



UNITED STATES DEPARTMENT OF ENERGY

OFFICE OF RIVER PROTECTION

Update on Hanford's Tank Farms Hanford Advisory Board – Tank Waste Committee

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January 8, 2014



C-Farm Progress

- Eleven single-shell tanks (SSTs) retrieved with C-110 the most recent
- C-101 is under review
- Two tanks in retrieval, C-107 and C-112
- C-102 tank is in readiness
- C-105 tank is in construction and readiness
- Waste Management Area C Performance Assessment has resumed and is underway

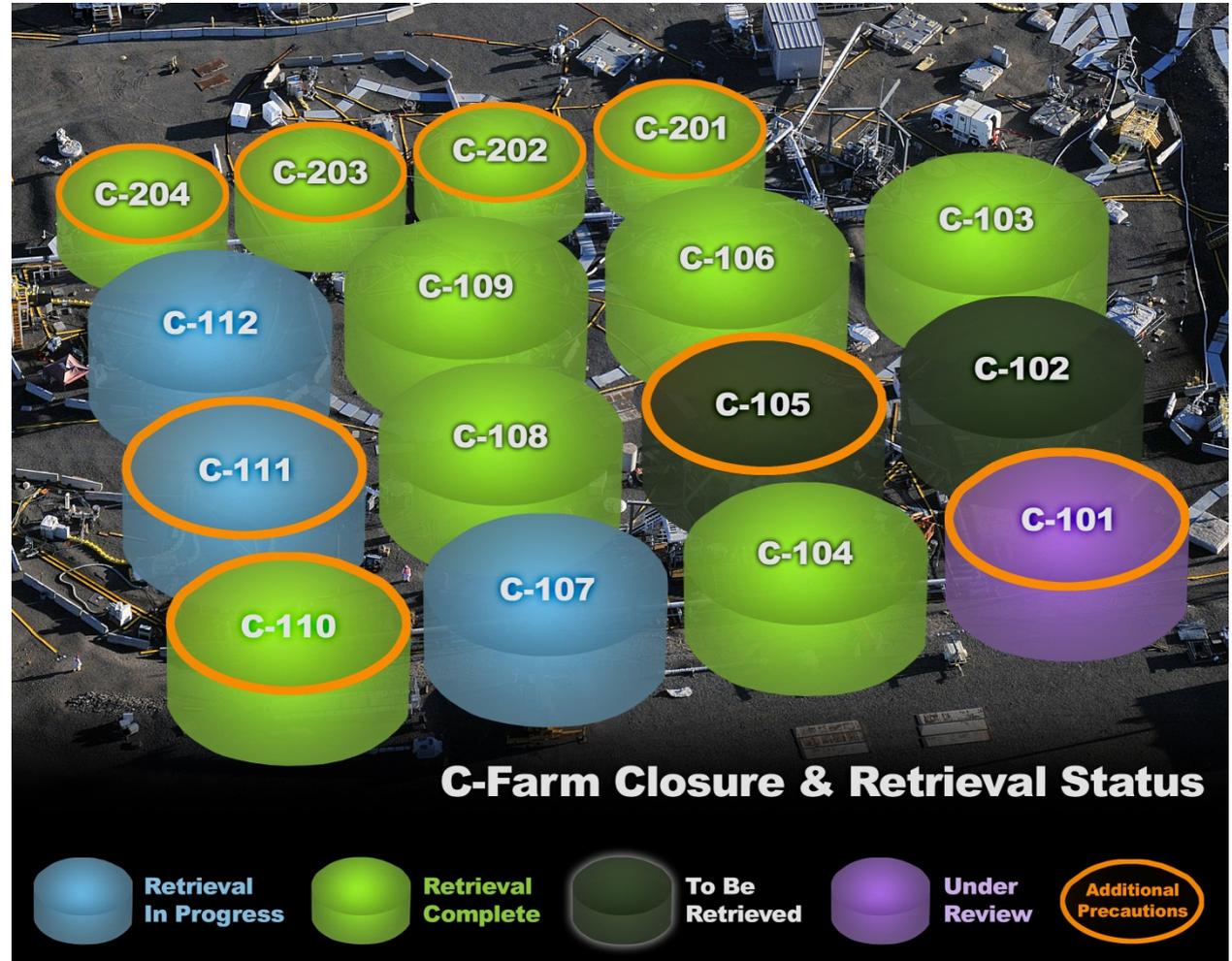


C-107 slurry pump removal



Single-Shell Tank Waste Retrieval Status

- Consent Decree milestone requires DOE to retrieve 10 C-Farm tanks by Fiscal Year (FY) 2014
- To date, 10 of the 16 tanks in C-Farm have been retrieved to regulatory standards
- Six tanks have been retrieved under the Tri-Party Agreement
- Four Consent Decree tanks have been retrieved to date
- One tank has been retrieved in S-Farm



