Environmental Management Cleanup Program Performance Measures Update

Rich Olsen
Planning Analyst
DOE-Savannah River

Strategic & Legacy Management Committee
December 8, 2014
Purpose

- Fulfill a Strategic & Legacy Management (S&LM) Committee Work Plan requirement to periodically provide Environmental Management (EM) performance updates.

- Provide an update to EM performance measures for Fiscal Year 2014 (ending Sept. 30).

Note: This update will not include target levels for FY 2015 and beyond as EM Budget & Funding has not been finalized.
Acronyms

ARP          Actinide Removal Process
D&D          Deactivation & Decommission
DWPF         Defense Waste Processing Facility
HEU          Highly Enriched Uranium
LLW          Low Level Waste
MCU          Modular Caustic Side Solvent Unit
MLLW         Mixed Low level Waste
Pu           Plutonium
SNF          Spent Nuclear Fuel
SRE          Sodium Reactor Experiment
SWPF         Salt Waste Processing Facility
TRU          Transuranic Waste
WIPP         Waste Isolation Pilot Plant
The EM Cleanup Program for the SRS started in the 1990’s.

- Current Lifecycle Estimate (scope, cost, schedule) indicates EM cleanup completion by 2042.

Performance Measures have been developed to track progress towards end state targets.
SRS Cleanup Program – Major Areas

Radioactive Liquid Waste
- Insoluble Waste (Sludge)
- Soluble Waste (Salt)
- Tank Closures

Solid Waste
- Transuranic (TRU) Waste
- Mixed & Low Level Waste

Nuclear Materials
- Nuclear Materials Disposition
- Spent Nuclear Fuel Receipt, Storage & Disposition

Soil, Water & Facilities
- Waste Site Remediation
- Facilities Deactivation & Decommission
“How did we do in FY 2014?”

Answer: Continued progress under funding & weather constraints
FY14 Challenges

- Government Shutdown October 2013 (beginning of FY14)
  - Temporary Funding Authorization Constraints
  - Temporary SRS Furloughs
- FY14 Continuing Resolution
  - Beginning of year delays in authorization
  - Budget constraints
- Polar Vortex
  - Freezing Temperatures
  - Steam Outage and Equipment Damages
- Ice Storm
  - Site Closing and Equipment Damages
- Temporary closing of WIPP
  - Delay of planned TRU shipments
Highlights of FY 2014 SRS Cleanup Program

- Vitrified 126 Canisters of Radioactive Waste
- Completed operational closure of two Liquid Waste Tanks (Tanks 5 and 6)
- All Legacy Transuranic Waste (TRU) Remediated and WIPP characterization completed
- 405 cubic meters of legacy Transuranic Waste (TRU) disposed at WIPP
- Spent Nuclear Fuel: Completed dissolution of the Sodium Reactor Experiment (SRE) Campaign and began dissolution of Foreign & Domestic Research Reactor fuel for uranium recovery
- Prepared Plutonium for MOX Plutonium Production; HB-Line began oxide production
- Continued receipt, safe storage and shipment of Nuclear Materials (including UNF)
- Operated and maintained 39 remedial systems and completed sampling and analysis on more than 2,300 groundwater monitoring wells
- Began field activities at the D Area Ash Project
## Canister Production

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>Cum FY14</th>
<th>End State*</th>
<th>% Complete</th>
<th>Est. Year Complete*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitrify Insoluble Waste (Sludge)</td>
<td>Canisters Produced</td>
<td>125</td>
<td>126</td>
<td>3,877</td>
<td>7,580</td>
<td>51</td>
<td>2028</td>
</tr>
</tbody>
</table>

* Based on System Plan Rev 17
### Liquid Waste: Saltstone Processing

#### Saltstone Production Facility

#### Saltstone Disposal Unit (SDU2)

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>Cum FY14</th>
<th>End State</th>
<th>% Complete</th>
<th>Est. Year Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Salt Solution</td>
<td>K Gallons Processed</td>
<td>1,200</td>
<td>1,167</td>
<td>9,891</td>
<td>124,657</td>
<td>8%</td>
<td>2028</td>
</tr>
</tbody>
</table>

* Based on System Plan Rev 17
Liquid Waste: Tank Closure

Grouting of Tanks 5 & 6
(Tanks operationally closed in Fiscal Year 2014)

