



OFFICE OF  
**RIVER PROTECTION**  
United States Department of Energy

# Tank Farms A and AX Retrieval Overview

**Hanford Advisory Board, Tank Waste Committee**

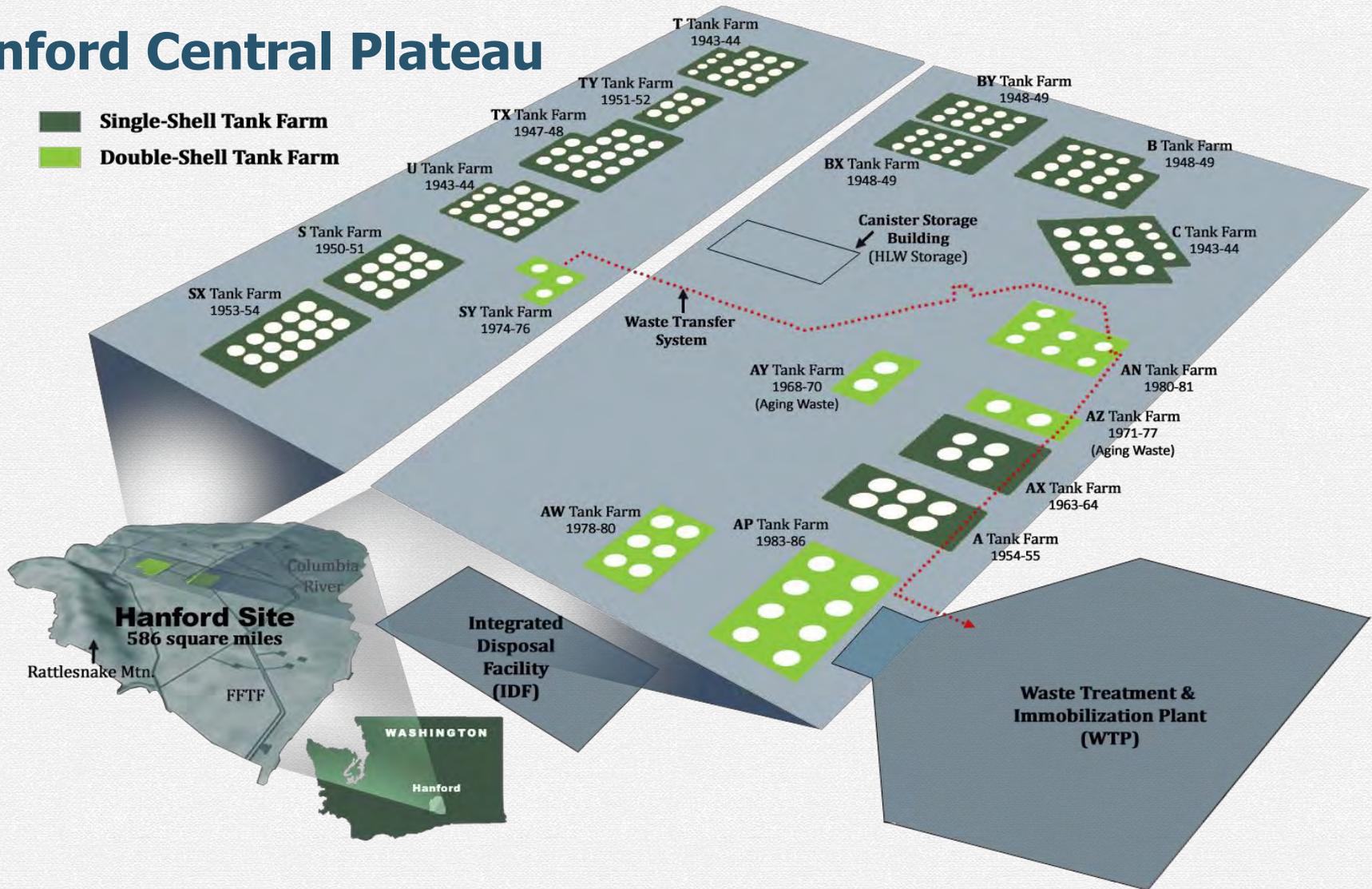
Presented by: Chris Kemp, U.S. Department of Energy, Office of River Protection Deputy  
Federal Project Director for Tank Farm Retrieval and Closure

