February 14, 2020

Daina McFadden
Nuclear Waste Program
Washington State Department of Ecology
3100 Port of Benton Blvd
Richland, WA 99354

RE: Comment on permit modification to allow for disposal of mixed low-level waste at the Integrated Disposal Facility.

Dear Ms. McFadden,

On behalf of the undersigned organizations, I hereby submit the following comments on the proposed Class 3 permit modification to the Hanford Facility Dangerous Waste Permit to allow for disposal of mixed low-level waste at the Integrated Disposal Facility (IDF). This modification would support operations and allow for disposal of mixed low-level waste in both disposal cells of the IDF, add receipt of mixed low-level wastes from Hanford Site operations, and allow for the construction of a treatment pad and a storage pad. The comment period is from Dec. 16, 2019 to Feb. 14, 2020.

Commenters

Hanford Challenge is a non-profit, public interest, environmental and worker advocacy organization located at 2719 East Madison Street, Suite 304, Seattle, WA 98112. Hanford Challenge is an independent 501(c)(3) membership organization incorporated in the State of Washington and dedicated to creating a future for Hanford 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.

The Natural Resources Defense Counsel (NRDC) is a national non-profit membership environmental organization with offices in Washington, D.C., New York City, San Francisco, Chicago, Los Angeles, and Beijing. NRDC has a nationwide membership of over one million combined members and activists. NRDC's activities include maintaining and enhancing environmental quality and monitoring federal agency actions to ensure that federal statutes

enacted to protect human health and the environment are fully and properly implemented. Since its inception in 1970, NRDC has sought to improve the environmental, health, and safety conditions at the nuclear facilities operated by the U.S. Department of Energy ("DOE" or "Department") and its predecessor agencies, and we will continue to do so.

Columbia Riverkeeper (CRK) 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 13,000 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.

Summary

During our review of the proposed permit modification, the commenters have concluded that the Washington Department of Ecology (Ecology) should deny the modification until the requirements specified in our comments are met. Our primary goal is a future for the Hanford nuclear site that does not pose an unacceptable risk to human health and the environment. We believe that, in its current iteration, waste slated for disposal at IDF would pose an unacceptable risk and that permit modifications are instead needed to increase long-term protections for humans and the environment.

The Hanford Nuclear Site has 56 million gallons of high-level nuclear waste stored in 177 underground nuclear waste tanks. The tanks are well-beyond their service life, and about a third have failed and leaked. The waste in these tanks is a toxic and radioactive brew consisting of about 146 million curies of radioactivity. The EPA sets limits for exposure to many of these radionuclides in the trillionths of a curie. Many of the radionuclides are extremely long-lived and it is imperative that these wastes are not released into the environment in the short or long-term where living organisms could be impacted.

We support the safe and effective disposal of these long-lived and highly dangerous wastes in deep isolation to prevent contamination from harming human health and safety and the environment into the future. We do not support allowing economic considerations to override human health and safety and environmental risks.

We support plans reflected in the Tri-Party Agreement for vitrifying Hanford's tank waste that involves separating the high-level tank waste into two streams, high-level and low-activity through removal of long-lived radionuclides. We are aware that the majority of the low-activity vitrified waste is slated for disposal at IDF. However, we are concerned that the allowable radionuclide content and concentrations for low-activity waste are changing in ways that increase risks to human and environmental risk.

The Department of Energy (DOE) is working to change the agreed upon requirements for tank waste treatment by redefining what constitutes high-level waste and, in so doing, is paving the

way for more high-level waste to be disposed of on site. Further, DOE has a stated preference for grouting Hanford's supplemental low-activity waste, which would also be disposed of on site at IDF. We have opposed the use of grout as it poses an unacceptable risk to human and environmental health as it is a less effective waste form for immobilizing Hanford's tank waste. Therefore, the permit requirements for IDF are of utmost importance to ensure that the waste disposed there does not pose an unacceptable risk to human health and the environment.

Please consider the following comments included first in summary form and then with more detail in the technical section below:

- Deny this permit modification and disallow burial of high-level waste at IDF.
- Set permit conditions that disallow IDF to be used as a de facto high-level waste disposal site for relabeled high-level waste, which could set a dangerous precedent allowing DOE to abandon most of the tank waste – by volume and concentration – in place at Hanford, citing economic expediency.
- Require DOE to update its Performance Assessment to ensure adequate protection of human health and safety during the longer timespans in which long-lived radionuclides decay.
- Require a fully vetted Hanford Site Composite Analysis prior to issuing the IDF Permit to ensure the evaluation of cumulative risks.
- Require that IDF Leachate Volume, Risk, and Composition be addressed.
- Require the inclusion of an IDF Sampling Strategy or Sampling and Analysis Plan.
- Require an explanation of how Solid Waste Acceptance Criteria has been revised to address shipments of waste to IDF.
- Specify if 200 West Pump and Treat will treat IDF Leachate in the future, and if yes, require documentation of the relative exposures/risks from the alternative flow sheets.
- Require DOE to provide a Comprehensive Risk Evaluation.
- Require IDF Modeling Risk Budget Tool Calculation assumptions to be specified to be in compliance with NQA-1 Quality Assurance requirements.
- Increase permit language specificity to match the Risk Budget Tool.
- Verify accuracy of Waste Treatment Plant (WTP) permit conditions III.10.C.2.m and III.10.C.2.n, including subsections.
- Continue prohibiting disposal or treatment of liquids at IDF.
- Ensure that WTP Effluent Management Facility bottoms are excluded from IDF unless properly analyzed and covered by the National Environmental Policy Act (NEPA).
- Verify IDF Performance Assessment assumptions regarding WTP immobilized low-activity waste (ILAW) container decontamination system.
- Evaluate new/different risks resulting from elimination of the robotic CO_2 decontamination system. Complete process test results before IDF is allowed to operate.
- Require DOE to describe how the risk budget tool will be used and kept up to date.
- Require the creation of an Integrated Flow Sheet.