Aerial photograph of C-Farm with graphical overlay that depicts current status of each single-shell tank



Tanks With Level Decreases

- Eighty-three tanks with interstitial liquid level and/or surface level data decrease less than - 0.001 inches per year
- Twenty tanks were recommended for initial evaluation
- Six tanks had level decreases that were believed to be of the most concern in February 2013:
T-111, TY-105, T-203, T-204, B-203, B-204



Tank 241-T-111

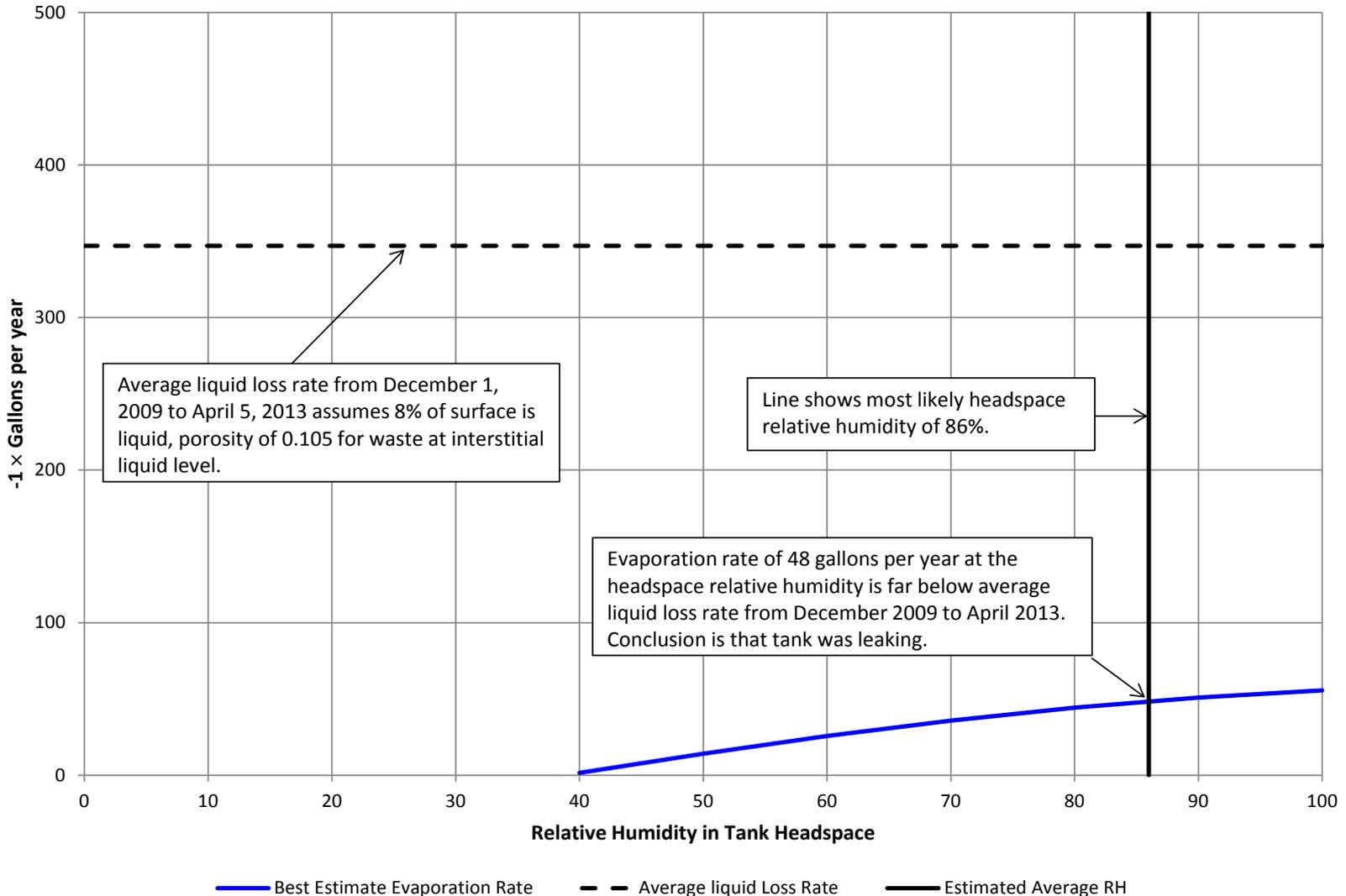
Close up of T-111 waste surface and tank wall



