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Department of Ecology
NWP - Richland

August 3, 2022

Daina McFadden
Washington Department of Ecology
3100 Port of Benton Boulevard
Richland, WA 99354

Subject: Public Comment on the Revised ETF Notice of Construction Application

Dear Ms. McFadden:

Thank you for providing the opportunity to comment on the ETF Notice of Construction (NOC) Application (comments due by August 24, 2022).

I looked at both the original and the revised Notice of Construction documents.

TOC-ENV-NOC-5303, Rev. 00 (April 2021), was the *"Criteria and Toxics Air Emissions Notice of Construction for the Modification and Operation of the Effluent Treatment Facility in Support of Direct Feed Low Activity Waste Vitrification,"* published in April 2021. This report has a scope that includes WTP operations and ETF Brine loadout, but not Acetonitrile concentrate load out capability.

TOC-ENV-NOC-5303, Rev. 01 (March 2022), has the same title, and its changes are defined as adding brine storage tanks and the acetonitrile load out (ADLO) facility. The revisions show the related increases in chemical emissions.

Further, the Department of Energy has made a Temporary Authorization Request¹ (TA) dated July 25, 2022, to allow the Department to begin construction activities associated with the installation of brine storage tanks, acetonitrile distillate storage tanks and Acetonitrile Distillate Loadout Facility at the ETF.

Each NOC document estimates the toxic air pollutant emissions per year. The table below shows data from both Rev 0 and Rev 1 of the NOC for significant releases.

¹ 22-ECD-001213, TEMPORARY AUTHORIZATION REQUEST FOR LIQUID EFFLUENT RETENTION FACILITY AND 200 AREA EFFLUENT TREATMENT FACILITY OPERATING UNIT GROUP 3 FOR CONSTRUCTION OF THE BRINE STORAGE TANKS, ACETONITRILE STORAGE TANKS AND ACETONITRILE DISTILLATE LOAD-OUT FACILITY (T-2-8, S-2-8), July 25, 2022.

Table 1. Estimated Emissions from the ETF Notices of Construction			
Parameter	TOC-ENV-NOC-5303, Rev. 00 (without acetonitrile loadout)	TOC-ENV-NOC-5303, Rev. 01 (with acetonitrile loadout)	Percent Increase in Emissions from NOC Rev 0 to NOC Rev 1
Acetonitrile (Methyl Cyanide) estimated filtered emissions from ETF, (lb/year)	743	1,410	90%
Ammonia/ammonium estimated ETF Emissions, (lb/year)	3,076	3,330	8%
Emissions Text comparison (See NOC Sections 7.2)	<i>“36% of all acetonitrile received is exhausted with half attributed to volatilization estimates and the balance off the steam stripper condensate vessels.”</i>	<i>“36% of all acetonitrile received being exhausted as air emissions, with half estimated to be due to volatilization and the balance attributed to emissions from the steam stripper condensate vessels.”</i>	-
Abated release rate of tritium per year (Per TOC-ENV-NOC-5298*, Rev 0, May 12, 2021)	3.01 Ci/Yr	RAD NOC with acetonitrile loadout is unavailable.	Unknown.
*Radiological Air Emissions Notice of Construction Application for the Operation of the Effluent Treatment Facility in Support of Direct Feed Low Activity Waste Vitrification			

1. Section 7.2 in both NOC documents shows that **36%** of all acetonitrile received goes up the stack into the air (percent released is unchanged). Yet the total amount that is released nearly doubles (increases by 90%) when you add the new equipment. In the first NOC, 743 lb is 36% of 2,064 lb received. No mention was made of any changes in the amount or concentration of feed to be received. Therefore, shouldn't the percent

released in the updated NOC (Rev 1) be 1,410 lb/2,064 lb = **68%**, a whopping amount of the toxic, volatile material received discharged to the air?

