



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**

# Idaho Cleanup Project Progress to Date Citizens Advisory Board

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Idaho Cleanup Project

**October 27, 2016**

# Idaho Cleanup Project Scope

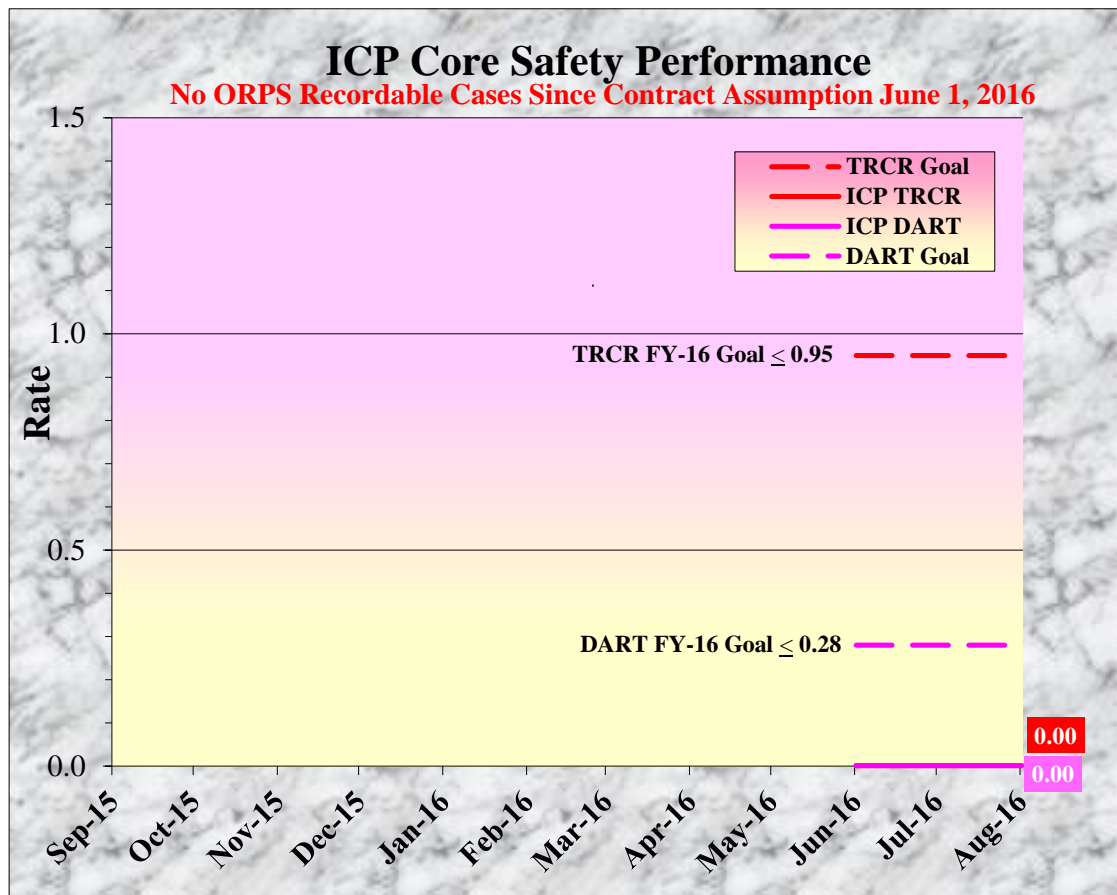
- Transuranic Waste Disposition
- Advanced Mixed Waste Treatment Project (AMWTP)
- Comprehensive Environmental Response Compensation Liability Act (CERCLA) Remediation
  - Waste Area Group (WAG) 1 – Test Area North (TAN)
  - Waste Area Group (WAG) 2 – Test Reactor Area (TRA) - **Complete**
  - Waste Area Group (WAG) 3 – Idaho Nuclear Technology and Engineering Center (INTEC)
  - Waste Area Group (WAG) 4 – Central Facilities Area (CFA) - **Complete**
  - Waste Area Group (WAG) 5 – Power Burst Facility (PBF)/Auxiliary Reactor Area (ARA) - **Complete**
  - Waste Area Group (WAG) 6 – Experimental Breeder Reactor No. I (EBR-I) - **Complete**
  - Waste Area Group (WAG) 7 – Radioactive Waste Management Complex (RWMC)
  - Waste Area Group (WAG) 9 – Argonne National Laboratory – West (ANL-W) - **Complete**
  - Waste Area Group (WAG) 10 – Site-wide Miscellaneous Sites/Snake River Plain Aquifer
- Idaho CERCLA Disposal Facility

