion	$10,000	$23,200	$5,000	$10,000	N/A

Because all of the add-on technologies failed the cost-effectiveness criterion, ICF recommends that none of them should be defined as BACT. Instead, ICF recommends that BACT for each pollutant should be defined as use of EPA Tier-2 certified engines, with diligent annual operation and maintenance requirements required under New Source Performance Standards Subpart IIII.

Methodology

Emission Estimation Methods (Nominal-Controlled Emission Rates)

The AERMOD modeling used for NAAQS compliance and risk assessments for Vantage's permit application used the vendor-guaranteed, "not-to-exceed" (NTE) load-specific controlled emission rates as the starting point for the emission calculations. Vantage's equipment contractor is ELM Energy, LLC. ELM's vendor guaranteed NTE controlled emission rates apply to each individual engine at each load.

Most of the control devices considered for this BACT assessment use a metal catalyst to destroy the pollutants. After a cold start, these catalysts temporarily remain inactive until the hot flue gas heats the catalyst up to its minimum operating temperature. To account for this temporary cold-start delay, an additional cold-start catalyst delay factor was applied to each control device. The cold-start catalyst delay factors for each control device are calculated in Attachments B-F.

After the load-specific, cold-start "nominal-controlled" emission rates were calculated for each control device, the facility-wide "nominal-uncontrolled" and "nominal-controlled" emission rates were calculated by applying the hourly emission rates to the runtime hours presented in Vantage's permit application. The runtime hours considered for the BACT assessment included scheduled testing, corrective maintenance, storm avoidance, and unplanned power outages. The annual-average runtime hours for initial commissioning tests and for periodic stack emission testing were not included in the BACT assessment. The facility-wide "nominal-uncontrolled" emission rates are calculated in Attachment A. The facility-wide "nominal-controlled" emission rates for each control device are calculated in Attachments B-F.

Cost Estimating Methods

Cost spreadsheets for each category of control device considered for this BACT assessment are provided in Attachments B-F. The methods used to calculate the total capital investment (TCI) for each type of control device were as follows:

- For each control device other than DOCs, the purchase price listed as "Freight on Board (FOB" at the manufacturer's facility was provided. For DOCs, the Department of Information Services (DIS) provided a tally of the total installed cost at their Olympia data center.

- In some cases ICF used FOB purchase price information for control devices designed for either 2,000 kWe or 2,500 kWe generators at other data centers, rather than the 3,000 kWe generators at the Vantage Data Center. In those cases, ICF adjusted the FOB purchase price upward using the "0.6 rule".

- Cost factors for indirect installation costs (shipping, installation, design fees, etc.) were derived from EPA's guidance manual EPA Pollution Control Cost Manual, January 2002. The cost factors from Section 4.2 Chapter 1, Selective Catalytic Reduction, were used.

- Annual capital recovery cost was based on an assumed 25-year equipment life, with a conservatively low discount rate of 4%.

- Indirect annual costs (overhead, insurance, and taxes) were calculated by cost factors from EPA's control cost guidance manual listed above.

- For this screening-level analysis it was assumed that none of the control devices would incur annual costs for operation and maintenance. This results in a conservatively low estimate of the control device capital cost, annual cost, and cost-effectiveness.

- The Total Annual Cost for each control device was calculated by summing the estimate annual costs for capital recovery, direct operation and maintenance, and indirect annual costs.

Cost-Effectiveness Criteria for Individual Pollutants

For the individual pollutants, the individual pollutant cost-effectiveness was calculated by dividing the total annual cost ($/year) by the tons of facility-wide pollutant removed by the control device. The derived cost-effectiveness was then compared to the following cost-effectiveness criteria values, which were developed by Ecology for the Sabey-Intergate-Quincy data center's air quality permit:

NOX: $10,000/ton
Total PM (FH+BH): $23,200/ton
CO: $5,000/ton
VOC: no value listed. Assumed to be $10,000/ton (same as NOx)

Reasonableness Cost Effectiveness for Multi-Pollutant Analyses

All of the control devices considered for this BACT assessment are at least marginally effective at controlling the entire range of pollutants. The manufacturer-provided removal efficiencies range from a low of 25% for PM removed by DOCs, to as high as 99.9% for CO removed by 3-Way Catalysts.

To account for the variable reduction efficiencies for the various pollutants, for each control device the multi-pollutant cost effectiveness was evaluated by comparing two facility-wide cost parameters: the actual total annual cost to own and operate the control device being considered; and the "reasonable annual control cost for combined pollutants". The evaluation is done using a three-step process:

- The "reasonable annual cost" for each individual pollutant is calculated by multiplying the annual tons/year of that pollutant removed by the control device times the Ecology cost-effectiveness criterion for that pollutant.

- The facility-wide "total reasonable annual cost" is calculated by summing the calculated values for each individual pollutant.

- The "total reasonable annual cost" is then compared to the actual total annual cost. If the actual annual cost is less than the "total reasonable annual cost" then the cost for multi-pollutant treatment is considered "reasonable" and the control device satisfies the BACT cost-effectiveness criterion. However, if the actual annual cost exceeds the "total reasonable annual cost" then the cost for multi-pollutant treatment is considered "non-reasonable" and the control device fails the BACT cost-effectiveness criterion.

Identification of Technically Feasible Control Technologies

Since 2007 Ecology and other Washington state agencies have issued air quality permits for the following data centers that use large diesel emergency generators: Sabey-Intergate-Quincy; Dell-Quincy; Yahoo-Quincy; Microsoft-Quincy; Intuit-Quincy; Titan-Moses Lake; Dept. of Information Services (DIS) Data Center –Olympia; Sabey-Intergate-Wenatchee; and T-Mobile-Wenatchee. ICF reviewed Ecology's BACT determinations for these existing data centers, and developed the following list of technically feasible emission controls applicable for diesel generators:

- EPA Tier-2 certified engines with combustion controls including timing retard, exhaust gas cooling, exhaust gas recirculation, and turbocharging. This technology is considered the base case for the BACT assessment.
- Vantage's proposed AirClarity system (catalyzed Diesel Particulate Filter plus Urea-based Selective Catalytic Reduction). Technical information, emission estimates, cost data, and cost-effectiveness calculations are provided in Attachment B.
- Catalyzed Diesel Particulate Filter by itself (technical information in Attachment C).
- Urea-Selective Catalytic Reduction by itself (technical information in Attachment D).
- Three-Way Catalyst (also known as Two-Stage Catalyst). Technical information is provided in Attachment E.
- Diesel Oxidation Catalyst (see Attachment F).

BACT Analysis for NOx

Vantage's Proposed AirClarity System (Urea-Based SCR Plus Catalyzed DPF)

ELM energy has contracted with Vantage to install MTU's AirClarity emission control system on each generator. Technical information is provided in Attachment B. The AirClarity system consists of a modular system including a catalyzed DPF and a urea-based SCR.

The SCR system evaluated for this analysis is the Clean Air Systems package. Technical information is provided in Attachment C. 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 a lean ultralow sulfur fuel is required to achieve good NOx destruction efficiencies. SCR can reduce NOx emissions by up to 90-95 percent while simultaneously reducing hydrocarbon (VOC), CO and PM emissions.

For SCR systems to function effectively, exhaust temperatures must be high enough (about 200 to 500 degrees C) to enable catalyst activation. For this reason, SCR control efficiencies are expected to be

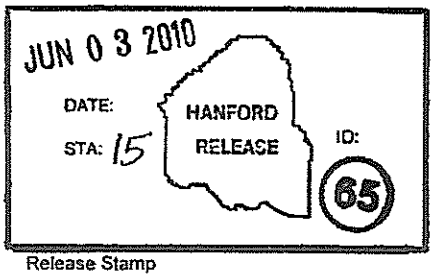
Evaluation of Best Available ControlTechnology for Toxics (tBACT) Double Shell Tank Farms Primary Ventilation Systems Supporting Waste Transfer Operations

Carolyn C. Haass, J. Louis Kovach / Steven E. Kelly, David A. Turner
Columbia Nuclear International LLC / Washington River Protection Solutions
Richland, WA 99352
U.S. Department of Energy Contract DE-AC27-08RV14800

EDT/ECN:	823603	UC:	
Cost Center:	2MH00	Charge Code:	200478
B&R Code:		Total Pages:	112

Key Words: tBACT, BACT, Ecology, Primary Ventilation Systems, 241-AN, 241-AP, 241-AW, 241-AY, 241-AZ, 241-SY, ASIL,

Abstract: This report is an evaluation of Best Available Control Technology for Toxics (tBACT) for installation and operation of the Hanford double shell (DST) tank primary ventilation systems. The DST primary ventilation systems are being modified to support Hanford's waste retrieval, mixing, and delivery of single shell tank (SST) and DST waste through the DST storage system to the Waste Treatment and Immobilization Plang (WTP).



Nancy A Fouad 6-3-10
Release Approval Date

Release Stamp

Approved For Public Release

Exhibit 32

- Letter February 18, 2005, M.A. Wilson to R.J. Schepens, Approval of Non-Radioactive Air emissions Notice of Construction (NOC) for Operation of New Ventilation Systems in AN and AW Tank Farms, Approval Order DE05NWP-001.

The maximum previous plateau tBACT value was $5,700/ton and the maximum ceiling value was $10,500/ton. The additional tBACT factors used in the previous tBACT evaluations were based upon two options. These options took into account the toxicity and carcinogenicity of the various TAPs to scale the tBACT cost factors to reflect the hazards of these pollutants based upon either the classification of each TAP (Class A or B) or the ASIL associated with each TAP.

Option 1: The first option used in the previous tBACT evaluations refers to the Class A and Class B TAP classification defined in the previous (prior to June 20, 2009) WAC 173-460 regulation. For Class A TAPs, the "Plateau" and "Ceiling" values were multiplied by a factor of 10. For Class B TAPs, the "Plateau" and "Ceiling" values were multiplied by a factor of 5.

As of June 20, 2009, the revised WAC 173-460-150 no longer uses the Class A and Class B designations for identification of TAPs to use this method, however, it was noted that the previous Class A TAPs had, for the most part, annual averaging periods and Class B TAPs had 24-hour averaging periods. The current version of the regulations use annual, 24-hour, and hourly averaging periods and no longer designate Class A and B. None of the TAPs with hourly averaging periods were above the de minimis.

The "Plateau" and "Ceiling" values used for all current TAPs with annual averaging periods were multiplied by a factor of 10. **Table 2-1** takes the highest "Plateau" of $5,700 and the "Ceiling" of $10,500 values from the previous tBACTs and multiplies these by the factors of 5 and10 to demonstrate this tBACT adjustment described above.

Table 2-1. tBACT Cost Factors

Method	Cost Factor	Cost Effectiveness Threshold ($/ton)	
		Plateau	Ceiling
Toxic Air Pollutants (TAP) Classification			
Annual Averaging TAP	10	$57,000	$105,000
24-hour Averaging TAP	5	$28,500	$52,500

Option 2: The second option used in the previous tBACT evaluations for assessing tBACT cost effectiveness was based on individual pollutant ASILs and involves calculating a pollutant-specific cost factor using the following:

$$\text{Cost Factor} = \log_{10}(27{,}000 \div \text{ASIL})$$

The cost effectiveness thresholds for tBACT "Plateau" and "Ceiling" values were then determined for each pollutant by multiplying the maximum pollutant "Plateau" and "Ceiling" values by the pollutant-specific cost factor. **Table 2-2** demonstrates these cost factors for all pollutants determined to be above the de minimis for purposes of this tBACT evaluation.

Designated Methodology: All of the tBACT cost factors from Option 2 were under a factor of 10, except for dimethyl mercury. A multiplier of 10 was determined to be the upper limit for adjustment of the previously used tBACT "Plateau" and "Ceiling" values. The upper and bounding "Plateau" and "Ceiling" values used for this tBACT evaluation were then $57,000/ton and $105,000/ton respectively.

Reference materials submitted by Ecology Staff

Reference for Ecology response to Comment 5:

8.1.3. Purpose, electrical load and duration of runtime for each diesel engine during any periods of operation.

8.1.4. Annual gross power generated by or for each independent tenant at the facility and total annual gross power for the facility.

8.1.5. Upset condition log for each engine and generator that includes date, time, duration of upset, cause, and corrective action.

8.1.6. Any recordkeeping required by 40 CFR Part 60 Subpart IIII.

8.1.7. Air quality complaints received from the public or other entity, and the affected emissions units.

9. **REPORTING**

9.1. 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 the Building 2, 3, and ETC phases of this project.

9.2. The following information will be submitted to the AQP at the address in Condition 7 above by January 31 of each calendar year. This information may be submitted with annual emissions information requested by the AQP.

9.2.1. Monthly rolling annual total summary of air contaminant emissions,
9.2.2. Monthly rolling hours of operation with annual total,
9.2.3. Monthly rolling gross power generation with annual total as specified in Approval Condition 8.1.4,
9.2.4. A log of each start-up of each diesel engine that shows the purpose, fuel usage, and duration of each period of operation.

9.3. 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 (3) days of receipt of any such complaint.

9.4. 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**

10.1. **Commencing/Discontinuing Construction and/or Operations:** This approval shall become void if construction of the facility is not begun within 18 months of permit issuance or if facility operation is discontinued for a period of eighteen (18) months or more. In accordance with WAC 173-400-111(7)(c), each phase must commence construction within 18 months of the projected and approved construction dates in this Order.

Reference for Ecology response to Comment 31:

4. GENERAL TESTING AND MAINTENANCE REQUIREMENTS

4.1. 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.

4.2. Within 12 months of the first engine installation and every 36 months thereafter, the Vantage Data Center shall measure emissions of particulate matter (PM), Volatile Organic Compounds (VOC), nitric oxide (NO), nitrogen dioxide (NO_2), carbon monoxide (CO), Ammonia (NH_3), and oxygen (O_2) from at least one representative engine's exhaust stack in accordance with Approval Condition 4.3. This testing will serve to demonstrate compliance with the emission limits contained in Section 5, 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.

