

## **WASTE MANAGEMENT ACTIVITIES AND CHALLENGES AT THE IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY**

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### **ABSTRACT**

The Waste Management Program at the Idaho National Engineering and Environmental Laboratory (INEEL) provides consolidated characterization, treatment, storage, and disposal services for stored and newly generated hazardous, low-level, mixed, transuranic, and industrial waste on site.

The objective of the program is zero accidents, and that all work will be protective of human health and the environment. The disposition of waste shall be timely and cost effective, and waste backlog volumes shall be reduced from current inventories to meet compliance schedules, and avoid future legacy problems.

The work is organized based upon waste type and characterization services. The main projects are:

1. Waste Generator Services
2. Low-Level Waste Treatment/Storage/Disposal,
3. Mixed Low-Level Waste Treatment/Storage/Disposal,
4. Hazardous Waste Treatment/Storage/Disposal,
5. Stored (Contact-Handled and Remote-Handled) Transuranic Waste

The technical approach to accomplish this work is combination of INEEL and commercial characterization, treatment, storage and disposal services to dispose the waste in accordance with regulatory requirements.

### **WASTE GENERATOR SERVICES**

In 1999, a centralized organization was put in place at the Laboratory. Waste Generator Services brought a focused approach to waste management activities at the Idaho National Engineering and Environmental Laboratory. This approach means one organization is responsible for all aspects of the process, from generation to disposal. It also meant appointing a single point-of-contact for each type of waste generated at the Site. The waste specialists play an important role in safely and cost-effectively managing the INEEL's hazardous, radioactive waste, mixed low-level waste and industrial waste.

Accountability is the focus of the service. Waste management activities are their only job. They assist the generator in waste minimization and avoidance and take responsibility for treatment, storage and disposal and provide for packaging and transportation including waste container management. The work is performed in accordance with the Resource Conservation and Recovery Act and Department of Transportation regulations.

The goal is to remove the backlog of waste at the Laboratory through cost-effective treatment and disposal.

## **LOW-LEVEL WASTE PROJECT**

The scope of the low-level waste project includes volume reduction, and disposal of processed and bulk low-level waste generated at the INEEL at the Radioactive Waste Management Complex. Work also includes working with the commercial sector for the processing of liquid low-level wastes and other wastes generated at the INEEL.

The performance assessment, composite analysis, and disposal authorization statement is maintained for the Radioactive Waste Management Complex Subsurface Disposal Area. Construction of additional remote handled disposal vaults at the Subsurface Disposal Area is underway. The work is performed in accordance with DOE Order 435.1, "Radioactive Waste Management".

The backlog of low-level waste at the INEEL at the end of fiscal year 2000 was 805 cubic meters. This is a result of an aggressive move to get waste out of storage and into permanent disposal. In fiscal year 2000, 4,343 cubic meters of low-level waste was disposed.

### **Challenges**

- Effective use of the on-site disposal cell,
- Liquid low-level waste treatment and disposal
- Becoming an approved generator to use off-site disposal at NTS and/or Hanford.

## **MIXED WASTE PROJECT**

The mixed waste project supports treatment, storage and disposal of INEEL generated mixed waste. The mixed waste project includes treatment of INEEL mixed waste and the disposal of treated mixed waste at commercial facilities in accordance with commercial disposal waste acceptance requirements. Mixed waste storage facilities are managed for the storage of mixed waste awaiting treatment and disposal. Additionally, the project supports lead cask dismantlement, lead treatment, and lead recycling.

In fiscal year 2000, 812 cubic meters was treated and 470 cubic meters of waste was disposed of off-site. Treatment technologies used include incineration, consolidation, stabilization and cask dismantlement.

Incineration came under fire in 2000. The INEEL had to make a decision under newly promulgated air emission guidelines on whether or not to invest approximately \$6 million to upgrade the incineration air emission equipment. Under the new Environmental Protection Agency's Maximum Achievable Control Technology, the INEEL's primary treatment process would have to undergo significant changes to meet the new regulations.