# Idaho Cleanup Project Scope (cont.)

- Sodium Bearing Waste Treatment
- INTEC Liquid Waste Treatment Facility (Tank Farm Closure)
- Calcine Disposition
- Spent Nuclear Fuel Management
- Decontamination and Decommissioning: Materials and Fuels Complex

# Safety Performance – July-August 2016

(Information and Data through August 28, 2016)



## July 2016

**Six First Aid Cases and No Recordable Injuries**

### One ORPS Reportable Occurrence:

- Powered Air Purifying Respirator blower hose disconnected from blower housing during Anti-C doffing

## August 2016

**Six First Aid Cases and No Recordable Injuries**

### Two ORPS Reportable Occurrences:

- A fuel handling unit (FHU) became un-grappled while it was being lowered into a storage bucket
- A worker was struck on the foot by a counterweight that fell from a metal brake handle during operation

# Context: Off-site Waste Disposition

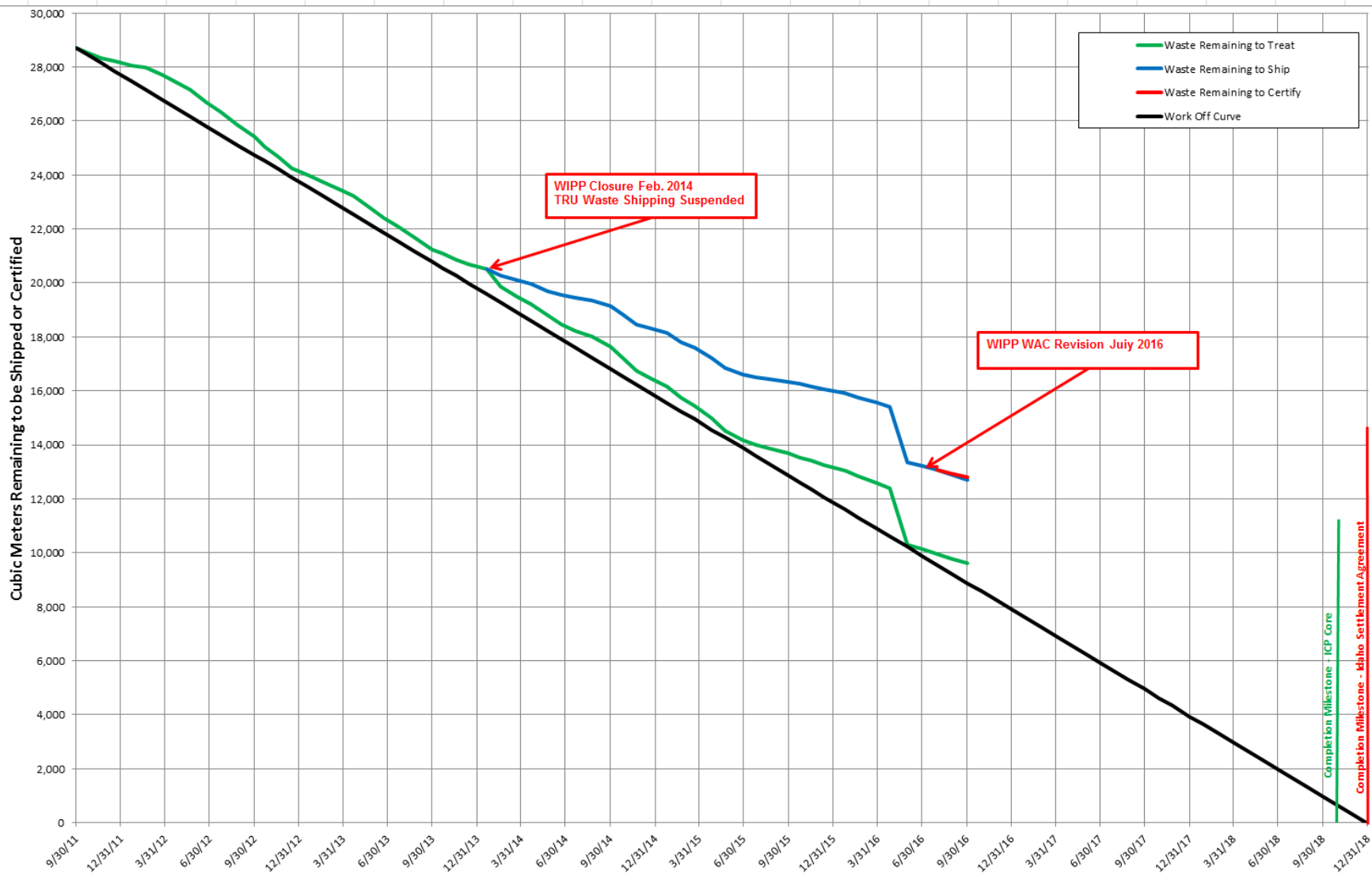
- What is the Waste: TRU and MLLW, principally from Rocky Flats, Argonne National Laboratory, Mound, and other smaller generators stored in retrievable configurations at the Transuranic Storage Area and at the Radioactive Scrap and Waste Facility.
- Potential Risks: Waste contains long lived transuranic isotopes which pose a risk to the workers and the environment. Retrieval of the waste and shipment for disposal in a deep geologic repository (i.e. WIPP) ensures that humans and the environment are protected from the waste for the thousands of years that it remains harmful.
- Settlement Agreement: Requires removal of estimated 65,000 cubic meters of stored transuranic waste from the State of Idaho by December 31, 2018.
- How treated/disposed: Repackaged, treated to remove prohibited conditions, characterized and certified to meet waste acceptance criteria for WIPP or MLLW disposal facilities as appropriate.

