Response to Comments

Thermal Oxidation System draft Notice of Construction DE23NWP-002

June 22 – July 28, 2023

For the **Nuclear Waste Program**

Washington State Department of Ecology

Richland, Washington

September 2023, Publication 23-05-009

DEPARTMENT OF ECOLOGY
State of Washington

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[1] https://apps.ecology.wa.gov/publications/summarypages/2305009.html
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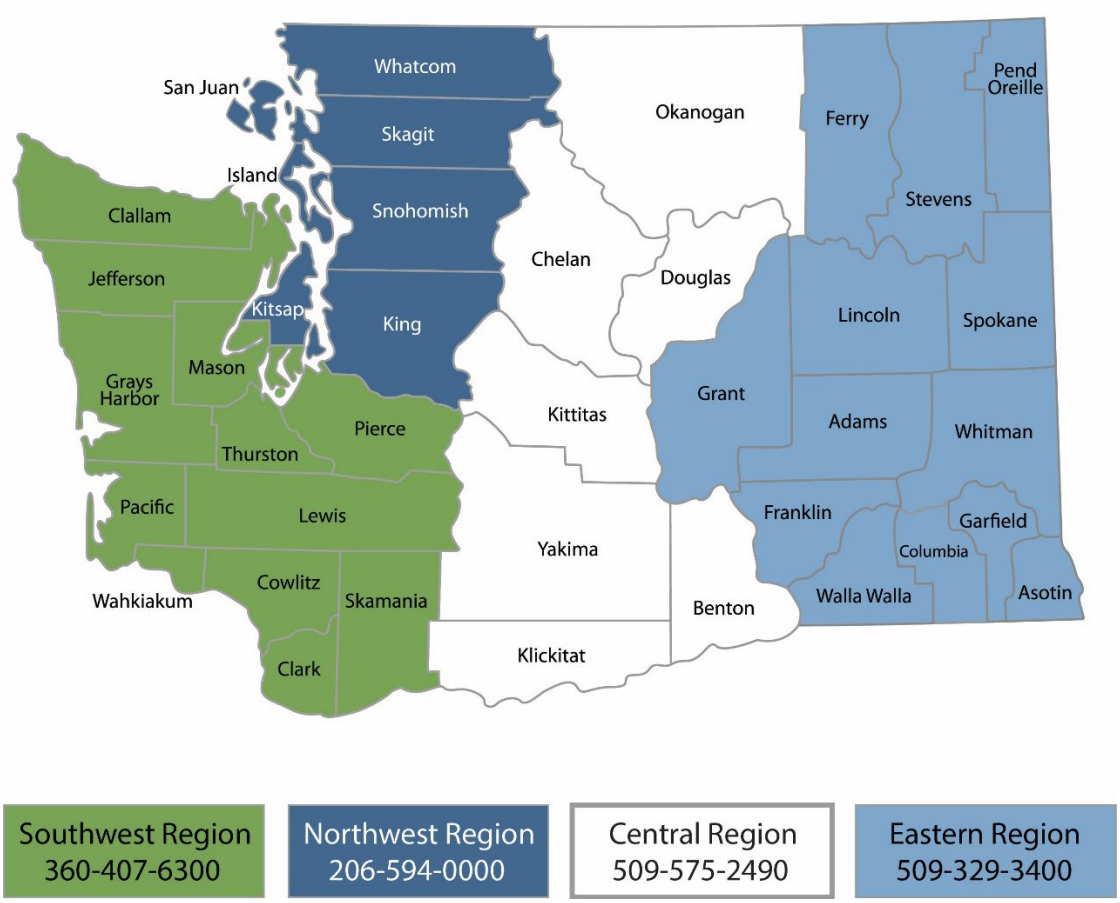

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Table of Contents

Introduction

The Washington State Department of Ecology's Nuclear Waste Program (Ecology) regulates air pollution sources at the Hanford Site. Ecology is the permitting authority for new or modified sources requiring new source review under Washington Administrative Code (WAC) 173-400-110 at Hanford.

When a new order or a modification to an existing order is proposed, Ecology may hold a public comment period to allow the public to review the proposed order and provide formal feedback. (See WAC 173-400-171 for Public Notice and Opportunity for Public Comment requirements for approval of a notice of construction application.)

The Response to Comments is the last step before issuing the final permit, and its purpose is to:

- Specify which provisions, if any, of a permit will become effective upon issuance of the final permit, providing reasons for those changes.
- Describe and document public involvement actions.
- List and respond to all significant comments received during the public comment period and any related public hearings.

This Response to Comments is prepared for:

Comment period	Thermal Oxidation System (TOS) draft Notice of Construction (NOC) June 22 – July 28, 2023
Approval Order Number	DE23NWP-002
Permittees	United States Department of Energy – Office of River Protection (Energy)
Original Issuance date	Sept. 13, 2023
Effective date	Sept. 13, 2023

To see more information related to the Hanford Site and nuclear waste in Washington, please visit our webpage, Hanford Cleanup[3].

[3] https://www.ecology.wa.gov/Hanford

Reasons for Issuing the Permit

Approval Order DE23NWP-002 will authorize air pollutant emissions from temporary testing of an experimental TOS attached to single-shell Tank BY-108. The TOS is Phase 3 of Energy's development of a potential treatment system to control tank vapors, resulting from a 2018 settlement agreement in Case No. 4:15-cv-5086-TOR in the United States District Court for the Eastern District of Washington. That case addressed the potential for worker exposure to short-term emissions under endangerment provisions of Chapter 173-303 WAC. For more information, please see https://hanfordvapors.com/.

Ecology is issuing this order because the associated NOC Application submitted under WAC 173-400-110 satisfied the requirements for approval identified in WAC 173-400-113. DE23NWP-002 does not address or satisfy other permitting requirements, such as those under Chapter 173-303 WAC, Dangerous Waste Regulations. Energy must secure all required permits and authorizations prior to operation of the TOS.

The NOC Application demonstrated that emissions of criteria and toxic air pollutants would not cause or contribute to exceedance of an ambient air standard and that the project would employ Best Available Control Technology (BACT) and BACT for Toxics. Energy also demonstrated that the small diesel fuel-fired engine meets federal standards for stationary non-emergency engines if it is operated with the additional control devices in the TOS. These controls include an aftermarket diesel particulate filter and catalytic converter. Emissions from BY-108 will also be controlled by chemically treated activated carbon and high efficiency particulate air filtration prior to introduction into the engine for combustion.

The primary purpose of testing is to demonstrate the effectiveness and feasibility of a system such as the TOS. Emission data generated may also provide additional information on short-term tank emissions from quiescent waste.

Public Involvement Actions

Ecology encouraged public comment on the draft Approval Order and Technical Support Document during a 30-day, public comment period held June 28 to July 28, 2023. Comments were accepted starting June 22, but the official comment period was restarted on June 28 due to a website posting issue.

The following actions were taken to notify the public:

- Emailed a notice announcing the start of the comment period to the Hanford-Info email list, which has 1,565 recipients.
- Posted the comment period notice on the Washington Department of Ecology – Hanford's Facebook and Twitter pages.
- Posted the comment period notice on the Washington Department of Ecology, Nuclear Waste Program's website.

The following public notices for this comment period are in Appendix A of this document:

- Notice sent to the Hanford-Info email list
- Notices posted on the Washington Department of Ecology – Hanford's Facebook and Twitter pages
- Notice posted on the Washington Department of Ecology, Nuclear Waste Program's website.

List of Commenters

The table below lists the names of organizations or individuals who submitted a comment on the Approval Order and Technical Support Document. The comments and responses are in Attachment 1.

Commenter	Organization
Anonymous	Citizen
Bill Green	Citizen

Attachment 1: Comments and Responses

Description of comments:

Ecology accepted comments from June 22 through July 28, 2023. This section provides a summary of comments that we received during the public comment period and our responses, as required by RCW 34.05.325(6)(a)(iii). Comments are grouped by individual, and each comment is addressed separately.