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>Cum FY14</th>
<th>End State*</th>
<th>% Complete</th>
<th>Est. Year Complete*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close Tanks: Old Style</td>
<td>Tanks Closed</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>24</td>
<td>25%</td>
<td>2022</td>
</tr>
<tr>
<td>Close Tanks: New Style</td>
<td>Tanks Closed</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>27</td>
<td>0</td>
<td>2028</td>
</tr>
</tbody>
</table>

* Based on System Plan Rev 17
### Solid Waste Disposal: Transuranic Waste

#### Transuranic Waste (TRU) Shipment to WIPP

![Image of TRU Shipment to WIPP](image)

#### Last Legacy TRU Container Remediated

![Image of last Legacy TRU Container Remediated](image)

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>Cum FY14</th>
<th>End State</th>
<th>% Complete</th>
<th>Est. Year Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRU- Legacy (in storage prior 2009)</td>
<td>Cubic Meters</td>
<td>716</td>
<td>405</td>
<td>11,063</td>
<td>11,600</td>
<td>95%</td>
<td>2017</td>
</tr>
<tr>
<td>TRU- Newly Generated</td>
<td>Cubic Meters</td>
<td>118</td>
<td>24</td>
<td>139</td>
<td>3,980 (Est)</td>
<td>Ongoing</td>
<td>TBD</td>
</tr>
</tbody>
</table>
## Solid Waste Disposal: Mixed & Low Level Waste

### Mixed Waste Shipment to Utah

![Mixed Waste Shipment Image](image)

### Low Level Waste (LLW) New Trench - On Site

![Low Level Waste Image](image)

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>Cum FY14</th>
<th>End State</th>
<th>% Complete</th>
<th>Est. Year Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>M&amp;LL-Legacy (Prior to April 2008)</td>
<td>Cubic Meters</td>
<td>0</td>
<td>0</td>
<td>103,171</td>
<td>103,171</td>
<td>100%</td>
<td>2008</td>
</tr>
<tr>
<td>M&amp;LL-Newly Generated</td>
<td>Cubic Meters</td>
<td>&lt; 400*</td>
<td>Met</td>
<td>&lt; 400</td>
<td>&lt; 400</td>
<td>Ongoing</td>
<td>TBD</td>
</tr>
</tbody>
</table>

* Accumulation of M&LL not to exceed 400 Cu Meters at anytime
## Spent Nuclear Fuel Receipt, Storage & Disposition

**Spent Nuclear Fuel (SNF) Bundle stored in L-Basin**

**SNF being sent to H Canyon via 70 Ton Cask**

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>FY13</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>FY14</th>
<th>L-Basin Capacity</th>
<th>% Fill</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Basin Inventory</td>
<td>Bundles</td>
<td>3,165</td>
<td></td>
<td></td>
<td>3065</td>
<td>3650</td>
<td>84%</td>
</tr>
<tr>
<td></td>
<td>Cores</td>
<td>120</td>
<td></td>
<td></td>
<td>120</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Added: New Receipts</td>
<td>Bundles</td>
<td>N/A</td>
<td>6</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removed: SRE &amp; DRR&amp;FRR</td>
<td>Bundles</td>
<td>105</td>
<td>106*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Actualls include SNF from Sodium Reactor Experiment (SRE) campaign (95 bundles) and Domestic Research Reactor and Foreign Research Reactor fuel (11 bundles)*
# Nuclear Materials Disposition

## First SNF Bundle Charged to H-Canyon Dissolver in SRE Campaign

![Image of SNF Bundle]

## Plutonium 3013 Type Container

![Image of Plutonium Container]

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>Cum FY14</th>
<th>End State</th>
<th>% Complete</th>
<th>Est. Year Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEU Dissolved (SNF from L-Basin)</td>
<td>Bundles</td>
<td>105</td>
<td>106</td>
<td>158</td>
<td>1,147*</td>
<td>13%</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td>Cores</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>TBD</td>
</tr>
<tr>
<td>Plutonium Prepared for Disposition (All Paths)</td>
<td>Containers</td>
<td>10</td>
<td>10</td>
<td>167</td>
<td>5,600</td>
<td>3%</td>
<td>2031</td>
</tr>
</tbody>
</table>

*Current approved number of bundles / cores to be dissolved in H canyon*
Field activities have begun at the D Area Ash Project