## Context (continued)

- Current Budget: (Annually)
  - AMWTP (Contact-handled TRU waste retrieval, characterization, treatment, certification)
  - ARP Support to AMWTP (Processing sludge waste, large items)
  - RH-TRU (Processing remote-handled transuranic waste)
  - ICP MLLW (Processing low-level waste for offsite disposal)
  - RWMC Infrastructure
  - Total ~ \$185.5M



# Idaho Settlement Agreement Work-off Status



# Waste Programs Overview

- Idaho TRU Certified Backlog:
  - 20,136 Containers
  - 820 CH-TRU shipments
  - 90 RH-TRU shipments
- MLLW Key Activities/Actions:
  - Between the June 1 contract transition and September 25, Fluor has shipped 102 m<sup>3</sup> of legacy waste for treatment and disposal at Energy Solutions in Clive, Utah and 131 m<sup>3</sup> of legacy waste for disposal at NNSS.
- MLLW Upcoming Activities:
  - Continue shipment of legacy salt, soil, and debris waste.

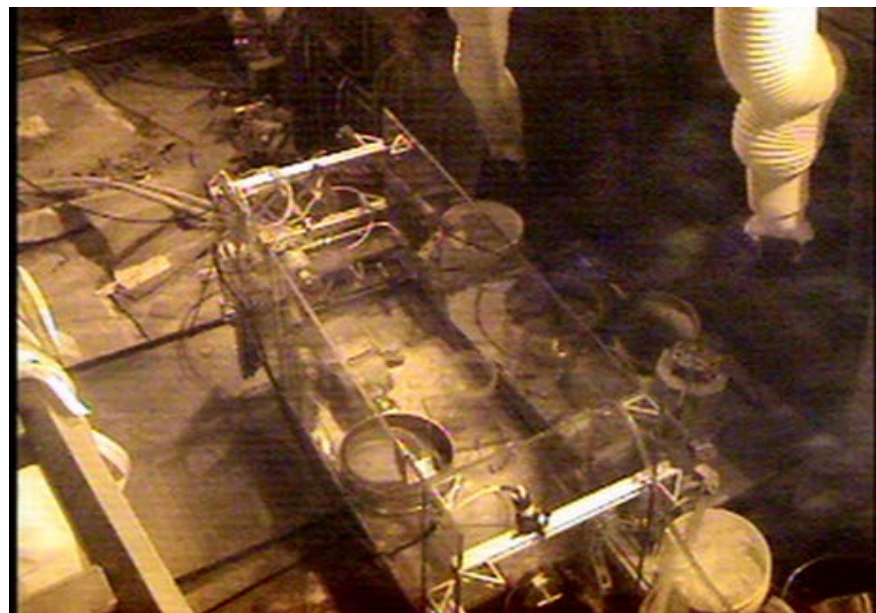
	Certified Containers	Shipments
<b>CH-TRU Waste</b>		
Product Drums	3,849*	256
Direct Ship	1,967*	105
SWB's	8	2
SRP Drums	10,052	335
Buried Waste	4,260	122
CH-TRU Total	20,136	820
<b>RH-TRU Waste</b>		
Drums	161	90
* Includes containers in pre-sub certified status that require Flammable Gas Analysis prior to certification.		