I-1: ANONYMOUS CITIZEN

Comment I-1-1

1. Of note is that the MERSORB carbon bed was not included in the Phase Il testing (PNNL27816), because it was "considered a mature technology." Per page 84, PNNL recommended: *"When doing the pilot-scale tests, it is advised to consider reactions on the MERSORB ® bed carbon sorbent that will improve removal efficiency for several compounds. The expected reductions of nitrous oxide, ammonia, and formaldehyde on the carbon (due to cross-reactions) can be further investigated during this phase of system demonstration and operation."* I did not see this investigation identified in the NOC. What is the status of the recommended testing?

Response to I-1-1

Thank you for your comments. The Permittee did not submit data regarding further investigation of the activated carbon after Phase 2 testing. Currently, the manufacturer only guarantees that the chemical treatment increases mercury removal efficiency over standard activated carbon.

Ecology will be reviewing actual emissions data generated in Phase 3 testing. If there are indications that the activated carbon is significantly reducing non-mercury toxic air pollutants (TAPs), it may be taken into account when evaluating proposed best available control technology (BACT) and BACT for Toxics (tBACT) at the Hanford Site in the future.

Conservatively, the application assumed no reduction of tank emissions by the TOS when estimating potential emissions for Chapters 173-400 and 173-460 WAC. This ensures that ambient air standards will be protected even if the TOS is completely ineffective at reducing tank emissions. Because there was no claim of control efficiency, Ecology did not require additional supporting documentation for the purposes of authorizing air emissions from the test.

Comment I-1-2

2. The Phase Il test report did not provide a process flow diagram. Omission of the carbon bed in Phase Il testing means that a prototypic arrangement with all of the associated pressure drops (including across the carbon bed) was not evaluated. How will Phase Ill testing address pressure drops and other items not tested in Phase Il? Will the diesel engine still pull the same volume as expected from Tank BY-108.

Response to I-1-2

Pressure drop across elements of the TOS will be balanced through the Booster Blower (BLO-001), which will provide additional back pressure upstream of the carbon adsorber. If properly operated, this blower will ensure that tank vapors are delivered to the TOS engine air intake at the correct flow rate and pressure.

Comment I-1-3

3. Figure 3 of NOC shows a "typical" breather filter, without dimensions. It would be helpful to be more specific to BY-108. The Hanford Air emissions license shows the BY-108 breather filter stack height to be 14.5 ft. (Was this height previously ele vated to help mitigate vapors/odors? The height of the TOS stack is listed as 6.1 meters (20 ft)). Was the TOS elevation also chosen to reduce odors?

Response to I-1-3

For the purposes of Chapters 173-400 and 173-460 WAC, Ecology did not require additional information on the existing breather vent identified in the Hanford Air Operating Permit (AOP), Attachment 2, as Emission Unit ID 291 because potential emissions of criteria and toxic air pollutants (TAPs) for passive ventilation of Tank BY-108 are unchanged. This tank and method of operation predates the New Source Review (NSR) permitting requirements of Chapter 173-400. However, the breather vent is subject to a Radioactive Air Emissions Licenses (RAEL) issued by DOH which must be included in Attachment 2 of the AOP.

For existing sources, WAC 173-400-110 (1)(d) limits the applicability of NSR requirements to the emission unit or units proposed to be modified and the air contaminants that would have an increase in emissions. For the tank farms, Ecology has accepted an approach of conducting NSR for new equipment, such as portable exhausters, which are attached to the tanks and cause an increase in emissions. Riser selection for connection of the TOS is being reviewed separately under Chapter 173-303 WAC, Dangerous Waste Regulations, because it will not directly influence air emissions from the TOS.

For the purposes of Chapters 173-400 and 173-460 WAC, Ecology did not require additional information to support the selected stack height for the TOS, because it is less than the "excess stack height" threshold defined in WAC 173-400-200 (2). Modeling for Approval Orders DE19NWP-001 and DE21NWP-001, which authorized traditional generator sets, was based upon stack heights ranging from 2.675 to 5.5 meters. A stack height of 6.1 meters is within the range Ecology would reasonably expect for a commercial generator set mounted on a skid, like the TOS, because it releases emissions above the general breathing zone without requiring a significant amount of extra stabilization or support.

Comment I-1-4

4. Figure 4 of the NOC is a flow diagram that is not legible. Is the diesel "catalytic converter" the catalyst for thermal oxidation? What material is used? The same diagram from Rev 1 of the NOC is much more legible, Can you make the final version easier to read? Printed copies are enclosed, In addition, Figure 2 shows the item to be a "catalytic muffler." What is it, really? Does it have a commercial name?

Response to I-1-4

Ecology requested a more legible version of the process flow diagram for inclusion as Figure A-1 of DE23NWP-002. The catalytic converter is a Catalytic Exhaust Products, LTD model 4SX-2.5" F. The manufacturer uses both catalytic converter and catalytic muffler in product literature and states that catalyst used is a platinum-rhodium coating for non-selective catalytic reduction.

Comment I-1-5

5. Section 3 of the NOC states —The Tank Farm Contractor proposed BY-108 "based on vapor characteristic data." What vapor characteristic data for BY-108, compared to other tanks, recommended this tank? How does this tank compare to the vapors from tank SY-101? Tank SY-101 vapors are relevant to TBI and represent a potential public exposure hazard. When I look at the Event Investigation Reports provided on the HanfordVapor.com web page, I see that of about 69 event reports for individual tank farms, none are for BY Farm. C Farm, S Farm, TX Farm, AX Farm, SX Farm, and A Farm all have Event Reports for odors. Was any consideration given to selecting a known source of objectionable odors? SY farm had event reports too, as did ETE Waste tank summary reports show tank BY-108 is a confirmed leaker (so the liquids/volatiles are already mostly gone?), and it has the least amount of waste (~264,000 gallons) of the tanks in this farm, so it has a smaller source term. Any clarification of the selection method and comparative results would be helpful.

Response to I-1-5

For the purposes of Chapters 173-400 and 173-460 WAC, Ecology did not request additional information on tank selection because it was not necessary to evaluate compliance with WAC 173-400-113. Additionally, requiring the Permittee to select a different tank would likely be inconsistent with the Environmental Protection Agency (EPA) guidance on "redefining the source" in BACT evaluations. Tank selection, for the purposes of Phase 3 testing, is being separately evaluated under Chapter 173-303 WAC, Dangerous Waste Regulations.

Comment I-1-6

6. Section 5.0 of NOC states - "Testing of the NUCON unit will determine if it can be an effective abatement system for vapors from Hanford Site waste tanks." If successful, is Ecology considering requiring this technology for use on other tank waste-derived vapors, effluents, acetonitrile concentrates and brines that are now planned for shipping to Perma-Fix inside the Richland City limits?

Response to I-1-6

Future requirements that may apply to Hanford or other facilities under Chapter 173-303 WAC, Dangerous Waste Regulations, are outside the scope of this comment period and will be evaluated by appropriate permitting staff at the time they are established.

Ecology is not the permitting authority for Chapters 173-400 and 173-460 WAC at the Perma-Fix Northwest facility in Richland. EPA has delegated this authority directly to the Benton Clean Air Agency (BCAA). For more information on this delegation, please see 40 C.F.R. 52.2470 (C) Table 4.

Ecology is the permitting authority for Chapters 173-400 and 173-460 WAC at the Hanford Site, because it is a major source subject to WAC 173-400-700 and therefore excluded from BCAA's delegated authority. If the TOS proves to be effective, a similar design might be considered in future BACT and tBACT determinations. This would be done on a case by case basis and in accordance with Ecology and EPA guidance.

Comment I-1-7

7. If successful, how easily can the NUCON diesel engine be scaled up to other applications? Tank farm ventilation systems are often rated at 1,000 cfm or higher — with flows that exceed 100 cfm per tank . How can a diesel drawing only about 50-60 cfm be scaled for anything other than for a single tank? Are other thermal oxidation systems more flexible in capacity?

Response to I-1-7

Thermal oxidation using a furnace-like external combustion system has been commercially demonstrated to be extremely scalable. Ecology is not aware of internal combustion systems, like the TOS, being employed for control of air emissions without also being used for power generation. Larger engines and turbines are used to combust emissions from landfills and anaerobic digesters. However, emissions from those sources are typically concentrated enough to combust without supplemental fuel. If the TOS is successful as a small-scale test, Ecology would evaluate additional factors such as feasibility and fuel use for any future BACT and tBACt determinations.

