

**STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY**

IN THE MATTER OF
AN ADMINISTRATIVE ORDER

AGREED ORDER
DOCKET NO. 21304

CONCERNING:
U.S. DEPARTMENT OF ENERGY

To:

Brian T. Vance, Manager
Office of River Protection
U.S. Department of Energy
PO Box 450, MSIN: H6-60
Richland, Washington 99352

I. INTRODUCTION

This is an Agreed Order (Order) between the Washington State Department of Ecology (Ecology) and the U.S. Department of Energy (USDOE) to respond to and mitigate the ongoing release of mixed waste from the specific leaking single-shell tanks (SSTs) 241-B-109 and 241-T-111. This Order establishes a schedule to implement near-term corrective actions and to undertake long-term leak response planning and development as needed to effectively respond to these and any future leaking SSTs at the Hanford Site.

II. AUTHORITY

This Order is issued pursuant to the authority vested in Ecology by the Hazardous Waste Management Act (HWMA), Revised Code of Washington (RCW) 70A.300, and the Dangerous Waste regulations, Washington Administrative Code (WAC) 173-303. RCW 70A.300.120(1) authorizes Ecology to issue an administrative order upon determining that a person “has violated or is about to violate” any provision(s) of RCW 70A.300, in order to require compliance within a specified period of time.

Ecology has received authorization from the United States Environmental Protection Agency (EPA) to implement the HWMA and Dangerous Waste regulations in lieu of the Resource Conservation and Recovery Act (RCRA), and administers and enforces such provisions at the Hanford Site in accordance with Permit No. WA7890008967 (Sitewide Permit) and consistent with the Hanford Federal Facility Agreement and Consent Order (HFFACO) (commonly known as the “Tri-Party Agreement” [TPA]) and the Amended Consent Decree.¹ While Ecology regulates the dangerous waste component of mixed waste under the HWMA and Dangerous Waste regulations, USDOE regulates certain radioactive materials, including the radioactive component of mixed hazardous waste at Hanford, pursuant to the Atomic Energy Act of 1954,

¹ *Washington v. Granholm*, No. 2:08-CV-5085-RMP (E.D. Wash.).

42 U.S.C. §§ 2011–2297h-13 (AEA). Where information regarding treatment, management, or disposal of the radioactive source, byproduct material, special nuclear material (as defined by the AEA, as amended) and/or the radionuclide component of mixed waste has been incorporated into this Order, it is not incorporated for the purpose of Ecology regulating the radiation hazards of such components under the authority of this Order or RCW 70A.300.

As a signatory to this Order, USDOE agrees to undertake all actions required by the terms and conditions of the Order and not to contest Ecology’s jurisdiction and authority to administer and enforce this Order.

Nothing in this Order shall in any way relieve USDOE of its obligations to comply with the applicable requirements of the Sitewide Permit, the HFFACO, the Amended Consent Decree, the HWMA and Dangerous Waste regulations, the federal and state Clean Air Acts, or any other applicable requirements of the law. Nor shall anything in this Order limit Ecology’s authority to enforce the applicable provisions of the Sitewide Permit, the HFFACO, the Amended Consent Decree, or any other requirements of the HWMA and Dangerous Waste regulations.

III. BACKGROUND

The hazardous waste portion of the “mixed waste” currently stored in the underground tanks at the Hanford Site is subject to regulation under HWMA, RCW 70A.300, and the Dangerous Waste regulations, WAC 173-303. Ecology is authorized by EPA to implement the HWMA and Dangerous Waste regulations in lieu of RCRA. *See* 51 Fed. Reg. 3782 (Jan. 30, 1986); 52 Fed. Reg. 35,556 (Sept. 22, 1987).

As the owner and co-operator of the Hanford Site, USDOE is responsible for implementing all required closure and cleanup activities in compliance with applicable federal and state law.

In 1989, the HFFACO was established by USDOE, Ecology, and EPA (collectively, the Tri-Parties). Among other things, the HFFACO serves as a RCRA consent order and contains enforceable requirements and schedules designed to bring USDOE into compliance with federal and state hazardous waste management laws.

Approximately 56 million gallons of radioactive and chemical waste is currently stored in 177 underground storage tanks at the center of the Hanford Site. Most of these tanks—149 of the 177—are SSTs built with a welded carbon steel liner, encased within a concrete shell.

Each SST is a Dangerous Waste Management Unit subject to permitting and closure requirements under the HWMA and Dangerous Waste regulations. Pursuant to Condition I.A of Revision 8C of the Sitewide Permit, the SSTs are currently subject to RCRA interim status standards.² Upon incorporation of the SST System into the Sitewide Permit Revision 9, the SSTs

² The federal interim status regulations set forth in 40 Code of Federal Regulations (C.F.R.) 265, Subpart J (Tank Systems) are incorporated by reference into the Dangerous Waste regulations at WAC 173-303-400(3)(a).

will be subject to final status standards and permit conditions. The SSTs lack secondary containment and were identified as “unfit for use” in 2002. This unfit-for-use determination triggered legal obligations under RCRA and the Dangerous Waste regulations to remove these tanks from service; to remove as much waste as is necessary to prevent release to the environment; and to close the tank system pursuant to state hazardous waste management standards.