In making the decision on whether or not to upgrade, the INEEL considered two primary factors.

- First, was a lack of sufficient waste throughout the DOE complex scheduled for treatment at WERF by incineration. (The INEEL has been a cornerstone of the DOE complex for mixed waste treatment under provisions in the Site Treatment Plan approved by the state of Idaho.)
- The second was the actual and projected increased availability of commercial treatment and disposal facilities. The INEEL determined it was cheaper to use commercial treatment than upgrade and operate the WERF incinerator.

In October 2000, the DOE decided to cease operating the Waste Experimental Reduction Facility incinerator as specified by the Idaho Department of Environmental Quality's final denial of a Part B hazardous waste treatment permit for the facility. DOE decided to place the incinerator into cold stand-by and aggressively pursue alternative treatments for mixed (hazardous and radioactive) waste currently stored at the site.

The INEEL has initiated Resource Conservation and Recovery Act (RCRA) closure on the incinerator system. However, this closure activity creates a budget challenge for mixed low-level waste treatment.

## **Challenges**

The decision to close the incinerator in October 2000 came one year sooner than was being used in planning assumptions. The INEEL must now rely on commercial facilities for the majority of its waste treatment. Costs for WERF closure activities may impact the ability to use commercial contracts to treat mixed low-level waste.

## **HAZARDOUS WASTE PROJECT**

Hazardous waste treatment/storage/disposal project manages INEEL-generated hazardous waste for treatment and disposal at commercial permitted facilities. The INEEL approach is to dispose the waste as it is generated and maintains only minimal storage. The work is performed in accordance with the Resource Conservation and Recovery Act.

## **TRANSURANIC WASTE PROJECT**

The scope of the transuranic waste project is to provide environmentally safe and compliant management of contact-handled (CH-TRU) and remote-handled (RH-TRU) transuranic waste stored at the Radioactive Waste Management Complex. Three sub-projects have been established to accomplish the Transuranic Waste Project:

1. Shipment of 3,100 m<sup>3</sup> of Certified Transuranic Waste to WIPP Project
2. Facility Operations and Turnover (FO&T) Project

### 3. TRU Technical Integration (TTI) Project

Capabilities to retrieve, overpack, characterize, certify, and dispose stored remote-handled transuranic waste are also being developed. Infrastructure support (maintenance; environmental safety, health, and quality assurance; landlord) for the Radioactive Waste Management Complex is provided to ensure compliance with authorization basis requirements necessary to accomplish project mission.

#### **Shipment of 3,100 m<sup>3</sup> of Certified Transuranic Waste to WIPP Project**

This project supports meeting the milestone in the 1995 agreement between the state of Idaho, the U.S. Department of Energy, and the U.S. Navy for removing 3,100 m<sup>3</sup> of transuranic waste from the state of Idaho by December 31, 2002.

Waste shipments to the Waste Isolation Pilot Plant (WIPP) were initiated in April 1999. Waste shipments comply with requirements delineated in the WIPP-Waste Acceptance Criteria, the Hazardous Waste Facility permit issued to WIPP by the New Mexico Environment Department (NMED), and the TRUPACT-II Safety Analysis Report for Packaging.

Capabilities to complete this project include nondestructive examination and assay of waste drums; headspace gas sampling and analysis; visual examination and sampling of selected solidified waste forms; gas generation testing; preparing and loading TRUPACT-II containers for shipment to WIPP; and performing data validation, certification, and reporting of waste parameters to WIPP. Operations must be performed at levels necessary to ensure an adequate inventory of waste can be qualified for shipment to WIPP to meet Settlement Agreement commitments.

Successful completion of this project will require overcoming significant challenges. Due to the Waste Isolation Pilot Plant not opening as planned, the schedule for the project has been condensed from four years into 27 months. This compression has required the INEEL to refocus its approach to the project.

