Transuranic (TRU) Project Update

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# Acronyms

- **ARRA**: American Recovery and Reinvestment Act
- **CAB**: Citizens Advisory Board
- **CH**: Contact Handle
- **DOE**: Department of Energy
- **FY**: Fiscal year
- **HA**: High activity
- **NDA**: Non-Destructive Assay
- **NDE**: Non-Destructive Examination
- **NRC**: Nuclear Regulatory Commission
- **PEC**: Plutonium Equivalent Concentration
- **RCRA**: Resource Conservation and Recovery Act
- **RH**: Remote Handle
- **SCDHEC**: South Carolina Department of Health and Environmental Control
- **SRS**: Savannah River Site
- **TRUPACT III**: Transuranic waste shipping container III
- **TRU**: Transuranic
- **V&P**: Vent and Purge
- **WIPP**: Waste Isolation Pilot Plant
Agenda

- TRU Waste Inventory Overview
- Progress and Accomplishments
- TRU Pad 1 Waste
- Volume and WIPP Shipping Metrics
- Safety Environment
- Waste Disposition Challenges
- 200 cubic meters of Very Difficult Waste
- Summary
Overview
- Background

Phase I (FY01 – 2Q, FY09):

CH Drums (~30,500 drums or ~ 6,000 m³)

Emptied 7 TRU Pads (Pads 7 -13)

Exceeded the original target of 30,000 drums for the TRU Drum Program

Lessons learned incorporated into the Phase II Process

1st TRU Waste Shipment – May, 2001

1,000th TRU Waste Shipment – June, 2009
Overview
- Remaining Scope

Phase II (3Q, FY09 – CY12):

Disposition of 5,000 m³ remaining legacy CH- and RH-TRU wastes with significantly higher levels of PEC and/or larger physical sizes including:

- Special Case CH Drums
- Pad 1 Drums and Boxes
- Non-Drum CH Containers
- RH Containers

$300 to $400 Million Project
American Recovery and Reinvestment Act of 2009 Funded
December 2012 Completion Date
200 m³ of very difficult waste planned post ARRA
Field Progress and Highlights
1st Year under ARRA

Pad 1 Culvert Excavation
Pad 1 Drum Mining
WIPP Shipment

Mock Up Training for Drum Remediation
WIPP Shipment Inspection under “Big Top”
Recent Accomplishments
February through April 2010

• **F Canyon**
  • Started Pad 1 drum remediation
  • Dismantled and removed old enclosure from truckwell
  • Restarted the F canyon warm crane

• **H Canyon**
  • Started box size reduction (Box #7)
  • Completed 9 large boxes (6 repackaging and 3 remediation)

• **E Area**
  • Resumed WIPP shipping on March 19 with 21 planned shipments
  • Started final retrieval phase on TRU Pad 1
  • Started field assay operation
  • Start large box X-ray testing
  • Started box repackaging on Pad 6 on March 31
TRU Pads 1 Activities

Before Soil Cover
May 1971

With Soil Cover
June 2005

Culvert Excavation
July 2009

Drum Mining
August 2009
TRU Pad 1 Contents

- Inner Containers paint/food cans, plastic bags placed in 55 gallon and 30 gallon drums or plywood boxes. Loaded waste into concrete culverts or boxes.
- 83 culverts and 6 concrete boxes from 1970-1972, over 6500 inner containers
- Organic and inorganic debris, resins, equipment, steel, glass, paper, plastic, trash and sweepings
- 11,000 grams (24 lbs) Pu238 total ~265m3, 180,000 curies
- Impure Pu238 oxide (~1.2kg) Included
WIPP Shipments

SRS ARRA Legacy TRU Program Shipping
TRU Waste
Through April 19, 2010
WIPP Shipping Casks

TRUPACT-II

TRUPACT-III
Drop Test

TRUPACT-III
Under NRC Review

72-B
ARRA – Ongoing/Enhanced Safety Focus

- **Mandatory Safety Training**
  - General Employee Training
  - Safety Culture Orientation
  - Hazards Recognition

- **Additional Project/Facility Requirements**
  - Rad Worker Training
  - Facility Orientation Training
  - Procedures Training
  - Mockup Training
  - Safety Basis Requirements Training
  - Local Safety Improvement Teams
  - BBS Program

- **Conduct of Operations Enhancement**
  - Mentor Program
  - HPI Tools
  - Daily Hot Wash
  - Housekeeping Routine

- **ISMS**
- **Management Field Presence**
- **ESH&Q Functional Support**
- **Independent Oversight**
- **External Safety Assessment**
- **Safety Improvement Actions**

![ZERO INCIDENTS](image)
High PEC and Pu-238 Challenges

**Total PEC**
- Disposed 145,500 PEC
- Remaining 375,100 PEC
  - 63% Pu238
  - 31% Pu239
  - 6% misc.
Large Boxed Waste Challenges

Boxed TRU Waste on Pad 26
TRU Boxed Wastes Disposition Process – by September 2010

5 Remediation Paths in E Area and F-/H-Canyons

- E Area
  - Container Preparation (V&P, Drain, ISOCS, RTR/LC NDE)
  - Remediation, Repackaging (Modified MWPF on Pad 6)
  - Staging
  - LLW, MLLW Processes

- H Canyon Truck Well
  - Warm Shop
  - Unpackaging, Repackaging
  - VE, Remediation, Resizing, Repackaging
  - LSBB (TDOP?)

- F Canyon Truck Well
  - VE, Remediation, Resizing, Repackaging
  - SLB, SWB

- CCP
  - Characterization, Certification
  - WIPP Shipment

Box Repackaging/Remediation Challenges
Size Reduction Change

Container Types

<table>
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<tr>
<th>Volume (m$^3$)</th>
<th>Life Cycle Baseline</th>
<th>ARRA Disposition Plan</th>
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<td>SLB-2</td>
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<tr>
<td>SWB</td>
<td>980</td>
<td>4280</td>
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<tr>
<td>Drum</td>
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Aggressive Size Reduction Challenges

• More Hands-On Work
• Longer Processing Time
• Increase in Overall Worker Exposure Dose
• Increase Probability of Contamination Event

1 SLB-2, 2 TDOPs, 4 SWBs, or 30 Drums
200 m³ of Very Difficult Waste

- High Gamma Emitting Wastes – NDA issues
  - Concrete casks from SRNL
  - Silver Saddles from F- & H-Canyons
- High Curie Content Wastes – over WIPP and/or NC limits
  - Mound and Los Alamos wastes on Pad 1
- Highly Contaminated Wastes – up to 400 million dpm alpha
  - Stainless steel boxes from H-Canyon Hot Sample Aisle
  - MSM from 235-F
  - One-pack plywood boxes from HBL
- Waste with Integral Lead Shielding – NDA and NDE issues
  - Stainless steel boxes from H-Canyon Hot Sample Aisle
- Oversized RH Debris – size reduction needed
200 m³ Very Difficult Waste Challenges

• RH-TRU Repackaging Process
• RH-TRU Size Reduction and Repackaging Process
• Special Container Grouting Process
• Waste Solidification Process
• High FGE/PEC Container Handling Process
• Secure Sorting and Segregation Process
• Other Special Characterization Tasks
Summary

- Worker Safety Highest Priority
- 30,000 Drum Inventory Complete
- Multiple Size Reduction/Remediation Facilities Needed to Complete the Remaining Legacy Inventory
- Significant Technical Challenges Remain
- Overall Project Still in Early Phase of Execution
- Progress to Date Is a Little Behind Plan