



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

Requirements for Idaho High Level Radioactive Waste Treatment & Disposal

Teresa Perkins & Joel Case

U.S. DOE— Idaho Operations Office

February 21, 2018

Idaho Cleanup Project HLW Management

- **Idaho Cleanup Project is responsible for the high level waste (HLW) calcine stored in bin sets and the sodium-bearing waste (SBW) in the tank farm, all located at the Idaho Nuclear Technology and Engineering Center (INTEC).**
 - Both waste streams are radioactive and hazardous wastes (“mixed waste”).
- **SBW is proposed to be considered “Waste Incidental to Reprocessing” and classified as transuranic waste.**
 - Treatment through the Integrated Waste Treatment Unit (IWTU).
 - If not reclassified as transuranic waste, planned for treatment and disposition with calcine as HLW.
 - Remainder of the presentation is focused on the calcine waste.
- **Calcine Disposition Project baseline is for treatment using the Hot Isostatic Press (HIP) process.**

HLW Management Requirements

- **Significant External Requirements**
 - Idaho Settlement Agreement
 - Nuclear Waste Policy Act of 1982 (NWPA)
 - Nuclear Regulatory Commission (NRC) transportation regulations
 - Environmental
 - Resource Conservation and Recovery Act (RCRA)/Idaho Hazardous Waste Management Act (HWMA)
 - Federal Facility Compliance Act (FFCA) Site Treatment Plan (STP)
 - National Environmental Policy Act (NEPA)
- **DOE Requirements**
 - DOE Order 435.1 Radioactive Waste Management

Nuclear Waste Policy Act of 1982

The Act defines HLW as:

- (A) The highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and
- (B) Other highly radioactive material that the Commission, consistent with existing law, determined by rule requires permanent isolation.

DOE Order 435.1 HLW Definition

- **DOE M 435.1 defines HLW as:**

High-level waste is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation.

Calcine milestones

- 12/1/2012 - Submit the RCRA permit application for treatment. *Completed*
- 12/31/2035 – “DOE shall treat all HLW currently at INEL (now INL) so that it is ready to be moved out of Idaho for disposal by a target date of 2035.”
 - *Sodium Bearing Waste considered high-level waste until reclassification to transuranic waste through the Waste Incidental to Reprocessing mechanism is approved.*

ISA Penalty – Suspension of receipt of spent nuclear fuel.

RCRA Action Forcing Requirements

- **RCRA: Resource Conservation and Recovery Act (governs management of hazardous waste, including “mixed” waste.)**
- Storage of hazardous (HW) or mixed waste (MW) is allowed for up to 1 year in a permitted storage facility.
 - Extended storage allowed under Site Treatment Plan/ Consent Order, with milestones for treatment.
- Land Disposal Restrictions in RCRA require specific treatment methods for different waste types for disposal.
- A “no migration variance” is required to dispose of hazardous or mixed waste that has not been treated per specified treatment standards.
 - To obtain a no-migration variance for a disposal unit, a facility must petition EPA and demonstrate that the waste will not leak or escape from the unit for as long as the wastes remain hazardous.

Environmental Requirements

- **Site Treatment Plan (STP)**
 - Calcine Disposition Project treatment milestones:
 - 9/30/2019 Procure Contracts for treatment facility
 - 9/30/2020 Initiate Construction of treatment facility
 - 3/31/2024 Commence Operation of treatment facility
 - STP penalty – dispute resolution, if unsuccessful could result in penalty assessment under RCRA/HWMA of \$10,000/day/per violation
- **RCRA HLW Treatment Standard: Vitrification**
 - Change to RCRA treatment standards or technical equivalency required for HIP to meet treatment requirements.
- **RCRA Permits**
 - Volume 22-Calcine Solids Storage Facility Permit (Bin Sets)
 - Volume 23-Calcine Treatment Permit Application
 - ISA milestone: submitted permit application December 2012 for calcine treatment through Hot Isostatic Press (HIP)

- **HLW and Facilities Disposition Environmental Impact Statement (EIS) and Record of Decision (ROD)**
 - 2010 Amended ROD – DOE decision to treat calcine using the HIP process.
 - A change in treatment method requires at least an amended ROD.