September 23, 2015



# Hanford Central Plateau

- Single-Shell Tank Farm
- Double-Shell Tank Farm





## Selection Process for AX and A Farm Tanks

The four AX tanks and five A tanks (not including A-103) were selected under Consent Decree milestone B-2

- Risk reduction
- Curie count
- Technetium-99 concentrations
- Prior spill volumes





## AX Tank Farm

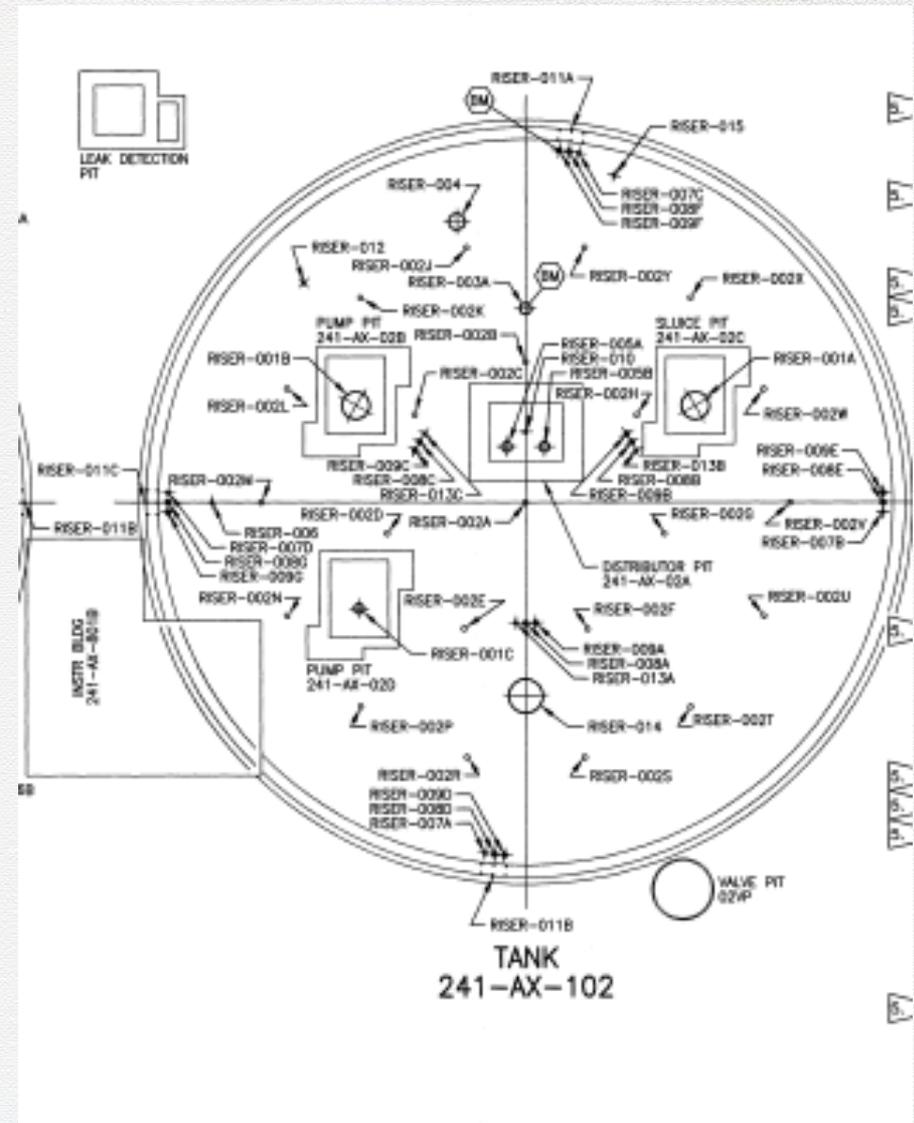
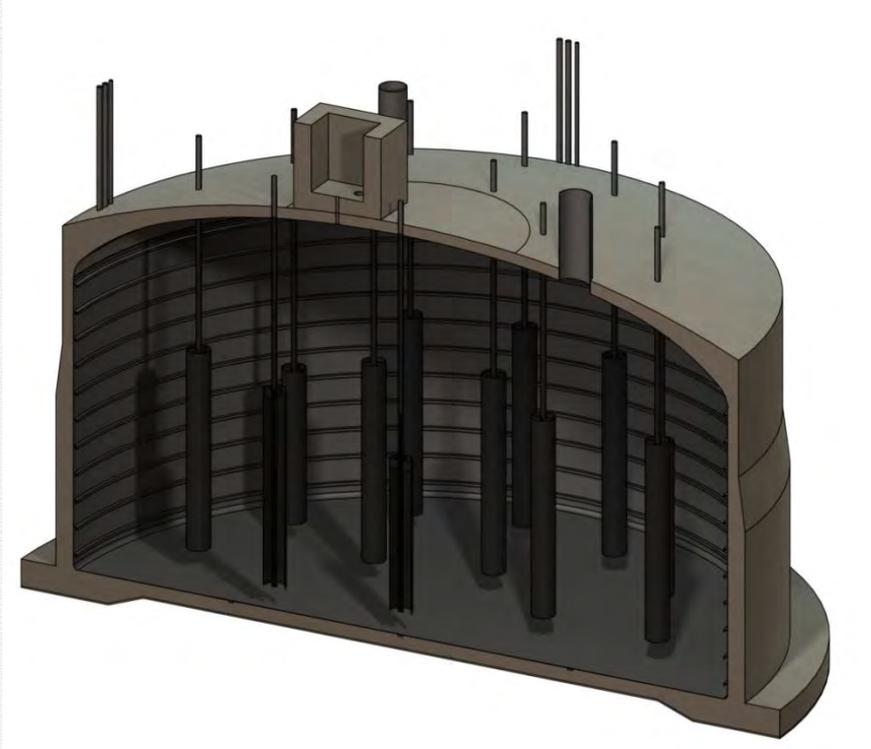
|             | Sludge<br>(K gallons) | Saltcake<br>(K gallons) | Supernate<br>(K gallons) | Status |
|-------------|-----------------------|-------------------------|--------------------------|--------|
| AX-101      | 3                     | 355                     | 0                        | Sound  |
| AX-102      | 6                     | 24                      | 0                        | Sound  |
| AX-103      | 8                     | 99                      | 0                        | Sound  |
| AX-104      | 7                     | 0                       | 0                        | Sound  |
| Total       | 24                    | 478                     | 0                        |        |
| Grand Total |                       |                         | 502                      |        |

