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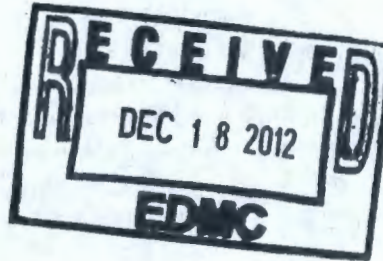
STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

3100 Port of Benton Blvd • Richland, WA 99354 • (509) 372-7950  
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

December 12, 2012

12-NWP-188

Mr. Scott L. Samuelson, Manager  
Office of River Protection  
United States Department of Energy  
P.O. Box 450, MSIN: H6-60  
Richland, Washington 99352



Re: Washington State Department of Ecology (Ecology) Assessment Report for Field Monitoring Activities conducted November 12, 2012 of the waste material near Riser 83 of the 241-AY-102 Double Shell Tank (DST)

Dear Mr. Samuelson:

On November 12, 2012, Ecology staff visited the 241-AY Farm. The purpose of this visit was to witness the weekly visual inspection of the waste material found near Riser 83 of the 241-AY-102 DST. Ecology staff noted the following:

- The extent of the area of the waste material with respect to the annulus "landmarks" (orange foam pieces, black pebble, the ventilation slot, etc.) appeared to slightly grow as compared to the amount of material viewed during the visual inspection conducted 10/18/12 and 10/25/12.
- The moisture streaks on either side of the waste within the ventilation slot near Riser 83 once again appeared to be wet, indicating that the slow leak is still present and has not "self-healed".
- An increased amount of white mineralization on the outside perimeter of the waste material within the annulus space.
- The waste material near the 6-inch refractory/connector ring had turned color from yellow to white. The size or height of the white waste material appeared to "grow" or crystalize. This increase in waste height, in turn created the appearance of "deeper" waste pools and finger channeling of the green and darker yellow colored waste.
- The waste is in direct contact with tank components. During this inspection Ecology staff could not determine if the 6-inch wide carbon steel refractory ring, annulus floor, primary tank liner, or the refractory/concrete material showed staining, cracking, pitting, etc., at those specific locations, as a result of the direct contact. The lack of visual assessment is due to the increased crystal growth, especially in the lower two-thirds of the leak area within the annulus space near Riser 83.

5.2.3





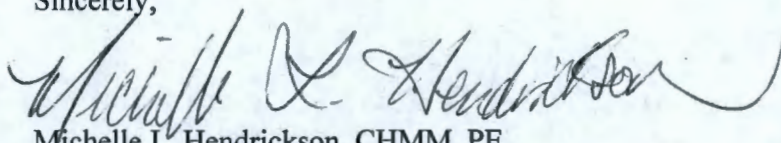
Mr. Scott Samuelson  
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The United States Department of Energy-Office of River Protection, Washington River Protection Solutions LLC, and Ecology Integrated Project Team (IPT) continue to meet on a weekly basis and use this data to develop and evaluate options for the interim and longer term management of this tank and its contents. Ecology staff also participated in a DST Expert Panel on Corrosion (EPOC) conference call. At this time, the EPOC and IPT are unsure of the impacts this waste will have on the tank components that it is in contact with. Analytical results are pending, but preliminary results indicate that the waste is high in nitrite and hydroxide compounds. This would indicate that additional environmental stress cracking due to the waste should be at a slower rate. The EPOC has proposed to initiate additional corrosion tests using simulant that closely matches interstitial liquid and supernatant in the AY-102 DST based on the preliminary analytical results of the waste material.

Attached are Ecology's assessment report and photographs from the November 12, 2012, field visit. If you have any questions, please contact me at 509-372-7970 or Michelle.Hendrickson@ecy.wa.gov.

Sincerely,



Michelle L. Hendrickson, CHMM, PE  
Tank System Operations and Closure Engineer  
Nuclear Waste Program

dbm  
enclosures (2)

cc electronic w/enc:

Tom Fletcher, USDOE-ORP  
Lisa Domnoske-Rauch, USDOE-ORP  
Jeremy Johnson, USDOE-ORP  
Jeff Voogd, WRPS  
Steve Killoy, WRPS  
Jason Engeman, WRPS

Dennis Washenfelder, WRPS  
David Bernhard, NPT  
Dirk Dunning, ODOE  
Ken Niles, ODOE  
Randall Robinson, DNFSB

cc w/enc:

Stuart Harris, CTUIR  
  
Gabriel Bohnee, NPT  
Steve Hudson, HAB  
Russell Jim, YN

Administrative Record: DST/Tank Waste  
Storage/214-AY-102/S-2-3  
Environmental Portal, LMSI  
USDOE-ORP Correspondence Control  
WRPS Correspondence Control





