

March 8, 2020

Washington State Department of Ecology
Attn: Daina McFadden
3100 Port of Benton Blvd
Richland, WA 99354

RECEIVED

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Department of Ecology
DWF - Richland

U.S. Environmental Protection Agency
Attn: Dave Bartus
1200 Sixth Avenue, Suite 155
Seattle, WA 98101

Washington State Department of Health
Attn: John Martell
309 Bradley Blvd., Suite 201
Richland, WA 99352

Dear Ms. McFadden, Mr. Bartus, and Mr. Martell:

Following are comments in response to the Class 2 Notice for a proposed permit modification to the Perma-Fix Northwest, Richland, Inc. Dangerous Waste Permit and TCSA Approval No. WAR 0000 10355. This is for the comment period from January 24, 2020 to March 24, 2020. This modification was described as clarifications and updates to operational requirements of the In-Container Mixer Unit at the Perma-Fix Northwest mixed waste facility.

In working with other commercial vendors for mixed and radioactive waste management, DOE, by agreement with the State of Texas, was required to indemnify a vendor in the event of bankruptcy. DOE agreed to take over possession and operation of the Waste Control Specialists "federal" commercial site. Texas would not agree to approving the Waste Control Specialists permit without DOE's participation and partnership with a sole-source vendor. Please see DOE Public Meeting Minutes¹ from the Environmental Management Site Specific Advisory Board, page 16. No such agreement exists for DOE to acquire or manage future liability risks from the Perma-Fix Site, which has an active, radioactive stack, close to homes, businesses, and a day care facility.

1. If this is legal, I would appreciate if the Department of Ecology would require DOE to similarly indemnify and take responsibility for the Perma-Fix Northwest Facility and its past and potential future environmental releases, due to the DOE-sourced risks. I believe the "equal protection" clause applies here. Actually I would prefer DOE to remove DOE's waste treatment operations from Perma-Fix in Richland to the 200 Areas, where

¹ See ENVIRONMENTAL MANAGEMENT SITE-SPECIFIC ADVISORY BOARD to the U.S. DEPARTMENT OF ENERGY PUBLIC MEETING MINUTES, located at:
<https://www.energy.gov/sites/prod/files/2014/02/f7/SSAB%20Meeting%20Summary%20for%20November%202013.pdf>.

there is less risk of releases affecting the public and the groundwater. If that can't occur, DOE should be made financially responsible for Perma-Fix's performance.

It is much more difficult to find information related to the performance and risks of the Perma-Fix facility versus the records publicly available for the DOE Hanford Site and other DOE sites, yet the DOE sites (e.g. Hanford, Idaho, Oak Ridge) provide the majority of waste treated. The Perma-Fix location is far closer to the homes of the public than are the Hanford areas, so the information is of compelling interest.

To start, I looked at the Hanford Site Environmental Report for Calendar Year 2016 (DOE-RL-2017-24²). This report states that the single greatest contributor to off-site doses from Hanford facilities is ingestion of food containing *tritium* (elemental or tritiated water) from the 300 area.

DOE-RL-2017-24 further states that "The Perma-Fix Northwest Richland (PFNW) facility is a commercial TSD located on 35 ac (14 ha) "*adjacent*" to the DOE Hanford Site." In addition, DOE reports that Hanford Site Environmental Reports prior to 2011 routinely evaluated dose contributions from Perma-Fix, but DOE does so no longer³. As a result, residents have to make a considerable hunt for data that affects them, and DOE wastes shipped to Perma-Fix are not accounted for.

2. I would appreciate if you will include Perma-Fix results once again in the Hanford Environmental Reports, and make the detailed sections of the Perma-Fix Permits and Emissions Units licenses accessible on line so that we have equivalent transparency. Perma-Fix assists DOE in meeting TPA milestones, so there should be a basis for doing so.

Take a look just at tritium (as an example; I did not review all isotopes). For 2016, all of Hanford released 24 curies of elemental tritium. Per DOE/RL-2017-24⁴, **240** curies of tritiated water vapor were released from the 300 areas, and none from the 200E area. [In the 200E area, one might expect the 242-A evaporator to discharge tritium, except that 242-A evaporator is equipped with a condenser that captures tritiated water and sends it to the SALDS.] Perma-Fix has an evaporator, thermal incinerators (bulk processing units), and vitrification via a "Geomelt" mixed waste melter, but as far as I can tell, no condenser.

The non-published Perma-Fix Environmental Monitoring Report for 2018 shows **12.3** curies of tritium released that year. Despite this, the report states that sampling at the Mixed Waste Thermal Stack (Mixed Waste Thermal Processing via Geomelt vitrification) was to be *discontinued* for tritium in 2019, with no apparent change in the waste acceptance criteria. Perma-Fix received **43.5** curies of tritium, so the release fraction was considerable (28%). Data are in the air emissions tables and Appendix A tables of the PFNW Environmental Monitoring Reports.