Comment I-1-8

8. Section 5.1 of the NOC Rev 2 provides a table of assumptions. Some assumptions in this table are missing that were formerly present in Rev 1 of the NOC (just 4 months ago). What is the status of the deleted assumptions? For example:

Assumption 4 (old): *"Measurements were made over a quiescent waste and passively ventilated tanks for 241-BY Tank Farm. A constant emission rate was assumed as long as the tank waste remained quiescent."* This assumption is now absent. What assumption is made now regarding emission rate?

Assumption 5 (old): *Data was not selected for the source term if it did not have a Chemical Abstract Service (CAS) number listed in the WAC 173-460-150 table*. This assumption is now absent. How has this been corrected?

Assumption 6 (old): *There will be no waste disturbing activities conducted in BY-108 during the NUCON research project*. This assumption is now absent. Are waste disturbing activities planned?

Assumption 7 (old): *The NUCON project is evaluating a control technology for potential use at the Hanford tank farms. Phase II testing developed preliminary reduction efficiencies. Because the project is field-testing the new NUCON control technology (thermal oxidation) equipment in Phase III, reduction efficiencies for thermal oxidation were not used in the emissions calculations for this application*. This assumption is now absent. What changes have been made regarding emission calculations?

It would help to have a more specific description of the changes between Rev 1 and Rev 2 of the NOC.

Response to I-1-8

Three of the four assumptions cited above from TOC-ENV-NOC-5294, Revision 1, are still applicable for Revision 2.

For the original Assumption 4, the new Table 2, Assumption 6 is roughly equivalent. It states that "Measurements were assumed to be made over a quiescent waste in HEPA-filtered exhaust stream." No attempt was made to scale testing data for the conditions under which the sample was taken. Emission rates used in calculations are still constant at 60 standard cubic feet per minute of tank vapors with the maximum pollutant concentration found in the Permittee's testing databases for Tank BY-108 and the 241-BY Tank Farm.

The original Assumption 5 is no longer valid. The NOC application now addresses diesel engine exhaust, particulate (DEEP). DEEP does not have an official CAS, but the Permittees use an internal working CAS of M11 for tracking purposes. For more information, please see TOC-ENV-NOC-5294, Table 2, Assumption 1.

For the original Assumption 6, the updated NOC Application does not scale emissions for waste disturbing activities. Therefore, such activities would be inconsistent with the application and would likely lead to exceedance of emission limits. Ecology has confirmed that waste-disturbing activities are not planned during testing of the TOS and has added Approval Condition 2.b.v to require that the waste in Tank BY-108 be quiescent while emissions are routed to the TOS.

The original Assumption 7 is still valid. Ecology confirmed that control credit was not applied to emission from Tank BY-108. Control credit for the diesel particulate filter and catalytic converter are indirectly applied to engine emissions through the use of performance testing results in calculations. This is allowable under the definition of potential to emit in WAC 173-400-030 (76) because the engine is subject to enforceable emission standards under federal regulations and DE23NWP-002 now requires that the TOS be operated in the same configuration used for performance testing.

Comment I-1-9

9. Section 5.3 of NOC—Table 2 in Rev 2 of the NOC changed for VOCs versus reporting in Rev 1. A value of Was 9.06 lb/yr was changed to 369 lb/yr VOC emission rate. What changed? Data for the diesel engine in Table 4 changed a lot too from Rev 1 to Rev 2. Why?

Response to I-1-9

At the request of the Permittee, Ecology halted review of the emission calculations submitted with TOC-ENV-NOC-5294, Revision 1, prior to declaring the application complete. Ecology was not certain of some underlying assumptions used in the original VOC calculations when the Permittee requested the application be held for redevelopment.

The updated application was found to be complete under WAC 173-400-113, including sufficiently documentation of VOC emission calculations. However, Ecology considered the original calculations replaced by the submission of the updated application. Therefore, Ecology did not continue review of the original assumptions to develop a comparison between the two approaches for VOC.

For the TOS engine, the primary change in potential emission calculations is that the Permittee based emissions of nitrogen oxides, carbon monoxide, and particulate matter on source-specific test data. In Revision 1, the Permittee used generic emission factors from EPA's AP-42: Compilation of Air Pollutant Emission Factors (AP-42), Section 3.3. Ecology accepted the revised potential emissions because EPA guidance places a preference on source-specific testing over generic emission factors.

Additionally, Section 3.3 of AP-42 was last updated in 1996. This was prior to the promulgation of federal standards for both mobile and stationary engines which have significantly reduced engine emissions. This makes the AP-42 emission factors appropriate for historical engines, but overly conservative for newer engines like the one included in the TOS.

There is one potentially confusing aspect of Table 4. Footnote a states the engine is 28 brake horsepower (bhp), which was the rating before additional parasitic loads were added in the TOS. The values for carbon monoxide (CO) and sulfur oxides presented were adjusted to the measured power output of approximately 25 bhp combined with AP-42 emission factors. Ecology accepted this calculation because both values were still conservative for screening against the WAC 173-400-110 (5) exemption levels. Federal fuel standards now require ultra-low sulfur diesel, which was not required or readily available in 1996, and better combustion management in modern engines has also significantly reduced CO emissions.

Comment I-1-10

10. Table 10 of NOC Rev 2 is changed from Table A-1 of previous version. What are the changes?

Response to I-1-10

Ecology's concerns regarding the 2020 application led to the Permittee requesting that the application be held for redevelopment via Letter 22-ECD-000020, received January 28, 2022. Based upon this requested hold, Ecology did not complete a full review of specific TAP emission calculations in Table 10 of Revision 1 and cannot provide a comprehensive comparison of changes that were made in the Revision 2 submittal. One primary difference is that Revision 2, Table 10, now includes TAPs without a CAS such as DEEP.

Comment I-1-11

11. This NOC is for a system whose vapor thermal oxidation occurs inside a diesel internal combustion engine. It therefore takes tank smell and makes it smell like a diesel. None Of the documents to date identify whether a procedure was in use for the NUCON ® testing to identify and document any odors detected. What procedure will be used for the Phase Ill test, in the event odors are detected?

Response to I-1-11

For the purposes of NSR, there is no requirement to demonstrate odor control on the Permittee's property. WAC 173-400-040 requires that sources in Washington producing odors which "unreasonably interfere with any other property owner's use and enjoyment of her or his property must use recognized good practice and procedures to reduce these odors to a reasonable minimum."

The Permittee does not have a history of odor complaints from neighboring properties, in part due to the extreme size of the Hanford Site. The TOS will be located approximately 10 miles from the nearest property boundary. Based upon this, Ecology determined that it was unlikely that odor from Tank BY-108 or the TOS itself would interfere with a neighboring property owner. The TOS engine is also equipped with industry-standard emission controls which will indirectly reduce odors, meeting the current standard for recognized good practices.

Comment I-1-12

12. The NOC omits reference to a data quality objectives (DQO) report. Without a DQO how can we be sure all the analytes that are important are covered? Is BY-108 a good trial? For example, acetonitrile is important to ETF and off-site facilities as well as in tank waste, for example. How does BY-108 compare to other sources? How does the BY-108 vapor humidity compared to other sources?

Response to I-1-12

No DQO is required for NSR permitting because performance testing of the TOS is not being conducted under requirements established by the Washington and Federal Clean Air Acts. Instead, testing will be conducted pursuant to a 2018 settlement agreement in Case No. 4:15-cv-5086-TOR in the United States District Court for the Eastern District of Washington. That case addressed the potential for worker exposure to short-term emissions from Hanford's passively-ventilated tanks under endangerment provisions of the Resource Conservation and Recovery Act.

Ecology is required to issue Approval Order DE23NWP-002 if it determines that the proposed project satisfies the requirements identified in WAC 173-400-113. This includes any standards established under Chapter 70A.15 RCW (formerly codified as Chapter 70.94 RCW), the Washington Clean Air Act. The requirements in Chapter 173-303 WAC were established under Chapter 70A.300 RCW (formerly codified as Chapter 70.105 RCW), the Hazardous Waste Management Act. Chapter 173-303 WAC is not included in the approval requirements for WAC 173-400-113.