4.3. The following procedure shall be used for each test for the engines as required by Approval Condition 4.2 unless an alternate method is proposed by the Vantage Data Center and approved in writing by Ecology prior to the test:

4.3.1. 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.

4.3.2. PM including the condensible fraction, NO, NO_2, VOC, CO and ammonia emissions measurement shall be conducted for each engine tested at the proposed maximum engine load that corresponds to scheduled engine operating scenarios in Approval Conditions 3.2.

4.3.3. EPA Reference Methods from 40 CFR 60, 40 CFR 51, BAAQMD ST-1B (for ammonia) and/or 40 CFR 89 as appropriate for each pollutant shall be used for at least one (representative) engine at this data center. A test plan will be submitted for Ecology approval at least 30 days before any testing is conducted and must include the criteria used to select the engine for testing, as well as any modifications to the standard test procedures contained in the above references.

4.3.4. 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 4.5, shall be included in the test report, along with the emissions calculations.

4.4. Each engine shall be equipped with a properly installed and maintained non-resettable meter that records total operating hours.

4.5. 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 during operation.

ties of equipment are presented in Chaps. 13 through 15. A convenient reference to these various cost figures is given in the Table of Contents and in the subject index.

Estimating Equipment Costs by Scaling

It is often necessary to estimate the cost of a piece of equipment when no cost data are available for the particular size of operational capacity involved. Good results can be obtained by using the logarithmic relationship known as the *six-tenths-factor rule*, if the new piece of equipment is similar to one of another capacity for which cost data are available. According to this rule, if the cost of a given unit at one capacity is known, the cost of a similar unit with X times the capacity of the first is approximately $(X)^{0.6}$ times the cost of the initial unit.

$$\text{Cost of equip. } a = \text{cost of equip. } b \left(\frac{\text{capac. equip. } a}{\text{capac. equip. } b}\right)^{0.6} \tag{1}$$

The preceding equation indicates that a log-log plot of capacity versus equipment cost for a given type of equipment should be a straight line with a slope equal to 0.6. Figure 5-5 presents a plot of this sort for shell-and-tube heat exchangers. However, the application of the 0.6 rule of thumb for most purchased equipment is an oversimplification of a valuable cost concept since the actual values of the cost capacity factor vary from less than 0.2 to greater than 1.0 as shown in Table 5. Because of this, the 0.6 factor should only be used

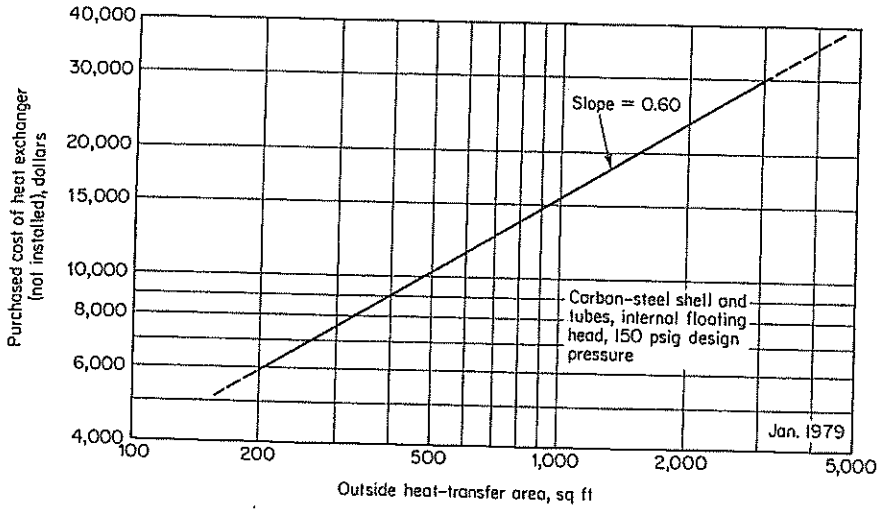


Figure 5-5 Application of "six-tenth-factor" rule to costs for shell-and-tube heat exchangers.

federal enforcement action by the EPA until and unless the schedule is submitted and adopted as an amendment to the state implementation plan.

(3) **Penalties for delayed compliance.** Sources on a compliance schedule but not meeting emissions standards may be subject to penalties as provided in the Federal Clean Air Act.

[Statutory Authority: Chapter 70.94 RCW. 91-05-064 (Order 90-06), § 173-400-161, filed 2/19/91, effective 3/22/91.]

WAC 173-400-171 Public notice. The purpose of this section is to specify the requirements for notifying the public about air quality permit actions and to provide opportunities for the public to participate in those permit actions.

(1) **Prevention of significant deterioration, and relocation of portable sources.**

This section does not apply to:

(a) A notice of construction application designated for integrated review with actions regulated by WAC 173-400-720. In such cases, compliance with the public notification requirements of WAC 173-400-740 is required.

(b) Portable source relocation notices as regulated by WAC 173-400-036, relocation of portable sources.

(2) **Internet notice of application.**

(a) For those applications and actions not subject to a mandatory public comment period per subsection (3) of this section, the permitting authority must post an announcement of the receipt of notice of construction applications and other proposed actions on the permitting authority's internet web site.

(b) The internet posting must remain on the permitting authority's web site for a minimum of fifteen consecutive days.

(c) The internet posting must include a notice of the receipt of the application, the type of proposed action, and a statement that the public may request a public comment period on the proposed action.

(d) Requests for a public comment period must be submitted to the permitting authority in writing via letter, fax, or electronic mail during the fifteen-day internet posting period.

(e) A public comment period must be provided for any application or proposed action that receives such a request. Any application or proposed action for which a public comment period is not requested may be processed without further public involvement at the end of the fifteen-day internet posting period.

(3) **Actions subject to a mandatory public comment period.** The permitting authority must provide public notice and a

public comment period before approving or denying any of the following types of applications or other actions:

(a) Any application, order, or proposed action for which a public comment period is requested in compliance with subsection (2) of this section.

(b) Any notice of construction application for a new or modified source, including the initial application for operation of a portable source, if there is an increase in emissions of any air pollutant at a rate above the emission threshold rate (defined in WAC 173-400-030) or any increase in emissions of a toxic air pollutant above the acceptable source impact levels as regulated under chapter 173-460 WAC; or

(c) Any use of a modified or substituted air quality model, other than a guideline model in Appendix W of 40 CFR Part 51 (in effect on July 1, 2010) as part of review under WAC 173-400-110, 173-400-113, 173-400-117, or 173-400-720; or

(d) Any order to determine reasonably available control technology, RACT; or

(e) An order to establish a compliance schedule issued under WAC 173-400-161, or a variance issued under WAC 173-400-180; or

Note: Mandatory notice is not required for compliance orders issued under WAC 173-400-230.

(f) An order to demonstrate the creditable height of a stack which exceeds the good engineering practice, GEP, formula height and sixty-five meters, by means of a fluid model or a field study, for the purposes of establishing an emission limitation; or

(g) An order to authorize a bubble; or

(h) Any action to discount the value of an emission reduction credit, ERC, issued to a source per WAC 173-400-136; or

(i) Any regulatory order to establish best available retrofit technology, BART, for an existing stationary facility; or

(j) Any notice of construction application or regulatory order used to establish a creditable emission reduction; or

(k) Any order issued under WAC 173-400-091 that establishes limitations on a source's potential to emit; or

(l) The original issuance and the issuance of all revisions to a general order of approval issued under WAC 173-400-560 (this does not include coverage orders); or

(m) Any extension of the deadline to begin actual construction of a "major stationary source" or "major modification" in a nonattainment area; or

(n) Any application or other action for which the permitting authority determines that there is significant public interest.

(4) **Advertising the mandatory public comment period.** Public notice of all applications, orders, or actions listed in subsection (3) of this section must be published in a

newspaper of general circulation in the area where the source or sources are or will be located. This public notice can be published only after all of the information required by the permitting authority has been submitted and after the applicable preliminary determinations, if any, have been made. The notice must be published before any of the applications or other actions listed in subsection (3) of this section are approved or denied. The applicant or other initiator of the action must pay the publishing cost of providing public notice.

(5) **Information available for public review.** The information submitted by the applicant, and any applicable preliminary determinations, including analyses of the effects on air quality, must be available for public inspection in at least one location near the proposed project. Exemptions from this requirement include information protected from disclosure under any applicable law, including, but not limited to, RCW 70.94.205 and chapter 173-03 WAC.

(6) **Published notice components.**

(a) The notice must include:

(i) The name and address of the owner or operator and the facility;

(ii) A brief description of the proposal and the type of facility, including a description of the facility's processes subject to the permit;

(iii) A description of the air contaminant emissions including the type of pollutants and quantity of emissions that would increase under the proposal;

(iv) The location where those documents made available for public inspection may be reviewed;

(v) A thirty-day period for submitting written comment to the permitting authority;

(vi) A statement that a public hearing will be held if the permitting authority determines that there is significant public interest;

(vii) The time, date and location of the public hearing for those ecology only actions listed in WAC 173-400-171(12);

(viii) The name, address, and telephone number and e-mail address of a person at the permitting authority from whom interested persons may obtain additional information, including copies of the permit draft, the application, all relevant supporting materials, including any compliance plan, permit, and monitoring and compliance certification report, and all other materials available to the permitting authority that are relevant to the permit decision, unless the information is exempt from disclosure;

(b) For projects subject to special protection requirements for federal Class I areas, public notice must include an explanation of the permitting authority's draft decision or state that an explanation of the draft decision appears in the support document for the proposed order of

approval; and

(c) For a redesignation of an area under WAC 173-400-118, the notice must state that an explanation of the reasons for the proposed redesignation is available for review at the public location.

(7) **Length of the public comment period.**

(a) The public comment period must be at least thirty days long.

(b) If a public hearing is held, the public comment period must extend through the hearing date.

(c) The final decision cannot be issued until the public comment period has ended and any comments received during the public comment period have been considered.

(8) **Requesting a public hearing.** The applicant, any interested governmental entity, any group, or any person may request a public hearing within the thirty-day public comment period. All hearing requests must be submitted to the permitting authority in writing via letter, fax, or electronic mail. A request must indicate the interest of the entity filing it and why a hearing is warranted.

(9) **Setting the hearing date and providing hearing notice.** If the permitting authority determines that significant public interest exists, then it will hold a public hearing. The permitting authority will determine the location, date, and time of the public hearing.

(10) **Notice of public hearing.**

(a) At least thirty days prior to the hearing the permitting authority will provide notice of the hearing as follows:

(i) Publish the notice of public hearing in a newspaper of general circulation in the area where the source or sources are or will be located; and

(ii) Mail the notice of public hearing to the applicant and to any person who submitted written comments on the application or requested a public hearing.

(b) This notice must include the date, time and location of the public hearing and the information described in subsection (6) of this section.

(c) The applicant must pay all publishing costs associated with meeting the requirements of this subsection.

(11) **Notifying the EPA.** The permitting authority must send a copy of the notice for all actions subject to the mandatory public comment period to the EPA Region 10 regional administrator.

(12) **Special requirements for ecology only actions.**

(a) Ecology must comply with the requirements of 40 CFR 51.102, in effect on July 1, 2010, on the following ecology only actions:

(i) A Washington state recommendation to EPA that will be submitted by the director of ecology for approval of a SIP revision including plans for attainment, maintenance, and

visibility protection;

(ii) A Washington state recommendation to EPA for designation, redesignation, or a change of boundaries of an attainment area, or nonattainment area, or an unclassifiable area;

(iii) A Washington state recommendation to EPA to redesignate Class I, II, or III areas under WAC 173-400-118.

(b) The notice must comply with subsection (10) of this section.

(13) **Other requirements of law.** Whenever procedures permitted or mandated by law will accomplish the objectives of public notice and opportunity for comment, those procedures may be used in lieu of the provisions of this section.

[Statutory Authority: Chapter 70.94 RCW. 11-06-060 (Order 09-01), § 173-400-171, filed 3/1/11, effective 4/1/11. Statutory Authority: RCW 70.94.395 and 70.94.331. 07-11-039 (Order 06-03), § 173-400-171, filed 5/8/07, effective 6/8/07. Statutory Authority: RCW 70.94.152. 05-03-033 (Order 03-07), § 173-400-171, filed 1/10/05, effective 2/10/05. Statutory Authority: Chapter 70.94 RCW, RCW 70.94.141, [70.94.]152, [70.94.]331, [70.94.]510 and 43.21A.080. 01-17-062 (Order 99-06), § 173-400-171, filed 8/15/01, effective 9/15/01. Statutory Authority: Chapter 70.94 RCW. 95-07-126 (Order 93-40), § 173-400-171, filed 3/22/95, effective 4/22/95; 93-18-007 (Order 93-03), § 173-400-171, filed 8/20/93, effective 9/20/93; 91-05-064 (Order 90-06), § 173-400-171, filed 2/19/91, effective 3/22/91.]

WAC 173-400-175 Public information. All information, except information protected from disclosure under any applicable law, including, but not limited to, RCW 70.94.205, is available for public inspection at the issuing agency. This includes copies of notice of construction applications, orders, and applications to modify orders.

[Statutory Authority: RCW 70.94.152. 05-03-033 (Order 03-07), § 173-400-175, filed 1/10/05, effective 2/10/05.]

WAC 173-400-180 Variance. Any person who owns or is in control of a plant, building, structure, establishment, process, or equipment may apply to ecology for a variance from provisions of this chapter governing the quality, nature, duration, or extent of discharges of air contaminants in accordance with the provisions of RCW 70.94.181.

(1) **Jurisdiction.** Sources in any area over which a local air pollution control authority has jurisdiction shall make application to that authority rather than ecology. Variances to state rules shall require ecology's approval prior to being

Reference for Ecology response to Comment 34:

- Pages 11 and 12, Table 3-1: These run-time hours are not consistent with Table AA2. Table AA2, apparently used as modeling inputs, has been used to establish run-time limits in the current preliminary determination.