All the SSTs have been removed from service and isolated, and most of them were interim stabilized to minimize the risk of leaks to the environment. The SST System is now undergoing an extended closure process during which most of the SSTs will continue to store mixed waste for many years. To date, the waste contained in 20 SSTs has been removed and placed in double-shell tanks (DSTs) for continued storage pending the development and operations of waste treatment capacity.

The SST leak detection and monitoring program is governed by TPA Primary Document RPP-9937 Rev. 4, “Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document (RPP-9937).” USDOE’s full compliance with the requirements set forth in RPP-9937 satisfies interim status standards for SST leak detection, monitoring, and reporting, as set forth in Title 40, C.F.R., Part 265, Subpart J [incorporated by reference in WAC 173-303-400(3)(a)].

In addition to setting forth leak detection, monitoring, and reporting requirements, RRP-9937 establishes a process that USDOE and Ecology must follow when a potential SST leak has been detected. First, USDOE must conduct a formal leak assessment to determine the likelihood of an active liner leak. Once a leak has been confirmed through this assessment process, USDOE and Ecology Project Managers must attempt to reach unanimous agreement about next steps. If unanimous agreement is not reached, Ecology retains the ability to initiate an enforcement action directly under its HWMA authority.

The SST integrity monitoring program, which is guided by the Tank Integrity Expert Panel (TIEP), includes a significant number of activities to support the safe operation of the SST System as it continues to store mixed waste throughout its extended closure period. The program includes (1) in-tank monitoring, (2) ex-tank monitoring when needed, (3) tank inventory accounting, (4) visual inspections; (5) structural integrity assessments, and (6) tank status assessments to identify potential water intrusion and leak status changes. To the extent the actions required by this Order will not satisfy all applicable requirements related to monitoring and maintaining the integrity of the SST System throughout its extended closure period, any such remaining requirements will be established through the Sitewide Permit or the HFFACO, as appropriate.

In addition to the SST integrity monitoring program, USDOE operates the 200 West Area pump and treat (P&T) system designed to capture and treat contaminated groundwater. The 200 West P&T removes contaminants of concern from the influent water streams to meet cleanup levels. The treatment system is conservatively designed to treat 2,500 gallons/minute and is designed to address contaminated groundwater associated with historical releases from the tank farms,

including Waste Management Areas B and T. USDOE estimates it could take more than 25 years for any contamination from tank B-109 to reach the water table. To the extent the actions required by this Order will not satisfy all applicable requirements related to groundwater monitoring and corrective action for releases from the SST System, any such remaining requirements will be established through the Sitewide Permit or the HFFACO, as appropriate.

SST 241-T-111

On February 11, 2013, USDOE notified Ecology that SST 241-T-111 appeared to be actively leaking. USDOE subsequently provided Report RPP-RPT-54964, "Evaluation of Tank 241-T-111 Level Data and In-tank Video Inspection," Rev 2. This document summarized the status of tank T-111 as of January 1, 2014, and estimated a leak rate and post-1994 leak volume for the tank. The estimated leak rate as of January 1, 2014, was 1.8 gallons/day, and it was estimated to have leaked approximately 2,500 gallons from 1994 to 2014.

Following the 2013 notification, USDOE and Ecology discussed a response action. Subsequent to those discussions, USDOE actively ventilated T-111 from January 2015 through January 2019. Following the shutdown of the ventilation system in 2019, liquid levels in T-111 continued to decline, indicating that it continues to actively leak.

Between May and October of 2020, USDOE and Ecology transmitted letters 20-NWP-082, 20-TF-0044, 20-TF-0082, and 20-NWP-168, regarding the significance of the continued decrease in liquid level data for T-111 and potential further leak response actions. During the May 2021 HFFACO Project Managers Meeting, USDOE and Ecology began the process of attempting to reach unanimous agreement on the next steps for a response, in accordance with Section 4.1.2 of RPP-9937 Rev. 4, *Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document*.

SST 241-B-109

On July 15, 2020, USDOE notified Ecology that its contractor had initiated a formal leak assessment for SST 241-B-109 to investigate the tank's decreasing interstitial liquid levels. On April 29, 2021, USDOE notified Ecology that it had determined that 241-B-109 is actively leaking. USDOE subsequently provided notification TOC-ENV-NOT 2021-4609, "Written Follow-up Report for Declaration of B-109 Leak," which reported that 3,100 gallons of waste had been released from B-109 as of April 29, 2021, and that the tank continues to actively leak.

USDOE and Ecology immediately began the process of attempting to reach unanimous agreement on the next steps for a response, in accordance with Section 4.1.2 of RPP-9937 Rev. 4, *Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document*.

IV. REQUIREMENTS

The leak response and corrective actions required by Section V of this Order are intended to satisfy the following RCRA and HWMA requirements with respect to the active leaks in SSTs T-111 and B-109. To the extent these actions will not satisfy all applicable requirements related to planning, leak response, and corrective action for the SST System, any such remaining requirements will be established through the Sitewide Permit or the HFFACO, as appropriate.

A. Interim Status

Pursuant to Condition I.A of the Sitewide Permit, all dangerous waste management units (DWMUs) within the SST System (including 241-B-109 and 241-T-111) are currently subject to RCRA interim status standards and will remain so subject until the SST System is incorporated into the Sitewide Permit Revision 9.