Receiver Tank for AX Farm  
is DST AZ-102



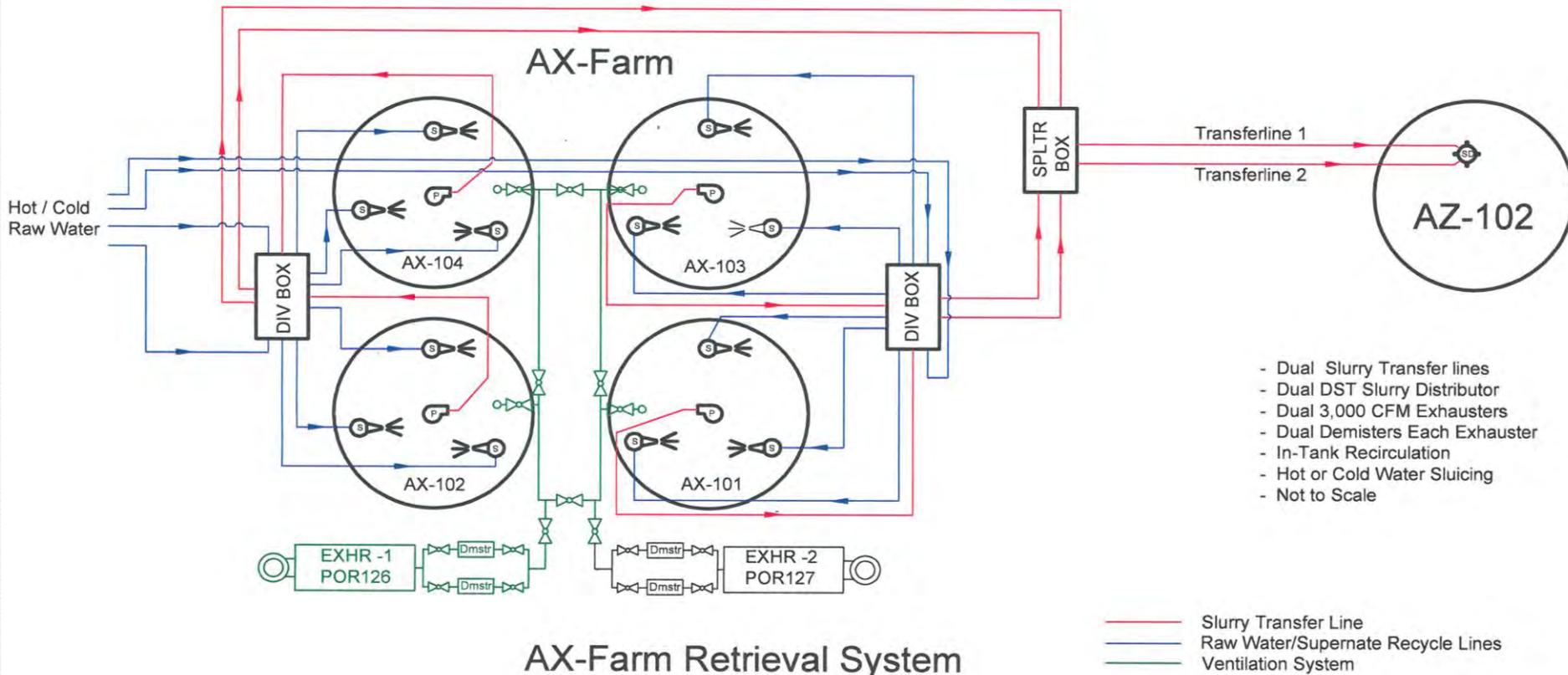


# Typical AX Farm Tank





# Simple Depiction of AX Farm Retrieval System





## A Tank Farm

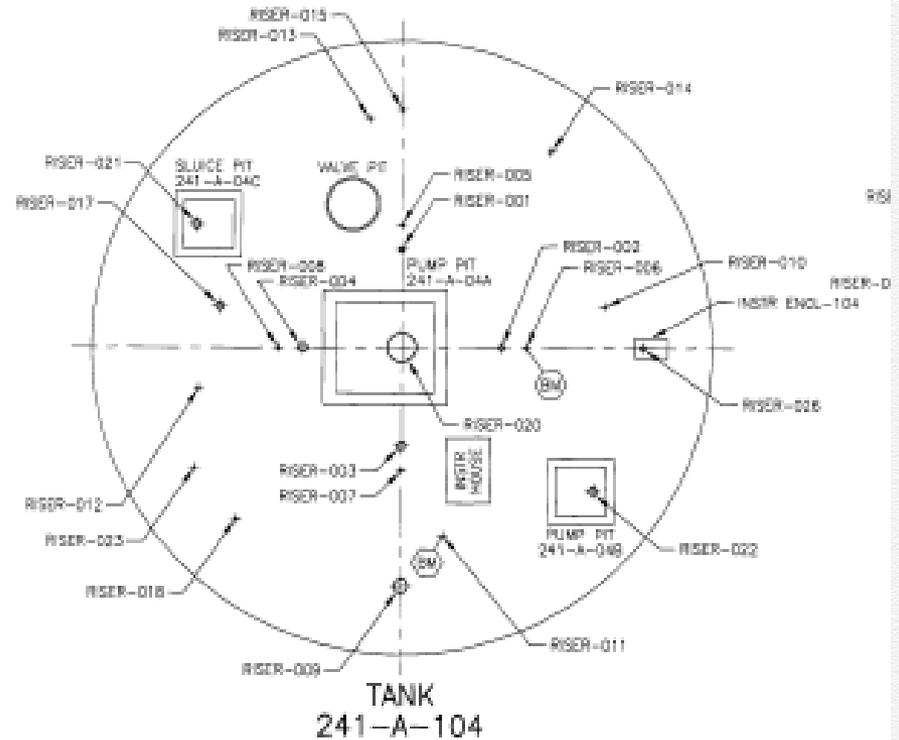
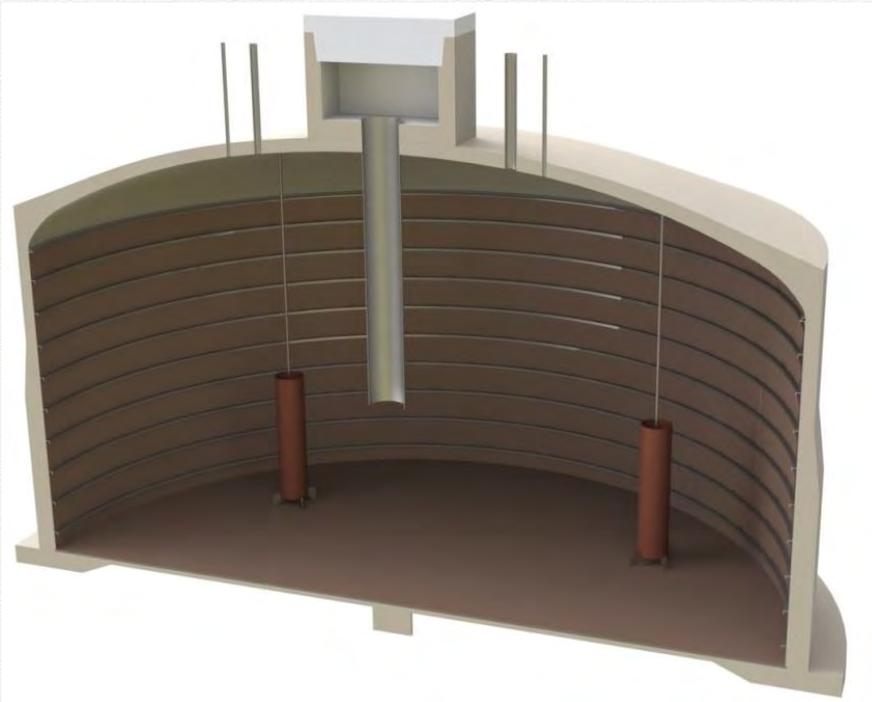
|             | Sludge<br>(K gallons) | Saltcake<br>(K gallons) | Supernate<br>(K gallons) | Status         |
|-------------|-----------------------|-------------------------|--------------------------|----------------|
| A-101       | 3                     | 317                     | 0                        | Sound          |
| A-102       | 0                     | 37                      | 3                        | Sound          |
| A-103       | 2                     | 372                     | 4                        | Sound          |
| A-104       | 28                    | 0                       | 0                        | Assumed Leaker |
| A-105       | 37                    | 0                       | 0                        | Assumed Leaker |
| A-106       | 50                    | 29                      | 0                        | Sound          |
| Total       | 120                   | 755                     | 7                        |                |
| Grand Total |                       |                         | 882                      |                |

