



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

**Oct. 25, 2018**

# Idaho Cleanup Project Scope

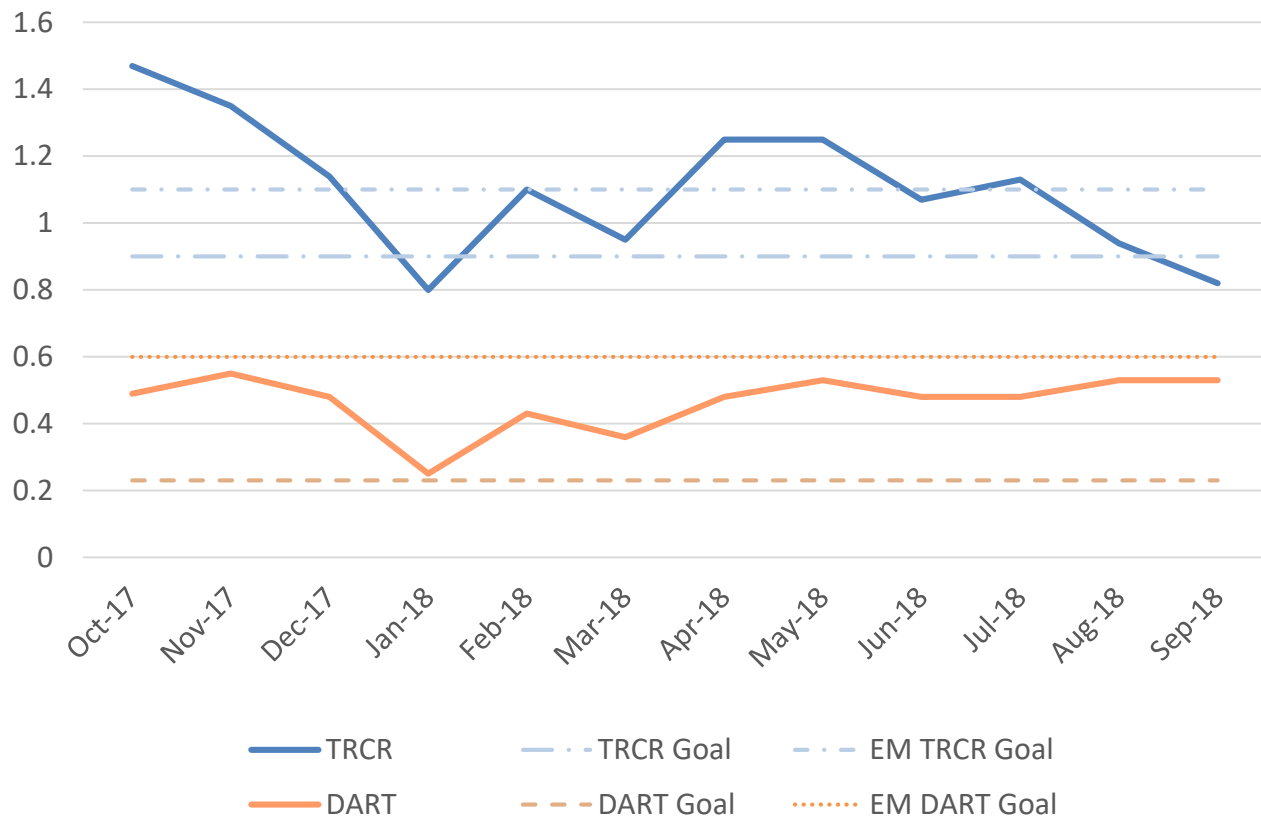
- Transuranic Waste Disposition
- Advanced Mixed Waste Treatment Project (AMWTP)
- Comprehensive Environmental Response Compensation Liability Act (CERCLA) Remediation
  - Waste Area Group (WAG) 1 – Test Area North (TAN)
  - Waste Area Group (WAG) 2 – Test Reactor Area (TRA) - **Complete**
  - Waste 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
- Calcine Disposition
- Spent Nuclear Fuel Management
- Decontamination and Decommissioning: Materials and Fuels Complex