1. Federal Interim Status Standards

WAC 173-303-400(3)(a) incorporates by reference the interim status standards promulgated by the EPA under RCRA, including those set forth in 40 C.F.R. 265, Subpart J (Tank Systems).

- i. 40 C.F.R. § 265.196 (Response to leaks or spills and disposition of leaking or unfit-for-use tank systems).

2. Additional State Interim Status Standards

WAC 173-303-400(3)(a)(i) also requires DWMUs subject to interim status standards to comply with the land disposal restrictions (LDR) set forth in WAC 173-303-140, the facility requirements set forth in WAC 173-303-280 through WAC 173-303-440 (except -335), and the corrective action requirements set forth in WAC 173-303-646. WAC 173-303-140(2)(a) incorporates by reference the federal land disposal restrictions set forth in 40 C.F.R., Part 268, and WAC 173-303-140(4)(a) incorporates the HWMA's restrictions on the disposal of Extremely Hazardous Waste set forth in RCW 70A.300.070, which was recently recodified from RCW 70.105.050.

- i. WAC 173-303-140 (Land Disposal Restrictions)
- ii. RCW 70A.300.070 (Disposal at other than approved site prohibited—Disposal of radioactive wastes)³
- iii. WAC 173-303-340 (Preparedness and Prevention)
- iv. WAC 173-303-350 (Contingency Plan and Emergency Procedures)
- v. WAC 173-303-646 (Corrective Action) and WAC 173-303-64620 (Requirements)

³ RCW 70A.300.070 was recodified from RCW 70.105.050.

B. Final Status

Upon incorporation of the SST System into the Sitewide Permit, the SSTs will become subject to final status standards and permit conditions. Because Ecology and USDOE anticipate that the SSTs will be incorporated into the Sitewide Permit prior to a number of the deadlines established in Section V, all deliverables and actions required by Section V will be prepared and performed, respectively, in accordance with the final status standards set forth in WAC 173-303.

1. Final Status Standards

The WAC 173-303 provisions cited above in Section IV.A.2 are applicable to both interim status and final status units, and are hereby incorporated by reference into this section. In addition, the following WAC 173-303 section will apply to the SSTs upon incorporation of the SST System into the Sitewide Permit.

- i. WAC 173-303-640 (Tank Systems)

V. LEAK RESPONSE AND CORRECTIVE ACTIONS

Pursuant to Section 4.1.2 of RPP-9937, USDOE and Ecology reached unanimous agreement regarding the near-term corrective actions and long-term planning and development that USDOE will implement in order to respond to and mitigate the ongoing release of mixed waste from the specific leaking SSTs B-109 and T-111.

A. SST System Leak Response Plan

1. Incorporation into Sitewide Permit. USDOE must develop a general SST System Leak Response Plan to enable a timely response to any future leaking SSTs and submit the Plan for incorporation into the Sitewide Permit as follows.

- i. By August 25, 2023, USDOE must prepare and submit a Leak Response Plan for the SST System as part of the permit application for Revision 9 of the Sitewide RCRA Permit (as part of the SST System Part V, Closure Unit Group 4, Addendum J) to serve as part of the Contingency Plan required by WAC 173-303-350 and WAC 173-303-806(4)(a)(vii).
- ii. USDOE and Ecology will collaborate throughout the development of the SST System Leak Response Plan in order to minimize the number of deficiencies ultimately requiring resolution during the approval process. The parties intend to develop a plan that can be adapted to the varying physical conditions of the SST System and to enable the execution of appropriate response actions applicable to the specific tank and farm conditions. The Leak Response Plan will be applied to future new actively leaking SSTs.

- iii. The SST System Leak Response Plan must satisfy all applicable requirements of WAC 173-303-350(3), including but not limited to the identification and description of all available leak response equipment or technologies and their capabilities, as well as the minimum requirements set forth in Sections V.A.2 through V.A.6, below.
- iv. USDOE must periodically review the SST System Leak Response Plan and amend the SST System Leak Response Plan, as necessary, in accordance with WAC 173-303-350(5), including but not limited to when there is a change to the list of available leak response equipment and when the facility changes in a way that materially increases the potential for releases of dangerous wastes or dangerous waste constituents from the SST System.
- v. In order for Ecology to approve the SST System Leak Response Plan, it must demonstrate how USDOE will satisfy the requirements in WAC 173-303-640(7) for leak response actions as well as all other applicable requirements of WAC 173-303. The Leak Response Plan will take into consideration the physical conditions of the SST System that impact the practicability of implementing certain leak response actions.