Receiver Tank for A Farm is  
DST AP-106





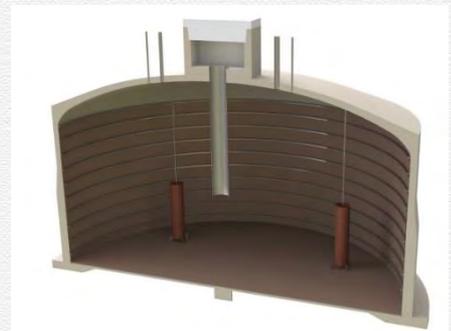
# Typical A Farm Tank





# Key Differences Between C Farm and A/AX Farm

| Attribute                                   | C Farm  | A and AX  |
|---|---|---|
| Predominate Waste Type                      | Sludge  | Saltcake  |
| Waste Volume (in Gallons)                   | 1.65 million gallons in 1999 when retrieval started | A Farm, 882,000 gallons   |
|   |   | AX Farm, 502,000 gallons  |
| Tank Bottom                                 | Dish Bottom   | Flat Bottom (AX has a dished side wall, A has a butt weld 90 degree wall) |
| Capacity (in Gallons)                       | 530,000   | 1,000,000   |
| Number of Air Lift Circulators              | None  | A Farm, 4   |
|   |   | AX Farm, 22   |
| Distance to Receiver Tanks                  | ~1000 Feet  | ~4000 feet for A Farm   |
| Curie Content Beta                          | 1X  | AX – 4.5X, A – 2X   |
| Curie Content Gamma                         | 1X  | AX – 12X, A – 5X  |
| Vapor Chemicals of Potential Concern (COPC) | 13 COPCs  | 6 COPCs   |





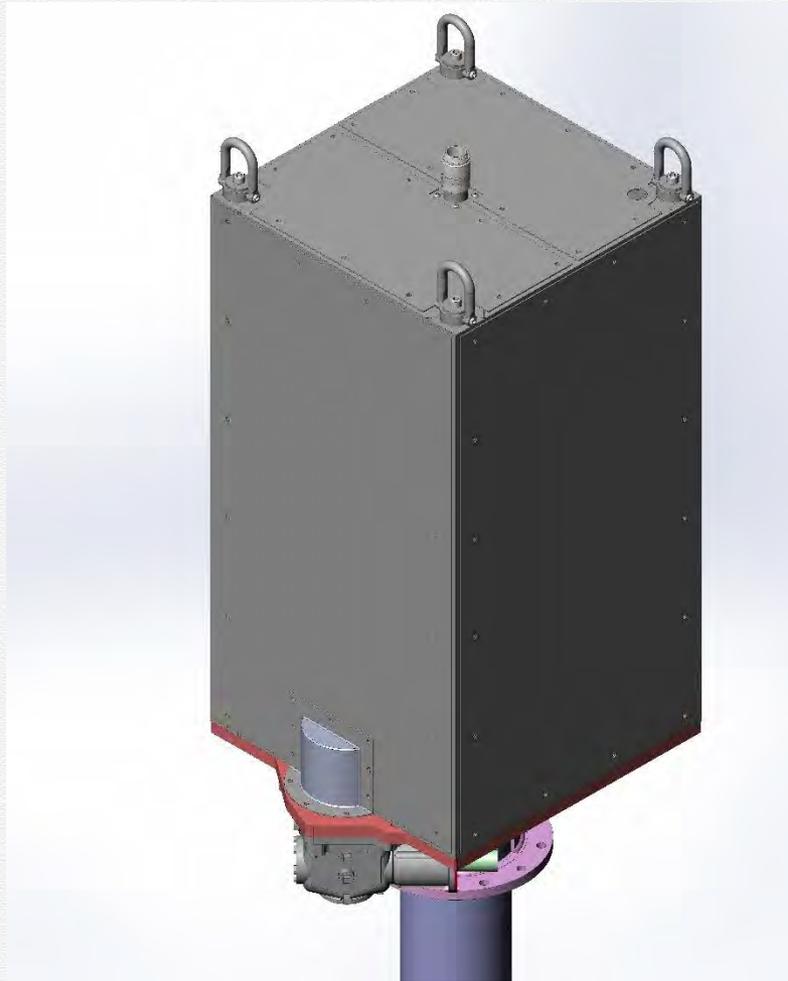
## Execution Strategy

- Farm-wide approach
- Full upgrade of infrastructure prior to initiation of retrieval
- Deployment of two proven technologies at the start of retrieval
- Simultaneous retrievals into a DST
- Spares and redundant capabilities to increase operational performance
- Use of alternate shifts to avoid heat stress hazards
- Incorporation of lessons learned from C Farm retrieval
- Rigorous risk evaluation and management plan



