U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

CHBWV Project Update (Including Vitrification Demolition Plan)

Scott Anderson
Deputy General Manager

Citizen Task Force Meeting
March 22, 2017

Safety Performance

As of March 9, 2017, CHBWV and subcontractors worked approximately 2,485,066 work hours (1,585 days) without a lost-time work accident or illness.

High-Level Waste Crew

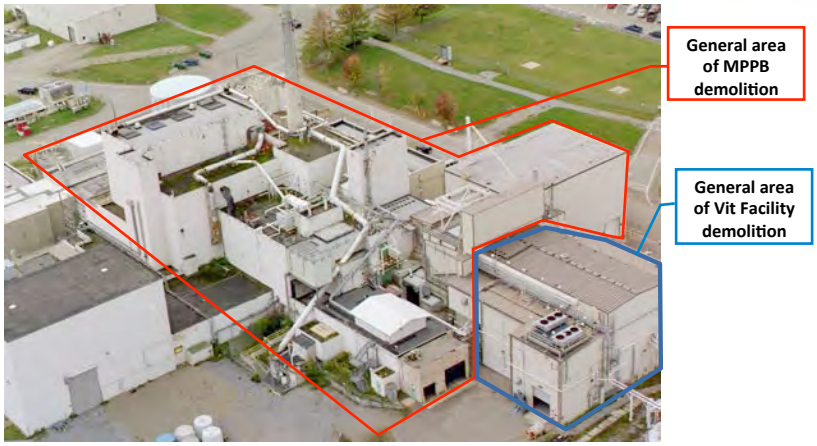
OFFICE OF ENVIRONMENTAL MANAGEMENT

FY 2017 Goals

- Perform all work safely and compliantly
- Complete relocation of legacy waste from Main Plant Process Building (Head-End Cell drums)
- Begin demolition of Vitrification Facility (Contingent on funding)
- Ship demolition debris from Vitrification Facility (Contingent on funding)
- Continue deactivation of Main Plant Process Building
- Continue reconfiguration of water, natural gas, electric, communications infrastructure (Contingent on funding)

OFFICE OF ENVIRONMENTAL MANAGEMENT

Facility Deactivation Status



- Vitrification Facility Deactivation – 100% Complete
- Main Plant Process Building Deactivation – 62% Complete

OFFICE OF ENVIRONMENTAL MANAGEMENT

Vitrification Facility Location

OFFICE OF ENVIRONMENTAL MANAGEMENT

Agenda

- Vitrification Facility Background
- Review of Regulatory Requirements
- Demolition Preparations
- Demolition Approach
- Waste Management and Disposal
- Status and Schedule

Approved for Public Release; Further Dissemination Unlimited

OFFICE OF ENVIRONMENTAL MANAGEMENT

Vitrification Facility Background

- Single-purpose facility constructed to vitrify the WVDP's liquid high-level waste (HLW)

Vitrification Facility Exterior

Component Test Stand Construction Begins (future Vitrification Facility) 1983

Vitrification Facility Construction Complete/ HLW Vitrification Begins 1996

Vitrification Processing Complete (275 Production Canisters) 2002

Vitrification Facility Used as a Supplemental Remote Waste Processing Facility 2006-2013

Vitrification Process Equipment Removed and Packaged 2005

Vitrification Facility Deactivation Begins 2013

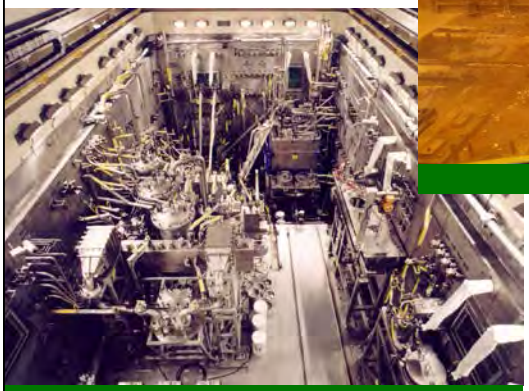
Vitrification Components Disposed 2016

Vitrification Facility Demolition-Ready 2017

OFFICE OF ENVIRONMENTAL MANAGEMENT

Vitrification Facility Background (continued)