2. Or alternatively, is the second NOC document correct and 1,140 lb is 36% of an updated total received, which would be 3,900 lb received? In this case, how was the feed amount so clearly underestimated?
3. When 68% of toxic air pollutants are vented to the air – it appears that best available control technology for toxics has not been applied. Can you provide a tBACT analysis? Acetonitrile in these concentrations is newly generated at WTP in the melter off-gas. How has tBACT been applied from the outset? Thermal oxidation is preferred, but has not been discussed with respect to melter off-gas (upstream of the submerged bed scrubber) or with respect to ETF steam stripper off-gas prior to condensing and prior to storage or load out. The “safe by design” approach would recommend changing operations so the acetonitrile is not produced and not sent to LERF, or by destroying it per EPA preferences as close to the source as possible. The impacts are non-trivial. The SQER for acetonitrile will likely exceed 4.4 lb/24-hr because ETF does not process this feed steadily every day. So sometimes, the 24-hr result will be higher. It would be very helpful if you can discuss this topic.
4. The impact of the revised NOC on ETF operations is not clearly stated – a review of the last several years of Hanford Site Air Emissions Inventory Reports² shows that ETF had performed admirably, in that the ETF VOC emissions for each year was 0. None. So the proposed changes are a complete change to the usual operations and personnel hazards.
5. The cumulative impact of the revised NOC on ETF radioactive operations is not discussed, so I looked up the last NOC for radionuclides at ETF, TOC-ENV-NOC-5298, April 2021. This RAD NOC addresses installation of a steam stripper. It does not mention acetonitrile or the acetonitrile loadout capability. This NOC is dated April 2021, the same as the out of date chemical toxics NOC Rev 0. Looking at the 90% estimated increase in acetonitrile emissions from Rev 0 to Rev 1, it appears likely that tritium emissions would also increase (contrary to the ALARA principal). I would appreciate if Ecology would check to see the cumulative impact on isotopes released. The regulatory network may restrict reviews of individual agencies, but that makes no difference to the persons breathing the air. They get both the chemicals and the isotopes to breathe.

² DOE/RL-2022-06 (2021),
DOE/RL-2021-11 (2020),
DOE/RL-2020-07 (2019),
DOE/RL-2010-20 (2009).

6. The impact of adding the acetonitrile steam stripper to ETF can also be evaluated in terms of the prior operating history for tritium. Looking at the recent Radionuclide Air Emissions Reports³ for the Hanford Site shows that ETF had non-reportable or **zero** discharges of tritium (a volatile isotope) for all years where data are available. The change instituted with addition of the steam stripper increased the tritium discharges from 0 Ci/year to 3 Curies per year. The additional discharges due to addition of the acetonitrile loadout facility and storage tanks have not been evaluated. Will tritium be increased in the same percentage as the acetonitrile? Note that releasing tritium up the stack at ETF is entirely contrary to ALARA and to the facility design that focused on discharging tritium in an aqueous phase so that it would decay in the SALDS and not make it to the river or where it would expose the public. I would appreciate if Ecology could request DOH to make an ALARA review or revisit the BARCT basis for ETF.
7. Lastly, the updated NOC does not identify a final treatment method for the acetonitrile concentrate. The concentrate is radioactively contaminated. This should be a deal-breaker, since a DOE failure to treat the volatile waste will result in storage for an indefinite (forever) period, where it will continue to be a hazard to personnel and the public. I would very much appreciate if you will reject DOE's temporary construction authorization request to build taxpayer funded, orphan equipment, until such time as there is a permanent and fully approved (not vaguely "promised") disposal pathway. Ecology has already noted that Perma-Fix Northwest (PFNW) does not have the appropriate permits⁴. In addition the PFNW EIS does not cover processing of this waste or anything like it. For context, DOE is busy trying to find destruction techniques for Acetonitrile⁵.

Thank you very much for considering these comments.

³ DOE/RL-2014-14 (2013),
DOE/RL-2015-12 (2014),
DOE/RL-2016-10 (2015),
DOE/RL-2017-17 (2016),
DOE/RL-2018-05 (2017),
DOE/RL-2019-09 (2018),
DOE/RL-2020-08 (2019),
DOE/RL-2021-12 (2020),
DOE/RL-2022-07 (2021).

⁴ According to Ecology: "Perma-Fix Northwest is not currently permitted to receive any waste that would be generated through the DFLAW waste treatment process." (See January 2021 Ecology Publication 21-05-005.

⁵ WRPS-67868, Acetonitrile Destruction and Fate of Organics in the Reverse Osmosis System at the ETF, December 2021. See also EXPRESSION OF INTEREST (EOI) FOR SUPPLEMENTAL ORGANIC TREATMENT, April 1, 2019, <https://www.hanford.gov/tocpmm/files.cfm/EOI - Supplemental Organic Treatment 3-28-2019.pdf>