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DEPARTMENT OF ECOLOGY

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June 26, 2019

19-NWP-101

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

Re: Director's Determination on United States Department of Energy Request for a Waiver
of Single-Shell Tank Retrieval Criteria

Dear Brian T. Vance:

Enclosed is a Director's Determination to resolve the *Hanford Federal Facility Agreement and Consent Order* (HFFACO) dispute regarding the United States Department of Energy's request for a waiver of the retrieval criteria in Appendix H of the HFFACO for Single-shell Tank 241-C-106.

This Determination is appealable as provided in Article VIII, Paragraph 30.D of the HFFACO.

If you have any questions regarding this determination, please do not hesitate to contact me at alex.smith@ecy.wa.gov or (509) 372-7905.

Sincerely,

Alexandra K. Smith
by John B. Price
Alexandra K. Smith
Program Manager
Nuclear Waste Program

Enclosure: Copy of Determination

cc: See page 2

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Brian T. Vance
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cc electronic:

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FINAL DETERMINATION

Final Determination Pursuant to *Hanford Federal Facility Agreement and Consent Order (HFFACO)* regarding the U.S. Department of Energy's Request for Waiver to HFFACO Waste Retrieval Criteria for Single-Shell Tank 241-C-106

This determination concludes efforts at resolving a dispute under the HFFACO between the Washington Department of Ecology (Ecology) and the U.S. Department of Energy (USDOE). As such, this constitutes my final determination pursuant to HFFACO Part Two, Article VIII, Paragraph 30(D). This determination has been made following review and consideration of Ecology's Administrative Record in this matter.

I. Introduction

From 1944 to 1989, the federal government produced approximately two-thirds of the nation's weapons-useable plutonium at Hanford. This activity generated highly radioactive and chemically hazardous waste as a byproduct. The hazardous waste portion of this mixed waste is subject to regulation under Washington's Hazardous Waste Management Act (HWMA), RCW 70.105, through authorization under the federal Resource Conservation and Recovery Act (RCRA).

Approximately 56 million gallons of this legacy waste is currently stored in 177 temporary underground holding tanks at the center of the Hanford site. Most of these tanks—149 of the 177—are "single-shell tanks" (SSTs) that consist of a single welded carbon steel liner, encased within a concrete shell for structural support. Under normal conditions, each SST was expected to only operate for an approximately 20- to 30-year design life. The oldest SSTs were built in 1944; the newest SST was built in 1964. In addition, the SSTs have been subjected to severe operating conditions due to factors such as waste composition and extreme heat generated by tank contents.

Not surprisingly, waste has already escaped to the environment from nearly half of the SSTs. At least 25 SSTs have reported breaches in the sides or bottoms of their carbon steel liners, which has caused tank waste to leak directly to the surrounding soil. Despite USDOE's initial assurances that any leakage would remain in soil beneath the tanks, USDOE confirmed in November 1997 that contamination from the tanks had reached the groundwater, more than 200 feet below the surface. This groundwater eventually discharges to the Columbia River, which is about five to eight miles from the location of the tank farms.

In regulatory terms, none of the SSTs meet applicable requirements for hazardous waste storage tanks under RCRA and the HWMA. Specifically, the SSTs lack secondary containment, leak integrity, and leak detection. Further, all 149 SSTs have been identified as "unfit for use" through an engineering assessment conducted by USDOE in 2002. This unfit-for-use determination triggers a legal obligation under RCRA and the HWMA for USDOE to "immediately" remove the tank from service; to remove as much waste as is necessary to prevent release to the environment, "at the earliest practicable time"; and to "close" the tank system

pursuant to state hazardous waste management standards if the system is not upgraded or repaired to meet minimum standards.

The Hanford Federal Facility Agreement and Consent Order (HFFACO), also known as the Tri-Party Agreement, is a RCRA compliance order that USDOE entered into with Ecology and the U.S. Environmental Protection Agency (EPA) (collectively, the "Tri-Parties") in 1989 in order to address Hanford's numerous compliance issues. Among other things, the HFFACO establishes schedules and associated regulatory requirements, known as milestones, for bringing Hanford facilities into compliance with applicable environmental requirements. These milestones are set forth in Appendix D of the HFFACO.

Appendix H of the HFFACO establishes an iterative process by which the Tri-Parties work together to continuously develop, evaluate, and refine tank waste retrieval technologies, retrieval goals, and plans for tank closure in order to incorporate lessons learned as cleanup and closure activities progress at the Hanford Site. Appendix H sets forth a series of "steps" to complete as part of this iterative process.

Pursuant to Step 1, the Tri-Parties must establish a "retrieval goal," which is defined as a standard for "waste retrieval percentage and the method to be used to calculate the allowable residual waste¹ volume following completion of retrieval operations." In 1994, the agreed-upon retrieval goal was incorporated into milestone M-045-00, "Complete the closure of all Single Shell Tank Farms." This milestone requires "retrieval of as much tank waste as technically possible" prior to closure. For the 100-series SSTs, this standard is defined as "tank waste residues not to exceed 360 cubic feet . . . , or the limit of waste retrieval technology capability, whichever is less."