Vitrification Cell After Equipment Removal



Vitrification Cell Prior to Vitrification Start

OFFICE OF ENVIRONMENTAL MANAGEMENT

Review of Regulatory Requirements

Regulatory Authority	Citation	Relevancy
U.S. Department of Energy (DOE)	10 CFR 835 – Occupational Radiation Protection	Establishes annual occupational exposure limits for CHBWV employees: • 5 rem/year (5,000 mrem/year) for radiological workers* • 100 mrem/year for non-radiological workers
	DOE Order 435.1	• Establishes requirements for management of radioactive waste
	DOE Order 458.1	Establishes annual exposure limits for members of the public: • 100 mrem/year
U.S. Environmental Protection Agency (EPA)	40 CFR 61 (NESHAPS)	Establishes emission standards for radionuclides in air (commonly referred to as Radionuclide National Emission Standards for Hazardous Air Pollutants) • 10 mrem/year (sitewide) with EPA approval • 0.1 mrem/year without specific EPA approval • Also sets standards for buildings that contain asbestos
U.S. Nuclear Regulatory Commission (NRC)	West Valley Demonstration Project Act	Establish decommissioning standards for WVDP (complete) and provides for review and consultation regarding WVDP activities

* CHBWV has established an Administrative Control Level of 500 mrem/year for the general workforce and up to 1,000 mrem/year for a portion of the workforce

OFFICE OF ENVIRONMENTAL MANAGEMENT

Review of Regulatory Requirements, cont.

Regulatory Authority	Citation	Relevancy
New York State Department of Environmental Conservation (NYSDEC)	6 NYCRR Part 373-3	Establishes standards for interim status operation and closure of hazardous waste management units
	6 NYCRR Part 750-2	Establishes standards for discharge of waste water
U. S. Department of Transportation (USDOT)	49 CFR – Hazardous Materials Regulations	Establishes packaging, labeling, and transportation of hazardous material, including radioactive waste
New York State Department of Labor (NYDOL)	12 NYCRR Part 56	Establishes standards for removal of asbestos

* CHBWV has established an Administrative Control Level of 500 mrem/year for the general workforce and up to 1,000 mrem/year for a portion of the workforce

Demolition Preparation

- Objective
  - To ensure safe and environmentally protective facility demolition in compliance with worker and environmental protection limits, and in keeping with As Low As Reasonably Achievable (ALARA) principles
- Meeting the Objective
  - Characterization
    - Radiological sampling
    - Contamination surveys

Radiological Sampling Inside the Vitrification Facility

Demolition Preparation (continued)

- Meeting the Objective (continued)
  - Airborne Dispersion Modeling
    - Used to identify quantity, type and/or location of contamination that can remain in a structure during open-air demolition that results in defined exposure restrictions at surrounding control boundaries for worker and public protection
    - Key variables that effect model results are contamination levels (i.e., source term), contaminant emission rate, and meteorological conditions
      - Contamination levels are controlled through how much pre-demolition decontamination is performed
      - Contaminant emission rate is controlled by the rate at which demolition is performed and the demolition method used
      - Meteorological conditions are based on five years of actual WVDP data
    - Two models utilized
      - AERMOD used to estimate worker dose
      - CAP-88 used to estimate public dose

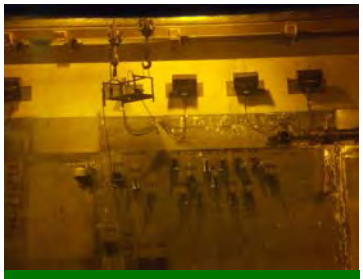
Demolition Preparation (continued)

- Meeting the Objective (continued)
  - Demolition Methods and Controls
    - Dismantlement approach (e.g., hammer, saw)
    - Fugitive dust control
      - Application of fixatives during deactivation, prior to demolition and on the waste pile prior to shipment
      - Fogging/misting during demolition
    - Storm and surface water management
    - Weather limitations defined by existing site procedures
    - Air monitoring action levels established through work control documents (e.g., Radiological Work Permit, Work Instruction Package)

Fixative Application in the Vitrification Facility Crane Room

Demolition Preparation (continued)

- Meeting the Objective (continued)
  - Deactivation and Decontamination
    - Residual accessible equipment and hazardous materials removed
    - Decontamination performed on cell walls and floor
    - Environmental release points isolated
      - Penetrations/embedded piping sealed
      - Floor grouted
    - Facility de-energized and isolated
    - Remaining residual contamination "fixed" in place



Wall Washing in Progress

Embedded Piping Sealed

Demolition Approach

- CH2M HILL and BWXT have decades of radioactive facility demolition experience and will apply lessons learned during successful demolition of 01-14 Building in 2012-2013
  - Demolition performed by trained and qualified heavy equipment operators using long reach shears and processors

01-14 Building at Start and Completion of Demolition

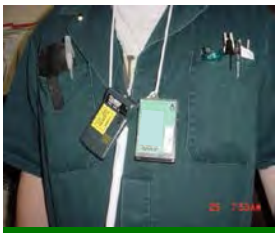
Demolition Approach (continued)

- Sequenced Demolition Plan beginning at building exterior
  - Working from least contaminated areas inward toward the most contaminated areas
- Demolition Plan
  - Summarizes the approach for deactivation, decommissioning and demolishing the facility
  - DOE review/approval
  - NRC review/comment