T-111 central pool



Tank T-111 Estimated Evaporation and Liquid Loss Rates



Average liquid loss rate from December 1, 2009 to April 5, 2013 assumes 8% of surface is liquid, porosity of 0.105 for waste at interstitial liquid level.

Line shows most likely headspace relative humidity of 86%.

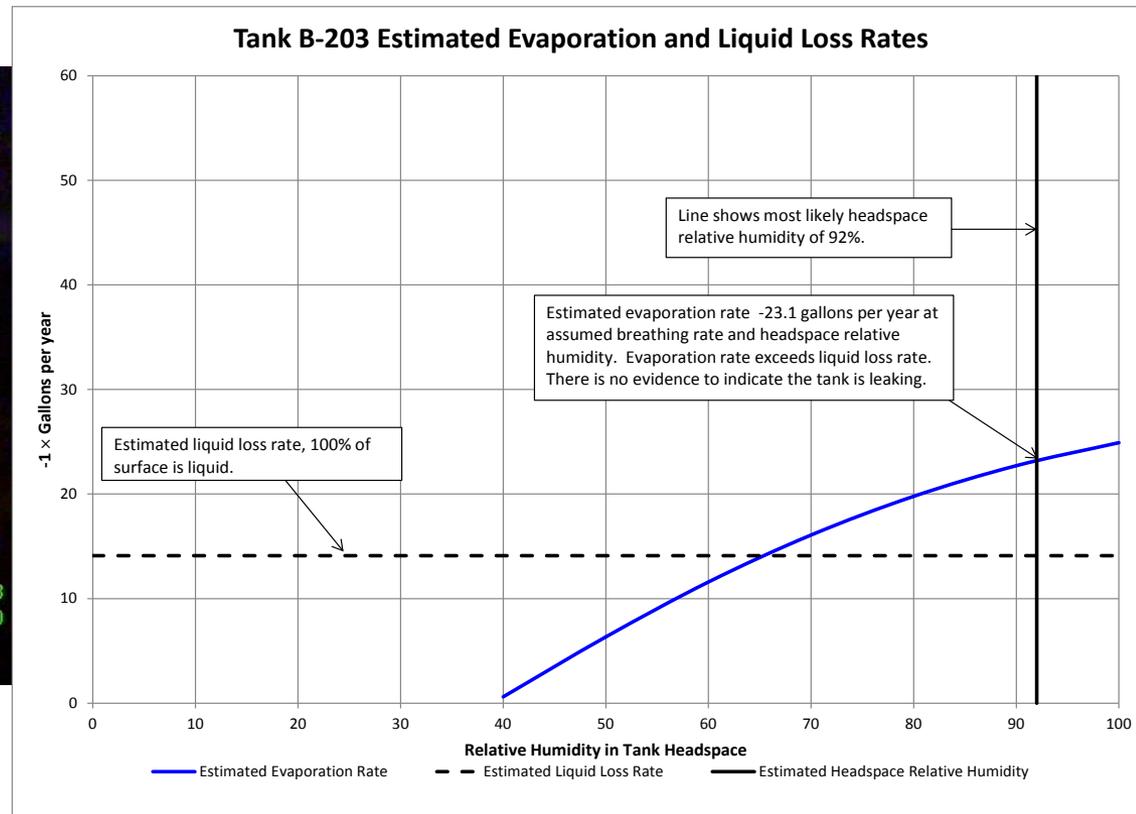
Evaporation rate of 48 gallons per year at the headspace relative humidity is far below average liquid loss rate from December 2009 to April 2013. Conclusion is that tank was leaking.