Pursuant to Step 2(a), "SST Technology Demonstrations," the achievability of the M-045-00 retrieval goal must be assessed against a number of retrieval technologies, including salt cake dissolution, modified sluicing, vacuum retrieval, and robotic technologies.

Pursuant to Step 2(b), the M-045-00 retrieval goal must be assessed in the context of "regulatory requirements of high-level waste (HLW) disposal from applicable rules, regulations and DOE Orders." In conducting this evaluation, USDOE is required to "[e]stablish an interface with the Nuclear Regulatory Commission (NRC), and reach formal agreement on the retrieval and closure actions for single shell tanks with respect to allowable waste residuals in the tank and soil column."

Pursuant to Steps 3-5, the Tri-Parties are to evaluate the M-045-00 retrieval goal in light of the technology demonstrations and the regulatory analysis performed; to modify the retrieval goal as appropriate; and to finalize closure plans with formal criteria for retrieval of the remaining SSTs. To date, the Tri-Parties have not modified the retrieval goal of 360 ft³ or the limits of technology, whichever is less.

¹ Appendix H defines residual waste as follows: "Tank waste remaining in the tank after all waste retrieval actions have been completed. Some materials may be excluded from residual waste volume calculations, subject to approval in the closure plan."

Pursuant to Steps 4–8, USDOE is to proceed with retrieval of the remaining SSTs in accordance with approved closure plans, and to determine for each tank whether the M-045-00 retrieval goal has been met. If the goal has been met for a given tank, USDOE may proceed with final closure of that tank pursuant to Step 14. If the goal has not been met, USDOE may request a “regulatory waiver” of the retrieval criteria from Ecology and EPA (“Appendix H waiver”).

Pursuant to Step 9 and Attachment 2 to Appendix H, USDOE must include the following information in a request for an Appendix H waiver:

1. The reason [US]DOE does not believe the retrieval criteria can be met.
2. The schedule, using existing technology, to complete retrieval to the criteria if possible.
3. The potential for future retrieval technology developments that could achieve the criteria, including estimated schedules and costs for development and deployment.
4. The volume of waste proposed to be left in place, and [its] chemical and radiological characteristics.
5. Expected impacts to human health and the environment if the residual waste is left in place.
6. Additional information as required by EPA and/or Ecology.

If EPA and Ecology grant an Appendix H waiver, then “retrieval will be considered complete for the tanks in question,” and USDOE may proceed with final closure pursuant to Step 14. If EPA and Ecology deny USDOE’s request for an Appendix H waiver, then USDOE “must continue to attempt to retrieve the tank wastes until the criteria is met for the tank, or they may choose to enter into the RCRA dispute resolution procedures of [the HFFACO].”

II. History of the Dispute

Initiation of Waste Retrieval from 241-C-106

The original 1989 HFFACO included milestones to address the prolonged storage and ultimate treatment of tank waste. Under these original milestones, USDOE was required to complete the retrieval of waste from all 149 SSTs by 2018.²

In 1991, USDOE identified SST 241-C-106 as a “Priority 1” tank for resolution of safety issues due to the “heat-generating strontium-rich sludge” it contained.³ In 1994, the Tri-Parties established milestone M-045-03A, which required initiation of waste retrieval from C-106 by October 31, 1997.⁴ In May 1997, USDOE requested an extension of this milestone deadline to

² Milestone M-045-70 now requires USDOE to complete the retrieval of waste from all 149 SSTs by December 31, 2040.

³ WHC-SA-1215-FP. *Hanford Waste Tank Safety Issues*, at 4, 9–10 (Aug. 1991).

⁴ HFFACO Change Control Form No. M-45-93-01. *Complete Closure of Single Shell Tank Farms*, at 3 (Jan. 25, 1994).

September 1998.⁵ Ecology found that USDOE did not demonstrate that good cause existed for the extension and denied the request.

In response to the denial of its request for an extension, USDOE invoked the dispute resolution procedures of the HFFACO, which ultimately resulted in the issuance of a Final Determination by the Director of Ecology pursuant to HFFACO Article VIII, Paragraph 30(D).⁶ The Final Determination found that delays in the retrieval of C-106 were due to “management failures” of USDOE and its contractor, and affirmed the denial of USDOE’s extension request.⁷

USDOE appealed the Director’s Final Determination to the Pollution Control Hearings Board (PCHB). On September 29, 1998, the PCHB affirmed Ecology’s denial of USDOE’s request for an extension of M-045-03A.⁸

First Appendix H Waiver Request

On February 27, 2004, USDOE notified Ecology that “full scale retrieval of Tank 241-C-106 was completed on December 31, 2003.”⁹ USDOE stated that 359.0 ft³ of waste remained inside the tank following the deployment of two retrieval technologies—oxalic acid dissolution and modified sluicing. Because this value did not exceed the M-045-00 criterion of 360 ft³, USDOE did not request an Appendix H waiver at that time.

