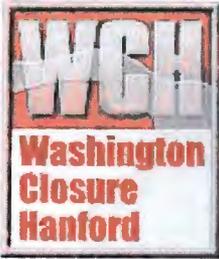


*DOE's Largest Environmental Cleanup Closure Project*



*River Corridor  
Closure Project*

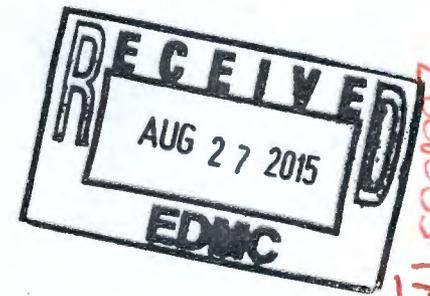


U.S. Department of Energy  
Richland Operations Office

# Treatment of Hazardous Debris within the ERDF Landfill

*Mark French  
Department of Energy  
Richland Operations Office*

February 12, 2014



1230873  
[008033714]

# ERDF Reaches 15M Tons Disposed



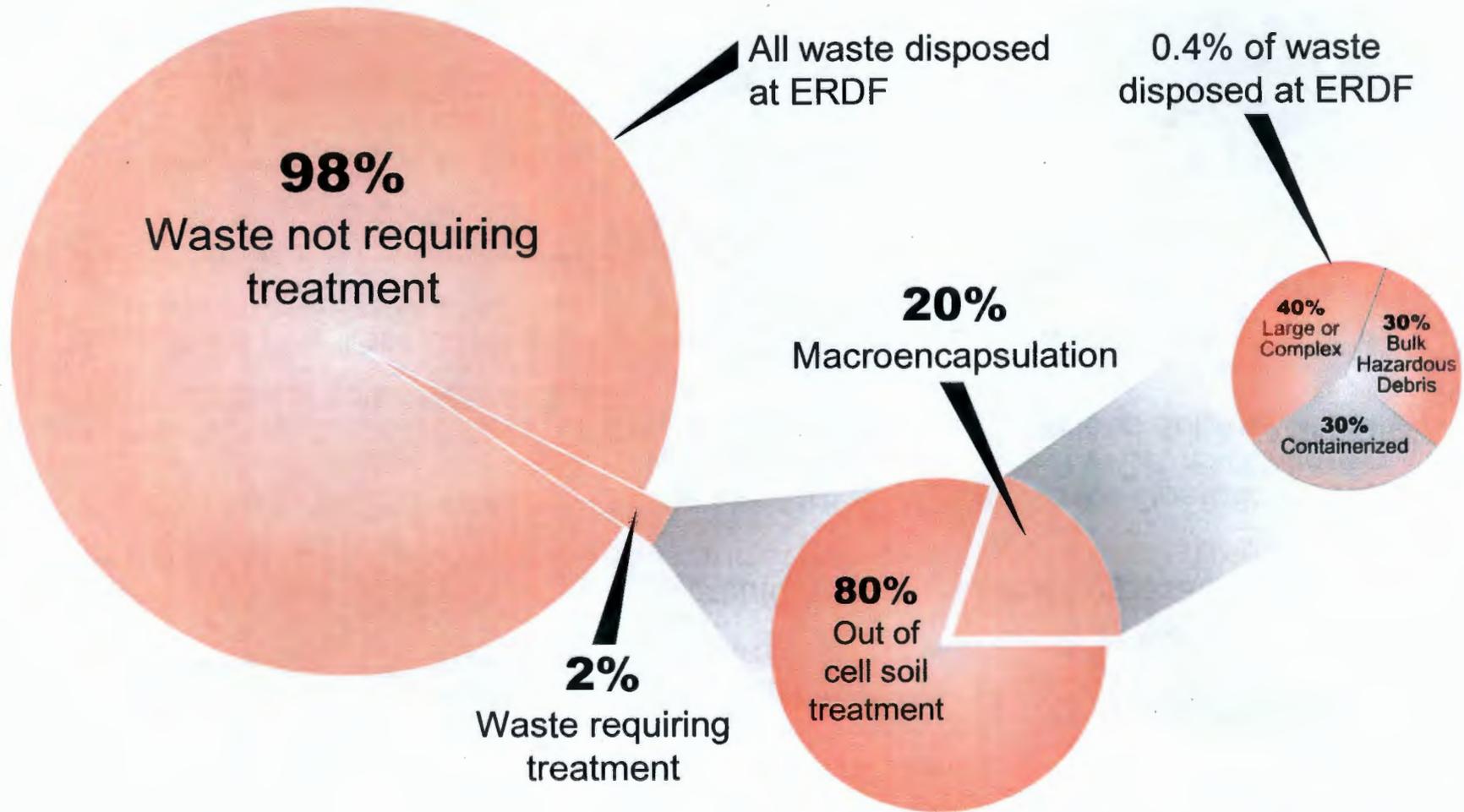
*One Team for Safe, Visible Cleanup of the River Corridor*

