

Savannah River Remediation - Overview and Status

Stuart MacVean

SRR President and Project Manager

Savannah River Remediation

Savannah River Site

Waste Management Symposia 2015

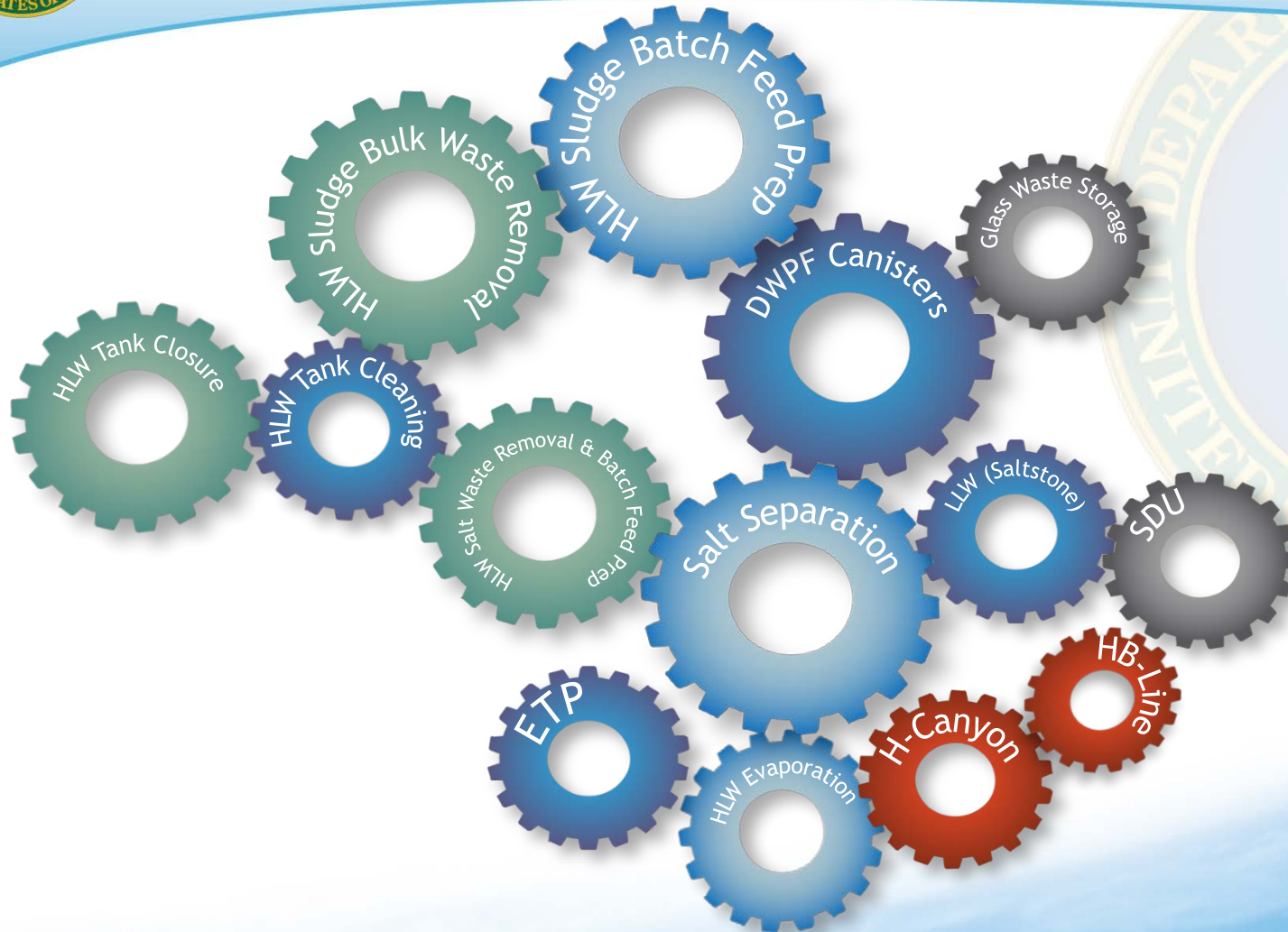
March 17, 2015

Savannah River Site



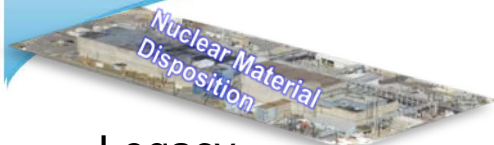


Liquid Waste System Optimization





SRR Liquid Waste Program (with current status)

