



***Solving Waste Disposition Challenges at the West Valley
Demonstration Project***

***Scott Anderson, Deputy General Manager
March 8, 2017***

Agenda

- ▶ Who We Are
- ▶ Site Background
- ▶ Agency Responsibilities
- ▶ Project Scope
- ▶ Solving Waste Disposition Challenges
- ▶ Future Challenges

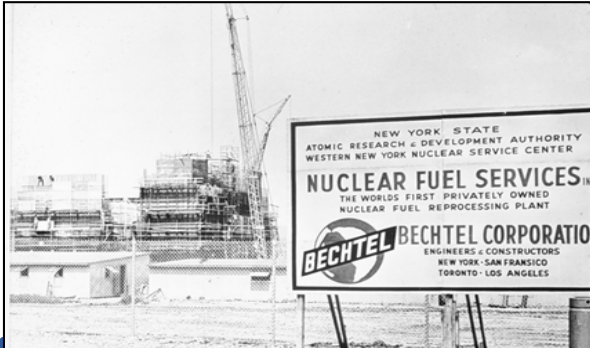
Who we are



The CHBWV team is comprised of CH2M HILL, BWX Technologies, Inc. and Environmental Chemical Corporation (ECC). The project is conducted by the U.S. Department of Energy (DOE) in cooperation with the New York State Energy Research and Development Authority (NYSERDA). The West Valley Demonstration Project is an environmental cleanup and waste management project located about 35 miles south of Buffalo.

- **CHBWV Team – 304 employees**
 - **Salaried – 124**
 - **International Association of Machinists and Aerospace Workers, Lodge 2401 – 92**
 - **Subcontractors – 88 (over 80% is awarded to Small/Woman Owned/Disadvantaged Businesses)**

Background



1962 - Nuclear Fuel Services constructed first commercial nuclear fuel reprocessing plant in United States.

1966 – 1972 Spent nuclear fuel was reprocessed - Resulting in 600,000 gallons of liquid High Level Waste (HLW). The plant shut down for modifications and never resumed operations.



HLW vitrification begins in 1996 and is complete in 2002.



2011 - CH2M HILL BWXT West Valley was awarded the Contract for Phase I Decommissioning

Agency Responsibilities



- ▶ New York State Energy Research Development Authority (NYSERDA) owns 3,345 acres surrounding WVDP premises – West Valley Nuclear Service Center (WVNSC)
 - Includes the State-owned Low-Level Waste disposal area (SDA) and the Nuclear Regulatory Commission Licensed Disposal Area (NDA)



- ▶ DOE manages 200 acre portion of WVNSC
 - ☑ Solidify High Level Waste (HLW)
 - ☑ Develop Containers for Disposal of HLW
 - Transport HLW to Federal Repository for Disposal
 - Dispose Low-Level Waste and Transuranic Waste Resulting from HLW Solidification Program
 - Facility Decontamination and Decommissioning
- ▶ U.S. Nuclear Regulatory Commission (NRC) prescribed WVDP decommissioning criteria
 - Consistent with decommissioning criteria under NRC's license that is held in abeyance by NYSERDA



Project Scope

Milestone 1:

Relocation of 275 High-Level Waste Canisters to Temporary On-Site Storage Pad

Milestone 2:

Process, Ship, Dispose of all Legacy Waste, not including Transuranic Waste (TRU)

Milestone 3:

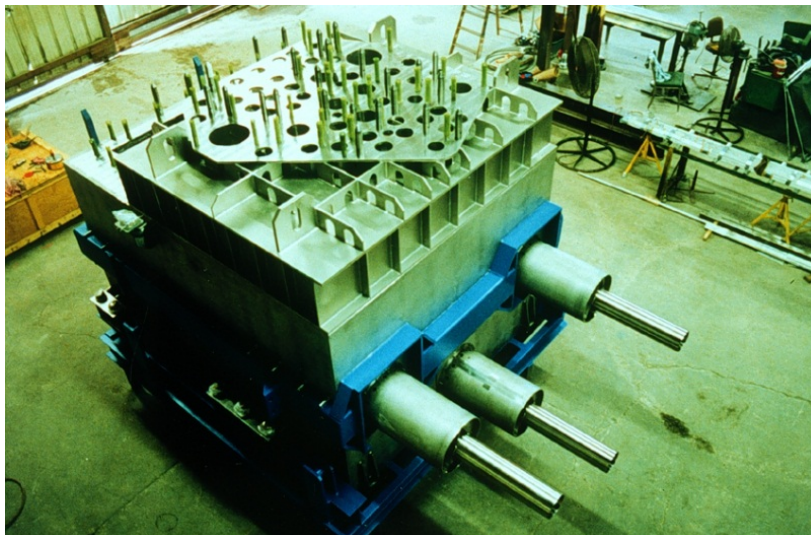
Demolition and Removal of Main Process Plant Building and the Vitrification Facility

Milestone 4:

Complete All Work in Performance Work Statement, including Balance of Site Facilities, Surveillance and Maintenance, and Site Operations

Solving Waste Disposition Challenges

- ▶ Vitrification Component Disposition
 - Vitrification Melter
 - Concentrator Feed Makeup Tank (CFMT)
 - Melter Feed Hold Tank (MFHT)



Vitrification Melter



CFMT and MFHT

The Challenge

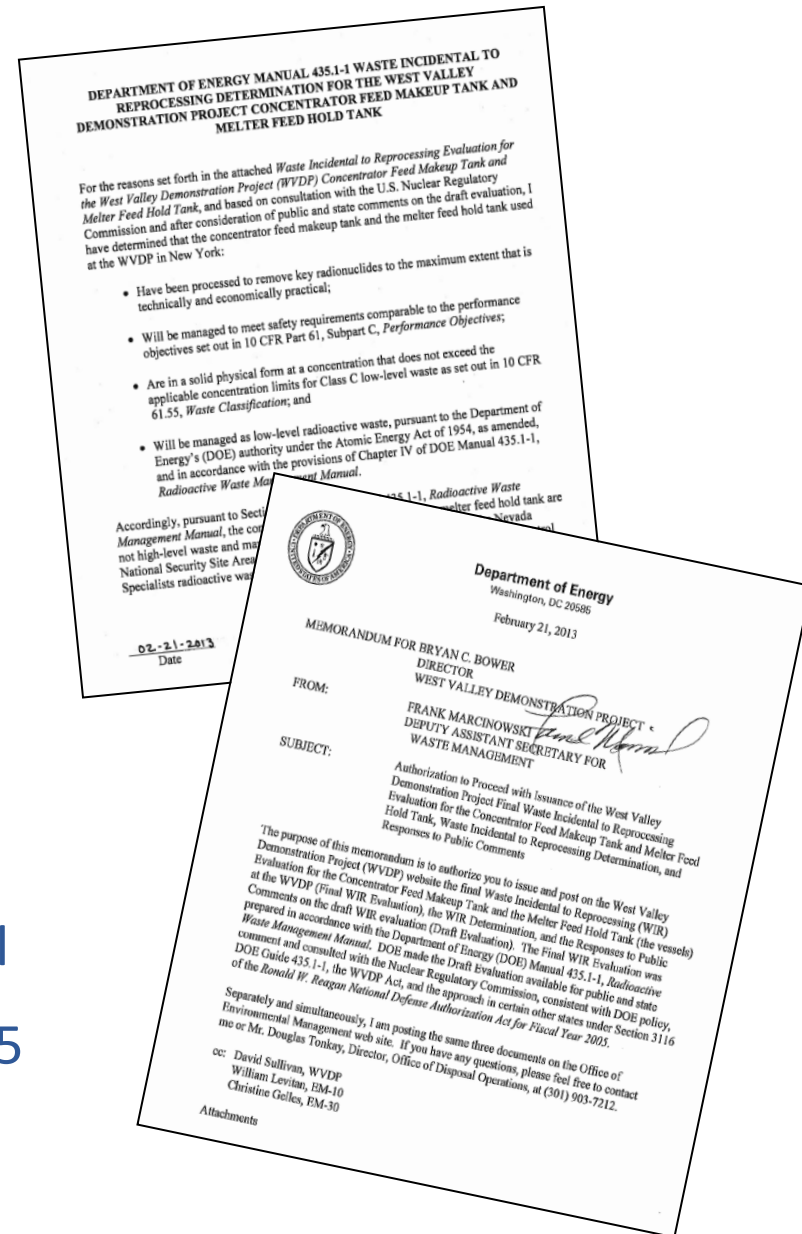
- ▶ High Level Waste Residuals
- ▶ Size
 - Melter – 10 ft. x 10 ft. x 10 ft.
 - CFMT – 13.5 ft. long x 10 ft. dia.
 - MFHT – 10 ft. long x 10 ft. dia.
- ▶ Transportation and Disposal



