West Valley Demonstration Project

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**West Valley Environmental Services**

# Cement Drum Waste Shipped from the WVDP to the NTS

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# Drum Cell History

- Drum Cell facility constructed for storage of cemented waste produced from the solidification of supernatant liquid waste
- 19,877 drums placed in storage between 1988 - 1995
- Facility monitored and maintained

*WVDP aerial view showing Drum Cell*

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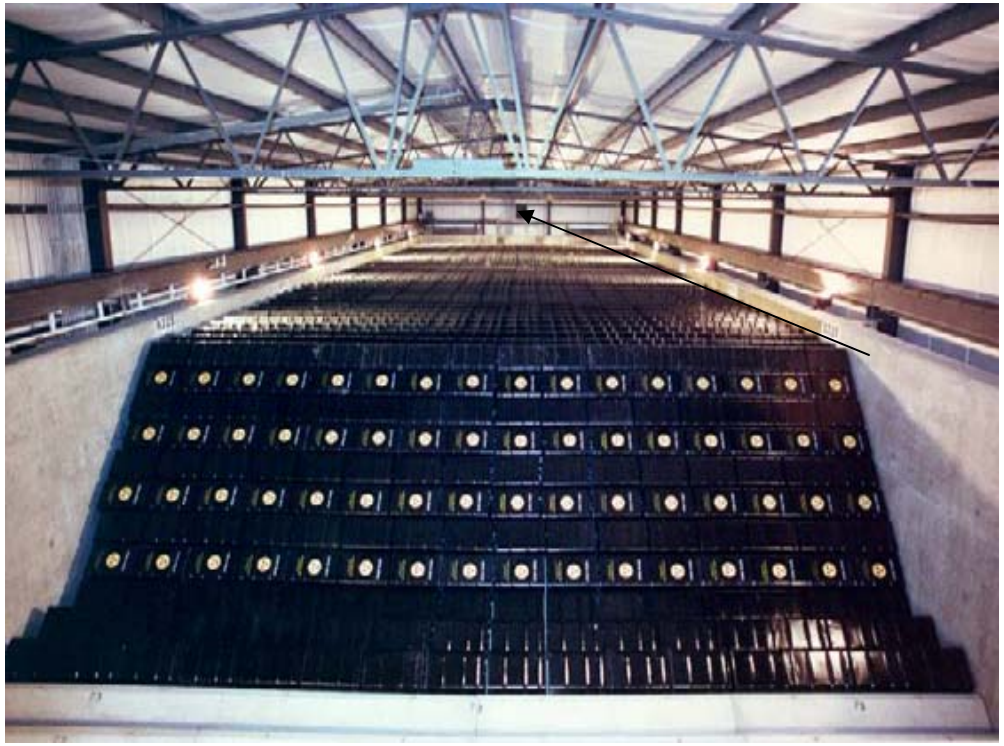
# Drum Cell Facility

- Shielded storage area for drums
- 375 ft by 60 ft
- Holds 11 layers of drums
- Remote Operated Bridge Crane
- Enclosed in Pre-engineered building



*Drum Cell shown at 3/4 full*

# Drum Cell Drums

- 71-gallon square drum
- Approximately 1000 lbs
- Carbon steel construction
- 23” width by 35” height
- Inner polyethylene liner
- 6.5 inch fill port
- Crimped fill port lid
- Efficient drum stacking


*71 gallon square drums*

# 2006 Drum Cell Shipments

2006 shipping startup included:

- Drum Cell and UNH waste profiles approved
- Development of retrieval and packaging methods for removing drums from storage
- Established on site packaging and staging sites
- Development of handling procedures
- Training and qualification of operations and support crews
- Line Management Readiness Assessment and Radiological Operations Assessment performed
- Operated on single 8-hour shift
- Production rate was 12-18 drums per shift

# 2006 Drum Cell Shipping Summary

- Initiated off site disposal at the NTS in July 2006
  - Six drums per pallet
  - Transport via dedicated truck
  - 1524 drums shipped in 2006

This was accomplished by extensive communication and coordination with the NTS Operations Group

*Pallet of drums being prepared for shipment*

*6 six-packs loaded for shipment*

# 2006 Drum Cell Shipping Requirements

NTS Operations accepted the six packs of drums as a single package with the following conditions:

1. Must be banded to a metal pallet with a plywood or OSB board top.
2. Must be wrapped with plastic wrap to represent a single package (this was dropped after the plastic wrap showed up at the NTS shredded).
3. Each drum must be marked and labeled per DOT (Radioactive-LSA).
4. The six pack must be marked/labeled per NTS WAC on two ends.

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# 2006 Drum Cell Process Flow

- Each drum was removed from storage using the overhead crane then lowered into an Upender where it was turned upright, surveyed, inspected, and decontaminated if necessary
- The Drum was then lifted and moved onto a metal pallet in a “six-pack” configuration
- Drum fill ports were caulked
- The pallets of drums were secured with banding, and covered with OSB and wrapped to form the NTS package
- 6 six-packs were loaded on trucks for shipment to NTS


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# Six-pack Final Package

- The drum was the DOT shipping package
- The six-pack was the NTS disposal package

# 2007 Efficiency Improvements

- Increased staffing

  Drum Cell Operations:

  — Full staff in place to operate three 8-hours shifts, 5 days per week

  — Radiation Safety Techs 24 hours

  Support:

  — Quality Assurance Inspectors

  — Waste Certification Official and Alternate

  — DOT Certified Shippers

  — Characterization Engineers

  — Additional Operators to mark/label and load the packages onto trucks

*Inside the Drum Cell Control Room*

# 2007 Use of IP-2 containers

- Packaging modifications
  - Worked with MHF to develop a certified IP-2 lift liner bag system meeting DOT requirements for transporting the WVDP cement drums to the NTS:
    - Each filled 6,600 lb lift liner was considered a waste package containing 6 drums of cement waste.
    - This eliminated the need to caulk around the fill ports of the drums – cut time and exposure
    - Eliminated the need to perform a final documented inspection of each drum.
    - Eliminated the need to mark/label every drum per DOT
    - Enabled rail shipping via gondola cars and transloading by MHF

*Drum is lowered into open bag*

*Sealed bag is surveyed*

*Transportation-ready package stored for loading on rail car*

# 2007 Meeting and Verifying DOT and NTSWAC Requirements

- Developed a Label Board to be attached to opposite sides of each lift liner bag via tie straps
- The Label Boards were affixed with the DOT labels/markings and the NTS barcodes
- Then the WCO attached the NV-211 verifying barcodes while a QA Inspector verified that all 49 CFR  requirements were met
- The boards were attached to the correct package by operations with QA verification of each package

# 2007 Started Using Rail

- Rail Shipments
  - First set of rail cars arrived on site March 5
  - 1st shipment of 1 gondola left WVDP on March 21
  - 2nd Shipment of 4 gondolas left WVDP on April 10
    - Estimate 40-50% savings in transportation costs by shipping by rail
    - One rail car contained 5 truckloads of drums
    - Each shipment of five gondola cars held 900 drums
    - Transloading (rail to truck) began in Denver by MHF
    - MHF supplied dedicated rail cars/Shippers/Radiation techs/unloading gondolas and loading onto trucks
    - WVDP developed a shipper's checklist for the Transload shipper which was faxed, with pictures of each truck load, to the WVDP shipper to ensure DOT/NTS requirements were met by trucks prior to leaving the transload facility

# Process Improvements Implemented to Facilitate Rail Shipping

- Barcode reader and computer generated waste package data sheets to reduce manual data recording
- Waste characterization paper work streamlined
- Use of IP-2 lift liners to reduce the number of process operations
- Characterization of multiple drum type in lift liners to eliminate drum sorting activities
- Combined WCO verifications with NV-211 certification application and QA Inspection requirements
- Use of rail shipment to reduce transportation costs

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# MHF IP-2 Lift Liner Simplified the Process

- Eliminated decontamination of drums
- Eliminated caulking of drum lid
- Eliminated final package inspection of each drum
- Eliminated surveying of each drum
- Eliminated DOT marking of each drum
- Eliminated drum/pallet banding operation to form six-pack
- Waste package paperwork was reduced to one-sixth of original requirement

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# Rail Car Loading Operations

- 30 Lift liners per gondola
- 180 drums per gondola
- Composed of five pre-determined truck shipments
- Each Gondola was dose rate modeled to meet 2 meter readings < 10 mR/hr
- PSDRs and Bar Codes were generated for each truck shipment in the gondola
- Bar Codes, NTS Certification label and DOT marking and labeling attached to each lift liner

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# Rail Car Loading

- Staged lift liners for gondola
- Prepared gondola, removed snow, lined with geotextile, secured the straps
- Performed final package inspections on the lift liners
- Attached bar codes and labels to lift liners
- Verified correct label boards were on the packages
- Loaded the lift liners into the gondola using a crane
- Secured four lift liners together with straps in the gondola car

# Rail Car Loading Continued

- 15 lift liners were placed in lower layer as determined by the Cognizant Shipper's load plan
- The liners were covered with plywood and geotextile
- A second layer of 15 lift liners was loaded on top in a predetermined order which facilitated off loading at the Transload Facility.
- The load plan was e-mailed to the Transload Facility so that they could unload the gondola onto trailers in prearranged truck loads.

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# Rail Car Loading

- The Gondola was covered with a tarp
- Radioactive Placards were attached
- The Rail Shipment was scheduled through MHF
- Shipped five Gondola cars per week

# Transload Facility Operations

- Unloaded the gondolas using a crane and lifting frame
- Inspected lift liner condition, made repairs if necessary
- Loaded each truck with 6 lift liners as determined by the WVDP Shipper
- WVDP provided shipment documentation, the Original Low Level Waste Certification, and Original PSDRs via Fed Ex.
- All documentation was reviewed by the WVDP QA Inspectors prior to shipment, therefore, the Transload Shipper only had to match the paperwork with the truck shipment.
- Then the completed Transload Facility Shipment Checklist was faxed to the WVDP Shipper (usually on a Saturday to facilitate off loading by NTS during the week).
- The WVDP Shipper approved release of the shipment to NTS and emailed the WCO with release of the electronic PSDRs (this could have been up to 2 weeks after the Gondola left site).

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# MHF Transload Facility Operations

Gondola Unloading and Trailer Loading

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# Unloading and Disposal at the NTS

**>300,000 ft$^2$ of waste shipped to NTS, 100% Compliant**


# Greg G. Contacted the WVDP WCO – Unsure of What to Do with Live Animals

Somewhere between the Transload Facility and the NTS Alpha, Beta and Gamma were moved onto a WVDP truck (after NTS rad release they were adopted by the truck driver)