Comment I-1-13

13. Ecology's web page states that this comment period only addresses the potential exposure of members of the public to emissions from the TOS during the performance test. Are there other exposures to be evaluated later? During disposal of the equipment?

Response to I-1-13

Additional review is being conducted under dangerous waste regulations, WAC 173-303-809, for a research, development, and demonstration (RD&D) permit. The RD&D permitting process includes more general requirements to protect human health and the environment, including areas which are excluded from NSR authority under Chapter 173-400 WAC.

Comment I-1-14

14. The NOC does not address radionuclides, yet synergy exists between the chemicals and the isotopes and this synergy may be a root cause of the total risk. What radioactivity will be

released? Tritium? C-14? Is there a companion radioactive NOC? Will it be available for public review?

Response to I-1-14

In accordance with WAC 173-480-070 (1) and Chapter 246-247 WAC, permitting for air emissions of radionuclides is under the authority of the Washington Department of Health (DOH). Enforcement of 40 CFR Part 61, Subpart H - National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities (NESHAP Subpart H) is also delegated directly from EPA to the DOH. For more information on this delegation, see the Federal Register 87 FR 74319, published December 5, 2022.

Chapter 246-247 WAC establishes application requirements and procedures fo the issuance of RAELs. Ecology was notified of submittal of a Notice of Construction (NOC) to DOH for this project via Letter 23-ECD-001738, dated May 17, 2023. A 28-day draft RAEL for the BY-108 TOS was issued and transmitted with Letter AIR-902 on September 6, 2023. Unless adjudicated or issued early at the request of the Permittee, final issuance of this license is expected by approximately November 5, 2023. However, Ecology is not a direct participant in this review.

Comment I-1-15

15. The new NOC (Table 6) identifies the maximum stack flow to be 5.07 m^3 /min, This is equivalent to 180 cfm. In contrast, Table A-3 shows that the emissions are calculated at 60 cfm, Yet the text in Section 6.3 says "The source was modeled at the maximum flow rate to produce the worst-case air dispersion factors for this project." Which is correct?

Response to I-1-15

Both values are correct within their context. Combustion of fuel and organics produces additional gas volume which would not be included in the 60 standard cubic feet per minute (scfm) of tank vapors drawn from Tank BY-108. This is primarily due to the hydrogen in the liquid diesel fuel combining with oxygen (O_2) to form two molecules of water (2 H_2O), which is a gas at the expected exhaust temperature.

Additionally, the value in Table 6 is for modeling purposes and has not been corrected to standard temperature and pressure. In general, the volume of exhaust produced by an engine is several times the required air intake, due to increased temperature and additional gases.

Comment I-1-16

16. What flow rate does booster blower pull from BY-108 vapor space? (A process description and flow diagram with data tables for flow rates, pressures, and temperatures would be helpful). Is BY-108 interconnected with other tanks? Can the booster blower and Diesel engine pull enough vapor to create a vacuum in the tank? Some tanks have vacuum limits (~6 inches WG) to prevent structural damage. Even a frost can restrict tank air inflow so that the negative pressure increases. Is there a pressure indicator/alarm?

Response to I-1-16

Once the engine has warmed up and switched from initial operation on ambient air, the booster blower will be set to maintain 60 scfm through the TOS up to the point fuel is introduced. More

detailed information on the expected actual flow rates, temperatures, and pressures at specific points of the TOS was not necessary to demonstrate compliance with WAC 173-400-113.

TOC-ENV-NOC-5294, Rev. 2, Section 5.0 discusses that interconnection between the tanks of the 241-BY Tank farm is assumed and that emissions were based upon available testing data for the entire farm. By assuming the most conservative scenario of complete connection there is no need to demonstrate that there were fewer connections between the tanks.

At least some level of vacuum will be necessary to maintain flow rate from BY-108 to the TOS, but the details of pressure monitoring and tank protection are considerations for Dangerous Waste permitting under Chapter 173-303 WAC.

Comment I-1-17

17. Where will the skids be located? Have the weight and vibrations been compared to dome loading limits?

Response to I-1-17

The stack location for the TOS is shown in TOC-ENV-NOC-5294, Rev. 2, Table 8. Relative placement to the tanks, dome loading limits, and other specifics of waste storage are considerations for Dangerous Waste permitting under Chapter 173-303 WAC.

Comment I-1-18

18. Is the system sampler equipped to measure isotopes as well as chemicals?

Response to I-1-18

The Permittee is not required to submit information on radioactive air sampling equipment for NSR under Chapter 173-400 WAC and did not voluntarily disclose this information. Additional information on radioactive air sampling was submitted with Letter 23-ECD-001738. For the most up to date information, please contact DOH.

Comment I-1-19

19. Has the vapor composition been compared to corrosion criteria for the diesel engine and other equipment? Will the engine, etc. be examined at the end of the test?

Response to I-1-19

Chemically treated activated carbon to remove mercury was added, in part, to the Phase 3 design for corrosion protection. Material compatibility is not generally reviewed for NSR under Chapter 173-400 WAC, unless there is a concern regarding degraded ventilation or control equipment leading to excess emissions. The TOS has a time-limited authorization, and the performance of the controls will be under evaluation throughout the testing period. If system performance is affected during testing, Ecology is reserving the right to use testing data as evidence of excess emissions.

Comment I-1-20

20. How much diesel fuel is consumed (gallons) during the test? Is diesel cost effective versus other methods? Does the diesel power the fan and heater?

Response to I-1-20

The estimated fuel use for the test was not provided in the application and would depend upon how much the engine needs to be run during initial operational testing, which is addressed in Approval Condition 2.b.i. The TOS is based upon a Kohler 15REOZK generator set. Kohler specification sheet G5-434, dated 6/23, rates the maximum fuel consumption at 1.4 gallons per hour for prime operation at 100% capacity prior to the modifications made to manufacture the TOS. Diesel fuel is cost effective enough that it is still the industrial default for small engines, but this is also based upon simplicity and reliability advantages over gasoline, natural gas, or propane.

The TOS does require supplemental mainline power for support and testing equipment. In the Phase 3 testing design, electricity generated by the TOS will be sent to a load bank and will not be used to power the system itself.

Comment I-1-21

21. The system layout seems to show drainage from the ventilation system being routed back to tank BY-108. Isn't this piping contrary to intrusion prevention to preclude liquids going back to single shell tanks?

Response to I-1-21

Condensate collection and reintroduction to BY-108 would be evaluated for Dangerous Waste permitting under Chapter 173-303 WAC. Collecting and returning this liquid prevents it from becoming air emissions which would be subject to NSR.

Comment I-1-22

21. How much temperature elevation is created by the heater? What temperature range is needed for effective catalyst operations? Is this temperature monitored?

Response to I-1-22

The preheater will just be used to warm tank vapors enough to ensure condensation does not occur on the high efficiency particulate air filter elements. The tank vapors will then be cooled, prior to introduction into the engine, to ensure they are closer to ambient temperature and pressure of combustion air in a more typical setting.

The EPA Air Pollution Control Technology Fact Sheet for Catalytic Incinerators (EPA-452/F-03-018) indicates that heating to 600-800 °F is typical for the larger oxidative catalyst beds used in non-engine applications. This is consistent with the minimum operating temperatures Ecology has observed are necessary for engine catalytic converters to operate efficiently.

This heat will be provided by the combustion of diesel, which is the standard method in both stationary and mobile engines. The TOS procedures are to start up the system on ambient air before switching to tank vapors, which will ensure that the engine exhaust has sufficiently warmed the catalyst before tank vapors are introduced.

Comment I-1-23

21. On March 14, 2022 Ecology and DOE signed a permitting plan for this project (letter 21-NWP-218). This plan calls for an RD&D permit, a Radioactive Air Emissions License, and approval order for Criteria and Toxics Air Emissions NOC (this action). The dates listed are now out of date. Can you provide expected dates for public review of the RD&D draft permit and date of submittal of the application for Radioactive Air Emissions License? It would help to have coordinated information so that the public review includes the entire permitting context. Is any action required by the Benton County Clean Air Agency?