# Remote-Handled Transuranic Waste Disposition

## Key Activities/Actions:

- Remote-handled transuranic waste shipments are on hold until WIPP re-opens.
- Activity Status
  - Continue with repackaging ISA waste.
  - Continue processing waste stream approvals for ISA waste.
  - Continue preparations for Navy waste stream.
- Remaining EM RH-TRU waste to meet Idaho Settlement Agreement:
  - Approximately 25 cubic meters.
  - Six waste streams are submitted and pending CBFO approval.
  - Seven waste stream packages are in development for submittal for review.
  - Waste stream approval by EPA and CBFO is required prior to certification and transport for disposal.



Argon Repackaging Station inside the Hot-Cell

# Advanced Mixed Waste Treatment Project



Above: New Brokk 400 installed in South Box Line

Below: View of South Box Line Floor with Brokk Removed



## Key Activities/Actions:

- Contact-handled transuranic waste shipments are on hold until WIPP resumes operations.
- 820 Shipments of CH TRU have been certified for shipment to WIPP\*.
- Shipment of 791 m<sup>3</sup> of Legacy LLW/MLLW off-site in support of ISA milestone in FY2016.

*\*Includes containers that require Flammable Gas Analysis for DOT Transport prior to transportation certification.*

## Upcoming Activities:

- Continue Infrastructure Improvements through the 1<sup>st</sup> and 2<sup>nd</sup> Quarters of 2017.
- Continue work on chemical compatibility requirements with WIPP.
- Develop additional treatment capacity for difficult wastes (e.g. Oversized Boxes) during the 1<sup>st</sup> and 2<sup>nd</sup> Quarters of 2017.



# Advanced Mixed Waste Treatment Project



Pad 1 Cell 1 center row of boxes,  
top 9/14 and bottom 9/21,  
complete September 2016

## Key Activities Retrieval and Cargo Operations:

- FY 16 - Retrieved 1,344 cubic meters as of Sep 25.
- Emptied 89 of 104 cargo containers.
- Continued retrieving waste from Pad 1 Cell 1, the final cell with waste containers.
- We have about 142 boxes and 500 drums left to retrieve – about 655 cubic meters.

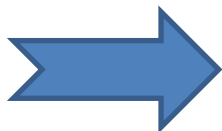
## Upcoming Activities:

- 19 empty cargo containers ready for transferring to ICDF.
- Complete retrieval 2<sup>nd</sup> quarter FY 2017.

# Dashboard Legend



Ahead of schedule, under budget, better than expected.









On schedule, on budget, performance as expected.



Behind schedule, over budget, performance less than expected.

# Dashboard Summary – Solid Waste Disposal

Key Questions	Dashboard Indicator	Comments
Schedule Performance		WIPP closure and changes to acceptance criteria puts ID behind schedule in shipping and characterization. Fluor Idaho performing to current contract requirements.
Cost performance		Delays in shipping and characterization will increase life-cycle costs. Fluor Idaho performing to current contract requirements.
Impact on employment/economic development		Work is ongoing at AMWTP and INTEC.
Affect on agreements		Closure of WIPP has precluded shipment of 2,000 cubic meter rolling average., places 2018 milestone at risk.
Impact on safety and environment		Waste disposition operations were performed safely and compliantly during the reporting period.
Impact on cleanup DOE-wide		No impact on complex wide cleanup.

# CERCLA Remediation Project Objectives

- WAG 1: Test Area North (TAN)
  - TAN Groundwater Remediation
- WAG 3: Idaho Nuclear Technology and Engineering Center (INTEC)
  - Complete the work associated with the OU 3-14 Record of Decision
  - Operate the Idaho CERCLA Disposal Facility (ICDF) to compliantly disposition CERCLA waste
- WAG 7: Radioactive Waste Management Complex (RWMC)
  - **Exhume 5.69 acres of buried waste (Completed 4.31 acres as of September 30, 2016)**
  - Complete the work associated with the OU 7-13/14 Record of Decision
- WAG 10: Site Wide
  - Maintain site wide institutional controls, and operations and maintenance program
  - Maintain groundwater monitoring program
  - Maintain the New Site Identification Process for future CERCLA sites