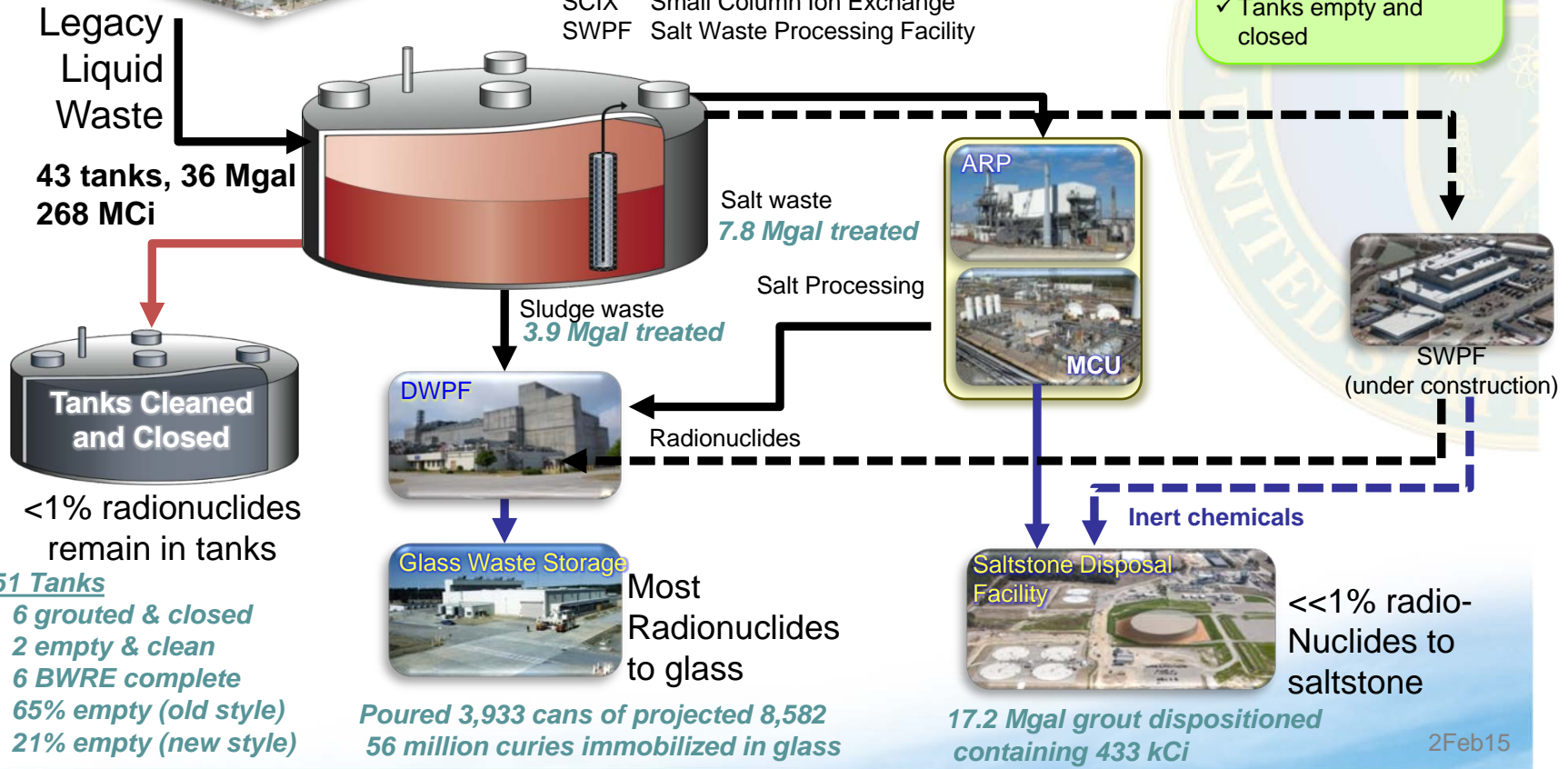


Legend:

- ARP Actinide Removal Process
- BWRE Bulk Waste Removal Efforts
- DWPF Defense Waste Processing Facility
- MCU Modular Caustic Side Solvent Extraction Unit
- SCIX Small Column Ion Exchange
- SWPF Salt Waste Processing Facility

Operational Goals

- ✓ Radionuclides to glass
- ✓ Chemicals to Saltstone
- ✓ Tanks empty and closed



- 51 Tanks**
- 6 grouted & closed
 - 2 empty & clean
 - 6 BWRE complete
 - 65% empty (old style)
 - 21% empty (new style)

2Feb15



Liquid Waste Integration for SWPF Support

\$8M spent on Salt Disposition & Integration (SDI) in FY14

20 of 60 System Operational Tests reviewed-to-date

97 SRR employees/craft supporting SDI

Bi-monthly technology exchanges & integrated schedule reviews

Defense Waste Processing Facility (DWPF) Mods = \$24.7



Saltstone Mods = \$22.1



Blend & Feed Tanks = \$11.6M



Transfer Lines = \$10.5M



Salt Waste Processing Facility (SWPF)



Effluent Treatment Plant - Complete



Scope to be completed prior to or during SWPF outage



Liquid Waste Integration for SWPF Support

(Cont'd.)

- DWPF Modifications

- Use of Alternative Reductant coupled with infrastructure modifications eliminate hazards with formic acid
- Strip Effluent Feed Tank (SEFT) to Slurry Mix Evaporator (SME) scope provides flexibility of Strip Effluent to be processed via the Sludge Receipt and Adjustment Tank (SRAT) or the SME
- Dry Frit scope would reduce the amount of recycle water going to H-Tank Farm
- Bag-less Waste scope provides improvements for handling higher activity SWPF waste

- Siltstone Modifications

- Enhanced Low Activity Waste Disposal (ELAWD) II modifications support increased Decontaminated Salt Solution (DSS) throughput from SWPF
- Salt Solution Receipt Tanks (SSRT) will provide additional 120,000 gallons of receipt space at Saltstone



Liquid Waste Integration for SWPF Support

(Cont'd.)