2. Removal of Waste at the Earliest Practicable Time. In order to ensure future leak response actions satisfy WAC 173-303-640(7)(b) requirements, the SST System Leak Response Plan must:

- i. Include an evaluation of a suite of potential options for leak response actions that involve the retrieval of as much of the waste as is necessary to prevent further release of dangerous waste to the environment and a development process to evaluate the potential options based on the leak rate and location of any leaking tank(s);
- ii. Include a suite of options for interim leak response actions, including active ventilation and selective liquid retrieval, that, if appropriate, can be initiated to remove liquid waste and/or mobile waste constituents in order to mitigate the near-term impacts of an active tank leak;
- iii. Include monitoring methods and technologies capable of detecting changes in the leak rate during implementation of a leak response action with an accuracy and sensitivity applicable to the SST system for low volume leakage of drainable interstitial liquid to determine condition, nature, location and extent of any leakage. This will be informed by the leak detection and monitoring technology evaluation required by Section V.F.1 of this agreement; and

- iv. Include an analysis estimating what generally constitutes “the earliest practicable time” for the initiation and completion of each potential leak response option. Variations in the timeframe for each potential response option will recognize timeframes based on the leak, leak rate, and location of any leaking tank(s).

3. Intrusion Monitoring, Investigation, and Response. In order to ensure future leak response actions satisfy WAC 173-303-640(7)(a) requirements, the SST System Leak Response Plan must:

- i. Include a summary of USDOE’s existing water intrusion prevention, mitigation, and monitoring programs for the SST System, including:
 - a. A list of any water intrusion prevention actions completed to date and incorporation of the policies and/or plans that establish the components of USDOE’s existing intrusion monitoring program;
 - b. Incorporation of the policies and/or plans that establish the components of USDOE’s existing water intrusion mitigation and maintenance program; and
 - c. A description of any existing monitoring processes currently being implemented to determine if any water is entering a tank from the surface of the tank farm and/or ancillary equipment such as connected pipelines and pits.
- ii. Establish a process for developing tank-specific intrusion response plans for implementation in response to tanks with newly identified suspected intrusion, similar to the intrusion response outlined in the agreement.

4. Closure Planning. In order to ensure future leak response actions satisfy WAC 173-303-640(7)(e)⁴ requirements, the SST System Leak Response Plan must:

- i. Establish a process for determining, on a case-by-case basis, whether the implementation of one or more leak response actions would achieve the RCRA closure performance standards applicable to the leaking tank, and if not, the extent of additional retrieval that would be required for closure; and
- ii. Include a requirement to amend the RCRA closure plan for the leaking tank to incorporate the leak response action(s) selected for implementation pursuant to Section V.A.2.iv as an interim or final closure action, as appropriate.

⁴ Because all of the SSTs have been identified as unfit-for-use, the parties agree that all leaking SSTs will proceed to closure instead of being repaired and returned to service pursuant to WAC 173-303-640(7)(e).

- 5. Selection of Leak Response Action(s) to Implement.** The SST System Leak Response Plan must also establish a process by which Ecology and USDOE will determine which leak response action(s) to implement on a case-by-case basis.
- i. This process must include an evaluation of each option against specified objective criteria, including but not limited to short-term and long-term effectiveness in preventing further releases, short-term and long-term risks to human health and the environment, cost estimates, implementation schedules, technological feasibility, and unavoidable impacts on other closure or cleanup priorities.
 - ii. In order to maximize the efficiency of retrieval efforts and minimize duplication of work, this evaluation must also take into consideration the determination(s) made pursuant to the process established in accordance with Section V.A.4.i as to the extent of additional retrieval that would be required, if any, to achieve the applicable RCRA closure performance standards.
- 6. Treatment and Disposal of Removed Waste.** In order to ensure future leak response actions satisfy WAC 173-303-140 requirements, the SST System Leak Response Plan must identify options for how the waste removed from a leaking tank as part of a selected leak response action can be managed, treated, and ultimately disposed.

B. Intrusion Investigation and Response

The parties agree that halting the ongoing intrusion of additional liquids into the leaking tanks will reduce the amount of liquid waste in each tank that can contribute to further releases. RPP-9937 describes certain actions USDOE takes for SST System monitoring, including monitoring for intrusion.

1. Development of Intrusion Response Work Plan.

- i. USDOE must conduct an intrusion investigation to determine if there are additional actions that can be taken to halt ongoing intrusion and, if additional intrusion response actions are determined to be needed, develop an Intrusion Response Work Plan for tanks T-111 and B-109 that can be initiated by October 31, 2023, and ultimately incorporated by reference into the RCRA closure plans for T-111 and B-109.
- ii. By August 25, 2023, USDOE must submit the results of the T-111 and B-109 intrusion investigation and, if additional intrusion response actions are determined to be needed, the associated Intrusion Response Work Plan for Ecology's review and approval as a single TPA Primary Document. In order for Ecology to approve the results of the intrusion investigation and the associated Work Plan, the submission must include:

- a. All data and other information collected and/or reviewed during the the intrusion investigation performed for each tank;
 - b. A summary of USDOE's analysis of the data and other information collected and/or reviewed during the intrusion investigation;
 - c. An evaluation of the potential options for intrusion response actions for each tank, including the timeframe for initiation and completion of each option;
 - d. USDOE's proposed determination for each tank as to whether additional intrusion response actions are needed, including a summary of the supporting data and analysis for each proposed determination; and
 - e. If additional intrusion response actions are determined to be needed, a proposed schedule for implementation of one or more intrusion response actions for each tank that can be initiated no later than October 31, 2023.
- iii. In the event USDOE and Ecology are unable to resolve Ecology's comments on the T-111 and B-109 intrusion investigation and/or Intrusion Response Work Plan pursuant to HFFACO Action Plan Section 9.2.1, either party may elect to invoke dispute resolution pursuant to HFFACO Article VIII. USDOE's obligation to initiate implementation of the T-111 and B-109 Intrusion Response Work Plan will be stayed pending resolution of the dispute, unless otherwise agreed to by the parties.