# CERCLA Remediation – WAGs 1, 3, and 10

- Key Activities/Actions:
- WAG 1
  - Continued ISB injections into new injection/monitoring well at Test Area North
  - “Snapshot” sampling event completed (July).
    - Results confirmed the plume is behaving as the original groundwater model predicted
  - New distal zone monitoring well will be drilled next field season to better monitor boundary of plume.
  - Discovered that 500 gal. of monitoring well purge water with an Sr-90 concentration of 29 pCi/L was introduced into the Test Area North groundwater treatment facility, which exceeded the treatment facility’s 8 pCi/L Sr-90 acceptance criterion for blended purge water.
    - The 8 pCi/L blended purge water acceptance limit is specified in the 2012 agency-approved facility O&M Plan.
    - As required by the O&M Plan, Agency notifications were made and corrective actions implemented to prevent future similar events.
    - The 2012 O&M Plan nonconformance was the result of a monitoring field technician’s error.



Excavating TRA-75 footprint



Grouting 33-TRA SIW within TRA-75



Transporting excavated soil from TRA-75 to ICDF for disposal



Backfilled TRA-75

# CERCLA Remediation – WAGS 1,3 and 10 (cont.).

- WAG 10
  - Completed remediation of New Site TRA-75 (July).
  - Evaluation of PCE Contamination of well MIDDLE-2051.
  - Implementation of four NSI Field Sampling Plans for TRA-61, TRA-82, TRA-79 and TRA-80 scheduled for this fall.
- Ongoing Activities:
  - WAG 1 - Continue ISB injections into new wells - Anticipate four FY17 injections.
  - WAG 3 - Continue perched water monitoring and recharge controls at INTEC.
  - WAG 10 –
    - Continue monitoring and institutional controls.
    - Continue New Site evaluation/remediation.

# CERCLA Remediation – Idaho CERCLA Disposal Facility (ICDF)

## Key Activities/Actions:

- FY2016 - Received 23,103 gallons of liquid for disposal to evaporation
  - WAG2 Well Purge water
  - WAG3 Well Purge water
  - USGS Well Purge water
- FY2016 - Received a total of 1,752.38 m<sup>3</sup> of solid waste for landfill disposal
  - MFC D&D debris
  - WAG3 Debris
  - AMWTP – cargos and soil sacks



Receipt of AMWTP Cargo Containers into ICDF


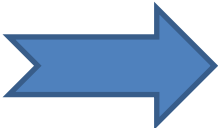
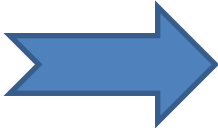
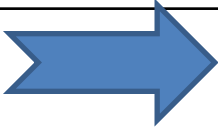
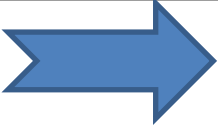
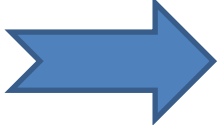


Preparing AMWTP Cargos for Grouting

## Upcoming Activities:

- Continue receipt and disposal of aqueous wastes in Evaporation Ponds.
- Dispose of solid waste from environmental restoration actions, including Phase II of AMWTP cargo containers and soil sacks and D&D debris.
- Continue operation and maintenance of ICDF complex processes and facilities.

# Balance of CERCLA (WAGs 1, 3, & 10) Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		Activities slightly ahead of schedule.
Cost Performance		Cost performance just slightly under budget.
Impact on employment/economic development		Project will continue at a similar level of effort for several years.
Affect on agreements		Project continues to meet regulatory milestones.
Impact on safety and environment		No ongoing safety issues; Safety goals are being met.
Impact on cleanup DOE-wide		No impact on DOE-wide cleanup.



## Context: Buried Waste Exhumation

- What is the Waste: TRU waste, principally from Rocky Flats, buried in pits and trenches at the Subsurface Disposal Area at RWMC prior to 1970.
- Potential Risks: Potential contamination of the Snake River Plain Aquifer to above drinking water standards (volatile organic compounds primary contaminants of concern).
- Settlement Agreement: Part of FFA/CO CERCLA remediation of the buried waste under OU 7-13/14 ROD.
- How treated/disposed: Packaged to meet acceptance criteria for disposal at WIPP.
- Current Budget: Current Fiscal Year Budget for buried waste exhumation is \$21.6M.

