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Superfund Focus Sheet

U.S. EPA Issues Explanation of Significant Difference (ESD) For USDOE Hanford 300 Area, 300-FF-1 Operable Unit, Hanford Site

Benton County, Washington

During cleanup of the 300-FF-1 Operable Unit (OU) located in the 300 Area of the Hanford Site, unexpected lead contamination was encountered in the soil at a waste site. The lead-contaminated soil also contains debris that is not contaminated with lead but may be radioactively contaminated. Since there is no way to release the debris as free of radioactive contamination, it must be disposed of in the Environmental Restoration Disposal Facility (ERDF). The lead contamination is in a form and quantity that has caused the soil to be classified as Resource Conservation and Recovery Act of 1980 (RCRA) hazardous waste that is also subject to land disposal restriction (LDR) requirements. The 1996 record of decision (ROD) that governs cleanup of the 300-FF-1 OU selected a remedy consisting of excavation of contaminated soil and debris from the waste sites and subsequent disposal in the ERDF. The ROD also specified that any wastes not meeting the land disposal restriction criteria, as defined by RCRA, would require treatment or a treatment variance prior to land disposal at the ERDF.

The U.S. Environmental Protection Agency (EPA), the U.S. Department of Energy (DOE), and the Washington State Department of Ecology (Ecology)(the Tri-Parties) concur that an explanation of significant difference (ESD) is the appropriate method to document this change to the selected remedy in accordance with CERCLA. A site-specific treatment variance is approved through this ESD. The change will reduce cleanup cost and complexity, while maintaining protection for human health and the environment.

Site Background

The Hanford Site was listed on the National Priorities List (NPL) in November 1989. The listing consisted of four NPL Sites including the 100 Area, the 200 Area, the 300 Area, and the 1100 Area. Each of these areas was further divided into OUs, which are groupings of individual waste units based primarily on geographic area and common waste sources. The 300 Area NPL Site consists of the 300-FF-1, 300-FF-2 and 300-FF-5 OUs.

The 300-FF-1 OU addresses contaminated soil, structures, and debris associated with burial grounds and many of the past 300 Area liquid waste disposal units. The OU covers an area of approximately 47.4 ha (117 acres), and is bounded on the east by the Columbia River. The primary contaminants found in 300-FF-1OU waste sites are isotopes of uranium and cobalt, as well as arsenic, cadmium, PCBs, and the newly discovered lead.

Explanation of Significant Difference

The LDR standard for lead in soil is 5 mg/L based on the Toxicity Characteristic Leachate Procedure (TCLP). Leachable lead concentrations in samples collected from the waste site ranged from 19 mg/L to less than 1 mg/L by the TCLP. Treatment of the lead-contaminated soil from this site to meet the LDR standard would result in concentrations that are below those necessary to minimize short- and long-term threats to human health and the environment.

This ESD exercises an option in the 300-FF-1 OU ROD to approve a site-specific variance from the applicable LDR treatment standard for lead and establishes an alternative treatment standard of 25 mg/L by the TCLP. Lead-contaminated soil may be disposed of in the ERDF without treatment if the alternative treatment standard is met. Soil with concentrations of lead exceeding the 25 mg/L alternative standard must be treated such that leachability is reduced by 90% or less than 3.7 mg/L, whichever is less stringent.

Using a reasonable maximum exposure scenario, implementation of the 25 mg/L alternative standard is protective of and minimizes threats to human health and the environment posed by land disposal of the waste. A two-step process was used to determine that this alternative level is protective. First, considering direct exposure, the reasonable maximum exposure scenario for the ERDF is industrial land use. An appropriate level for total lead concentration in industrial soil is 1000 mg/kg. The mean total

lead concentration for soils at this site is 576 mg/kg, well below the applicable standard. Second, considering potential groundwater impacts, test results from underlying soil at the waste site do not show any elevated lead concentrations, even though the wastes were placed there 20 to 30 years ago.

In addition to evaluation of direct exposure and groundwater impacts, a modified TCLP test was performed to predict leachability of the waste after disposal in the ERDF. Instead of the prescribed TCLP solution, liquid from the ERDF leachate collection system was used to test the leachability of the lead. The highest leachable lead concentration using the modified leach test was 0.05 mg/L. Therefore, the alternative lead treatment standard of 25 mg/L is protective of human health and the environment. This change will reduce cleanup cost and complexity, while maintaining protection for human health and the environment.

At the waste site there is approximately 725 cubic meters of soil and 200 cubic meters of debris, completely intermingled. The soil meets the 300-FF-1 OU radiological cleanup standard, but is lead-contaminated. The debris is not lead-contaminated, but cannot be free-released as non-radioactive. Disposal of the debris at the ERDF is required to be protective. One option is to screen out the debris, leaving the soil in place without triggering LDR issues. This would be a labor-intensive manual task, with an increased potential for personnel injury. The other option would be to treat the soil and debris together, which would cost approximately $200,000 more. This change improves on the other two options by reducing the complexity (no sorting) and the cost ($59,000 versus $253,000). In addition, it would be more protective to dispose of both the soil and debris in ERDF as described by this change.

What's Next?

The amended remedy remains protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements directly associated with these remedial actions, and is cost-effective. However, this remedy will still result in hazardous substances remaining in the ERDF above health-based levels, so a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment

For More Information

The Explanation of Significant Difference and other site documents are available for public review at the following information repositories:

PORTLAND
Portland State University
Branford Price Millar Library
934 SW Harrison and Park
Attn: Michael Bowman
(503) 725-3690

RICHLAND
U.S. Department of Energy Public Reading Room
Washington State University
2770 University Drive
CIC Room 101L
Attn: Terri Traub
(509) 372-7443

SPOKANE
Gonzaga University Foley Center
E. 502 Boone
Attn: Connie Scarpelli
(509) 323-3839

SEATTLE
University of Washington
Suzzallo Library Government Publications
Attn: Eleanor Chase
(206) 543-7443

In addition, other detailed information concerning this proposal is also available at the Washington State University, Tri-Cities location. If you have any questions about the Explanation of Significant Difference, please contact:

Dave Einan
U.S. EPA Project Manager
712 Swift Boulevard, Suite 5
Richland, Washington 99352
(509) 376-3883
David.Einan@epa.gov

Bob McLeod
U.S. Department of Energy Project Manager
3350 George Washington Way
Richland, Washington 99352
(509) 372-0096
Robert_G_Bob_McLeod@rl.gov

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