Response to I-1-23

A 28-day draft RAEL for the BY-108 TOS was issued and transmitted with Letter AIR-902 on September 6, 2023. Unless adjudicated or issued early at the request of the Permittee, final issuance of this license is expected by approximately November 5, 2023. The RD&D Permit is at the stage of "Permittees and Ecology develop the draft permit in workshops" for the permitting plan provided with Letter 21-NWP-218. Ecology can't guarantee permitting timelines or whether the RAEL or RD&D Permit will be issued.

I-2: BILL GREEN

Comment I-2-1

Comment 1. Technical Support Document (TSD) above: **The TSD (above) attributed to Matt Williams, P.E., is not dated, not signed, and does not contain his P.E. stamp. Lacking a date, a signature, and a P.E. stamp, this document should be given the same consideration as an unsigned and undated letter; that is, no consideration at all.**

Response to I-2-1

Thank you for your comments. EPA recommends, and in some cases requires, a technical support document (TSD), statement of basis, fact sheet, or similar non-enforceable document be generated for air permitting actions. A TSD is supposed to provide additional information on how enforceable conditions are derived and to clarify requirements. Ecology is now producing a TSD for minor New Source Review (NSR) permitting action, such as issuance of Approval Order DE23NWP-002, as part of the effort to standardize minor NSR throughout the state. WAC 173-400-111 (4)(b) does not require signing and stamping of the TSD by a registered professional engineer (PE).

Comment I-2-2

Comment 2. General: **Provide the public with: a) the total risk to our health anticipated from this proposed action; and b) adjust the impacted non-radionuclide air emission limits to reflect the presence of air emissions from radionuclides.**

(This comment recognizes Ecology has zero authority under state statute to regulate radionuclide air emissions at Hanford, and should not be interpreted otherwise. See RCW 70A.388.)

a) The proposed action does not assess anticipated risks from radioactive emissions, even though there is no possible way to separate non-radioactive air emissions from radioactive air emissions expected from operation of the Thermal Oxidation System (TOS). By failing to account for all air emissions with the potential to negatively impact human health, Ecology is effectively depriving the public of the opportunity to be informed of the total risk resulting from the proposed action. Afterall, the potential risk to the public is from the total of all regulated air pollutants attributable to the proposed action. Because non-radionuclide air emissions may be below levels of concern, and separately, radionuclide air emissions may be below levels of concern does not guarantee the total emissions from the combination of radionuclide and non-radionuclide air emissions, or any synergistic reactions between/among the constituents in these emissions will be below levels of concern.

Through the public comment process, the public must have the ability to impact the air we breathe resulting from ALL regulated air pollutants from the proposed action before this action commences. Any meaningful impacts from public participation need to occur before the proposed action becomes operational.

There is no question the proposed action will release radionuclides.

> "The [tank] waste material is radioactive, continually generating heat, continually catalyzing both known and unknown chemical reactions in all layers, and continually generating gases and known and unknown chemical products that are continuously created and destroyed via chemical, thermal, radiocatalytic and radiolytic processes in all layers." TVAR at 21 of 153

. . . and

> "Emissions from vents, stacks, alternative tank leakage pathways, and overflow and transfer lines originate from the waste material in the tanks. The tanks contain a complex mixture of chemicals, including both radioactive isotopes and toxic chemical compounds." TVAR at 23 of 153

. . . and

> "The vapors from the tank will pass through the filter system,. . ." NOC-5294 at 8-1

. . . and

> ". . . high-efficiency particulate air (HEPA) filters . . . control radioactive [particulate] contaminants while allowing gases and vapors to readily pass through." TVAR 22 of 153

. . . and

> "Tank emissions are a source of radionuclides. . ." TSD at 6 of 11

Washington Administrative Code 173-480-070(1) designates the Washington Department of Health (Health) as the agency responsible for administration of radionuclide air emissions including those attributed to Hanford. (See also RCW 70A.388 and WAC 246-247.) Emissions of radionuclides from Hanford are also regulated federally by 40 CFR 61 subpart H.

Terms and conditions to control radionuclide emissions must eventually appear in Hanford's Air Operating Permit (AOP), a permit issued and enforced by Ecology pursuant to WAC 173-

401. Under WAC 173-401, Ecology must have the authority to enforce all applicable requirements including those provisions regulating radionuclide air emissions (40 CFR 70.4, including (k)). That portion of an activity with the potential to emitting radionuclide air emissions is regulated by Health via terms and conditions in a license. Terms and conditions in a Health-issued license are only subject to public participation when Hanford's AOP is re-opened for renewal. Such renewal is required to occur only once every 5 (five) years. Thus, an activity emitting radionuclides can operate for many years before the public has any knowledge of that activity.

At no time in the regulatory process is the public provided with the total risk of the proposed action from all expected regulated air pollutants, both non-radioactive air pollutants and radioactive air pollutants combined. While Ecology is not allowed under state law to administer requirements for control of radioactive air emissions until such requirements eventually appear in a permit issued under WAC 173-401, Ecology is not prohibited from informing the public of the TOTAL risk to our health anticipated from a proposed action. Furthermore, Ecology has a contract-like agreement with Health needed to fully implement WAC 173-401. It seems Ecology could easily use this agreement to obtain any needed expertise from Health regarding anticipated risks from exposure to radionuclides.

The public is not the enemy, rather we are the victim of a regulatory scheme that mandates ignorance with respect to activities involving the potential for exposure to radioactive emissions. However, it is Ecology's choice whether we the public will receive an assessment of the TOTAL risks to our health anticipated from the proposed action.

b) Another consequence of establishing air emission limits, separately, for non-radioactive emissions and for radioactive air emissions is that radionuclides in the form of gases and vapors freely pass through HEPA filters. The radioactive decay process changes the state of the gaseous emissions to one or more daughter products that are particulates. The radioactive particulates settle on surrounding land and vegetation where they are subject to re-suspension in the air via climatic events. These re-suspended particulates are overlooked in establishing emission limits or assessing any associated health risks. (Such re-suspension of radionuclides at Hanford is not foreign to Health.)

Response to I-2-2

Ecology does not have the information requested and is not aware of any readily available source of this information because it is outside of the scope and authority of Chapters 173-400 and 173-460 WAC, as promulgated under the Washington Clean Air Act. When implementing NSR under Chapter 173-400 WAC, Ecology is obligated to operate in accordance the regulations and the state implementation plan approved by EPA in 40 CFR 52, Subpart WW.

DOH must operate in accordance with Chapter 246-247 WAC and their delegation for 40 CFR Part 61, Subpart H, from EPA. That includes processing NOC applications for a RAEL in accordance with WAC 246-247-060.

Comment I-2-3

Comment 3. Public review: **The Permittee is seeking to use, inappropriately, a public review process that is not consistent with requirements of WAC 173-401 to change a permit required and issued pursuant to WAC 173-401.**

Permittee's letter number 20-ECD-0059 transmits its notice of construction application for public review conducted pursuant to WAC 173-400. Permittee's letter (20-ECD-0059) also transmits a request to change its Air Operating Permit (AOP), a permit required by and issued in accordance with the Operating Permit Regulation, WAC 174-401.

> "The Notification of Off-Permit Change (Attachment 3) is being submitted to Ecology for its administration of the Hanford Site Air Operating Permit (AOP), as well as U.S. Environmental Protection Agency, Region 10, as part of the notification process for the off-permit changes as outlined in the AOP." Letter from Vance, B.T., Manager, U.S. Dept. of Energy, Hanford Site to S.N. Schleif, Washington State Dept. of Ecology, Nuclear Waste Program, and K. McFadden, U.S. Environmental Protection Agency, Region 10, "The Notification of Off-Permit Change (Attachment 3) is being submitted to Ecology for its administration of the Hanford Site Air Operating Permit (AOP), as well as U.S. Environmental Protection Agency, Region 10, as part of the notification process for the off-permit changes as outlined in the AOP.", 20-ECD-0059, Dec. 08, 2020 (Stamped as received by Ecology, NWP, also on Dec. 08, 2020.)