Two weeks later, on March 11, 2004, USDOE notified Ecology that, “after further evaluation of the volume data provided . . . ORP has determined that the remaining residual in 241-C-106 in fact exceeds the HFFACO criterion.”¹⁰ USDOE stated that it was “evaluating the feasibility of deploying another retrieval technology in C-106,” and therefore did not request an Appendix H waiver at that time.

By letter dated April 5, 2004, Ecology agreed with USDOE’s proposal to evaluate the feasibility of deploying an additional retrieval technology to reduce the volume of residual waste in C-106 in order to meet the M-045-00 criterion.¹¹ Ecology also set forth its expectations and requirements for a future Appendix H waiver request for C-106:

If ORP decides to initiate the Appendix H process for SST 241-C-106, Ecology will require the following:

⁵ See *U.S. Dep’t of Energy v. Dep’t of Ecology*, PCHB No. 97-157, at 7 (Sept. 29, 1998).

⁶ See *id.* at 8.

⁷ See *id.* at Ex. R-7.

⁸ See *id.* at 10.

⁹ 04-TPD-025. Roy J. Schepens, USDOE-ORP, to Michael A. Wilson, Ecology. *Completion of Hanford Federal Facility Agreement and Consent Order (HFFACO) Target Date M-45-05L-T01 and Partial Completion of Target Date M-45-05M-T01* (Feb. 27, 2004).

¹⁰ 04-TPD-030. Roy J. Schepens, USDOE-ORP, to Michael A. Wilson, Ecology. *Completion of Tank 241-C-106 Waste Retrieval* (Mar. 11, 2004).

¹¹ 0061551. Jeffery J. Lyon, Ecology, to Roy J. Schepens, USDOE-ORP. *Re: Single-Shell Tank 241-C-106* (Apr. 5, 2004).

1. A very rigorous, complete presentation of the information required in Attachment 2 of Appendix H. Specifically, to meet the requirements of Appendix H, Attachment 2, Step 3, ORP must provide a substantive, technically supported evaluation of retrieval technology developments that could achieve the criteria. This evaluation must include those forms of technology that are currently under consideration (i.e., the mobile retrieval system and the vacuum process).
2. For Appendix H, Step 2.b), a formal notification that USDOE has established an interface with the Nuclear Regulatory Commission (NRC) and reached "formal agreement" with NRC on "the necessary retrieval and closure actions for single shell tanks with respect to allowable waste residuals in the tank and soil column." ORP's notification to Ecology should include submission of this formal agreement with NRC.

Two months later, on June 3, 2004, USDOE submitted an Appendix H waiver request for C-106 to Ecology.¹² USDOE claimed that "deploying additional technology for further waste removal is not justified based on the technical merits of the available technologies, the minimal risk reduction potentially attained from additional retrieval, and the significant cost of deploying additional technology."

By letter dated August 10, 2004, Ecology denied USDOE's Appendix H waiver request due to "both procedural and technical deficiencies."¹³ But instead of requiring the deployment or development of additional retrieval technologies pursuant to Step 10 of Appendix H, Ecology stated that it would allow USDOE "to submit a revised exception request when the procedural and technical deficiencies outlined below have been addressed." The letter went on to identify a number of deficiencies in USDOE's request and the ways in which such deficiencies could be resolved. Of particular relevance to this dispute, Ecology summarized the "procedural deficiency" as follows:

Completion of the requirements in the Appendix H Retrieval Criteria Procedure, Step 2(b) and Step 9, to establish an interface with the Nuclear Regulatory Commission (NRC), and reach formal agreement on the retrieval and closure actions for SSTs with respect to allowable waste residuals in the tank and soil column. Ecology understands that USDOE-ORP is working on this issue and looks forward to a positive response from the NRC.

¹² 04-TPD-059. Roy J. Schepens, USDOE-ORP, to Michael A. Wilson, Ecology. *Request for Exception to the Hanford Federal Facility Agreement and Consent Order (HFFACO) Waste Retrieval Criteria, Retrieval Data Reports for Single-Shell Tank (SST) 241-C-106; HFFACO Milestones M-45-00 and M-45-05H, and Target Dates M-45-05L-T01 and M-45-05M-T01* (June 3, 2004).

¹³ 0062542. Michael Wilson, Ecology, to Roy J. Schepens, USDOE-ORP. *Re: Letter from R. Schepens, USDOE, to M. Wilson, Ecology, dated June 3, 2004, "Request for Exception to the Hanford Federal Facility Agreement and Consent Order (HFFACO) Waste Retrieval Criteria, Retrieval Data Reports for Single-Shell Tank (SST) 241-C-106; HFFACO Milestones M-45-00 and M-45-05H, and Target Dates M-45-05L-T01 and M-45-05M-T01", with 4 attachments* (Aug. 10, 2004).

