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**OFFICE OF RIVER PROTECTION**

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14-TF-0125

**NOV 19 2014**

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Ms. Hedges:

THE U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION,  
TRANSMITTAL OF TANK 241-AY-102 MONTHLY MONITORING REPORT FOR  
SEPTEMBER 2014 IN RESPONSE TO SECTION II.B.13 OF THE 241-AY-102  
SETTLEMENT AGREEMENT

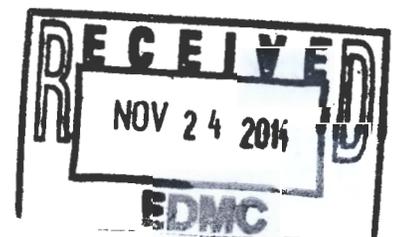
Reference: Pollution Control Hearings Board, State of Washington, 241-AY-102 Settlement Agreement, PCHB No. 14-041c, signed and submitted September 29, 2014, effective October 2, 2014.

The 241-AY-102 Settlement Agreement (Reference 1) signed by the parties and submitted to the Pollution Control Hearings Board (Board), became effective upon issuance of the Board's Order dismissing the appeal. The Settlement Agreement requires a number of documents and actions regarding Tank 241-AY-102, including the following item in Section II.B.13:

**13. Report on Leak Inspections**

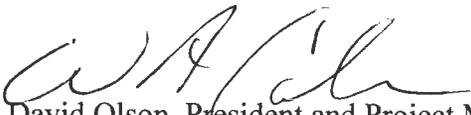
Monthly: Provide written reports to Ecology on all Tank 241-AY-102 annulus inspection and monitoring results conducted according to the Monitoring Plan (provided under requirement B.7 above) and the SY Settlement Agreement. These documents shall include reporting on annulus ventilation performance and status, images of the annulus, CAM readings, ENRAF readings, CAM and ENRAF calibration results, sample analysis results, waste heat monitoring results, including any interpretations and conclusions based on the results.

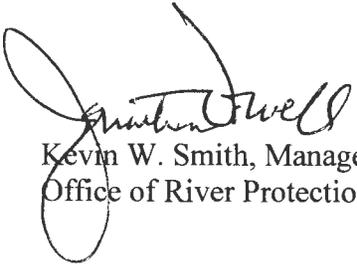
The purpose of this letter is to transmit the September 2014 Tank 241-AY-102 Monthly Report to the Washington State Department of Ecology.



NOV 19 2014

If you have any questions, please contact Thomas W. Fletcher, Assistant Manager for Tank Farms, Office of River Protection, at (509) 372-8828, Jessica Joyner, Environmental Protection, Washington River Protection Solutions LLC, at (509) 376-7533.

  
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Attachment

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Administrative Record

Environmental Portal, LMSI

WRPS Correspondence Control

**ATTACHMENT**

**14-TF-0125**

**TANK 241-AY-102 MONTHLY REPORT**

**SEPTEMBER 2014**

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## ABBREVIATIONS AND ACRONYMS

CAM	continuous air monitor
ENRAF	Enraf-Nonius Series 854
Ecology	Washington State Department of Ecology
Settlement Agreement	<i>Settlement Agreement and Stipulated Order of Dismissal</i>
TOC	Tank Operations Contractor

## 1.0 INTRODUCTION

### 1.1 PURPOSE

The September 2014 monthly monitoring report for Tank 241-AY-102 is submitted pursuant to Section II.B.13 of the Settlement Agreement in *Washington River Protection Solutions and U.S. Department of Energy, Office of River Protection v. State of Washington, Department of Ecology* (Ecology) PCHB No. 14-041c, effective on October 2, 2014. That provision states as follows:

*Monthly: Provide written reports to Ecology on all Tank 241-AY-102 annulus inspection and monitoring results conducted according to the Monitoring Plan (provided under requirement B.7 above) and the SY Settlement Agreement. These documents shall include reporting on annulus ventilation performance and status, images of the annulus, CAM readings, ENRAF readings, CAM and ENRAF calibration results, sample analysis results, waste heat monitoring results, including any interpretations and conclusions based on the results.*

The September 2014 monthly report contained herein, applies only to AY-102. This report for September 2014 covers the time period from August 22, 2014 to September 21, 2014. The monthly report cycle will include all requested data and information for the one month period from approximately the 23<sup>rd</sup> day of each month.