## ASSESSMENT REPORT

### Field Monitoring Activities

#### A. GENERAL INFORMATION

Project: 241-AY-102 Field Monitoring, Riser 83 Video

Project Contact: Jeremy Johnson (ORP) Phone: (509) 376-1866

Review Date: 11/12/2012

Reviewer: Michelle Hendrickson, CHMM, PE

USDOE Project: US Department of Energy-Office of River Protection (USDOE-ORP)

USDOE Contact: Tom Fletcher/Jeremy Johnson

Prime Contractor: Washington River Protection Solutions (WRPS)

Project Manager: Michael Hardesty Phone: (509) 373-4573

Location: 241-AY-102, 200 East Area, Hanford

Scheduled Start Date: 11/12/2012 Actual Start Date: 11/12/2012 Completion Date: 11/12/2012

Contract Amount: Approximately \$75,000 for 4 Riser Visual Inspections

Sub-Contractor: N/A

Location: 200 East Area, Hanford Nuclear Reservation, Richland, WA

#### PROJECT DESCRIPTION:

- On an 8/8/12 visual inspection, material was found in the Annulus Space at AY-102. On 10/23/2012, USDOE-ORP reported that the DST was leaking and more material was accumulating in the Annulus Space.
- To monitor the slow leak, WRPS is conducting weekly and often twice weekly video inspections of the material through the AY-102 Tank's Riser #83.

The Pre-job meeting was conducted at 8:00 AM, including the conditions of RWP WTO04399, Rev. 2. The job in the field consisted of:

1. We entered the farm at approximately 9:45 AM. The ventilation exhauster was throttled down in the annulus from -14 inch to a -1 inch vacuum. The ventilation vacuum was lessened as the air currents generated by the vacuum create air currents which cool the sludge. However, these currents also impede the collection of a flammable gas sample and cause the camera to swing and makes its manipulation within the annular space very difficult..
2. A flammable gas sampled was collected and indicated that the annulus space was less than 25% lower flammability limit.
3. The camera was in a plastic bag and wire attached in a sleeve. The sleeve was carefully inspected and then the camera was removed from the bag and lowered into the annulus space. The camera was lowered to the 55-foot mark for the video/photographs. The camera completed a 360-degree scan and was raised and tilted. Also, a zoom of 10-times was used for close-up observation of the waste. Close-ups of the material along the entire area of waste deposition were viewed. The "landmarks" within the tank (black dot or rock, two white pebbles, and ventilation slots) were specifically viewed.
4. Once all of the views were captured, the camera was raised and re-bagged.
5. We surveyed out of the 241-AY Farm.



**B. RECORDS AND PROCEDURES**

1. Personnel Contacted During Assessment

	<u>Name</u>	<u>Title or Duties/Organization</u>	<u>Phone</u>
a.	Steve Stamper	Camera Operator - WRPS	509-392-3977
b.	Michael Hardesty	Field Work Supervisor	509-373-4573
c.	Roger Hammer	Camera Operator - WRPS	509-373-3355
d.			

2. Progress

a. Scheduled Percentage 100 %

	Yes	No	NA	See Remarks
3. Stockpiled equipment or materials				
a. Records adequate?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Protected?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Monitoring Procedures up to date?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Work Packages up to date?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Adequate involvement in changes?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Change of monitoring procedures appropriate and submitted to Ecology?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
8. Instrument(s) Calibrated adequately?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Permit No/TPA Requirement.: DST System Unit RCRA Permit				

**C. FIELD MONITORING**

- The weather was reported at the Plan of the Day meeting was rain and low winds.
- The video taken of the waste material was near Riser 83 of the 241-AY-102 Annulus Space.
- The video was viewed and camera manipulated in the AY-801 Building.
- As the camera descended to the bottom of the annular space, a thermocouple became visible. The camera zoomed in and the off-riser sampler/crawler's tracks were no longer visible.
- All witnessing the inspection noted that the color of the waste appeared to be changing. The dark green was changing to a lighter green in some locations. The lighter green was becoming a dark yellow. The darker yellow was changing to a lighter yellow. The lighter yellow was turning to a white color along the waste perimeter. This indicates that the waste material may be drying, most likely due to the ventilation.
- The camera viewed the waste in respect to the different in-annular space "landmarks" including the black dot or rock, two white pebbles and ventilation slots. It was noted by all witnessing the video that the size of the area of the waste material did appear to have slightly increased in size, especially in the ventilation slot landmark, as compared to the amount of waste material viewed during the visual inspection conducted on 10/25/12.
- All witnessing the video also noted that there appeared to be moisture streaks indicating that the concrete near the ventilation slot was wet on either side of the waste. This had been viewed during previous visual inspections.
- Ecology noted that there appeared to be an increased amount of white mineralization on the outside perimeter of the waste material in the annulus space.
- Ecology also noted some rust and pitting on the primary tank. It is unclear if this was previously identified or if it is a newer development.
- Ecology also noted that the waste material near the 6-inch refractory/connector ring



