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Please distribute to the following:

100/300 AREA UNIT MANAGER MEETING
ATTENDANCE AND DISTRIBUTION

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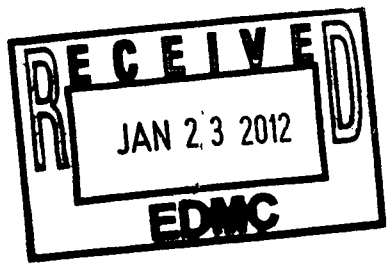
Gadbois, Larry E	Gadbois.larry@epa.gov	B1-46	EPA
Hadley, Karl A	karl.hadley@wch-rcc.com	H4-21	WCH
Lewis, Jacquie	jllewis@wch-rcc.com	H4-21	WCH



163550

100/300 AREA UNIT MANAGERS MEETING
APPROVAL OF MEETING MINUTES

December 8, 2011

APPROVAL: _____ Date 1/12/12

Mark French, DOE/RL (A3-04)
River Corridor Project Manager

APPROVAL: _____ Date 1/12/12

Briant Charboneau, DOE/RL (A6-33)
Groundwater Project Manager

APPROVAL: _____ Date 1-12-12

Nina Menard. Ecology (H0-57)
Environmental Restoration Project
Manager

APPROVAL: _____ Date 1/12/12

Laura Buelow, Rod Lobos, or Christopher
Guzzetti, EPA (B1-46)
100 Area Project Manager

APPROVAL: _____ Date Jan 12-2012

Larry Gadbois, EPA
(B1-46)
300 Area Project Manager

100 & 300 AREA UNIT MANAGER MEETING MINUTES

Groundwater and Source Operable Units; Facility Deactivation, Decontamination, Decommission, and Demolition (D4); Interim Safe Storage (ISS); Field Remediation (FR); and Mission Completion

December 8, 2011

ADMINISTRATIVE

- Next Unit Manager Meeting (UMM) – The next meeting will be held January 12, 2012, at the Washington Closure Hanford (WCH) Office Building, 2620 Fermi Avenue, Room C209.
- Attendees/Delegations – Attachment A is the list of attendees. Representatives from each agency were present to conduct the business of the UMM.
- Approval of Minutes – The November 10, 2011, meeting minutes were approved by the U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and U.S. Department of Energy, Richland Operations Office (RL).
- Action Item Status – The status of action items was reviewed and updates were provided (see Attachment B).
- Agenda – Attachment C is the meeting agenda.

EXECUTIVE SESSION (Tri-Parties Only)

An Executive Session was not held by RL, EPA, and Ecology prior to the December 8, 2011, UMM.

100-F & 100-IU-2/100-IU-6 AREAS (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 2 provides status and information for Field Remediation activities. No issues were identified and no action items were documented.

Agreement 1: Attachment 3 provides an agreement to continue excavation at the south side of 100-F-57.

Agreement 2: Attachment 4 provides an agreement to discontinue running the perimeter air monitors at 100-F.

100-D & 100-H AREAS (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 2 provides status and information for Field Remediation activities. No issues were identified.

Action Item 1: DOE will provide Ecology with a briefing on the wells damaged by the flooding at 100-D.

Agreement 1: Attachment 5 provides an agreement to accept the Treatment Plan for 100-D Burial Grounds NaK.

Agreement 2: Attachment 6 provides an agreement to vent the acetylene cylinders at 100-D.

100-N AREA (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 2 provides status and information for Field Remediation activities. Attachment 7 provides status and information for D4/ISS activities at 100-N. No issues were identified and no action items were documented.

Agreement 1: Attachment 8 provides an agreement to commingle waste site material in the 100-N South Staging Pile Area 1. Waste will be removed and disposed by the M-16-55 milestone completion date of December 31, 2012, and the area verification sampled. Sampling and closure documentation will be performed with the 100-N-61 waste site.

Agreement 2: Attachment 9 provides an agreement of the sampling approach for the soil near the 116-N-2, UPR-100-N-5, and UPR-100-N-25 power pole.

Agreement 3: Attachment 10 provides an agreement of a noncontiguous onsite determination to send approximately 3,000 gallons of liquid removed from various pipe runs at 100-N to the Effluent Treatment Facility.

100-K AREA (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 2 provides status and information for Field Remediation activities. No issues were identified and no agreements or action items were documented.

100-B/C AREA (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 2 provides status and information for Field Remediation activities. No issues were identified and no agreements or action items were documented.

300 AREA – 618-10/11 (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. No issues were identified and no agreements or action items were documented.

300 AREA - GENERAL (GROUNDWATER, SOILS, D4/ISS)

Attachment 1 provides status and information for groundwater. Attachment 11 provides status of the 300 Area Closure Project activities. No issues were identified and no agreements or action items were documented.

REGULATORY CLOSEOUT DOCUMENTS OVERALL SCHEDULE

No issues were identified and no action items were documented.

Agreement 1: Attachment 12 provides an agreement of the Rapid Improvement Event – Verification Work Instruction Preparation conducted with representatives of DOE-RL, Ecology, EPA, and WCH between November 1 and 2, 2011.

MISSION COMPLETION PROJECT

Attachment 13 provides status and information regarding the Orphan Sites Evaluations, Long-Term Stewardship, River Corridor Baseline Risk Assessment, the Remedial Investigation of Hanford Releases to the Columbia River, and a Document Review Look-Ahead. No issues were identified and no agreements or action items were documented.

5-YEAR RECORD OF DECISION ACTION ITEM UPDATE

No changes were reported to the status of the CERCLA Five-Year Review action Items. No issues were identified and no agreements or action items were documented.

Attachment A

100/300 AREA UNIT MANAGER MEETING
ATTENDANCE AND DISTRIBUTION
December 8, 2011

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Attachment B

100/300 Area UMM
Action List
December 8, 2011

Open (O)/ Closed (X)	Action No.	Co.	Actionee	Project	Action Description	Status
O	100-181	RL	J. Hanson	100-HR	DOE will provide Ecology with a briefing on the applicability and status of bioremediation of chromium and the associated feasibility studies.	Open: 4/14/11; Action:
X	100-189	RL	J. Hanson	100-HR	DOE will provide Ecology with the decommissioning schedule for the ISRM Pond by October 17, 2011. Action was transferred to the IAMIT for resolution.	Open: 9/8/11; Action: Closed 11/10/11
X	100-191	RL	J. Hanson	100-HR	DOE will have CHPRC provide Ecology with a schedule for evaluating the decommissioning path-forward of the ISRM Pond and a schedule for when a meeting will be held to present recommendations. Action was transferred to the IAMIT for resolution.	Open: 10/13/11; Action: Closed 11/10/11

Attachment C

100/300 Area Unit Manager Meeting
December 8, 2011
Washington Closure Hanford Building
2620 Fermi Avenue, Richland, WA 99354
Room C209; **2:00p.m. (NEW START TIME)**

Administrative:

- Approval and signing of previous meeting minutes (November 10, 2011)
- Update to Action Items List
- Next UMM (1/12/2012, Room C209)

Special Topics

- EPA's global issues from review of 100-K RI/FS (Chris Guzzetti)
- Hanford Site Strategy for Management of Investigation Derived Waste (Laura Buelow)
- RDR/RAWP for the 100 Areas (Laura Buelow)

Open Session: Project Area Updates - Groundwater, Field Remediation, D4/ISS:

- 100-F & 100-IU-2/6 Areas (Greg Sinton/Tom Post/Jamie Zeisloft)
- 100-D & 100-H Areas (Jim Hanson/Tom Post/Joanne Chance)
- 100-N Area (Joanne Chance, Rudy Guercia, Mike Thompson)
- 100-K Area (Jim Hanson, Jamie Zeisloft, Ellen Dagon, Steve Balone)
- 100-B/C Area (Greg Sinton, Tom Post)
- 300 Area - 618-10/11 exclusively (Jamie Zeisloft)
- 300 Area (Mike Thompson/Rudy Guercia)
- Regulatory Closeout Documents Overall Schedule (John Neath, Mike Thompson)
- Mission Completion Project (John Sands)

Special Topics/Other

- 5-Year Record of Decision Action Item Update (Jim Hanson)

Adjourn

Attachment 1

100/300 Areas Unit Managers Meeting
December 8, 2011

General information on Aquifer Tube Sampling
The comprehensive, annual sampling event for FY 2012 is scheduled for October through December. Sampling began in November. Relative priority for aquifer tube sampling has been set so that tubes that were not sampled in FY 2011 (100-BC, 100-F, Hanford Town Site, and fall event in 300 Area) get highest priority.

General information on Groundwater Sampling
The sampling organization reported delays in obtaining CERCLA groundwater samples scheduled for October. The wells completed successfully are reported in a table on the last page of this handout. Primary contributors to delays include the large number of samples scheduled during October, drilling activities continuing into FY 2012, and laboratory issues being resolved at WSCF. CHPRC is working to resolve the backlog.

100-FR-3 Groundwater Operable Unit – Bert Day / Mary Hartman
(M-015-64-T01, 12/17/2011, Submit CERCLA RI/FS Report and Proposed Plan for the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units for groundwater and soil.)
Schedule Status - The new planned delivery date for the 100-FIU Draft A RI/FS Report to the regulators is May 14, 2012. Field investigations are complete.

No new groundwater monitoring results to report. The full network of wells was scheduled for sampling in October but has been delayed, as discussed above, as of the end of November four of 26 wells had been sampled.

100-HR-3 Groundwater Operable Unit – Bert Day / John Smoot
(M-15-70-T01, 11/24/2011, Submit feasibility study report and proposed plan for the 100-HR-1, 100-HR-2, 100-HR-3, 100-DR-1 and 100-DR-2 operable units for groundwater and soil.)
Schedule Status - The new planned delivery date for the 100-D/H Draft A RI/FS Report to the regulators is January 12, 2012. Field investigations will be complete after slug testing is complete. Slug tests for the RI wells in 100-D were completed in November; the 100-H wells will be completed in December.

(M-16-111C, Expand current pump-and-treat system at 100-HR-3 operable unit utilizing ex situ treatment, in situ treatment or a combination of both to a total 800 gpm capacity or as specified in the work plan.)
Schedule Status – Completed 9/29/2011 with the startup of HX facility. Currently HR-3 Operable Unit pump and treat systems are running at a combined treatment rate of approximately 1050 gpm. A letter is forthcoming to document the completion of this milestone.

- HR-3 Treatment System was placed in cold standby on May 5, 2011.
- DR-5 Treatment System was placed in cold standby on February 28, 2011.
- DX Pump and Treat system
    - For the period November 1 through 30, 2011:
    - The DX pump and treat system is operating.
    - November 1 through 30, 2011 performance:
        - The system treated 21.2 million gallons.
        - Average treatment rate: 491 gpm
        - The system removed 68.7 kg of hexavalent chromium.
    - Design modifications are being prepared to protect the four wells on the flood plain from damage in future high water events. Work packages are being prepared to repair the wells and return them to service.

2011. Well N-18 was sampled for the last time in 2011 and will only be used for product removal (using Smart Sponges) in 2012. Diesel removal data (for N-18) to date is reported below.

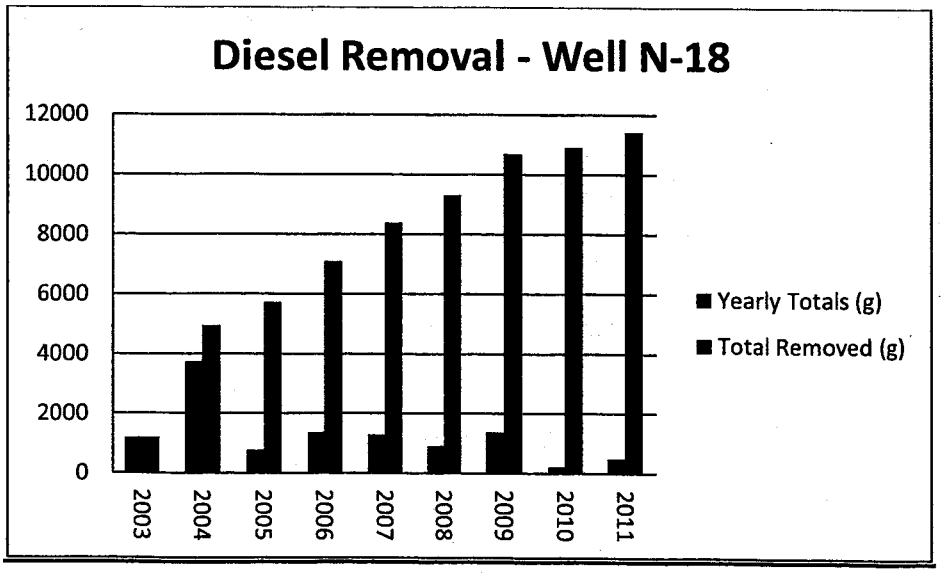
Year	TPH Product Removed (g)	Notes
2003	~1,200 (see notes below)	Estimate provided per information given in note below; data records lost when original work package was lost in the field.
2004	3,475	Changed out twice per month.
2005	780	Changed approximately every 2 months.
2006	1,370	Changed every 2 months.
2007	1,294	Changed every 2 month.
2008	920	Changed every 2 months.
2009	1,380	Changed approximately every 2 months.
2010	225.5	Changed only twice prior to June 2010; smart sponge broke apart in well. No removal for second half of 2010.
2011*	500	Changed approximately every two months.
Total		**~11,410 g removed through November of 2011**

Notes:

1. DOE/RL-2004-21, *Calendar Year 2003 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Operable Unit (OU) Pump & Treat Operations*, reports that product removal started in October 2003.

2. DOE/RL-2005-18, *Calendar Year 2004 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Operable Unit Pump-and-Treat Operations*, states that the average mass removal for FY 2004 (October 2003 through October 2004) was approximately 0.4 kilograms per month, so an estimate is provided for the 3 months missing in CY 2003.

*Through 11-7-11



- RI/FS report Draft A and Proposed Plan Draft A delivery to DOE-RL scheduled for December 16, 2011.

This status report covers the groundwater impacted by releases from waste sites associated with three geographic subregions: 300 Area Industrial Complex, 618-11 Burial Ground, and 618-10 Burial Ground/316-4 Cribs. Principal controlling documents are:

- 300-FF-5 OU operations and maintenance plan (DOE-RL-95-73, Rev. 1, 2002)
- 300-FF-5 OU sampling and analysis plan (DOE/RL-2002-11, Rev. 2, 2008)
- 300 Area RI/FS work plan (DOE/RL-2009-30, Rev. 0, 2010)
- 300 Area RI/FS sampling and analysis plan (DOE/RL-2009-45, Rev. 0, 2010).

300 Area Industrial Complex — The only new information since the November unit manager meeting comes from the first results for sampling new wells that are part of the remedial investigation. There are no significant changes since the November unit manager meeting report; trend charts will be updated following the semi-annual comprehensive sampling event in December, and receipt of analytical results for aquifer tube samples. For other wells in the 300-FF-5 network, the most recent sampling was conducted in mid-November and included many of the aquifer tubes located along the shoreline, along with some wells that are sampled monthly.

