



# U.S. DEPARTMENT OF **ENERGY**

## **Tank AY-102 Status**

**Tom Fletcher**

August 20, 2012



***EM*** *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

[www.em.doe.gov](http://www.em.doe.gov)

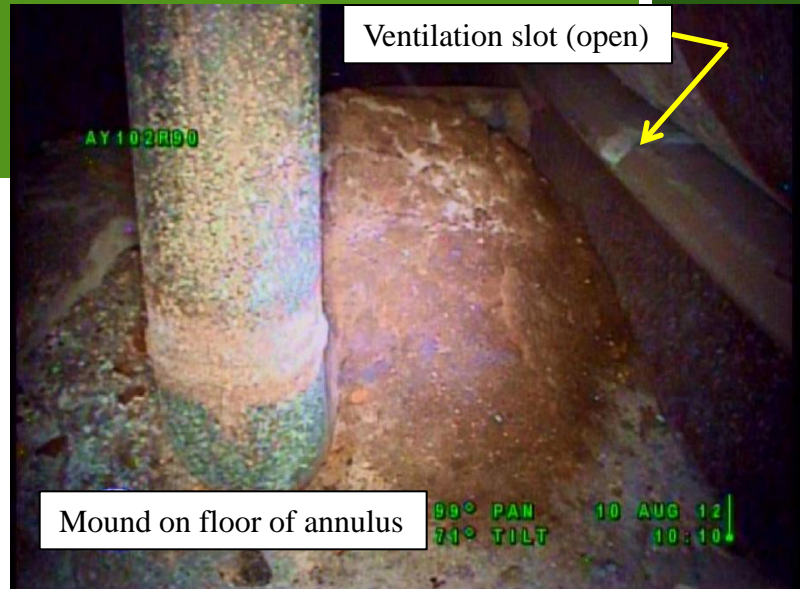
# Summary

Routine periodic visual monitoring (via camera) of the AY-102 annulus found material that was never before seen. Inspection of the annulus noted the following;

- Material found in two locations near Riser 90 – source unknown
  - mound approximately (2 ft. x 3 ft. x 8 inches)
  - white material on both the refractory (tank sits on refractory) and annulus floor
- Material is dry (i.e., no standing water or indications of moisture)
- Leak Detection and Constant Air Monitor (CAM) Operable in Annulus (real time monitoring)
- Camera equipment removed from annulus without incident (i.e., no contamination on equipment)
- Contamination present when annulus floor sample was taken

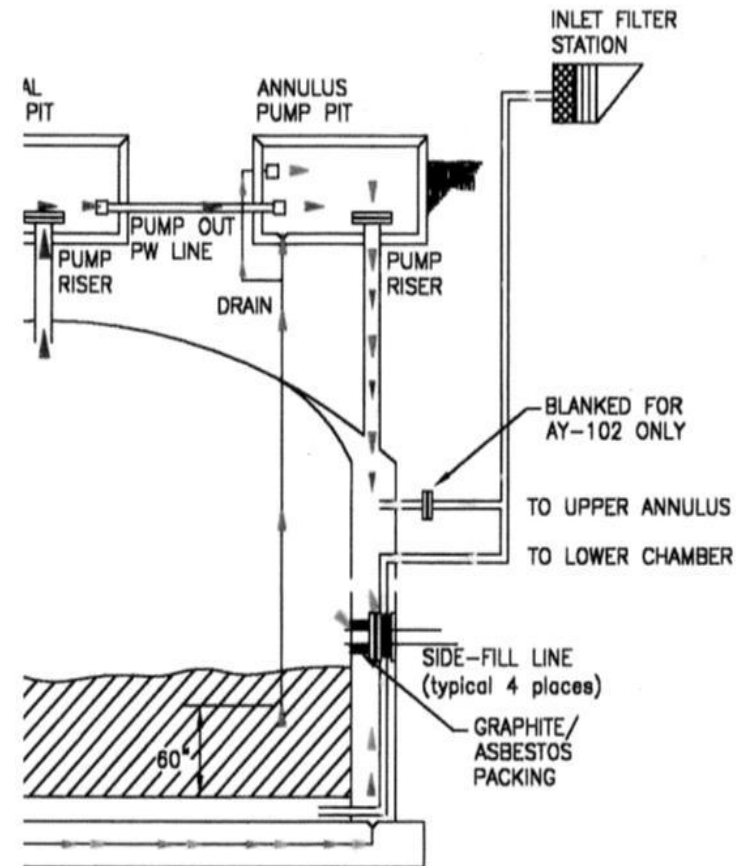


# Riser 90 Inspection Photographs



# Background

- AY-102 built in 1970 and placed into service in 1971 as aging waste spare and received waste in 1977
- Annulus ventilation used to remove tank residual heat
- Liner provides secondary containment of waste
- Primary waste types are B Plant evaporated waste and Sludge from C-106 Sluicing
- No other Hanford Waste Tank closely approximates this composition of sludge
  - High H<sub>2</sub> Generation
  - Sludge contains solution low in Nitrate, Nitrite, and pH < 12
  - High Heat Generation
- Current volume 857,000 gallons of sludge and supernatant
- No unexplained primary tank level changes