# CERCLA Remediation - WAG 7 Objectives

- Complete remediation work in accordance with the Record of Decision (ROD) for OU 7-13/14
- Conduct Targeted Waste Retrieval at the Accelerated Retrieval Projects (ARP) and disposition waste:
  - ARP I, II, III, IV, V, VI and VII - **completed**
  - ARP VIII: 1.03 acres out of 1.72 acres have been exhumed as of 9/30/16.
  - ARP IX:
    - Design and foundation construction – **completed**
    - Retrieval Enclosure construction – **in progress**
- ARP I & VI D&D - **completed**
- Complete in situ grouting of 21 locations - **completed**
- Subsurface solvent vapor extraction (OCVZ)
- Environmental monitoring and institutional controls



## Key Activities/Actions:

- Achieved requirement to exhume 7,485 m<sup>3</sup> (packaged) of buried waste.
- Continued ARP VIII waste exhumation. 1.03 acres have been exhumed as of September 30, 2016.
- ARP IX design and foundation construction complete. North Wind, Inc. began construction of the enclosure, July 2016. Construction is scheduled to be completed late spring 2017.
- Since 1996, 245,740 pounds of TVOC removed using vapor extraction as of September 30, 2016.

## Non-CERCLA Activities:

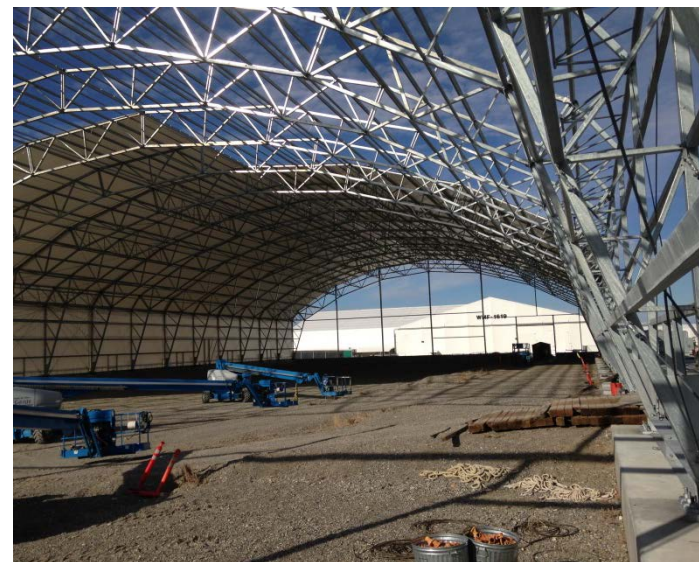
- Continued ARP V repackaging AMWTP sludge waste. 2,364 drums and 60 boxes have been repackaged as of 9/30/16
- Started up AMWTP debris repackaging process in ARP VII on March 9, 2016. 31 boxes have been processed and repackaged as of 9/30/2016.

## Ongoing Activities:

- Continue to exhume targeted buried waste in ARP VIII.
- Continue AMWTP sludge repackaging in ARP V.
- Continue AMWTP debris repackaging in ARP VII
- Complete ARP IX facility construction.
- Continue organic vapor extraction.