Ecology's August 10, 2004 letter also reminded USDOE that Attachment 2 to Appendix H requires waiver requests to be submitted jointly to Ecology and EPA. On October 6, 2004, USDOE submitted the waiver request to EPA, explaining that it "was not formally provided to the U.S. Environmental Protection Agency concurrently with Ecology due to an administrative oversight."¹⁴

NRC Review of Waiver Request and SST Performance Assessment

On October 6, 2004, USDOE submitted the information supporting its Appendix H waiver request to NRC.¹⁵ USDOE stated that it was "seeking NRC technical review of its retrieval completion process and the analysis for determining radiological sufficiency of retrieval for Tank C-106." USDOE also stated that it was in the process of "developing other documents . . . for [NRC] review in the near future, including an SST . . . performance assessment."

On January 19, 2005, NRC transmitted its first set of comments, referred to as a Request for Additional Information (RAI) ("2005 RAI").¹⁶ Among other things, NRC asked USDOE to provide additional justification "to support the conclusion that current methods could not achieve the waste retrieval goal." As the basis for this comment, NRC explained:

The Stage II Retrieval Data Report for Single-Shell Tank 241-C-106 [3] indicates a "worst case" analysis shows that only 1.27 m³ (44.8 ft³) of waste could be removed with the existing modified sluicing and acid dissolution technologies. . . . This analysis appears to be non-conservative because the "worst case" removal estimate deliberately underestimates the amount of removal likely to result from additional removal efforts and thus is biased toward a decision not to pursue additional removal.

The 2005 RAI stated that "NRC cannot complete its review until the U.S. Department of Energy has provided responses to these comments." NRC also noted that it had not yet received "the performance assessment and supporting documentation used to develop the estimates of risk from material remaining in Single-Shell Tank (SST) 241-C-106" and that "additional comments and questions pertaining to tank retrieval may be generated after the performance assessment is reviewed."

¹⁴ 04-TPD-094. Roy J. Schepens, USDOE-ORP, to Nicholas Ceto, EPA. *Request for Exception to Hanford Federal Facility Agreement and Consent Order (HFFACO) Waste Retrieval Criteria, Retrieval Data Reports for Single-Shell Tank (SST) 241-C-106* (Oct. 6, 2004).

¹⁵ 04-TPD-095. Roy J. Schepens, USDOE-ORP, to Anna H. Bradford, NRC. *Request for Nuclear Regulatory Commission (NRC) Review of Basis for Exception to the Hanford Federal Facility Agreement and Consent Order Retrieval Criteria for Single-Shell Tank (SST) 241-C-106* (Oct. 6, 2004).

¹⁶ Anna H. Bradford, NRC, to Roy J. Schepens, USDOE-ORP. *Request for Additional Information on the Office of River Protection's Basis for Exception to the Hanford Federal Facility Agreement and Consent Order Waste Retrieval Criteria for Single-Shell Tank 241-C-106* (Jan. 19, 2005).

In April 2006, USDOE released its performance assessment (PA) for the SST System (“2006 SST PA”).¹⁷ A primary purpose of the 2006 SST PA was to analyze the entire SST System and “[e]stimate the impacts to human health of any residual wastes remaining in the tanks, ancillary equipment, or soil following waste and contaminant removal actions.”¹⁸

The 2006 SST PA concluded that contamination resulting from “past releases to the soil, primarily from past releases during tank farm operations,” had greater negative impact on the ability of groundwater to meet performance objectives as compared to residual waste left inside the tanks and ancillary equipment.¹⁹ In particular, the 2006 SST PA estimated that the total volume of liquid waste released to soils during past tank farm operations was “between 0.5 to 1 million gallons”²⁰ and concluded that “[r]emediation or immobilization of over 90% of key mobile contaminants found in past releases is indicated as necessary to address appropriate groundwater performance objectives at the WMA fenceline.”²¹

USDOE submitted the 2006 SST PA to NRC on May 18, 2006.²² Two years later, on April 18, 2008, USDOE submitted an updated “Basis for Exception to the HFFACO Retrieval Criteria for SST 241-C-106” to NRC.²³ USDOE explained that the document was “updated to address comments received from the NRC” and “includes an update to the estimates of risk from the Tank C-106 residual waste based on the results of the [2006] SST PA.” USDOE described its expectations for the scope of NRC review as follows:

Based on discussions with the EPA and Ecology, ORP believes that it would be helpful for NRC to review the waste retrieval actions completed at Tank C-106 In particular, ORP requests NRC to assess the soundness of ORP’s conclusions regarding completion of retrieval. ORP also requests that NRC provide a final report documenting its conclusions at the completion of its review.

Also on April 18, 2008, USDOE transmitted this updated information to Ecology and EPA.²⁴ USDOE stated: “ORP requests Ecology and EPA take no further action on the

¹⁷ DOE/ORP-2005-01, Rev. 0. *Initial Single-Shell Tank System Performance Assessment for the Hanford Site* (Apr. 2006).

¹⁸ *Id.* at ES-ii (emphasis added).

¹⁹ *Id.* at ES-i.