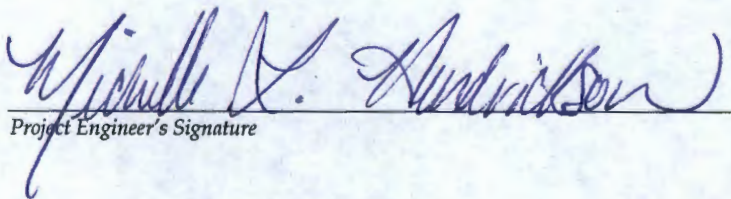
- had turned from yellow to white and appeared to "grow" in height or crystalize. And as this white waste material appears to increase in height, the finger channels of waste or pools of waste (that are dark green, light green, and yellow) appear to look deeper and slightly extend in length.
- Ecology could not visually distinguish if any visual damage indicators such as staining, cracking, pitting, etc. of the 6 inch wide carbon steel refractory ring, annulus floor, primary tank liner, or the refractory/concrete material where the waste was in direct contact with the tank structures. This lack of visual assessment is due to the increased growth of crystals, especially in the lower 2/3rds of the leak area and increased amount of deposition of mineralization around the perimeter of the leak area within the annulus. It is unknown at this time what influence the waste will have that is contacting the annulus floor and refractory/concrete pedestal.

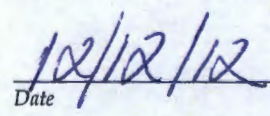
	Yes	No	NA	See Remarks
1. Comply with Procedures and QA/QC Specifications?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Field Test Being Accomplished?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Satisfactory Contractor Quality Control?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Inspection Documentation Satisfactory?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Site Condition				
a. Orderly?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Control room interface adequate?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Equipment set-up adequate?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Monitoring bypassing satisfactory?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
7. Unsafe Conditions/Health Hazards Observed?	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
8. Is Project on Schedule?	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Is the Operations and Maintenance Documentation on Schedule?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
10. Is the Maintenance Management System on Schedule?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
11. Traffic control and traffic safety?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

REMARKS:

Photographs from this field monitoring event are attached.

Assessment Completed:

  
 Project Engineer's Signature

  
 Date



11/1/2012



11/5/2012



11/8/2012



11/12/2012

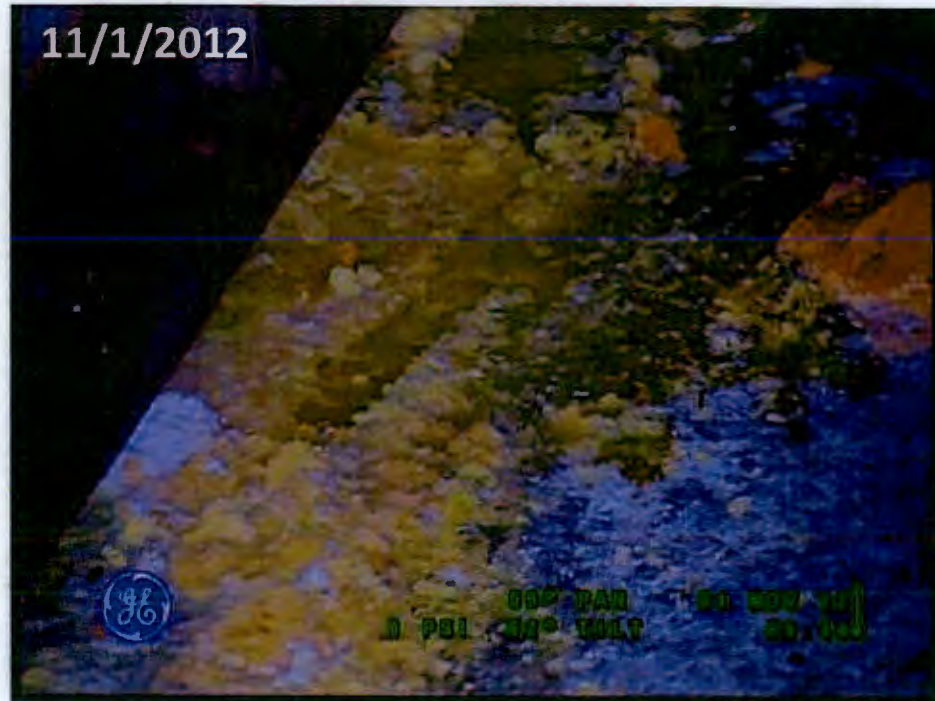




10/25/2012



11/1/2012



11/8/2012



11/12/2012





11/8/2012





11/12/2012