### 1.2 OBJECTIVE

This document provides the results of visual and video annulus inspections, annulus ventilation performance and status, CAM readings, ENRAF readings, CAM and ENRAF calibration results, sample analysis results, waste heat monitoring results, and including any interpretations and conclusions based on the results. A summary of the visual and video annulus inspections is provided in Section 2.0, all other results and readings are provided in Section 3.0.

## 2.0 ANNULUS VISUAL AND VIDEO INSPECTIONS

Visual and video inspections of the AY-102 annulus for the August 22 through September 21, 2014, reporting period are summarized below. Locations noted in Figure 1 were used to estimate material volume in the annulus. Table 1 provides information regarding the waste accumulation sites and their locations on Figure 1. Date of inspection for each location is provided in Table 2. Figure 1 provides locations and pictures of the annulus from the three known waste accumulation sites.

**Table 1. Waste Accumulation Sites**

Waste Accumulation Site	Waste span
1	210° to 240°
2	330° to 10°
3	15° to 35°

Note: Waste span locations are estimates based on visual inspections.

**Table 2. Dates of Visual Inspections of AY-102**

Waste Accumulation Sites 1, 2, and 3 Weekly Inspections	Other Locations Utilized for >95% Enhanced Inspection	Date Inspected
8/28/2014	80°	9/3/2014
9/3/2014	100°	9/16/2014
9/10/2014	145°	9/3/2014
9/15/2014	210°	8/28/2014
	280°	9/15/2014
	325°	8/28/2014

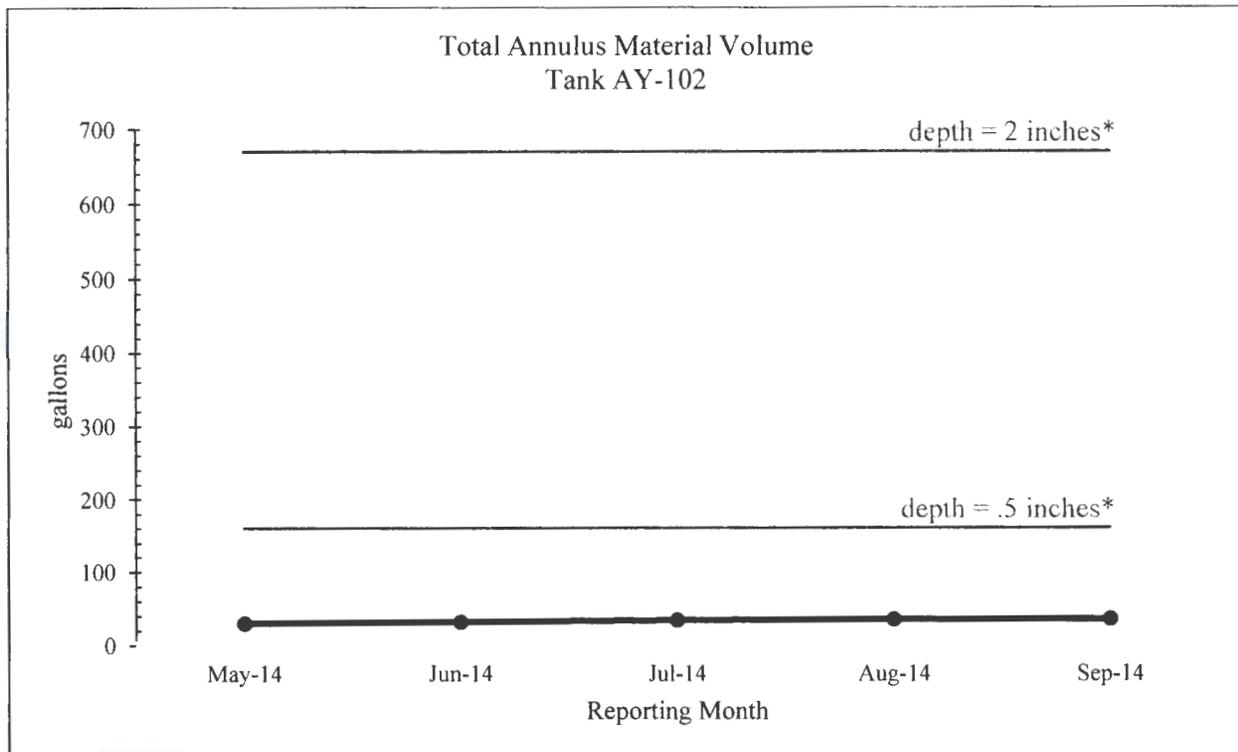
The current monthly reporting period, August 22 through September 21, 2014, estimates an increase of 0.4 gallons of material volume in the annulus; bringing the total estimated material volume in the annulus to 35.7 gallons as of September 21, 2014 (see Table 3). No new material was identified in any other location besides the locations previously identified as waste accumulation sites 1, 2, and 3.

