



June 1, 2022

Comments submitted electronically: <https://nw.ecology.commentinput.com/?id=rMVa7>

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

RE: Public Comment Period for Class 2 Permit Modification LERF and 200 Area ETF Chapter related to Acetonitrile

To Whom It May Concern,

Hanford Challenge and Columbia Riverkeeper appreciate the opportunity to submit comments on the proposed Class 2 permit modification to the Hanford Dangerous Waste Permit, "Liquid Effluent Retention Facility and 200 Area Effluent Treatment Facility" chapter to add an Acetonitrile Distillate Loadout Facility, acetonitrile distillate tote storage, acetonitrile distillate storage tanks, and brine storage tanks to the 200 Area Effluent Treatment Facility (ETF).

Hanford Challenge is a non-profit, public interest, environmental, and worker advocacy organization located in Seattle, WA.¹ Hanford Challenge is an independent 501(c)(3) membership organization incorporated in the State of Washington with a mission to create a future for the Hanford Nuclear Site that secures human health and safety, advances accountability, and promotes a sustainable environmental legacy. Hanford Challenge has members who work at the Hanford Site. Other members of Hanford Challenge work and/or recreate near Hanford, where they may also be affected by hazardous materials emitted into the environment by Hanford. All members have a strong interest in ensuring the safe and effective cleanup of the nation's most toxic nuclear site for themselves and for current and future generations, and who are therefore affected by conditions that endanger human health and the environment.

Columbia Riverkeeper is a 501(c)(3) nonprofit organization with a mission to protect and restore the Columbia River, from its headwaters to the Pacific Ocean. Since 1989, Riverkeeper and its predecessor organizations have played an active role in educating the public about Hanford, increasing public participation in cleanup decisions, and monitoring and improving cleanup activities at Hanford. Columbia Riverkeeper and its 16,000 members in Oregon and Washington have a strong interest in protecting the Columbia River, people, fish, and wildlife from contamination at Hanford, including pollution originating in Hanford's tank farms.

¹ Hanford Challenge mailing address: P.O. Box 28989 Seattle, WA 98118.

Worker health and safety is a cornerstone of Hanford Challenge's work and mission. Although we appreciate that the U.S. DOE is taking steps to address acetonitrile through treatment at the Effluent Treatment Facility, we believe more steps should be taken to secure worker and environmental health from this hazard. We believe that more work should be done to figure out how to destroy the acetonitrile, instead of the current plan to concentrate it, send it to an offsite waste treatment facility such as Perma-Fix Northwest (PFNW) where it would be grouted, and dispose of it at the Integrated Disposal Facility on the Hanford site.

As we understand it, acetonitrile or methyl cyanide, is created when cyanide in the liquid tank waste is heated in the Low Activity Waste (LAW) melter and mixed with the sugars in the molten glass formula. The glass making process produces an off-gas that includes the newly formed acetonitrile which condenses into a liquid and is sent to the Effluent Management Facility (EMF) for treatment. The liquid waste stream that comes out of the Effluent Management Facility is then sent to the Liquid Effluent Retention Facility (LERF) basins for storage and then to the Effluent Treatment Facility (ETF) where the liquid waste is treated to remove various chemical contaminants, including acetonitrile.

Specifically, Hanford Challenge and Columbia Riverkeeper are concerned that potentially hazardous working conditions at the waste treatment facility were overlooked by the contractor and the regulators. Secondly, we are concerned that the treatment plan calls for sending ETF waste over to Perma-Fix Northwest to be grouted, when that waste form will apparently contain very high levels of acetonitrile. Third, we are concerned about the disposal path for this highly-contaminated waste.

In the public meeting on May 10, 2022 the Integrated Disposal Facility was named as the onsite disposal site. We are concerned with the explosive/flammable nature of acetonitrile and believe the threat of an underground fire from disposal of this waste at IDF should be addressed. It seems prudent, in light of its explosive/flammable nature and inhalation danger in its vapor state to workers, that DOE and Ecology fully consider treatment technologies that oxidatively or catalytically destroy the acetonitrile in situ, instead of concentrating it as acetonitrile distillate.