²⁰ *Id.* at ES-iii.

²¹ *Id.* at ES-i.

²² 06-TPD-028. Roy J. Schepens, USDOE-ORP, to Scott C. Flanders, NRC. *Submittal of the U.S. Department of Energy (DOE), Office of River Protection (ORP) Hanford Single-Shell Tank (SST) Performance Assessment (PA), DOE/ORP-2006-01 Revision 0, for Review* (May 18, 2006).

²³ 08-TPD-017. Shirley J. Olinger, USDOE-ORP, to Scott C. Flanders, NRC. *Update to the Basis for Exception to the Hanford Federal Facility Agreement and Consent Order (HFFACO) Retrieval Criteria for Single-Shell Tank (SST) 241-C-106, Request for Nuclear Regulatory Commission (NRC) Review* (Apr. 18, 2008).

²⁴ 08-TPD-019. Shirley J. Olinger, USDOE-ORP, to Jane Hedges, Ecology, and Nicholas Ceto, EPA. *Update to the Basis for Exception to the Hanford Federal Facility Agreement and Consent Order (HFFACO) Retrieval Criteria for Single-Shell Tank (SST) 241-C-106* (Apr. 18, 2008).

Tank C-106 exception request at this time. The primary purpose for issuing this revision is to allow the NRC to perform its review.” As requested, Ecology took no further action pending NRC’s review of the updated information.

On January 30, 2009, NRC transmitted its second set of comments based on its review of the updated information that USDOE submitted in April 2008 (“2009 RAI”).²⁵ In analyzing whether key radionuclides had been removed from the residual waste in C-106 to the maximum extent practical, as required by DOE Order 435.1, NRC commented that “detailed information on the amount and types of radioactivity removed from the tank was not provided” and that “[i]nsufficient information was provided to determine the ability of the selected waste retrieval technology and alternatives to remove key radionuclides.”²⁶

With respect to the radiological risk associated with the residual waste in C-106, NRC commented that “limited information is provided regarding the screening process used to identify primary contaminants of potential concern that were targeted for sampling” and that “[t]he basis for elimination of [certain] radionuclides is not clear.”²⁷ NRC also commented that “additional justification is needed regarding the assumption of homogeneity of the residual waste that was used as a basis for determining the sufficiency of a single sample location to develop inventory estimates for Tank C-106.”²⁸

With respect to soil contamination caused by past releases, NRC commented that “limited information is provided on the distribution of contaminant plumes in the subsurface over time that may show [e]ffects of dispersion, lateral flow in the vadose zone, or other factors affecting contaminant concentrations in saturated groundwater.”²⁹ Among other things, NRC asked USDOE to provide “[a]dditional information on the modeling and calibration of past releases and a discussion of the relevance of these past releases to future conditions and events.”³⁰

USDOE never submitted a written response to the 2009 RAI.

Second Appendix H Waiver Request

On February 27, 2018, USDOE directed NRC to “close its review of the [US]DOE exception request for Tank 241-C-106 under the HFFACO.”³¹ USDOE explained that it identified a “common theme” in NRC’s 2009 RAI “that the retrieval [of C-106] should be considered with

²⁵ Patrice M. Bubar, NRC, to Shirley J. Olinger, USDOE-ORP, *Request for Additional Information on Update to the Basis for Exception to the Hanford Federal Facility Agreement and Consent Order Retrieval Criteria for Single-Shell Tank 241-C-106, Request for U.S. Nuclear Regulatory Commission Review* (Jan. 30, 2009).

²⁶ *Id.* at 16 (Comment 24).

²⁷ *Id.* at 14 (Comment 22).

²⁸ *Id.* at 15 (Comment 23).

²⁹ *Id.* at 10 (Comment 15).

³⁰ *Id.* at 9 (Comment 14).

³¹ 18-ECD-0009. Brian T. Vance, USDOE-ORP, to John Tappert, NRC, *Request the U.S. Nuclear Regulatory Commission Close its Review of U.S. Department of Energy Exception Request for Tank 241-C-106 Under Appendix H of the Hanford Federal Facility Agreement and Consent Order* (Feb. 27, 2018).

the entire Tank Farm” in which C-106 is located, referred to as Waste Management Area C (WMA-C). USDOE noted that NRC is currently reviewing a PA for WMA-C in the context of reviewing USDOE’s draft Waste Incidental to Reprocessing (WIR) Evaluation for WMA-C, and asserted that “NRC will formally review the final risk decision for all of the 16 primary tanks, 5 ancillary tanks, 7 diversion boxes, and past operational releases with the upcoming closure decision in the context of the entire WMA-C.”

NRC responded to USDOE’s request by letter dated April 23, 2018.³² NRC noted that USDOE never responded to the 2009 RAI but agreed that a “common theme” of the 2009 RAI was that “the retrieval exception for Tank 241-C-106 would be more appropriately evaluated within the context of the staff’s risk evaluation of the entire Waste Management Area C (WMA-C) tank farm.” NRC accepted USDOE’s request to close its review of the Appendix H waiver request for C-106 and stated that “the technical issues identified previously by the staff related to the Tank 241-C-106 retrieval will be incorporated into the NRC’s evaluation of WMA-C.”