Technical Comments

Comment Number 1: Deny this Permit Modification and Disallow Burial of High-Level Waste at IDF

IDF will not only be disposing of "mixed low-level waste." A cursory review of documents associated with the IDF project reveals that high-level nuclear waste (i.e., inappropriately renamed as "low-level nuclear waste") will be disposed of in this shallow-land burial method, contrary to the Nuclear Waste Policy Act (NWPA). We recommend the Department of Ecology deny this permit modification and ensure that IDF is reconfigured to disallow the burial of high-level waste.

In DOE's "Risk Budget Tool," DOE states that the IDF is "expected to receive vitrified low-activity tank waste."[1] Somehow, DOE has even renamed vitrified "low-activity waste" as "low-level waste."

Radionuclides to be disposed in IDF

DOE has not released a detailed inventory of radionuclide contents and concentrations that it plans to dispose of in the IDF. However, past descriptions of the overall plan to dispose of Hanford's tank waste include the statement that roughly ten percent of the tank waste radionuclides will be buried in vitrified form at Hanford's IDF.[2] Ten percent of Hanford tank inventory would be from 14 to 15 million curies of radioactivity. The commenters believe this curie content (14-15 million curies) poses an unacceptable risk and therefore permit conditions should specify stricter removal restrictions for long-lived radionuclide concentrations in the waste being treated prior to long-term disposal at IDF. This is especially true insofar as the DOE has yet to specify how much nuclear waste will end up in shallow land burial at Hanford, therefore preventing any kind of cumulative impact assessment of Hanford's disposal plan.

[1] RPP-CALC-63176, Rev. 0. Integrated Disposal Facility Risk Budget Tool Analysis (June 25, 2019), p. 15.

[2] National Academy of Sciences, Review of the Final Draft Analysis of Supplemental Treatment Approaches of Low-Activity Waste at the Hanford Nuclear Reservation: Review #3 (2019), p. vii.

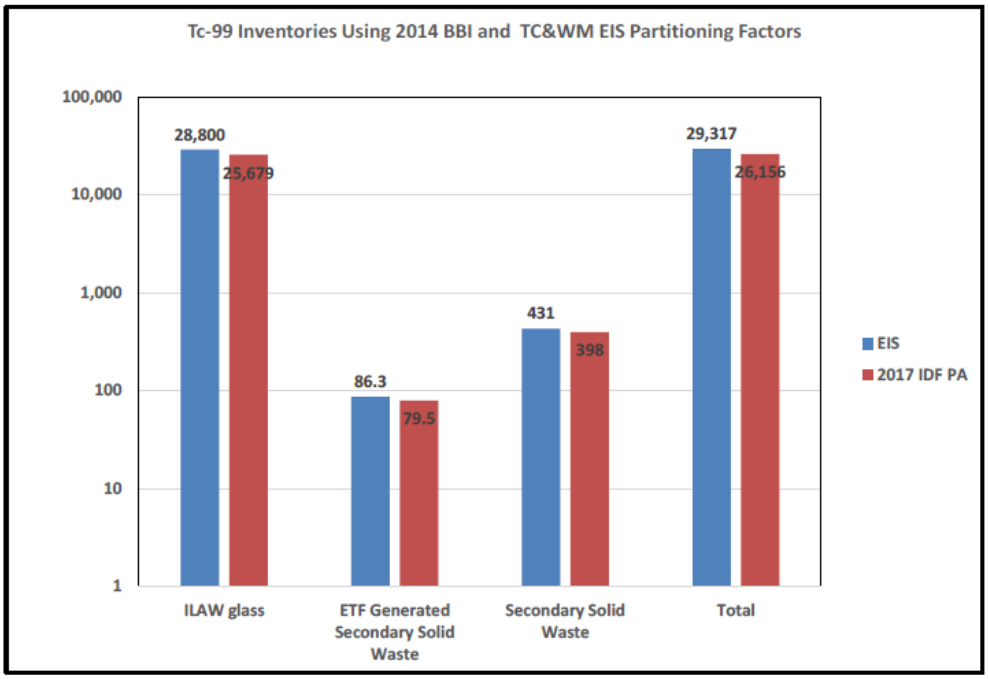
We do get a glimpse of some of the radionuclide inventory set for IDF disposal. For instance, a document entitled Inventory Data Package for the IDF Performance Assessment[3] states that nearly 26,000 curies of Technicium-99 (Tc-99) could be disposed of in IDF from tank waste sources. Tc-99 has a half-life of 211,000 years – and will be around for 2.1 million years. The EPA's limit for Tc-99 in a liter of water for consumption is 900 picocuries per liter (pCi/l). A picocurie is a trillionth of a curie. It is highly mobile in the environment.