— Best Estimate Evaporation Rate - - Average liquid Loss Rate — Estimated Average RH



SST Level Decrease Evaluations – 20 Tanks

- T-111 only tank found to be leaking
- Enhanced monitoring practices and procedures





Tank Level Decrease Evaluations

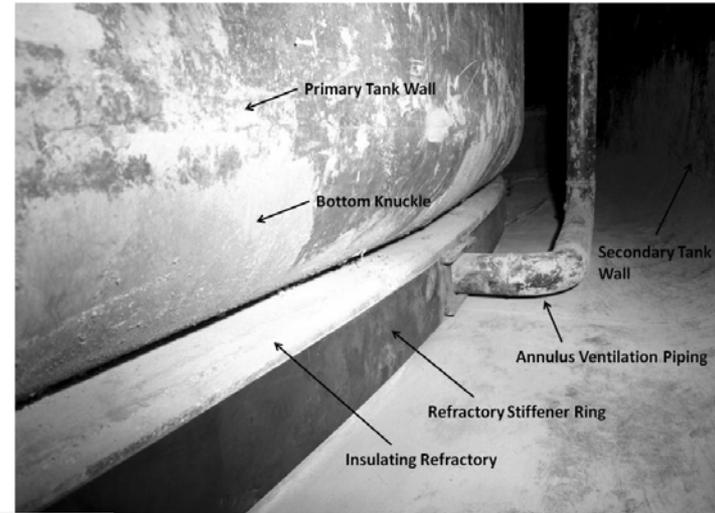
Tank	Description	Evaluation Status
B-203	Assumed Leaker	Evaporation accounts for level decrease
B-204	Assumed Leaker	Evaporation accounts for level decrease
T-111	Assumed Leaker	Active leak
T-203	Sound	Evaporation accounts for level decrease
T-204	Sound	Evaporation accounts for level decrease
TY-105	Assumed Leaker	Evaporation accounts for level decrease



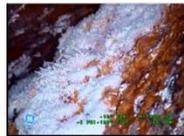
Tank AY-102 – Condition and Plans



Tank AY-102 Layout and Annulus Conditions



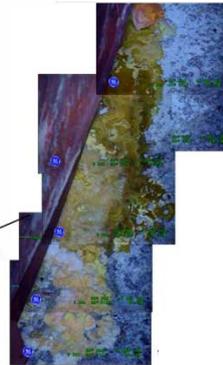
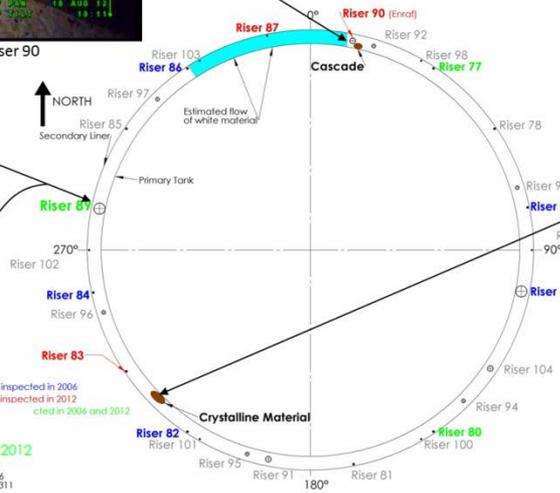
8/10/2012 Riser 90



8/1/2012 Riser 89

Blue - Riser inspected in 2006
Red - Riser inspected in 2012
Green - Riser inspected in 2006 and 2012

Reference:
H-14-010506
RPP-RP1-34311



8/29/12 Riser 83



How are we monitoring AY-102 for change?