The volumes of accumulated tank wastes reported are those noted in the visually observable areas of the annulus. The range of total waste reported in RPP-RPT-53793, *Tank 241-AY-102 Leak Assessment Report*, November 7, 2012, bounds the current volume in the annulus even with the small (~0.4 gallon) changes in volume noted in this report. For comparison purposes, the total annulus volumes for July 2014 and August 2014 are also listed in Table 3. Figure 2 shows the total annulus material volume over time for each of the reporting months.

**Table 3. AY-102 Annulus Visually Observable Volumes**

<b>Location (refer to Figure 1)</b>	<b>Previous Material Volume</b>	<b>New Material Volume</b>	<b>Total Material Volume</b>
<b>Leak Accumulation Sites</b>			
1 (210° to 240°)	~ 2.9 gallons	~ 0.2 gallons	~ 3.1 gallons
2 (330° to 10°)	~ 27.4 gallons	~ 0.2 gallons	~ 27.6 gallons
3 (15° to 35°)	~ 5.0 gallons	0	~ 5.0 gallons
<b>Other Locations</b>			
80°	0	0	0
100°	0	0	0
145°	0	0	0
215°	0	0	0
280°	0	0	0
325°	0	0	0
<b>Total Annulus September 2014</b>	~ 35.3 gallons	~ 0.4 gallons	~ 35.7 gallons
Total Annulus August 2014	~ 34.5 gallons	~ 0.8 gallons	~ 35.3 gallons
Total Annulus July 2014	~ 32.0 gallons	~ 2.5 gallons	~ 34.5 gallons





\*RPP-PLAN-60014, Tank 241-AY-102 Waste Leak Status Contingency Plan, requires installation of the emergency annulus pumping system at annulus ENRAF measurements of  $\geq 0.5$  inches depth. Removal of primary tank supernatant is required at annulus ENRAF measurements of  $\geq 2$  inches depth.

**Figure 2. Total Annulus Material Volume**

### 3.0 MONITORING

Table 44 provides AY-102 annulus ventilation performance and status, CAM readings, ENRAF readings, CAM and ENRAF calibration results, waste heat monitoring results, and interpretations and conclusions based on the monitoring results for September 2014.