# Safety Performance – June thru September 2018

ICP Core Injury Rates



## June 2018

- One First Aid Case, One Recordable Injury, and no Restricted cases
- Four ORPS Reportable Occurrences

## July 2018

- Three First Aid Cases, no Recordable Injuries, and no Restricted cases
- One ORPS Reportable Occurrence

## August 2018

- Four First Aid Cases, no Recordable Injuries, and no Restricted cases
- Two ORPS Reportable Occurrences

## September 2018

- One First Aid Cases, no Recordable Injuries, and no Restricted cases
- One ORPS Reportable Occurrence

# 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 4.85 acres as of Sept. 30, 2018)**
  - 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 (cont.).

## • Ongoing Activities:

### - WAG 1

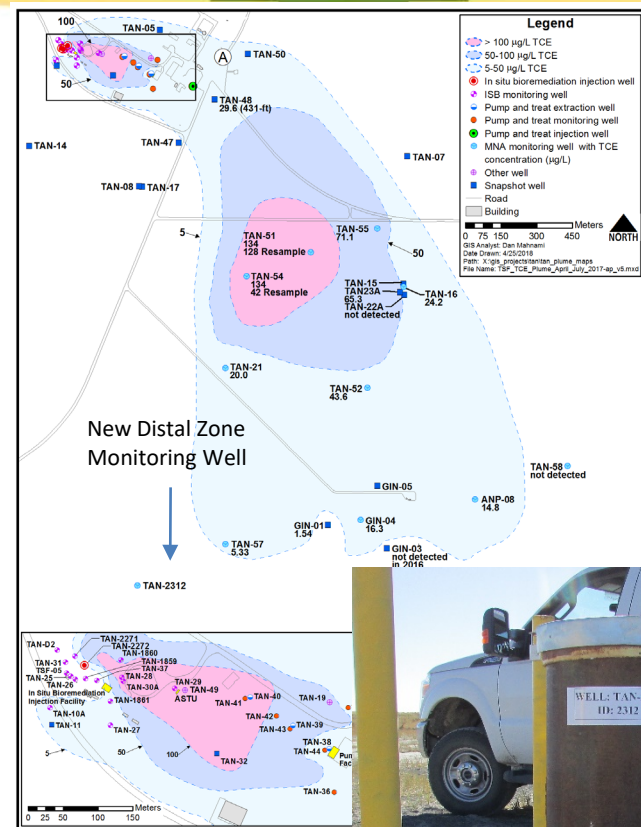
- Continue Partial Insitu Bioremediation Rebound Test in source zone.
  - Conditions are slowly changing, however more time is needed for conditions to return to background to evaluate if trichloroethylene (TCE) concentrations will rebound.
- Continue TAN-28 Source Action.
  - The next injection into TAN-37 is scheduled for November 5, 2018. Still too early to evaluate effectiveness.
- Sample results from the new distal zone well TAN-2312 have resulted in non-detect TCE concentrations. This new well was completed last fall for the purpose of better monitoring the outer plume boundary.

### - WAG 3 –

- Continue perched water monitoring and recharge controls at INTEC.

### - WAG 10 –

- Continue monitoring and institutional controls.
- Continue New Site evaluation/remediation.
- Continue Westbay Well Rehabilitation to remove PCE contamination from the tubing fluid inside three groundwater monitoring wells.



Location of new monitoring well in Distal Zone of TAN TCE plume.



New well TAN-2312

# Idaho CERCLA Disposal Facility (ICDF)

## Key Activities/Actions:

- FY 2018 ( Oct. 2017 through Sept., 2018)
  - Received 20,715 gallons of liquid for disposal to the ICDF evaporation ponds.
  - Received a total of 1,592 cubic meters for landfill disposal.
  - Completed AMWTP Campaign:
    - AMWTP cargo containers, M-III Bins, soil sacks and “cakeboxes” to ICDF Landfill.
    - Collaborative process included DOE, EPA and DEQ .
    - Significant cost savings over off-site shipping and disposal.