- Page 14, Table 3-2: This Table is not consistent with Table BB2 and Table BB2 is not consistent with Table AA2. Again, Table AA2 was used to establish run-time limits in the current preliminary determination.

- Consistent with the first bullet above, Page 20, 21: " Vendor-guaranteed removal efficiencies are as follows:
  - NOx > 90%
  - CO > 90%
  - VOC > 90%
  - PM > 87%"

  Vantage has provided no documentation of these control efficiencies. It is misleading to include them in this document. Actual control levels are closer to an average of 60%.

The present preliminary determination includes run-times and emission limits using the lowest of those presented where there are inconsistencies. Other determinations remain as outlined in the original TSD as follows:

1. BACKGROUND

Starting in 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 start construction before July 1, 2011. The AQP has received 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.

2. EXECUTIVE SUMMARY

Reference for Ecology response to Comment 41:

5. EMISSION LIMITS

5.1. The seventeen (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.

5.2. If required to demonstrate compliance with the g/kW-hr EPA Tier IV average emission limits through stack testing, the Vantage Data Center shall conduct exhaust stack testing and average emission rates for 5 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.

5.3. Nitrogen oxide (NOx) 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:

Table 5.3: Nitrogen oxide (NOx) emission rate limits

	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.3.1	Annual Step Testing	100%		10.3
5.3.2	Corrective Maintenance	100%		10.3
5.3.3	Building 1 Outage, Storm Avoidance	81% 10%		7.58 2.6
5.3.4	Buildings 2 and 3 Outage	90%		8.83
5.3.5	Building ETC Outage	93%		9.3

5.4. Nitrogen dioxide (NO_2) 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:

Table 5.4: Nitrogen dioxide (NO_2) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.4.1	Annual Step Testing	100%		1.50
5.4.2	Corrective Maintenance	100%		1.50
5.4.3	Building 1 Outage, Storm Avoidance	81% 10%		0.40 1.50
5.4.4	Buildings 2 and 3 Outage	90% 10%		0.40 1.50
5.4.5	Building ETC Outage	93% 10%		0.40 1.50

5.5. Carbon monoxide 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:

Table 5.5: Carbon monoxide (CO) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.5.1	Annual Step Testing	100%		1.35
5.5.2	Corrective Maintenance	100%		1.35
5.5.3	Building 1 Outage, Storm Avoidance	81% 10%		1.05 0.60
5.5.4	Buildings 2 and 3 Outage	90% 10%		1.19 0.60
5.5.5	Building ETC Outage	93% 10%		1.24 0.60

5.6. Diesel Engine Exhaust Particulate (DEEP) emissions (Total PM after control on these engines) 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:

Table 5.6: Diesel Engine Exhaust Particulate (DEEP) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.6.1	Annual Step Testing	100%		0.484
5.6.2	Corrective Maintenance	100%		0.484
5.6.3	Building 1 Outage, Storm Avoidance	81% 10%		0.374 0.400
5.6.4	Buildings 2 and 3 Outage	90% 10%		0.425 0.400
5.6.5	Building ETC Outage	93% 10%		0.444 0.400

5.7. Volatile Organic Compound (VOC) 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:

Table 5.7: Volatile Organic Compound (VOC) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.7.1	Annual Step Testing	100%		0.22
5.7.2	Corrective Maintenance	100%		0.22
5.7.3	Building 1 Outage, Storm Avoidance	81% 10%		0.22 0.25
5.7.4	Buildings 2 and 3 Outage	90% 10%		0.22 0.25
5.7.5	Building ETC Outage	93% 10%		0.22 0.25

5.8. Total Particulate Matter (PM) emissions from all 17 engines combined shall not exceed 0.22 tons/yr (440 lbs/yr). All PM emissions shall be considered diesel engine exhaust particulate (DEEP) and $PM_{2.5}$ emissions.

5.9. Nitrogen dioxide (NO_2) emissions from all 17 engines combined shall not exceed 18.1 lbs/hr and 0.6 tons/yr.

5.10. Volatile organic compound (VOC) emissions from all 17 engines combined shall not exceed 0.37 tons/yr (740 lbs/yr).

5.11. Carbon Monoxide (CO) emissions from all 17 engines combined shall not exceed 1.22 tons per year (2440 lbs/yr).

5.12. Ammonia emissions from any of the 17 engines at the Vantage Center shall not exceed 15 ppmvd at 15%O2, nor 0.64 pounds per hour.

5.13. Sulfur dioxide emissions from all 17 engines combined shall not exceed 0.020 tons/yr (40 lbs/yr).

5.14. Visual emissions from each diesel electric generator exhaust stack shall be no more than 5 percent, with the exception of a two (2) 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

6.1. 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:

6.1.1. 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.

6.1.2. Normal operating parameters and design specifications.

6.1.3. 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

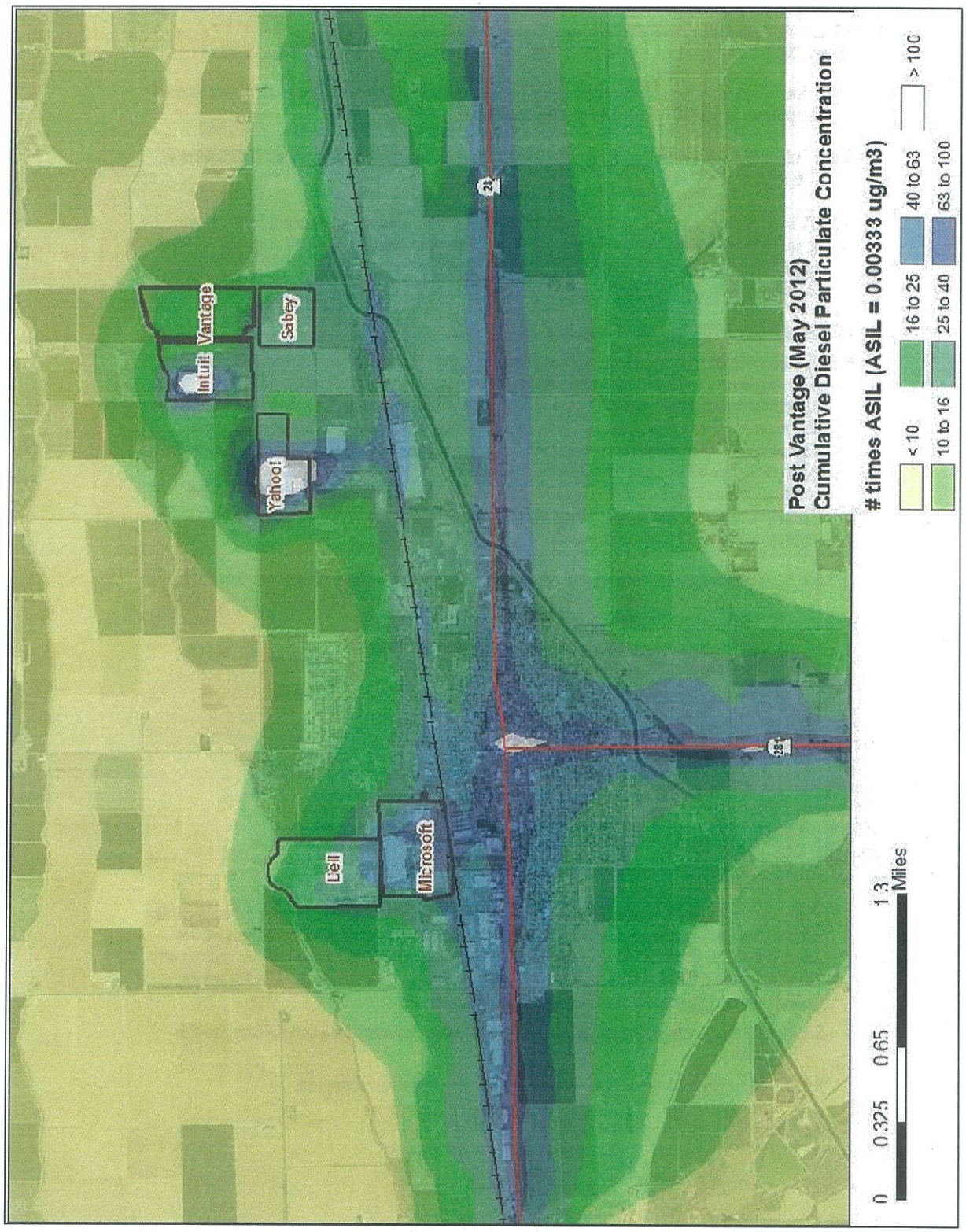
8. RECORDKEEPING

8.1. 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:

8.1.1. Fuel receipts with amount of diesel and sulfur content for each delivery to the facility.

8.1.2. Monthly and annual hours of operation for each diesel engine.

Reference for Ecology response to Comment 43:



July 12, 2012

Greg Flibbert and Robert Koster
Washington State Department of Ecology, Eastern Regional Office
4601 N. Monroe Street
Spokane, WA, 99205
509/329-3400

Subject: Summary Response for BACT vs. Vendor-Guaranteed Not To Exceed Emission Rates
Vantage Data Center, Quincy, WA

Dear Greg and Robert:

On behalf of Vantage Data Centers, ICF is pleased to submit this summary response to the supplemental information requested by Ecology on July 5, 2012. This summary response is divided into five parts:

- Signed certification form (see Attachment A)
- Submit comments to the public-review Draft PD (see Attachment B)
- Provide a supplemental Top-Down BACT assessment, using "Nominal-Uncontrolled" and "Nominal-Controlled" emission rates.
- Explain why Vantage proposes emission controls that go beyond BACT.
- Explain why Ecology should revise Vantage's emission limits to match the vendor-guaranteed NTE

We trust this response letter provides the information Ecology needs to revise the Draft Proposed Determination to reflect Vantage's requests. Please do not hesitate to call either Mike Duffy of Vantage Data Centers at 206/406-9148 or me at 206/801-2832 if you have any questions about this letter.

Sincerely,

James Wilder
Managing Consultant

VANTAGE RESPONSES TO ECOLOGY'S SUPPLEMENTAL DATA REQUEST
VANTAGE DATA CENTER, QUINCY, WA
RESPONSES PREPARED JULY 11, 2012

PROVIDE A SUPPLEMENTAL TOP-DOWN BACT ASSESSMENT

A thorough supplemental Top-Down BACT assessment, including detailed information and cost calculations, is enclosed with this response letter. A brief summary is provided below. As requested by Ecology, this supplemental top-down BACT assessment used "Nominal-Uncontrolled" and "Nominal-Controlled" emission rates, which are substantially lower than the "Not-to-Exceed (NTE) Vendor-Guaranteed Emission Rates" that ICF used for our original BACT assessment, AERMOD modeling, and risk assessment used for our permit application package.

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 PM2.5) and sulfur dioxide.

Generators equipped with EPA Tier-2 certified engines were considered the base case for the BACT assessment. The following add-on technologies were considered for the top-down BACT assessment:

- AirClarity System (Catalyzed DPF and SCR) proposed by Vantage
- Catalyzed Diesel Particulate Filter
- Urea-Selective Catalytic Reduction
- Three-Way Catalyst
- Diesel Oxidation Catalyst

All of the add-on technologies are technically feasible. They are commercially available, and offer substantial pollutant removal efficiencies. None of them would pose unreasonable operational difficulties.

However, all of the add-on technologies failed the cost-effectiveness criteria by a wide margin, for the individual pollutants and for the multi-pollutant reasonableness test. The forecast cost-effectiveness values for each technology are listed in Table 1 below.

Because all of the feasible add-on technologies failed the cost-effectiveness criterion, ICF recommends that none of them (not even the AirClarity system proposed by Vantage) should be defined as BACT. Instead, ICF recommends that BACT for each pollutant should be defined as use of EPA Tier-2 certified engines, with diligent annual operation and maintenance requirements required under New Source Performance Standards Subpart IIII.

Table 1. Comparison of BACT Cost-Effectiveness Evaluations for Feasible Control Technologies

Control Device	Cost-Effectiveness ($/ton)				
	NOX	Total PM	CO	VOC	Combined Pollutants
MTU AirClarity System (Catalyzed DPF + SCR) proposed by Vantage	$81,000	$700,000	$434,000	$1,645,000	$60,000
Catalyzed DPF Alone	Ineffective	$252,000	$152,000	$578,000	$81,000
SCR Alone	$40,300	$1,519,000	$216,000	$820,000	$32,000
3-Way Catalyst	$37,500	$125,000	$71,000	$296,000	$19,200
Diesel Oxidation Catalyst	Ineffective	$310,000	$55,000	$314,000	$41,000
Ecology Cost-Effectiveness Criterion	$10,000	$23,200	$5,000	$10,000	N/A

EXPLAIN WHY VANTAGE HAS ALWAYS PROPOSED TO VOLUNTARILY INSTALLTHE AIRCLARITY EMISSION CONTROL SYTEM, WHICH GOES BEYOND THE RECOMMENDED BACT REQUIREMENT

As described in the previous section, ICF concludes that none of the identified add-an control technologies satisfy BACT because they all fail the cost-effectiveness criterion by a wide margin. Regardless, ever since the inception of this project Vantage has proposed installing the AirClarity emission control system on all of the generators at the Vantage-Quincy data center. The AirClarity system is a modular system designed for the MTU generators, that includes a catalyzed DPF and a urea-based SCR. The reasons Vantage has voluntarily elected to voluntarily install expensive add-on controls are as follows:

SEPA Checklist. For the State Environmental Policy Act (SEPA) Checklist, which was submitted to the City of Quincy in August 2011, Vantage committed that every diesel generator installed at the facility will comply with EPA Tier-4 emission standards. Vantage did this to reflect its corporate commitment to install environmental controls at all of its corporate-wide facilities that go beyond all minimum regulatory requirements.