(NOTE: "Attachment 3" referenced in the above quote is not included in review material Ecology submitted to support this public review.)

An "Off-Permit Change" is a specific type of change to a sources AOP, a permit both required by and issued in accordance with WAC 173-401. (Requirements for an Off-Permit Change are codified in WAC 173-401-724.)

Thus, the Permittee is co-mingling activities conducted pursuant to WAC 173-400 with an activity needed to satisfy requirements specific to WAC 173-401.

The current public review conducted under WAC 173-400 doesn't meet the minimum requirements for public review conducted pursuant to WAC 173-401, The Operating Permit Regulation. Specific deficiencies include:

- failure to publish a public notice in the Permit Register [WAC 173-401-800 (2)(b)(iii)];
- failure to provide notice via Ecology's mailing list as required by WAC 173-401-800 (2)(c); and
- failure to provide all relevant materials used in the permitting process [40 C.F.R. 70.7 (h)(2)]

That portion of Washington's State Implementation Plan (SIP) codified at WAC 173-400-111 (2)[1] requires that a notice of construction application designated for incorporation into the source's

[1] 79 Fed. Reg. 59,653, 59,655 (Oct. 3, 2014):

AOP must be processed in accordance with the operating permit program procedures and deadlines[2]. Such procedures and deadlines are codified at WAC 173-401.

Public review consistent with WAC 173-401 must also include all relevant materials used in the permitting process, as mandated by the U.S. Environmental Protection Agency (EPA) in 40 C.F.R. 70.7 (h)(2). (WAC 173-401 must faithfully implement all federal requirements specified in 40 CFR 70.) Forty C.F.R. 70.7 (h)(2) requires the public be supplied with all information used in the permitting process to justify terms and conditions in either a particular regulatory order or specific to particular portion(s) of the Permittee's application, or to both.

In interpreting language in 40 C.F.R. 70.7 (h)(2) EPA determined information that must be provided to support public review consists of all information deemed relevant by being used in the permitting process. EPA's view is captured as a finding in case law.

> "EPA has determined that the phrase 'materials available to the permitting authority that are relevant to the permit decision,' **40 C.F.R. § 70.7(h)(2), means the information that the permitting authority has deemed to be relevant by using it in the permitting process**. . . " (emphasis added) Sierra Club v. Johnson, 436 F.3d 1269, 1284, (11th Cir. 2006)

Thus, relevant information must be included in the information provided by Ecology. Requiring the public search other forums for such information seems not to comply with either the spirit or the letter of EPA's interpretation of its own regulation.

Ecology errored by a) not including "Notification of Off-Permit Change (Attachment 3)" transmitted by letter 20-ECD-0059 referenced-above, and by b) using a public review process that is inconsistent with the minimum requirements specified by WAC 173-401 to change a permit issued pursuant to WAC 173-401.

It is apparent from the bulleted items above that the instant public review is not being conducted in accordance with the procedures required to change an AOP. Whether conditions from DE23NWP-002 qualify as an "Off-Permit Change" to Hanford's AOP must be the subject of a separate action by Ecology, an action that is consistent with WAC 173-401.

Response to I-2-3

The Hanford AOP is not being revised, amended, or otherwise modified by the issuance of DE23NWP-002. Ecology recognizes that the public comment period for DE23NWP-002 does not meet all requirements of WAC 173-401-800 because this permitting action does not qualify as any of the AOP-related actions requiring a comment period under WAC 173-401-800 (2). DE23NWP-002 addresses minor NSR permitting requirements in Chapter 173-400 WAC. Therefore, the comment period was conducted in accordance with WAC 173-400-171

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[2] "Coordination with chapter 173-401 WAC, operating permit regulation. A person seeking approval to construct or modify a source that requires an operating permit may elect to integrate review of the operating permit application
or amendment required under chapter 173-401 WAC and the notice of construction application required by this section. **A notice of construction application designated for integrated review must be processed in accordance with operating permit program procedures and deadlines in chapter 173-401 WAC** and must comply with WAC 173-400-171." (emphasis added) WAC 173-400-111 (2)

(3)(n).WAC 173-400-111 (2) states that the Permittee "may elect" to integrate review of an AOP application or amendment under Chapter 173-401 WAC with the NSR permitting action taken under Chapter 173-400 WAC. The Permittee did not request, and Ecology does not generally encourage, integrated review.

The Permittee has provided notification of an off-permit change (OPC) under WAC 173-401-724. An OPC notification is not an AOP application or amendment. As stated in WAC 173-401-724 (1), an OPC is a change which specifically does not require revision of the AOP prior to implementation. Therefore, an OPC notification does not have an associated public comment period under WAC 173-401-800 (2). This notification to EPA and the permitting authority is required to ensure that they are aware of the project and do not object to it being an OPC.

The OPC notification is not a document, listed in WAC 173-400-171 (5)(b), which was required to be posted on Ecology's website during the public comment period. It does not provide any additional information on the project and was not considered in Ecology's review for compliance with the requirements of Chapter 173-400 WAC. In accordance with WAC 173-400-171 (5)(a), "information submitted by the applicant" is only required to be part of an administrative record (AR) made available either on the Ecology website or in at least one physical location near the proposed project. As communicated to Mr. Green via email on July 3, 2023, the OPC notification was available in the Hanford AR which has two physical viewing locations in Richland, Washington. It is also available at https://pdw.hanford.gov.

The only reference to Chapter 173-401 WAC in the draft or final documents is Approval Condition 2.b.i.A.III, which identifies that any required AOP application for WAC 173-401-500 (3)(c) must be filed within an appropriate time after commencing operation. Ecology does not typically include such a condition in minor NSR approval orders. In this case, Ecology wanted to be certain that an appropriate timeline was established for the AOP because the TOS is expected to be a temporary source.

Comment I-2-4

Comment 4. **The TOS "[is]** a small diesel fuel-fired engine to combust volatile tank vapors . . ." (TSD at 1.) **The draft NOC does not require ultra-low sulfur diesel (ULSD) as specified in WAC 173-400-040(7). Require use of only ultra -low sulfur diesel (sulfur content <= 15 ppm) along with appropriate recordkeeping to ensure the only diesel fuel combusted is ULSD.**

Response to I-2-4

WAC 173-400-040 (7) does not require use of ultra-low sulfur diesel (ULSD). It sets a general requirement for all sources, whether or not they go through minor NSR, to limit the concentration of sulfur dioxide in air emissions. The TOS would meet this standard even if the engine were firing low sulfur diesel. The use of ULSD is required by 40 C.F.R. 60.4207. Both of these requirements are enforceable by rule, even without DE23NWP-002. Ecology included Approval Condition 2.c.v to require compliance with the applicable requirements of 40 C.F.R. Part 60, including use of ULSD.

While reviewing this comment, Ecology has found a typographical error in the draft Approval Condition 2.c.v. The final version of this condition has been updated from "Subpart JJJJ" to

"Subpart IIII." For more information, please see Section 3.b.i of the TSD, which discusses the correct federal standards.

Comment I-2-5

Comment 5. Visible emissions – **Condition 2, c. iii on page 4 of 11 of the Draft Approval Order requires that "[v]**isible emissions from the TOS must not exceed 5 percent opacity, as determined by 40 C.F.R. Part 60, Appendix A, Test Method 9**". Five percent (5%) opacity as measured by Method 9 is below EPA's method detection limit[3], unless the plume is black. Ecology does not require the plume be black. Require: a) that all visible emissions be black, or b) require use an appropriate EPA-approved method or methods, or c) require instrumental monitoring, capable of determining continuous compliance with the 5% opacity requirement regardless of the color of the plume, or d) impose a visible emission limit that can accurately be measured using EPA's Method 9.**

Using Method 9, the 99% confidence limit for white smoke is < 7.5% opacity[4]. Thus, for white smoke, the Permittee could exceed the 5% opacity limit by a little less than 2.5%, and that exceedance might not be detected using Method 9

Response to I-2-5

The document referenced by this comment, which includes EPA Methods 9 and 22 and background on their development, does not contain the terms "method detection limit" or "MDL." Previous comments submitted to Ecology with similar content have generally referred to an EPA "Frequent Questions" website on analytical methods for water sampling associated with the Clean Water Act. This website was not relevant to visual estimation of plume opacity in air. For more information, please see Ecology's response to comments I-7-32, I-7-39, I-7-57, I-7-129, I-10-5, and I-10-7 by Mr. Bill Green in the Response to Comments for Renewal 3 of the Hanford AOP, Ecology publication 19-05-010, August 2019.