²[https://www.emcbc.doe.gov/SEB/CPCC/Documents/Document%20Library/Other/Hanford%20Site%20Environmental%20Report%20for%20Calendar%20Year%202016%20-%20\(DOE-RL-2017-24,%20Rev.%200\).pdf](https://www.emcbc.doe.gov/SEB/CPCC/Documents/Document%20Library/Other/Hanford%20Site%20Environmental%20Report%20for%20Calendar%20Year%202016%20-%20(DOE-RL-2017-24,%20Rev.%200).pdf)

³ DOE/RL-2017-24, *Hanford Site Environmental Report for Calendar Year 2016*, Rev 0, Section 4.2.3, (page 4-23).

⁴ DOE/RL-2017-24, *Hanford Site Environmental Report for Calendar Year 2016*, Rev 0, Table D-16 (page D-9).

In 2017, Perma-Fix released **432** curies of tritium (based on stack monitoring), with processing reported only **463** curies (93% released). This was a greater release than from all of the 300 Area in 2016.

In 2016, Perma-Fix released **0.316** Ci of tritium based on processing 30.8 Ci.

In 2015, Perma-Fix released **172** curies of tritium based on processing 103 Ci. This was greater than 100% release.

In 2014, Perma-Fix released **126** curies of tritium based on processing 18 Ci. Also greater than 100% release.

In 2013, Perma-Fix released **58.1** curies of tritium based on processing 106 Ci.

Sometimes, as in 2014 and 2015, and *more tritium was released than received/processed*. And this is despite statements that the manifest-based processing amounts received were called out as being conservatively large (by a factor of 2 to 10), while the release data were from sample measurements.

3. I would appreciate if the tritium monitoring discontinued in 2019 could be revisited in light of the quality assurance questions for the data, and because the amounts released by Perma-Fix can exceed what is released elsewhere at Hanford.

In order to understand the context of Perma-Fix operations, the public has to sort through three permits: RCRA/TSCA Dangerous Waste, LLW Radioactive Air Permit, and Mixed Waste Air Permit. And in addition, the Department of Health has issued 7 specific emissions unit licenses that are referenced by the Air Permits.

4. I would appreciate if there could be an integrated flow sheet and reporting for the entire process and facilities (All LLW and MW and TRU). The air permit environmental reports do not report the total tons of waste processed (limited by the RCRA permit), and it is hard to determine if the possession limits for radionuclides in each of the emissions unit licenses is met. The tritium limit certainly seems to have been exceeded.

The DOH air permits allow Perma-Fix to possess only 380 curies at a time of any isotope, with specific conditions establishing annual possession quantities (See RAEL-012, NOC 1335) limiting tritium to **27** curies per year. Or **50** Ci/year for LLW (per RAEL-012). Or 50 Ci/yr for MW per AIR-01-902, NOC ID 459. Other isotopes have similar individual limits.

5. I would appreciate if the environmental monitoring report could compare the amount processed/possessed during the year against the individual emission unit possession limits, since these seem to have been exceeded for tritium, carbon-14, and TRU isotopes.
6. Further, the emissions results in the annual monitoring reports include negative numbers for emissions of Cesium-137 and Cobalt -60. This is numerically impossible (negative

mass), and very improbable, given that DOH investigates hot spots for Cs-137 outside the building. Increasing soil concentrations of alpha contamination outside the building have also been observed. Perm-Fix changed labs in 2017 due to low results – what were the QA requirements for the lab?

7. The performance record for Perma-Fix Northwest includes a fire associated with the Geomelt Vitrification System in 2019, and a release to the outdoors from a leaking PFP glove box. The public should be made aware when these events occur so they have the option to avoid driving in the area. Drainage from the exterior to the Richland storm water system does not seem to be discussed anywhere, yet fire hoses were used outside on the formerly ignited mixed waste glass.

The Department of Health issued a Mixed Waste Demonstration Permit for Geomelt that was stated to address contaminated sodium. See License AIR 18-906. This GeoMelt emission unit's license was to support the installation and *temporary* operation of the GeoMelt system to develop techniques for processing sodium bearing waste. Perma-Fix and GeoMelt advertised that this demonstration was for Fermi Sodium drums from Idaho. The Tank Closure and Waste Management EIS⁵ shows that the Fermi drums are contaminated with Na-22, Tritium, and Cs-137. Yet the DOH license for the demonstration allows annual possession of 30.8 Ci of Am-241, 278 Ci of Pu-241, and 38.8 Ci of Pu-239.

8. What is the justification for a “demonstration” with such high annual limits of TRU isotopes that should not be present? What were the Dangerous Waste limitations on the amounts of reactive sodium to be treated?