NAAQS Compliance. Vantage recognized that background air quality in the northeastern industrial area of Quincy has already been affected by permitted emissions from the existing (or permitted) emergency generators at the Yahoo Data Center, Intuit Data Center, and Sabey-Intergate Data center. In order to comply with the federal National Ambient Air Quality Standards (NAAQS) for particulate matter and NO2, Vantage recognized its generators would have to be equipped with emission controls that are more efficient than the EPA Tier-2 controlled engines that have been installed at every other data center in Quincy. For the Notice of Construction air quality application package, Vantage used the AERMOD dispersion model to include the "vendor-guaranteed NTE emission rates" provided by ELM Energy LLC, Vantage's supplier for the generators and the AirClarity system. Based on the vendor-guaranteed NTE emission rates, Vantage demonstrated the controlled emissions comply with the NAAQS for all pollutants, even after using Ecology's mandated screening-level modeling requirements.

ASIL for NO2. Vantage recognized that emissions of toxic air pollutants are a valid concern for local citizens. To demonstrate compliance with Ecology's Acceptable Source Impact Levels (ASILs) for all pollutants including NO2 (but not including DEEP), Vantage used the AERMOD model to account for the vendor-guaranteed NTE emission rate for NO2. By doing so, Vantage demonstrated the controlled worst-case NO2 impact caused solely by the facility's emissions achieved the ASIL by a comfortable margin.

Second-Tier Cancer Risk for DEEP. Vantage recognized that DEEP emissions are a valid concern for local citizens. Vantage modeled carcinogenic DEEP emissions as being identical to ELM's vendor-guaranteed NTE controlled emission rates for total particulate (front-half plus back-half). Even with the vendor-guaranteed controlled emission rate the modeled DEEP impact at the maximum boundary receptor exceeded the ASIL, so Vantage was required to comply with Ecology's Second Tier risk assessment standard for DEEP. By accounting for ELM Energy's vendor-guaranteed NTE controlled emission rates for DEEP, Vantage was able to demonstrate that the DEEP cancer risks at all receptor locations (at onsite tenant space and at all offsite locations) achieved Ecology's Second-Tier standard of 10-per-million by a comfortable margin.

EXPLAIN WHY VANTAGE REQUESTS THAT ALL HOURLY EMISSION LIMITS BE SET EQUAL TO ELM'S VENDOR-GUARANTEED NTE CONTROLLED EMISSION RATES

As described above, all of Vantage's AERMOD dispersion modeling used for NAAQS compliance, ASIL compliance, and Second-Tier DEEP risk assessment used Elm Energy's conservatively high vendor-guaranteed NTE controlled emission rates at each generator load. Vantage's air quality permit application package clearly indicated that process, and clearly requested that the Ecology permit should specify hourly emission rates for all pollutants and all generator loads equal to Elm Energy's vendor-guaranteed NTE emission rates.

However, the Preliminary Determination air quality permit, which has been distributed by Ecology for public review and comment, sets Vantage's load-specific hourly emission rates to

values that are substantially lower than Elm Energy's vendor-guaranteed NTE controlled rates. Instead of specifying the vendor-guaranteed rate for each generator load, Ecology staff did their own manual calculations to specify lower emission limits based on Elm Energy's "nominal-uncontrolled" rates. Those reduced allowable emission limits are listed in Section 5 of the Preliminary Determination.

Vantage requests that Ecology should revise the emission limits set in Section 5 of the PD to match Elm Energy's vendor-guaranteed NTE controlled rates that were requested in Vantage's permit application package. A marked-up copy of Section 5 of the PD is attached, showing the requested corrections. Vantage's reasons for requesting this change are listed below.

Vantage Presented the Vendor-Guaranteed NTE Rates in Its AERMOD Modeling and Second-Tier Risk Assessment. Vantage worked closely with Ecology's modelers and risk assessment specialists to conduct the AERMOD modeling used for the NAAQS compliance demonstration and the Second Tier risk assessment. We all agreed to use the conservatively high emission rates set by Elm's vendor-guaranteed NTE limits. That conservatively high AERMOD modeling showed compliance with the NAAQS and the Second-Tier cancer risk limit (10-per-million) with a comfortable safety margin. Therefore, Vantage believes it is reasonable to set the permitted hourly emission limits to the same values that were used for the AERMOD modeling (i.e., Elm Energy's vendor-guaranteed NTE rates).

There is a Reasonable Likelihood Of Future Stack Testing Requirement. Given the current litigious climate for air quality permitting in Quincy, Vantage believes it is prudent to assume they will eventually be required to conduct multi-load stack testing on many, if not all, of their installed generators. Therefore, it is crucial that Vantage's load-specific emission limits be set at Elm's vendor-guaranteed NTE rates.

Ecology's Reduced Limits Are Unacceptably Close To (Or Even Below) Elm Energy's Measured Stack-Tested Values. Vantage's permit application package presented Elm Energy's stack test data for the AirClarity system installed on a similar MTU diesel generator. In at least one case Ecology's reduced emission limit is actually less than the stack-tested value. On June 21, 2011 ICF submitted an email to Ecology staff identifying at least one "fatal flaw" condition whereby Ecology's permit limit was actually less than Elm Energy's stack-test value:

> Requested NTE NOx rate at 10% load: 1.9 lbs/hr
> Elm's stack-tested value (NOx, 10% load): 1.7 lbs/hr
> Ecology limit (NOx, 10% load): 0.57 lbs/hr

Ecology's reduced emission limits for Total PM are higher than Elm's stack-tested values, but their reduced PM limit unacceptably reduces the "safety-factor" that Elm originally applied when they developed the vendor-guaranteed NTE rates. For example, the values for PM at 100% load are as follows:

Elm's stack-tested value (PM, 100% load): 0.36 lbs/hr
Requested NTE for PM rate at 100% load: 0.484 lbs/hr (34% safety factor)
Ecology limit (PM, 100% load): 0.42 lbs/hr (safety factor reduced to 17%)

Given the variability in the stack-tested PM rates that were recently measured by Microsoft on their generators, Vantage questions the rationale for Ecology choosing to reduce Vantage's safety factor for PM.

"Nominal-Uncontrolled" Rates Used By Ecology Are Not Vendor-Guaranteed, and Do Not Apply to Individual Generators. Elm Energy's NTE rates are vendor-guaranteed for each individual generator, and at each individual engine load. Therefore, if Ecology's required stack testing indicates an exceedance of Elm's NTE rate for any engine or any generator load, then Elm Energy and Vantage will have the contractual flexibility to promptly undertake corrective measures. However, Ecology's reduced emission limits relied on Elm Energy's "Nominal-Uncontrolled" rates. Those "nominal" values are Elm's engineering judgment about the "typical, average" performance for MTU's entire engine family. Those "nominal-uncontrolled" rates are not vendor-guaranteed, and they do not apply to any individual generator, nor to any individual engine load. Therefore, we question Ecology's use of those "Nominal-Uncontrolled" rates to derive load-specific emission limits that will apply to the stack tests for every individual generator.

Ecology's Reduced Emission Limits Put Vantage At Unacceptable Business Risk. For all of the reasons stated above, Ecology's specification of permit limits lower than Elm Energy's vendor-guaranteed NTE rates will put Vantage at an unacceptable business risk. If Ecology's required stack testing shows tested emissions for any individual generator and load that exceed Ecology's limit but are less than Elm's vendor-guaranteed rate, then Ecology will be required to issue a Notice of Violation to require Vantage to correct the violation. However, in that case the measured emissions would satisfy Elm Energy's vendor guarantee, so Vantage would have no contractual ability to require Elm to correct the problem. That constitutes a severe business risk to Vantage, that is unacceptable to Vantage's senior management.

Ecology's Reduced Emission Limits Are Inconsistent With Ecology's Recent Precedents for Permitting Vantage's Business Competitors. In 2011 Ecology issued air quality permits to other computer data centers in Quincy, some of which are Vantage's business competitors. Those other data centers requested load-specific emission limits that were at least as high as their suppliers' vendor-guaranteed rates, and for some pollutants considerably higher than their vendor-guaranteed rates. In those recent cases Ecology granted their request. Therefore, Vantage questions Ecology's decision to change its recent precedents, and to impose arbitrarily low reduced emission limits, but only for the Vantage Data Center.

ATTACHMENT A
CERTIFICATION FORM FOR SUPPLEMENTAL RESPONSE

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY
NOTICE OF CONSTRUCTION APPLICATION
DECLARING INTENT TO CONSTRUCT, INSTALL OR ESTABLISH
OR
REPLACEMENT OR SUBSTANTIAL ALTERATION OF
EMISSION CONTROL TECHOLOGY ON AN EXISTING STATIONARY SOURCE

I. PERMITTING AUTHORITY (Send Completed Application to this address)

Department of Ecology Headquarters / Industrial Section PO Box 47600 Olympia WA 98504-7600 360-407-6000	Department of Ecology Central Region 15 East Yakima Avenue, Suite 200 Yakima WA 98902-3452 509-575-2490	Department of Ecology Eastern Region North 4601 Monroe Spokane WA 98205-1295 (509) 329-3400

II. COMPANY INFORMATION

1. Legal Name of Company Vantage Data Centers Management Company, LLC	
2. Company Mailing Address (street, city, state, zip) 2625 Walsh Ave., Santa Clara, CA 95051	
3. Company Responsible Official Jeff Kane, Senior Vice President	
4. Company Phone (408) 215-7300	5. Company Fax: (408) 716-2529

XII. OTHER DATA See NOC Tech Support Document and Second Tier Risk Reports for DPM

1. Site Plan and Equipment Layout for the site attached?	XXYES	☐NO
2. MSDS Sheets for Chemicals or Materials related to this proposal attached?	☐YES	XXNO
3. Vendor's and/or Manufacturer's information attached?	XXYES	☐NO
4. Modeling Information attached?	XXYES	☐NO
5. Fugitive Dust Control Plan attached?	☐YES	XXNO Not applicable
6. All Enclosures for your Specific Proposal attached?	XXYES	☐NO

7. Name and Title of Person Filling out this Form: James Wilder, ICF International
Telephone: 206/801-2832
Email: jwilder@ icfi.com
Date: 5-14-2012

James Wilder

8. Signature of Responsible Official Name: Jeffrey P. Kane, Senior Vice President

Date: July 11, 2012

Jeff P Kane

ATTACHMENT B
VANTAGE'S REQUESTED REVISIONS TO SECTION 5 "EMISSION LIMITS" IN PRELIMINARY DETERMINATION

Downloaded from Ecology web's site 7/11/2012

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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

Preliminary Determination

VANTAGE DATA CENTER'S COMMENTS AND REQUESTED CHANGES TO PUBLIC-DRAFT PRELIMINARY DETERMINATION, COMMENTS DATED 7-11-2012

TO: Jeff Kane, Vice President
Vantage Data Centers Management Company, LLC
2625 Walsh Ave
Santa Clara, CA 95051

EQUIPMENT

The list of equipment that was evaluated for this order of approval 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. Annual operations and emissions will be restricted to 169,500 gallons per year of fuel consumption and 57.5 hours per year of operation. Each engine will operate for approximately 75.5 hours per year for required maintenance testing and outage operation and an additional 9.5 hours per year of no-load idle cool down. The generators will be installed in four phases. Phase 1 will consist of seven 3.0 MWe generators that will be installed upon approval. Phases 2, 3, and 4 will consist of a total of ten additional 3.0 MWe generators, which will be installed at the facility as independent tenant companies contract for space at the Vantage-Quincy Data Center (hereafter "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	DC1-1P	3.0			
"	DC1	DC1-2P	3.0			
"	DC1	DC1-3P	3.0			
"	DC1	DC1-4P	3.0			
"	DC1	DC1-5P	3.0			
"	DC1	DC1-6R	3.0			
"	DC1	DC1-7R	3.0			
2	DC2	DC2-1P	3.0			
"	DC2	DC2-2P	3.0			
"	DC2	DC2-3P	3.0			
"	DC2	DC2-4R	3.0			
3	DC3	DC3-1P	3.0			
"	DC3	DC3-2P	3.0			
"	DC3	DC3-3P	3.0			
"	DC3	DC3-4R	3.0			
4	ETC	ETC-1P	3.0			
"	ETC	ETC-2R	3.0			

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The Vantage Data Center will utilize non-evaporative cooling units to dissipate heat from electronic equipment at the facility, thus eliminating evaporative cooling tower emissions from the project.

PROJECT SUMMARY

The Vantage Data Center Phase 1 construction will consist of Building 1 with 5 primary engine-generators and 2 reserve. Phases 2, 3, and 4 construction will consist of Buildings 2, 3, and 4 with 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 Vantage 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 excluding emissions due to commissioning of each engine. Table 2b contains toxic air pollutant potential-to- emit for the Vantage-Quincy Data Center project excluding emissions due to commissioning of each engine.