Summary of Hanford Challenge's and Columbia Riverkeeper's questions and comments:

- **How will DOE Ensure Workers are Protected from Acetonitrile?:** The DOE surveillance report, "Surveillance of the Washington River Protection Solutions LLC Process Hazard Analysis for Effluent Treatment Facility Acetonitrile Treatment Project, DOE-ASMT-2021-3251, August 27, 2021", highlighted the need for a solution to potential worker exposures to acetonitrile. We appreciate that this surveillance took place and that efforts were made to investigate this worker health and safety hazard after it was identified that it had not been properly evaluated. However, Hanford Challenge and Columbia Riverkeeper believe this surveillance should have had findings and not "opportunities for improvement," because of the omission of significant vapor hazards from acetonitrile that rendered the

hazards analysis inadequate to support design. The Permit Modification for ETF should take these opportunities for improvement to heart and ensure that workers are protected.

- **Why Not Destroy the Acetonitrile?:** It is unclear to Hanford Challenge and Columbia Riverkeeper why the steam stripper project was selected instead of a treatment technology that oxidatively or catalytically destroys the acetonitrile. We would like this explained and reconsidered, especially the rationale to concentrate the waste for grouting at Perma-Fix Northwest when acetonitrile is so dangerous in concentrations far smaller than the 23,000 ppm acetonitrile distillate concentration proposed here for grouting.

As a separate note, the surveillance was limited to hazards analysis procedure and did not extend itself into the design process scope. How was this process selected? Why was it selected - how does it match up with the design-safety hierarchy to first have solutions that are designed for safety?

- **Do Not Dispose of Acetonitrile at the Integrated Disposal Facility:** We have the understanding that there will be a separate permit modification related to disposal of acetonitrile, however, we would like to state now, that we have major concerns with disposing of a concentrated grouted acetonitrile waste form at IDF, due to its explosive and flammable nature. It does not seem worth the risk of starting an underground fire in this landfill, when there are technologies that could destroy the acetonitrile.

Could you please explain how the steam stripper process was selected when there is no disposal pathway for the concentrated acetonitrile? How could that happen if DOE needs to get a DOE Order 435.1 exemption before sending off-site? What alternatives are being considered for disposal? Where is the preferred onsite treatment?

- **What is the Treatment Plan for Acetonitrile?:** The May 10, 2022 public meeting indicated that there was no selected offsite treatment facility, however, other documents indicate that Perma-Fix Northwest is the assumed treatment facility. Could you please explain where you imagine the acetonitrile distillate being treated and how long it would sit in storage while awaiting treatment? Just to note, Hanford Challenge and Columbia Riverkeeper do not believe the acetonitrile distillate should be sent to PFNW for treatment. It poses too great a threat to workers, the public, and the environment.
- **Better Worker Protections Are Needed:** Please explain what is being done to protect workers from the contents of the process and tanks? Are there design changes planned for the ETF ventilation system? The explanation at the May 10, 2022 public meeting that the system design will prevent acetonitrile vapors from escaping is grossly inadequate. We believe real-time monitoring is necessary to detect dangerous working conditions (i.e. not modeling) and that workers should be required to wear respirators if they are in a work area where there is the potential to be exposed to acetonitrile vapors.

Not only should workers have access to respirators, but these respirators should be in good working order and maintained properly. The "improper use of respirators is dangerous. Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134)." It is important that rigorous protocols are in place to ensure that all PPE is clean and in good working order, including any respiratory protection equipment. There have been [worker exposures at ETF](#) in the recent past that add weight to the recommendations below for respiratory protection (2018).

Additionally, the [NJ Right to Know Hazardous Substance Fact Sheet](#) recommends: "Where the potential exists for exposure over 13 ppm, use a NIOSH approved full facepiece respirator with an organic vapor cartridge. Increased protection is obtained from full facepiece powered-air purifying respirators." "Where the potential exists for exposure over 200 ppm, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode."