2. Implementation of Intrusion Response Work Plan.

- i. Upon Ecology's approval, USDOE must implement the approved T-111 and B-109 Intrusion Response Work Plan in accordance with the schedule set forth in the approved Plan.
- ii. USDOE must also submit a final report to Ecology, in accordance with the schedule set forth in the approved Plan, that describes the investigation and response action(s) implemented, sets forth all data collected during implementation, and assesses the effectiveness of the response action(s) in slowing or halting the intrusion of additional liquids into each tank.

C. Active Ventilation

Active ventilation, if determined to be appropriate and practicable, could enable the reduction of volume limiting further releases, at an earlier time than is practicable to implement a full leak response action for 241-B-109.

1. Air Emissions Evaluation.

- i. By August 25, 2023, USDOE must perform an evaluation to determine the practicability of installing and operating an active ventilation system as an interim leak response action for tank B-109.
- ii. The evaluation must include a consideration of whether installation and operation of an active ventilation system to evaporate liquid waste from tank B-109 would create a new emission point under the Hanford Site Air Operating Permit or otherwise trigger additional air permitting requirements.
- iii. USDOE will install the active ventilation system on tank B-109 pursuant to an approved Active Ventilation Work Plan, as discussed below. Notwithstanding the foregoing, installation will not be required if, based on the approved evaluation, USDOE determines that installation (i) would create a new emission point or (ii) compromise nuclear safety requirements or (iii) permitting or other requirements or issues (e.g., design limitations, scaling limitations) would pose an unreasonable impediment to proceeding to installation.
- iv. By August 25, 2023, USDOE must notify Ecology of its determination and submit the evaluation for Ecology's review and approval. In the event Ecology does not approve the evaluation or disagrees with USDOE's determination, either party may invoke dispute resolution pursuant to HFFACO Article VIII. USDOE's obligation to submit an Active Ventilation Work Plan pursuant to Section V.C.2.i will be stayed pending resolution of the dispute, unless otherwise agreed to by the parties.
- v. If USDOE is required or has elected to proceed with installation and operation of the active ventilation system on tank B-109, USDOE must submit an Active Ventilation Work Plan pursuant to Section V.C.2.i below.

2. Active Ventilation Work Plan.

- i. Within 90 days of Ecology's approval of USDOE's practicability evaluation and determination, if USDOE is required or has elected to proceed with installation and operation of an active ventilation system, USDOE must submit an Active Ventilation Work Plan for Ecology's review and approval as a TPA Primary Document.
- ii. In order for Ecology to approve the Active Ventilation Work Plan, it must include:
 - a. A detailed description of the active ventilation system, including how it will be designed, installed, operated, and closed.

- b. The schedule for installation and operation of the active ventilation system.
 - c. A detailed description of any control equipment that may be used to capture the waste evaporated by the active ventilation system and how the captured waste will be treated and disposed, as applicable.
- iii. In the event Ecology does not approve the Active Ventilation Work Plan, either party may invoke dispute resolution pursuant to HFFACO Article VIII. USDOE's obligation to implement the Active Ventilation Work Plan pursuant to Section V.C.3 will be stayed pending resolution of the dispute, unless otherwise agreed to by the parties. Alternatively, the parties may agree to forego dispute resolution over Ecology's disapproval of the Active Ventilation Work Plan, in which case installation and operation of the active ventilation system will not be required under this Order. If the parties agree to forego dispute resolution, such agreement will be documented in writing and placed in the administrative record.

3. Installation and Operation. USDOE must complete installation and begin operating the active ventilation system and any associated control equipment on tank B-109 pursuant to the schedule set forth in the approved Active Ventilation Work Plan.

D. Interim Surface Barriers

The parties agree that installation of interim surface barriers are intended to minimize further migration of released dangerous waste constituents through the vadose zone to the underlying groundwater.

1. Interim Barrier Design

- i. **T Farm.** By August 31, 2025, USDOE must submit the following to Ecology in accordance with Section V.D.1.iii:
 - a. The design for an interim surface barrier that fully covers the 241-T Tank Farm.
 - b. A revised RPP-RPT-61684, "Maintenance & Performance Monitoring Plan for the Interim Barriers" that includes the new 241-T Tank Farm barrier.
- ii. **B Farm.** By August 31, 2026, USDOE must submit the following to Ecology in accordance with Section V.D.1.iii:
 - a. The design for an interim surface barrier that fully covers the 241-B Tank Farm.
 - b. A revised RPP-RPT-61684, "Maintenance & Performance Monitoring Plan for the Interim Barriers" that includes the 241-B Tank Farm barrier.

iii. **Incorporation into Sitewide Permit.**

- a. If Revision 9 of the Sitewide Permit has been issued and is in effect with respect to Closure Unit Group 4, USDOE must submit each of the interim barrier designs and plan revisions as a permit modification request to amend the Tier 2 Closure Plan for Waste Management Area T or Waste Management Area B, as applicable, pursuant to WAC 173-303-830(4)(b).
- b. In any other circumstance, USDOE must submit the interim barrier design and plan revision for Ecology's informal review and approval, for future incorporation by reference into the Sitewide Permit. Within sixty (60) days of the effective date of Revision 9 of the Sitewide Permit, USDOE must submit the informally approved interim barrier design(s) and plan revision(s) as a certified permit modification request to amend the Tier 2 Closure Plan(s) pursuant to WAC 173-303-830(4)(b).