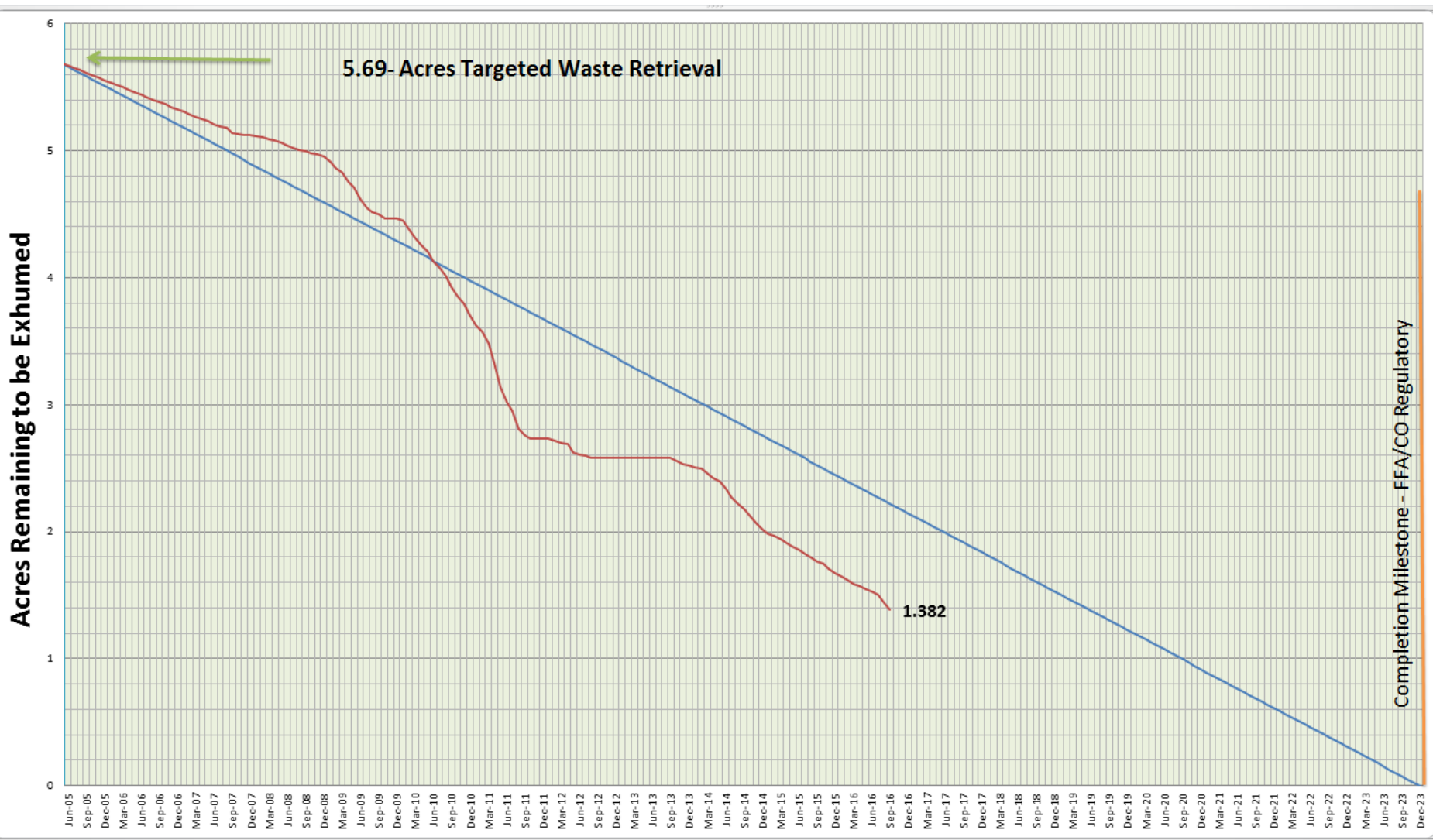


ARP IX retrieval enclosure framing



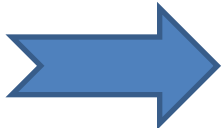

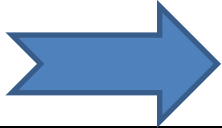



ARP IX outer fabric installation

# Buried Waste Exhumation Work-off Chart



# WAG 7 Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		As of September 30, 2016, 4.31 acres (75.7%) of the required total of 5.69 acres have been exhumed. Project is about two years ahead of regulatory requirements.
Cost Performance		Cost performance under budget.
Impact on employment/economic development		Project is expected to continue with same level of employment for several years.
Affect on agreements		Project is ahead of pace to meet regulatory milestones.
Impact on safety and environment		No ongoing safety-related issues; safety goals being met.
Impact on cleanup DOE-wide		Crew performing buried waste exhumation and sludge/debris repackaging in ARP V/VII

# CERCLA Progress

Waste Area Group (WAG)	Milestone Title	Milestone type	Milestone Date	FY2017
WAG 3 (INTEC)	Interim INTEC Tank Farm Cover Phase <ul style="list-style-type: none"> <li>Phase A (western 2/3)</li> <li>Phase B (eastern 1/3)</li> </ul>	<ul style="list-style-type: none"> <li>FFA/CO Regulatory</li> <li>FFA/CO Regulatory</li> </ul>	<ul style="list-style-type: none"> <li>Submit RA Report by November 30, 2017 (on track)</li> <li>Submit RA Report by Nov. 30 of first field season after tank farm closure (on track)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> <li>N/A</li> </ul>
WAG 3 (INTEC)	Final Tank Farm Evapo-transpiration cover	FFA/CO Regulatory	After INTEC Closure	N/A