- Weekly Inspection Summaries
 - Double-Shell Tank (DST) AY-102 Riser 83
 - DST AY-102 Riser 87
 - pH readings of leak detection pit liquid

- DST AY-102 Monthly Status



August 8, 2012

Riser 87 Inspection



November 25, 2013



August 29, 2012

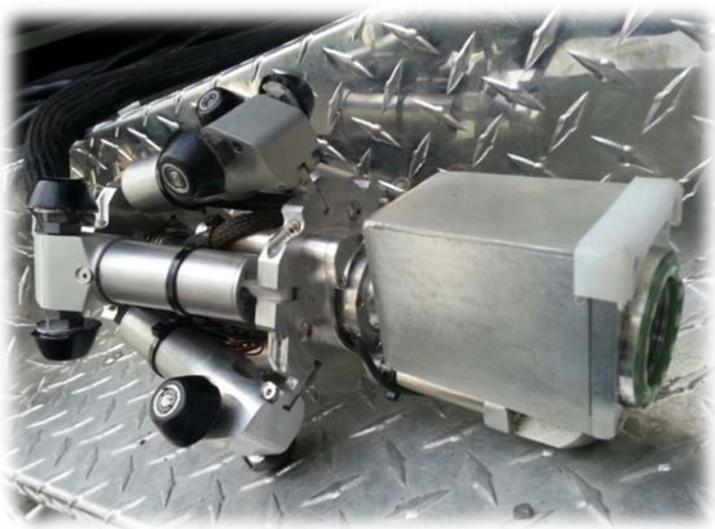
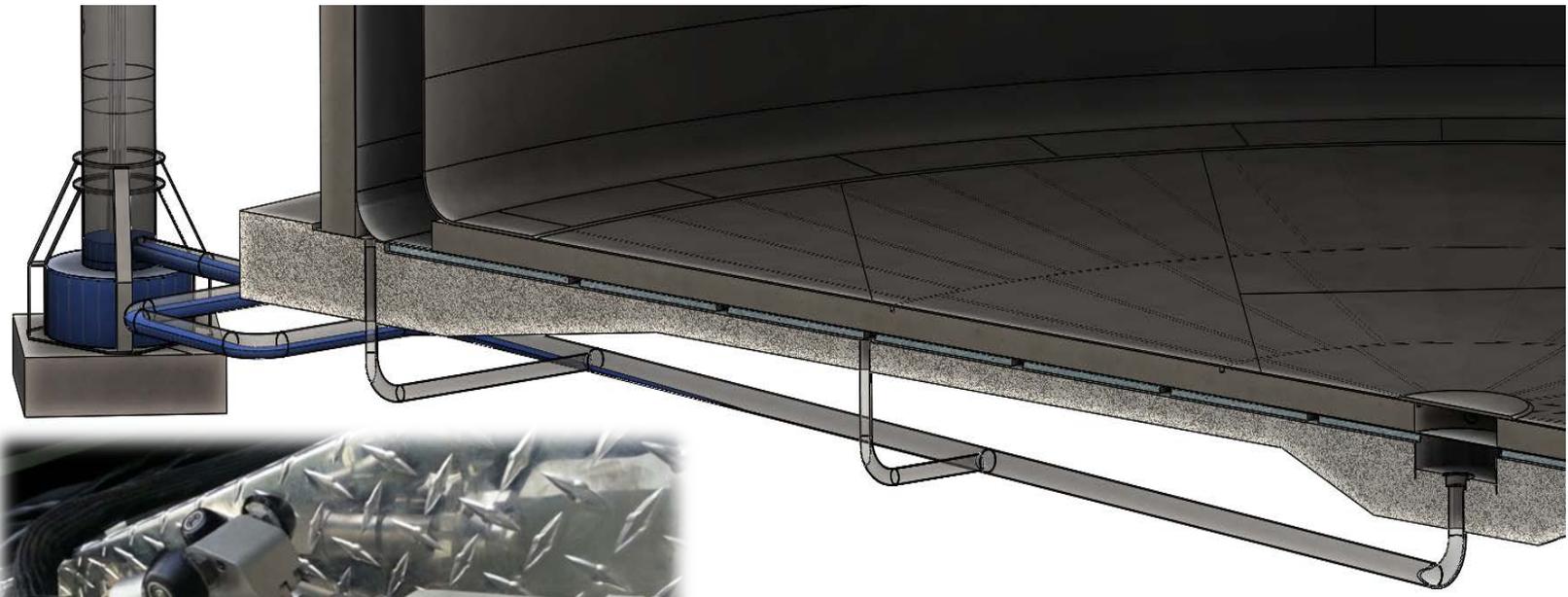
Riser 83 Inspection



