DEPARTMENT OF ECOLOGY
State of Washington

Fact Sheet for Hanford 200 Area Effluent Treatment Facility Delisting Modification

June 2021

Purpose of this Fact Sheet

This fact sheet explains and documents the evaluation the Department of Ecology (Ecology) performed in making a tentative decision to grant targeted technical amendments to the existing exclusion for the United States Department of Energy (Energy) for the Hanford Site in Richland, Washington. This will be a deregulatory action that will allow the petitioning facility to manage additional liquid effluents from startup of the Direct Feed Low Activity Waste treatment system (DFLAW) as non-hazardous.

Ecology is providing written notice of its tentative decision to grant these changes submitted by Energy for public review and comment at least thirty (30) days before making the final decision on the proposed delisting modification. Copies of the official submittal for the proposed modifications, changes and supporting information and this fact sheet are available for public review and comment from June 7 through July 7, 2021. Submit comments to Hanford 200 Area Effluent Treatment Facility Delisting Modification by July 7, 2021.

Upon the written request of any interested person, Ecology may, at its discretion, hold a conference to consider oral comments on the action proposed in the delisting modification. A person requesting a conference must state the issues to be raised and explain why written comments would not suffice to communicate the person's views.

After evaluating all public comments, Ecology will make a final decision to grant or deny the delisting modification. The approval or denial of the proposed modifications will be by letter from Ecology. We will summarize substantive comments and provide responses to them and make it available with the final decision to approve or deny the proposed delisting modifications. The full document will become part of the administrative record contained in the two facilities' regulatory files.

Summary

The Department of Ecology's Nuclear Waste Program is proposing technical amendments to an existing exclusion from the list of federal hazardous waste (delisting) issued to the United States Department of Energy (Energy) under the Resource Conservation and Recovery Act. Energy formally submitted a petition on March 31, 2021, in accordance with Washington Administrative Code (WAC) 173-303-910(3). The petition requests modifications that address changes to the 200-Area Effluent Treatment System associated with the delisting necessary to accept liquid effluents expected to be generated from vitrification of certain low-activity mixed wastes at the Hanford Federal Facility, or Hanford Site, in Richland, Washington. These amendments relate to the planned startup of the Hanford Waste Treatment and Immobilization Plant.

These will be modifications to the existing Hanford 200 Area Effluent Treatment Facility (ETF) delisting, under which ETF treated effluent has been managed since initial promulgation of this

exclusion by the U.S. Environmental Protection Agency (EPA) in 1995 (See 60 Federal Register [FR] 31107, June 13, 1995) and subsequent approval by Ecology. Energy also submitted a delisting modification to the existing Hanford 200 Area Effluent on May 27, 2004, for an expanded constituents list and an increase in the annual ETF treated effluent volume limit. This delisting modification was approved by Ecology in 2005.

The process for delisting is a two-step process. First, EPA must grant the petition through a formal Federal Register rulemaking. Then, Ecology considers both the information required by EPA and additional information that addresses separate state criteria to determine granting or not granting the petition for the state. EPA is currently publishing the Notice to grant the petition. Ecology has reviewed all information submitted as part of the petition and is tentatively approving the petition and making it available for public comment.

Background

Hanford's 200 Area Effluent Treatment Facility

The 200 Area ETF is a radioactive aqueous wastewater treatment system located in the 200 East Area of the Hanford Site that provides treatment for a variety of aqueous mixed waste. This aqueous waste includes process condensate from the 242-A Evaporator, Hanford landfill leachates, and other aqueous waste generated from onsite remediation and waste management activities, potentially carrying a range of listed and characteristic dangerous waste numbers. The 200 Area ETF consists of a primary and a secondary treatment train. The primary train includes treatment processes to treat both organic and inorganic waste constituents, including ultraviolet oxidation (UV/OX), reverse osmosis, ion exchange, pH adjustment and filtration. The secondary treatment train manages backwash from the primary treatment train filters, ion exchange regeneration, and the stream from the reverse osmosis system that is retained by the reverse osmosis membrane, also known as retentate. Construction of the 200 Area ETF began in 1992 with waste management operations beginning in November of 1995.

Treated effluent from the 200 Area ETF is discharged to the State Approved Land Disposal Site, or SALDS, located north of the 200 West Area of the Hanford Site. This disposal unit allows tritium remaining in the treated effluent to naturally decay in the subsurface – it is not authorized to accept dangerous waste. To this end, the EPA issued an exclusion from the list of hazardous wastes to Energy in 1995. See 60 Federal Register (FR) 6054, February 1, 1995. This exclusion was amended by the EPA in 2005. See 70 FR 44496, August 3, 2005.