Preparing the Melter for Removal and Packaging

The Solution

- ▶ Waste Incidental to Reprocessing (WIR) Determination
 - DOE Manual/Guide 435.1-1
 - 1) Waste has been processed to remove radionuclides to the maximum extent technically and economically practical
 - 2) Waste will be managed to meet performance objectives of 10CFR61, Subpart C
 - 3) Waste will be managed under DOE Authority, as a solid physical form at concentrations less than Class C established in 10CFR61.55



The Solution (cont.):

- ▶ Purpose Built Packaging
 - Custom-built waste containers constructed with up to six-inch thick steel walls
 - Void spaces were filled with low density cellular concrete (grout) to stabilize the load



Shielded Box Containing the Melter



Melter Transported to the Site South Plateau



Transport CFMT Shipping Container from Fabrication Facility to On-Site Storage

The Solution (cont.):

- ▶ Draft WIR Evaluation for the Vitrification Melter released in 2011
- ▶ Draft WIR Evaluation for the concentrator feed makeup tank and the Melter Feed Hold Tank vessels in 2012
- ▶ After consultation with the Nuclear Regulatory Commission (NRC) and consideration of public and state comments, it was determined the three components can be shipped and disposed of in a Class C Low-Level waste disposal facility



Melter Grouting Operations



Melter Inspection

Transportation and Disposal

- ▶ For Melter Waste Package only; NRC Special Package Authorization Required
 - DOE WVDP submitted to NRC in mid October 2014, the “Safety Analysis Report for the West Valley Melter Package” which demonstrates that the package meets 10 CFR 71, Packaging and Transportation of Radioactive Material, by compliance with or equivalency to those requirements
 - NRC approval received August 2015

The image shows two overlapping documents from the United States Nuclear Regulatory Commission. The top document is a 'SAFETY EVALUATION REPORT' for Docket No. 71-9797, West Valley Melter Package, Revision No. 0. The bottom document is a 'SPECIAL PACKAGE AUTHORIZATION FOR THE WEST VALLEY MELTER TRANSPORTATION PACKAGE (DOCKET NUMBER 71-9797)' dated August 5, 2015, addressed to Mr. Bryan Bower, Director of Energy. Both documents include the NRC logo and detailed technical information regarding the transportation of a melter waste package.

**UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001**

SAFETY EVALUATION REPORT

Docket No. 71-9797
West Valley Melter Package
Revision No. 0

SUMMARY

By letter dated October 16, 2014, and supplemented April 16, 2015, the U.S. Department of Energy (DOE) West Valley Demonstration Project (WVDP) submitted an application for a Special Package Authorization for a transportation package for the West Valley Melter Package (WVMP) to be transported from the West Valley Melter Facility, Andrews, Texas.