## Ongoing Activities:

- Continue receipt and disposal of aqueous wastes in evaporation ponds.
- Dispose CERCLA solid waste
- Continue operation and maintenance of ICDF complex processes and facilities.



M-III Bins from AMWTP unloaded at ICDF.



AMWTP shipments of soil sacks and cargos heading to ICDF.

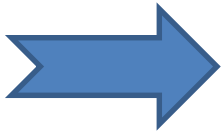


AMWTP shipment of “cakeboxes” heading to ICDF.

# Dashboard Legend



Ahead of schedule, under budget, better than expected.





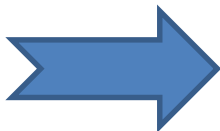
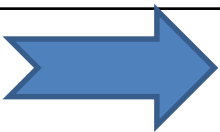
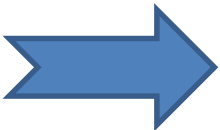
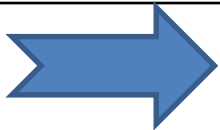
On schedule, on budget, performance as expected.



Behind schedule, over budget, performance less than expected.



# 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 current safety issues; progressing towards meeting safety goals.
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 \$31.3M.

# 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: 1.57 acres out of 1.72 acres have been exhumed as of 9/30/18.
  - ARP IX: Buried waste exhumation will begin in late 2018 when ARP VIII exhumation is complete.
- 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:

- Continued ARP VIII waste exhumation. 1.57 of 1.72 acres have been exhumed as of Sept. 30, 2018. (91.3% complete)
- Since 1996, over 255,000 pounds of volatile organic compounds have been removed using vapor extraction as of August 26, 2018.

## Ongoing Activities:

- Continue to exhume targeted buried waste in ARP VIII. The waste exhumation process was revised with additional controls to mitigate the risk of an event similar to the ARP V drum event. Exhumation resumed on 8/23/18.
- Continue organic vapor extraction.
- Continue SDA cap design. The draft 90% design will be submitted for regulatory review before the end of 2018.



