

Department of Energy
Office of River Protection
Richland, Washington

DOE/EA-2086

**FINDING OF NO SIGNIFICANT IMPACT
TEST BED INITIATIVE DEMONSTRATION
HANFORD SITE, WASHINGTON**

AGENCY: U.S. Department of Energy, Office of River Protection

ACTION: Finding of No Significant Impact

ENVIRONMENTAL ASSESSMENT: The U.S. Department of Energy (DOE) completed the National Environmental Policy Act (NEPA) *Environmental Assessment of the Test Bed Initiative Demonstration* (TBI EA; DOE/EA-2086), which analyzes the potential environmental impacts of the Proposed Action. On August 17, 2021, in compliance with DOE's NEPA implementing procedures (10 CFR 1021.301(d)), DOE notified host states and host tribes of the availability of the draft EA for review and comment. DOE also notified states and tribes that could be affected by the Proposed Action. DOE considered all comments received in preparing the final TBI EA. The final TBI EA is hereby incorporated herein by reference.

DOE's proposal would separate and pretreat approximately 2,000 gallons of supernate tank waste from Hanford waste Tank 241-SY-101 (SY-101) through in-tank settling, decanting, filtration, and ion exchange (IX) media in an In-Tank Pretreatment System (ITPS). Following pretreatment, DOE would characterize and, if appropriate, classify the waste as mixed low-level radioactive waste (MLLW). DOE would have the waste treated and stabilized by grouting and then dispose of the immobilized waste form in an appropriately permitted and licensed commercial disposal facility.

In addition to the Proposed Action, the EA analyzes a No Action Alternative as required by DOE NEPA implementing procedures (10 CFR Part 1021). Based on the analysis presented in the final EA, DOE has determined that the Proposed Action will not constitute a major federal action significantly affecting the quality of the human environment within the meaning of NEPA. Therefore, the preparation of an environmental impact statement is not required, and DOE is issuing this Finding of No Significant Impact (FONSI).

In a separate process, DOE prepared a *Final Waste Incidental to Reprocessing Evaluation for the Test Bed Initiative Demonstration* (Final WIR Evaluation) in accordance with DOE Manual 435.1-1, *Radioactive Waste Management Manual*. The Final WIR Evaluation shows that approximately 2,000 gallons of separated, pretreated, and solidified low-activity waste (LAW) under the proposed TBI Demonstration would be waste incidental to the reprocessing of spent nuclear fuel, would not be high-level radioactive waste, and may be managed as low-level

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radioactive waste (LLW).¹ DOE prepared the Final WIR Evaluation after consulting with the U.S. Nuclear Regulatory Commission (NRC) and after considering comments from the NRC, stakeholders, states, tribal nations, and the public. Based on the Final WIR Evaluation, DOE may issue a potential WIR Determination.

PUBLIC AVAILABILITY AND CONTACT INFORMATION: The FONSI and the Final EA (DOE/EA-2086) are available via:

- <http://www.hanford.gov/page.cfm/EnvironmentalAssessments>
- U.S. Department of Energy Public Reading Room
Washington State University, Tri-Cities
Consolidated Information Center, Room 101-L
2770 University Drive
Richland, WA 99352

For questions about this FONSI or EA, contact:

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PROPOSED ACTION: The Proposed Action is to separate and pretreat approximately 2,000 gallons of supernate tank waste from Hanford waste Tank SY-101 through in-tank settling, decanting, filtration, and IX media using an ITPS. Following pretreatment, DOE would characterize and, if appropriate, classify the waste as MLLW. DOE would have the waste treated and stabilized by grouting and then dispose of the immobilized waste form in an appropriately permitted and licensed commercial disposal facility.

ALTERNATIVES CONSIDERED: Under the No Action Alternative, DOE would not conduct the proposed TBI Demonstration. Instead, DOE would maintain the status quo, which is represented by the continued management and retrieval of tank wastes, the eventual treatment and disposal of tank waste, and eventual closure of the tanks in accordance with the 2013 Record

¹ If DOE issues a WIR Determination, then the pretreated LAW would be managed as LLW (MLLW), subject to the analysis and commitments in the Final WIR Evaluation and the WIR Determination. Such waste would be appropriately stored, transported, solidified, and disposed of as LLW.

of Decision (ROD), as amended (78 *Federal Register* (FR) 75913, 83 FR 23270, and 84 FR 424). The 2013 ROD decided to implement most but not all of the components of Alternative 2B, as analyzed in the *Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site* (TC&WM EIS), but would not include any of the additive effects from the proposed TBI Demonstration.