Hanford's Waste Treatment and Immobilization Plant

The Waste Treatment and Immobilization Plant (WTP), is intended to process and stabilize much of the 56 million gallons of radioactive and chemical waste currently stored at the Hanford Site. As originally envisioned, the WTP would treat high-level and low-activity radioactive waste simultaneously. To begin treating waste as soon as practicable, Energy developed an approach to treat low-activity waste prior to the start-up of the WTP pre-treatment and the high-level waste facilities. This approach is called direct-feed low-activity waste, or DFLAW, and is focused on sending low-activity waste from the tank farms directly to the WTP Low-Activity Waste (LAW) Facility. A new Effluent Management Facility (EMF) has been constructed at the WTP to manage effluents generated from the WTP LAW Facility during

DFLAW. The EMF is needed to evaporate the liquid secondary waste generated by the off-gas treatment system associated with the two WTP LAW Facility vitrification melters. Evaporator process condensate from the EMF, combined with WTP LAW Facility caustic scrubber effluents, will receive treatment at the 200 Area ETF, with the resulting treated effluent disposed of at the SALDS. The waste stream transferred from WTP to the 200 Area ETF is referred to as the WTP DFLAW effluent waste stream.

Changes to 200 Area Effluent Treatment Facility Capability

Through the design and permitting of the WTP complex, Energy identified several additional constituents it expected to be present in WTP DFLAW effluent waste stream which are not typically found in wastes managed by the 200 Area ETF, or are present at levels above the current capabilities of the 200 Area ETF. Most of these additional constituents are within the existing treatment capabilities of the 200 Area ETF, and do not require special consideration. One constituent, acetonitrile, which is formed in the WTP LAW Facility vitrification melters, is predicted to be present at levels in excess of the current capability of the 200 Area ETF, as reflected in the current organic treatability envelope documented in Table C–2 of the delisting petition dated November 29, 2001. Within the 200 Area ETF, the UV/OX system treats organic compounds, including but not limited to acetonitrile. However, acetonitrile is not easily degraded through UV/OX. Table C-2 in the November 29, 2001, petition shows an electrical energy per order (EE/O) of magnitude destruction of 50. EE/O reflects the relative difficulty for destruction of the organic constituent in the UV/OX unit. Constituents in Table C-2 with an EE/O of 40 or higher are considered hard to treat organics.

After examining various options for addressing this issue, Energy determined that the addition of supplemental organic treatment in the form of a steam stripper to the 200-ETF to separate acetonitrile from treated effluents would be the preferred approach to ensuring additional constituents associated with the WTP DFLAW effluent waste stream can be effectively managed at the 200 Area ETF. To accommodate the addition of the proposed steam stripper unit to the 200 Area ETF, two technical amendments are necessary to the current delisting. First, the list of unit operations in Condition (1)(d)(iv) of the current delisting must be amended to include steam stripping. Second, a new condition is necessary to establish a mechanism whereby Energy can operate the 200 Area ETF outside of the existing treatability envelope to gather demonstration test data to increase the treatability envelope concentration for acetonitrile to accommodate the predicted level in the WTP DFLAW effluent waste stream.

Delisting Regulations

Ecology regulates the management of dangerous waste in Washington State in accordance with the Washington State Hazardous Waste Management Act, Chapter 70.105 Revised Code of Washington (RCW) and the Dangerous Waste Regulations, Chapter 173-303 WAC.

EPA also regulates facilities that manage hazardous waste in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) and the Hazardous and Solid Waste Amendments of 1984 (HSWA) and the regulations in Title 40 of the Code of Federal Regulations (CFR). EPA has authorized Ecology to implement these federal regulations in Washington.

Both the federal hazardous waste regulations and state dangerous waste regulations include provisions that allow a facility to petition for exclusion ("delisting") from the list of federal hazardous wastes. The state provisions for delisting petitions are found in WAC 173-303-910(1) and (3). The federal provisions for delisting petitions are found in 40 CFR 260.20 and 260.22.

While Ecology has received final authorization to implement most of its dangerous waste program regulations in lieu of the federal program, including the listing and identification of U019 and U220 wastes, it has not been authorized to implement its delisting regulations program in lieu of the federal program. As a result, Energy must seek approval of their delisting petition from both Washington State and EPA.

State-Only Criteria

The Washington State Dangerous Waste Regulations are more protective in some ways than the federal hazardous waste regulations. One area where the state regulations are more protective is determining what materials are regulated as dangerous waste. Washington has criteria for toxicity and persistence that the EPA does not. Materials not regulated as hazardous waste by the federal regulations must also be checked during the delisting evaluation process against the state criteria in WAC 173-303-100.

Proposed Decision

Ecology has reviewed all information submitted as part of the delisting petition and has made a tentative decision to grant this petition for modification.

Based on the review of the petition submitted by Energy, there do not appear to be any significant legal, environmental, scientific, or economic issues. The facility has demonstrated compliance with applicable regulatory criteria for this action.

Ecology is proposing to grant the petition, pending approval by EPA after publication in the Federal Register and any subsequent revisions resulting from public comment. This approval is conditional. Energy must meet delisting levels, conduct waste verification testing, and meet data submittal requirements and other conditions, as outlined in EPA's notice of proposed delisting. EPA's notice can be found on the Federal Register.