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Table 2a: Criteria Pollutant Potential to Emit for Vantage Data Center			
Pollutant	**Emission Factor (EF) Reference**	**Emission Factors**	**Facility Emissions**
Criteria Pollutant		Lb/hr	tons/yr
2.1.1 NOx Total			5.83
2.1.1a NOx 10% load	MTU Guarantee	3.12	na
2.1.1b NOx 93.3% load	MTU Guarantee	15.4	na
2.1.1c NOx 100% load	MTU Guarantee	17.2	na
2.1.2 CO Total	MTU Guarantee	na	1.22
2.1.2a CO 10% load	MTU Guarantee	1.41	na
2.1.2b CO 81% load	MTU Guarantee	1.93	na
2.1.2c CO 93.3% load	MTU Guarantee	2.17	na
2.1.2d CO 100% load	MTU Guarantee	2.39	na
2.1.3 SO_2	MTU Guarantee	na	0.02
2.1.4 $PM_{2.5}$/DEEP Total	MTU Guarantee	na	0.22
2.1.4a DEEP 10% load	MTU Guarantee	0.205	na
2.1.4b DEEP 81% load	MTU Guarantee	0.396	na
2.1.4c DEEP 93.3% load	MTU Guarantee	0.47	na
2.1.4d DEEP 100% load	MTU Guarantee	0.512	na
2.1.5 VOC 10% Load	MTU Guarantee	0.39	0.36

Table 2b: Toxic Air Pollutant Potential to Emit for Vantage 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	6.8E-03
2.1.7 Acrolein	7.88E-06	1.92E-05
2.1.8 Benzene	7.76E-04	1.89E-03
2.1.9 Toluene	2.81E-04	6.85E-4
2.1.10 Xylenes	1.93E-04	4.71E-04
2.1.11 Napthalene	1.30E-04	1.96E-03
2.1.11 1,3 Butadiene	1.96E-05	4.77E-05
2.1.12 Formaldehyde	7.89E-05	1.92E-04
2.1.13 Acetaldehyde	2.52E-05	6.14E-05
2.1.14 Benzo(a)Pyrene	1.29E-07	2.98E-07
2.1.15 Benzo(a)anthracene	6.22E-07	1.44E-06
2.1.16 Chrysene	1.53E-06	3.55E-06
2.1.17 Benzo(b)fluoranthene	1.11E-06	2.58E-06
2.1.18 Benzo(k)fluoranthene	1.09E-07	2.53E-07
2.1.19 Dibenz(a,h)anthracene	1.73E-07	4.02E-07
2.1.20 Ideno(1,2,3-cd)pyrene	2.07E-07	4.81E-07

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2.1.21 PAH (no TEF)	3.88E-06	9.01E-06
2.1.22 PAH (apply TEF)	4.98E-07	1.16E-06
State Criteria Pollutant Air Toxics		
2.1.23 DEEP/$PM_{2.5}$	MTU Guarantee	0.19
2.1.24 Carbon monoxide	MTU Guarantee	1.13
2.1.25 Sulfur dioxide	MTU Guarantee	0.02
2.1.26 Primary NO_2*	10% total NOx	0.6
2.1.27 Ammonia	15 ppmv at 15%O_2	0.36

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

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 below:

Table 3: Best Available Control Technology Requirements	
Pollutant(s)	**BACT Determination**
Particulate matter (PM), carbon monoxide and volatile organic compounds (VOC)	a. Use of a catalyzed diesel particulate filter; b. Use of EPA Tier 2 certified engines if the engines are installed and operated as emergency engines, as defined at 40 CFR §60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; c. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII; and d. Emission levels reflecting 90% control of uncontrolled engine emissions of VOC and CO, 87% of PM

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Nitrogen oxides (NOx)	a. Use of urea-based SCR with no more than 15 ppmv ammonia slip; b. Use of EPA Tier 2 certified engines if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; c. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII; and d. Emission levels reflecting 90% control of uncontrolled engine emissions of NOx
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 one toxic air pollutant – diesel engine exhaust particulate matter – exceeds the Acceptable Source Impact Level (ASIL) for that pollutant, as defined in Chapter 173-460 WAC. Ecology has reviewed the health risks associated with diesel engine exhaust particulate 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:

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APPROVAL CONDITIONS

1. ADMINISTRATIVE CONDITION

1.1. 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.

2. EQUIPMENT RESTRICTIONS

2.1. Any engine used to power the electrical generators shall be certified by the manufacturer to meet 40 CFR 89 Tier IV emission levels or other specifications as 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), and must be equipped with CO,VOC, PM, and NOX control equipment at least as effective as that evaluated in this NOC approval. Each engine approved in this Order must operate as an emergency engine as defined at $0 CFR 60, Subpart IIII or 40 CFR 63, Subpart ZZZZ.

2.2. The only engines and electrical generating units approved for operation at the Vantage Data Center are those listed by serial number in Table 1 above.

2.3. 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 community impacts.

2.4. The installation of any new engines after July 1, 2014 will require notification to Ecology that includes engine manufacturer's specification sheets. Ecology will decide 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.

2.5. The seventeen (17) MTU Model 20V4000 engines exhaust stack heights shall be greater than or equal to 41 feet above ground level for engines providing power to Buildings 1,2, and 3, and 43.8 feet for engines serving Building ETC, and will be no more than 26 inches in diameter. All engines that may be used for this project shall be required to verify that exhaust stack parameters such as diameter, height, and exhaust rate and velocity do not result in community emissions impacts greater than what was evaluated for this project.

2.6. The manufacture and installation of the seventeen (17) engine/generator sets proposed for Building 1, Building 2, Building 3, and Building ETC of the project shall occur by July 1, 2015. If the manufacture and installation of the engines has not been completed by the above date, new source review may be required prior to installation, and community impacts will be re-evaluated if new source review is required. Vantage may request an extension of this time schedule, and Ecology may approve of an extension without revision to this Order.

2.7. This Order only applies to the seventeen (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 review. New source review will not be

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required for engines with a rated full standby capacity of less than 4678 hp that comply with the engine certification requirements and control equipment requirements contained in Approval Condition 2.1 unless there is an increase in community emission impacts. On a case-by-case basis, Ecology may require additional ambient impacts analyses prior to installation of smaller engines.

3. OPERATING LIMITATIONS

3.1. Excluding commissioning/start-up testing, the fuel consumption at the Vantage Data Center facility shall be limited to a total of 169,500 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 (3) year period using monthly rolling totals.

3.2. Except as provided in Approval Condition 3.5, the seventeen (17) Vantage Data Center engines are limited to the following average hours of operation, and averaging periods:

3.2.1. Each engine serving Building 1 shall not exceed 85 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average.

3.2.2. Operation of the two Building 1 reserve engines shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing. The reserve engines may also provide outage (8 hours) or storm avoidance (16 hours) power in the event of the failure of a primary engine. These hours may be averaged over a three (3) year period using monthly rolling totals.

85 combined

3.2.3. Operation of the five primary engines serving Building 1 shall not exceed 10% load except for ~~8.5~~ hours per year at 100% load for step testing, ~~and 8 hours at 100% load for~~ and corrective maintenance, and 41 hours per year at 81.3% load for building transformer maintenance, storm avoidance, and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.4. Each engine serving Building 2, 3 and ETC shall not exceed 69 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average. A total of 16 hours per year of 'storm avoidance' operation may be added to the above total without amendment of this approval upon satisfactory demonstration to Ecology that these hours are a necessity for the tenants of these buildings.

3.2.5. Operation of each of the Building 2 and Building 3 and ETC Building reserve engines (one at each building) shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing. The reserve engines may also provide outage power in the event of the failure of a primary engine. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.6. Operation of the six primary engines serving Building 2 (3) and Building 3 (3) shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing, and 25 hours per year at 90% load for building transformer maintenance and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.7. Operation of the primary engine serving Building ETC shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing, and 25 hours per year at 93% load for building transformer maintenance and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.3. 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.

3.4. The seventeen (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.

3.5. Initial start-up (commissioning) testing for the seventeen (17) MTU Model 20V4000 engines at the Vantage Data Center is restricted to an average of 40 hours per generator and 8,692 gallons of fuel per generator, averaged over all generators installed during any consecutive 3 year period.

3.5.1. Except during site integration testing as specified below, only one engine shall be operated at any one time during start-up testing.

3.5.2. During a site integration test, no more than seven (7) generator engines may operate concurrently for up to four continuous hours.

3.5.3. All startup and commissioning testing shall be conducted during daylight hours.

3.5.4. Fuel use limits contained in Approval Conditions 3.1 and emission limits contained in Approval Conditions 5, are not applicable to initial commissioning testing of each engine.

4. GENERAL TESTING AND MAINTENANCE REQUIREMENTS

4.1. 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.

4.2. Within 12 months of the first engine installation and every 36 months thereafter, the Vantage Data Center shall measure emissions of particulate matter (PM), Volatile Organic Compounds (VOC), nitric oxide (NO), nitrogen dioxide (NO_2), carbon monoxide (CO), Ammonia (NH_3), and oxygen (O_2) from at least one representative engine's exhaust stack in accordance with Approval Condition 4.3. This testing will serve to demonstrate compliance with the emission limits contained in Section 5, and as an indicator of proper operation of the engines. The selection of the engine(s) to be

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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.

4.3. The following procedure shall be used for each test for the engines as required by Approval Condition 4.2 unless an alternate method is proposed by the Vantage Data Center and approved in writing by Ecology prior to the test:

4.3.1. 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.

4.3.2. PM including the condensible fraction, NO, NO_2, VOC, CO and ammonia emissions measurement shall be conducted for each engine tested at the proposed maximum engine load that corresponds to scheduled engine operating scenarios in Approval Conditions 3.2.

4.3.3. EPA Reference Methods from 40 CFR 60, 40 CFR 51, BAAQMD ST-1B (for ammonia) and/or 40 CFR 89 as appropriate for each pollutant shall be used for at least one (representative) engine at this data center. A test plan will be submitted for Ecology approval at least 30 days before any testing is conducted and must include the criteria used to select the engine for testing, as well as any modifications to the standard test procedures contained in the above references.

4.3.4. 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.

4.4. Each engine shall be equipped with a properly installed and maintained non-resettable meter that records total operating hours.

4.5. 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 during operation.

5. EMISSION LIMITS

5.1. The seventeen (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 as determined according to those approval conditions.

5.2. If required to demonstrate compliance with the g/kW-hr EPA Tier IV average emission limits through stack testing, the Vantage Data Center shall conduct exhaust stack testing

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and average emission rates for 5 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.

5.3. Nitrogen oxide (NOx) 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 uncontrolled engine emission factors provided by the engine manufacturer and on control effectiveness guarantees included in the NOC application documents:

Table 5.3: Nitrogen oxide (NOx) emission rate limits

	Operating Scenario	Operating Load	Emissions Limit per engine in lb/hr[1]
5.3.1	Annual Step Testing	100%	10.3 5.17
5.3.2	Corrective Maintenance	100%	10.3 5.17
5.3.3	Building 1 Outage, Storm Avoidance	81% 10%	8.83 3.72 0.57 1.83
5.3.4	Buildings 2 and 3 Outage	90%	7.58 4.36
5.3.5	Building ETC Outage	93%	~~7.58~~ 4.61 9.3

E/m Energy NTE rate

[1] MTU Uncontrolled Engine Emissions Less The Fractional Control Guarantee in NOC Documents

5.4. Nitrogen dioxide (NO_2) emissions from each of the seventeen (17) MTU Model 20V4000 engines rated at 2937 brake horse power shall not exceed the following emission rates at the stated loads, based on uncontrolled engine emission factors provided by the engine manufacturer and on control effectiveness guarantees included in the NOC application documents:

Table 5.4: Nitrogen dioxide (NO_2) emission rate limits

	Operating Scenario	Operating Load	Emissions Limit per engine in lb/hr[1]
5.4.1	Annual Step Testing	100%	1.03 0.52
5.4.2	Corrective Maintenance	100%	1.03 0.52
5.4.3	Building 1 Outage, Storm Avoidance	81% 10%	0.88 0.37 0.07 0.06
5.4.4	Buildings 2 and 3 Outage	90% 10%	0.76 0.44 0.07 0.06
5.4.5	Building ETC Outage	93% 10%	0.93 0.46 0.07 0.06

NO2 = 10% of NOX

[1] 10% of total NOx emission limits

5.5. Carbon monoxide 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 uncontrolled engine emission factors provided by the engine manufacturer and on control effectiveness guarantees included in the NOC application documents:

Table 5.5: Carbon monoxide (CO) emission rate limits			
	Operating Scenario	Operating Load	Emissions Limit per engine in lb/hr[1]
5.5.1	Annual Step Testing	100%	1.35 0.68
5.5.2	Corrective Maintenance	100%	1.35 0..68
5.5.3	Building 1 Outage, Storm Avoidance	81% 10%	1.05 0.53 0.28 0.60
5.5.4	Buildings 2 and 3 Outage	90% 10%	1.19 0.60 0.28 0.60
5.5.5	Building ETC Outage	93% 10%	1.24 0.63 0.28 0.60

[1] MTU Uncontrolled Engine Emissions Less The Fractional Control Guarantee in NOC Documents

5.6. Diesel Engine Exhaust Particulate (DEEP) emissions (Total PM after control on these engines) 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 uncontrolled engine emission factors provided by the engine manufacturer and on control effectiveness guarantees included in the NOC application documents:

Table 5.6: Diesel Engine Exhaust Particulate (DEEP) emission rate limits			
	Operating Scenario	Operating Load	Emissions Limit per engine in lb/hr[1]
5.6.1	Annual Step Testing	100%	0.48 0.42
5.6.2	Corrective Maintenance	100%	0.48 0.42
5.6.3	Building 1 Outage, Storm Avoidance	81% 10%	0.374 0.32 0.17 0.194
5.6.4	Buildings 2 and 3 Outage	90% 10%	0.425 0.37 0.17
5.6.5	Building ETC Outage	93% 10%	0.444 0.38 0.17 0.194

[1] MTU Uncontrolled Engine Emissions Less The Fractional Control Guarantee in NOC Documents

Elm Energy NTE rate

5.7. Volatile Organic Compound (VOC) 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 uncontrolled engine emission factors

provided by the engine manufacturer and on control effectiveness guarantees included in the NOC application documents:

Table 5.7: Volatile Organic Compound (VOC) emission rate limits			
	Operating Scenario	Operating Load	Emissions Limit per engine in lb/hr[1]
5.7.1	Annual Step Testing	100%	0.22 0.11
5.7.2	Corrective Maintenance	100%	0.22 0.11
5.7.3	Building 1 Outage, Storm Avoidance	81% 10%	0.22 0.11 0.12 0.25
5.7.4	Buildings 2 and 3 Outage	90% 10%	0.22 0.11 0.12 0.25
5.7.5	Building ETC Outage	93% 10%	0.22 0.11 0.12 0.25

[1] MTU Uncontrolled Engine Emissions Less The Fractional Control Guarantee in NOC Documents

Elm Energy NTE rate

Table 2A says 0.22

5.8. Total Particulate Matter (PM) emissions from all 17 engines combined shall not exceed 0.19 tons/yr (380 lbs/yr). All PM emissions shall be considered diesel engine exhaust particulate (DEEP) and $PM_{2.5}$ emissions.