- *Analytical results from new RI monitoring wells* — The new RI monitoring wells were sampled in mid-October and nearly all analytical results are now available and being incorporated into the Draft A RI/FS report. The uranium concentrations are consistent with concentrations observed in samples collected during drilling, and with concentrations in nearby existing wells. Concentrations for volatile organic compounds are also consistent with expectations and nearby conditions. Nitrate at 'temporary well' 399-1-62, located near the southern end of the former North Process Pond, is elevated compared to concentrations at nearby wells (141 mg/L compared to expected values of 25 ~ 30 mg/L). The 'temporary wells' have short 2-ft screens placed at the elevation of the seasonal low water table; whereas routine monitoring wells have 15-ft screens that cover the range of water table elevations. Evaluation of results from the new RI monitoring wells and 'temporary wells' is continuing and will be included in the Draft A RI/FS report. All results for the 300 Area COPCs presented in the work plan are at lower concentrations than their respective drinking water standards except for cis-1,2-dichloroethene, manganese and nitrate (non-Hanford related), and uranium, as expected.
- *Uranium Plume* — (No change since November unit manager meeting). Following increased concentrations associated with the unusually high water table conditions in June, uranium concentrations are decreasing toward more typical levels at the uranium plume hotspot areas (Figure A, well 399-1-17A). Dilution by river is no longer a major factor at wells near the river, and concentrations have therefore increased during the fall (Figure B, well 399-1-16A). The next samples are scheduled for December.
- *Groundwater contamination associated with the 618-7 Burial Ground remedial action* — (No change since November unit manager meeting). Uranium concentrations increased during the June 2011 seasonal high water table conditions, as evidenced by the increased concentration in well 399-8-5A (Figure C, well 399-8-5A); the next samples are scheduled for December. The plume has not been clearly recognizable along its projected migration path at distances greater than approximately 350 meters, i.e., at well 399-8-1, although some variability in uranium concentrations at downgradient wells, such as well 399-3-6, may be associated with migration of the 618-7 plume.
- *Groundwater impacts related to the 324 Building* — (No change since November unit manager meeting). Recent groundwater monitoring results for wells in the vicinity of the 324 Building do not show clear evidence of impacts related to the recent discovery of leakage under the B-hot cell. Monitoring is conducted quarterly using gross beta as an indicator for strontium-90, a principal hot cell

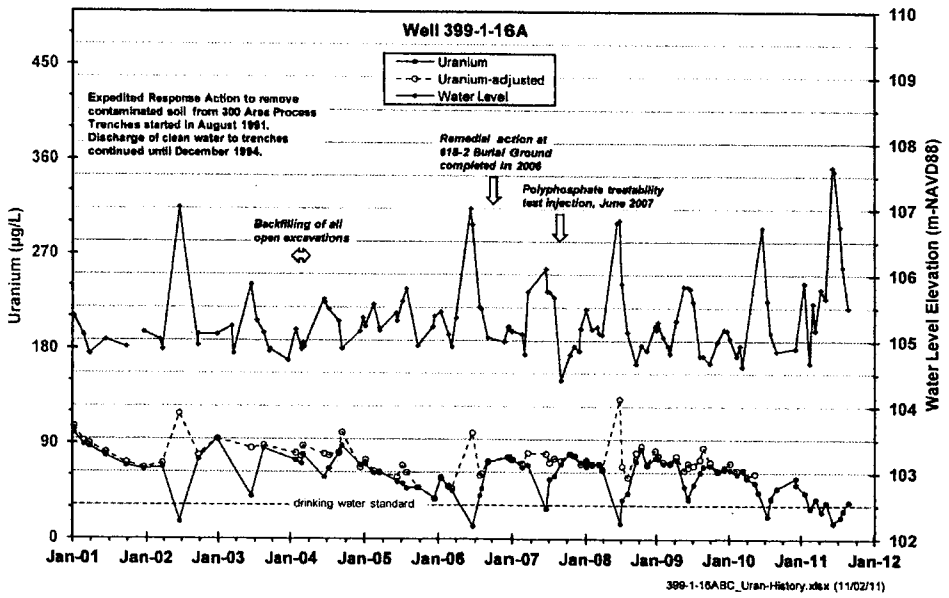


Figure B. Uranium Concentrations at 399-1-16A, A Near-River Well.

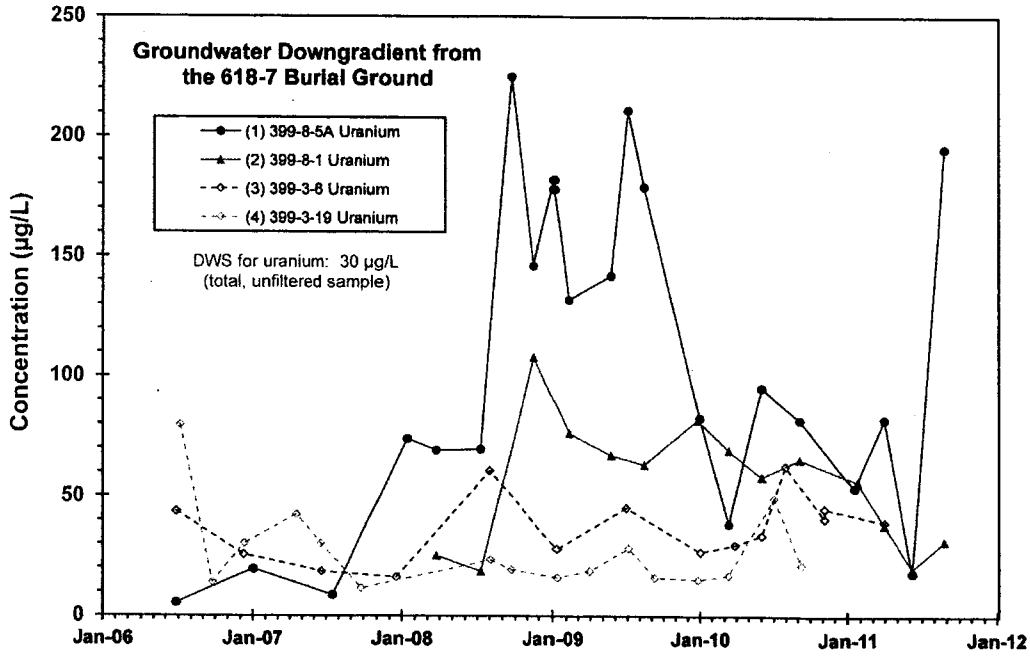


Figure C. Uranium Concentrations at 399-8-5A, Adjacent to the Former 618-7 Burial Ground Remedial Action, and Downgradient Wells.

Wells sampled in November 2011

Summary of Wells Sampled in the River Corridor Areas During November 2011						
Week	**100-BC**	**100-K**	**100-N**	**100-D/H**	**100-F**	**300 Area**
1-6 Nov11		199-K-153 199-K-154 199-K-163 199-K-148 199-K-146 199-K-130 199-K-145 199-K-144 199-K-166 199-K-152 199-K-147 199-K-165 199-K-161	199-N-64 199-N-106A 199-N-147			399-3-38 399-1-58
7-13 Nov 11		199-K-150 199-K-181 199-K-191 199-K-157 199-K-184 199-K-31 199-K-125A	199-N-165 199-N-75			
14-20 Nov 11		199-K-171 199-K-114A 199-K-113A 199-K-120A 199-K-127				
21-27 Nov 11						
28-30 Nov 11				199-H4-9 199-H4-12A 199-H4-8		

Attachment 2

December 8, 2011 Unit Manager's Meeting
Field Remediation Status

100-B/C

- Continued remediation efforts at 100-C-7 & 100-C-7:1
  - 100-C-7, 312,000 bank cubic meters removed, excavation depth 84 feet
  - 100-C-7:1, 545,000 bank cubic meters removed, excavation depth 75 feet

- Continued load-out activities
  - Truck and pup, 143,000 tons
  - ERDF cans, 60,101 tons
  - LDR material, 36,300 tons

- MSA continued engineering design for relocation of high voltage transmission line

100-D

- Initiated remediation of 100-D-50:2, 100-D-66 and 100-D-77
- Continued demolition, processing and load-out at 100-D-50:6, 100-D-100 and 100-D-104
- Continued preparation for anomaly processing final anomalies at 118-D-3
- Completed remediation of 100-D-65 and 100-D-66 below ordinary high water mark
- Completed backfill of 100-D-1, 100-D-7, 100-D-13, 100-D-15, 100-D-31:8, 100-D-31:10, 116-D-8, 116-D-10, 116-DR-10, 128-D-2, 130-D-1, 600-30, 628-3, and 116-DR-8 in accordance with Section 3.1.2 and Section H.6 of Appendix H of the 100 Area RDR (DOE/RL-96-17, Rev. 6)
- Completed revegetation of 100-D-1, 100-D-7, 100-D-13, 100-D-31:10, 116-D-8, 116-DR-10, 128-D-2, 600-30, and 628-3 in accordance with Appendix H of the 100 Area RDR (DOE/RL-96-17, Rev. 6)

100-F

- Began construction of ramp to allow deepening of excavation to chase plume at the south end of 100-F-57

100-H

- Continued excavation and stockpiling at 100-H-28:2
- Began demolition and load-out of 100-H excess trailers
- Continued miscellaneous restoration activities
- Continued backfill of 118-H-1:1 (30% complete) and 118-H-6:4 (60% complete, remainder to be backfilled with 132-H-3)

- Completed backfill at 118-H-1:1 and 118-H-6:4 in accordance with Section 3.1.2 and Section H.6 of Appendix H of the 100 Area RDR (DOE/RL-96-17, Rev. 6)
- Completed revegetation of 118-H-1:1/2, 118-H-3, and 118-H-5 in accordance with Appendix H of the 100 Area RDR (DOE/RL-96-17, Rev. 6)

100-K

- Continued final cleanup activities (removal of pad-in material/downposting/surveying/sampling/spot removal) at trenches I, J/L and N
- Performed GPERS surveys on the slopes of trench N as confirmation all debris removed
- Conducted mock-ups as preparation for shipment of SNF to 105-KW
- Continued orphan site cleanup work at 600-29

100-N

- Continued excavation and load-out at UPR-100-N-18, 100-N-60 and 100-N-63 and collocated waste sites (100-N-60, UPR-100-N-5, UPR-100-N-13, UPR-100-N-25 and UPR-100-N-26)
- Excavation and load-out completed for 100-N-26, UPR-100-N-19 and UPR-100-N-36

618-10 Trench Remediation

- Surveyed and moved drums from Interim Storage Area to Material Release Area
- Removed drums from North Trench (concrete) and South Trench (chips/oil)
- Continued development of the "in trench" bottle processing
- Readiness for Load-out activities
- Excavation slow due to encountering drums in all 3 excavation trenches

100-IU-2/6

Milestone Sites

- Began revegetation of 600-120
- 600-108, 600-109, 600-124, 600-127, 600-176, 600-178, 600-182, 600-188, 600-202, 600-205, 600-280 backfill and/or recon touring complete, awaiting revegetation.

- 600-186 (Hanford Construction Camp Septic and Pipelines) continued the closure process
- 600-186, 600-149:1 and 600-3 completed all closure documents
- 600-5, 600-100, 600-125, 600-146 backfilled and revegetated. All work completed.

Non-Milestone Sites

- Received cultural clearance for 600-299:2 and 600-320:7
- Waiting for completion of cultural review prior to remediation at the IU farmstead sites
- Waiting for completion of cultural review prior to remediation at the IU White bluffs sites

Attachment 3

162769

^WCH Document Control

From: Saueressig, Daniel G
Sent: Wednesday, November 30, 2011 3:31 PM
To: ^WCH Document Control
Subject: FW: 100-F-57 Plume Chase:

Please provide a chron number. This email documents a regulatory agreement.

Thanks,

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

-----Original Message-----
From: Guzzetti.Christopher@epamail.epa.gov [mailto:Guzzetti.Christopher@epamail.epa.gov]
Sent: Wednesday, November 30, 2011 11:06 AM
To: Jakubek, Joshua E
Cc: Post, Thomas C; Saueressig, Daniel G; Fancher, Jonathan D (Jon)
Subject: Re: 100-F-57 Plume Chase:

I concur.

Christopher J. Guzzetti
U.S. EPA Region 10
Hanford Project Office
Phone: (509) 376-9529
Fax: (509) 376-2396
Email: guzzetti.christopher@epa.gov

-----"Jakubek, Joshua E" <jejakube@wch-rcc.com> wrote: -----

==========
To: "Post, Thomas C" <thomas.post@rl.doe.gov>, Christopher Guzzetti/R10/USEPA/US@EPA
From: "Jakubek, Joshua E" <jejakube@wch-rcc.com>
Date: 11/30/2011 10:15AM
Cc: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>, "Fancher, Jonathan D (Jon)" <JDFANCHE@wch-rcc.com>
Subject: 100-F-57 Plume Chase:
==========

Gentlemen, concerning the plume chase at the south side of F-57; we had our structural engineer come out today to assess the structural integrity of the columns. He will be drafting up a document with his findings and required controls, which will come tomorrow sometime, but essentially it is safe to continue excavation up to the pillars with a 1.5 to 1 slope away. This should get us down to approximately the 30' deep mark which will hopefully take care of the plume. I will forward his e-mail to you once I get it. I know you both already gave us the nod to continue over the phone (with this structural contingency) but if you wouldn't mind, please reply to this e-mail with your concurrence. Thanks again!

Thanks,

Josh Jakubek
Washington Closure Hanford
Resident Engineer
509-942-4703

"Safety, Productivity & Quality Achieved by Integrity & Teamwork."

Attachment 4

162758

^WCH Document Control

From: Saueressig, Daniel G
Sent: Wednesday, November 30, 2011 10:18 AM
To: ^WCH Document Control
Subject: FW: 100-F AIR MONITORING PLAN

Please provide a chron number. This email documents a regulatory agreement.

Thanks,

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

-----Original Message-----
From: Post, Thomas C [mailto:thomas.post@RL.gov]
Sent: Wednesday, November 30, 2011 10:09 AM
To: 'Guzzetti.Christopher@epamail.epa.gov'; Saueressig, Daniel G
Cc: Fancher, Jonathan D (Jon); Jakubek, Joshua E
Subject: RE: 100-F AIR MONITORING PLAN

I also concur.

Tom Post

-----Original Message-----
From: Guzzetti.Christopher@epamail.epa.gov [mailto:Guzzetti.Christopher@epamail.epa.gov]
Sent: Wednesday, November 30, 2011 9:40 AM
To: Saueressig, Daniel G
Cc: Post, Thomas C; Fancher, Jonathan D (Jon); Jakubek, Joshua E
Subject: Re: 100-F AIR MONITORING PLAN

I concur.

Christopher J. Guzzetti
U.S. EPA Region 10
Hanford Project Office
Phone: (509) 376-9529
Fax: (509) 376-2396
Email: guzzetti.christopher@epa.gov

-----"Saueressig, Daniel G" <dgsauere@wch-rcc.com> wrote: -----

==========
To: Christopher Guzzetti/R10/USEPA/US@EPA, "Post, Thomas C" <thomas.post@rl.doe.gov>
From: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>
Date: 11/29/2011 02:48PM
Cc: "Fancher, Jonathan D (Jon)" <JDFANCHE@wch-rcc.com>, "Jakubek, Joshua E" <jejakube@wch-rcc.com>
Subject: 100-F AIR MONITORING PLAN
==========

Chris/Tom, we've finished remediation of all radioactively contaminated sites at 100-F, I believe backfill concurrence has been received for all the radioactively contaminated sites in the air monitoring plan.
100-F-64 is the only site that hasn't received backfill concurrence, however, it was mistakenly added to the air monitoring plan, radionuclides are not considered a COPC for this site and were not included in the Verification Work Instructions just recently approved.
With that said, I'd like to discontinue running the perimeter air monitors. Let me know if you concur and I'll document the agreement at the next UMM.

Thanks,

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

Attachment 5

162836

^WCH Document Control

From: Saueressig, Daniel G
Sent: Wednesday, December 07, 2011 11:07 AM
To: ^WCH Document Control
Subject: FW: NaK Approval

Please provide a chron number. This email documents a regulatory agreement.

Thanks,

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

From: Menard, Nina (ECY) [mailto:nmen461@ECY.WA.GOV]
Sent: Wednesday, December 07, 2011 9:16 AM
To: French, Mark S
Cc: Saueressig, Daniel G; Boyd, Alicia; Varljen, Robin; Kapell, Arthur (ECY)
Subject: NaK Approval

The Department of Ecology offers conditional acceptance of the Treatment Plan for 100-D Burial Grounds NaK based on compliance with ARARs described in Action Specific ARARs section 2.1.6.2 of the 100 Area RDRRAWP (DOE/RL-96-17 Rev. 6), specifically those described in WAC 173-303-140 Land Disposal Restriction. In addition DOH's has offered conditional acceptance of the Treatment Plan for 100-D Burial Grounds NaK based on compliance with ARARs described Chemical Specific ARARs section 2.1.6.1 of the 100 Area RDRRAWP (DOE/RL-96-17 Rev. 6), specifically those described in WAC 246-247 regulating radiation protection-air emission.