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Unit of Measure</th>
<th>Target FY14</th>
<th>Actuals FY14</th>
<th>Cum FY13</th>
<th>End State</th>
<th>% Complete</th>
<th>Est. Year Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remediation of Waste Sites</td>
<td>Waste Site</td>
<td>0</td>
<td>0</td>
<td>399</td>
<td>515</td>
<td>77%</td>
<td>2042</td>
</tr>
<tr>
<td>Facilities D&amp;D’d</td>
<td>Facilities</td>
<td>0</td>
<td>0</td>
<td>284</td>
<td>1,103</td>
<td>26%</td>
<td>2042</td>
</tr>
<tr>
<td>EM Site Cleanup - Major Categories</td>
<td>Unit of Measure</td>
<td>Fiscal Year</td>
<td>Cum Actuals</td>
<td>End State Quantity</td>
<td>% Complete</td>
<td>Est. Year to Complete</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------------</td>
<td>-----------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Liquid Waste</td>
<td></td>
<td>Fiscal Year</td>
<td>Actuals (FYTD)</td>
<td>Annual Target</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitrify Highly Radioactive Components</td>
<td>Canisters</td>
<td>126</td>
<td>125</td>
<td>3,877</td>
<td>7,580</td>
<td>51%</td>
<td>2028</td>
</tr>
<tr>
<td>Process Low Level Components (Saltstone)</td>
<td>k Gallons</td>
<td>1,167</td>
<td>1,200</td>
<td>9,891</td>
<td>124,657</td>
<td>8%</td>
<td>2028</td>
</tr>
<tr>
<td>Close Tanks - Old Style</td>
<td>Tanks</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>24</td>
<td>25%</td>
<td>2022</td>
</tr>
<tr>
<td>Close Tanks - Newer Style</td>
<td>Tanks</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>27</td>
<td>0%</td>
<td>2028</td>
</tr>
<tr>
<td>Solid Waste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transuranic Waste Disposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legacy TRU (prior to 2009)</td>
<td>Cu Meters</td>
<td>405</td>
<td>716</td>
<td>11,063</td>
<td>11,600</td>
<td>95%</td>
<td>2017</td>
</tr>
<tr>
<td>Newly Generated TRU</td>
<td>Cu Meters</td>
<td>24</td>
<td>118</td>
<td>139</td>
<td>3,980</td>
<td>Ongoing</td>
<td>2042</td>
</tr>
<tr>
<td>Mixed &amp; Low-Level Waste Disposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legacy (prior to 2008)</td>
<td>Cu Meters</td>
<td>Complete</td>
<td>Complete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear Materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highly Enriched Uranium: Blend Down &amp; Ship</td>
<td>Trailers</td>
<td>Complete</td>
<td>Complete</td>
<td></td>
<td>336</td>
<td>Complete</td>
<td>2012</td>
</tr>
<tr>
<td>Plutonium Preparation - All Paths</td>
<td>Containers</td>
<td>10</td>
<td>10</td>
<td>167</td>
<td>5,600</td>
<td>3%</td>
<td>2031</td>
</tr>
<tr>
<td>Spent Nuclear Fuel: Dissolve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium Reactor Experiment</td>
<td>Bundles</td>
<td>95</td>
<td>95</td>
<td>147</td>
<td>147</td>
<td>100%</td>
<td>2014</td>
</tr>
<tr>
<td>Foreign &amp; Domestic Reactor Fuel</td>
<td>Bundles</td>
<td>11</td>
<td>10</td>
<td>11</td>
<td>1,000</td>
<td>1%</td>
<td>TBD</td>
</tr>
<tr>
<td>High Flux Isotope Reactor Fuel</td>
<td>Cores</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>200</td>
<td>0%</td>
<td>TBD</td>
</tr>
<tr>
<td>Spent Nuclear Fuel Receipt &amp; Storage</td>
<td>Bundles</td>
<td>(100)</td>
<td>NA</td>
<td>3,065</td>
<td>0</td>
<td>Ongoing</td>
<td>TBD</td>
</tr>
<tr>
<td>Soil, Groundwater &amp; Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation of Waste Sites</td>
<td>Waste Sites</td>
<td>0</td>
<td>0</td>
<td>400</td>
<td>515</td>
<td>78%</td>
<td>2042</td>
</tr>
<tr>
<td>Facilities Deactivated &amp; Decommissioned</td>
<td>Facilities</td>
<td>0</td>
<td>0</td>
<td>285</td>
<td>1,103</td>
<td>26%</td>
<td>2042</td>
</tr>
</tbody>
</table>
Savannah River Site Workforce

- Personnel
- Actuals

10,956
Sept 2014
Summary

- DOE-SR will continue to track & monitor performance measures for the key operational areas of EM cleanup operations.
  - Performance Targets for FY15 & beyond will be shared with the CAB when available.

- Suggestions from the CAB for any additional improvements are welcomed.