01-14 Building "Outside-to-Inside" Demolition

Detailed Demolition Safety Planning

- Detailed Demolition Safety Planning and Execution
  - Worker protection:
    - Radiological protection – Personal Protective Equipment (PPE), dosimetry, air monitoring
    - Industrial Protection – Plan of the Day, Computer model for Pre-job briefings
    - Area access restricted to necessary personnel
    - Work Instruction Packages define demolition sequences and "Hold Points"



Personnel Monitoring Equipment

Demolition Boundary Air Monitors

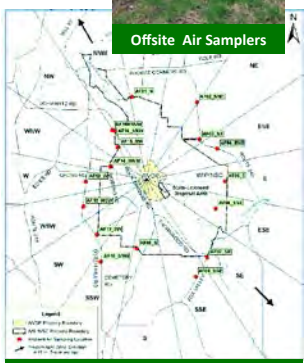
01-14 Demolition Boundary

Detailed Demolition Safety Planning (continued)

- Detailed Demolition Safety Planning and Execution (continued)
  - Public and Environmental Protection:
    - Restricted site access
    - Air monitoring / Air dispersion modeling program approved by U.S. Environmental Protection Agency (EPA)
      - Real-time monitoring in demolition area
      - Demolition boundary monitoring
      - Off-site perimeter monitoring
    - Storm water management / Dust suppression
    - Daily fixative / cover of waste pile
    - Limiting size of debris pile / Frequent waste packaging and disposal
    - Fixative application during deactivation (prior to demolition)
    - Detailed final surveys

Offsite Air Samplers

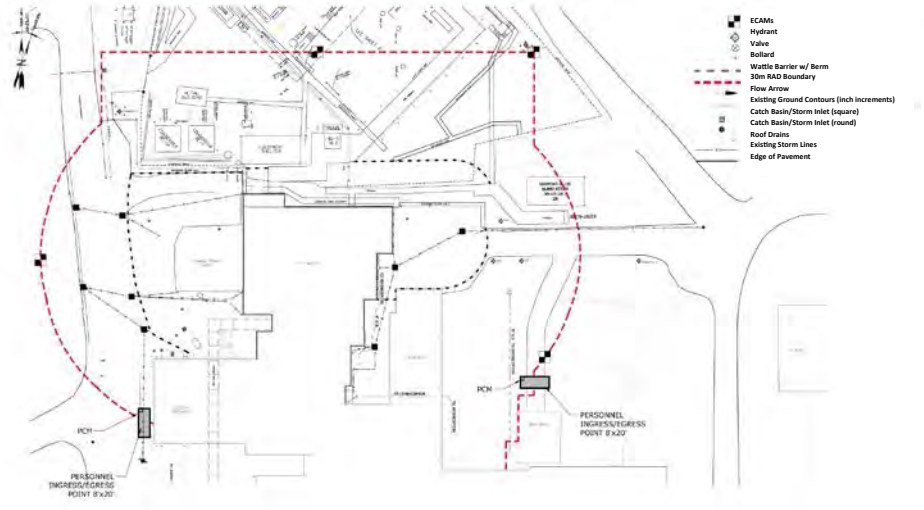
01-14 Building Debris Packaging



Perimeter Monitoring Locations

OFFICE OF ENVIRONMENTAL MANAGEMENT

Demolition Boundaries and Features



30-meter Area Boundary Includes Facility and Waste Storage/Loading Areas

OFFICE OF ENVIRONMENTAL MANAGEMENT

Waste Management and Disposal

- Vitrification Facility Specific Waste Disposition Plan Developed
- Vitrification Facility demolition will generate ~6,700 tons of debris
  - Debris piles kept small and packaged or covered daily
  - Debris loading into 25-cubic yard Intermodals
  - All projected to be NRC Class A low level radioactive waste

Intermodal Shipments Leaving the WVDP

- Shipment and disposal plans in place
  - Truck or truck-to-rail shipment for disposal at Nevada National Security Site (NNSS), *Energy*Solutions and Waste Control Specialists (WCS) licensed facilities in Nevada, Utah and Texas, respectively
  - Estimate 15 Intermodals per week (450 total shipments)

OFFICE OF ENVIRONMENTAL MANAGEMENT

Status and Schedule

- Deactivation and decontamination are 100% complete
- Vitrification Facility is demolition ready
  - Start date contingent upon available funding
  - Approximately 8-month overall schedule to demolish building and ship waste

Fixative Application in Vitrification Cell Ceiling

Utilities Isolated and Air-Gapped

Utility Lines Sealed Shut

OFFICE OF ENVIRONMENTAL MANAGEMENT

Demolition Complete

Questions?