The exterior surface of the surface contamination on the melter waste package, 15'9" long by 12'7" wide by 12'6.5" high. The maximum fully loaded weight is approximately 390,800 lbs.

NRC staff reviewed the application for Transportation and Packaging of Radioactive Material, 10 CFR 71.41(g) – Special Package Authorization. The staff determined that the package would be provided of fracture toughness and subject to brittle fracture testing to demonstrate that the package is not leak-tight but meets the requirements of 10 CFR 71.41(g). Accordingly, the package is authorized for transportation under the provisions of Title 10 of the Code of Federal Regulations (CFR) Part 71. The results of the staff's review are documented in the enclosed safety evaluation report.

Reference

Safety Analysis Report (SAR) for the WVMP, dated April 2015.

**UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001**

August 5, 2015

Mr. Bryan Bower, Director
Department of Energy
West Valley Demonstration Project
10282 Rock Springs Road
West Valley, NY 14171-9799

SUBJECT: SPECIAL PACKAGE AUTHORIZATION FOR THE WEST VALLEY MELTER TRANSPORTATION PACKAGE (DOCKET NUMBER 71-9797)

Dear Mr. Bower:

By letter dated October 16, 2014, and supplemented April 16, 2015, the U.S. Department of Energy (DOE) West Valley Demonstration Project (WVDP) submitted an application for a Special Package Authorization for a transportation package for the West Valley Melter Package (WVMP). The WVMP will be transported from the West Valley site to the Waste Control Specialist (WCS) disposal site in Texas. The staff has reviewed the application, as supplemented, and determined that a Special Package Authorization is acceptable for a one-time only shipment of the WVMP under the provisions of Title 10 of the Code of Federal Regulations (CFR) Part 71. The results of the staff's review are documented in the enclosed safety evaluation report.

The melter was used in the WVDP vitrification facility to process high level waste into an homogenized glass form. After shutdown, electrodes were cut and shield plugs installed. The exterior surface of the melter was coated with a polymeric system to ensure fixation of the surface contamination. The WVMP is a rectangular shaped package, encased in low density cellular concrete, 15'9" long by 12'7" wide by 12'6.5" high, with eight shock absorbers and an impact limiter. The maximum fully loaded weight is approximately 390,800 lbs.

The maximum quantity of material is greater than a Type A quantity of radioactive material, i.e., about 215 A, with a total activity of 3,554 curies from Cesium (Cs-137) and Strontium (Sr-90) and their daughter products. There are approximately 82 grams of fissile material within the WVMP; however, the WVMP meets the exemption standards in 10 CFR 71.15.

In addition to the requirements of Subpart G of 10 CFR Part 71, the following conditions apply to the Special Package Authorization under 71.41(d):

- (1) The package is a one-time only exclusive use shipment.
- (2) The package is constructed and assembled in accordance with Drawing Nos. 4005-DW-001, Revision 7, sheets 1-8, and R-R3-A-00063, Revision 1.
- (3) The package must be conspicuously and durably marked with the trefoil symbol and the following information: Type B(U), Model No. 9797, Package Identification Number USA/9797/B(U)-96.
- (4) The package authorized by this letter must be transported on a motor vehicle or on a railroad car assigned for the sole use of the shipper.

Transportation and Disposal (cont.)

- ▶ Awarded transportation subcontract to MHF Logistics
- ▶ Awarded disposal subcontract to Waste Control Specialists
- ▶ Transport and disposal completed December 2016



Vitrification Melter Packaged:
14'x13'x13', 160 tons

CFMT Packaged:
13'x14'x19', 180 tons

MFHT Packaged :
13'x14'x16', 150 tons

Transportation and Disposal (cont.)



Future Challenges



Type	Current Inventory	Projected Additional Inventory
CH-TRU	285 m ³	0
RH-TRU	570 m ³	28 m ³
Totals	855 m ³	28 m ³