November 4, 2013

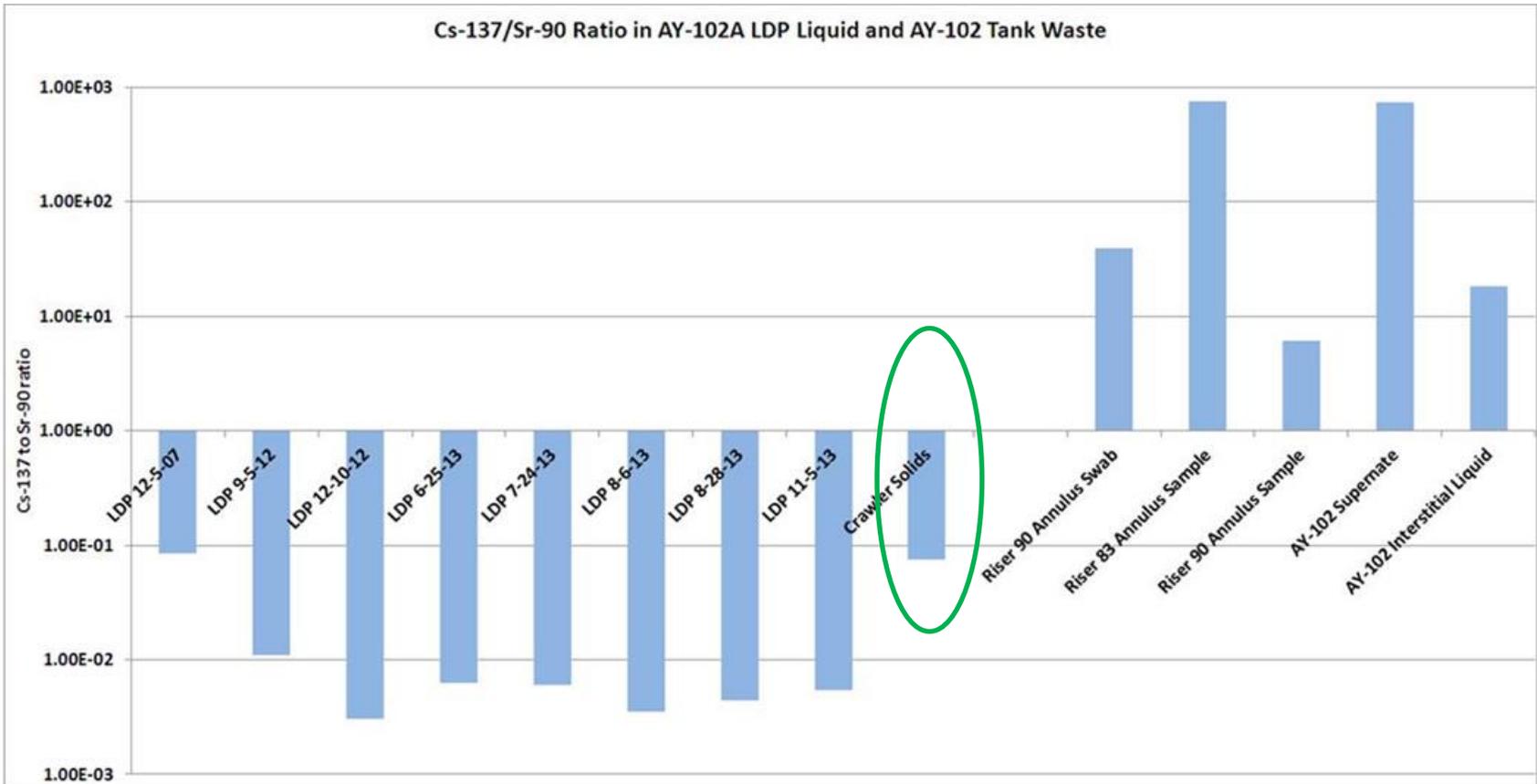


Tank AY-102 – Leak Detection Pit and Drain System





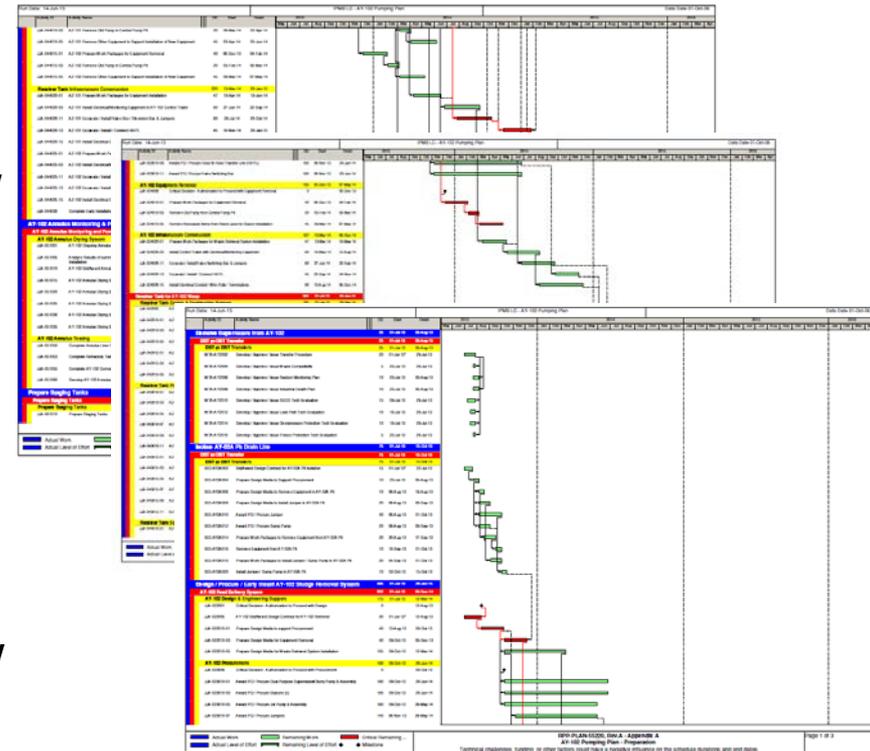
Leak Detection Pit – Cs-137/Sr-90 Ratio





Tank AY-102 Transfer Readiness

- Tank Mitigation Project in place/steps necessary to transfer supernatant completed June 28, 2013
- Maintenance checks completed on supernatant pump
 - Pump is installed and standing by
- Retrieval method selected for sludge removal
 - Modified sluicing using vertical reach sluicers
- AY-102 Pumping Plan
 - Submitted to the State of Washington Department of Ecology on June 14, 2013
 - Nineteen months required to plan, procure and install out-of-tank equipment