Nina M. Menard
Environmental Restoration
WA Dept. of Ecology
509-372-7941 Office
509-420-6839 Cell

TREATMENT PLAN FOR 100-D BURIAL GROUNDS NaK

1.0 INTRODUCTION

During remediation of the 100-D/100-DR burial grounds, numerous pieces of suspect spent nuclear fuel (SSNF) were identified and segregated. These items were segregated from the other waste streams until they could be fully characterized to determine if they were indeed spent nuclear fuel (SNF). The process of characterizing these items included collecting gamma spectrum information (In Situ Object Counting System) for each, determining mass, collecting dimensional information, performing detailed videography for visual inspections, and recording any unique identifiers (e.g., serial numbers). This collection of data was then compared to known SNF reference material, including comparison of serial numbers when available, to confirm if the suspect item was actually SNF. Once this evaluation was completed, confirmed SNF was segregated from test specimens that were determined not to be SNF for shipment to the SNF storage facility at 105-KW.

2.0 BACKGROUND

During the course of this characterization process, two discrete test specimens were identified. The unique identifiers assigned to each of these specimens by Washington Closure Hanford (WCH) are 118D3-SSNF-018 and 118D3-SSNF-026. These test specimens were part of a series of experiments during 100-DR Reactor operations to help determine the failure mechanism of zircaloy-2 clad fuel elements. Survey results identified low levels of removable contamination on the exterior surfaces of the test specimens. The design of the test specimens consists of uranium capsule(s) (1.47% enriched by weight in 018 and 1.60% enriched by weight for 026) centered in a tube with a small annular space around the capsules and an "expansion chamber" at one end. The annular space was filled with a eutectic alloy of sodium and potassium commonly referred to as NaK. The purpose of the expansion chamber was to allow the NaK to expand when heated without pressurizing the test assembly to the point of failure. To ensure the inner uranium capsules were evenly heated, NaK was used as heat transfer material in these test specimens.

Both test specimens, 018 and 026 (Figures 1 and 2, respectively), are similar in design but with unique characteristics. The design differences were to capture different variables for the same objective, the determination of cladding failure mechanisms. Each specimen is expected to contain between 10 and 16 cc of NaK, based on historical documentation (see HW-67264 and HW-63513 for additional specifications on the design for each specimen).

NaK, because it is a eutectic alloy, remains liquid at room temperature. It is a pyrophoric material that is highly water reactive and can form potassium oxides (K2O) or super oxides, (KO)2, when contacted by air. The super oxides can become shock sensitive when combined with organics.

Offsite treatment for these two test specimens was investigated but not available due to the combination of radioactive material and reactive material, NaK.

3.0 TREATMENT PROCESS

The processing area will be set up to minimize the spread of contamination and the release of airborne radioactivity from the work area. The work will be performed within a high-efficiency particulate air- (HEPA-) ventilated enclosure that is operated under negative pressure. The ventilated enclosure is being used in conjunction with separate containments set up within the enclosure where the NaK deactivation and test specimen disassembly work will be performed. During this NaK treatment and disassembly process, secondary containment will be provided for items containing liquid waste to prevent a spill of potentially contaminated material to the environment.

The NaK deactivation process takes place in the containment vessel that has a vacuum system, which, by design, will provide negative air flow inside the vessel when it is opened to remove the test specimens after drilling.

The test specimen disassembly is conducted in a NaK disassembly system (NDS) within a containment that is designed to create an inert atmosphere for the test specimens during the disassembly process. Nitrogen is introduced to inert the NDS containment atmosphere, and the containment is ventilated through a HEPA-filtered exhauster located inside the HEPA-ventilated enclosure.

Only one test specimen will be processed at a time, and on different days.

3.1 NaK DEACTIVATION

Each of the two specimens will be subjected to a NaK deactivation process in a type of containment vessel known as the Valkyr Mark III (Figure 3). The Mark III vessel is a schedule 40 carbon-steel 6-in. pipe that is 24 in. long with a class 150 door closure mechanism built to American Society of Mechanical Engineers (ASME) standards. The Mark III door closure is rated for 320 psig at 250 °F. The Mark III design has been used for years to process small (lecture bottle) compressed gas cylinders. The specimen is inserted inside the Mark III and the door sealed.

The basic process is to remotely drill a hole through the expansion chamber (from top through bottom) after inerting the atmosphere inside the Mark III with nitrogen, then inject steam into the Mark III to convert the NaK into sodium/potassium hydroxide, thus eliminating the reactive nature of the NaK. By drilling the hole completely through the test specimen on the opposite end from the zircaloy-clad uranium pieces, it eliminates the possibility of condensed steam pooling in the expansion chamber. The process is as follows:

1. Air is purged from the Mark III interior and replaced with an inert gas, the Mark III is heated to approximately 250 °F to minimize steam condensation, and the drill activated. For this

project, the drilling will be done remotely. The progress of the drill will be viewed by an infrared camera and a remotely positioned monitor.

2. Once the test specimen has been penetrated steam is injected into the Mark III. Use of steam has been demonstrated by the alkali metal industry to be one of the safest and most thorough methods of NaK deactivation. A valve on the steam generator is opened and steam allowed to flow into the Mark III and, subsequently, into the specimen through the drilled hole. A series of vessel evacuations followed by steam injections are conducted to complete the NaK deactivation process. Note that both vessel temperature and pressure will be remotely monitored. NaK reacts quickly and completely with steam to form both sodium and potassium hydroxide. The immediate evolution of hydrogen is anticipated. The temperature and pressure are controlled through remote valve operation. The pressure will not be allowed to exceed 25 psig, and the maximum temperature allowed is 250 °F.

3. A condensate collection vessel between the venturi scrubber and the Mark III will be used to capture condensed steam and reacted material from the Mark III. A venturi scrubber will be used to evacuate the Mark III to sub-atmospheric pressure for the purpose of removing both steam and hydrogen from the Mark III. A venturi scrubber is a liquid-phase scrubber that recirculates reagent, in this case water, through a venturi, thus inducing a vacuum. This vacuum provides the motive force to move the steam and hydrogen through the condensate collection vessel, which is sparged through a dip tube submerged in water. The water in both the condensate collection vessel and the venturi scrubber serves two purposes, to help cool the steam that is evacuated and to trap or entrain any particles that may be carried by the condensate or steam. The hydrogen and nitrogen are then released to the atmosphere inside the ventilated enclosure. There are no emissions of reacted material, sodium, or potassium hydroxide because they are captured in either the condensate collection vessel or the venturi. The temperature of the air leaving the venturi will be monitored to ensure any material coming from the venturi will not impact the ducting or HEPA filtered exhausters.

4. After the Mark III's initial purge with steam and subsequent evacuation, the vessel will again be isolated and steam injected. Pressure will be allowed to build in an effort to force steam into the area between the capsules and the container wall. Operators will monitor vessel pressure and open the vessel outlet valve to allow the scrubber to remove the contained atmosphere. It is anticipated that this process will be repeated at least three times or more as required until no further pressure buildup is observed on system pressure sensors. The lack of pressure increase after processing, as described above, is a clear indication no unreacted NaK remains.

3.2 TEST SPECIMEN DISASSEMBLY

After the NaK deactivation process is complete, the test specimen will be transferred from the Mark III to the NDS. The NDS consists of a remotely operated lathe designed to make multiple circumferential cuts along the outer shell of the NaK test specimen to support separation of the uranium capsule from the test specimen outer casing. Each cut is restricted to a specific cutting depth to maintain the integrity of the uranium capsule. Upon completion of circumferential cutting, the test specimen outer casing is removed. During the cutting and separation process, the test specimen will be sprayed with an atomized water mist to neutralize any remaining NaK, if present.

The remotely operated lathe operations will take place inside a polycarbonate containment structure that is 72 in. long by 36 in. wide by 32 in. high and inerted with nitrogen. Exhaust from the NDS containment is recirculated through a HEPA-filtered exhauster located inside the HEPA-ventilated enclosure. Nitrogen will also be used as a cooling/purge gas for the lathe cutting blade. Progress of the cutting process will be viewed by a camera and remotely positioned monitor.

Continuous monitoring of oxygen levels within the NDS containment will be conducted. A digital display indicating current oxygen levels will be observed by the control operator using a closed circuit monitor. Oxygen levels during operations will be maintained below 10%.

4.0 TREATMENT OBJECTIVES

The NaK is treated to meet the treatment standards for D001, Ignitable Characteristic Wastes, and D003, Water Reactive Subcategory. It will be treated to meet the land disposal restriction (LDR) standard of deactivation to remove the hazardous characteristic (DEACT) and meet 40 *Code of Federal Regulations* (CFR) 268.48 standards. As the NaK consists solely of potassium and sodium, there are no underlying hazardous constituents (UHCs) to address. There will be no sampling and analysis to confirm these treatment standards have been met as the treatment standards are simply deactivation of the hazard. This treatment process, as described above, will produce a very dilute aqueous stream including small amounts of sodium-hydroxide and potassium-hydroxide.

After treatment is complete for both specimens, the liquid waste will be sampled and analyzed per the *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan* (DOE/RL-2001-35) to quantify radiological components, measure the pH (estimated to be <12.5), and determine the concentration of metals. The results of the analysis will dictate the disposal path of wastes generated.

A small amount of hydrogen gas will be vented to the atmosphere inside the ventilated enclosure during the treatment process (<0.25 moles for each test specimen containing NaK). If the pH of the aqueous stream generated is D002 (≤2 or ≥12.5), it will need to meet the treatment standard of DEACT and meet 40 CFR 268.48. Again, there are no UHCs. Treatment of the aqueous stream may be done by the generator, in which case DEACT will be accomplished through elementary neutralization using nitric acid, sulfuric acid, or hydrochloric acid. Once the pH is <12.5, the waste will be stabilized in concrete or absorbed using a nonbiodegradable polyacrylate absorbent. Alternatively, the aqueous stream may be sent to Permafix for treatment through a lead regulatory agency-approved *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* offsite determination in accordance with the *Remedial Design Report/Removal Action Work Plan for the 100 Area* (DOE/RL-96-17).

If the aqueous stream contains metals above regulated levels (WAC 173-303-090 or 40 CFR 268.48), it will be treated via stabilization in concrete or sent to Permafix for treatment.

Secondary wastes, which likely will include processing components from the Mark III and downstream, will be managed based on sampling results of the liquid. Scaling factors may be used to more accurately reflect field radiological survey results and/or potential residues remaining.

5.0 WASTE DISPOSAL

The uranium capsules will be sent to the Central Waste Complex in the 200 West Area of the Hanford Site for storage and ultimately to the Waste Isolation Pilot Plant for disposal.
The treated secondary waste will be shipped to the Environmental Restoration Disposal Facility (ERDF) for disposal. This material will be loaded into an ERDF container in accordance with procedures for the normal loadout of waste from the burial grounds. The treated waste form will meet all requirements of the ERDF waste acceptance criteria (WCH-191).

6.0 BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY

A discussion of the best available radionuclide control technology for the NaK treatment project is included in Appendix A.

7.0 AIR MONITORING

Monitoring activities consist of operating four near-facility monitoring stations upwind and downwind of the 100-D/DR Area, as described in the "Air Monitoring Plan for the 100-D/DR Area Remaining Site and Burial Grounds Remedial Action" (WCH 2010).

A low-volume air sampler will be located within the ventilated enclosure and at the outlet of the ventilated enclosure. Boundary low-volume air samplers will also be located downwind from the ventilated enclosure. Air sampling will be performed when work activities are being conducted within the ventilated enclosure. The air samples will be field counted for gross alpha and gross beta/gamma. If air sample results exceed 0.1 TDAC (based on strontium-90, 7E-09 µC/mL and thorium-232, 3E-12 µCi/mL), then the samples will be sent to the Radiological Counting Facility for gamma energy analysis, alpha energy analysis, and gross alpha and gross beta/gamma analysis.

In addition, as described in the air monitoring plan, potential release locations on the ventilated enclosure, such as the ductwork and seams, will be surveyed on a routine basis for potential radionuclide releases and the results recorded (e.g., post-survey results negative). Any positive survey results will require appropriate maintenance on the equipment prior to further processing of the test specimens as described in this plan. In addition, work progress contamination surveys and dose rate monitoring will be performed within the ventilated enclosure to ensure that contamination levels are within the radiological control requirements.

8.0 REFERENCES

40 CFR 268, "Universal Treatment Standards," *Code of Federal Regulations*, as amended.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq.

DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6, U.S. Department of Energy, Richland, Operations Office, Richland, Washington.

DOE/RL-2001-35, 2001, *100 Area Burial Grounds Remedial Action Sampling and Analysis Plan*, Rev. 0, U.S. Department of Energy, Richland, Operations Office, Richland, Washington.

HW-63513, 1960, *Final Report: Temperature Measurement of Uranium Swelling Capsule PT-IP-200-A*, General Electric, Hanford Atomic Products Operation, Richland, Washington.

HW-67264, 1960, *Proposal for the irradiation of Cladding Studies Capsules*, General Electric, Hanford Atomic Products Operation, Richland, Washington.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code,* as amended.

WCH, 2010, "Air Monitoring Plan for the 100-D/DR Area Remaining Sites and Burial Grounds Remedial Action," CCN 157902, Washington Closure Hanford, Richland, Washington

WCH-191, 2010, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, Rev. 2, Washington Closure Hanford, Richland, Washington

Figure 1. Typical Design for Test Specimen 118D3-SSNF-018.

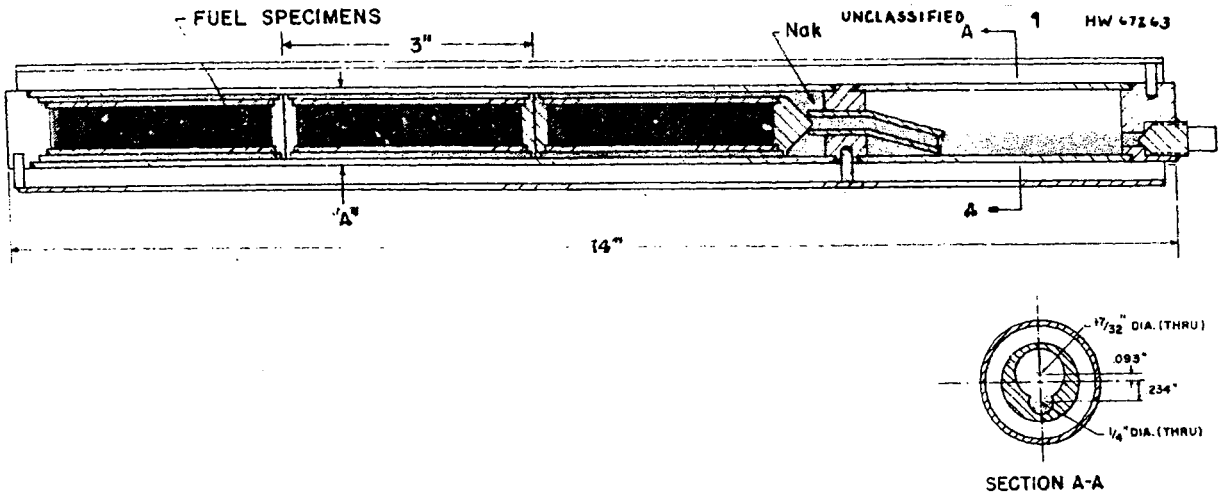


Figure 2. Typical Design for Test Specimen 118D3-SSNF-026.