5.9. Nitrogen dioxide (NO_2) emissions from all 17 engines combined shall not exceed 29.24 lbs/hr and 0.6 tons/yr.

ICF calculates 181 lbs/hr NOx and 18.1 lbs/hr NO2

5.10. Volatile organic compound (VOC) emissions from all 17 engines combined shall not exceed 0.37 tons/yr (740 lbs/yr).

5.11. Carbon Monoxide (CO) emissions from all 17 engines combined shall not exceed 1.2 tons per year (2440 lbs/yr).

5.12. Ammonia emissions from any of the 17 engines at the Vantage Center shall not exceed 15 ppmvd at 15%O2, nor 0.64 pounds per hour.

5.13. Sulfur dioxide emissions from all 17 engines combined shall not exceed 0.020 tons/yr (40 lbs/yr).

5.14. Visual emissions from each diesel electric generator exhaust stack shall be no more than 5 percent, with the exception of a two (2) 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

6.1. 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:

6.1.1. 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.
6.1.2. Normal operating parameters and design specifications.
6.1.3. 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

8.1. 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:

8.1.1. Fuel receipts with amount of diesel and sulfur content for each delivery to the facility.

8.1.2. Monthly and annual hours of operation for each diesel engine.

8.1.3. Purpose, electrical load and duration of runtime for each diesel engine period of operation.

8.1.4. Annual gross power generated by each independent tenant at the facility and total annual gross power for the facility.

8.1.5. Upset condition log for each engine and generator that includes date, time, duration of upset, cause, and corrective action.

8.1.6. Any recordkeeping required by 40 CFR Part 60 Subpart IIII.

8.1.7. Air quality complaints received from the public or other entity, and the affected emissions units.

9. REPORTING

9.1. Within 10 business days after entering into a binding agreement with an independent tenant, Vantage shall provide Ecology with the company name and contact information of the company representative. The serial number, manufacturer make and model,

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standby capacity, and date of manufacture will be submitted prior to installation of engines in the Building 2, 3, and ETC phases of this project.

9.2. The following information will be submitted to the AQP at the address in Condition 7 above by January 31 of each calendar year. This information may be submitted with annual emissions information requested by the AQP.

9.2.1. Monthly rolling annual total summary of air contaminant emissions,
9.2.2. Monthly rolling hours of operation with annual total,
9.2.3. Monthly rolling gross power generation with annual total as specified in Approval Condition 8.1.4,
9.2.4. A log of each start-up of each diesel engine that shows the purpose, fuel usage, and duration of each period of operation.

9.3. Any air quality complaints resulting from operation of the emissions units or activities shall be promptly assessed and addressed. A record shall be maintained by each tenant 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 (3) days of receipt of any such complaint.

9.4. Each tenant 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 the tenant from annual reporting of operations contained in any section of Approval Condition 9.

10. GENERAL CONDITIONS

10.1. **Commencing/Discontinuing Construction and/or Operations:** This approval shall become void if construction of the facility is not begun within 18 months of permit issuance or if facility operation is discontinued for a period of eighteen (18) months or more. In accordance with WAC 173-400-111(7)(c), each phase must commence construction within 18 months of the projected and approved construction dates in this Order.

10.2. **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.

10.3. **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.

10.4. **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.

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10.5. **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.

10.6. **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.

10.7. **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.

No changes this page

- 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 th day of August, 2012, at Spokane, Washington.

Prepared By:

Robert Koster, P.E.
Eastern Regional Office
Department of Ecology
State of Washington

Approved By:

Karen K. Wood, Section Supervisor
Eastern Regional Office
Department of Ecology
State of Washington

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Appendix E:
Technical Support Document

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TECHNICAL SUPPORT DOCUMENT (TSD)
NOTICE OF CONSTRUCTION APPROVAL ORDER NO. 12AQ-E450
VANTAGE DATA CENTERS MANAGEMENT COMPANY, LLC
VANTAGE-QUINCY DATA CENTER
MARCH 18, 2013

This TSD and the Approval Order and application(s) have been made available for public review during two 30 day public comment periods. Between the two periods, the documents were the subject of a public hearing conducted in Quincy. Many comments were received during this extended public participation process. Ecology has responded to the comments and compiled the responses and comments in a Document No. 13-02-001 which can be accessed by its link: https://fortress.wa.gov/ecy/publications/SummaryPages/1302001.html The comments did not result in revisions to the preliminary determination of approval, thus Ecology is issuing the Approval No. 12AQ-E450 on this date: March 18, 2013.

On October 22, 2012, Vantage resubmitted application materials to correct errors in its low load emission rates. Emission limits presented previously for the operating condition of 'idle to 10% load' were lower than those determined from emission testing conducted following the original submittal and original preliminary determination Ecology made available to the public. This amendment describes the October 22, 2012 submittal and Ecology's review of those materials. The unmodified May-June-July 2012 TSD follows this amendment.

The determination that emission rates were higher than proposed at low loads resulted in modifications to the Vantage proposal including reducing allowable hours of operation at low load, and removing some of the 'safety factor' in emission limits and run times for high loads. The application materials were incompletely revised, retaining or generating a number of inconsistencies as follows:

- Page 3, Paragraph 4, 3rd, 4th, and 5th sentences: "The proposed generators will use EPA Tier 4 certified equipment. Each generator will be equipped with MTU's AirClarity emission control system that includes a catalyzed diesel particulate filter (DPF) for particulate matter control and destruction of CO and unburned hydrocarbons, and a Selective Catalytic Reduction (SCR) catalyst with urea injection for control of NOx. This combination of controls represents the highest level of available control equipment, and thereby satisfies BACT as summarized in Section 4."

  These sentences are misleading. There is no analysis in the application demonstrating EPA Tier 4 emission levels will be satisfied. The last sentence suggests some connection of the proposed control equipment to BACT. Vantage has insisted that Tier 2 engines (no add-on control) are the highest level of control Ecology can require as BACT. The references to Tier 4 and BACT should be removed from this paragraph.

- Page 7, 6th bullet: "Vantage will not install any other diesel engines larger than 500 horsepower for use as fire pumps or for building safety generators."

  The 500 horsepower New Source Review (NSR) exemption alluded to by this statement is not applicable to this project. Only the MTU 3,000 kWe engines have been reviewed and approved (preliminarily). Project equipment not identified in this application must

be approved by Ecology prior to installation. Additional diesel engines of any size supporting this project are subject to NSR.

- Page 8, 'Compliance Emission Testing', Paragraph 2: "Vantage requests that the run-time required for Ecology-required compliance emission testing should (sic) not be counted against the facility's allowable run-time limits for routine operations."

  Ecology has limited all run-time hours in the preliminary determination. Compliance emission testing will be accomplished without additional run-time hours.

- Pages 11 and 12, Table 3-1: These run-time hours are not consistent with Table AA2. Table AA2, apparently used as modeling inputs, has been used to establish run-time limits in the current preliminary determination.

- Page 14, Table 3-2: This Table is not consistent with Table BB2 and Table BB2 is not consistent with Table AA2. Again, Table AA2 was used to establish run-time limits in the current preliminary determination.

- Consistent with the first bullet above, Page 20, 21: " Vendor-guaranteed removal efficiencies are as follows:
  - NOx > 90%
  - CO > 90%
  - VOC > 90%
  - PM > 87%"

  Vantage has provided no documentation of these control efficiencies. It is misleading to include them in this document. Actual control levels are closer to an average of 60%.

The present preliminary determination includes run-times and emission limits using the lowest of those presented where there are inconsistencies. Other determinations remain as outlined in the original TSD as follows:

1. BACKGROUND

Starting in 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 start construction before July 1, 2011. The AQP has received 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.

2. EXECUTIVE SUMMARY

Vantage Data Centers Management Company, LLC submitted a Notice of Construction (NOC) application received by Ecology on February 10, 2012, 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 February 10, 2012 NOC application began on February 11, 2012, and a notification that more information was necessary was issued on February 22, 2012 by the Department of Ecology under the supervision of the Eastern Regional Office Section Manager (Wood). Partial response to the request for additional information was received by Ecology on March 19, 2012. The NOC application was considered complete as of May 1, 2012. 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 27, 2012 in the Columbia Basin Herald. Vantage and its consultant, ICF, found that the emission limits resulting from use of the BACT analyses in the application submittals (the stack test emission limits in Condition 5 of the Preliminary Determination) would be difficult to achieve, and submitted a supplemental BACT analysis received by Ecology on July 16, 2012. Ecology's evaluation of this BACT submittal follows at the end of this TSD. Public review began on approximately , and ended on .

3. PROJECT DESCRIPTION

The Ecology Air Quality Program (AQP) received a Notice of Construction (NOC) application for the Vantage-Quincy Data Center on February 10, 2012. 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 described as 'reserve'. The timing of Phases 2-4 depends on customer demand and is not yet determined. Phase 1 is expected to be operational around the end of 2012 and includes the 5 primary and 2 reserve generators all of which are to be 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 - 3 primary engine generators, plus 1 reserve), Data Center 3 (phase 3 - 3 primary engine generators, plus 1 reserve), and a Building described as 'ETC' (phase 4 - 1 primary engine generator plus 1 reserve). The sequence of expected construction was not described. 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 169,500 gallons of ultra-low sulfur diesel fuel. Individual engine operating limits of 85 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. It should be noted that some of the emissions included in Tables 1a and 1b are not approved by this preliminary determination: the preliminary determination requires that stack testing be included in with other approved run-times, and that 'storm avoidance' hours be approved prior to each of phases 2-4 of this 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 (including commissioning and stack testing as modeled by applicant)

Pollutant	**Emission Factor (EF) Reference**	**Facility Emissions**
Criteria Pollutant		tons/yr
2.1.1 NOx Total	Engine NTE* + PC** Vendor Guarantee	7.58
2.1.2 CO	Engine NTE* + PC** Vendor Guarantee	1.46
2.1.3 SO_2	Engine NTE* + PC** Vendor Guarantee	0.023
2.1.4 $PM_{2.5}$/DEEP	Engine NTE* + PC** Vendor Guarantee	0.280
2.1.5 VOC	Engine NTE* + PC** Vendor Guarantee	0.40
2.1.6 Primary NO_2	Assumed 10% of NOx	0.76

Table 1b: Toxic Air Pollutant Maximum Year 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
2.1.7 Propylene	2.79E-03	8.6E-03

2.1.8 Acrolein	7.88E-06	2.12E-04
2.1.9 Benzene	7.76E-04	2.09E-03
2.1.10 Toluene	2.81E-04	7.58E-04
2.1.11 Xylenes	1.93E-04	5.21E-04
2.1.12 Napthalene	1.30E-04	4.01E-04
2.1.13 1,3 Butadiene	1.96E-05	5.28E-05
2.1.14 Formaldehyde	7.89E-05	2.12E-04
2.1.15 Acetaldehyde	2.52E-05	6.79E-05
Poly Aromatic Hydrocarbons (PAH)		
2.1.16 Benzo(a)Pyrene	1.29E-07	3.77E-07
2.1.17 Benzo(a)anthracene	6.22E-07	1.82E-06
2.1.18 Chrysene	1.53E-06	4.49E-05
2.1.19 Benzo(b)fluoranthene	1.11E-06	3.26E-06
2.1.20 Benzo(k)fluoranthene	1.09E-07	3.20E-07
2.1.21 Dibenz(a,h)anthracene	1.73E-07	5.09E-07
2.1.22 Ideno(1,2,3-cd)pyrene	2.07E-07	6.09E-07
2.1.23 PAH (no TEF)	3.88E-06	1.14E-05
2.1.24 PAH (apply TEF)	4.98E-07	1.47E-06
State Criteria Pollutant Air Toxics		
2.1.25 DEEP/$PM_{2.5}$	NTE + PC Guarantee	0.280
2.1.26 Carbon monoxide	NTE + PC Guarantee	1.46
2.1.27 Sulfur dioxide	NTE + PC Guarantee	0.023
2.1.28 Primary NO_2***	10% total NOx	0.76
2.1.29 Ammonia	Maximum 10 ppmv	0.36

* Engine Manufacturer 'Not To Exceed'
** Pollution Control Equipment Vendor Guarantee
***Assumed to be equal to 10% of the total NOx 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 (non-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 defined[1] 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 this project, 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. Vantage also established a control cost criteria for future data center diesel engines at a budget-level estimate of $47,714 per ton of combined pollutants controlled.

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, PM_{10} 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.

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

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.

5.1.6 **BACT determination for NOx**
Ecology determines that BACT for NOx is:

a. Use of urea-based SCR with ammonia slip no greater than 15 ppmv at 15% O_2;
b. Use of EPA Tier 2 certified engines, pre-control, if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; and
c. 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 pre-control if the engines are installed and operated as emergency engines, as defined at 40 CFR§60.4219; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; 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/ICF 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 BACT requirement
1,3-Butadiene	Compliance with the VOC BACT requirement
Carbon monoxide	Compliance with the CO BACT requirement

[2] WAC 173-460-020

Diesel engine exhaust particulate	Compliance with the PM BACT requirement
Formaldehyde	Compliance with the VOC BACT requirement
Nitrogen dioxide	Compliance with the NOx BACT requirement
Sulfur dioxide	Compliance with the SO_2 BACT requirement
Toluene	Compliance with the VOC BACT requirement
Total PAHs	Compliance with the VOC BACT requirement
Xylenes	Compliance with the VOC BACT requirement

6. AMBIENT IMPACTS ANALYSIS

Vantage obtained the services of ICF 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. ICF 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.