DOE also projects that there will be about 10 curies of Iodine-129 (I-129) in the ILAW waste and around 45 curies total in IDF. I-129 has a half-life of 15 million years, and is also highly mobile in the environment. Ecology states that I-129 is "water soluble, and moves easily from atmosphere to living creatures." [4] Further:

- When ingested, most I-129 passes from the body, and about 30 percent goes to the thyroid;

RPP-ENV-58562, Rev. 3

Figure 5-2. Technetium-99 Comparison using Tank Closure and Waste Management Environmental Impact Statement Partitioning Fractions.



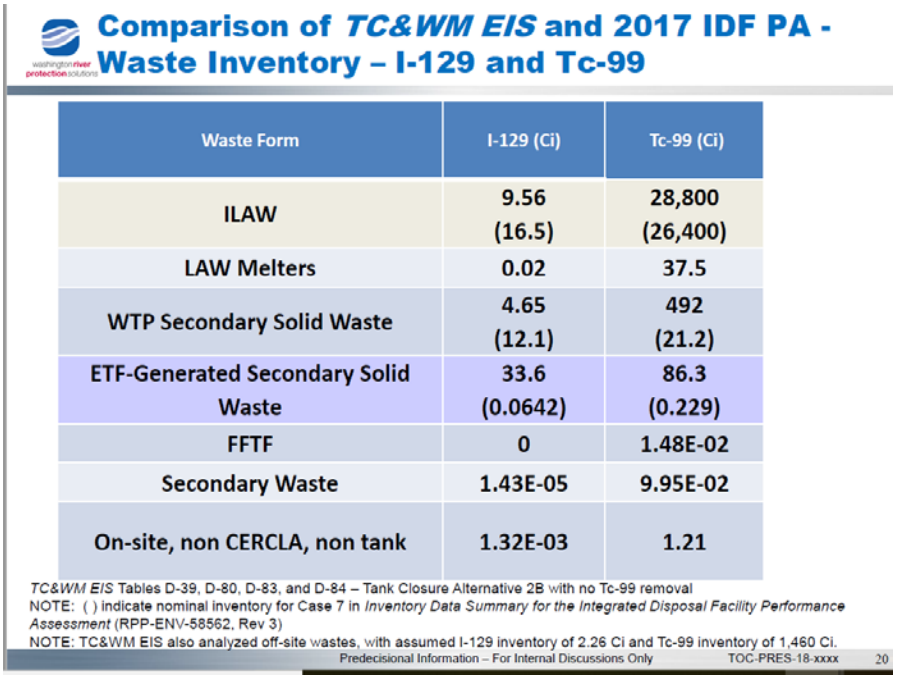
BBI = Best-Basis Inventory
EIS = Environmental Impact Statement
ETF = Effluent Treatment Facility
IDF = Integrated Disposal Facility
ILAW = Immobilized Low-Activity Waste
PA = Performance Assessment
TC&WM = Tank Closure and Waste Management

[3] RPP-ENV-58562, Rev. 3, Inventory Data Package for the Integrated Disposal Facility Performance Assessment (May 9, 2016).
[4] https://ecology.wa.gov/Waste-Toxics/Nuclear-waste/Hanford-cleanup/Protecting-air-water/Groundwater-monitoring/Groundwater-contaminants

- In humans, half of the remaining iodine leaves the body every 100 days;
- Long-term chronic doses can cause thyroid cancer; and
- It can be absorbed by crops and end up in milk products.

The EPA sets a standard for I-129 in drinking water at one picocurie per liter.

Another detailed analysis[5] was prepared by a Hanford contractor showing both Tc-99 and I-129 concentrations for IDF disposal concentrations:



Comparison of *TC&WM EIS* and 2017 IDF PA - Waste Inventory – I-129 and Tc-99

Waste Form	I-129 (Ci)	Tc-99 (Ci)
ILAW	9.56 (16.5)	28,800 (26,400)
LAW Melters	0.02	37.5
WTP Secondary Solid Waste	4.65 (12.1)	492 (21.2)
ETF-Generated Secondary Solid Waste	33.6 (0.0642)	86.3 (0.229)
FFTF	0	1.48E-02
Secondary Waste	1.43E-05	9.95E-02
On-site, non CERCLA, non tank	1.32E-03	1.21

TC&WM EIS Tables D-39, D-80, D-83, and D-84 – Tank Closure Alternative 2B with no Tc-99 removal
NOTE: ( ) indicate nominal inventory for Case 7 in *Inventory Data Summary for the Integrated Disposal Facility Performance Assessment* (RPP-ENV-58562, Rev 3)
NOTE: TC&WM EIS also analyzed off-site wastes, with assumed I-129 inventory of 2.26 Ci and Tc-99 inventory of 1,460 Ci.