2. Interim Barrier Construction

- i. **T Farm.** By September 31, 2028,⁵ USDOE must complete construction of the replacement interim surface barrier in the 241-T Tank Farm, in accordance with the approved design.
- ii. **B Farm.** By September 31, 2028,⁶ USDOE must complete construction of the interim surface barrier in the 241-B Tank Farm, in accordance with the approved design.
- iii. **Barrier Maintenance.** Upon completion of construction, USDOE must maintain the interim surface barriers in accordance with the approved RPP-RPT-61684.

E. Retrieval Sequencing Prioritization

The parties agree that the construction of remote tank farm infrastructure will be necessary to accomplish the removal of waste from 241-B-109 and/or 241-T-111. Initiating the planning and development processes is also necessary to ensure such waste removal can be completed at the earliest practicable time.

The ongoing tank waste retrieval evaluation processes contained within the system planning process set forth in HFFACO milestone M-062-40, considers ongoing evaluations and

⁵ The barrier design should be approved by Ecology, by November 30, 2025. Ecology will authorize construction upon approval of the final design. A day-for-day slip in completing construction of the barrier will be given for each day construction is not authorized following 3 months after submittal.

⁶ The barrier design should be approved by Ecology, by November 30, 2026. Ecology will authorize construction upon approval of the final design. A day-for-day schedule extension for completing construction of the barrier will be given for each day construction is not authorized following 3 months after submittal.

assessment of changing SST system conditions including leak status and physical risk conditions for all non-retrieved SSTs as part of risk based mission planning of all SST retrieval and closure priorities.

The parties agree that the HFFACO System Plan 10 process will enable USDOE and Ecology to evaluate the practicability of accelerating retrieval schedules for tanks B-109 and T-111. USDOE and Ecology will then use the evaluation documented in the System Plan 10 process to negotiate and establish new enforceable milestones for the retrieval schedule for tanks B-109 and T-111, respectively, at the earliest practicable time.

1. System Plan Process Development.

- i. The parties agree that the HFFACO System Plan process enables USDOE and Ecology to document evaluation of the practicability of accelerating SST retrieval schedules to address changes in the SST System, including changes to SST tank integrity status. System Plan 10 will document the parties' evaluation of the practicability of accelerating the retrieval schedules for tanks B-109 and T-111 to address the active leaks. Future System Plans will document specific evaluations to address any new changes in SST System conditions since the last System Plan.
- ii. Consistent with the process set forth in Milestone M-062-40, the HFFACO System Plan 10 process evaluation, due October 2023, must include the following elements:
 - a. Documentation of the active leaks associated with SSTs 241-B-109 and 241-T-111;
 - b. Evaluation of various infrastructure and technology developments that could potentially accelerate the construction of remote tank farm infrastructure and new or refined retrieval technologies for tank waste retrieval;
 - c. Evaluation of additional options to mitigate residual tank leakage risks; and
 - d. Evaluation of the relative practicability of various timeframes for the retrieval of tanks T-111 and B-109, respectively.

2. Creation of New HFFACO Milestones. Upon finalization of System Plan 10, currently required October 2023, USDOE and Ecology will negotiate new HFFACO milestones for the retrieval of tanks T-111 and B-109, respectively.

- i. USDOE and Ecology must complete these negotiations by August 31, 2024.⁷ The new milestones must consider the evaluation documented in the System Plan and

⁷ A day-for-day slip in completing these milestone negotiations will be given for each day that the deadline for submission of System Plan 10 under HFFCO Milestone M-062-40 is extended by mutual agreement of the parties.

establish retrieval schedules for T-111 and B-109 that USDOE and Ecology agree represent completion of these retrievals at the earliest practicable time.

- ii. In the event USDOE and Ecology do not reach agreement on new milestones as required by this subsection, either party may invoke dispute resolution pursuant to HFFACO Article VIII. If USDOE and Ecology do not reach agreement on new milestones and neither party triggers dispute resolution, Ecology reserves the right to take appropriate enforcement action under RCW 70A.300 and WAC 173-303.

F. Leak Detection and Monitoring

Installation of new leak detection and monitoring technology could be beneficial in identifying fate and transport of liquid waste released from SSTs with active leaks if the instrumentation is sensitive enough to monitor the tank leakage rate. USDOE will evaluate the effectiveness of new technologies for determining the volume and rate of leaks and when enough waste has been removed from a leaking tank to prevent further releases.