EPA itself uses Method 9 as the compliance demonstration for limits which are as, or more, stringent than 5% with no mention of smoke color. These include 0% and 5% opacity limits for grain elevators in 40 C.F.R. 60, Subpart DD [40 C.F.R. 60.302 (b) and (c)] and 3% opacity limits for electric arc furnaces in 40 C.F.R. 60, Subpart AAa [40 C.F.R. 06.272a (a)].

EPA Region 10 also uses Method 9 as the compliance determination method for opacity limits of 5% or less in minor NSR permits for sources under their NSR authority in Washington. Examples are available at https://www.epa.gov/caa-permitting/air-permits-issued-epa-region-10.

Comment I-2-6

Comment 6. Emission evaluation and testing. Require the Permittee develop a Sampling and Analysis Plan (SAP) for approval by Ecology and the public.

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[3] *Method Detection Limit* (MDL) here means the minimum opacity that can be measured and reported with 99 percent confidence. Using Method 9, the 99% confidence limit for white smoke is < 7.5% opacity and for black smoke the 99% confidence limit is < 5% opacity. (*Visible Emissions Field Manual EPA Methods 9 and 22*, EPA 340/l -92-004 December 1993, p.6)

[4] *Visible Emissions Field Manual EPA Methods 9 and 22*, EPA 340/l -92-004 December 1993, pp.6, B-2

Ecology writes in the *Draft* NOC order of approval that the "[p]ermittee plans to evaluate inlet and outlet concentrations of specific chemicals of concern to determine if an internal combustion engine and additional air pollution control devices can be an effective method of reducing emissions from tank waste." (*Draft* NOC approval order at 1.) However, Ecology overlooks requiring the Permittee to specify how the inlet and outlet emissions will be evaluated, as well as specifying the required laboratory analytical test methods and sampling frequencies for all forms of "specific chemicals" including hydrocarbons, both stable and unstable.

Because of the extreme difficulty, if not impossibility, of separating stable from unstable forms of "specific chemicals" including hydrocarbons, Ecology should either assume all carbon in the emissions is unstable, or require the Permittee specify how they intend to separate unstable from stable form of hydrocarbons.

It is highly likely that combustion of unstable "specific chemicals" including hydrocarbons will yield, in part, radioactive gases that will pass freely through any HEPA filtration. The Permittee should be required to quantify such emissions.

Ecology also overlooks the very significant impact waste-disturbing activities will have on emissions, with respect to both composition and concentration. Such waste-disturbing activities are inherent to the proposed project.

In a document prepared for the U.S. Department of Energy and published at government expense, an independent panel of nationally-recognized experts, writes:

> "Waste disturbing activities can greatly alter the concentration and composition of the head space gases and vapors. Past head space characterization did not evaluate the effect of waste disturbing activities on the chemicals in the head space and their concentrations." TVAR at 23 of 153

. . . and:

> "[] it was noted that waste-disturbing activities can profoundly disturb the temporal concentrations of chemicals in the head space. More specifically, waste disturbing activities associated with sluicing of waste with water jets, dissolution and transfer pump operations are believed to have the highest potential to release a large fraction of retained gas and vapors over a short time period. <u>The effects are dramatic resulting in organic vapor concentrations increasing by several orders of magnitude.</u>" TVAR at 38 of 153, references omitted, emphasis is mine

The TOS activity under consideration cannot occur without disturbing the relevant tank waste and suffering the huge increases noted above by the independent panel of experts.

It is also evident from the nature of the waste in the tank that radionuclides will be encountered in both the inlet and outlet gases. Even though condition 7. f. on page 8 of 11 in the draft order requires testing in accordance with WAC 173-400-105, it is a certainty the specified analytical methods are inappropriate for safely analyzing samples containing radionuclides. All sampling of tank emissions conducted for this project will be

radioactive. Ecology should not even entertain the thought of allowing radioactive samples to be tested in lab that is not equipped to analyze radionuclides.

NOC approval condition "7. f." should be replaced by the requirement to submit and abide by, a sampling and analysis plan (SAP) that addresses how the "[p]ermittee plans to evaluate inlet and outlet concentrations of specific chemicals of concern. . . ". The SAP must be reviewed and approved by Ecology and the public before the TOS is allowed to operate.

Response to I-2-6

As addressed in the comment period posting on Ecology's website, sampling resulting from Case No. 4:15-cv-5086-TOR is related to worker protection for Chapter 173-303 WAC, not Chapters 173-400 and 173-460 WAC. Therefore, it is outside the authority and scope of DE23NWP-002. Any sampling and analysis plan for testing under the settlement should be developed independently of the Approval Order.

The "radioactive gases that will pass freely through any HEPA filtration" would only be considered under Chapters 173-400 and 173-460 WAC if they are criteria pollutants or TAPs. Based upon testing data for engines, it does not appear likely that products of incomplete combustion would be significant enough to cause or contribute to an exceedance of any ambient air quality standard. However, if the TOS were not constructed and operated in accordance with the NOC application, Ecology could use the data generated by performance testing as credible evidence of an emissions limit exceedance whether or not it is addressed in the issued Approval Order.

Ecology disagrees that "waste-disturbing activities are inherent to the proposed project" with the definition of waste disturbance used for the Hanford Tank Vapor Assessment Report (TVAR), SRNL-RP-2014-00791, dated October 30, 2014. The waste in Tank BY-108 will be quiescent while the tank headspace is withdrawn at 60 standard cubic feet per minute, which is significantly different than "sluicing of waste with water jets, dissolution and transfer pumping operations." Movement of air through the tank headspace does not appear to be classified as waste disturbance for the TVAR and has not been considered waste disturbance for previous Ecology permitting actions.

To ensure that the project is conducted in accordance with the NOC Application, Ecology has added Approval Condition 2.b.v to the final permit to ensure that waste disturbing activities are not conducted while emissions are routed to the TOS. For this condition, Ecology is considering waste disturbing activities to be sluicing, mixing, pumping, adding or removing waste, and other processes which directly move waste. Incidental movement of waste caused by airflow at the surface would not be considered waste disturbance.

Comment I-2-7

Comment 7. **Ecology should not approve the TOS project because any benefits are greatly exceeded by the disadvantages.**

While internal combustion engines have been used across the country to combust hydrocarbon pollutants extracted from contaminated environmental media, TOS has never before been used in the highly radioactive environment presented by Hanford's tank farms.

The Permittee claims no unique benefits from the TOS project that would not otherwise be achieved at the Waste Treatment Plant. The TOS appears to be nothing short of a taxpayer-funded scheme aimed at proving even radioactive organic headspace gases can be combusted, while diverting Hanford's limited clean-up dollars from worthwhile activities.

The TOS project has significant disadvantages beyond mis-spending Hanford's clean-up dollars. These disadvantages include:

- The organics in the tank farm emissions will be addressed in other facilities that are either under construction or for which the Permittee has already issued contracts;
- The permitting process for these facilities is already well underway;
- Implementing the TOS project will create a new point-source(s), and perhaps a fugitive source(s), of air emissions including radioactive air emissions. Some gaseous combustion byproducts will freely pass through the required HEPA filters;
- The new source of emissions, some or all of which are radioactive, will increase the likelihood of worker exposures, and potentially exposures by the public;
- Equipment used in the TOS project will certainly become radioactively contaminated after coming into contact with tank farm emissions. At the close of the project, the radioactively contaminated equipment will need be thoroughly decontaminated or, more likely, be buried on-site to control the spread of radionuclides while sticking future generations with more Hanford waste to contend with; and
- The TOS project will duplicate expenses and demand for radio-lab analyses that will still be required by the treatment process in the Waste Treatment Plant facilities.