[NIOSH Recommends the Following Respirator Protocol:](#)

"Respirator Recommendations NIOSH

Up to 200 ppm:

- (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)
- (APF = 10) Any supplied-air respirator

Up to 500 ppm:

- (APF = 25) Any supplied-air respirator operated in a continuous-flow mode
- (APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)
- (APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
- (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
- (APF = 50) Any self-contained breathing apparatus with a full facepiece
- (APF = 50) Any supplied-air respirator with a full facepiece"²

- **Acetonitrile Should Not Be Shipped to Perma-Fix Northwest for Treatment:** Perma-Fix NW appears in documents related to the ETF Steam Stripper projects as one of the potential treatment locations for treatment of acetonitrile distillate. Perma-Fix NW has

² Centers for Disease Control and Prevention, The National Institute for Occupational Safety and Health, *Acetonitrile*, 2019, <https://www.cdc.gov/niosh/npg/npgd0006.html>

off-gas stacks and groundwater within the Richland city limits, where residential communities are potentially impacted from releases. Perma-Fix NW is not a facility that should be under consideration for treating acetonitrile distillate.

Perma-Fix Northwest is a commercial Low-Level Waste (LLW) and Mixed Low-Level Radioactive Waste (MLLW) treatment and storage facility approved, permitted or licensed for operation by the Environmental Protection Agency (EPA) Region 10, the Washington State Department of Ecology, and the Washington State Department of Health under their respective authorities. Perma-Fix Northwest is located on 35 acres in an urban area in the City of Richland and near the Department of Energy's (DOE) Hanford Nuclear Site. According to the EPA, in 2010 over 32,000 people lived within 5 miles of Perma-Fix Northwest. Richland residents are at risk from the radioactive and hazardous materials transported over public roads between Hanford and Perma-Fix Northwest.

According to the State of Washington and federal regulators, Perma-Fix Northwest in Richland improperly stored radioactive and other hazardous wastes, handled wastes resulting in leakage of plutonium and significant workplace contamination, failed to notify regulators of known violations, and exposed several employees to radiation. Perma-Fix Northwest was also fined a total of \$551,891 from 2008 to 2019 by the U.S. Environmental Protection Agency and the Washington Department of Ecology for hazardous waste violations.

Hanford Challenge's November 2020 investigation, [Risky Business at Perma-Fix Northwest](#)³, uncovered a disturbing history of accidents, violations, findings, and non-compliances that raise serious questions about whether Perma-Fix NW should be allowed to continue treating dangerous Hanford waste. If acetonitrile is shipped to Perma-Fix NW, then comprehensive worker protection measures including thorough worker trainings, adequate PPE, robust safety systems, and full protection from chemical vapors must be implemented.

- **Acetonitrile Emissions Concerns:** Hanford Challenge and Columbia Riverkeeper echo concerns voiced by the WA State Department of Ecology in its response to USDOE: *RCR for DOE/ORP-2021-05, Rev. 0 Direct-Feed Low-Activity Waste Secondary Liquid And Solid Waste Work Plan*, including the following specific comments related to emissions:

Comment 16. General: "Solidification of the Waste "as is" at Perma-fix Northwest: Is the treatment system at PFNW sufficient to collect and "control" the HAP

³ Hanford Challenge, [Risky Business at Perma-Fix Northwest](https://static1.squarespace.com/static/568adf4125981deb769d96b2/t/5fce533274a40730fbc928bf/1607357241336/2020+12.04+PermaFix+Report+updated.pdf), Nov 2020, available at <https://static1.squarespace.com/static/568adf4125981deb769d96b2/t/5fce533274a40730fbc928bf/1607357241336/2020+12.04+PermaFix+Report+updated.pdf>.

emissions during solidification? If so, what do they do with the collected emissions?

Comment 17. General: "Based on the information provided, it appears that majority of the Acetonitrile would end up going to the atmosphere. Stripping the Acetonitrile out of the waste only to let it evaporate here and there seems to defeat the purpose of capturing it at ETF. What is the ultimate fate of the Acetonitrile and how much, i.e., what percentage, will be permanently destroyed? How much will be permanently sequestered?"

- **Offsite Impacts:** Where will offsite environmental impacts be evaluated for acetonitrile treatment? There is an incomplete analysis of the plan to concentrate acetonitrile distillate and grout it offsite, without information, such as groundwater impacts, worker health and safety threats, and transportation risks resulting from treating waste at Perma-Fix Northwest in Richland or another offsite treatment facility.