Perma-Fix noted in 2017 that one generator had shipped more activity than was listed on the waste manifest (a fraudulent or mismanaged manifest). This was caught, not by quality control, but by having emissions results that were greater than the quantity received. This was too late to prevent public exposure. Ecology should be concerned about this because there could be other manifests that undercount the amounts of hazardous constituents as well. No extent of condition review was conducted against other manifests or for dangerous waste quantities.

9. Was the inaccurate manifest generator a DOE contractor? The public should know. How does Perma-Fix verify the quantities on each manifest including those from other generators? How does Perma-Fix ensure that the received material is processed in the correct facility so that there are no unintended releases?

Ecology, EPA, and the Department of Health can better serve residents by assessing integrated chemical and radioactive risks, making information more accessible, and by requiring DOE to establish financial responsibility – before approving any modifications to this permit.

Enclosed is a table with some of the data for Environmental Monitoring Reports.

⁵Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Page E-207.

Isotope	2013 Ci	2013 Ci	2014 Ci	2014 Ci	2015 Ci	2015 Ci	2016 Ci	2016 Ci
Perma-Fix Northwest Monitoring Data	Processed	Total Release Emissions	Processed	Total Release Emissions	Processed	Total Release Emissions	Processed	Total Release Emissions
H-3	106.00	58.10	62.20	126.00	103.00	172.00	30.80	0.32
C-14	52.20	3.34	12.10	7.75	7.01	13.40	0.18	0.02
Tc-99	3.68		0.48		0.49		0.37	
Am-241	9.70		18.00		25.10		37.90	
Cm-244	1.76E+00		5.44E-02				4.04E-02	
Pu-238	1.99E+00		3.42E+00		5.77		1.26E+01	
Pu-239	1.64E+01		2.89E+01		55.6		68.5	
Pu-240	5.39E+00		8.06E+00		14.9		2.06E+01	
Pu-241	108.00		107.00		228.00		333.00	
Pm-147							3.05E+00	
Eu-152	1.91E+01		3.43E-01		0.292		7.91E-03	
Eu-154	1.40E+01		1.48E-02		0.0743		1.84E-02	
Eu-155	5.70E+00		9.37E-03		0.231		7.28E-01	
Sr-90	7.23E+00		7.87E+00		8.55		8.08E+00	
Cs-137	5.35E+00	-2.23E-11	7.40E+00	3.00E-11	4.80E+00	-1.28E-11	6.73E+00	-2.67E-12
Cs-134	NR		1.51E+00		0.136		3.65E-02	
Co-60	4.83E-01	-9.28E-11	1.60E+00	2.28E-11	3.55E-01	-3.92E-11	1.29E-01	4.60E-11
Ba-133	1.13E+00		2.20E+00					
Na-22								
Gross Alpha	3.52E+01	5.14E-11	5.84E+01	9.50E-11	1.01E+02	1.22E-10	1.40E+02	6.66E-11
Total Curies on Manifest	362.82		266.62		457.35		524.08	

Isotope	2017 Ci	2017 Ci	2018 Ci	2018 Ci	Annual Limit	Annual Limit	Annual Limit
Perma-Fix Northwest Monitoring Data	Processed	Total Release Emissions	Processed	Total Release Emissions	License AIR 13-310 Annual Possession Quantity (Ci) [Low Level Non-Thermal, Mixed Waste Thermal]	License AIR 18-906 GEO MELT Mixed Waste Demo (2018 only)	License AIR 01-902 Mixed Waste Stabilization Building APQ (Ci)
H-3	463.00	432.00	43.50	12.30	50	27	50
C-14	112.00	108.00	0.99	1.31	50	0.000368	100
Tc-99	0.42		0.08		50	0.0271	50
Am-241	63.00		50.40		50	30.8	50
Cm-244					50	0.0246	50
Pu-238	1.08E+01		6.51		50	9.04	50
Pu-239	87		73.6		50	38.8	50
Pu-240	7.70E+01		19.6		50	4.46	50
Pu-241	335.00		249.00		50	278	50
Pm-147			0.0887		50	0.0747	50
Eu-152					50	0.0178	50
Eu-154	1.14E-02		0.0211		50	0.103	50
Eu-155	8.66E-02		12.9		50	0.0104	50
Sr-90	5.50E+00		2.98		100	0.0534	50
Cs-137	4.41E+00	-8.59E-13	4.62E+00	-5.63E-11	100	24.4	100
Cs-134	3.20E-02		0.0142		50	0.395	10
Co-60	7.93E-01	5.05E-11	1.25E+00	8.04E-11	100	0.36	200
Ba-133	3.18E+00		2.28		50	1.8	50
Na-22					50	0.204	5
Gross Alpha	2.38E+02	1.33E-10	1.50E+02	8.29E-11			
Total Curies on Manifest	651.63		474.49				