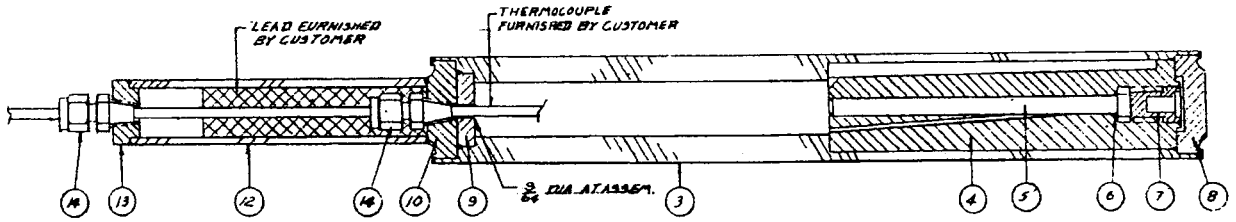
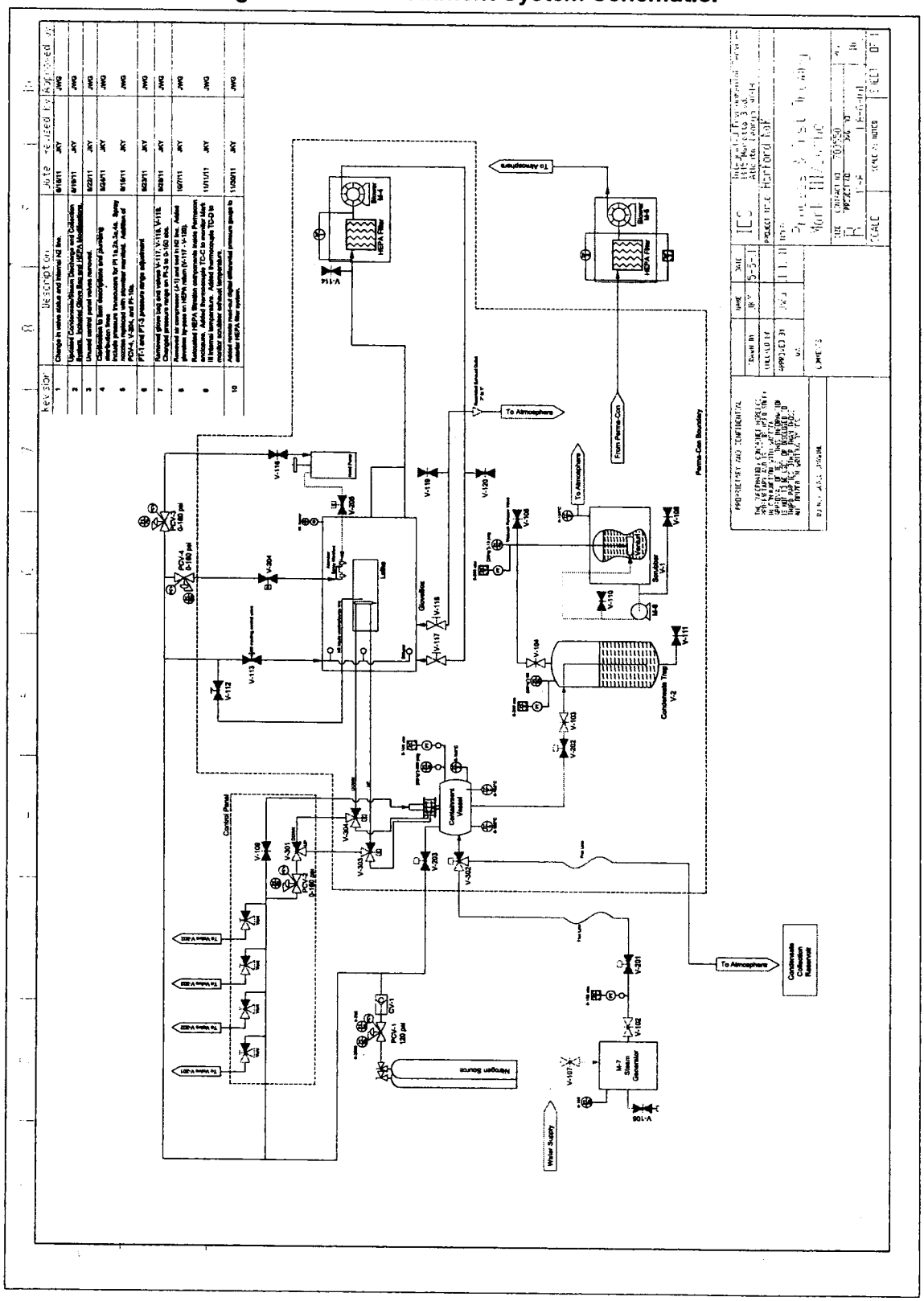


Figure 3. NaK Treatment System Schematic.



APPROVALS

Nina Menard, Project Manager, Washington State Department of Ecology — Date: 12/8/11

Mark French, DOE Federal Project Director — Date: 12/8/11

APPENDIX A

BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY

1.0 SUMMARY OF BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY DEMONSTRATION

A best available radionuclide control technology (BARCT) demonstration is used to choose control technologies for the mitigation of emissions of radioactive material from new emission units or significant modifications to emission units. The bases for the BARCT demonstration requirements are the BARCT standard given in *Washington Administrative Code* (WAC) 246-247-040, and the definition of BARCT given in WAC 246-247-030. This procedure incorporates certain implementing criteria that enable the department to evaluate a facility's compliance with the BARCT standard (WAC 246-247-120).

The BARCT demonstration includes the abatement technology and indication devices that demonstrate the effectiveness of the abatement technology from entry of radionuclides into the ventilated vapor space to release to the environment. The applicant shall evaluate all available control technologies that can reduce the level of radionuclide emissions (WAC 246-247-120).

Technology Standards. The BARCT demonstration and the emission unit design and construction must meet, as applicable, the technology standards listed below if the unit's potential-to-emit (PTE) exceeds 0.1 mrem/yr total effective dose equivalent (TEDE) to the maximally exposed individual (MEI). If the PTE is below this value, the standards must be met only to the extent justified by a cost/benefit evaluation (WAC 246-247-120).

- ASME/ANSI AG-1, *Code on Nuclear Air and Gas Treatment* (where there are conflicts in standards with the other listed references, this standard shall take precedence)
- ASME/ANSI N509, *Nuclear Power Plant Air-Cleaning Units and Components*
- ASME/ANSI N510, *Testing of Nuclear Air Treatment Systems*
- ANSI/ASME NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities*
- 40 CFR 60, Appendix A, Methods 1, 1A, 2, 2A, 2C, 2D, 4, 5, and 17
- ANSI/HPS N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities.*

The following standards and references are recommended as guidance only:

- ANSI/ASME NQA-2, *Quality Assurance Requirements for Nuclear Facilities*
- ANSI N42.18, *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents*
- ERDA 76-21, *Nuclear Air Cleaning Handbook*
- ACGIH 1988, *Industrial Ventilation, A Manual of Recommended Practice*, 20th ed., American Conference of Governmental Industrial Hygienists.

Part of the BARCT demonstration process includes defining facility physical and chemical processes. Included are the potential radionuclide release rates (by isotope, in units of curies per year), process variables (such as flow rate, temperature, humidity, chemical composition), and other technical considerations. The radionuclide release rates are based on the PTE (WAC 246-247-120).

2.0 RADIONUCLIDE PHYSICAL/CHEMICAL FORM, RELEASE RATES, FORM, AND POTENTIAL-TO-EMIT

Radionuclides selected for consideration in the BARCT demonstration shall include those that contribute more than 10% of the potential TEDE to the MEI or more than 0.1 mrem/yr and any others that the department determines are necessary (WAC 246-247-120).

The radionuclide release rates in curies per year and the PTE for an offsite MEI for the NaK treatment process are documented in Calculation No. 0100D-CA-V0427, *Total Effective Dose Equivalent for the Treatment of NaK-Filled Specimens in the 100-D Area*, and shown in Table A-1. The radionuclide release rates in curies per year and the PTE, for a potential river receptor for the NaK treatment process, are documented in Calculation No. 0100D-CA-V0431, *Total Effective Dose Equivalent for the Treatment of NaK-Filled Specimens in the 100-D Area (River)*, and shown in Table A-2. As documented in these calculations five radionuclides (Pu-238, Pu-239, Pu-240, Pu-241, and Am-241) are anticipated to account for more than 99% of the dose drivers based on N Reactor Mark IV fuel (HNF-SD-SNF-TI-058, *A Discussion of the Methodology for Calculating Radiological and Toxicological Consequences for the Spent Nuclear Fuel Project at the Hanford Site*). The only other radionuclides of significance are Sr-90 and Cs-137. Only the five radionuclides that are the dose drivers, uranium, Sr-90, and Cs-137, are included in the calculation. Uranium, Sr-90, and Cs-137 were included in the inventory for completeness only; they are not the dose drivers and contribute less than 10% of the potential dose. Two isotopes, Na-24 and K-42, were produced during exposure of NaK to the reactor neutron flux, but both have half-lives less than 24 hours and both decay to stable products; therefore, they are not included in the inventory.

It is assumed that 100% of the calculated radionuclide inventory is available for release and release fractions are applied as follows:

- A release fraction of 1E-06 is applied to 95% of the radionuclide inventory as the test specimens are considered to be a solid, except for Cs-137. The test specimens have not been exposed to air, and oxides (particulates) would not have formed. The test specimens would not be friable based on the known exposures associated with the production tests.

- A release fraction of 1E-03 for particulates is applied to 5% of the radionuclide inventory to be conservative.

- A release fraction of 1E-03 is applied to 100% of the Cs-137 inventory in the test specimen as the Mark III will be heated to ~250 °F, which is above the melting point for this radionuclide. This temperature is well below the melting point for all other radionuclides and an order of magnitude below the boiling point of all radionuclides. This is a very conservative assumption as the test specimens are a solid, and all of the Cs-137 would have to migrate out of the test specimen. The condensed steam and reacted materials

are evacuated from the Mark III and collected in a condensate tank followed by a venturi scrubber. The water in both the condensate collection vessel and the venturi scrubber serves to cool the evacuated materials. It is likely that if any of the Cs-137 melted and migrated out of the test specimen, it would be in the form of entrained liquid droplets that would remain either in the condensate trap or venturi scrubber.

- A release fraction of 1E-03 for particulates is applied to all of the removable contamination that is present on the outside of the test specimens. All of the alpha activity is assumed to be Am-241 and all the beta/gamma activity is assumed to be Sr-90 and daughter product Y-90.

The assumptions concerning the release fractions for the inventory in the test specimens are based on previous tests and studies conducted on the Hanford Site in the 1950s and 1960s. These previous experiments are applicable to the proposed NaK treatment process for the following reasons:

- Capsules used in experiments are similar in design to specimens found at the 100-D Area.
- NaK/water reaction used in experiments is more energetic than the NaK/steam reaction.
- Maximum measured temperature in proximity to NaK/water reaction site of 400 °C is significantly below the 1200 °C peak cladding temperature limit criterion in 10 CFR 50 to prevent runaway oxidation in a loss of coolant accident.
- Oxidation studies have shown that stainless steel (used in capsule failure experiments) behaves similarly to zircaloy below 800 °C.

Two series of tests were completed to determine (1) safe methods for processing NaK-containing fuels in the nonproduction fuel (NPF) processing program and (2) the characteristics and consequences of a NaK-filled capsule failure within a reactor process tube. The specimens found at the 100-D Area are believed to be irradiated capsules similar in design to the capsules tested in the second program. Testing of the NaK-water reaction in the first program (HW-66562) was performed by hack sawing through capsules containing NaK that were in a shallow water bath in a submerged hood. Twenty capsules containing a 1.5-in.-long by 0.425-in.-diameter U-Mo fuel slug clad in stainless steel were cut in final prototype tests as part of this program. Inspection of the slugs after cutting showed that the reaction had no visible affect on the U-Mo material, which supports the conclusion that the test specimens are a solid with a release fraction of 1E-06. The dimensions of these fuel slugs are very similar to those of the slugs believed to be present in the 100-D specimens. Testing of the NaK-water reaction in the second program (HW-56588, HW-67721, HW-67717) was performed by perforating the NaK-containing chamber and allowing the NaK to react with water in a reactor process tube. This program demonstrated that an explosion was not a concern for NaK/water reactions after a capsule failure and that temperatures adjacent to the reaction point did not exceed 400 °C (≈750 °F). This supports the conclusion the NaK treatment process will not exceed temperatures above the melting point for any radionuclide other than Cs-137, and will not exceed temperatures that would result in the emission of radionuclides as a gas.

DUN-3955, *Fission Product Release Rate from Aluminum Clad Uranium Fuel*, presents the data and some conclusions from initial tests on fission product release rates from irradiated fuel heated to temperatures of about 1000 °C. Three of these tests provide data on the range of

releases expected for cesium for metallic uranium fuel that does not melt. The total percentage of cesium released during heating from about 650 °C to goal temperature of about 1000 °C, holding at goal temperature for 10 to 20 minutes and subsequent cool down averaged 0.021% (2.1E-04). The percentage of cesium released during heating from 650 °C to goal temperature ranged from 0.00008% to 0.008% (8E-07 to 8E-05). The average cesium release during this heating period to goal temperature was about 0.003% (3E-05). Based on this test data the assumption of 1E-03 for Cs-137 assumed for the NaK treatment process is conservative as the Mark III will be heated to ~250 °F.

The potential total unabated effective dose equivalent (TEDE) to an offsite MEI, assumed to be located at 10,114 m west-northwest at the site boundary, is estimated to be 3.3E-05 mrem/yr (0100D-CA-V0427) (Table A-1). The potential TEDE to a potential river receptor is 7.95E-04 mrem/yr (0100D-CA-V0431) (Table A-2). Since this PTE is less than 0.1 mrem/yr, the technology standards identified above must be met only to the extent justified by a cost/benefit evaluation. The following section addresses the cost/benefit evaluation requirement. The abated offsite MEI and river receptor doses are 3.3E-07 mrem/yr and 7.95E-06, respectively, based on the adjust factor to emissions for high-efficiency particulate air (HEPA) filters from 40 CFR 61, Appendix D.

3.0 COST/BENEFIT EVALUATION

The cost/benefit evaluation follows the methodology used for the Tanker Truck Notice of Construction (NOC) as documented in correspondence from the U.S. Department of Energy, Richland Operations Office (DOE-RL) to the Washington State Department of Health (WDOH) (05-AMCP-0041).

The cost for a system to exhaust the NaK containment structure that meets the technology standards listed above, is compared to: "...the most commonly used value in the U.S. is $1,000 per person-rem" (DOE/EV/1830-T5 as referenced in WAC 246-247-130). Accounting for inflation, $1,000 in 1980 would be equivalent to ~$2750 in 2011. If the cost is above $2,750 per person-rem, then generally the dose reductions are not considered cost beneficial.

(Cost escalation from U.S. Bureau of Labor Statistics:
http://www.bls.gov/data/inflation_calculator.htm)

The WDOH recently approved, via AIR 11-913, two stages of HEPA filtration as BARCT for particulate radionuclide emissions from newly constructed units required to meet the technology standards listed above as documented in DOE/RL-2001-57, *Radioactive Air Emissions Notice of Construction for the Transuranic Waste Retrieval Project*. The cost for the next generation retrieval exhauster approved by AIR 11-913 is $211,100 (Table A-3) and is used in the following cost/benefit analysis.

3.1 COST/BENEFIT EVALUATION FOR A RECEPTOR LOCATED AT THE RIVER

The following is the calculated cost/benefit evaluation based on a dose to potential receptors at the Columbia River.

Person-rem:

Estimated dose of 7.95E-04 mrem/yr (100D-CA-V0427) to river receptor / 1000 = 7.95E-07 rem/yr

7.95E-07 rem/yr x 450 fishermen on the river = 3.58E-04 person rem/yr

NOTE: The number of fishermen on the river is based on U.S. Fish and Wildlife information concerning peak use during peak fall salmon fishing season.