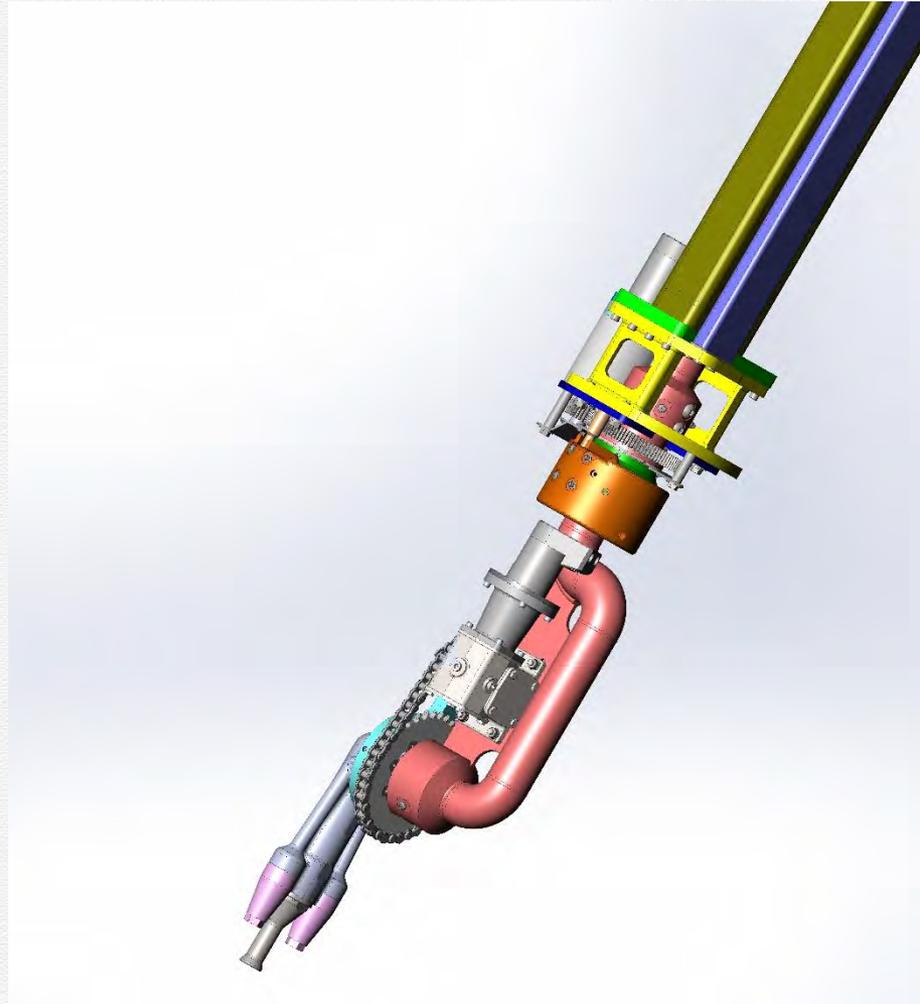


# Enhanced Reach Sluicer Containment





## Nozzle View of Enhanced Reach Sluicer





## Elbow View for Enhanced Reach Sluicer





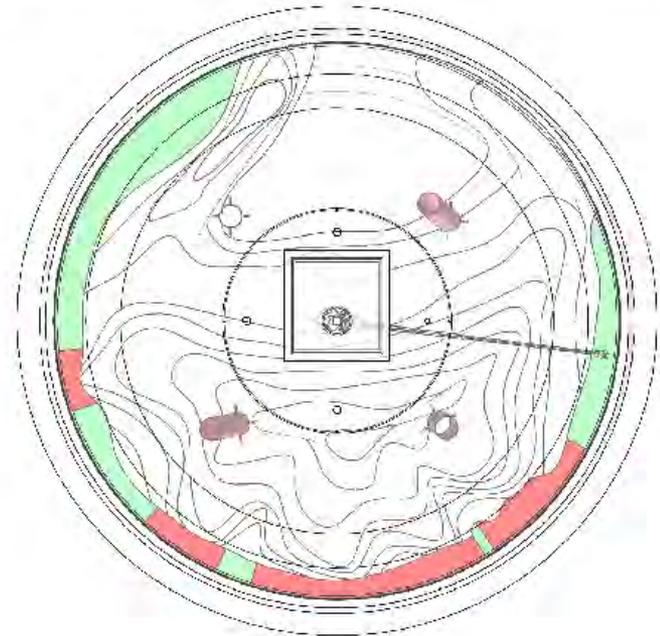
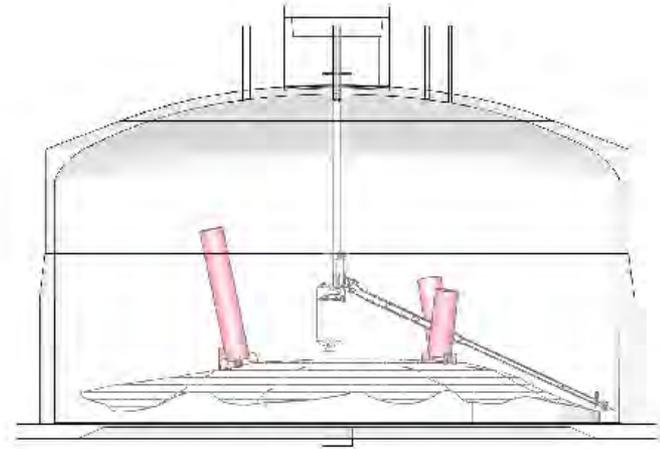
# Extension for Enhanced Reach Sluicer





## Challenges

- In tank obstructions
- Adaptation of retrieval equipment to A and AX Tanks
- High radiation levels
- High heat load





## AX Farm Retrieval Technologies

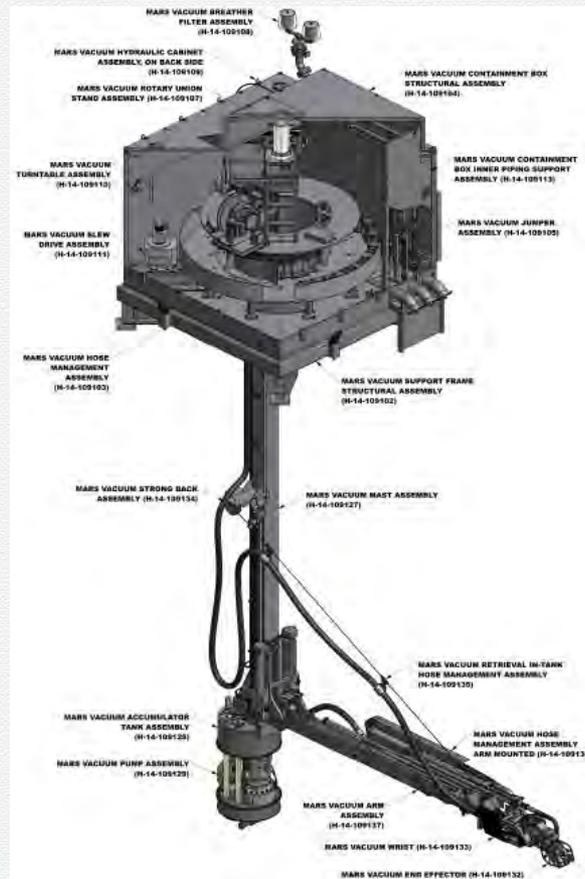
- All tanks in AX Farm are classified as sound
- Two technologies to be deployed
  - Sluicing with water
  - High pressure water
- Both technologies will be deployed on the Extended Reach Sluicer System (ERSS)





# A Farm Retrieval Technologies

- The following tanks are classified as sound: A-101, 102, 103 and 106
- Two technologies to be deployed
  - Sluicing with water
  - High pressure water
- Both technologies will be deployed on the ERSS
- Tanks A-104 and A-105 are classified as assumed leakers





**Thank You**

**Questions**