Response to I-2-7

WAC 173-400-113 states that Ecology "shall issue an order of approval if it determines that the proposed project satisfies..." the requirements identified in WAC 173-400-113 (1) through (5). The list of disadvantages in this comment do not appear to be relevant to these requirements.

Ecology determined that the TOS would meet the requirements of WAC 173-400-113, if it is constructed and operated in accordance with the NOC Application. Therefore, Ecology is issuing DE23NWP-002 to satisfy the requirements of WAC 173-400-113.

Appendix A. Copies of All Public Notices

Public notices for this comment period:

- Notice sent to the Hanford-Info email list
- Notices posted on the Washington Department of Ecology – Hanford's Facebook and Twitter pages
- Notice posted on the Washington Department of Ecology, Nuclear Waste Program's website.

From: Washington Department of Ecology
To: McFadden, Daina (ECY)
Subject: Public comment period restarting today
Date: Wednesday, June 28, 2023 10:02:16 AM

Thermal Oxidation System draft Notice of Construction DE23NWP-002

Public comment period restarting today

Due to anticipated public interest, Ecology initially scheduled a 30-day comment period June 22 through July 24, 2023. On June 26, Ecology discovered that a website outage had occurred. The comment period was then restarted on June 28 to run through July 28, 2023, to ensure that the public notice is posted for the duration of the comment period in accordance with WAC 173-400-171(4)(a). Any comments submitted for the original comment period will also be accepted.

If comments are received, including any which were submitted from June 22 through June 28, Ecology will publish the comments, Ecology responses, and any revisions between the draft and final versions of Approval Order as a separate Response to Comments document issued with the final Approval Order.

We are holding a 30-day comment period under WAC 173-400-171(3)(n) for a draft Notice of Construction (NOC) Approval Order, DE23NWP-002, authorizing air emissions from performance testing of a Thermal Oxidation System (TOS) connected to existing double-shell tank 241-BY-108. This tank is located on the Hanford Site in southeastern Washington.

The draft NOC Approval Order is now available for public review:

Review starts: **June 28, 2023**
Review ends: **July 28, 2023**

Background

The U. S. Department of Energy is proposing to test the TOS to determine if it would be effective for destroying chemicals of potential concern in vapors emitted from tank farms. The TOS will include high efficiency particulate air filtration, MERSORB activated carbon for mercury removal, a diesel fuel-fired engine to combust tank vapors, diesel particulate filter, and a diesel oxidation catalyst.

Testing is scheduled for four months, but the agency is proposing conditions in the draft DE23NWP-002 to allow up to one year of testing with Ecology approval. If the TOS is effective, we would require an additional review under Chapters 173-400 and 173-460 WAC prior to permanent authorization.

This comment period only addresses the potential exposure of members of the public to emissions from the TOS during the performance test.

How to comment

The draft Approval Order is available for review online at the Nuclear Waste Program's public

comment page.

Please submit comments by **July 28, 2023**. Electronically (preferred) or deliver to:

Daina McFadden
3100 Port of Benton Blvd
Richland WA 99354

Comment

Public hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

Daina McFadden

Permit Communication Specialist

Hanford@ecy.wa.gov

509-372-7950

From: Washington Department of Ecology
To: McFadden, Daina (ECY)
Subject: Public comment period starts today!
Date: Thursday, June 22, 2023 10:02:29 AM

Thermal Oxidation System draft Notice of Construction DE23NWP-002

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The draft Approval Order is available for review online at the Nuclear Waste Program's public comment page.

Please submit comments by **July 23, 2023**. Electronically (preferred) or deliver to:

Daina McFadden
3100 Port of Benton Blvd
Richland WA 99354

Comment

Public hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

Daina McFadden

Permit Communication Specialist

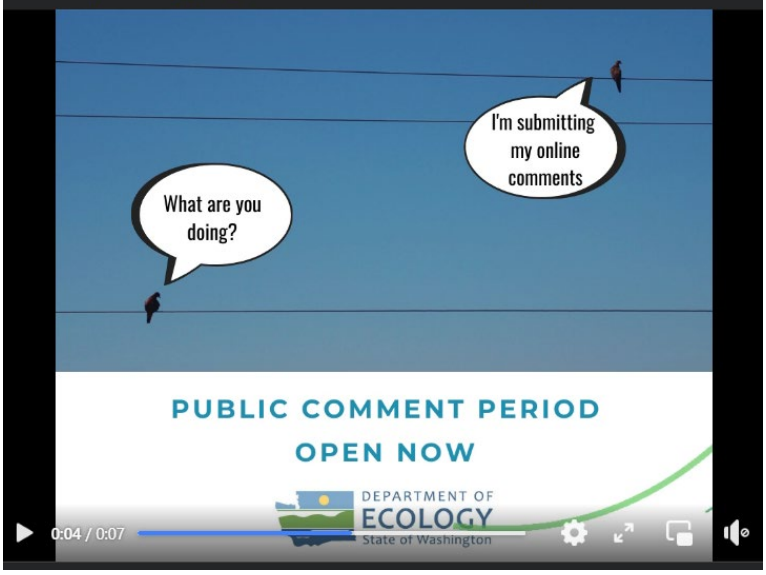
Hanford@ecy.wa.gov

509-372-7950

Washington Department of Ecology - Hanford
Published by Decology McFadden · June 28 ·

The Thermal Oxidation System draft Notice of Construction public comment period starts today.

Please submit your comments by July 28, 2023. Read more and provide your input here: https://ecology.wa.gov/.../Nuclear.../Public-comment-periods



Ecology - Hanford @ecyHanford · Jun 28

The Thermal Oxidation System draft Notice of Construction public comment period starts today.

Please submit your comments by July 28, 2023. Read more and provide your input here: ecology.wa.gov/Waste-Toxics/N...

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Thermal Oxidation System draft Notice of Construction DE23NWP-002

June 28 - July 28, 2023 *Updated*

Due to technical issues with the website the comment period has been restarted and will run from June 28 - July 28, 2023. Any comments that were submitted during the June 22 - June 27, 2023, time period are still valid and do not need to be resubmitted.

We are holding a 30-day comment period under WAC 173-400-171(3)(n) for a draft Notice of Construction Approval Order, DE23NWP-002, authorizing air emissions from performance testing of a Thermal Oxidation System (TOS) connected to existing double-shell tank 241-BY-108. This tank is located on the Hanford Site in southeastern Washington.

Background

The U.S. Department of Energy is proposing to test the TOS to determine if it would be effective for destroying chemicals of potential concern in vapors emitted from tank farms. The TOS will include high efficiency particulate air filtration, MERSORB activated carbon for mercury removal, a diesel fuel-fired engine to combust tank vapors, diesel particulate filter, and a diesel oxidation catalyst.

Testing is scheduled for four months, but our agency is proposing conditions in this draft notice of construction to allow up to one year of testing with Ecology approval. If the TOS is effective, we would require an additional review under Chapters 173-400 and 173-460 WAC prior to permanent authorization.

The TOS has commonly been identified by the name of the company which designed and constructed it, NUCON International, Inc. It is Phase 3 of Energy's development of a potential treatment system resulting from a 2018 settlement agreement in Case No. 4:15-cv-5086-TOR in the United States District Court for the Eastern District of Washington. That case addressed the potential for worker exposure to short-term emissions under endangerment provisions of Chapter 173-303 WAC.

For more information, please see the Hanford Vapors website. Worker protection, inside the ambient air boundary of the Hanford Site, is not addressed by Chapters 173-400 and 173-460 WAC. This comment period only addresses the potential exposure of members of the public to emissions from the TOS during the performance test.

Please submit comments by **July 28, 2023**, electronically, by mail, or deliver to:

Daina McFadden
3100 Port of Benton Blvd.
Richland WA 99354

Public hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

Daina McFadden
Hanford@ecy.wa.gov
509-372-7950

Documents

Approval Order
Technical Support Document
March 22, 2023 letter
Attachment 1
Hold request letter
December 8, 2020 letter
Attachment 1 old application
Attachment 2 NOC form