Acetonitrile Background, Dangers, and Unresolved Issues

We became aware of many of the acetonitrile issues through a DOE surveillance report entitled: "Surveillance of the Washington River Protection Solutions LLC Process Hazard Analysis for Effluent Treatment Facility Acetonitrile Treatment Project, DOE-ASMT-2021-3251, August 27, 2021." We are incorporating the entire report into our comments.

We have compiled the following background/information about acetonitrile or methyl cyanide concentrations in the table below for ease of reference. This table also highlights the high levels expected to be present as the acetonitrile is concentrated per the current plan:

"Cyanomethane, Ethyl nitrile, Methyl cyanide [Note: Forms cyanide in the body.]⁴"

Concentration Information	Level in Parts Per Million	Source	Note
Immediately Dangerous to Life and Health (IDLH)	137 ppm	CDC NIOSH Pocket Guide to Chemical Hazards ⁵	
OSHA Legal Airborne Permissible Exposure Limit (PEL)	40 ppm	OSHA	Averaged over an 8-hour work shift
NIOSH recommended airborne exposure limit (REL)	20 ppm	NIOSH	Averaged over a 10-hour work shift

⁴ Centers for Disease Control and Prevention, The National Institute for Occupational Safety and Health, *Acetonitrile*, 2019, <https://www.cdc.gov/niosh/npg/npgd0006.html>

⁵ Ibid.

First responders use supplied air if acetonitrile concentrations are:	>13 ppm	NJ Right to Know Hazardous Substance Fact Sheet ⁶	
WTP off-gas system for the LAW melter	60 ppm	May 10, 2022 Public Meeting on Permit Mod	
Highest estimated concentration after it goes through the Effluent Treatment Facility	2.3 weight percent or 23,000 ppm	May 10, 2022 Public Meeting on Permit Mod	
"The mass and energy balance calculation performed in the RPP-CALC-63989, "ETF Steam Stripper Process Vent LFL Calculation," report	"acetonitrile concentration could reach up to 463,343 ppm in the concentrator condensate tank vent, which is connected to the vessel offgas system and normally under negative pressure with respect to atmosphere, and could reach 49,910 ppm (H-2- 839048 SHI) in the vapor leaving the concentrator column, which is estimated to be at 12 inches water gauge positive pressure with respect to the surrounding equipment room in which it was installed."		
Universal treatment standard for acetonitrile (methyl cyanide) for wastewater	5.6 mg/L or 5.6 ppm	Per 40 CFR 268.48 ⁷	1 mg/L = 1 parts per million (ppm) for dilute aqueous solutions. NOTE that the concentration in the

⁶ New Jersey Department of Health, *Right to Know: Hazardous Substance Fact Sheet*, 2016, <https://www.nj.gov/health/eoh/rtkweb/documents/fs/0008.pdf>

⁷ National Archives and Records Administration, 40 CFR 268.48, *Universal Treatment Standards*, <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-268/subpart-D/section-268.48>

			acetonitrile distillate that is planned to go to PFNW or another offsite waste treatment facility for grouting is 22,694 ppm (mg/L)
Universal treatment standard for acetonitrile (methyl cyanide) for non-wastewater	38 mg/kg or 38 ppm	Per 40 CFR 268.48 ⁸	1 mg/kg = 1 parts per million (ppm) for dilute aqueous solutions. NOTE that the concentration in the acetonitrile distillate that is planned to go to PFNW or another offsite waste treatment facility for grouting is 22,694 ppm (mg/L)

We are sharing the following information we have gathered about acetonitrile hazards and worker protection as a reference point:

- Acetonitrile is flammable with a narrow flammability range similar to ammonia. It is also often explosive. This is likely due to its reaction with oxygen. It must be stored under inert gas.
- Ignition sources must be kept away from acetonitrile. Meaning that the rooms where it is stored or handled will have to meet the electrical code requirements for preventing any possible interaction with ignition sources.
- Acetonitrile is shock sensitive. Therefore, agitation or shock contact must be prevented.
- The amount of acetonitrile stored or used in any area must be strictly limited. Those areas must be carefully designed to prevent extensive damage in the event of a detonation, to prevent the spread to more areas, to protect personal from exposure, and to provide alarms, emergency egress, and emergency ventilation with destruction of the off-gas vapors.
- "Acetonitrile can affect you when inhaled and by passing through the skin.
- Acetonitrile may cause reproductive damage. **HANDLE WITH EXTREME CAUTION.**
- Contact with acetonitrile can irritate the skin and eyes.
- Inhaling acetonitrile can irritate the nose, throat, and lungs.
- Exposure can cause cyanide poisoning. Symptoms include flushing of the face, chest tightness, headache, nausea and vomiting, weakness and shortness of breath, and may lead to death.
- Repeated exposure to acetonitrile may affect the liver, kidneys, nervous system, and thyroid gland.

⁸ Ibid.

- Acetonitrile is a FLAMMABLE LIQUID and a DANGEROUS FIRE HAZARD."⁹

Prior to working with Acetonitrile workers should be trained on its proper handling and storage including:

- "Acetonitrile reacts violently with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE, and FLOURINE.
- Acetonitrile is not compatible with STRONG ACIDS (such as HYDROCHLORIC, SULFURIC, and NITRIC); STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE); REDUCING AGENTS (such as LITHIUM, SODIUM, ALUMINUM and their HYDRIDES); ALKALI METALS (such as POTASSIUM); NITRATING AGENTS; IRON SALTS of PERCHLORATE; NITROGEN-FLOURINE COMPOUNDS;¹ CHLOROSULFONIC ACID; INDIUM; PERFLOUROUREA; and SULFUR and NITROGEN TRIOXIDES.
- May react with WATER, MOISTURE, and STEAM to form toxic and flammable vapors.
- Store in tightly closed containers in a cool, well-ventilated area.
- Sources of ignition, such as smoking and open flames, are prohibited where Acetonitrile is used, handled, or stored.
- Metal containers involving the transfer of Acetonitrile should be grounded and bonded.
- Use only non-sparking tools and equipment, especially when opening and closing containers of Acetonitrile."¹⁰

Additional Concerns Related to Acetonitrile Issues in the DOE Surveillance Report

The surveillance report was conducted by a DOE team to analyze problems identified during a review of WRPS's plans to start up the Effluent Treatment Facility (ETF), which will be handling liquid waste coming out of the vit plant and from other sources, including tanks. [Here is the [Ecology Fact Sheet on ETF, 2021](#)]

DOE states in its report, "After another year of [extensive equipment upgrades](#), EM Office of River Protection (ORP) tank operations contractor Washington River Protection Solutions (WRPS) is conducting its fiscal 2022 processing campaign at the [Hanford Site](#)'s Effluent Treatment Facility (ETF) with a goal to process approximately 1 million gallons of wastewater over the next few months. The facility removes radioactive and hazardous contaminants from wastewater generated by tank waste activities, groundwater projects, solid waste disposal facilities and other Hanford cleanup activities."

⁹ New Jersey Department of Health, *Right to Know: Hazardous Substance Fact Sheet*, 2016, <https://www.nj.gov/health/eoh/rtkweb/documents/fs/0008.pdf>

¹⁰ New Jersey Department of Health, *Right to Know: Hazardous Substance Fact Sheet*, 2016, <https://www.nj.gov/health/eoh/rtkweb/documents/fs/0008.pdf>

The [ETF](#) is being upgraded to support the Direct-Feed Low-Activity Waste ([DFLAW](#)) Program for treating tank waste by immobilizing it in a glass form. When fully operational, Hanford's [Waste Treatment and Immobilization Plant](#) will be the primary generator of liquid waste to be treated by the ETF.

This document raised numerous issues with WRPS for failing to appropriately identify and/or guard against the toxic vapor concerns associated with the Acetonitrile Treatment Project. Acetonitrile is a very toxic compound of cyanide and is dangerous in tiny doses. The ETF Steam Stripper Project was initiated to remove acetonitrile from the Waste Treatment and Immobilization Plant effluent to be processed at ETF during direct-feed low-activity waste. The acetonitrile must be removed to meet RCRA requirements.