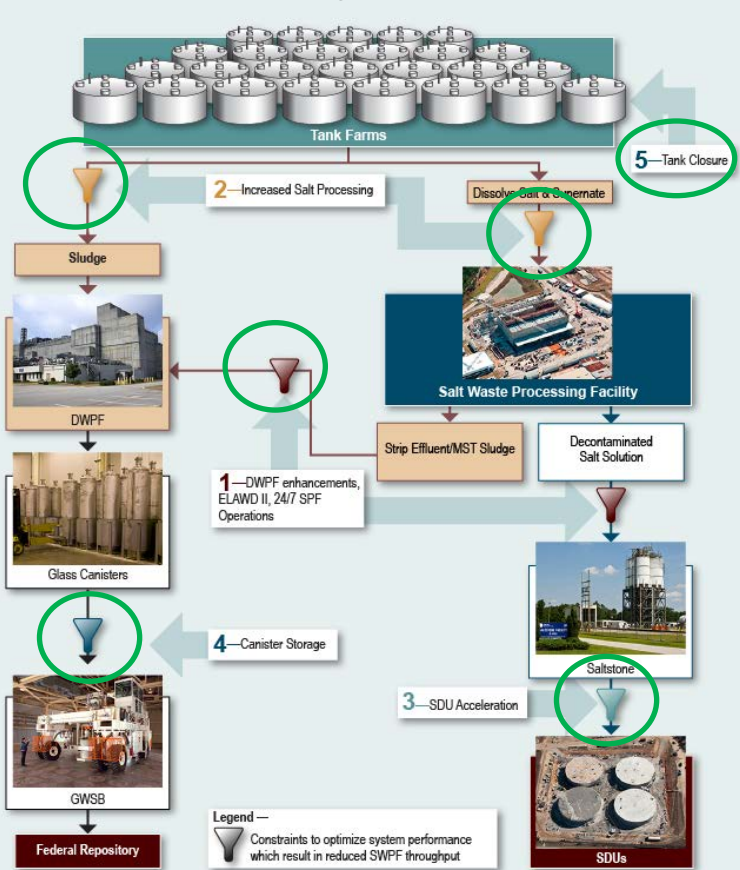
- Blend and Feed Tank Modifications
 - Installs new equipment and piping to allow feed from H-Tank to be transferred to SWPF
- Transfer Line Modifications
 - Connects existing liquid waste facility piping to SWPF



Salt Processing Bottlenecks

– Maximize Liquid Waste System

Liquid Waste System Bottlenecks



Bottleneck Remedies

1 DWPf enhancements, ELAWD II, and 24/7 SPF Operations improvements enable LW to support SWPF processing greater than 6 Mgal per year

2 Increased Salt Processing ARP/MCU acceleration creates sufficient tank space to position LW to supply feed to SWPF at its rated capacity

3 SDU Acceleration Provides grout receipt space to allow acceleration of ARP/MCU and operation of SWPF at capacity

4 Canister Storage Provides over 2200 canister storage locations which enable ARP/MCU acceleration and delays the need for the GWSP Line Item Project over 7 years

5 Tank Closure Improves regulator relationships by enabling continued progress towards closure of old-style tanks

Progress

Alternate Reductant—Cost savings enabled SRNL testing

Sludge BWR Acceleration—Accelerated BWR (Tanks 15 and 26) + Tank 22 matches salt processing to 3 Mgal/yr

Studies to Increase Filtration—in ARP Building 512-S to feed MCU at highest rate with current filter

Large Tank Strike—Initiation of the Large Tank Strike flow sheet leading to ARP acceleration

No Monosodium Titanate - Demonstration

SDU6 Availability—9 month acceleration (from May 2017 to **September 2016**) increases ARP/MCU production by 1.5 Mgal/year (from 1.4 Mgal/year to 2.9 Mgal/year)

Canister Double Stack—Annual glass waste annual storage limitation improved from **164 to 249** canisters/year supports up to 4 Mgal/yr of salt processing

Tank Closure Tank 16 closure ~~7 months~~ **0 months** beyond the FFA milestone date and Tank 12 ~~12 months~~ **8 months** beyond