On August 15, 2018, USDOE notified Ecology and EPA that “NRC has agreed to close its review of the Tank 241-C-106 exception request” and that NRC would review the post-retrieval waste volume from C-106 “as part of its formal consultative review” of the draft WIR Evaluation for WMA-C.³³ USDOE then renewed its request for an Appendix H waiver for C-106:

With closure of the NRC consultation, [US]DOE respectfully requests reconsideration of its Petition for Regulatory Waiver of the Appendix H residual criteria from U.S. Environmental Protection Agency and Washington State Department of Ecology as outlined in HFFACO Appendix H, Step 9.

By letter dated January 16, 2019, Ecology denied USDOE’s renewed request for an Appendix H waiver for C-106.³⁴ Ecology stated, in pertinent part:

Ecology cannot approve the waiver request at this time. USDOE-ORP must complete the Appendix H SST Waste Retrieval Criteria Procedure initiated in 2004.

...

During the initial Appendix H efforts related to 241-C-106 (2004-2008), USDOE-ORP requested the NRC’s review of the Appendix I Performance Assessment (IPA) for the SST system (DOE/ORP-2005-01, 2006). The document USDOE-

³² John Tappert, NRC, to Brian T. Vance, USDOE-ORP. *U.S. Nuclear Regulatory Commission Staff Response to the U.S. Department of Energy’s Request to Close the U.S. Nuclear Regulatory Commission’s Review of the Tank 241-C-106 Exception Request Under Appendix H of the Hanford Federal Facility Agreement and Consent Order* (Apr. 23, 2018).

³³ 18-ECD-0055. Brian T. Vance, USDOE-ORP, to Alexandra K. Smith, Ecology, and Dave Einan, EPA. *Request for Waiver to Hanford Federal Facility Agreement and Consent Order Waste Retrieval Criteria for Single-Shell Tank 241-C-106* (Aug. 15, 2018).

³⁴ 19-NWP-012. Alexandra K. Smith, Ecology, to Brian T. Vance, USDOE-ORP. *Denial of the United States Department of Energy – Office of River Protection’s (USDOE-ORP) Request for Waiver to Hanford Federal Facility Agreement and Consent Order Waste Retrieval Criteria for Single-Shell Tank 241-C-106* (Jan. 16, 2019).

ORP submitted for NRC review was a fully-integrated IPA and properly included discussion of impacts from both the tank residuals and soil contamination.

Although USDOE-ORP properly initiated the Appendix H and I processes for 241-C-106, USDOE-ORP failed to reach formal agreement with the NRC regarding the allowable waste residuals in the tank and soil column.

...

Ecology will continue to support USDOE-ORP in your efforts to close tank farms, but we can only do that when USDOE-ORP properly completes the HFFACO Appendix H and I processes initiated in 2004.

Ecology expects USDOE-ORP to establish an interface with the NRC that includes NRC review of the complete IPA and resolution of the 2009 RAI to the satisfaction of the NRC. This is necessary for Ecology to consider granting a waiver of the Appendix H waste retrieval criteria for 241-C-106.

On January 23, 2019, USDOE invoked the HFFACO dispute resolution process based on its objection to Ecology's denial of the renewed request for an Appendix H waiver.³⁵ USDOE committed to "make a good faith effort to informally resolve this dispute with Ecology at the Project Manager level."

HFFACO Dispute Resolution Process

HFFACO Article VIII, Paragraph 30, establishes a dispute resolution process that requires USDOE and Ecology to "make reasonable efforts to informally resolve disputes at the project manager level." If the project managers cannot resolve the dispute informally within 30 days, USDOE may elevate the issue to the Interagency Management Integration Team (IAMIT) by submitting a written statement of dispute.

Upon submission of a written statement of dispute, the IAMIT must "unanimously resolve the dispute" within 21 days, unless the Parties agree to an extension. If the IAMIT is "unable" to resolve the dispute unanimously, then "the Director of Ecology shall make a final written decision or written determination no more than thirty-five (35) days after submission of the written statement of the dispute to the IAMIT." If USDOE objects to the Director's Determination, it may challenge the decision pursuant to the Administrative Procedure Act, RCW 34.05, "in either the Pollution Control Hearing[s] Board (PCHB) or in the courts."

Following USDOE's invocation of the HFFACO dispute resolution process on January 23, 2019, project managers from USDOE and Ecology met at least twice in an attempt to reach informal resolution. The Parties agreed to a 30-day extension of the dispute at the project manager level, but the project managers remained unable to reach a resolution.

³⁵ 19-ECD-0007. Brian T. Vance, USDOE-ORP, to Alexandra K. Smith, Ecology. *Initiation of Dispute Resolution Process for Denial of Request for Waiver to Hanford Federal Facility Agreement and Consent Order Waste Retrieval Criteria for Single-Shell Tank 241-C-106* (Jan. 23, 2019).