For decades, the consensus on what to do with these types of long-lived, highly dangerous waste inventories has been that they must be disposed of in deep geologic repositories. In a 1957 report, prepared at the request of the Atomic Energy Commission (AEC), the National Research Council of the U.S. National Academies "endorsed the concept of geological disposal—placing high-level waste in a carefully selected deep underground formation, where it would remain isolated from human beings and the environment long enough for the radioactivity to decay to near natural background levels."[6] And this 1957 technical observation remains the consensus for federal and state governments, tribes, industry, and public interest groups. The National Research Council observed:

[5] Powerpoint presentation, WRPS, Integrated Disposal Facility Performance Assessment: Technical Approach, October 9, 2017, available at https://www.energy.gov/sites/prod/files/2017/11/f46/Bob%20Andrews%20IDF%20PA%20Modeling%20Approach_PRA_CoP_Oct2017_Rev2.pdf

[6] National Research Council, The disposal of radioactive waste on land, Washington, D.C.: National Academy Press, available at https://ia800509.us.archive.org/18/items/disposalofradioa00nati/disposalofradioa00nati.pdf.

> "Unlike disposal of any other type of waste, the hazard related to radioactive waste is so great that no element of doubt should be allowed to exist regarding safety. Stringent rules must be set up and a system of monitoring and inspection instituted. Safe disposal means that waste must not come into contact with any living things."[7]

Defining High-Level Waste

The AEC first formally defined the term "high-level radioactive waste" in Appendix F to its reactor licensing rules in 1970,[8] based on the waste's origin rather than the hazard posed by it various components. The AEC wrote that high level radioactive waste means:

> "those aqueous wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuels."[9]

Congress first used the term high-level waste in 1972. In the Marine Protection, Research, and Sanctuaries Act of 1972, which prohibited ocean dumping of high-level waste, Congress wrote a definition of high-level waste that adhered to that of the AEC's, but also included the spent fuel from commercial reactors. High-level waste was, at that time:

> "the aqueous waste resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated waste from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuels, or irradiated fuel from nuclear power reactors."[10]

Congress also defined the term "disposal" in plain language: "[T]he emplacement *in a repository* of [high-level waste], spent nuclear fuel, or other highly radioactive material *with no foreseeable intent of discovery*…"[11] The intent of Congress with respect to HLW is plain. HLW from the reprocessing of spent nuclear fuel is to be disposed of in a deep, geologic repository constructed and regulated pursuant to the NWPA.[12] In case there is any doubt, the NWPA's legislative history displays Congress's intent that high-level waste should be as isolated as possible from humans and their natural environment pursuant to the NWPA. Congress wrote:

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[7] Id.

[8] Policy Relating to the Siting of Fuel Reprocessing Plants and Related Waste Management Facilities, 35 Fed. Reg. 17530, 17532 (Nov. 14, 1970) (10 C.F.R. Part 50, App. F). Until this treatment, the AEC had informally defined HLW in terms of the hazard it posed. Office of Technology Assessment, Managing the Nation's Commercial High-Level Radioactive Waste 204-205 (1985), available at http://govinfo.library.unt.edu/ota/Ota_4/DATA/1985/8514.PDF.

[9] *Id.*

[10] 33 U.S.C. 1402.

[11] 42 U.S.C. § 10101(9) (emphasis added); *see also* the discussion above of the decades of scientific agreement on the need to dispose of reprocessing waste in a geologic repository.

[12] 42 U.S.C. § 10107(b)(2); *see also* August 2002 Decision at 11 ("Unless the President finds otherwise, defense high-level waste must be disposed of in civilian repositories established by the NWPA.").

> "The Committee strongly recommends that the focus of the Federal waste management program remain, as it is today, on the development of facilities for disposal of high-level nuclear waste *which do not rely on human monitoring and maintenance to keep the waste from entering the biosphere. As has been emphasized and reiterated over the lifetime of the federal nuclear program, high level wastes should not be a burden on future generations*."[13]

As DOE is well aware, the AEC was abolished with the Energy Reorganization Act of 1974 , and Congress transferred all civilian regulatory responsibilities to the Nuclear Regulatory Commission (NRC) and nuclear weapons activities to the Energy Research and Development Administration (which was replaced by DOE in 1977). The Energy Reorganization Act did not specifically authorize external regulation (by the NRC) of the weapons activities. It did, however, specifically authorize the NRC to license and regulate any "facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive waste generated by the Administration...."[14]

The Energy Reorganization Act focused on the transfer of power among newly created federal agencies, and did not explicitly define "high-level radioactive waste." The NRC did, however, interpret the term to mean the same thing in the Energy Reorganization Act that it meant in the AEC's Appendix F and the Marine Sanctuaries Act.[15] The Energy Research and Development Administration plainly viewed the material stored in the tanks at Hanford and Savannah River to be high-level radioactive wastes.[16] Those wastes in the tanks remained under the self-regulatory purview of the newly created DOE a few years after, even as it was becoming clear that the industry dream of a closed fuel cycle would not come true and this waste would have to be prepared in some fashion for disposal in deep geologic repositories.

In managing the high-level waste in the tanks and with theoretically readying that waste for final disposal, DOE has kept the high-level waste in huge, underground interim storage tanks at the Savannah River Site in South Carolina, the Idaho National Engineering Laboratory in Idaho, and the Hanford Nuclear Reservation in Washington. Over these many decades of storage, hundreds of thousands of gallons of this waste have leaked into the environment, primarily at Hanford. Because this high-level waste contains highly corrosive components, organics, and heavy metals, it is also a mixed waste regulated under the Resource Conservation & Recovery Act (RCRA), 42 U.S.C. §§6901-6992k.