DOE developed four alternatives for implementing the Proposed Action. Under each of the alternatives, DOE would pretreat approximately 2,000 gallons of low-activity supernate tank waste from Tank SY-101 through settling, decanting, filtration, and IX. Once characterized and classified as MLLW, the waste would be further characterized to confirm that it meets the receiving facility's waste acceptance criteria. The waste would then be transported off site to a licensed and permitted treatment facility in six process totes to be treated and stabilized by grouting and disposed of in a permitted and licensed commercial MLLW disposal facility. Alternative 1 would utilize the commercial facility owned by Perma-Fix in Richland, Washington (PFNW), for the waste treatment and stabilization. Alternative 2 would utilize the commercial facility owned by Perma-Fix in Kingston, Tennessee (Diversified Scientific Services, Inc. [Perma-Fix DSSI]) for waste treatment and stabilization. Under Alternatives 1 and 2, the treated/stabilized MLLW would be transported and disposed of at either the Waste Control Specialists LLC (WCS) Federal Waste Facility (FWF) near Andrews, Texas, or the EnergySolutions² disposal facility near Clive, Utah, depending on its LLW classification. Under Alternative 3, DOE would transport the liquid MLLW to the WCS facility near Andrews, Texas. WCS would treat, stabilize, and dispose of the waste. Under Alternative 4, DOE would transport the liquid MLLW to the EnergySolutions facility in Clive, Utah. EnergySolutions would treat, stabilize, and dispose of the waste.

Any proposal to pretreat, stabilize, and dispose of more than approximately 2,000 gallons of supernate tank waste would be evaluated in a separate NEPA review.

ENVIRONMENTAL CONSEQUENCES: The EA considered potential environmental impacts to air quality, human health (normal operations, accidents, and intentional destructive acts), waste management, radiological transportation, land use, visual resources, geology and soils, water resources, cultural and paleontological resources, ecological resources, noise, socioeconomics and environmental justice, infrastructure and utilities, and industrial safety. A summary is provided below.

Consistent with NEPA regulations, implementing procedures, and guidance, the analysis in the EA focused on those resource areas that are relevant to the Proposed Action, reasonable implementing alternatives, and their potential environmental impacts. The EA presents the rationale for resource areas that were eliminated from detailed analysis in the EA. The EA considered actions that could occur on the Hanford Site, along the transportation route, at the commercial treatment locations, and at the commercial MLLW disposal facilities. After the screening, the EA conducted a more detailed analyses of potential impacts related to (1) air

² EnergySolutions is only licensed for disposal of Class A LLW. Therefore, if the produced waste stream is Class B or Class C LLW, treatment and/or disposal at EnergySolutions would not be implemented. As identified in the EA and Section 1.5.3 of the Final WIR Evaluation, the pretreated and solidified tank SY-101 waste in the TBI Demonstration would be well below the NRC concentration limits for Class C LLW and is expected to meet Class A LLW concentration limits.

quality, (2) human health (normal operations), (3) human health (accidents and intentional destructive acts), (4) waste management, and (5) radiological transportation.

Under the Proposed Action, there would be minimal air emissions during the onsite processes since the filtration, IX, and pumping would be within the actively ventilated headspace of the tank. This would be the same for all alternatives. There would be vehicle emissions (including greenhouse gases) associated with the single shipment of the MLLW to the treatment facility and, in the case of Alternatives 1 and 2, with the two shipments of stabilized waste to the MLLW disposal facility (either in Texas or Utah). These emissions would be negligible for all alternatives but would be dependent on the total truck transportation distance.