15308A

## Background

- The Environmental Restoration Disposal Facility (ERDF) has been in operation since 1996, with over 15,600,000 tons of Hanford cleanup waste disposed of to date.
- Waste requiring macroencapsulation (grouting) to meet Land Disposal Restrictions was normally performed in the landfill cells and completed prior to disposal (covered).
- In response to a 2011 inspection of the Hanford Site Solid Waste Operations Complex by the EPA National Enforcement Investigation Center (NEIC) WCH discontinued macroencapsulation treatment of hazardous and mixed hazardous debris within the ERDF disposal cells in June 2012.
  - 40 CFR 268, "Land Disposal Restrictions," specifies that treatment standards must be met before these wastes can be placed (and disposed) within a landfill cell.
- As a result of the inspections in-trench treatment at ERDF was stopped and a staging area was established outside the disposal cells for treating the waste.
- The new processes substantially increase physical, chemical, and radiological hazards to workers performing macroencapsulation, and is less protective of the environment than the previous in-trench methods.
- DOE, EPA-Hanford and Washington Closure Hanford have been working to obtain a CERCLA applicable or relevant and appropriate requirements (ARARs) waiver allowing hazardous debris subject to land disposal restrictions (LDR) requirements to be treated within the ERDF landfill cells rather than in a unit outside of the cells.

# Waste Requiring Macroencapsulation



*One Team for Safe, Visible Cleanup of the River Corridor*

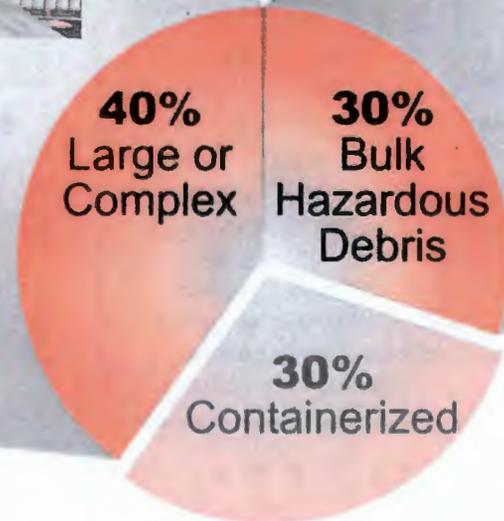
# Waste Requiring Macroencapsulation

## Hazardous and mixed waste characteristics

- Waste composition and waste forms are the same for in-trench and out-of-trench treatment
- Characteristic codes
  - No organic vapors present
  - No liquids



- *Complex items must be handled and manipulated to assure complete macroencapsulation*
- *Dangerous to coat and inspect underside of complex items*



- *The 324 Building alone will generate 3,000 cubic yards of hazardous debris. This highly contaminated facility poses extensive disposal challenges.*

*One Team for Safe, Visible Cleanup of the River Corridor*

# In-Trench vs. Out-of-Trench Treatment

## In-Trench Treatment



1 Offload into a staging area inside of the trench



2 Encapsulate with grout

### In-Trench Treatment:

- Reduces risks to environment
- Reduces radiological and industrial risks to workers (ALARA)
- Proven to be safe and efficient
- Reduces disposal costs

### Out-of-Trench Treatment:

- Increases risk to environment and workers
  - Significantly increases radiological exposure
  - Significantly increases industrial risks
  - Significantly increases chemical risks
- Increases treatment to disposal timeframe
- Increases disposal costs

## Out-of-Trench Treatment



1 Offload into a staging area outside of the trench



2 Protect from elements



3 Relocate to treatment area



4 Spray primer



5 Spray first coat of foam



6 Spray second coat of foam



7 Spray third coat of foam



8 Spray first coat of encapsulation coating



9 Spray second coat of encapsulation coating



10 Reposition debris to complete process



11 Complete foaming



12 Complete coating



13 Load finished debris



14 Transport finished debris to trench



15 Offload finished debris into trench

*One Team for Safe, Visible Cleanup of the River Corridor*

## Out-of-Trench Treatment Increases Risks to Workers



### Industrial Risks

- Increased crane use
- 1 lift/load for in-trench vs. 5 lifts/load for out-of-trench
- Heavier crane lifts
- Working with suspended loads



### Industrial Hygiene Risks

- Added chemical exposure pathway
- Additional respiratory protection needed
- Exposure time while spraying chemicals increased
- Weather-dependent
- Ergonomically hazardous
- Heat stress



### Radiological Risks

- Longer staging time increases worker exposure
- Close proximity to contaminated waste increases worker exposure
- 20x more dose to workers
- Size reduction not an option due to radiological risk

*One Team for Safe, Visible Cleanup of the River Corridor*

# Summary

## **In-Trench Treatment: Safe and Simplified Operations**

- In-trench treatment uses one method (grout) for all waste forms
- Waste is never moved post-treatment – assures integrity of macro
  - Contaminant migration potential is eliminated upon completion of grouting
  - Curing process is complete in seven days
- Waste handling is at absolute minimum – *one* time
- Room to work – Disposal cell area is compliant and protects environment
  - Not confined to small operations areas
  - Workers not in proximity of waste
  - More ALARA
- Less expensive – More funds available for cleanup

### **Summary**

***In-trench treatment is more protective of people and the environment, as well as less expensive.***

*One Team for Safe, Visible Cleanup of the River Corridor*