For the NWPA, a draft of the definition of "high-level radioactive waste" was initially modeled after the definition found in the West Valley Demonstration Project Act. Like the AEC's original 1970 definition and the first statutory definition from 1972, the West Valley Act defined high-level waste as waste "produced by the reprocessing ... of spent nuclear fuel," and included "both liquid wastes which are produced directly in reprocessing" and "dry solid material derived from

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[13] House Report at 29 (emphasis added).
[14] 42 U.S.C. 5842 (4).
[15] 52 Fed. Reg. 5992, 5993 (Feb. 27, 1987).
[16] *NRDC v. Administrator, Energy Research and Dev. Admin.*, 451 F. Supp. 1245, 1251 (D. D.C. 1978), aff'd in part and rev'd in part, *NRDC v. NRC*, 606 F.2d 1261 (D.C. Cir. 1979).

such liquid waste." The NWPA draft definition, however, also provided that the NRC may include "such other material" as may be necessary "for purposes of protecting the public health and safety."[17] Significantly, the West Valley Act gave the NRC the power to add material other than reprocessing wastes to the definition, but not to exempt any part of the reprocessing wastes from it. DOE objected to the definition and recommended that it be rewritten to "permit the regulatory agencies to exclude materials from 'high-level radioactive waste' that need not be disposed of in a repository because of low activity."[18] Congress rewrote that definition, but not as DOE asked. As enacted, the final definition provides that "high-level radioactive waste" means:

> "(A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and
>
> "(B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation."[19]

The NRC has interpreted subparagraph (A) as "essentially identical" to Commission's regulatory definition,[20] with one major difference. NRC's definition includes "solids into which such liquid wastes have been converted."[21] The NWPA's definition states "solid material derived from such liquid waste *that contains fission products in sufficient concentrations*."[22] NRC read the distinction to "reflect the possibility that liquid reprocessing wastes may be partitioned or otherwise treated so that some of the solidified products will contain substantially reduced concentrations of radionuclides."[23]

Debating High-Level Waste

In 1987, the NRC sought public comment on "whether the [NRC] should (1) numerically specify the concentrations of fission products which it would consider 'sufficient' to distinguish" high-level radioactive waste from non-high-level radioactive waste under subparagraph (A) of the statutory definition; or (2) define high-level radioactive waste "so as to equate" subparagraph (A) wastes "with those wastes which have traditionally been regarded as" high-level radioactive waste "under Appendix F ... and the Energy Reorganization Act."[24] After some significant discussion of its authorities, vis-a-vis setting standards for what might constitute sufficient

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[17] Public Law 96-368, sec. 6(4) (42 U.S.C. § 2021).
[18] H. Rept. 97-491 (part 2) at 17 (1982) (letter from Eric Fygi to Chairman Price).
[19] 42 U.S.C. § 10101(12). The Price-Anderson Amendments Act of 1988, Public Law 100-408, later incorporated the Nuclear Waste Policy Act's definition of "high-level radioactive waste" into the Atomic Energy Act of 1954 by reference. 42 U.S.C. § 2014(dd).
[20] *See* 52 Fed. Reg. at 5994. NRC's HLW disposal rules, adopted before NWPA's 1982 enactment, include: (1) irradiated reactor fuel; (2) liquid reprocessing wastes as defined in the AEC's Appendix F; and (3) "solids into which such liquid wastes have been converted." 10 C.F.R. § 60.2.
[21] 10 C.F.R. § 60.2.
[22] 42 U.S.C. § 10101(12)(A) (emphasis added).
[23] 52 Fed. Reg. at 5994.
[24] 52 Fed. Reg. at 5994.

concentrations of high-level waste, NRC concluded "that the preferable construction" of the NWPA's definition should "conform to the traditional definition" found in all the earlier iterations and 10 C.F.R. §60.2. What had been high-level waste remained high-level waste.[25]

After NRC's effort at rulemaking; after some years in consultation and preparation; and after the permanent abandonment of thousands of gallons of HLW in two tanks in South Carolina, DOE issued an internal rule on July 9, 1999. DOE's Order 435.1 created the "waste incidental to reprocessing exemption" ("WIR" or "incidental waste exemption").

NRDC and the Snake River Alliance filed suit challenging WIR in the United States Court of Appeals for the 9th Circuit in January 2000. After finding that it lacked original or exclusive jurisdiction to entertain Plaintiffs' claims under 42 U.S.C. § 10139, the 9th Circuit did not dismiss the case. Rather, the Court transferred the matter to the United States District Court for the District of Idaho, expressly leaving issues of standing, ripeness, and the merits to the District Court.[26]

After the transfer, NRDC *et al*., was joined by the Yakama Nation and Shoshone-Bannock Tribes. The combined set of plaintiffs filed a Complaint in February 2002. DOE filed an Answer in April 2002 and a Motion to Dismiss the Complaint in May 2002. At this point, the states of Washington, Idaho, South Carolina, and Oregon entered appearances as "Amici Curiae" in the proceeding. The District Court issued an opinion denying DOE's Motion to Dismiss on August 9, 2002.[27] The Court found that Plaintiffs had standing[28] and that Order 435.1 was both final agency action and ripe for purposes of judicial review.[29] The District Court found that Plaintiffs had presented claims upon which relief could be granted and that the law of the case did not prevent consideration of those claims.[30] The District Court found that Order 435.1 and its accompanying Manual and Guidance necessarily implicate the disposal provisions of the NWPA by reclassifying high-level waste as low-level radioactive waste.[31] The Court also held that DOE does not operate with unfettered discretion with regard to the disposal of radioactive waste.[32]