USDOE submitted its written statement of dispute to Ecology on March 21, 2019 in order to elevate the dispute to the IAMIT. USDOE argued that, based on the language of Appendix H, the Step 2(b) requirement to reach formal agreement with NRC regarding the allowable waste residuals in the tank and soil column is not triggered if USDOE determines that there are no “rules, regulations and DOE Orders that contain requirements of high-level waste disposal.” USDOE went on to argue that the only potential source of such requirements is the Nuclear Waste Policy Act (NWPA), and that “the NWPA is not an applicable rule, regulation, or DOE Order” because “neither the SSTs (including SST 241-C-106), nor the soil column surrounding them are repositories.”

USDOE also argued that considering soil contamination in the context of tank waste retrieval requirements under Appendix H is inappropriate. USDOE stated that any requirement for NRC to review the radiological risk posed by soil contamination in the tank farms “would be better suited to discuss in the context of Appendix I and not Appendix H.”

USDOE proposed as a “path forward to resolve dispute” that Ecology should reverse its decision and issue an Appendix H waiver for C-106. *See* Section III, USDOE Proposed Resolution, *infra*.

On May 8, 2019, the Parties agreed to extend the deadline for the Ecology Director’s Final Determination until “14 days after the IAMIT determines it cannot resolve the dispute.” The Parties also agreed to extend the period of dispute resolution at the IAMIT level until June 12.

On May 13, 2019, Ecology transmitted to the IAMIT via e-mail a written proposal for resolution of the dispute. *See* Section IV, Ecology Proposed Resolution, *infra*. Ecology offered to waive or postpone the Step 10 requirement to perform additional retrieval activities if USDOE would agree to update its interagency agreement with NRC to allow for NRC review of the entire PA for WMA-C, including soil contamination. Ecology also proposed that the Parties work together to amend HFFACO Appendices H and I and to establish milestones for the closure of WMA-C.

On May 21, USDOE sent a status update to the IAMIT via e-mail, stating that USDOE had commenced “internal discussions” about Ecology’s proposal earlier that day and that “they continue to talk.” This status update reiterated that the deadline to resolve the dispute at the IAMIT level was June 12. However, USDOE did not respond to Ecology’s proposal or provide a counterproposal by the June 12 deadline, nor did USDOE request an extension by that date. Accordingly, the deadline for the Ecology Director’s Final Determination is June 26, 2019.

III. USDOE Proposed Resolution

On March 21, 2019, USDOE submitted its written statement of dispute in order to elevate the dispute to the IAMIT level. USDOE proposed the following resolution:

Ecology should grant the Appendix H, Step 9 regulatory waiver for SST 241-C-106 because the [US]DOE-ORP completed all of the Appendix H steps that precede Ecology’s Step 10 Waiver Acceptance since:

- a. The [US]DOE-ORP completed its Appendix H, Step 2(b) evaluation of Appendix H, Step 1 tank retrieval goal against applicable high-level waste disposal rules, regulations and DOE Orders; and
- b. Appendix H tank waste residual retrieval process is separate and distinct from Appendix I requirements that apply to soil contamination and closure.

USDOE did not propose taking any additional action to satisfy the requirements of Appendix H, Steps 1 through 9 or Attachment 2. Instead, USDOE merely proposed that Ecology reverse its decision and issue an Appendix H waiver for C-106.

IV. Ecology Proposed Resolution

On May 13, 2019, Ecology transmitted to the IAMIT via e-mail a written proposal for resolution of the dispute. The e-mail set forth Ecology's proposal as follows:

- [USDOE-]ORP and Ecology sign an Agreement in Principle to negotiate changes to Appendix H & I
- [USDOE-]ORP and Ecology sign a tentative agreement on [HFFACO] milestones for C Farm closure (attached)
- [US]DOE modify its Inter-Agency Agreement with NRC, similar to the interagency agreement provided as Attachment 1 of the USDOE letter 04-TPD-085, to have NRC complete a review of [the] current 4-volume Performance Assessment, including soil contamination.
- Signed IAMIT agreement would stipulate that:
 - Ecology is not asking ORP to do further retrievals at this time
 - Ecology will use the NRC response to complete Appendix H, Attachment 2, item #6, that Ecology needs to process the waiver request
 - [USDOE-]ORP will re-submit the waiver request after NRC completes their review

USDOE did not respond to this proposal, nor did USDOE provide a counterproposal.

V. Findings and Final Determination

F-1. HFFACO Appendix H does not create a guaranteed right or entitlement to issuance of a regulatory waiver merely upon satisfaction of the criteria enumerated in Steps 1-9 and Attachment 2. Issuance of a regulatory waiver under Appendix H is a discretionary decision for Ecology and EPA to make once USDOE has demonstrated that all applicable criteria have been met.