NOTE: Tank Truck NOC cost/benefit analysis reduced this number by a factor of 100 as ON AVERAGE population receives 1% of the MEI dose. That factor was not applied here.

Cost per person-rem reduced:

Cost of compliant exhauster system $211,100/3.58E-04 person rem/yr = $589,664,805 per person-rem reduced. This value is above the $2,750 per person-rem benefit; therefore, a system that meets all of the technology standards is not proposed for the NaK treatment process.

3.2 COST/BENEFIT EVALUATION FOR THE OFFSITE MEI

Person-rem:

Estimated dose of 3.30E-05 mrem/yr (0100D-CA-V0431) to the offsite MEI / 1000 = 3.30E-08 rem/yr

3.30E-08 rem/yr x 482,000 population (RL 2009) = 1.59E-02 person rem/yr

NOTE: Tank Truck NOC cost/benefit analysis reduced this number by a factor of 100 as ON AVERAGE population receives 1% of the MEI dose. That factor was not applied here.

Cost per person-rem reduced:

Cost of compliant exhauster system $211,100/1.59E-02 person rem/yr = $113,276,730 per person rem reduced. This value is above the $2,750 per person-rem benefit; therefore, a system that meets all of the technology standards is not proposed for the NaK treatment process.

4.0 PROPOSED BARCT

The planned activities will be conducted in a ventilated enclosure that is operated under negative pressure with HEPA filtration. As discussed above, HEPA filtration has been approved by WDOH as BARCT for radionuclide particulate emissions as recently as September 2011. There is only one exhaust point for the ventilated enclosure, which is through a HEPA-filtered exhauster that is considered BARCT for this project.

The enclosure is a 12-ft by 12-ft by 12-ft metal structure with a window that has been designed and engineered specifically for radiological controlled operations. This type of structure has been used on the Hanford Site and for projects in other parts of the country involving radiological material.

ASME/ANSI AG-1

The exhauster that is proposed for use is an OmniAire 600V, certified to ANSI Z9.2-2006. The HEPA filter does not meet the American Standard Mechanical Engineer/American National Standard Institute AG-1, Section FC. This section of the code provides minimum requirements for the performance, design, construction, acceptance testing, and quality assurance for HEPA filters used in nuclear safety related air or gas treatment systems in nuclear facilities. The HEPA filter used in the OmniAire 600V meets industry standards for asbestos work. HEPA filters that meet asbestos standards are required to remove 99.97% of 0.3 micron monodispersed particles, which is equivalent to the nuclear-grade HEPA filter standards. These types of exhaust units are commonly used on the Hanford Site for control of radionuclides in environments where the PTE is less than 0.1 mrem/yr, such as for the NaK treatment process. The OmniAire 600V HEPA filter is certified to remove 99.99% of 0.3 micron monodispersed particles, which is a greater efficiency than the nuclear-grade HEPA filter standards. The as installed OmniAire 600V HEPA filter was also tested on the Hanford Site and was found to remove >99.95% of 0.7 monodispersed particles with an average flow rate of 291 cfm.

The ducting that is connected to the exhauster and ventilated enclosure is composed of polyvinyl chloride (PVC) and is rated for 2 in. Hg (vacuum), and is deemed to be compatible with the flow rates and materials being handled in the ventilated enclosure. There is no chemical incompatibility with this ducting, no physical hazard to the ducting from the material anticipated to pass through the ducting, and there are no flammable liquids used in the operation. While this ducting is deemed to be adequate for the proposed work, it does not meet the AG-1 standards.

While the asbestos standards do not require compliance with radiation resistance and fire resistance found in nuclear-grade HEPA filters and ducting, the HEPA filters and ducting for this project will not be subjected to extremes of radiation or temperature. Dose rates and temperature will be continuously monitored during process activities as discussed below.

The dose rates will be monitored utilizing two MGPI DMC2000S Electronic Dosimeters with one located near the Mark III and the other near the NDS containment. The dose rate readings will be transmitted to a remote digital readout location, outside of the ventilated enclosure that houses the Mark III and NDS containment. Remote real-time dose rate monitoring will provide early indications of changes in dose rates in the work area and associated processing equipment, to verify that the HEPA filters and ducting were not exposed to extremes

of radiation. The DMC2000S electronic dosimeters monitor gamma and X-ray radiation with energies from 60 keV to 6 MeV with a dose rate measurement range from 1 mrem/hr to 100 rem/hr.

The temperature and moisture content of the treatment system exhaust will be inconsequential relative to the volume of ambient air flowing through the ventilation system. However, the temperature of the air exhausted from the venturi scrubber and the temperature inside of the Mark III chamber will be monitored continuously during NaK deactivation. Temperature readings will be transmitted to a remote digital readout location at the control operation station, outside of the ventilated enclosure that houses the Mark III chamber and containment control system (CCS).

Differential pressure (DP) gauges are mounted in both of the exhausters and monitor the operation of the HEPA filters. In addition, a DP gauge manufactured by Dwyer and calibrated to NIST with a measurable range of 0.00 to 20.008 in. water column (W.C.), with an accuracy of 0.5% will be located on the inlet and outlet stream of the OmniAire 600V HEPA filter. Both DP gauges are used to monitor the pressure drop across the HEPA filter in OmniAire 600V. The pressure drop is continuously monitored, and the readings are transmitted to a remote digital readout location at the control operation station, outside of the ventilated enclosure that houses the Mark III chamber and NDS containment.

The disassembly of the treated test specimens is conducted in the NDS containment that is exhausted to a separate HEPA-filtered Mini Force II exhauster located inside the HEPA-ventilated 12-ft by 12-ft by 12-ft enclosure. It does not ventilate to the environment. The discussion above for the OmniAire 600V applies to the Mini Force II. The as-installed Mini Force II HEPA filter was also tested on the Hanford Site and was found to remove >99.95% of 0.7 monodispersed particles with an average flow rate of 209 cfm.

ASME/ANSI N509 and N510

The HEPA filters do not comply with ASME/ANSI N509 and N510. However, the HEPA filters are tested in-place to demonstrate they meet the performance requirements of ANSI/ASME N510 with a DOE-approved challenge aerosol. The test in these procedures determines aerosol penetration as a result of leakage through or around the filter unit due to faulty installation, defect in the filter unit mounting frame and housing, or defects and/or damage to the individual filter units. Although these procedures are not strictly N510 tests, the procedures are used throughout the Hanford Site and are proposed as adequate to demonstrate the HEPA filtration system is operating properly and meets the intent of N510. Hence, it is proposed that adherence to these procedures adequately demonstrates that the HEPA filtration systems are operating properly and is compatible with the standard. The HEPA filters installed in the exhaust units have been efficiency tested at the Hanford Site to demonstrate a minimum efficiency of 99.95% for removal of test aerosol with a minimum median diameter of 0.7 microns.

ANSI/ASME NQA-1

The exhaust system was not procured from an NQA-1 supplier.

As described in Section 7.0, air monitoring will be conducted during the NaK treatment process. The near-facility air monitor samples are collected and analyzed in accordance with the site-

wide environmental monitoring program and quality assurance requirements are addressed in MSC-2333 (latest revision). In addition, low-volume air sampling will be conducted in the ventilated enclosure, at the exhaust outlet and at the boundary of the work location. Smears and surveys will be taken, and dose rates will be monitored. Quality assurance for these activities is addressed in ENV-1, *Environmental Monitoring & Management*, ENV-1-1.15, "Quality Assurance Project Plan for Radiological Air Emissions Monitoring."

ANSI N13.1 1999

There is no sampling system on the OmniAire 600V. The PTE is less than 0.1 mrem/yr; therefore, the sampling criteria in ANSI N13.1 are not applicable. The methods discussed in Section 7.0 of this NaK treatment plan will be used to provide periodic confirmatory measurements of low emissions.

40 CFR 60, Appendix A Test Methods 1, 1A, 2, 2A, 2C, 2D and 4

The OmniAire 600V does not have a stack that can be tested using 40 CFR 60 Appendix A methods. Therefore, these methods are not applicable. Instead, air flow measurements are incorporated into the HEPA filter test procedures referred to previously addressing ASME/ANSI N510.

5.0 REFERENCES

05-AMCP-0041, 2004, "Supplemental Information to DOE/RL-2002-56, Rev 1, Radioactive Air Emissions Notice of Construction for Tanker Truck Loading of Radioactively-Contaminated Wastewater," to A. W. Conklin, Washington State Department of Health, from K. A. Klein, U.S. Department of Energy, Richland Operations, Richland, Washington, November 24.

0100D-CA-V0427, 2011, *Total Effective Dose Equivalent for the Treatment of NaK-Filled Specimens in the 100-D Area,* Rev. 1, Washington Closure Hanford, Richland, Washington.

0100D-CA-V0431, 2011, *Total Effective Dose Equivalent for the Treatment of NaK-Filled Specimens in the 100-D Area (River),* Rev. 0, Washington Closure Hanford, Richland, Washington.

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities," *Code of Federal Regulations*, as amended.

40 CFR 60, "Standard of Performance for New Stationary Sources," *Code of Federal Regulations*, as amended.

ACGIH 1988, *Industrial Ventilation, A Manual of Recommended Practice*, 20th ed., American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio.

AIR 11-913, Operation of the Transurance Waste Retrieval Project (Replaces NOC 719) (NOC 804; EU 455, 486, 755, 1181, 1322, 1326, 1327), Washington State Department of Health, September 21, 2011.

ANSI N42.18, *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents*, American National Standards Institute, Washington, D.C.

ANSI/ASME NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities,* American National Standards Institute/American Society of Mechanical Engineers, New York, New York.

ANSI/ASME NQA-2, *Quality Assurance Requirements for Nuclear Facilities,* American National Standards Institute/American Society of Mechanical Engineers, New York, New York.

ANSI/HPS N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities,* American National Standards Institute/Health Physics Society, McLean, Virginia.

ASME/ANSI AG-1, *Code on Nuclear Air and Gas Treatment*, American Society of Mechanical Engineers/American National Standards Institute, Washington, D.C.

ASME/ANSI N509, *Nuclear Power Plant Air-Cleaning Units and Components*, American Society of Mechanical Engineers/American National Standards Institute, Washington, D.C.

ASME/ANSI N510, *Testing of Nuclear Air Treatment Systems*, American Society of Mechanical Engineers/American National Standards Institute, Washington, D.C.

DOE/EV/1830-T5 UC-41, 1980, *A Guide to Reducing Radiation Exposure to As Low As Reasonably Achievable (ALARA)*, U.S. Department of Energy, Washington, D.C.

DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6, U.S. Department of Energy, Richland, Operations Office, Richland, Washington.

DOE/RL-2001-57, 2011, *Radioactive Air Emissions Notice of Construction for the Transuranic Waste Retrieval Project*, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DUN-3955, 1968, *Fission Product Release Rate from Aluminum Clad Uranium Fuel*, Douglas United Nuclear, Inc., Richland, Washington.

ENV-1, *Environmental Monitoring & Management*, ENV-1-1.15, "Quality Assurance Project Plan for Radiological Air Emissions Monitoring," Washington Closure Hanford, Richland, Washington.

ERDA 76-21, 1976, *Nuclear Air Cleaning Handbook*, prepared by Oak Ridge National Laboratory, Oak Ridge, Tennessee, for the Energy Research and Development Administration.

HNF-SD-SNF-TI-058, 1999, *A Discussion of the Methodology for Calculating Radiological and Toxicological Consequences for the Sent Nuclear Fuel Project at the Hanford Site,* Rev. 2, Fluor Daniel Hanford, Incorporated, Richland, Washington.

HW-56588, 1958, *Results of NaK Capsule Failures in Hot Water Flow Tube,* General Electric, Hanford Atomic Products Operation, Richland, Washington.

HW-66562, 1960, *NPF Mechanical Cell NaK Disposal and Fume Abatement,* General Electric, Hanford Atomic Products Operation, Richland, Washington.

HW-67717, 1961, *Failure Test of a Double Chambered NaK-Filled Irradiation Capsule*, General Electric, Hanford Atomic Products Operation, Richland, Washington.

HW-67721, 1960, *Out-Of-Reactor Failure Test of Uranium Swelling Capsule*, General Electric, Hanford Atomic Products Operation, Richland, Washington.

MSC-2333, *Environmental Quality Assurance Program Plan*, latest revision, Mission Support Contract, Richland, Washington.

WAC 246-247, "Radiation Protection – Air Emissions," *Washington Administrative Code*, as amended.

Table A-1. Estimated Release Rates and Unabated Total Effective Dose Equivalent for the Offsite Maximally Exposed Individual.

Isotope	Total Radionuclide Activity (Ci)[a]	Solids (Using 1E-06 RF)			Particulates/Liquids (Using 1E-03 RF)			Surface Removable Particulates (Using 1E-03 RF)			Total PTE (Ci/yr)	Unabated TEDE to the MEI[b] (mrem/yr)
		Radionuclide Activity (Ci)	RF	PTE (Ci/yr)	Radionuclide Activity (Ci)	RF	PTE (Ci/yr)	Total Radionuclide Activity (Ci)[c]	RF	PTE (Ci/yr)		
Am-241	4.07E-02	3.86E-02	1.00E-06	3.86E-08	2.03E-03	1.00E-03	2.03E-06	2.74E-06	1.00E-03	2.74E-09	2.08E-06	6.40E-06
Ba-137m	2.91E+00	2.77E+00	1.00E-06	2.77E-06	1.46E-01	1.00E-03	1.46E-04				1.48E-04	6.91E-06
Cs-137[d]	3.08E+00				3.08E+00	1.00E-03	3.08E-03				3.08E-03	1.10E-06
Pu-238	5.42E-03	5.15E-03	1.00E-06	5.15E-09	2.71E-04	1.00E-03	2.71E-07				2.76E-07	3.04E-09
Pu-239	6.43E-02	6.11E-02	1.00E-06	6.11E-08	3.22E-03	1.00E-03	3.22E-06				3.28E-06	1.21E-05
Pu-240	2.48E-02	2.35E-02	1.00E-06	2.35E-08	1.24E-03	1.00E-03	1.24E-06				1.26E-06	4.66E-06
Pu-241	1.33E-01	1.26E-01	1.00E-06	1.26E-07	6.64E-03	1.00E-03	6.64E-06				6.77E-06	4.50E-07
Pu-242	2.76E-06	2.62E-06	1.00E-06	2.62E-12	1.38E-07	1.00E-03	1.38E-10				1.41E-10	0.00E+00
Sr-90	2.61E+00	2.48E+00	1.00E-06	2.48E-06	1.31E-01	1.00E-03	1.31E-04	4.93E-08	1.00E-03	4.93E-11	1.33E-04	3.50E-07
U-234	6.88E-04	6.54E-04	1.00E-06	6.54E-10	3.44E-05	1.00E-03	3.44E-08				3.51E-08	9.10E-09
U-235	4.04E-05	3.84E-05	1.00E-06	3.84E-11	2.02E-06	1.00E-03	2.02E-09				2.06E-09	4.69E-10
U-238	2.83E-04	2.69E-04	1.00E-06	2.69E-10	1.42E-05	1.00E-03	1.42E-08				1.44E-08	3.04E-09
Y-90	2.61E+00	2.48E+00	1.00E-06	2.48E-06	1.31E-01	1.00E-03	1.31E-04	4.93E-08	1.00E-03	4.93E-11	1.33E-04	7.35E-08
												3.30E-05

[a] Inventory taken from Table 2 of 0100D-CA-V0427, *Total Effective Dose Equivalent for the Treatment of NaK-Filled Specimens in the 100-D Area*, Rev. 1.

[b] The annual unabated total effective dose equivalent was determined using the CAP88-PC, Version 3 model. The potential to emit (Ci/yr) was input to the model, and the model generated the annual unabated dose. The distance to the MEI for the treatment of NaK targets at the 100-D Area is 10,114 m west-northwest. The CAP88-PC model summary and synopsis are presented in Calculation 0100D-CA-V0427, *Total Effective Dose Equivalent for the Treatment of NaK-Filled Specimens in the 100-D Area*, Rev. 1.