**Table 4. Summary of September 2014 Monitoring and Calibration for AY-102**

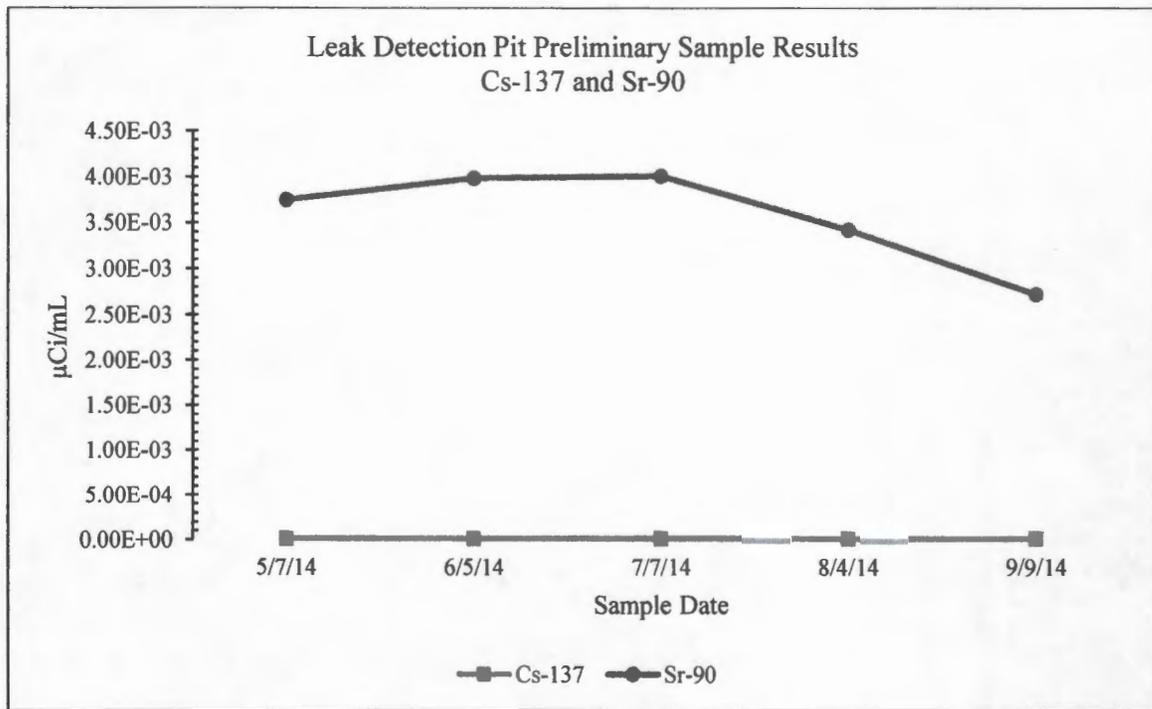
Description	Data Source	Instrument(s)	Calibration Results	Interpretations and Conclusions
Primary Tank Surface Level	TMACS	ENRAF (Riser 39) AY102-WST-LIT-101	Last: 1/30/14 Next: 12/26/14	Primary Tank Surface Level decrease for September is 0.99" (285.85" on 09/01/14 and 284.86" on 09/30/14).  This is within anticipated range for evaporation.
Annulus Surface Level	TMACS	ENRAF (Riser 88) AY102-WSTA-LDT-151	Last: 6/30/14 Next: 5/26/15	Level Readings for September between 0.18" and 0.18". Data is within the upper/lower approved limits.
		ENRAF (Riser 89) AY102-WSTA-LDT-152	Last: 8/18/14 Next: 7/14/15	Level Reading for September between 0.16" and 0.17". Data is within the upper/lower approved limits.
		ENRAF (Riser 91) AY102-WSTA-LDT-153	Last: 8/18/14 Next: 7/14/15	Level Readings for September between 0.14" and 0.16". Data is within the upper/lower approved limits.
Primary Tank Waste Temperatures	SACS	Permanently Installed Thermocouple Tree (Riser 29) AY102-TE-004 through TE-015 (Supernatant) AY102-TE-001 through TE-003 (Solid/Sludge)	Manual Reading taken by calibrated M&TE.	Average Supernatant Temperature change for September is -1°F (from 104 to 103 degrees F). Average Solid/Sludge Temperature change for September is -3°F (from 133 to 130 degrees F).
Annulus Leak Detection (CAM)	SACS	Continuous Air Monitor (CAM) AY102-WSTA-CAM-102	Last: 7/26/13 Next: 10/25/14	Annulus CAM (RAD) Readings for September between 10 cpm and 570 cpm.  Data is within the upper alarm limit of 2000 cpm.
<b>Description</b>	<b>Availability</b>		<b>Interpretations and Conclusions</b>	
Primary Tank Ventilation	100%		NA	
Annulus Tank Ventilation	100%		NA	