F-2. USDOE's statement that "each step of the [Appendix H] series must be completed before it is possible to progress to the next step" is not accurate. The "steps" set forth in Appendix H establish an iterative process by which the Parties continuously develop and refine retrieval technologies, retrieval goals, and plans for tank closure as work progresses and lessons are learned. The process is intended to provide flexibility in timing and/or sequence as necessary to maintain progress in retrieving waste from SSTs

in the face of changed or unanticipated conditions, such as permitting delays caused by USDOE's submission of insufficient permit application materials.

- F-3. USDOE has not demonstrated that all applicable criteria in Appendix H have been met. Although USDOE claims that it "completed Steps 1 through 9," there can be no genuine dispute that a number of these steps have not been completed. For example, the Parties have not finalized SST closure plans, as required by Step 5; nor has USDOE completed retrieval "in accordance with approved closure plans," as required by Step 6. In addition, USDOE has not complied with Ecology's request for additional information pursuant to Appendix H, Attachment 2, Item #6.
- F-4. Of particular importance to this dispute, USDOE has not established an interface with the NRC that will allow NRC to provide input related to allowable waste residuals in the soil column, as required by Step 2(b). Although USDOE claims that it completed Step 2(b) by conducting an "evaluation of Appendix H, Step 1 tank retrieval goals against applicable high-level waste disposal rules, regulations and DOE Orders," USDOE has provided no documentation to establish that it has reached "formal agreement" with NRC as to the "allowable waste residuals in the tank and soil column."
- F-5. USDOE's statement that "there are no applicable rules, regulations and DOE Orders against which to evaluate the Step 1 retrieval goal" is not accurate. Contrary to USDOE's assertion, the Nuclear Waste Policy Act is not the only source of "regulatory requirements of high-level waste (HLW) disposal." For example, "radioactive high level wastes generated during the reprocessing of fuel rods" are subject to Land Disposal Restrictions (LDR) under RCRA/HWMA: these wastes must be vitrified prior to land disposal. *See* WAC 173-303-140(2)(a) (incorporating by reference 40 C.F.R. §§ 268.40, 268.42). The retrieval of mixed waste from a tank system is also required by Washington's Dangerous Waste regulations as part of closure. *See* WAC 173-303-640(8). In addition, regulatory decisions related to the amount of residual waste that can be left in a tank system are subject to environmental review pursuant to the National Environmental Policy Act, 42 U.S.C. Chapter 55, and/or the State Environmental Policy Act, RCW 43.21C.
- F-6. NRC's acceptance of USDOE's request for NRC to "close its review" of the Appendix H waiver request for C-106 does not constitute the formal agreement required by Appendix H, Step 2(b). NRC's letter dated April 23, 2018, made clear that NRC intended to merge its review of USDOE's retrieval of C-106 into its review of USDOE's draft WIR Evaluation for WMA-C. That review is currently ongoing.
- F-7. As recently as February 27, 2018, USDOE acknowledged its obligation to establish an interface with NRC that involves review of the risk associated with soil contamination caused by past releases during tank farm operations. In particular, USDOE Manager Brian T. Vance wrote: "In the near future, NRC will formally review the final risk decision for all of the 16 primary tanks, 5 ancillary tanks, 7 diversion boxes, *and past operational releases* with the upcoming closure decision in context of the entire WMA-C." 18-ECD-0009, at 2 (emphasis added). However, the portion of the WMA-C

PA that NRC is currently reviewing in the context of USDOE's draft WIR Evaluation for WMA-C does not include any information or risk analysis related to soil contamination. The NRC's review of the draft WIR Evaluation for WMA-C is limited to radiological risks associated with residual waste inside the tanks and ancillary equipment.

- F-8. Ecology may deny USDOE's request for a regulatory waiver under Appendix H without automatically triggering an obligation for USDOE to immediately begin additional retrieval operations. Ecology has discretion to waive or postpone the requirement set forth in Appendix H, Step 10, to perform additional retrieval operations upon denial of a waiver request.

Consequently, in light of the Administrative Record and the findings outlined above, my final determination in this matter is as follows:

- D-1. Ecology's denial of USDOE's request for a regulatory waiver of the retrieval criteria for 241-C-106, pursuant to HFFACO Appendix H, was reasonable under the circumstances and is hereby affirmed.
- D-2. Ecology is not requiring USDOE to perform additional retrieval operations for C-106 at this time. In addition, Ecology will not require USDOE to perform additional retrieval of C-106 during the pendency of NRC's review of the draft WIR Evaluation for WMA-C and the WMA-C PA, *provided that* the scope of NRC's review of the WMA-C PA is adequately expanded to include consideration and analysis of allowable waste residuals in the soil column, as required by Appendix H, Step 2(b).
- D-3. Ecology reserves the right to require additional retrieval operations prior to final closure of C-106 if USDOE does not reach formal agreement with NRC on the retrieval and closure actions for C-106 with respect to allowable waste residuals in the tank and soil column, as required by Appendix H, Step 2(b).

Approved and issued this 26th day of June 2019.



Maia D. Bellon, Director
State of Washington, Department of Ecology