[c] Sheets 8 and 9 of 0100D-CA-V0427 show how removable activity was calculated. Assumed all alpha activity is Am-241 and all beta/gamma activity is Sr-90.

[d] Because the Mark III containment vessel is heated to ~ 250 °F, it is conservatively assumed that all Cs-137 is subject to temperatures above its melting point; therefore, a release fraction of 1E-03 has been applied.

Table A-2. Estimated Release Rates and Unabated Total Effective Dose Equivalent for a River Receptor.

Isotope	Total Radionuclide Activity (Ci)[a]	Solids (Using 1E-06 RF)			Particulates/Liquids (Using 1E-03 RF)			Surface Removable Particulates (Using 1E-03 RF)			Total PTE (Ci/yr)	Unabated TEDE to the MEI[b] (mrem/yr)
		Radionuclide Activity (Ci)	RF	PTE (Ci/yr)	Radionuclide Activity (Ci)	RF	PTE (Ci/yr)	Total Radionuclide Activity (Ci)[c]	RF	PTE (Ci/yr)		
Am-241	4.07E-02	3.86E-02	1.00E-06	3.86E-08	2.03E-03	1.00E-03	2.03E-06	2.74E-06	1.00E-03	2.74E-09	2.08E-06	1.56E-04
Ba-137m	2.91E+00	2.77E+00	1.00E-06	2.77E-06	1.46E-01	1.00E-03	1.46E-04				1.48E-04	1.58E-04
Cs-137[d]	3.08E+00				3.08E+00	1.00E-03	3.08E-03				3.08E-03	2.68E-05
Pu-238	5.42E-03	5.15E-03	1.00E-06	5.15E-09	2.71E-04	1.00E-03	2.71E-07				2.76E-07	2.29E-05
Pu-239	6.43E-02	6.11E-02	1.00E-06	6.11E-08	3.22E-03	1.00E-03	3.22E-06				3.28E-06	2.96E-04
Pu-240	2.48E-02	2.35E-02	1.00E-06	2.35E-08	1.24E-03	1.00E-03	1.24E-06				1.26E-06	1.14E-04
Pu-241	1.33E-01	1.26E-01	1.00E-06	1.26E-07	6.64E-03	1.00E-03	6.64E-06				6.77E-06	1.1E-05
Pu-242	2.76E-06	2.62E-06	1.00E-06	2.62E-12	1.38E-07	1.00E-03	1.38E-10				1.41E-10	0.00E+00
Sr-90	2.61E+00	2.48E+00	1.00E-06	2.48E-06	1.31E-01	1.00E-03	1.31E-04	4.93E-08	1.00E-03	4.93E-11	1.33E-04	8.53E-06
U-234	6.88E-04	6.54E-04	1.00E-06	6.54E-10	3.44E-05	1.00E-03	3.44E-08				3.51E-08	2.2E-07
U-235	4.04E-05	3.84E-05	1.00E-06	3.84E-11	2.02E-06	1.00E-03	2.02E-09				2.06E-09	1.14E-08
U-238	2.83E-04	2.69E-04	1.00E-06	2.69E-10	1.42E-05	1.00E-03	1.42E-08				1.44E-08	3.04E-09
Y-90	2.61E+00	2.48E+00	1.00E-06	2.48E-06	1.31E-01	1.00E-03	1.31E-04	4.93E-08	1.00E-03	4.93E-11	1.33E-04	7.4E-08
												7.95E-04

[a] Inventory taken from Table 2 of 0100D-CA-V0431, *Total Effective Dose Equivalent for the Treatment of NaK-filled Specimens in the 100-D Area (River)*, Rev. 0.

[b] The annual unabated total effective dose equivalent was determined using the CAP88-PC, Version 3 model. The potential to emit (Ci/yr) was input to the model, and the model generated the annual unabated dose. The distance to the MEI for the treatment of NaK targets at the 100-D Area is 10,114 m west-northwest. The CAP88-PC model summary and synopsis are presented in Calculation 0100D-CA-V0431, *Total Effective Dose Equivalent for the Treatment of NaK-filled Specimens in the 100-D Area (River)*, Rev. 0.

[c] Sheets 8 and 9 of 0100D-CA-V0431 show how removable activity was calculated. Assumed all alpha activity is Am-241 and all beta/gamma activity is Sr-90.

[d] Because the Mark III containment vessel is heated to 250 °F, it is conservatively assumed that all Cs-137 is subject to temperatures above its melting point; therefore, a release fraction of 1E-03 has been applied.

Table A-3. Cost for Next Generation Exhauster.

Detail	Cost	Cost Basis
Design work	$9,000	Actuals
Procure HEPA Demister/Heater Assembly	$98,000	Actuals
Procure Tent Exhauster	$27,000	Actuals
Procure HEPA Filter Housing	$32,000	Actuals
Procure HEPA Filters	$1,100	Actuals
Procure Monitoring System	$19,000	Quote
Prepare Compliance Matrix	$25,000	ROM
Total Cost	**$211,100**	

HEPA = high-efficiency particulate air
ROM = Rough Order of Magnitude Estimate

Attachment 6

162766

^WCH Document Control

From: Saueressig, Daniel G
Sent: Wednesday, November 30, 2011 11:08 AM
To: ^WCH Document Control
Subject: FW: ACETYLENE CYLINDERS AT 100-D

Please provide a chron number. This email documents a regulatory agreement.

Thanks,

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

From: Kapell, Arthur (ECY) [mailto:akap461@ECY.WA.GOV]
Sent: Tuesday, November 29, 2011 12:16 PM
To: Saueressig, Daniel G
Cc: Boyd, Alicia; Post, Thomas C; Wilkinson, Stephen G; Landon, Roger J; Menard, Nina; Welsch, Kim (ECY); Curcio, Joseph P
Subject: RE: ACETYLENE CYLINDERS AT 100-D

Dan,

Thanks for supplying me with the CGA guidance document CGA P-22-2007 "The Responsible Management and Disposition of Compressed Gases and the Cylinders" which provides the recommendation to vent the acetylene cylinders for 30 days with at least one week above 40 degrees F. They also state that the contained solvent within the cylinder would remain within the cylinder after the venting period.

Please adhere with the statement in Section 7.6.4.3: "Position cylinders so rainwater does not enter the cylinder through the valve well or accumulate on the cylinder head."

As a side note, after getting off the phone with you this morning I realized that I had read about the 30 day period on the IES website.

Please notify me when the cylinder is to be moved to ERDF.

Artie Kapell
Nuclear Waste Program
Washington State Department of Ecology
(509) 372-7972
(509) 372-7971 Fax

162766

From: Saueressig, Daniel G [mailto:dgsauere@wch-rcc.com]
Sent: Tuesday, November 29, 2011 9:10 AM
To: Kapell, Arthur (ECY)
Cc: Boyd, Alicia (ECY); Post, Thomas C; Wilkinson, Stephen G; Landon, Roger J; Menard, Nina (ECY); Welsch, Kim (ECY); Curcio, Joseph P
Subject: ACETYLENE CYLINDERS AT 100-D

Artie, we plan to vent the 2 acetylene cylinders later this morning. The plan is to set up a 100' perimeter exclusion area (no smoking or flames) and secure the cylinders to a post so they remain in an upright position. The workers will enter the area in supplied air and open the valves to vent the acetylene. The valves will be left open for 24 hours, then the workers will re-enter the area in supplied air to remove the valves from the cylinders. Based on the Compressed Gas Association guidance, the cylinders are to be left open for 30 days to allow any residual acetylene to come out of solution. Once the cylinders have been allowed to vent for 30 days, they will be macro-encapsulated at ERDF prior to disposal to ensure that void space issues are not a problem. Acetylene cylinders are designed to contain no free liquids, which will be confirmed prior to disposal.

Thanks and give me a call if you have any questions.

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

From: Kapell, Arthur (ECY) [mailto:akap461@ECY.WA.GOV]
Sent: Wednesday, November 16, 2011 8:07 AM
To: Saueressig, Daniel G
Cc: Boyd, Alicia; Post, Thomas C; Wilkinson, Stephen G; Landon, Roger J; Menard, Nina; Welsch, Kim (ECY)
Subject: RE: ACETYLENE CYLINDERS AT 100-D

Dan,

I am writing with regard to your request to vent the acetylene within two cylinders currently stored in the anomaly storage area at 100-D. In reviewing the Applicable or Relevant and Appropriate Requirements (ARARs) for the 100 Area, Ecology agrees that venting the cylinders is an allowable method of disposal for the acetylene.

As you are aware, the cylinders also contain acetone and a porous mass that stabilizes the acetylene. Once the acetylene is vented, the cylinders with acetone and the porous mass must be handled in a way appropriate for acceptance at ERDF. This includes noting the contents of the cylinders on the waste tracking form. Additionally, please notify Ecology of the steps that will be taken to vent these cylinders and prepare them for ERDF prior to any treatment.

Artie Kapell
Nuclear Waste Program
Washington State Department of Ecology
(509) 372-7972
(509) 372-7971 Fax

162766

From: Saueressig, Daniel G [mailto:dgsauere@wch-rcc.com]
Sent: Thursday, September 22, 2011 9:17 AM
To: Kapell, Arthur (ECY)
Cc: Boyd, Alicia (ECY); Post, Thomas C; Wilkinson, Stephen G; Landon, Roger J
Subject: ACETYLENE CYLINDERS AT 100-D

Artie, as you know, we have 2 acetylene containers stored in our anomaly storage area at 100-D. These cylinders were encountered during remediation of the 118-D-3 burial ground. We have confirmed that material remains in these cylinders. One cylinder contains 22-33 psi of material and the other contains 48-52 psi of material, we estimate the worst case volume of acetylene (if the cylinders were full) to be 10 ft3 for the 4" cylinder and 40 ft3 for the 6" cylinder. Acetylene is regulated as a dangerous waste (due to it's physical characteristics, not its health affects, it is a simple asphyxiant like nitrogen), not an extremely hazardous waste.

I've attached a pamphlet on acetylene from the Compressed Gas Association that discusses management of acetylene and marked areas of interest for you on the left margin. The risk of explosion when transferring the remaining acetylene to another DOT shippable container is too high due to acetylene's unique physical properties. The current packaging (cylinders) are not DOT shippable and can't be released from radiological controls, so offsite disposal is not an option.

With that said, I'd like to request Ecology approval to vent the remaining acetylene to the atmosphere. Let me know if you concur with our proposed path forward.

Thanks and give me a call if you have any questions.

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

<<ACETYLENE.PDF>>

Attachment 7

100 Area D4/ISS Status

December 8, 2011

D4 (WCH)

100-N River Structures (181-N, 181-NE, 1908-NE): No activity during the last month. Both excavators to be used for demolition are now on site. Preparations to demolish the 181-NA Guard Tower are likely to begin within two weeks provided weather permits.

182-N High Lift Pumphouse: Above grade demolition began last week and is now approximately 50 percent complete.

105-N Fuel Storage Basin (FSB): Demolition and loadout of examination and segregation pits (closest to SSE) complete. Demolition and loadout of north and south FSB floors is proceeding from east to west and approximately 50 percent complete. Department of Health personnel collected air samples last week and indicated additional samples may be collected prior to completion of FSB. To date, radiological controls in place have kept dose levels ALARA.

105-NE Fission Products Trap (FPT): Continuing to excavate and load out around the facility to facilitate demolition. Actual demolition of the facility scheduled to begin within next two weeks and may include removal of additional TSD piping between the FPT and the 1303-N Spacer Silos.

105-N/109-N Reactor/Heat Exchanger Buildings (ISS): ISS complete with the exception of installing pour backs and plates below grade on west side. Installation of those pour backs and plates is pending completion of FSB.

Other Areas

400 Area: Thirteen (13) of the fourteen (14) buildings scheduled for demolition this year are now complete with completion of building 4790 last week. Building 4702 demolition pending completion of interior (attic) asbestos removal.

Attachment 8

162747

^WCH Document Control

From: Faust, Toni L
Sent: Tuesday, November 29, 2011 5:44 AM
To: ^WCH Document Control
Subject: FW: 100-N South Staging Pile Area 1 Agreement

Please provide a chron number for the below email. This email documents a regulatory agreement.

Thanks

Toni Faust

From: Menard, Nina (ECY)
Sent: Tuesday, November 22, 2011 4:04 PM
To: Faust, Toni L; Boyd, Alicia (ECY)
Cc: Chance, Joanne C; Walker, Jeffrey L; Saueressig, Daniel G; Dobie, Chad H; Proctor, Megan L
Subject: RE: 100-N South Staging Pile Area 1 Agreement

Toni,

Ecology concurs with the general agreement portion of the text below.

Nina M. Menard

From: Faust, Toni L [mailto:tlfaust@wch-rcc.com]
Sent: Tuesday, November 22, 2011 3:20 PM
To: Menard, Nina (ECY); Boyd, Alicia (ECY)
Cc: Chance, Joanne C; Walker, Jeffrey L; Saueressig, Daniel G; Dobie, Chad H; Proctor, Megan L
Subject: RE: 100-N South Staging Pile Area 1 Agreement

Nina and Alicia

Based on our conversation earlier today and your request I have updated the general agreement portion of the text below. Please provide a concurrence email to the updated text.

Thanks
Toni Faust

100-N South Staging Pile Area 1 general agreement.

The 100-N South Staging Pile Area 1 (SSP Area 1) began operation on February 16, 2011, with the delivery of the first excavated soil from the 100-N-57 and 116-N-4 waste

sites for staging pending shipment to the Environmental Restoration Disposal Facility (ERDF). During operation of the SSP Area 1, soil and debris from adjacent and collocated waste sites will be staged prior to disposal at the ERDF. The waste sites staged at the SSP Area 1 include but are not limited to: 116-N-4, 100-N-57, UPR-100-N-1, UPR-100-N-2, UPR-100-N-29, UPR-100-N-30, UPR-100-N-32, 100-N-64, 100-N-61, 100-N-62, 100-N-84. Because these waste sites are adjacent and/or collocated with each other, it is not physically feasible to separate all soils and debris from each waste site within the SSP Area 1. Therefore, the SSP Area 1 within the berm contains comingled waste site material.

Waste staged at the SSP Area 1 will be removed and disposed of by the M-16-55 milestone completion date of December 31, 2012. Once the waste material is completely removed the SSP Area 1 will be verification sampled to show regulatory limits are met for closure of the SSP Area 1. Sampling and closure documentation for SSP Area 1 will be performed with the 100-N-61 waste site. Closure documentation for the other waste sites will refer to this (see VWI wording below).

SSP Area 1 will be operated and closed in accordance with requirements in the 100-N Area RDR/RAWP and sampling and closure will be performed per the 100-N Area SAP and RDR/RAWP.

Staging pile verification work instruction wording.

Approximately _____ BCM (_____ BCY) of contaminated soil and debris was removed from the waste site(s) and staged in South Staging Pile Area 1 (SSP Area 1) to the south of the excavation prior to load out for disposal at the ERDF. All waste from the 100-N-___ *(list waste sites affected)* waste site(s) staged in SSP Area 1 has been loaded out and disposed of at the ERDF. Closeout of the SSP Area 1 will be completed in the 100-N-61 verification work instruction.

Attachment 9

162716

^WCH Document Control

From: Faust, Toni L
Sent: Tuesday, November 22, 2011 9:07 AM
To: ^WCH Document Control
Cc: Saueressig, Daniel G; Walker, Jeffrey L
Subject: FW: 116-N-2 power pole agreement
Attachments: 116-N-2 Power Pole Agreement 11-21-11.doc

Please provide a chron number (and include the attachment). This email documents a regulatory agreement.