Buried waste exhumation in ARP VIII





# ARP VIII Footprint Exhumation Status

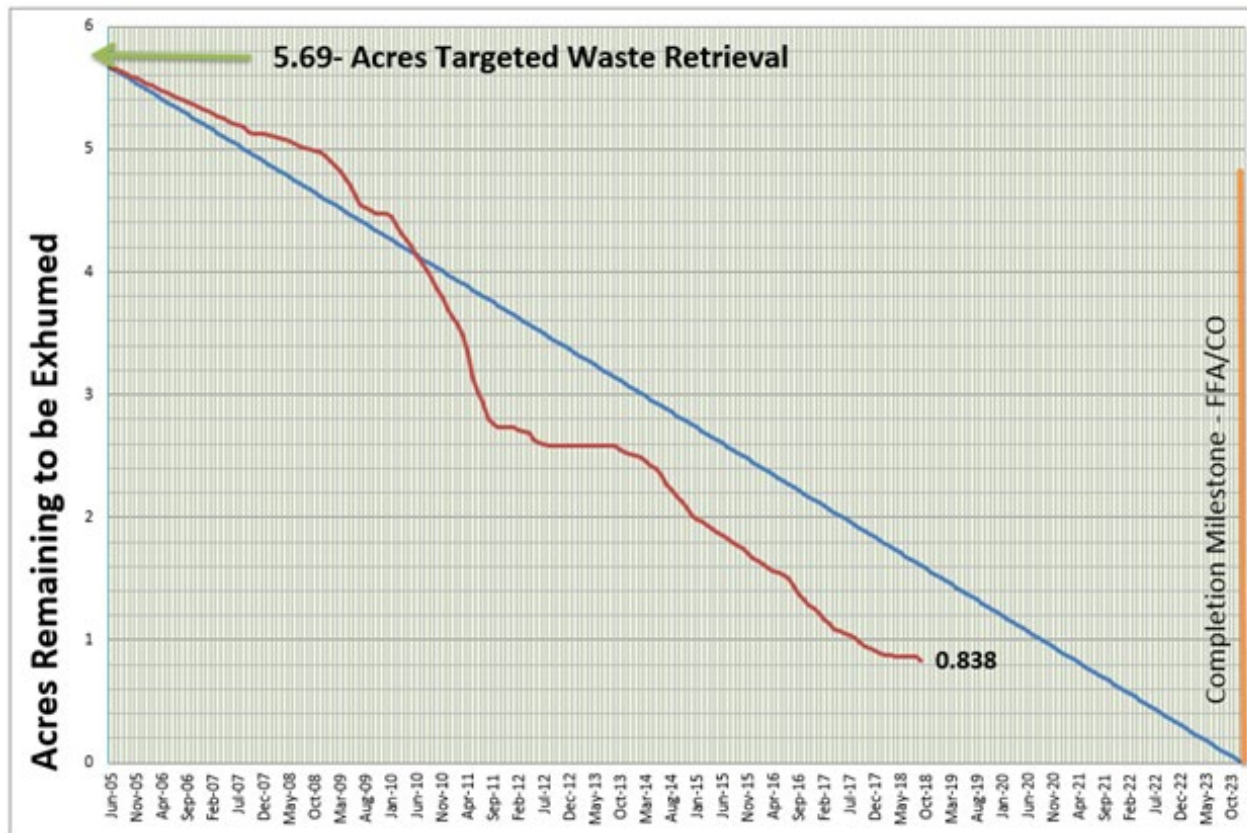
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A																													12	40	69	94	A	
B																					9	37	65	94	122	151	180	208	225	225	225	210	B	
C																		28	148	176	205	224	225	225	225	225	225	225	225	225	225	197	C	
D																		36	225	225	225	225	225	225	225	225	225	225	225	225	225	184	D	
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F	85	157	169	181	193	204	216	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	153	F	
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J	28	56	46	36	26	16	6																	10	59	225	225	225	225	225	225	106	J	
K			2	15	24											40	112	128	144	160	175	190	205	220	225	225	225	225	225	225	225	93	K	
L			124	225	222	60	33	49	64	79	95	110	126	141	184	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	80	L	
M			138	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	67	M	
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P			5	20	37	53	69	85	102	118	134	151	167	183	199	216	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	29	P	
Q																		7	17	27	40	55	70	84	99	114	129	143	158	175	192	211	16	Q
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			Remaining -SQ FT																															
			Exhumed -SQ FT																															

- Waste Exhumation (Acres) (FYTD) as of September 30, 2018



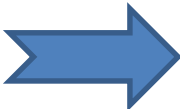

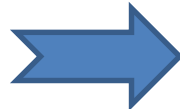

FY-18 Target: 0.40

FY-18 Actual: 0.142

Buried Waste Exhumation was intentionally delayed so exhumation crews could support AMWTP ISA waste processing in the ARPs. In addition, the exhumation was placed in a safety step-back from April 11 through August 23 as a result of the ARP V drum incident. Overall, exhumation remains about two years ahead of the regulatory schedule.



# WAG 7 Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		As of Sept. 30, 2018, 4.85 acres (85.2%) of the required total of 5.69 acres have been exhumed. Project is behind contract baseline schedule, but remains about two years ahead of regulatory requirements.
Cost Performance		Cost performance over budget due to shifting resources to higher priority ISA work in ARP IX and precautionary step-back due to ARP V event.
Impact on employment/economic development		Project is expected to continue with same level of employment through most of the current contract period.
Affect on agreements		Project remains ahead of pace to meet regulatory milestones.
Impact on safety and environment		No current safety issues; progressing towards meeting safety goals.
Impact on cleanup DOE-wide		Crews performing waste exhumation, sludge/debris in ARP VII and VIII.