Improvement Opportunities

Evolving Enablers

Need Increased Filter Performance

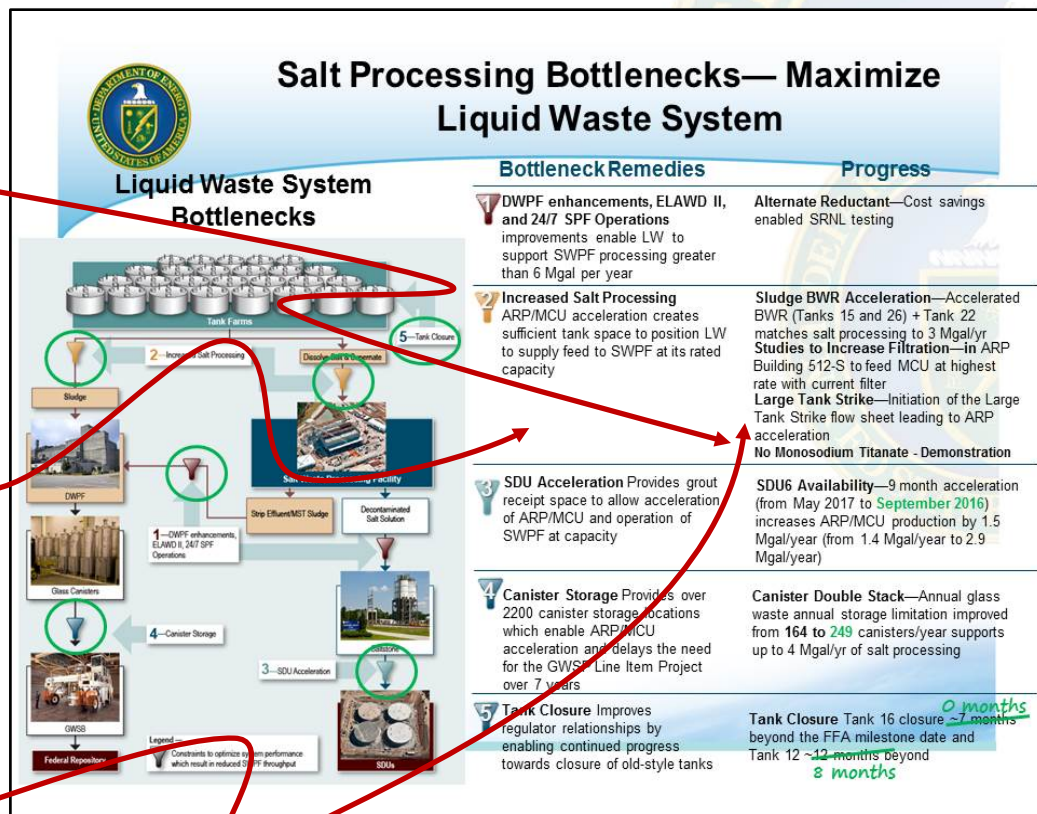
No MST

MCU Transfer System Available

SWPF Risk Mitigation — Parallel SWPF/MCU Operations

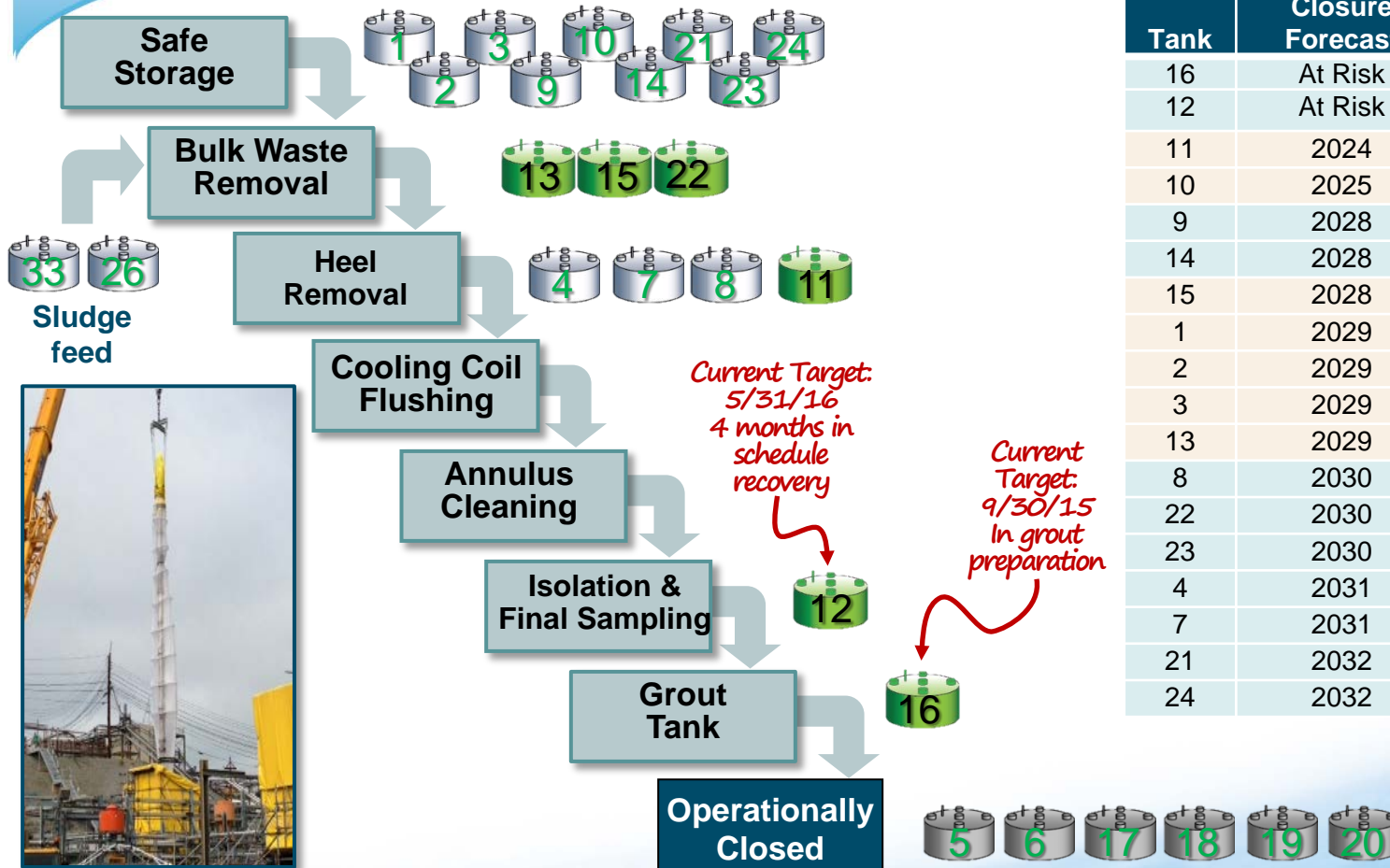
Shortened Transitions during Outage Period and More MCU Operations

Pretreat for MCU with Mini Ion Exchange





Tank Closure Progress



Tank	System Plan Closure Forecast	FFA Closure Milestone
16	At Risk	2015
12	At Risk	
11	2024	2017
10	2025	
9	2028	2019
14	2028	
15	2028	2021
1	2029	
2	2029	
3	2029	
13	2029	
8	2030	
22	2030	2022
23	2030	
4	2031	
7	2031	
21	2032	
24	2032	



Lean Business System at SRR

- October 2013: SRR began Lean journey
 - Launched model to be shared across DOE sites
 - Functional Area Coordination Team (FACT) formed with 7 other Federal Projects to share lessons learned and standard work practices
- 281 SRR Employees have participated in 31 Lean events (>15% of workforce)
- Strong Regulator and DOE-SR support
 - Involvement in 6 events
 - High energy for problem solving
- Enabled execution of additional project work scope
 - \$21M in FY14; \$2.5M to date in FY15
 - Doubling the pace of events in FY15
 - Establishing standard work practices and assisting cultural change at other DOE sites



\$600K savings
from wet sampling
Tank 12

50% reduction in
Tank 15 waste retrieval
schedule from Feed &
Bleed implementation

\$6M
savings per tank
closure

12 month
schedule reduction
in closing Tanks 5/6

\$1M
savings by using
Commercial Sludge
Mobilization Pumps

50%
reduction in
procedure changes
cycle time



Summary

- SRR is successfully reducing the risk from the liquid radioactive waste at the Savannah River Site through treatment, stabilization, and disposition activities and by operational closure of the waste tanks