- All 17 generator stacks at Building 1, Building 2 and building 3 were set at a height of 41 feet above local finished grade. The generator stacks on the ETC building were set at a height of 43.8 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 purposes of modeling compliance with the NAAQS, it was assumed the entire data
- center would experience a total 24 hours of power outage or storm avoidance per year
- (nominally 8 hours of power outage and 16 hours of storm avoidance) and that this would be spread over 5 calendar days per year, during which time all backup engines were assumed to operate for their assigned times and at their assigned loads for power outage conditions.

- 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/NOX ambient ratio of 90%. For purposes of modeling NO2 impacts, the primary NOX 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 DPM, 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 provided by Ecology (Bowman, 2010). These are:

PM10 (24-hour average)	60 $\mu g/m^3$
PM2.5 (98th percentile 24-hour average)	21 $\mu g/m^3$
NO2 (98th percentile 1-hour value)	29 $\mu g/m^3$
DEEP (annual average)	0.103 $\mu g/m^3$

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 Celite 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. Their combined contributions at the receptor that is maximally impacted by Vantage-only emissions are:

PM10 (24-hour average)	0.002 $\mu g/m^3$
PM2.5 (24-hour average)	0.08 $\mu g/m^3$
NO2 (1-hour average)	0.02 $\mu g/m^3$

Table 3 provides a summary of the modes of operation of the diesel engines proposed by Vantage. Table 4 is a summary of annual emissions after full buildout of the Vantage project. It should be noted that not all of these hours or emissions have been approved. Stack testing is required to be performed during periods when the engines are run for other testing unless approved by Ecology. Storm avoidance run-time is not pre-approved for any but the phase 1 generators. When each engine is installed, a commissioning test sequence occurs, described in Table 5. The impacts of the emissions anticipated from this project were modeled using worst case scheduling of these activities. The results of the modeling and a comparison to the NAAQS are shown in Table 6 for criteria pollutants. Table 7 provides the impacts modeled for Toxic Air Pollutants (TAPs) whose emission rates exceeded the Small Quantity Emission Rate (SQER) in WAC 173-460. TAPs with emission rates that exceed the SQER must be evaluated further and trigger a Tier 2 Health Impact Assessment if modeling shows the emission rates result in impacts above the ASIL.

Table 3. Summary of Diesel Generator Operating Modes

Generator 3000 kWe MTU		Weekly Testing			Monthly Testing			Quarterly Testing			Annual Full Building			Annual Step			Unscheduled Maintenance				Outage and Storm Avoidance		
																	Corrective Generator Maintenenace		Transformer Maintenance			Storm Avoid-ance	Outage
Gen #	Gen Bldg	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/test	Hrs/yr	% Load	Hrs/yr	% Load	Hrs/yr	% Load	Hrs/yr	Hrs/yr
DC1-1P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-2P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-3P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-4P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-5P	DC1	10	0.5	20	10	1	6	81.3	0.75	3	81.3	6	6	100	0.5	0.5	100	8	81.3	8	81.3	16	8
DC1-6R	DC1	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
DC1-7R	DC1	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
DC2-1P	DC2	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC2-2P	DC2	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC2-3P	DC2	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC2-4R	DC2	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
DC3-1P	DC3	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC3-2P	DC3	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC3-3P	DC3	10	0.5	20	10	1	6	90	0.75	3	90	6	6	100	0.5	0.5	100	8	90	8	90	16	8
DC3-4R	DC3	10	0.5	20	10	1	6	10	0.75	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
ETC-1P	ETC	10	0.5	20	10	1	6	93.3	0.5	3	93.3	6	6	100	0.5	0.5	100	8	93.3	8	93.3	16	8
ETC-2R	ETC	10	0.5	20	10	1	6	10	0.5	3	10	6	6	100	0.5	0.5	100	8	10	8	10	16	8
Cool Down at 10% Load, Each Engine, Primary and Reserve:									0.5	2		0.5	0.5		0.5	0.5		1		0.5		4	1

Table 4. Summary of Facility-Wide Emission Rates for Full Buildout Scenario

Pollutant	Weekly, Monthly, Quarterly Testing & Cool Down (ton/yr)	Annual Facility-wide and Step Tests (ton/yr)	Storm Avoidance & Unplanned Outage (24 hrs/yr) (ton/yr)	De-energized Building and Transformer and CorrectiveTesting (ton/yr)	Total Emissions (ton/yr)
PM2.5 (DPM) Normal Year	0.07	0.021	0.07	0.025	0.19
NOX	1.2	0.71	2.17	1.89	5.97
CO	0.36	0.1	0.38	0.29	1.13
VOC	0.19	0.02	0.1	0.06	0.37
SO2	0.0	0.0	0.0	0.0	0.02
Primary Nitrogen Dioxide (NO2)	0.12	0.07	0.22	0.189	0.6

Table 5. 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 6:
Modeled Concentrations of Criteria Pollutants (with background) and comparison to Ambient Air Quality Standards

Pollutant and Time Frame	Background plus Modeled Concentration – ug/m^3	National Ambient Air Quality Standard - ug/m^3	Percent of Standard
PM_{10} 24 Hour	82.2	150	55%
PM_{10} Annual	0.056	50	0.1%
$PM_{2.5}$ 24 Hour	26.1	35	74%
$PM_{2.5}$ Annual	0.056	15	0.4%
NO_2 1- Hour	166	188	88.3%
CO 1-Hour	203	40,000	0.5%
CO 8-Hour	113	10,000	1.1%
SO_2 1-Hour	3.6	319	1.1%
SO_2 3-Hour	2.9	1300	0.2%
SO_2 24 Hour	1.5	365	0.4%
SO_2 Annual	2.3E-8	80	3E-8%

Table 7: 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/m^3	Comparison of Modeled to ASIL
DEEP	Annual	0.0335	0.0033	1015%
NO_2	1-Hour	334.5	470	71.2%
Acrolein	24 Hour	0.0016	0.06	3%
Ammonia	24 Hour	23	70.8	32%

As is indicated in Tables 6 and 7, only Diesel Engine Exhaust Particulate (DEEP) exceeded the regulatory trigger level (the ASIL) for that pollutant. At this concentration, DEEP is required to be further evaluated in a Second Tier Toxics Review in accordance with WAC 173-460-90.

7. STORM AVOIDANCE HOURS

As indicated in Table 3, there are 16 hours per year assigned for operating the engine generators in 'storm avoidance' mode. This is a mode of operation not allowed for the four data centers already approved in the Quincy area. Vantage has proposed to demonstrate the necessity of these hours for its first of four buildings (first seven engine-generators). This demonstration will be required for each new tenant or phase of engine installation at the data center facility. The approval order allows these hours for the first building, but eliminates them for the following phases of the project without demonstration satisfactory to Ecology that these run-time hours are a necessity.

8. SECOND TIER REVIEW FOR DIESEL ENGINE EXHAUST PARTICULATE EMISSIONS

Proposed emissions of diesel engine exhaust particulate (DEEP) 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 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 decided to evaluate 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. 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.

9. 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.

****END OF VANTAGE JULY TSD ****

In Federal guidance regarding the process of determining BACT-level control, the applicant is assigned responsibility for presenting and defending a preferred control system (see, for instance, BNA Policy and Practice Series, Air Pollution Control, 10-91, Page 181:152). When Ecology indicated to Vantage and ICF that the BACT proposal in the application materials submitted on February 10, 2012, was incomplete, Vantage/ICF forwarded a cost-effectiveness summary for the catalysed DPF and SCR systems they propose to use. The application materials also indicated that those systems were guaranteed to reduce uncontrolled engine emissions of PM by 87%, and NOx, VOC, and CO by 90%. Ecology accepted this proposal as BACT for the Vantage project engines, and then calculated emission limits using uncontrolled engine emission data provided in the application, and using the above emission reduction percentages. These limits were significantly lower than those proposed by Vantage/ICF, for reasons that the applicant has not explained. Instead, Vantage/ICF forwarded a more comprehensive BACT analysis proposing that Tier 2 engines be considered BACT, and that the not-to-exceed (NTE) values they were proposing as emission limits be considered voluntary limits not connected to the BACT determination. This is acceptable to Ecology. The preceding section on BACT in this technical support document has been modified to reflect the BACT supplemental submittal received July 16, 2012.

****END OF VANTAGE JULY TSD ****

Appendix F:
Approval Order

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

COPY

March 18, 2013

Mr. Jeff Kane, Vice President
Vantage Data Centers Management Company, LLC
2625 Walsh Ave
Santa Clara, CA 95051

Re: Approval Order No. 12AQ-E450

Dear Mr. Kane:

The Department of Ecology Air Quality Program has determined that the Vantage Data Centers Quincy Project will satisfy all of the requirements of Washington New Source Review. The public participation period required per Washington Administrative Code (WAC) 173-400-171, has been completed. No public comments were received that resulted in changes to the latest preliminary determination made available to the public. Enclosed is APPROVAL ORDER No. 12AQ-E450, and the associated Technical Support Document (TSD).

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

All correspondence relating to this document should be directed to me at the Department of Ecology, Regional Air Quality Section, 4601 N. Monroe, Spokane, Washington 99205-1295. If you have any questions concerning the content of the document, please contact me at rkos461@ecy.wa.gov. or (509) 329-3493.

Sincerely,

Robert Koster, P.E.
Commercial/Industrial Unit
Regional Air Quality Program

RK:lc

Certified Mail # 7011 3500 0001 8626 1531

Enclosures: Approval Order 12AQ-E450, Technical Support Document

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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

Approval Order No. 12AQ-E450

TO: Jeff Kane, Vice President
Vantage Data Centers Management Company, LLC
2625 Walsh Ave
Santa Clara, CA 95051

EQUIPMENT

The list of equipment that was evaluated for this order of approval 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 167,205 gallons per year of fuel consumption and up to 82 hours per year of operation per engine. Each primary engine will operate for approximately 72.5 hours per year for required maintenance testing and outage operation and an additional 9.5 hours per year of no-load idle cool down. The generators will be installed in up to four phases. Phase 1 will consist of seven 3.0 MWe generators that will be installed upon approval. Phases 2, 3, and 4 will consist of a total of ten additional 3.0 MWe generators, which will be installed at the facility as independent tenant companies contract for space at the Vantage-Quincy Data Center (hereafter "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	DC1-1P	3.0			
"	DC1	DC1-2P	3.0			
"	DC1	DC1-3P	3.0			
"	DC1	DC1-4P	3.0			
"	DC1	DC1-5P	3.0			
"	DC1	DC1-6R	3.0			
"	DC1	DC1-7R	3.0			
2	DC2	DC2-1P	3.0			
"	DC2	DC2-2P	3.0			
"	DC2	DC2-3P	3.0			
"	DC2	DC2-4R	3.0			
3	DC3	DC3-1P	3.0			
"	DC3	DC3-2P	3.0			
"	DC3	DC3-3P	3.0			
"	DC3	DC3-4R	3.0			
4	ETC	ETC-1P	3.0			
"	ETC	ETC-2R	3.0			

The Vantage Data Center will utilize non-evaporative cooling units to dissipate heat from electronic equipment at the facility, thus eliminating evaporative cooling tower emissions from the project.

PROJECT SUMMARY

The Vantage Data Center Phase 1 construction will consist of Building 1 with 5 primary engine-generators and 2 reserve engines. Phases 2, 3, and 4 construction will consist of Buildings 2, 3, and 4 ('ETC') with 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 Vantage 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 excluding emissions due to commissioning of each engine. Table 2b contains toxic air pollutant potential- to- emit for the Vantage-Quincy Data Center project excluding emissions due to commissioning of each engine.

Table 2a: Criteria Pollutant Potential to Emit for Vantage Data Center

Pollutant	Emission Factor (EF) Reference	Emission Factors	Facility Emissions
Criteria Pollutant		Lb/hr	tons/yr
2.1.1 NOx Total			5.83
2.1.1a NOx 10% load	MTU Guarantee	3.73	na
2.1.1b NOx 93.3% load	MTU Guarantee	15.4	na
2.1.1c NOx 100% load	MTU Guarantee	17.2	na
2.1.2 CO Total	MTU Guarantee	na	1.22
2.1.2a CO 10% load	MTU Guarantee	1.41	na
2.1.2b CO 81% load	MTU Guarantee	1.93	na
2.1.2c CO 93.3% load	MTU Guarantee	2.17	na
2.1.2d CO 100% load	MTU Guarantee	2.39	na
2.1.3 SO_2	MTU Guarantee	na	0.02
2.1.4 $PM_{2.5}$/DEEP Total	MTU Guarantee	na	0.22
2.1.4a DEEP 10% load	MTU Guarantee	0.400	na
2.1.4b DEEP 81% load	MTU Guarantee	0.396	na
2.1.4c DEEP 93.3% load	MTU Guarantee	0.47	na
2.1.4d DEEP 100% load	MTU Guarantee	0.512	na
2.1.5 VOC 10% Load	MTU Guarantee	0.25	0.25

Table 2b: Toxic Air Pollutant Potential to Emit for Vantage 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	6.8E-03
2.1.7 Acrolein	7.88E-06	1.92E-05
2.1.8 Benzene	7.76E-04	1.89E-03
2.1.9 Toluene	2.81E-04	6.85E-4
2.1.10 Xylenes	1.93E-04	4.71E-04
2.1.11 Napthalene	1.30E-04	1.96E-03
2.1.11 1,3 Butadiene	1.96E-05	4.77E-05
2.1.12 Formaldehyde	7.89E-05	1.92E-04
2.1.13 Acetaldehyde	2.52E-05	6.14E-05
2.1.14 Benzo(a)Pyrene	1.29E-07	2.98E-07
2.1.15 Benzo(a)anthracene	6.22E-07	1.44E-06
2.1.16 Chrysene	1.53E-06	3.55E-06
2.1.17 Benzo(b)fluoranthene	1.11E-06	2.58E-06
2.1.18 Benzo(k)fluoranthene	1.09E-07	2.53E-07
2.1.19 Dibenz(a,h)anthracene	1.73E-07	4.02E-07
2.1.20 Ideno(1,2,3-cd)pyrene	2.07E-07	4.81E-07
2.1.21 PAH (no TEF)	3.88E-06	9.01E-06
2.1.22 PAH (apply TEF)	4.98E-07	1.16E-06
State Criteria Pollutant Air Toxics		
2.1.23 DEEP/$PM_{2.5}$	MTU Guarantee	0.19
2.1.24 Carbon monoxide	MTU Guarantee	1.13
2.1.25 Sulfur dioxide	MTU Guarantee	0.02
2.1.26 Primary NO_2*	10% total NOx	0.6
2.1.27 Ammonia	15 ppmv at 15%O_2	0.36

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

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 below:

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; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; b. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII; and
Nitrogen oxides (NO_x)	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; or applicable emission standards found in 40 CFR Part 89.112 Table 1 and 40 CFR Part 1039.102 Tables 6 and 7 if Model Year 2011 or later engines are installed and operated as non-emergency engines; b. Compliance with the operation and maintenance restrictions of 40 CFR Part 60, Subpart IIII; 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 one toxic air pollutant – diesel engine exhaust particulate matter – exceeds the Acceptable Source Impact Level (ASIL) for that pollutant, as defined in Chapter 173-460 WAC. Ecology has reviewed the health risks associated with diesel engine exhaust particulate 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 CONDITION

1.1. 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.

