



Vitrification Facility Demolition



Vitrification Facility

The West Valley Demonstration Project's (WVDP) Vitrification Facility was used to safely solidify radioactive liquid high-level waste (HLW) that was stored at the WVDP.

Facility Construction

- Constructed and operated in the 1980s as a non-radioactive testing area for the vitrification melter
- Following successful completion of melter testing, the facility was expanded and converted to a full-scale remotely operated vitrification facility
- 10,700 square foot reinforced concrete structure, 133 feet long by 102 feet wide
- Approximately 50 feet tall, with walls that ranged from 2-4 feet thick

Vitrification Facts

- The WVDP Vitrification Facility is one of only two such facilities to have operated in the U.S.
- During its operation, it achieved the highest operational availability of any vitrification facility in the world
- More than 25 million curies of highly radioactive material was safely vitrified at the WVDP
- Following vitrification completion, the facility was shut down, making it the first facility of its kind in the U.S. to complete its mission
- 278 10-foot-tall production canisters of vitrified HLW were produced at the WVDP between 1996 - 2002, with radiologic dose rates ranging from 1,100 to 7,460 R/hr each

Facility Demolition

- The Vitrification Facility was the largest radioactive facility demolished at the WVDP to date. The project was completed safely and in full compliance with regulatory requirements
- Vitrification Facility debris was safely transported and disposed at approved disposal facilities



The WVDP Vitrification Facility was used to vitrify radioactive HLW into glass.

Demolition of the Vitrification Facility – a major component of the CH2M HILL BWXT West Valley, LLC (CHBWV) workscope at the WVDP – was successfully completed in 2019, with the completion of waste disposition. Extensive planning and preparation was performed to prepare the facility for demolition, which took approximately one year to complete. The above-ground portion of the structure was removed during demolition.

The facility contained radiological and hazardous contaminants as a result of HLW vitrification activities that were performed inside the structure. Prior to demolition, all major process equipment was removed, interior surfaces were decontaminated and sealed, all utilities and connections with adjoining structures were disconnected, and characterization data was obtained to plan for demolition and waste disposal.

The structure was methodically demolished using heavy equipment and debris was loaded into waste containers staged at the demolition site. The resulting debris was disposed off site at licensed waste disposal facilities.

All activities were conducted in accordance with state, federal and regulatory requirements. Controls in place during demolition prevented the spread of contamination. Real-time air monitors adjacent to the facility throughout demolition and ambient air monitoring conducted at several locations surrounding the WVDP verified compliance with air emissions standards and ensured worker and public health and safety.



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First Bite: Demolition of the Vitrification Facility began September 11, 2017



In Progress: Vitrification Cell demolition is shown in April 2018



Completion: A temporary weather cover was placed on the building footprint

Vitrification Facility demolition was performed by trained operators using heavy equipment. All aspects of the work were planned to ensure compliance with state, federal and regulatory guidelines and to protect the safety of workers, the public and the environment. Preparation of the facility, a methodical demolition plan, the effective use of dust suppression and real-time monitoring of conditions at the demolition site were fundamental to the success of this project.

Facility Preparation

Extensive facility decontamination and deactivation was performed prior to demolition, including:

- Removing nearly all equipment, piping and radiologic source material from the facility
- Performing decontamination of cell surfaces (walls and floor, prior to grouting)
- Closing all embedded openings into the Vitrification Cell with expandable foam sealant and applying fixative to seal any remaining contamination
- Placing a layer of grout on the floor to reduce worker exposure and prevent water infiltration
- Performing characterization surveys inside the facility to confirm radiological conditions prior to demolition
- Physically isolating the facility from adjoining structures by severing and air-gapping electrical and mechanical interfaces

Demolition Project Safety

The Vitrification Facility demolition plan was modeled after the successful demolition of the 01-14 Building at the WVDP. Demolition of the 01-14 Building demonstrated safe, open-air demolition of a contaminated structure. Key components include:

- Extensive removal of radioactive material
- Secure demolition area boundary with access limited to involved personnel
- Structural evaluation performed and used to develop a detailed work sequencing plan
- Dust-suppression equipment deployed during demolition to reduce the potential for airborne contamination
- Water management barriers in place to manage demolition site runoff
- Real-time radiological air monitors within the demolition site and ambient air monitoring at 16 off-site perimeter locations
- An emphasis on the Stop Work authority all WVDP workers have if a condition appears unsafe

Schedule and Waste Disposal

- Demolition of the above-ground portions of the facility was completed on September 19, 2018
- ~ 6,700 tons of debris was generated, with 416 large containers and 42 special boxes safely shipped and disposed at off approved disposal facilities in January 2019
- Temporary weather-resistant protective cover installed in March 2019

The West Valley Demonstration Project (WVDP) is a U.S. Department of Energy-led environmental remediation project located approximately 35 miles south of Buffalo, NY. CH2M HILL BWXT West Valley LLC, (CHBWW) was formed to meet the specific requirements of Phase 1 decommissioning of the WVDP. The limited-liability partnership combines the experience and capabilities of Jacobs, BWX Technologies, Inc. (BWXT), and Environmental Chemical Corporation (ECC).