Thanks

Toni Faust

From: Boyd, Alicia (ECY) [mailto:aboy461@ecy.wa.gov]
Sent: Monday, November 21, 2011 4:19 PM
To: Faust, Toni L
Cc: Saueressig, Daniel G; Chance, Joanne C
Subject: RE: 116-N-2 power pole agreement

Joanne/Toni
The sampling approach in the attached agreement is acceptable to Ecology. Please submit it at the next UMM.

Alicia L. Boyd
Washington State Department of Ecology
3100 Port of Benton Blvd
Richland, WA 99352
509-372-7934

From: Faust, Toni L [mailto:tlfaust@wch-rcc.com]
Sent: Monday, November 21, 2011 9:00 AM
To: Varljen, Robin (ECY); Boyd, Alicia (ECY)
Cc: Saueressig, Daniel G; Walker, Jeffrey L; Buckmaster, Mark A; Chance, Joanne C
Subject: RE: 116-N-2 power pole agreement

Robin

Focus sample locations have been added. Please provide concurrence.

Thanks toni

From: Varljen, Robin (ECY) [mailto:RVAR461@ecy.wa.gov]
Sent: Monday, November 21, 2011 7:08 AM
To: Faust, Toni L; Boyd, Alicia
Cc: Saueressig, Daniel G; Walker, Jeffrey L; Buckmaster, Mark A; Chance, Joanne C
Subject: RE: 116-N-2 power pole agreement

Toni,
Can you identify the sample locations on the map?
Robin

From: Faust, Toni L [tlfaust@wch-rcc.com]
Sent: Wednesday, November 16, 2011 1:48 PM
To: Varljen, Robin (ECY); Boyd, Alicia (ECY)
Cc: Saueressig, Daniel G; Walker, Jeffrey L; Buckmaster, Mark A; Chance, Joanne C
Subject: 116-N-2 power pole agreement

Alicia and Robin

Attached is the 116-N-2 power pole agreement for your concurrence. The document is set up following the format we used for the 124-N-4 power pole agreement earlier this year.

Please provide a concurrence email and then next month Dan will present the agreement at the UMM.

Thanks toni

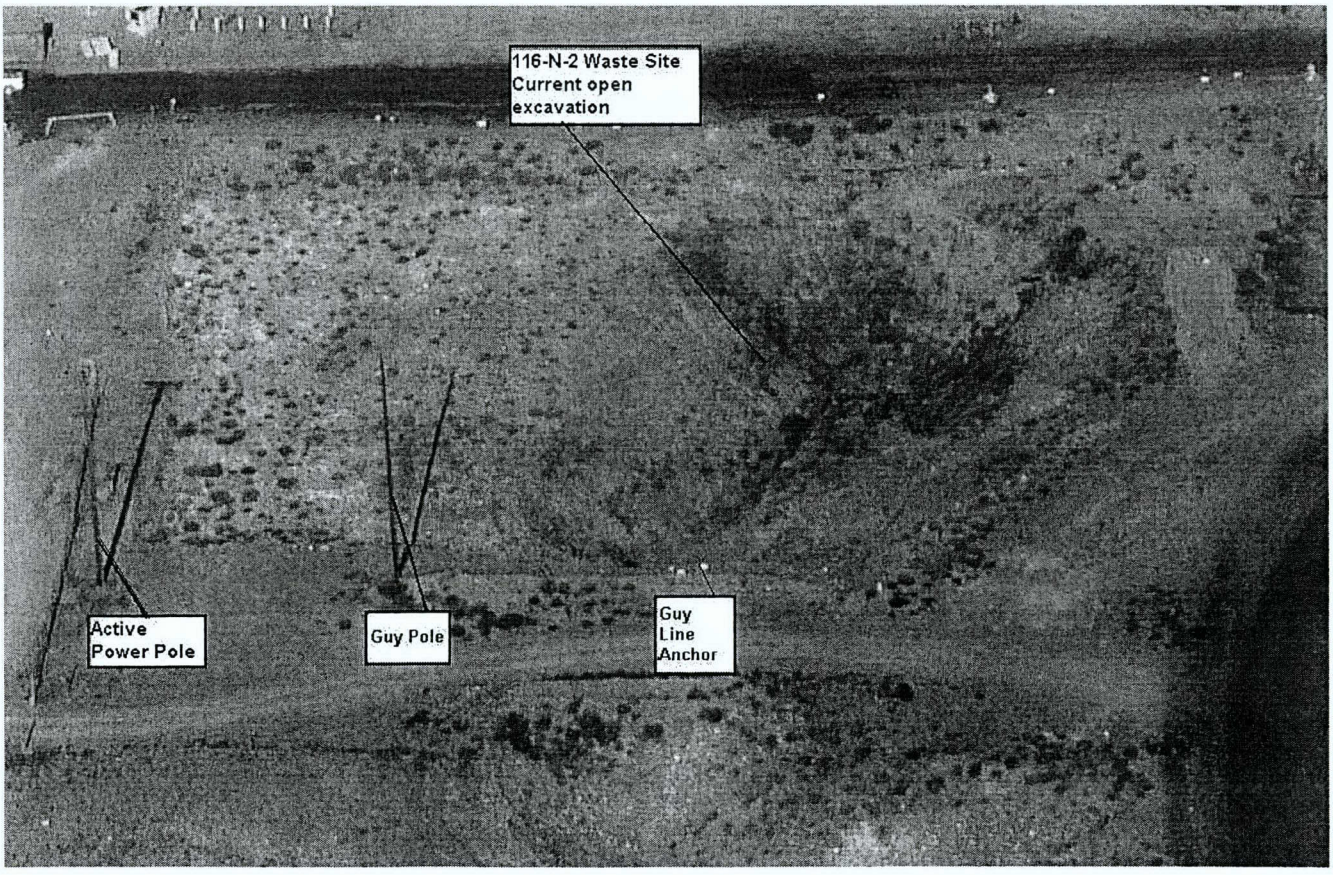
116-N-2, UPR-100-N-5 and UPR-100-N-25 Power Pole Agreement

Field Remediation will potentially need to leave small amounts of soil in the southeast portion of the excavation for the 116-N-2 UPR-100-N-5 and UPR-100-N-25 due to potential impacts to the active power line poles at the edge of this site (see attached drawing and aerial photo).

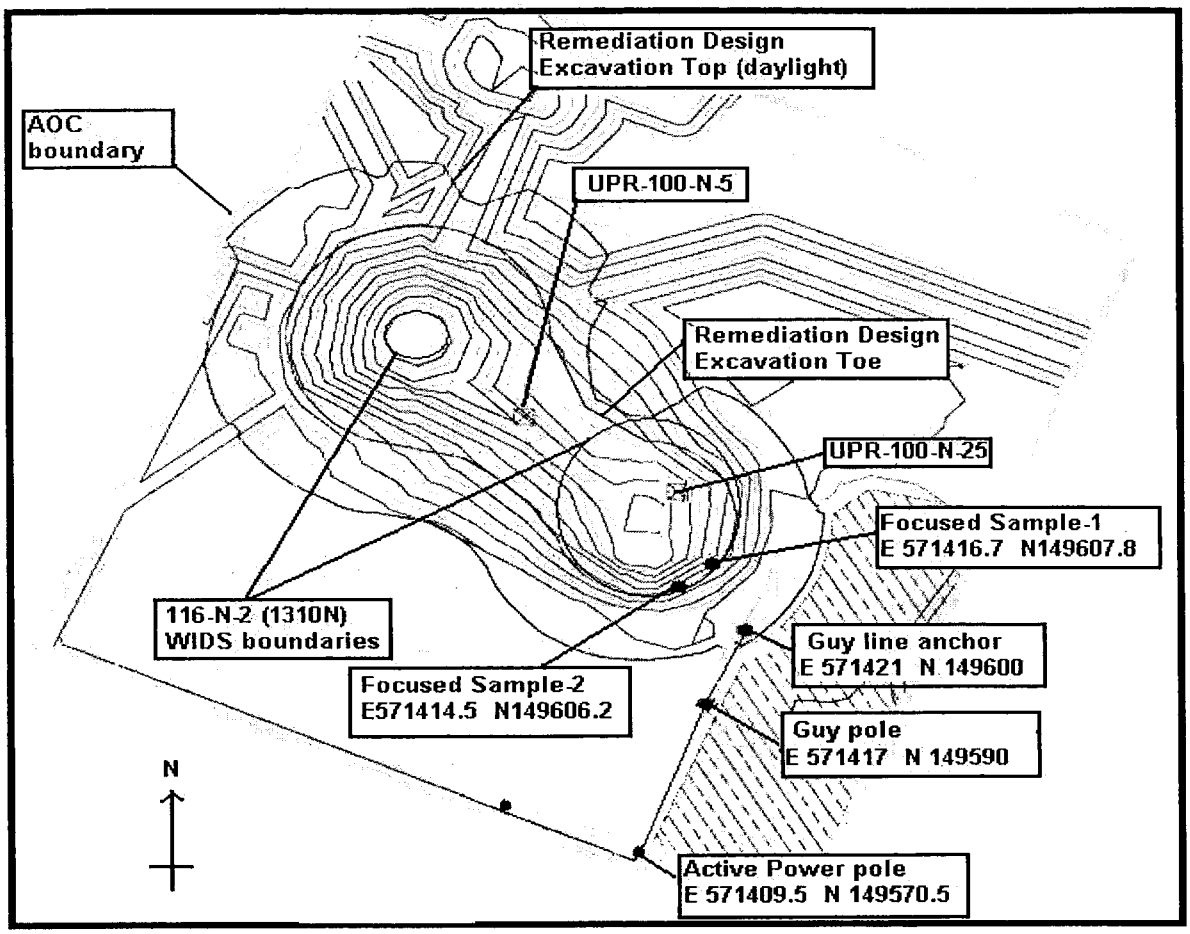
This excavation was originally designed to maintain a 1.5:1 slope. We are proposing a 1:1 slope in this area to maintain the guy anchor lines for the pole. Taking any additional soil in this area could impact the integrity of the active power pole, guy pole, and guy line anchor. WCH would appreciate Ecology concurrence with the adjustment to the remediation design and the below agreement for verification sampling.

WCH will be including 2 focused samples under full protocol to support closeout in the waste site verification sampling in this area where soil will remain to show no contamination in this area. These focused samples will only be collected if a 1:1 slope is required. The location and coordinates of the focused samples is provided in the map below. Remediation activities will be guided by in-process sampling. If in-process samples indicate contamination above the direct exposure RAGs in this area, alternative stabilization of the active power line pole, guy pole and guy line anchor will be identified, and the area will be remediated as necessary. COPCs to be analyzed to support in-process sampling include cobalt-60, metals, anions, and volatile organic compounds, semivolatile organic compounds, and polynuclear aromatic hydrocarbons (PAH). The list of COPCs for verification sampling may be modified based on results of in-process sampling and will be provided in a verification work instruction of the waste sites for Ecology's approval. Information related to the above agreement will also be provided in the waste site specific verification work instruction and remaining sites verification package.

Should DOE and Ecology agree with this path forward, this agreement will be documented at the next UMM.



116-N-2, UPR-100-N-5 and UPR-100-N-25 Power Pole Agreement



Attachment 10

162808

^WCH Document Control

From: Saueressig, Daniel G
Sent: Tuesday, December 06, 2011 7:18 AM
To: ^WCH Document Control
Subject: FW: 100-N LIQUIDS TO ETF

Please provide a chron number. This email documents a regulatory agreement.

Thanks,

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

-----Original Message-----
From: Buelow.Laura@epamail.epa.gov [mailto:Buelow.Laura@epamail.epa.gov]
Sent: Thursday, November 17, 2011 1:24 PM
To: Saueressig, Daniel G
Cc: Chance, Joanne C; Buckmaster, Mark A; Landon, Roger J; Varljen, Robin; Wilkinson, Stephen G
Subject: Re: 100-N LIQUIDS TO ETF

EPA concurs with the request.

Laura Buelow, Environmental Scientist
U.S. Environmental Protection Agency
Hanford Project Office
309 Bradley Blvd, Suite 115
Richland, WA 99352
Phone: 509 376-5466
Fax: 509 376-2396
E-mail: buelow.laura@epa.gov

From: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>
To: Laura Buelow/R10/USEPA/US@EPA, "Varljen, Robin" <RVAR461@ECY.WA.GOV>
Cc: "Varljen, Robin" <RVAR461@ECY.WA.GOV>, "Chance, Joanne C" <joanne.chance@rl.doe.gov>, "Wilkinson, Stephen G" <sgwilkin@wch-rcc.com>, "Landon, Roger J" <RJLANDON@wch-rcc.com>, "Buckmaster, Mark A" <MABUCKMA@wch-rcc.com>
Date: 11/08/2011 11:10 AM
Subject: 100-N LIQUIDS TO ETF

Hi Laura, we have approximately 3,300 gallons of liquid that we removed from various pipe runs at 100-N (100-N-84:2, :3, :4 and :6) that we are planning to send to EFT for treatment.

The 100-N RDR/RAWP (DOE/RL-2005-93) does not contain the same language that the 100 Area RDR/RAWP (DOE/RL-96-17) contains regarding standing approval to send liquid waste to ETF for treatment.

Section 4.1.1 of the 100 Area RDR states "The ETF is an approved noncontiguous onsite

facility pursuant to CERCLA Section 104(d)(4) to store and treat liquid waste generated from removal actions, provided the waste acceptance criteria are met."

Section 4.2.4.3 of the 100-N RDR states "Liquids that may remain in pipelines to be remediated will be collected, designated and transported to the ETF or other facility as authorized by the lead regulatory agency."

I'd like to request a noncontiguous onsite determination to send this liquid to ETF for treatment. I'd also like to request a standing approval to send liquid waste to ETF for treatment, consistent with the approval in DOE/RL-96-17, as long as it meets the ETF acceptance criteria.

Thanks and let me know if you have any questions.

Dan Saueressig
FR Environmental Project Lead
Washington Closure Hanford
521-5326

Attachment 11

300 Area Closure Project Status
December 8, 2011
100/300 Area Combined Unit Manager Meeting

Ongoing Activities

- 324 – Finalizing short-list evaluation of 300-296 remediation options and technologies.
- 309 – Removed remainder of containment structure to grade, completed above-grade demolition south and west. Load out and east wing demolition nearing completion.
- 308 – Completing final demolition preparations.
- 340 – Completed above-grade demolition of 340-B, 340-A, 3707-F and 340 Buildings.
- Completed above-grade demolition and initiated below-grade demolition of the 320 Building.
- Removed CRCTA vessel from 337-B basement, final asbestos abatement in caisson remains.
- Continue remediation of 321 and 3706 waste site areas.
- Resumed 327 below-grade demolition.
- Complete 338 below-grade demolition and backfill.
- Preparing to place source term array and grout sources in 3730 Gamma Irradiation Facility.

Current Demolition Preparations & Activities

- Finalize 308 demolition preparations.
- Continue preparations for 309 reactor core removal.
- Complete 320 building demolition.
- Complete load out of above-grade demolition debris for 340 Complex buildings and turn over to subcontractor to initiate waste site remediation and vault removal.
- Complete 337-B caisson asbestos abatement and backfill site.
- Prepare procurement for subcontractor waste site remediation services south of Apple St.

60-Day Project Look Ahead

- Complete recommendation for remediation of source-term beneath 324 Building.
- Initiate 340 waste site remediation and finalize engineering for vault removal.
- Initiate demolition of 308. Finalize engineering for TRIGA reactor removal.
- Complete below-grade demolition and backfill of 320 Building.
- Complete 327 below-grade demolition.
- Complete work at the 337 Complex, backfill and close area.
- Initiate north of Apple (Zone 7) process sewer remediation.
- Complete remediation of 321 and 3706 remediation areas.

Attachment 12

UMM Agreement - December 8, 2011
Rapid Improvement Event
Verification Work Instruction Preparation

A Rapid Improvement Event was conducted with representatives from DOE-RL, Ecology, EPA and WCH participating between November 1 and 2, 2011. During this event the Verification Work Instruction (VWI) process was mapped and analyzed for areas where duplication, waste, and non-value added steps and/or information exist in the process. From this analysis the team developed a new streamlined VWI process.