2. EQUIPMENT RESTRICTIONS

2.1. 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 specifications as 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), and must be equipped with CO,VOC, PM, and NOX control equipment at least as effective as that evaluated in this NOC approval. 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.

2.2. The only engines and electrical generating units approved for operation at the Vantage Data Center are those listed by serial number in Table 1 above.

2.3. 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 community impacts.

2.4. The installation of any new engines after July 1, 2014 will require notification to Ecology that includes engine manufacturer's specification sheets. Ecology will decide 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.

2.5. The seventeen (17) MTU Model 20V4000 engines exhaust stack heights shall be greater than or equal to 41 feet above ground level for engines providing power to Buildings 1,2, and 3, and 43.8 feet for engines serving Building ETC, and will be no more than 26 inches in diameter. All engines that may be used for this project shall be required to verify that exhaust stack parameters such as diameter, height, and exhaust rate and velocity do not result in community emissions impacts greater than what was evaluated for this project.

2.6. The manufacture and installation of the seventeen (17) engine/generator sets proposed for Building 1, Building 2, Building 3, and Building ETC of the project shall occur by July 1, 2014. 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 community impacts will be re-evaluated if new source review is required. Vantage may request an extension of this time schedule, and Ecology may approve of an extension without revision to this Order.

2.7. This Order only applies to the seventeen (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 review. New source review will not be required for engines with a rated full standby capacity of less than 4678 hp that comply with the engine certification requirements and control equipment requirements contained in Approval Condition 2.1 unless there is an increase in community emission impacts. On a case-by-case basis, Ecology may require additional ambient impacts analyses prior to installation of smaller engines.

3. OPERATING LIMITATIONS

3.1 Following commissioning/start-up testing, the fuel consumption at the Vantage Data Center facility at build-out (4 buildings with a total of 12 primary and 5 reserve engines) shall be limited to a total of 167,205 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 (3) year period using monthly rolling totals.

3.2 Except as provided in Approval Condition 3.5, the seventeen (17) Vantage Data Center engines are limited to the following average hours of operation, and averaging periods:

3.2.1 Each primary engine serving Building 1 shall not exceed 82 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average.

3.2.2 Each reserve engine serving Building 1 shall not exceed 62 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average.

3.2.3 Following start-up and commissioning, the engines serving Building 1 shall not exceed an annual fuel consumption of 65,907 gallons, averaged over a 3 year period using monthly rolling totals.

3.2.4 Operation of the two Building 1 reserve engines shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing. The reserve engines may also provide outage (8 hours) or storm avoidance (16 hours) power in the event of the failure of a primary engine. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.5 Operation of the five primary engines serving Building 1 shall not exceed 10% load except for 8.5 hours per year at 100% load for step testing and corrective maintenance, and 41 hours per year at 81.3% load for building transformer maintenance, storm avoidance, and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.6 Each primary engine serving Building 2, 3 and ETC shall not exceed 66 hours of operation (at any load, for any purpose) per year, on a rolling monthly 3-year average. A total of 16 hours per year of 'storm avoidance' operation may be added to the above total without amendment of this approval upon satisfactory demonstration to Ecology that these hours are a necessity for the tenants of these buildings.

3.2.7 Operation of each of the Building 2 and Building 3 and ETC Building reserve engines (one at each building) shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing. The reserve engines may also provide outage power in the event of the failure of a primary engine. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.8 Operation of the six primary engines serving Building 2 (3) and Building 3 (3) shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing, and 25 hours per year at 90% load for building transformer maintenance and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.2.9 Operation of the primary engine serving Building ETC shall not exceed 10% load except for 8.5 hours at 100% load for corrective maintenance and step testing, and 25 hours per year at 93% load for building transformer maintenance and power outages. These hours may be averaged over a three (3) year period using monthly rolling totals.

3.3 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.

3.4 The seventeen (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.

3.5 Initial start-up (commissioning) testing for the seventeen (17) MTU Model 20V4000 engines at the Vantage Data Center shall not exceed an average of 40 hours per generator and 8,692 gallons of fuel per generator, averaged over all generators installed during any consecutive 3 year period.

3.5.1 Except during site integration testing as specified below, only one engine shall be operated at any one time during start-up testing.

3.5.2 During a site integration test, no more than seven (7) generator engines may operate concurrently for no more than four continuous hours.

3.5.3 All startup and commissioning testing shall be conducted during daylight hours.

3.5.4 Fuel use limits contained in Approval Conditions 3.1 and emission limits contained in Approval Conditions 5, are not applicable to initial commissioning testing of each engine.

3.5.5 Following start-up and conditioning testing, the number of hours each engine has run, the fuel consumed during the testing, and the date shall be recorded. These data shall be provided to Ecology on request.

4. GENERAL TESTING AND MAINTENANCE REQUIREMENTS

4.1. 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.

4.2. Within 12 months of the first engine installation and every 36 months thereafter, the Vantage Data Center shall measure emissions of particulate matter (PM), Volatile Organic Compounds (VOC), nitric oxide (NO), nitrogen dioxide (NO_2), carbon monoxide (CO), Ammonia (NH_3), and oxygen (O_2) from at least one representative primary and one representative reserve engine's exhaust stack in accordance with Approval Condition 4.3. This testing will serve to demonstrate compliance with the emission limits contained in Section 5, 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.

4.3. The following procedure shall be used for each test for the engines as required by Approval Condition 4.2 unless an alternate method is proposed by the Vantage Data Center and approved in writing by Ecology prior to the test:

4.3.1. 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.

4.3.2. PM including the condensible fraction, NO, NO_2, VOC, CO and ammonia emissions measurement shall be conducted for each engine tested at the proposed maximum engine load that corresponds to scheduled engine operating scenarios in Approval Conditions 3.2.

4.3.3. EPA Reference Methods from 40 CFR 60, 40 CFR 51, BAAQMD ST-1B (for ammonia) and/or 40 CFR 89 as appropriate for each pollutant shall be used for at least one (representative) engine at this data center. A test plan will be submitted for Ecology approval at least 30 days before any testing is conducted and must include the criteria used to select the engine for testing, as well as any modifications to the standard test procedures contained in the above references.

4.3.4. 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 4.5, shall be included in the test report, along with the emissions calculations.

4.4. Each engine shall be equipped with a properly installed and maintained non-resettable meter that records total operating hours.

4.5. 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 during operation.

5. EMISSION LIMITS

5.1 The seventeen (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.

5.2 If required to demonstrate compliance with the g/kW-hr EPA Tier IV average emission limits through stack testing, the Vantage Data Center shall conduct exhaust stack testing

and average emission rates for 5 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.

5.3 Nitrogen oxide (NOx) 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:

Table 5.3: Nitrogen oxide (NOx) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.3.1	Annual Step Testing	100%		10.3
5.3.2	Corrective Maintenance	100%		10.3
5.3.3	Building 1 Outage, Storm Avoidance	81% 10%		7.58 2.6
5.3.4	Buildings 2 and 3 Outage	90%		8.83
5.3.5	Building ETC Outage	93%		9.3

5.4 Nitrogen dioxide (NO_2) 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:

Table 5.4: Nitrogen dioxide (NO_2) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.4.1	Annual Step Testing	100%		1.50
5.4.2	Corrective Maintenance	100%		1.50
5.4.3	Building 1 Outage, Storm Avoidance	81% 10%		0.40 1.50
5.4.4	Buildings 2 and 3 Outage	90% 10%		0.40 1.50
5.4.5	Building ETC Outage	93% 10%		0.40 1.50

5.5 Carbon monoxide 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:

Table 5.5: Carbon monoxide (CO) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.5.1	Annual Step Testing	100%		1.35
5.5.2	Corrective Maintenance	100%		1.35
5.5.3	Building 1 Outage, Storm Avoidance	81% 10%		1.05 0.60
5.5.4	Buildings 2 and 3 Outage	90% 10%		1.19 0.60
5.5.5	Building ETC Outage	93% 10%		1.24 0.60

5.6 Diesel Engine Exhaust Particulate (DEEP) emissions (Total PM after control on these engines) 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:

Table 5.6: Diesel Engine Exhaust Particulate (DEEP) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.6.1	Annual Step Testing	100%		0.484
5.6.2	Corrective Maintenance	100%		0.484
5.6.3	Building 1 Outage, Storm Avoidance	81% 10%		0.374 0.400
5.6.4	Buildings 2 and 3 Outage	90% 10%		0.425 0.400
5.6.5	Building ETC Outage	93% 10%		0.444 0.400

5.7 Volatile Organic Compound (VOC) 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:

Table 5.7: Volatile Organic Compound (VOC) emission rate limits				
	Operating Scenario	Operating Load		Emissions Limit per engine in lb/hr
5.7.1	Annual Step Testing	100%		0.22
5.7.2	Corrective Maintenance	100%		0.22
5.7.3	Building 1 Outage, Storm Avoidance	81% 10%		0.22 0.25
5.7.4	Buildings 2 and 3 Outage	90% 10%		0.22 0.25
5.7.5	Building ETC Outage	93% 10%		0.22 0.25

5.8 Total Particulate Matter (PM) emissions from all 17 engines combined shall not exceed 0.22 tons/yr (440 lbs/yr). All PM emissions shall be considered diesel engine exhaust particulate (DEEP) and $PM_{2.5}$ emissions.

5.9 Nitrogen dioxide (NO_2) emissions from all 17 engines combined shall not exceed 18.1 lbs/hr and 0.6 tons/yr.

5.10 Volatile organic compound (VOC) emissions from all 17 engines combined shall not exceed 0.37 tons/yr (740 lbs/yr).

5.11 Carbon Monoxide (CO) emissions from all 17 engines combined shall not exceed 1.22 tons per year (2440 lbs/yr).

5.12 Ammonia emissions from any of the 17 engines at the Vantage Center shall not exceed 15 ppmvd at 15%O2, nor 0.64 pounds per hour.

5.13 Sulfur dioxide emissions from all 17 engines combined shall not exceed 0.020 tons/yr (40 lbs/yr).

5.14 Visual emissions from each diesel electric generator exhaust stack shall be no more than 5 percent, with the exception of a two (2) 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

6.1 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:

6.1.1. 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.

6.1.2. Normal operating parameters and design specifications.

6.1.3. 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

8.1 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:

8.1.1. Fuel receipts with amount of diesel and sulfur content for each delivery to the facility.

8.1.2. Monthly and annual hours of operation for each diesel engine.

8.1.3. Purpose, electrical load and duration of runtime for each diesel engine during any periods of operation.

8.1.4. Annual gross power generated by or for each independent tenant at the facility and total annual gross power for the facility.

8.1.5. Upset condition log for each engine and generator that includes date, time, duration of upset, cause, and corrective action.

8.1.6. Any recordkeeping required by 40 CFR Part 60 Subpart IIII.

8.1.7. Air quality complaints received from the public or other entity, and the affected emissions units.

9. REPORTING

9.1 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 the Building 2, 3, and ETC phases of this project.

9.2 The following information will be submitted to the AQP at the address in Condition 7 above by January 31 of each calendar year. This information may be submitted with annual emissions information requested by the AQP.

9.2.1 Monthly rolling annual total summary of air contaminant emissions,

9.2.2 Monthly rolling hours of operation with annual total,

9.2.3 Monthly rolling gross power generation with annual total as specified in Approval Condition 8.1.4,

9.2.4 A log of each start-up of each diesel engine that shows the purpose, fuel usage, and duration of each period of operation.

9.3 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 (3) days of receipt of any such complaint.

9.4 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

10.1 Commencing/Discontinuing Construction and/or Operations: This approval shall become void if construction of the facility is not begun within 18 months of permit issuance or if facility operation is discontinued for a period of eighteen (18) months or more. In accordance with WAC 173-400-111(7)(c), each phase must commence construction within 18 months of the projected and approved construction dates in this Order.

10.2 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.

10.3 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.

10.4 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.

10.5 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.

10.6 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.

10.7 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 18th day of March, 2013 at Spokane, Washington.

Prepared By:

Robert Koster, P.E.
Eastern Regional Office
Department of Ecology
State of Washington

Approved By:

Karen K. Wood, Section Supervisor
Eastern Regional Office
Department of Ecology
State of Washington