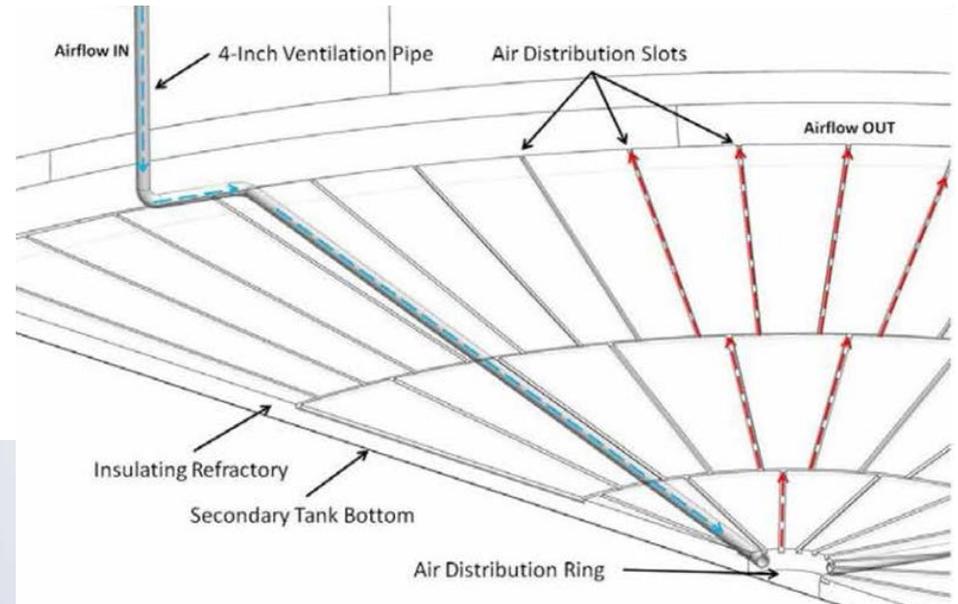
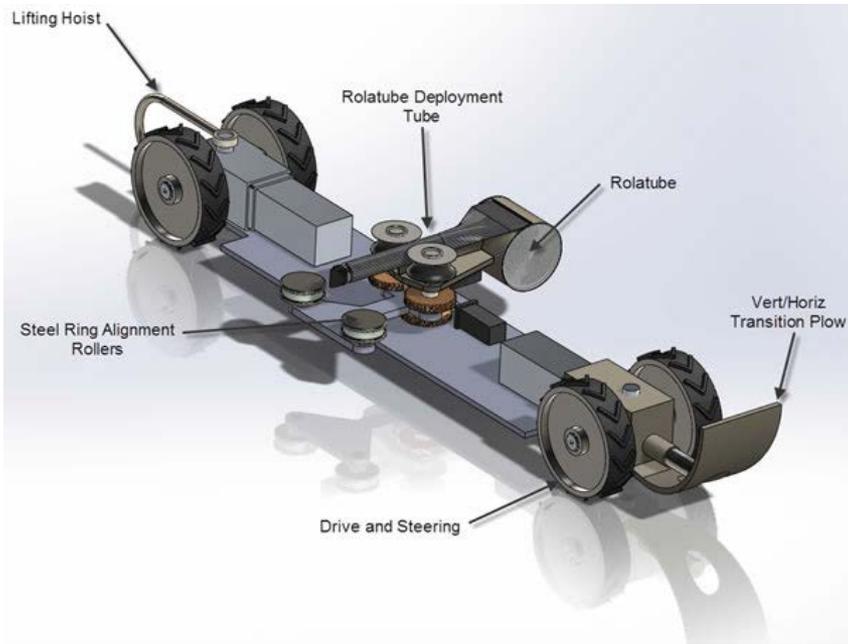


DST Structural and Leak Expert Panel Review

- Three meetings scheduled to conduct review
 - Tank AY-102 Leak Assessment (Complete)
 - Extent of condition and structural and leak integrity
 - Post retrieval forensic and non-destructive analysis of tank AY-102
- Eight panel members



Future Inspections





Electromagnetic Acoustic Transducers (EMAT) Non-Destructive Examination Development

- Fiscal Year 2014 development of EMAT capability for primary tank wall inspection
- Application of proven technology to improve wall inspection speed and efficiency



No.	Activity Name	RESP	RD	%	Start	Finish	CSLN	TF	2014															
									D	J	F	M	A	M	J	J	A	S						
5.1.1.5.2.30 - Electro Magnetic Acoustic Transducer (EMAT)																								
Procurement/Contract Award																								
1	Develop SOWs for PNNL & AREVA - EMAT	WRPS- Castleberry, J	5	0%	16-Dec-2013*	23-Dec-2013	-5	-3																
2	Review & Approve SOWs for PNNL & AREVA - EMAT	WRPS- Boomer, KD	3	0%	26-Dec-2013	30-Dec-2013	-5	-3																
3	Award Contracts for PNNL & AREVA - EMAT	WRPS- Procurement	2	0%	31-Dec-2013	02-Jan-2014	-5	-3																
4	Kickoff Meeting with PNNL & AREVA - EMAT	WRPS- Castleberry, J	1	0%	08-Jan-2014	08-Jan-2014	-5	-3																
FY14 Workscope																								
5	Initiate Development of EMAT Deployment Unit	WRPS- Castleberry, J	36	0%	09-Jan-2014*	06-Mar-2014	-3	-3																
6	Complete Development of EMAT Deployment Unit - FY14	WRPS- Castleberry, J	30	0%	07-Mar-2014	17-Apr-2014	-3	-3																
7	Train AREVA on EMAT Device	WRPS- Castleberry, J	45	0%	18-Apr-2014	27-Jun-2014	-3	-3																
8	Conduct Performance Demo Test on EMAT Device	WRPS- Castleberry, J	59	0%	30-Jun-2014	22-Sep-2014	-3	-3																
9	Develop Deployment Strategy for EMAT Device	WRPS- Castleberry, J	41	0%	31-Jul-2014	03-Oct-2014	-3	-3																