There would be minimal human health impacts from normal operations and process accidents. Radiological doses to the public are typically a result of emissions of radionuclides to the atmosphere, discharge of effluents to water bodies, or direct radiation. Because there would be no radiological emissions or effluents associated with onsite activities for the Proposed Action, and no direct radiation dose off site, there would be no doses to the public from activities on the Hanford Site. Radiological doses to workers are based on the annual dose rate, duration of the field work, and the estimated number of workers. Based on the similarity to existing work at the Hanford Site, the expected worker dose for the Proposed Action would be 1.26 millirem for an average worker and a collective worker dose of 50 person-millirem, resulting in essentially zero additional latent cancer fatality risk. Impacts to commercial facility workers are not expected to change compared to existing operations that were evaluated in their respective state permitting processes.

The accident scenario with the highest probability would involve potential leaks from the temporary piping or totes associated with the ITPS. However, since the ITPS operations would be conducted within a secondary containment, potential health impacts of any such accidental leaks would be minimal. At the commercial treatment facilities and disposal facilities, operations would be conducted in accordance with the radioactive material licenses and permits issued by the respective states and not involve any unique hazards that have not previously been considered during their licensing and permitting process. There is no meaningful difference in potential health impacts among alternatives. Impacts associated with radiological transportation were evaluated separately.

There would be minimal impacts to waste management at the Hanford Site. Disposition of secondary, radiological waste streams generated from the TBI Demonstration would be managed in accordance with existing Hanford Site procedures and processes. Prior to shipment to a commercial treatment facility, DOE would verify that the waste meets all applicable requirements for shipment to and receipt by the facility. The WCS FWF and the *EnergySolutions* disposal facility can accept MLLW that meets the facilities' waste acceptance criteria for disposal. WCS is permitted, licensed, and authorized to receive, treat, and dispose of Class A, Class B, and Class C LLW and MLLW. *EnergySolutions* is permitted, licensed, and authorized to receive, treat, and dispose of Class A LLW and MLLW. The amount of MLLW that would be disposed of at either WCS or *EnergySolutions* is minimal compared to their respective licensed and permitted limits. Therefore, waste management impacts at the commercial disposal facilities are expected to be negligible.

There would be negligible health impacts to the crew and the public from transportation of the radiological materials for treatment and disposal. For Alternative 1, the liquid MLLW would be shipped 26 miles to the PFNW facility, and then two shipments of stabilized (grouted) MLLW in 55-gallon drums (which has an external dose rate much less than the liquid MLLW) would be shipped to either WCS or EnergySolutions (approximately 1,800 and 650 miles, respectively). For Alternative 2, the liquid MLLW would be shipped 2,450 miles from the Hanford Site to the DSSI facility, and then two shipments of stabilized MLLW in 55-gallon drums would be shipped to either WCS or EnergySolutions (approximately 1,160 and 1,840 miles, respectively). For Alternative 3, the liquid MLLW would be shipped approximately 1,800 miles from the Hanford Site to the WCS FWF for treatment and disposal. For Alternative 4, the liquid MLLW would be shipped approximately 650 miles from the Hanford Site to the EnergySolutions facility for treatment and disposal. A severe transportation accident that caused a release of the liquid MLLW could result in a slightly increased latent cancer fatality risk to affected persons. The estimated radiological risk for a severe transportation accident under the four alternatives would range from 7.83×10^{-9} to 1.65×10^{-6} latent cancer fatalities, or essentially zero. Under all the alternatives, the impacts would be minimal; however, since impacts are a function of distance traveled, Alternative 1 would result in the lowest potential health impacts from radiological transportation.

Mitigation is not necessary to render the impacts of this action not significant.

DETERMINATION:

Based on the analysis in the EA, the Proposed Action to implement the TBI Demonstration will not constitute a major federal action significantly affecting the quality of the human or natural environment within the context of NEPA. DOE does not have a preference among alternatives. Because this determination is true for all alternatives evaluated in the EA, DOE can implement any of the analyzed alternatives. Therefore, the preparation of an environmental impact statement is not required, and DOE is issuing this FONSI.

Issued in Richland, Washington, this 16 day of March 2023.

Brian T. Vance Digitally signed by Brian T. Vance
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Brian Vance
Manager
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