The INEEL is taking the following actions to meet the project schedule.

- Establish a steady shipping schedule of 18 shipments per month (currently 9)
- Implement 24 hr/day, seven-days-a-week operations
- Increase capacity by using mobile vendor to characterize approximately 5,000 drums
- Requalify existing data on 2,000 to 4,000 drums
- Increase throughput
  - 10:1 Compositing for headspace analysis
  - Additional Gas generation testing, real-time radiography, and radioassay units
  - New TRUPACT loading facility
- Increase shippable inventory

- Overpack of alpha low-level waste with transuranic in standard waste boxes
- Implement Drum Age Criteria Class 2 modifications

### **Facility Operations and Turnover (FO&T) Project**

This project provides the necessary infrastructure to maintain the RWMC in compliance with authorization basis requirements to support needed facility operations. Included in this project are the maintenance of facility structures, systems and components, implementation of institutional programs for environmental safety, health, and quality assurance, capital equipment needs, and partial facility and project management support. Support necessary to accomplish the turnover of facilities and systems to the Advanced Mixed Waste Treatment Project (AMWTF), a privatization project between DOE-Idaho Operations Office and BNFL, Inc. are also provided.

Upon the completion of the 3100 m<sup>3</sup> project and the turnover of the stored CH-TRU waste to the AMWTF, this project will provide for the continued operations for LLW disposal and support the infrastructure for the disposition RH-TRU and for the disposition of CH-TRU not processed by the AMWTF.

### **TRU Technical Integration (TTI) Project**

This project provides technical support for transuranic waste management aspects not associated with the 3,100 m<sup>3</sup> project including implementation of DOE Order 435.1, evaluation and disposition planning for the stored transuranic waste, and development of capabilities to implement characterization, certification and shipment of remote-handled transuranic waste (RH-TRU) to WIPP for disposal.

The primary emphasis is development of the characterization and certification of RH-TRU for disposal at the WIPP site. The requirements for RH-TRU disposal are evolving. The development of the RH-TRU acceptable knowledge documentation has been initiated. Success of this project requires the issuance of the WIPP RH-TRU disposal requirements.

### **Public Involvement**

The INEEL has seen a marked increase in public scrutiny on on-going and planned activities. The increased public attention is and will continue to affect all projects at the INEEL including those managed by the Waste Management organization.

Specifically, the Waste Management Program has seen increased attention focused on permit modifications, treatment alternatives and general business practices. As the INEEL continues to remove various waste types from the state, public involvement will continue to play a large role in program decisions. The Waste Management Program will continue to be mindful of public input as decisions are made.

A proactive approach has been used for communicating on waste management projects. These proactive steps rely on a variety of communication tools for statusing the various stakeholder groups. For this discussion, stakeholder is defined as anyone with a perceived or real interest in the project. This includes internal audiences such as employees and senior management and also external publics such as activist groups and regulators.

To facilitate early and open discussions with the regulators, quarterly meetings are held to discuss activities surrounding the INEEL Site Treatment Plan and to discuss Resource Conservation and Recovery Act issues. Representatives from the program routinely provide information to the INEEL Citizens Advisory Board to keep the board statused on the success, issues and challenges facing the program.

The *INEEL Reporter*, a bi-monthly newsletter, is mailed to over 5,300 individuals who have asked to be kept apprised of the status of the EM program at the INEEL. In addition, an internal newsletter, *TRU News*, is being used to status the transuranic waste program to DOE, senior management and facility employees.

Enhancements have also been made to the mailing lists managed by the INEEL. A cross check has been performed with the Idaho Department of Environmental Quality's mailing list for INEEL projects to ensure consistency between the lists. The lists have also been evaluated to ensure activist groups are included on all mailings.

Efforts will continue to provide quality information to stakeholders on all Waste Management projects to ensure success.