NRDC *et al.* and the Bush Administration's DOE then filed cross-motions for summary judgment. The District Court reaffirmed two earlier rulings: (1) its ripeness decision; and (2) its decision that DOE does not have discretion to dispose of defense high-level waste somewhere other than a repository established under the NWPA.[33] Specifically, the court found that the NWPA plainly required DOE to use the civilian repository for defense high-level radioactive waste once President Reagan decided that a separate repository was not required, and that the tank wastes at Hanford, Savannah River, and Idaho National Lab fall within the definition of

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[25] 53 Fed. Reg. 17709 (May 18, 1988).
[26] *Natural Resources Defense Council v. Abraham*, 244 F.3d 742, 747 (9th Cir. 2001).
[27] *Natural Resources Defense Council v. Abraham*, 2002 U.S. Dist. LEXIS 28418 (D. Id. Aug. 9, 2002). See Attachment F for District Court opinion.
[28] *Id.* at 20.
[29] *Id.* at 7-11.
[30] *Id.* at 15.
[31] *Id.* at 17.
[32] *Id.* at 19.
[33] ER 354-58; *see* published opinion, *NRDC v. Abraham*, 271 F.Supp.2d 1260, 1263-64 (D. Id. 2003).

high-level radioactive waste. DOE's assertion that it can exempt waste streams based on technical and economic constraints, the court found, "directly conflicts with" the NWPA's definition of high-level radioactive waste.[34] The District Court also found that Congress has spoken clearly on the subject and that DOE's Order 435.1 directly conflicts with the NWPA's definition of HLW (citing *Chevron v. NRDC*, 467 U.S. 837, 842 (1984)).[35] Accordingly, the District Court granted Plaintiffs' Motion for Summary Judgment and denied DOE's Cross-Motion for Summary Judgment.[36]

High-Level Waste and IDF

The matter DOE and Ecology should consider before going forward is one of statutory interpretation. To wit, (1) Congress plainly stated that high-level waste is the highly radioactive material resulting from reprocessing spent nuclear fuel (and the rest of the definition of high-level waste under 42 U.S.C. § 10101(12)(A) is included for explanatory purposes); (2) Congress clearly intended that high-level waste be disposed of in a geologic repository pursuant to the NWPA without the need for human monitoring and maintenance; (3) the waste in DOE's tanks is high-level waste and thus, subject to the NWPA; (4) the incidental waste exemption, if finalized, would allow DOE to arbitrarily reclassify the high-level waste in the tanks so that the agency may avoid compliance with the NWPA; and (5) the incidental waste exemption is fundamentally inconsistent with the plain language of the NWPA and its overriding purpose of ensuring that high-level waste does not "adversely affect the public health and safety and the environment for this or future generations."[37]

Under Order 435.1's incidental waste exemption, DOE awards itself the unilateral authority to reclassify the high-level waste in the tanks as incidental waste and thus abandon that waste in place rather than in a geologic repository. Ostensibly no longer high-level waste, this waste is not subject to the requirements of the NWPA and may be disposed of under the substantially less strict requirements applicable to low-level waste. Rather than dispose of high-level waste in a geologic repository, DOE will begin, and is proposing to begin, to abandon millions of curies in shallow land burial at Hanford. We are concerned that allowing IDF to be a disposal site for relabeled high-level waste will set precedent and once started, will not stop, and could allow DOE to abandon most of the tank waste – by volume and concentration – in place at Hanford, citing economic expediency.

Fundamentally, DOE's proposed action creates a new national sacrifice zone for high-level waste. Disposal of millions of gallons of high-level waste in Washington could (1) result in a potentially catastrophic dispersal of radioactivity into the environment and (2), at a minimum, require significant land-use restrictions, maintenance, and monitoring in perpetuity. Both of these results are contrary to law.

[34] Natural Resources Defense Council v. Abraham, 271 F. Supp. 2d 1260 (D. Ida. 2003).
[35] *Id.*
[36] *Id*. at 1263.
[37] 42 U.S.C. §10131(a)(7).

<u>Comment Number 2</u>: Require DOE to update its Performance Assessment to ensure adequate protection of human health and safety during the longer timespans in which long-lived radionuclides decay

The Performance Assessment prepared by DOE is inadequate to protect human health and safety and future generations from the long-lived radioactive and chemical constituents in Hanford's tank waste.

According to Hanford's "Risk Budget Tool" –

> "Both the Disposal Authorization Statement and permit modification require a demonstration that the system of engineered and natural features of the disposal facility will limit releases from the facility and be protective of human health and the environment for the next 1,000 to 10,000 years."[38]

Notably, DOE intends to dispose of "vitrified low-activity tank waste (also referred to as immobilized low-activity waste (ILAW)) glass" in the IDF. Low-activity waste is still high-level waste – not low-level waste. (See discussion above).