## 4.0 LEAK DETECTION PIT PRELIMINARY SAMPLE RESULTS

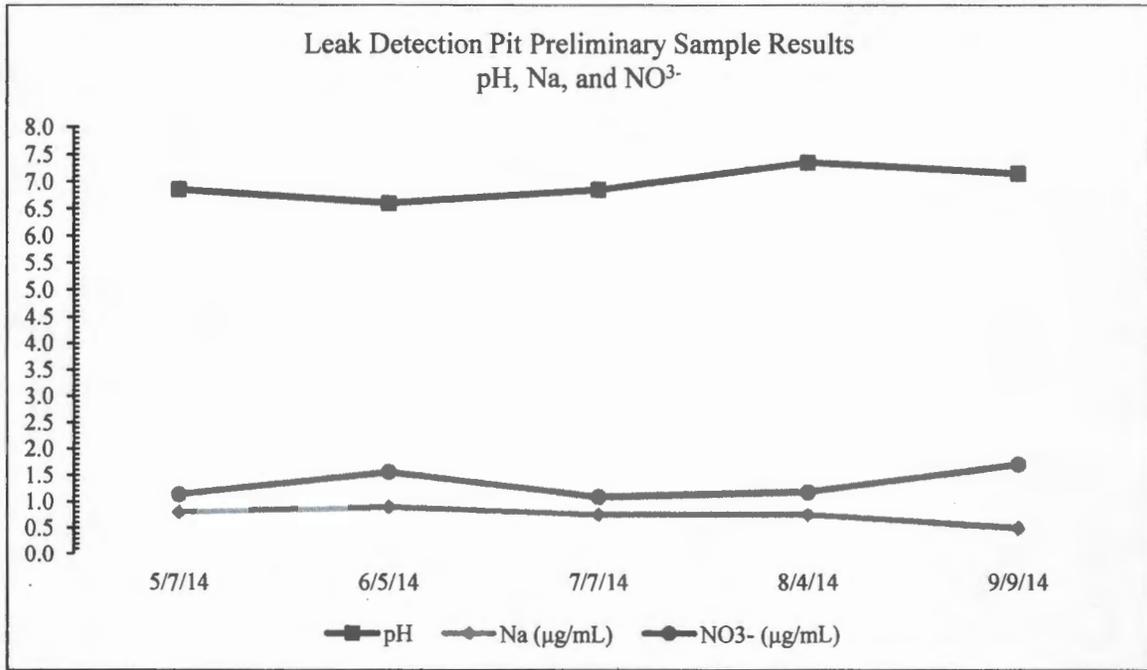
Final results for the AY-102 Leak Detection Pit (LDP) for August 2014 were transmitted to Ecology by ORP, and are documented in RPP-RPT-58218, *Final Report for Tank 241-AY-102A Leak-Detection Pit Liquid Grab Samples, August 2014*. Table 5 provides AY-102 selected preliminary analysis results for samples taken on September 9, 2014, for the AY-102 Leak Detection Pit (LDP). The entire laboratory data results package will be documented in a final report, transmitted to Ecology in response to Order Item #11. The previous sampling results for August 4, 2014 are also provided in Table 5 for reference. Figures 3 and 4 show preliminary sample data results for each monthly sampling effort.

**Table 5. Leak Detection Pit Preliminary Sample Results for September 2014**

Analyte	LDP 8-4-14 (August 2014)	LDP 9-9-14 (September 2014)	Interpretations and Conclusions
$^{137}\text{Cs}$	1.5 - 1.6( $10^{-5}$ ) $\mu\text{Ci/mL}$	1.1 - 1.7( $10^{-5}$ ) $\mu\text{Ci/mL}$	Preliminary results are similar to the last sampling event on 8-4-14.  Data suggests no impact to the integrity of the AY-102 annulus.
$^{90}\text{Sr}$	3.38 - 3.47( $10^{-3}$ ) $\mu\text{Ci/mL}$	2.41 - 3.04( $10^{-3}$ ) $\mu\text{Ci/mL}$	
pH	7.3 - 7.4	7.0 - 7.3	
Na	0.7 - 0.8 $\mu\text{g/mL}$	0.4 - 0.6 $\mu\text{g/mL}$	
$\text{NO}_3^-$	1.18 - 1.18 $\mu\text{g/mL}$	1.35 - 2.06 $\mu\text{g/mL}$	
Appearance	Clear colorless liquid	Clear colorless liquid	



**Figure 3. Leak Detection Pit Preliminary Sample Results Cs-137 and Sr-90**



**Figure 4. Leak Detection Pit Preliminary Sample Results pH, Na, NO<sup>3-</sup>**

## 5.0 REFERENCES

- RPP-ASMT-53793, 2012, *Tank 241-AY-102 Leak Assessment Report*, Rev. 0, U.S. Department of Energy, Office of River Protection, Washington River Protection Solutions, Richland, Washington.
- RPP-PLAN-60014, 2014, *Tank 241-AY-102 Waste Leak Status Contingency Plan*, Draft, U.S. Department of Energy, Office of River Protection, Washington River Protection Solutions, Richland, Washington.
- RPP-RPT-58218, 2014, *Final Report for Tank 241-AY-102A Leak-Detection Pit Liquid Grab Samples, August 2014*, Rev. 0, U.S. Department of Energy, Office of River Protection, Washington River Protection Solutions, Richland, Washington.