# CERCLA Progress

Waste Area Group (WAG)	Milestone Title	Milestone type	Milestone Date	FY2018
WAG 3 (INTEC)	Interim INTEC Tank Farm Cover Phase Phase B (eastern 1/3)	FFA/CO Regulatory	Submit RA Report by Nov. 30 of first field season after tank farm closure (on track)	N/A
WAG 3 (INTEC)	Final Tank Farm Evapo-transporation cover	FFA/CO Regulatory	After INTEC Closure	N/A



# CERCLA Progress (continued)

Waste Area Group (WAG)	Milestone Title	Milestone type	Milestone Date	FY2018
WAG 7 (RWMC)	Exhume .35 acres of targeted buried waste	DOE Fiscal Year Work Plan goal	9/30/18	
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

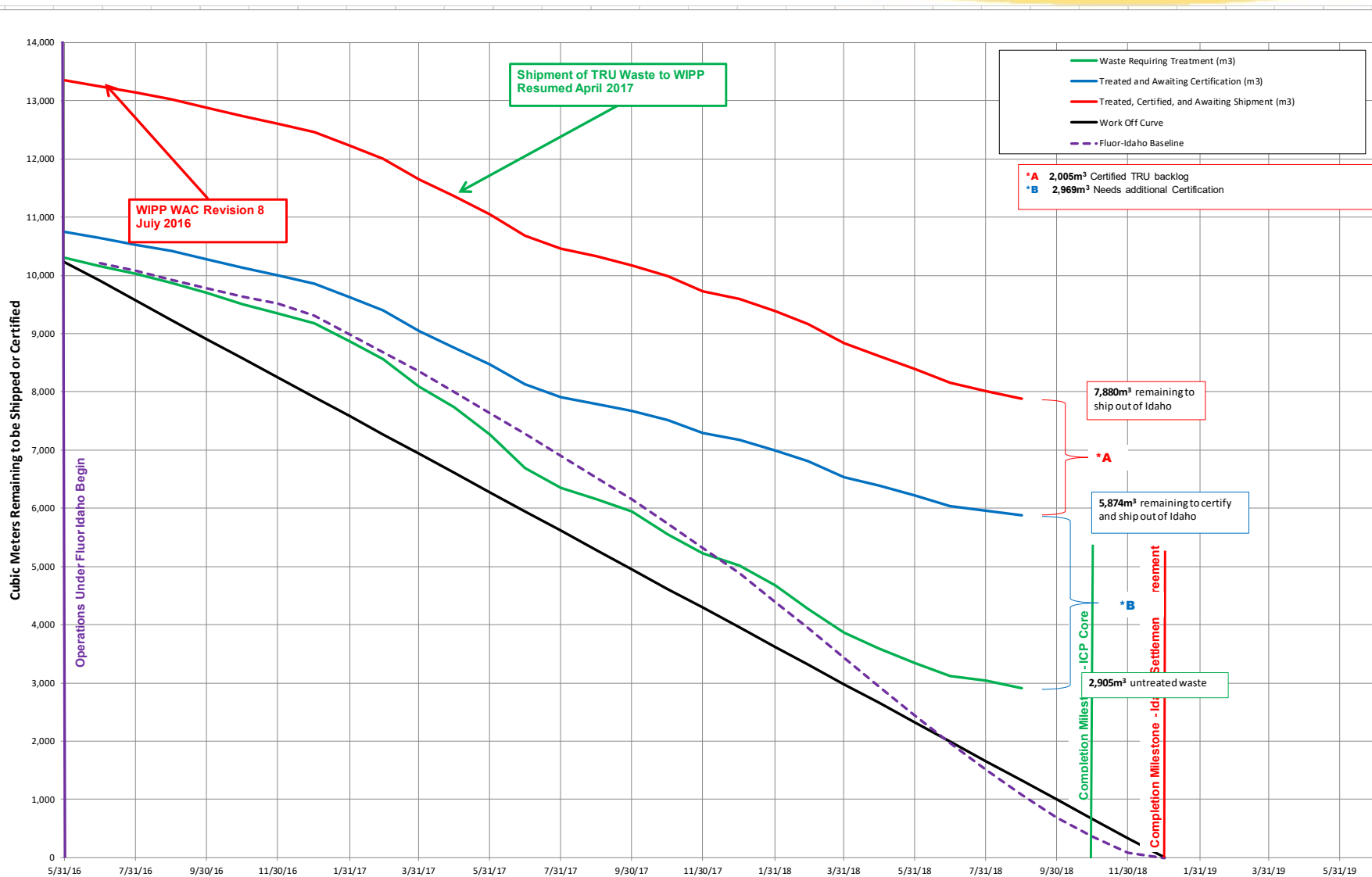
# Context: Stored Waste Disposition

- What is the Waste: Transuranic (TRU) and Mixed and Low Level Waste (M/LLW), principally from Rocky Flats, Argonne National Laboratory, Mound, and other smaller generators stored in retrievable configurations at the Transuranic Storage Area (TSA) and at the Radioactive Scrap and Waste Facility (RSWF).
- 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. the Waste Isolation Pilot Plant or 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 M/LLW disposal facilities as appropriate.

# Stored Waste Disposition

- Current Budget: (Annually)