> "By issuing authorization to operate the IDF, DOE has concluded that the underlying calculations met the intended purpose to simulate impacts from the facility and demonstrate that the disposal facility will be protective of human health and the environment for at least 1,000 years."[39]

As previously noted, some of the contaminants that DOE intends to dispose of in shallow land burial at Hanford include radioisotopes with extremely long half-lives. Iodine-129, for instance, has a half-life of 15.7 million years. What will Hanford look like in 5,000 years? In 50,000 years? Or a million years? Whatever assumptions are made in DOE's Performance Assessment cannot account for time frames of this longevity. This is precisely why such isotopes need to be disposed of in deep isolation, away from all living things, as stated by the National Research Council in 1957.

<u>Comment Number 3: Require a fully vetted Hanford Site Composite Analysis prior to issuing the IDF Permit to ensure the evaluation of cumulative risks</u>

DOE has not yet provided any kind of cumulative impact assessment that describes how much waste is being abandoned at Hanford. DOE is proceeding with plans to bury millions of curies of tank waste in shallow land burial at Hanford without providing consideration of a Hanford Site Composite Analysis to ensure that risks from multiple waste sites and sources were all considered.

[38] RPP-CALC-63176, Rev. 0. Integrated Disposal Facility Risk Budget Tool Analysis (June 25, 2019), p. 15.
[39] Id, (p. 28).

Comment Number 4: Require that IDF Leachate Volume, Risk, and Composition be Addressed

On page A-A.1, *Introduction,* the proposed permit revision states that leachate from the IDF disposal cell drainage will be transferred to the 200 Area Effluent Treatment Facility (ETF) for treatment. However, no flow rate or quantities of estimated effluent are provided, nor is an ETF "treatability" analysis provided for the leachate. Can you provide the appropriate references? The Interface Control Documents at Hanford should address the characterization and quantity of IDF leachate to be transferred to ETF, to verify that ETF/SALDS have the capacity and ability to treat the effluent.

Please note that DOE's Semiannual Report to Congress for the period October 1, 1999 to March 31, 2000[40] stated that "the [Office of the Inspector General] recommended that the Office of River Protection (ORP), Hanford Site, develop and put into place an integrated project baseline to include all activities, a critical path, and provisions for key [tank waste] decision evaluations".

The Assistant Secretary for Environmental Management concurred with the report finding and recommendations[41]. This recommendation was eventually closed, along with hundreds of others, yet the WTP/IDF project baseline is not integrated to include all tank waste activities. Among other subprojects, the volume, composition, and risk from IDF leachate is omitted and should be addressed.

Comment Number 5: Require the inclusion of an IDF Sampling Strategy or Sampling and Analysis Plan

Is there an IDF leachate sampling strategy or sampling and analysis plan, as have been prepared for the Environmental Restoration Disposal Facility? There appears to be no mention of either in the proposed modification.

Comment Number 6: Require an explanation of how Solid Waste Acceptance Criteria has been revised to address shipments of waste to IDF

Has there been a revision to the Hanford Site Solid Waste Acceptance Criteria document to address shipments to the IDF?

Comment Number 7: Specify if 200 West Pump and Treat will treat IDF Leachate in the future, and if yes, require documentation of the relative exposures/risks from the alternative flow sheets

Should we expect the IDF leachate to eventually be processed at the 200 West Area Pump and

[40] Semiannual Report to Congress, October 1, 1999, to March 31, 2000 https://energy.gov/sites/prod/files/igprod/documents/Semiannual/mar00sar.pdf

[41] (DOE/IG-0456 *Audit Report – The Management of Tank Waste Remediation at the Hanford Site*, January 2000, https://www.energy.gov/sites/files/igprod/documents/CalendarYear2000/ig-0456.pdf

Treat Facility as a cost savings measure, as was done for the ERDF leachate? If so, what are the relative exposures/risks from the alternative flow sheets?

Comment Number 8: Require DOE to provide a Comprehensive Risk Evaluation

DOE submitted an "IDF Modeling Risk Budget Tool" as a permit condition[42] during this comment period, but this tool is not mentioned in the requested modification. This tool does not integrate with other risk aspects of the Hanford Waste Treatment flow sheet (starting from tank waste and going all the way to disposal of all wastes and secondary wastes). Per the Office of the Inspector General guidance in IG-0456 (and recommendations from the Government Accountability Office), a more comprehensive risk evaluation is needed, as it should evaluate each increment of risk during the multiple handling actions for the waste, including WTP vitrification of loaded cesium ion exchange columns, effluent treatment, etc. Risk and personnel exposure occur each time the waste is handled on its way to the IDF, not in a vacuum of one facility at a time. Of interest is the sum of the risks created in each activity, versus the risk and exposures from disposal-in-place. The addition of new facilities and processes (EMF Evaporator, LAWPS, Ion Exchange Column vitrification) are increasing the risks of the current planning path.