## CERCLA Progress (continued)

Waste Area Group (WAG)	Milestone Title	Milestone type	Milestone Date	FY2017
WAG 7 (RWMC)	Exhume .35 acres of targeted buried waste	DOE Fiscal Year Work Plan goal	9/30/17	FY 2017 goal
WAG 7 (RWMC)	Complete ARP IX construction	Contract commitment	2017	N/A – Pursuing acceleration
WAG 7 (RWMC)	Complete 90% Design for final Subsurface Disposal Area (SDA)	FFA/CO Regulatory	9/30/2020	N/A
WAG 7 (RWMC)	Complete Buried waste exhumation (5.69 acres)	FFA/CO Regulatory	12/31/2023	N/A
WAG 7 (RWMC)	Completed SDA final Cover construction	FFA/CO Regulatory	12/31/2028	N/A

# Context: Spent Nuclear Fuel

**Type of Waste:** The term “spent nuclear fuel” means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. (Nuclear Waste Policy Act, 1982) Within DOE, spent nuclear fuel (SNF) is managed as a material of interest and value until it might be declared a waste prior to final disposition.

**Hazard to Public, Environment:** Low. While SNF typically is highly radioactive, it is appropriately stored, managed and protected. The high radiation levels require some sort of shielding: cask, water, concrete, etc.

**How Treated:** SNF is managed through safe, secure, compliant storage, which includes surveillance and maintenance of storage facilities. It will be repackaged prior to transfer to a final repository.



## Context: Spent Nuclear Fuel (cont.)

How Disposed: DOE intends to dispose of SNF in a geologic repository.

Current Year Budget: FY16 PBS 12:

- Defense-funded SNF program: \$15.25 million
- Non-defense funded SNF program: \$5.9 million

Total program: \$21.15 million

# Spent Nuclear Fuel Disposition Project

## Key Activities/Actions:

- Completed 12 planned EBR-II SNF transfers out of INTEC to MFC for the FY.
- Completed 1 ATR receipt into INTEC within the CPP-666 basin for the FY.\*

## Upcoming Activities:

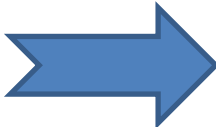
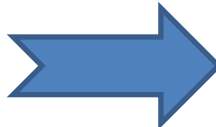
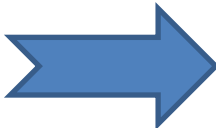

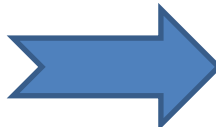

- Continue EBR-II SNF fuel transfers out of wet storage.
- Continue ATR SNF receipts into wet storage.
- Plan for ATR SNF transfers out of wet storage.
- Continue to prepare Three Mile Island's NRC license renewal application.





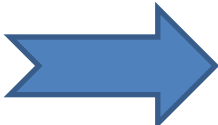



Spent Resin Cask Shipment

\* ATR was unable to ship.

# Dashboard Summary – Spent Nuclear Fuel Disposition Project

Key Questions	Dashboard Indicator	Comments
Percent of project completed		As of 5/31/16, the CWI project is complete. As of 09/30/16, the Fluor project is four months into a sixty month project (~7%). Progress is satisfactory.
Percent of budget expended		As of 5/31/16, the CWI project is complete. As of 09/30/16, the Fluor project is four months into a sixty month project (~7%). Progress is satisfactory.
Impact on employment/economic development		There was no loss of INTEC staff during the contract transition.
Affect on agreements		The project has met its planned scope commensurate with existing agreements.
Impact on safety and environment		INTEC projects routinely report among the lowest recordable incidents and contribute to the overall positive performance towards ICP safety goals.
Impact on cleanup DOE-wide		The project has met its goals.

# ICP Dashboard Summary

Key Questions	Dashboard Indicator	Comments
Amount of project completed		Reflects IWTU, TRU waste delays. Fluor Idaho performing to contract.
Amount of budget expended		IWTU, TRU waste issues causing life cycle costs to rise. Fluor Idaho performing to contract.
Impact on employment/economic development		Employment largely stable.
Affect on agreements		IWTU delay, WIPP closure impacting milestones.
Impact on safety and environment		Fluor Idaho performing well to established safety goals.
Impact on cleanup DOE-wide		No outstanding impacts.