Acetonitrile is also known as Methyl Cyanide. According to the MSDS, "Potential Acute Health Effects: Severe overexposure can result in death. Potential Chronic Health Effects include: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. The substance is toxic to blood, kidneys, lungs, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS). The substance may be toxic to the reproductive system. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs." **The recommended airborne exposure limit (REL) is 20 ppm. The Immediately Dangerous to Life and Health (IDLH) level is 137 ppm.**

By contrast, the DOE Surveillance indicates that concentrations "could reach up to 463,343 ppm in the concentrator condensate tank vent, which is connected to the vessel offgas system..." (emphasis added).

The document continued, "The assessment was initiated due to lack of consideration of the acetonitrile toxicological hazards in the original HAZOP, which led to a request from the Tank Farm Programs Division (TPD) manager to review the process to ensure compliance with workers safety and health laws, standards, and practices." (emphasis added).

The DOE Surveillance listed key "Opportunities for Improvement":

"OPPORTUNITY FOR IMPROVEMENT 0-01: Recommended modification of WRPS procedure TFC-ENGDESIGN-C-47 to require conducting a process HAZOP where significant workplace chemical hazards may exist regardless of the facility's radiological inventory or funding source. The application of the process HAZOP methodology for significant chemical hazards addressed the requirements of 29 CFR 1910 and 10 CFR 851 (cited above) and was viewed as a technical rigor improvement that would enhance the overall worker safety posture and ensure compliance with these codes, which did not differentiate between facilities based upon radiological inventory or funding source."

"OPPORTUNITY FOR IMPROVEMENT 0-02: The assessors could not confirm that all open items from the original HAZOP were tracked to closure. Because TFC-ENG-DESIGN-C-47 was not required for less than hazard category 3 facilities, this was sited as an opportunity for improvement (OFI), not an adverse condition. Recommended strengthening the procedure to emphasize comprehensive recording and tracking of all open items is a requirement."

"The mass and energy balance calculation performed in the RPP-CALC-63989, "ETF Steam Stripper Process Vent LFL Calculation," report indicated that the acetonitrile concentration could reach up to 463,343 ppm in the concentrator condensate tank vent, which is connected to the vessel offgas system and normally under negative pressure with respect to atmosphere, and could reach 49,910 ppm (H-2- 839048 SHI) in the vapor leaving the concentrator column, which is estimated to be at 12 inches water gauge positive pressure with respect to the surrounding equipment room in which it was installed." (p. 4-5 of 12, DOE Surveillance)

"WRPS designers stated they performed modelling to observe the effects of a hypothetical spill from the condensate tank but did not perform any modeling or calculations to determine the effect of a vapor leak. Despite having multiple columns and flanged piping connections with very high concentrations of acetonitrile in vapor phase, the WRPS Industrial Hygiene (IH) team only modelled acetonitrile spills in liquid phase. During the June 7 interview with WRPS IH, it was determined that WRPS IH was unaware of the presence of a vapor-phase contaminant and was not consulted or made aware of this aspect of WRPS engineers originally stated that acetonitrile in the vapor phase would essentially be at atmospheric pressure, and thus there will be no large motive force that would cause a significant acetonitrile leakage from the flanges/fittings to enter the room." (emphasis added).

"OPPORTUNITY FOR IMPROVEMENT 0-03: WRPS did not evaluate or assess whether the concentration of acetonitrile in the worker breathing space, due to leakage from the pressurized portions of the system of vapor phase acetonitrile, would be below the 29 CFR 1910 limits."

"OPPORTUNITY FOR IMPROVEMENT 0-04: Recommended modification of WRPS Design Process and I PrHA procedures to specify IH participation at each stage of the design review process, and during HAZOP, such that they would be informed of all aspects of design, and consulted regarding potential associated industrial hygiene hazards."

"In general, the design team and the HAZOP process appeared to have focused primarily on hazards associated with condensed acetonitrile liquid and had not considered the toxicological hazard to workers associated with the high concentration of acetonitrile in vapor phase."

We are curious about why was this hazard not identified long ago in the decades of interface control documents (ICDs) revisions and treatability studies being done for ETF/WTP?