Comment Number 9: Require IDF Modeling Risk Budget Tool Calculation assumptions to be specified to be in compliance with NQA-1 Quality Assurance requirements

The IDF Modeling Risk Budget Tool appears to be contrary to NQA-1 quality assurance requirements. This model is identified as a calculation. NQA-1 requires that a calculation be documented such that a reasonable person can follow it and understand it without recourse to the originator. Despite this requirement, Section 4.1 states that *"the IDF [Performance Assessment] assumptions that are inherent to the IDF [Performance Assessment] system model are also assumed for this calculation."*[43] The assumptions are not listed or enumerated, so that they cannot be reviewed for correctness or completeness. Nor were the assumptions made clear. As a result, the vaguely described inputs and assumptions cannot be checked. An independent-of-DOE quality assurance review should be conducted for this entire "calculation." A user's guide would be helpful, along with publication of the native Excel spreadsheet on the TPA administrative Record Web page. Provision should be made to add newly proposed waste forms, along with their performance data. Provision should be made to increase the footprint of the IDF if the volume capacity is expected to be exceeded.

Comment Number 10: Increase Permit Language Specificity to Match the Risk Budget Tool, Verify Accuracy of WTP Permit Conditions III.10.C.2.m and III.10.C.2.n, including subsections

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[42] See letter 19-ECD-0083, SUBMITTAL OF THE INTEGRATED DISPOSAL FACILITY MODELING RISK BUDGET TOOL PERMIT CONDITION 111.11.1.5 OPERATING UNIT GROUP 11, January 7, 2020. See also the fact sheet stating that the risk-budget tool was required by 2013, located at: https://fortress.wa.gov/ecy/nwp/permitting/HDWP/Rev/9/pdf/cards/idf.pdf

[43] Id.

The IDF Modeling Risk Budget Tool defines Hanford WTP secondary solid waste as:

- encapsulated High-Efficiency Particulate Air (HEPA) filters
- encapsulated other debris (OD)
- solidified ion exchange resin (IX)
- solidified carbon adsorption media (GAC), and
- solidified silver mordenite media (AgM)

However, the proposed permit modification is less specific, calling out only "Secondary Solid Waste" from WTP. Ecology should ensure that the permit language is at least as specific as the risk budget tool. This will help avoid scope creep/confusion.

Reference is made to an IDF Risk Budget Tool dating from 2008.[44] This was a public comment period for the WTP Dangerous Waste portion of the Hanford Permit. It imposed requirements on the WTP for integration with the IDF and for providing input to the IDF Risk Budget Tool.

Today, WTP permit conditions (III.10.C.2.m and III.10.C.2.n) show that WTP is still required to provide input to the risk-budget tool. Was that input provided? If so, is it current? WTP Permit Condition III.10.C.2.n requires that WTP report on secondary waste quantities and compositions based on an *August 2006* mass balance. The August 2006 mass balance is well out of date and predates the Direct Feed Low Activity Waste (DFLAW) flow sheet. Has Ecology arranged for updated inputs (as a result of the fast-track design build phased permitting)? WTP permit conditions III.10.C.2.m and III.10.C.2.n (including subsections) should be verified to be accurate and up to date before the IDF is allowed to operate.

<u>Comment Number 11</u>: Continue Prohibiting Disposal or Treatment of Liquids at IDF, Ensure that WTP Effluent Management Facility bottoms are excluded from IDF unless properly analyzed and covered by NEPA

Ecology is correct to prohibit disposal or treatment of liquids at the IDF, and should ensure that WTP Effluent Management Facility bottoms are excluded from the IDF unless/until they are properly analyzed and covered by NEPA. It would help to call this out, because the definitions in the permit are not always specific. Similarly, the permit should be specific that secondary wastes from the ETF are powder from the ETF dryers. (Grouting of ETF brine or other tank waste derived liquids off-site at Permafix do not have requisite NEPA coverage or Federal Acquisition Regulations coverage.) Note that this is also where an integrated flowsheet would be helpful to show the pathway for all wastes and effluents.

<u>Comment Number 12</u>: Verify IDF Performance Assessment assumptions regarding WTP ILAW container decontamination system. Evaluate new/different risks resulting from elimination of the robotic CO_2 decontamination system. Complete process test results

[44] https://www.hanford.gov/pageAction.cfm/calendar?&IndEventID=1129

before IDF is allowed to operate.

Ecology should verify that the newly reduced WTP ILAW container decontamination system will produce containers that are as clean as assumed in the IDF Performance Assessment. Elimination of the robotic CO_2 decontamination system could result in new/different risks to personnel and additional wastes. These also belong in an integrated flow sheet. Process test results should be completed before the IDF is allowed to operate.

<u>Comment Number 13</u>: Require DOE to describe how the risk budget tool will be used and kept up to date

In July of 2018, an Ecology Response to Comments Report (Publication No. 18-05-013) included a question about how Ecology plans to regulate the risk budget tool to ensure that requirements are met. This was at a public meeting, but a response was not provided due to lack of time. It would be helpful if Ecology can describe how the risk budget tool will be used and kept up to date.

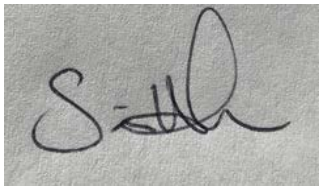
<u>Comment Number 14</u>: Create an Integrated Flow Sheet

As mentioned in many comments above, an integrated flow sheet should be required that includes:

- WTP ILAW container decontamination system
- Elimination of the CO2 decontamination system

Thank you for considering these comments.

Sincerely,



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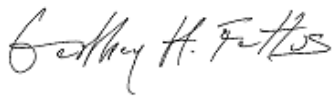

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