# DST Integrity Monitoring

## Two elements make-up the Double Shell Tank (DST) Integrity Monitoring Program – Inspections and Tank Waste Chemistry Control

### Inspections

- Annulus videos are performed on a nominal 5 year cycle, not to exceed 7 years.
  - AY-102 last perform in 2006
- Ultrasonic wall thickness testing is performed on the primary tank wall from the annulus on an 8 to 10 year cycle.
  - WRPS averages completing 3 to 4 tank UT scans each year
  - AY-102 UT last performed in 2007 (no abnormalities noted)

### Tank Waste Chemistry Control

- Corrosion monitoring probes are installed in many DST with removal and analysis of the probe every 3 years
  - AY-102's corrosion probe was installed in 2009
- Tank waste samples are taken on a nominal 5 year cycle for chemistry control, or more frequently when transfers are being made into or out of a tank (e.g., SST retrievals)





# Ongoing Investigatory Actions

Action	Status
<ul style="list-style-type: none"> <li>• Initiate camera installation in Riser 90                             <ul style="list-style-type: none"> <li>• Monitoring twice per week per monitoring plan</li> </ul> </li> </ul>	COMPLETE
<ul style="list-style-type: none"> <li>• Increased level monitoring of Annulus                             <ul style="list-style-type: none"> <li>• Monitor each Shift</li> </ul> </li> </ul>	COMPLETE
<ul style="list-style-type: none"> <li>• Perform bi-weekly monitoring of CAM</li> </ul>	COMPLETE
<ul style="list-style-type: none"> <li>• Develop tank specific history timeline                             <ul style="list-style-type: none"> <li>• Tank contents, Operational Events &amp; Radiological Events</li> </ul> </li> </ul>	COMPLETE
<ul style="list-style-type: none"> <li>• Initiate activities to obtain samples of materials                             <ul style="list-style-type: none"> <li>• Data Quality Objective (DQO) and Sample Plan under development</li> <li>• Obtain annulus samples mid to late September</li> </ul> </li> </ul>	IN PROGRESS
<ul style="list-style-type: none"> <li>• Initiate Tank Assessment Process                             <ul style="list-style-type: none"> <li>• Use TFC-ENG-CHEM-D-42, <i>Tank Leak Assessment Process</i></li> <li>• Complete assessment about 1 week after sample results are reported</li> </ul> </li> </ul>	IN PROGRESS
<ul style="list-style-type: none"> <li>• Document near term and long term actions in Engineering Path Forward</li> </ul>	IN PROGRESS



# Near Term Actions

- **Initiate tank annulus inspection (accessible areas)**
  - Developed List of Accessible Risers – Complete
  - Developing Work Package and Inspection Criteria – In Progress
  - Annulus inspection planned for week of August 27, 2012
- **Develop Contingency Plan to Transfer AY-102 Contents**
  - Developing transfer procedure – In Progress
  - Developing Work packages to verify transfer system components are operational (motors, valves, piping) – In Progress
  - Task Ready to Transfer – in 6 to 8 weeks (as non-emergency)
- **Sample & pump tertiary leak detection pit (Confirms secondary liner integrity)**
  - Review procedure and issue sample request – In Progress
  - Ready to sample and pump contents – by August 30



# Long Term Actions

- **Determine Extent of Condition (i.e., applicability to other tanks)**
  - Developing list of tanks for accelerated inspection (up to 7 tanks)
    - Similar Tank Construction and Operating History
    - Similar Process History
- **Initiate planning to inspect Ventilation piping and adjacent ventilation slots to assess cause**
  - Determining feasibility to perform inspection of ventilation piping
  - Developing work package to inspect ventilation slots
    - Evaluating ability to perform concurrent with annulus inspection
- **Explore means for removing material from annulus**
  - Initiated discussions with robotic crawler vendors





# Conclusion

- Tank is stable with enhanced monitoring in place
- Investigation in progress to determine source of dried solids on floor of annulus and material condition of tank components
- Extent of Condition Evaluation initiated
- Actions underway to mitigate hazard should conditions within the annulus change
- Tank Waste Mission essential to mitigate risk associated with aging waste tanks