Additional Concerns Relating to RCRA and Treatment Alternatives:

DOE told Ecology in the secondary waste plan in December that the concentrated acetonitrile distillate (produced in the steam stripper) would meet disposal criteria as generated, and it only needs solidification at PFNW. Is this information correct? The concentration as identified in the surveillance documents far exceed the treatment standards:

Acetonitrile Data

Concentrator Condensate Tank (Stream 302)

Acetonitrile 4.2309 lb/hr

Total Stream lb/hr 184.2393

PPM = 22,964 ppm Acetonitrile (2.3 wt%) (emphasis added).

- Source: RPP-RPT-63989, "Effluent Treatment Facility (ETF) Steam Stripper Process Vent Lower Flammability Limit (LFL) Calculation Report," February 2021

"The acetonitrile would need to be removed in order to ensure the ETF grouted brine waste stream would meet the Resource Conservation and Recovery Act's Land Disposal Restrictions for organic compounds." [Establishes delisting for the brine, but not the acetonitrile distillate.]

- Source: DOE Surveillance of the Washington River Protection Solutions LLC Process Hazard Analysis for Effluent Treatment Facility Acetonitrile Treatment Project, DOE-ASM T-2021-3251, August 27, 2021.

"The Concentrator Column is a packed bed with condensed Stripper Column vapor entering the top of the packing, and steam entering the bottom. Liquid at the bottom of the column is recycled to Stripper Column feed. Vapor leaving the top of the column, containing most of the organics fed to the Steam Stripper System, is condensed prior to transfer to a Distillate Storage Tank where it is stored awaiting disposal."

- Source: RPP-RPT-62702, Rev 0. "Effluent Treatment Facility (ETF) Steam Stripper Hazard and Operability Study (HAZOP) Report," November 2020.

"Distillate from steam stripping, containing essentially all acetonitrile present, will be accumulated in a Distillate Storage Tank prior to disposal. Several disposal options are currently under investigation."

- Source: RPP-RPT-62821, Rev B, February 2021, "Effluent Treatment Facility (ETF) Acetonitrile Steam Stripper Hazardous Area Classification."

"The treatment and disposal pathway for the concentrated acetonitrile distillate secondary waste stream will be part of another permit modification and the public will have the chance to review it. Ecology will ensure the concentrated acetonitrile waste stream is treated, stored and disposed of at an approved facility and in full compliance with dangerous waste regulations and applicable permits in a manner fully protective of human health and the environment."

- Source: "Response to Comments Effluent Treatment Facility Supplemental Organic Treatment permit modification," Publication 21-05-025, Department of Ecology, August 22, 2021.

"3.4.3 Acetonitrile Distillate - The new waste stream to be generated from the ETF primary treatment train is the acetonitrile distillate. This waste stream will be generated from operating the new supplemental organic treatment capability from the steam stripper system.

The WTP DFLAW effluent source is the only waste stream currently anticipated to be treated by the steam stripper system. When the new steam stripper system is operating, the acetonitrile distillate will be generated. The waste stream will meet treatment standards as generated. The waste stream will be shipped offsite to PFNW to perform solidification treatment to meet the IDF waste acceptance criteria." (emphasis added).

- Source: DOE/ORP-2021-05, Rev 0, "DIRECT-FEED LOW-ACTIVITY WASTE SECONDARY LIQUID AND SOLID WASTE WORK PLAN," December 16, 2021.

The universal treatment standard for acetonitrile (methyl cyanide) is 5.6 mg/L (5.6 ppm) for wastewater, and 38 mg/kg (38 ppm) for non-wastewater. Per 40 CFR 268.48.

The concentration of acetonitrile in the distillate is 22,694 ppm (mg/L). Therefore, it appears that this stream cannot meet standards to be grouted upon treatment with the steam stripper. This is newly generated dangerous waste, created in WTP vitrification. Grouting may not be acceptable. Use of PFNW is not approved per DOE Order 435.1 exemption, nor has DOE justified this in the face of the preferred approach to treat waste onsite. In addition, the DOE surveillance document (DOE-ASM-T-2021-3251) shows that vapor hazards were ignored when selecting the steam stripping process.

We appreciate the opportunity to weigh in on treatment plans for the acetonitrile waste stream. Thank you for considering our comments.

Sincerely,



Nikolas Peterson, Executive Director, Hanford Challenge



Dan Serres, Conservation Director, Columbia Riverkeeper