1. Leak Detection and Monitoring Technology Evaluation.

- i. USDOE must conduct an evaluation of potential leak detection technologies that could be applicable to the SST system for low volume leakage of drainable interstitial liquid to determine conditions, nature, location, and extent of any leakage, including changes or variations in vadose zone resistivity or moisture content in the vicinity of the tank(s) being evaluated.
- ii. By August 25, 2024, USDOE must submit the results of this evaluation to Ecology as a TPA Primary Document.
- iii. The Leak Detection and Monitoring Technology Evaluation must include:
 - a. An evaluation of any leak detection and monitoring technologies, including existing technologies used to detect tank leaks during retrieval operations;
 - b. An analysis of the extent to which additional research and/or development is needed to modify existing technologies in order to have sufficient accuracy and sensitivity to detect incremental changes in vadose zone resistivity or moisture content over time, including during and after implementation of a leak response action;
 - c. Establish the timeframe needed to complete any research or development activities identified pursuant to Section V.F.1.iii.b;
 - d. Include a comparison of the relative accuracy and sensitivity of the technologies evaluated based on whether they are installed for individual tanks or installed for tank farms; and

- e. Identify which emerging and/or existing technologies are technologically and economically practicable.
- iv. In the event USDOE and Ecology are unable to resolve Ecology's comments on the Leak Detection and Monitoring Technology Evaluation pursuant to HFFACO Action Plan Section 9.2.1, either party may elect to invoke dispute resolution pursuant to HFFACO Article VIII. USDOE's obligation to submit the Leak Detection and Monitoring Technology Work Plan pursuant to Section V.F.2.ii will be stayed pending resolution of the dispute, unless otherwise agreed to by the parties.

2. Installation and Operation.

- i. If one or more practicable technologies are identified for the SST System in the approved Leak Detection and Monitoring Technology Evaluation, future installation, schedule, and operation commitments will be negotiated by the parties through the development of a Leak Detection and Monitoring Technology Work Plan.
- ii. Within 90 days of Ecology's approval of the Leak Detection and Monitoring Technology Evaluation, USDOE must submit the Leak Detection and Monitoring Technology Work Plan to Ecology as a TPA Primary Document.
- iii. Upon Ecology's approval, USDOE must implement the approved Leak Detection and Monitoring Technology Work Plan in accordance with the schedule set forth in the approved Plan.
- iv. In the event USDOE and Ecology are unable to resolve Ecology's comments on the Leak Detection and Monitoring Technology Work Plan pursuant to HFFACO Action Plan Section 9.2.1, either party may elect to invoke dispute resolution pursuant to HFFACO Article VIII. USDOE's obligation to initiate implementation of the Leak Detection and Monitoring Technology Work Plan pursuant to Section V.F.2.iii will be stayed pending resolution of the dispute, unless otherwise agreed to by the parties.

G. Compliance Schedule

Section	Action or Submission Required	Due Date
V.A.1.i	Submit SST System Leak Response Plan	08/25/2023
V.B.1.ii	Submit results of intrusion investigation and, if applicable, Intrusion Response Work Plan	08/25/2023
V.B.2	If applicable, implement Intrusion Response Work Plan and submit final report on effectiveness of intrusion response actions	Pursuant to approved Intrusion Response Work Plan schedule
V.C.1.iv	Submit active ventilation practicability evaluation and determination	08/25/2023
V.C.1.v	If applicable, submit Active Ventilation Work Plan	Within 90 days of Ecology's approval of the active ventilation practicability evaluation and determination
V.C.2.iii	If applicable, install and begin operation of active ventilation system on B-109	Pursuant to approved Active Ventilation Work Plan schedule
V.D.1.i	Submit interim barrier design for T-Farm	08/31/2025
V.D.1.ii	Submit interim barrier design for B-Farm	08/31/2026
V.D.2.i	Complete construction of interim barrier at T-Farm	09/31/2028*
V.D.2.ii	Complete construction of interim barrier at B-Farm	09/31/2028*
V.E.2.i	Complete System Plan 10 milestone negotiations	08/31/2024*
V.F.1.ii	Submit Leak Detection and Monitoring Technology Evaluation	08/25/2024
V.F.2.ii	If applicable, submit Leak Detection and Monitoring Technology Work Plan	Within 90 days of Ecology's approval of the Leak Detection and Monitoring Technology Evaluation
V.F.2.iii	If applicable, implement Leak Detection and Monitoring Technology Work Plan	Pursuant to approved Leak Detection and Monitoring Technology Work Plan schedule

*Due date subject to day-for-day slip as described in the applicable Section of this Order.

VI. EFFECTIVE DATE

This Order is effective on the date the agreement has been signed by both parties.

VII. EXTENSION OF DEADLINES

The parties recognize that unexpected events beyond the reasonable control of either party can occur that cause delays and that, depending on the nature of the event, an extension of a deadline set forth in this Order may be justifiable. As such, provisions for extension of the deadlines are as follows:

- A. A request for extension of a deadline set forth in Section V of this Order (as summarized in the Compliance Schedule above) shall be granted only when a written request for an extension is submitted in a timely fashion, at least thirty (30) calendar days prior to expiration of the deadline for which the extension is requested or within thirty (30) calendar days after USDOE determines that an extension will be necessary, whichever is earlier, and only when good cause exists for granting the extension.
- B. All requests for extensions shall be submitted in writing to the attention of the Department of Ecology's Nuclear Waste Program Manager. The request shall specify:
 1. The deadline that is sought to be extended;
 2. The length of the extension sought;
 3. The reason(s) for the extension;
 4. Any other requirement of this Order, the Sitewide Permit, the HFFACO, or the Amended Consent Decree that would be affected if the extension were granted; and
 5. A showing that the proposed extended deadline provides for completing the required task(s) at the earliest practicable time.
- C. The burden shall be on USDOE to demonstrate to the satisfaction of Ecology that the request for an extension has been submitted in a timely fashion, that the extended deadline provides for completing the required task(s) at the earliest practicable time, and that good cause exists for granting the requested extension.
 1. Good cause may include, but is not limited to:
 - i. Circumstances beyond the reasonable control and despite the due diligence of USDOE, including but not limited to delays caused by unrelated third parties (not including USDOE contractors) or by Ecology, such as delays by Ecology in reviewing, approving, or modifying documents submitted by USDOE for Ecology's approval; or
 - ii. Acts of God, terrorism, or adverse weather conditions that could not be reasonably anticipated including fire, seismic event, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty.

2. Good cause does not exist if USDOE could meet the existing schedule by responding with reasonable diligence to the unexpected circumstance(s) or event(s). Efficient management practices are an appropriate consideration in determining whether reasonable diligence has been exercised.
 3. For purposes of this Order, neither increased costs of performance of the terms of this Order nor changed economic circumstances shall be considered good cause for granting an extension.
 - i. The parties may confer as to whether circumstances beyond the reasonable control of USDOE, but having some relation to changed economic circumstances, such as a temporary shutdown of the federal government, may justify extension of a deadline set forth in this Order.
 - ii. No provision in this Order shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. § 1341.
- D. Upon receipt of a timely written request for an extension, Ecology will provide USDOE with its written approval or denial in a timely fashion and not later than fifteen (15) calendar days after receipt of the written request. A requested extension shall not be effective until approved in writing by Ecology.
- E. An extension shall only be granted for such period of time as Ecology determines is necessary and reasonable under the circumstances.
1. Ecology may grant deadline extensions exceeding thirty (30) calendar days only as a result of unexpected circumstances deemed exceptional or extraordinary by Ecology.
 2. If USDOE requests a deadline extension for a requirement under this Order in which there is substantial tribal or stakeholder interest, Ecology will take into consideration the interest(s) of such tribes and/or stakeholders in determining whether to grant the extension and, if so, for how long.

VIII. FAILURE TO COMPLY

Pursuant to RCW 70A.300.120(2), failure to comply with any of the provisions of this Order may subject USDOE to enforcement action by Ecology, including the issuance of civil penalties of up to \$10,000 per day per violation.

IX. DURATION OF THE AGREEMENT

This Order shall remain in effect until USDOE has received written notification from Ecology of the timely and satisfactory completion of all requirements set forth in Section V, or as mutually agreed to otherwise, in writing, by USDOE and Ecology.

X. RIGHT TO APPEAL

As a signatory to this Order, USDOE expressly waives its right to appeal Ecology’s issuance of this Order upon the signature of both parties. USDOE expressly agrees that it: (1) will undertake all actions required by the terms and conditions of the Order, and (2) will not contest Ecology’s jurisdiction and authority to administer and enforce this Order. However, USDOE is not waiving its right to contest or appeal any future decisions or actions that Ecology issues or takes under, or in connection with, this Order, consistent with the applicable dispute resolution processes set forth herein.

A third party, other than USDOE, may appeal the issuance of this Order to the Pollution Control Hearings Board (PCHB). The appeal process is governed by RCW 43.21B and WAC 371-08.

An appealing party must do both of the following within thirty (30) calendar days of the “date of “receipt”⁸ of this Order:

- File the appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours. Electronic filing by e-mail is accepted, so long as the original document and any required copies are mailed on the same day.
- Serve a copy of the appeal and this Order on Ecology in paper form—by mail or in person. (See addresses below.) Electronic service by e-mail is not accepted.

An appealing party must also comply with all other applicable requirements set forth in RCW 43.21B and WAC 371-08.

An appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

XI. ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel Road SW Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

⁸ “Date of receipt” is defined in RCW 43.21B.001(2).

XII. CONTACT INFORMATION

Please direct all questions about this Order to:

Jeff Lyon, Tank Waste Storage Project Manager
Department of Ecology, Nuclear Waste Program
3100 Port of Benton Blvd.
Richland, WA 99354
Phone: 509-372-7914
Email: jeff.lyon@ecy.wa.gov

XIII. MORE INFORMATION

- **Pollution Control Hearings Board (PCHB) Website**
<https://eluh0.wa.gov/content/11>
- **RCW 43.21B – Environmental and Land Use Hearings Office – PCHB**
<http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B>
- **WAC 371-08 – Practice and Procedure**
<http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08>
- **RCW 34.05 – Administrative Procedure Act**
<http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05>
- **Laws and Rules**
<https://leg.wa.gov/LawsAndAgencyRules/Pages/default.aspx>

XIV. SIGNATURES

David Bowen
Program Manager, Nuclear Waste Program
Washington State Department of Ecology

August 25, 2022

Date

Brian T. Vance
Manager, Hanford Site
U.S. Department of Energy

August 25, 2022

Date