Process

An external share drive (file transfer protocol [FTP]) has been set up to transfer pieces of supporting documentation that in the past has been included in an approved VWI. The FTP share drive contains folders labeled with the appropriate title for each supporting piece of information. for review by DOE-RL and the lead regulatory agency. The FTP share drive contains 15 folders for supporting document information, labeled as shown in Attachment 1.

Supporting information to collect and upload to the FTP for each waste site is as follows:

FTP Folder	Content Description
01-WIDS	Waste Information Data System General Summary Report
02-SIS	RCC Stewardship Information System Site Summary Report
03-Geophysics	If Applicable - Geophysical survey
04-Waste Site Location Map	Created by the engineering/design (CAD) group. Includes waste site and surrounding buildings/roads/features. May also include a figure with more detailed technical information.
05-Confirmatory Map & COPC table	If Applicable – Includes confirmatory sampling summary, and may include confirmatory sampling locations and requested analyses.
06-Crosstabs	Ordered from the sample management group or retrieved from the SIS database. Includes confirmatory, waste characterization, and/or in-process data, organized with appropriate location labels, dates, and purpose of sample collection.
07-COPC Logic	A summary of the conceptual model and technical information required to support COPC determination. The summary is the logic resulting from a review of site history, technical information, remedial strategy, and analytical results. Include references if necessary.
08-Radiological Survey	If Applicable - Radiological surveys provided to the author from field remediation, and may include GPERS, LARADS, and/or handheld radiological survey records.
09-Photos	Several photographs to support site history and remedial action summary, including a photo of the site prior to remediation, post-remediation, and any significant features or anomalies.
10-Remedial Action Summary & Anomalies	Summary of the remedial action performed, depths of the excavation, waste removal, and dates of action. Information such as waste shipment quantities are not necessary to support the VWI, and can be excluded until the closure document.
11-In-Process Sampling Description or Map	If Applicable - In-process sampling description summarized from field remediation logbook pages and/or maps of this sampling.
12-Post-Ex Civil Survey or Shapefile	A final post-excavation civil survey or the shapefile to be used as a boundary for sample collection.
13-VSP Output Table	If Applicable - Summary of Sampling Design (currently Table 2 in VSP Appendix)
14-VWI	A review copy of the VWI should be indicated by an extension descriptor of Draft or Final. The following information should be included. Examples are provided in Attachment 2. Analytical Method Table Sample Summary Table Sample Location Map
15-Review Comments	Blank for use by DOE-RL/regulator

CAD = computer-aided design
COPC = contaminant of potential concern
DOE-RL = U.S. Department of Energy – Richland operations office
GPERS = global positional environmental radiological surveyor
LARADS = laser-assisted ranging and data system
SIS = stewardship enformation system
VSP = visual sample plan
VWI = verification work instruction
WIDS = waste information data system

When an FTP folder has been populated with final information, the addendum _P or _NA should be added to the file name, as outlined in Attachment 1. Once the FTP folder for a waste site is completed the SDCV Manager will notify DOE-RL and the lead regulatory agency that their review of the material is requested.

After completion of lead regulatory review, the regulatory agency will notify the SDCV Manager that comments are provided. Comments will be in two categories: Those specific to the VWI and those that are not directly related to finalization of the VWI. Comments specific to support VWI approval will be negotiated and dispositioned to support signature of the VWI. Other comments will be dispositioned separately so as to facilitate field sampling.

When comments have been resolved, the SDCV Manager will email the signature sheet (Attachment 2) to DOE-RL for signature. Once signed, the signature page will be delivered to the regulator for signature.

ATTACHMENT 1

FTP CHECKLIST

VWI FTP Checklist

Items to be included in the waste site folder on the FTP:

- 01-WIDS
- 02-SIS
- 03-Geophysics
- 04-Waste Site Location Map
- 05-Confirmatory Map & COPC table
- 06-Crosstabs
- 07-COPC Logic
- 08-Radiological Survey
- 09-Photos
- 10-Remedial Action Summary & Anomalies
- 11-In-Process Sampling Description or Map
- 12-Post-Ex Civil Survey or Shapefile
- 13-VSP Output Table
- 14-VWI
  - Analytical Method Table
  - Sample Summary Table
  - Sample Location Map
- 15-Review Comments

_P = populated
_NA = not applicable

WCH FTP Access Instructions

The WCH FTP site allows for file sharing across firewalls with external agencies involved in the VWI process. All information posted to the FTP is accessible by the regulators, DOE-RL, and other WCH employees.

To configure Filezilla:

1. Open Filezilla.
2. Click File then on Site Manager.
3. Click New Site
4. On the left-hand side, replace "new FTP site" with WCH FTP
5. On the right-hand side of the window, enter the following information:
   Host: ftp.wch-rcc.com
   Servertype: FTP
   Logontype: Normal
   User: **First name.Last name** (make sure you put the dot between the first and last name)
   Password: **XXXXXX**
6. Click "OK"
7. Click the little pulldown menu arrow on the side of the Computer icon that is below the File and Edit menus, click on WCH and you will connect to the WCH site.
8. You can now use the Local Site Windows to browse to the file you want to upload to the site, right click on the file you want to upload and click on upload, it will copy to the FTP site. (Use the lower set of windows for doing this.) To copy a file from the site to your computer or sharedrive, right click on the file to download on the right hand side of the screen.

External FTP Access Instructions

1. Go to My Computer
2. In the address line, type: ftp.wch-rcc.com
3. Enter your username and password.
4. Click "Log On".
5. You can then add this server to your favorites to use it regularly.
6. Access the files you wish to use, and save to your hard drive to make edits.

ATTACHMENT 2

VWI TEMPLATE

WORK INSTRUCTION

FOR

VERIFICATION SAMPLING OF THE XX-XX Waste Site, Title WASTE SITE

RIVER CORRIDOR CLOSURE PROJECT	Job No. 14655
	Work Instruction No. 0100H-WI-G0054
	Sheet 1 of X

Approved By:		
	DOE/RL Lead	**Date:**
(Name)		
	EPA/Ecology Lead	**Date:**
(Name)		

LABORATORY ANALTYICAL METHOD TABLE EXAMPLE

Table 1. XX-XX Laboratory Analytical Methods and COPCs.

Analysis	Analytical Method	Contaminant of Potential Concern
ICP metals [a]	EPA Method 6010	Cadmium, chromium, lead, selenium, and silver
Mercury	EPA Method 7471	Mercury
Hexavalent chromium	EPA Method 7196	Hexavalent chromium
IC anions [b]	EPA Method 300.0	Inorganic anions
NO_2/NO_3 [c]	EPA Method 353.2	Nitrogen in nitrate and nitrite
PAH	EPA Method 8310	Polycyclic aromatic hydrocarbons
PCB	EPA Method 8082	Polychlorinated biphenyls
Pesticides	EPA Method 8081	Dieldrin
SVOA	EPA Method 8270	Semivolatile organic compounds
TPH	EPA Method NWTPH-Dx	Total petroleum hydrocarbons
SVOA	EPA Method 8270	Semivolatile organic compounds
GEA	gamma spectroscopy	Americium-241, cesium-137, cobalt-60, europium-152, europium-154, europium-155
Technecium-99	liquid scintillation	Technecium-99
Carbon-14	liquid scintillation	Carbon-14
Nickel-63	liquid scintillation	Nickel-63
Strontium-90	liquid scintillation	Strontium-90
SVOA	EPA Method 8270	Semivolatile organic compounds
Tritium	liquid scintillation	Tritium
Isotopic plutonium		Plutonium-238, plutonium-239/240
Isotopic uranium		Uranium-238

[a] Analysis will be performed for the expanded list of ICP metals to include antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc.

[b] Analysis will be performed for the expanded list of IC anions to include bromide, chloride, fluoride, nitrate, nitrite, phosphate, and sulfate.

[c] To preclude holding time issues associated with EPA Method 300.0 for nitrites and nitrates, EPA Method 353.2 will be performed.

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
IC = ion chromatography
ICP = inductively coupled plasma
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
TPH = total petroleum hydrocarbons

SAMPLE LOCATION MAP EXAMPLE

Table 2. XX-XX Waste Site Verification Sample Summary Table.

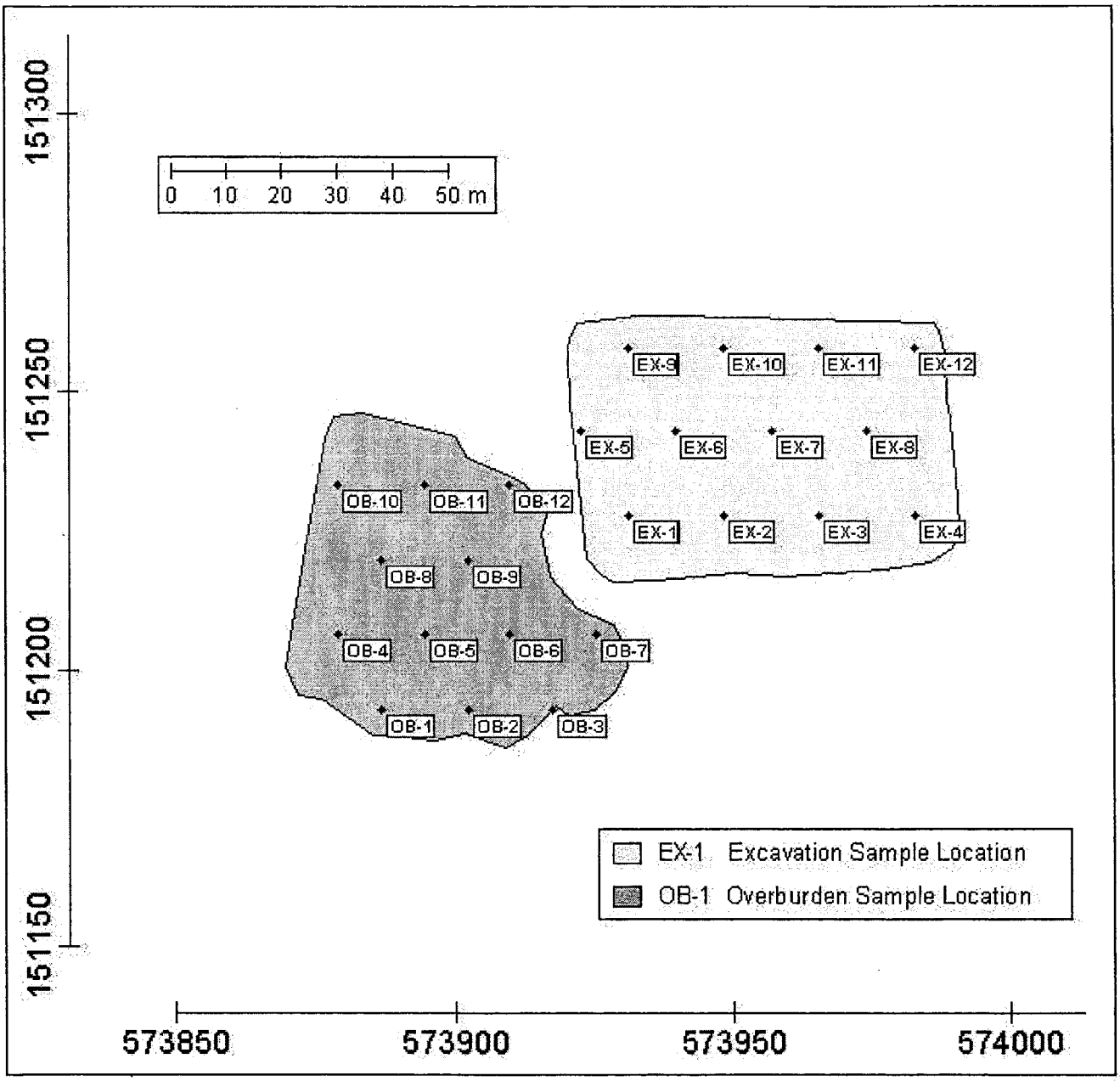
Sample Location	HEIS Sample Number	Easting	Northing	Sample Analysis [a]
EX-1	TBD	151227.8	573931.1	ICP metals, mercury, hexavalent chromium, PCBs, PAH, IC anions, NO_2/NO_3, GEA, carbon-14, nickel-63, strontium-90, isotopic plutonium, isotopic uranium, tritium, and technecium-99
EX-2	TBD	151227.8	573948.3	
EX-3	TBD	151227.8	573965.6	
EX-4	TBD	151227.8	573982.8	
EX-5	TBD	151242.7	573922.5	
EX-6	TBD	151242.7	573939.7	
EX-7	TBD	151242.7	573957.0	
EX-8	TBD	151242.7	573974.2	
EX-9	TBD	151257.7	573931.1	
EX-10	TBD	151257.7	573948.3	
EX-11	TBD	151257.7	573965.6	
EX-12	TBD	151257.7	573982.8	
EX Duplicate [b]	TBD	TBD	TBD	
OB-1	TBD	151192.8	573886.6	
OB-2	TBD	151192.8	573902.1	
OB-3	TBD	151192.8	573917.5	
OB-4	TBD	151206.2	573878.9	
OB-5	TBD	151206.2	573894.3	
OB-6	TBD	151206.2	573909.8	
OB-7	TBD	151206.2	573925.2	
OB-8	TBD	151219.6	573886.6	
OB-9	TBD	151219.6	573902.1	
OB-10	TBD	151233.0	573878.9	
OB-11	TBD	151233.0	573894.3	
OB-12	TBD	151233.0	573909.8	
OB Duplicate [d]	TBD	TBD	TBD	
Equipment blank	TBD	NA	NA	ICP metals, mercury, hexavalent chromium, IC anions NO_2/NO_3

a Sample analysis performed as defined in Table 1, Laboratory Analytical Methods
b One duplicate soil sample will be collected from each decision unit at a location selected at the project analytical lead's discretion.
HEIS = Hanford Environmental Information System
IC = ion chromatography
ICP = inductively coupled plasma
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyls
TBD = to be determined
NA = not applicable

SAMPLE LOCATION MAP EXAMPLE

All sampling will be performed in accordance with ENV-1, *Environmental Monitoring and Management* consistent with the SAP (DOE-RL 2009a) requirements.

Figure 1. Verification Sample Locations for the XX-XX Waste Site Excavation.



Attachment 13

Environmental Protection Mission Completion Project
December 8, 2011

Orphan Sites Evaluations

- The 100-F/IU-2/IU-6 Area – Segment 4 Orphan Sites Evaluation Report, Rev. 0 is in the process of being transmitted to RL.
- The 100-F/IU-2/IU-6 Area – Segment 5 Orphan Sites Evaluation Report, Rev. 0 is in the process of being finalized.

Long-Term Stewardship

- The consolidated Draft, 100-F/IU-2/IU-6 - Segment 2 turnover and transition package is currently undergoing RL review.
- Initiated drafting of the 100-F/IU-2/IU-6 – Segment 3 turnover and transition package, and interim remedial action reports.

River Corridor Baseline Risk Assessment

- The Draft C Ecological Risk Assessment report (Volume I) regulator review period has ended. EPA/Ecology both indicated they will not directly comment, but may make indirect comments during RI/FS review. DOE will consider applicable K RI/FS comments and finalize the RCBRA

Remedial Investigation of Hanford Site Releases to the Columbia River

- The Draft A screening level ecological risk assessment was distributed by RL to the regulators for review on October 13, 2011. An extension to December 22 was requested by the regulators for completion of their review.
- The Draft A human health risk assessment is being developed to reflect RL comments.

Document Review Look-Ahead

Document	Regulator Review Start	Duration
Columbia River Component Risk Assessment – Screening Level Ecological Risk Assessment Report (DOE/RL-2010-117, Draft A, Volume I)	October 17, 2011	45 days
Columbia River Component Risk Assessment – Baseline Human Health Risk Assessment Report (DOE/RL-2010-117, Draft A, Volume II)	December 2011	45 days