  - Advanced Mixed Waste Treatment Project (AMWTP) - Contact-handled Transuranic waste characterization, treatment, certification, and shipping
  - Accelerated Retrieval Project (ARP) support to AMWTP - Processing sludge waste, large items, roaster oxide conditioning
  - Mixed Low-Level Waste (MLLW) - Processing mixed low-level waste for offsite disposal
  - Remote Handled-Transuranic (RH-TRU) - Processing remote-handled transuranic waste
  - Radioactive Waste Management Complex (RWMC) Infrastructure
  - Total ~ \$185.5M

# Settlement Agreement TRU Production Status





# CH-TRU Shipping Status



- Idaho is shipping 6-8 shipments of CH-TRU per week to WIPP.
- Idaho continues to ship 4 shipments per week of M/LLW to other repositories.

# CH-TRU Waste Treatment



Above: Waste processing in the boxline using a robotic Brokk arm.

Right:  
Super-  
compactor.



Left: Unloading drums  
from over-pack drums in  
WMF-635 tent.

Right:  
Workers remove large  
and/or prohibited items  
from waste boxes in ARP  
VII.





# CH-TRU Waste Repackaging in ARP VII

## Key Activities:

- Large Item repackaging continues in ARP VII.

## Upcoming Activities:

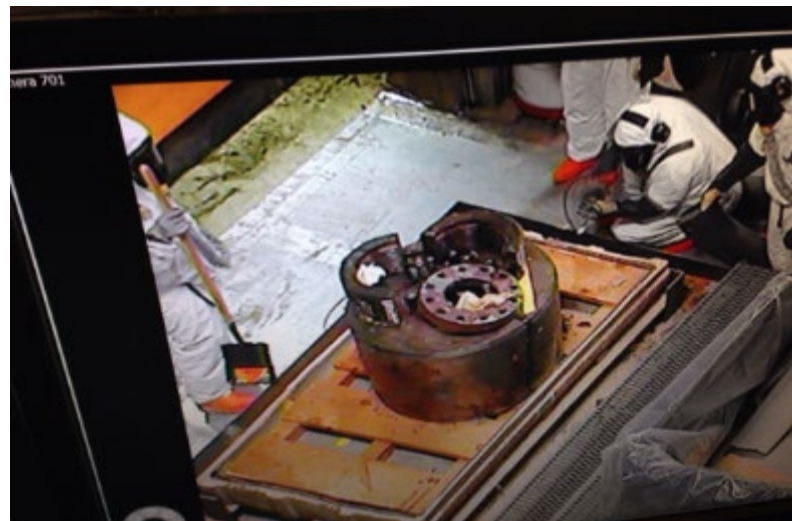
- Complete waste repackaging and explore use of facility to complete sludge waste treatment.



Excavator removing large item from fiberglass reinforced waste box.



Crews decontaminate the back-up roller for disposal as M/LLW.



Crews decontaminate the machinery items for disposal as M/LLW.

# Waste Treatment in ARP IX (Completed)



Excavator bucket raking roaster oxides to ensure treatment.



Drum of roaster oxide waste on the treatment table.

## Key Activities:

- Roaster oxide waste was treated/conditioned and repackaged for disposal.

## Upcoming Activities:

- Turn over facility to make preparations for return to targeted waste exhumation.





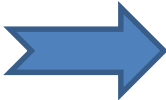



# RH-TRU Waste Treatment



Mexican Americium source foils and sources in CPP 659 Hot Cell.

CPP-659 Hot Cell treatment of suspect RH-TRU sources.

# TRU Waste Program Dashboard

Key Questions	Dashboard Indicator	Comments
Schedule Performance		Project will miss the milestone to ship all waste out of Idaho. Risk not treating all waste by 12/31/18.
Cost Performance		Cost performance over budget.
Impact on employment/economic development		Project will continue at a similar level of effort this year.
Affect on agreements		Project will miss the milestone to ship all waste out of Idaho.
Impact on safety and environment		No ongoing safety issues; safety goals are being met.
Impact on cleanup DOE-wide		No impacts to the DOE complex.

# Context: Spent Nuclear Fuel

**Material:** *Spent Nuclear Fuel* (SNF) is nuclear 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, SNF is managed as a material of interest and value until it might be declared a waste prior to final disposition. Therefore, SNF is not considered waste.

**Hazard to the Public or the Environment:** Low. While SNF typically is highly radioactive, it is safely, securely, and appropriately stored, managed and protected. The high radiation levels require shielding (e.g., cask, water, concrete).

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

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

**Budget:** Combined DOE and NRC-licensed fuels: \$29 million.



# Spent Nuclear Fuel Disposition Project

## Key Defense Funded Activities/Actions:

- All 12 planned EBR-II SNF transfers from CPP-666 to MFC/FCF are complete.
- All 11 (+1) planned NR SNF transfers from CPP-666 to NRF are complete.
- All 10 planned ATR SNF transfers from CPP-666 to CPP-603 are complete.
- All 3 planned transfers of good quality used TRIGA fuel to research reactors are complete.
- CPP-749 Degradation:
  - Phase 1 mitigation activities have been initiated.
  - DOE direction for Phase 2 activities to be issued.

## Key Non-Defense Funded Activities/Actions:

- License renewal application for the Three Mile Island-2 Independent Spent Fuel Storage Installation (ISFSI) has been submitted to the NRC. Response to NRC technical queries have been prepared and were submitted on time in September.

## Upcoming Activities:

- Starting in FY19, ATR SNF will be transferred from ATR directly into dry storage at CPP-603.

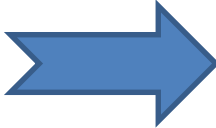
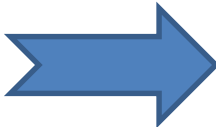
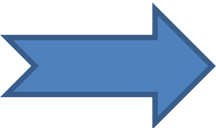

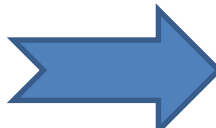


CPP-666 – Overhead crane shot of the six storage pools.









CPP-749 – Aerial view of dry storage vaults.

# Dashboard Summary – Spent Nuclear Fuel Disposition Project

Key Questions	Dashboard Indicator	Comments
Percent of project completed		For the reporting period, the SNF project is 27 months into a sixty month project. The project is on schedule.
Percent of budget expended		For the reporting period, the SNF project has expended ~34% of its planned budget. The project is under cost.
Affect on agreements		The SNF project is meeting its planned scope commensurate with existing agreements.
Impact on safety and environment		No current safety issues; progressing towards meeting safety goals.
Impact on cleanup DOE-wide		The SNF project is meeting its goals.



# ICP Dashboard Summary

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