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100/300 AREA UNIT MANAGER MEETING
ATTENDANCE AND DISTRIBUTION

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100/300 AREA UNIT MANAGERS MEETING
APPROVAL OF MEETING MINUTES

July14, 2011

APPROVAL: Jeanne C. Chance for Date 8-11-11
Mark French, DOE/RL (A3-04)
River Corridor Project Manager

APPROVAL: for B.C. Date 8-11-2011
Briant Charboneau, DOE/RL (A6-33)
Groundwater Project Manager

APPROVAL: Nina M. Menard Date 8/11/11
Nina Menard. Ecology (H0-57)
Environmental Restoration Project
Manager

APPROVAL: Date 8/11/11
Laura Buelow, Rod Lobos, or Christopher
Guzzetti, EPA (B1-46)
100 Area Project Manager

APPROVAL: Larry Gadbois Date 8-11-2011
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

July 14, 2011

ADMINISTRATIVE

- Next Unit Manager Meeting (UMM) – The next meeting will be held August 11, 2011, 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 June 9, 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)

Executive Session: An Executive Session was not held by RL, EPA, and Ecology prior to the July 14, 2011, UMM.

GENERAL

The groundwater, D4, FR, and Mission Completion presentations were provided in advance of the UMM. This allowed the presentation to be discussed "by exception." This practice will be continued for future UMMs.

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 on the plume chase campaign at 100-F-44:8.

Agreement 2: Attachment 4 provides an agreement to remove an additional three feet of soil from the southern excavation of the 600-351 site to reduce the TPH level.

Agreement 3: Attachment 5 provides an agreement to add 100-F-64 to the 100-F Air Monitoring Plan.

Agreement 4: Attachment 6 provides an offsite acceptability determination in order to ship one drum of nonradioactive oil, one drum of sludge, four drums of sodium silicate, and six drums of sodium dichromate from 100-F to Burlington Environmental, LLC, in Kent, WA.

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 and no action items were documented.

Agreement 1: Attachment 7 provides an agreement for the path-forward for sampling at 100-D-30.

Agreement 2: Attachment 8 provides an agreement to correct the numbers in the 100-D Air Monitoring Plan for air monitors N514 and N515.

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

Attachment 1 provides status and information for groundwater. Attachment 9 provides graphs of Gross Beta Trend Plots for the Apatite Permeable Reactive Barrier at 100-N. Attachment 2 provides status and information for Field Remediation activities. Attachment 10 provides status and information for D4/ISS activities at 100-N. No issues were identified and no action items were documented.

Agreement 1: Attachment 11 provides the proposed well design for 199-N-182. Ecology concurred with the proposed well construction on the basis that the proposed design is consistent with the 100-N SAP.

Agreement 2: Attachment 12 provides TPA Change Notice TPA-CN-434, revising DOE-RL-2010-34, *Removal Action Work Plan for River Corridor General Decommissioning Activities,* Rev. 0, to add the 4734D facility.

Agreement 3: Attachment 13 provides TPA Change Notice TPA-CN-450, revising DOE-RL-2005-93, *Remedial Design Report/Remedial Action Work Plan for the 100-N Area,* Rev. 0, to allow water found in pipelines, which is determined to meet clean water criteria (WAC-173-200 and WAC-173-340-720) to be used as dust suppression. In addition, when known clean water lines are encountered, the water in these lines may be used for dust suppression with process knowledge and field screening.

Agreement 4: Attachment 14 provides TPA Change Notice TPA-CN-465, revising DOE-RL-2002-70, *Removal Action Work Plan for 100-N Area Ancillary Facilities,* Rev. 2, to allow sediment to be removed from the floors of the 181-N, 181-NE, and 1908-NE facilities prior to backfill with clean fill material.

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 action items were documented.

Agreement 1: Attachment 15 provides an agreement to send two pieces of spent nuclear fuel stored at the 118-K-1 to K Basins and ultimately to the Canister Storage Building.

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 action items were documented.

> Agreement 1: Attachment 16 provides an agreement to expand the staging area for waste coming out of 100-C-7:1.

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 17 provides status of the D4 activities at the 300 Area. No issues were identified and no action items were documented.

> Agreement 1: Attachment 18 provides an agreement to reduce the sampling frequency for Wells 399-1-21A and 399-1-2 from monthly to quarterly.

REGULATORY CLOSEOUT DOCUMENTS OVERALL SCHEDULE

No issues were identified and no agreements or action items were documented.

MISSION COMPLETION PROJECT

Attachment 19 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. Attachment 20 provides a status of the last open item as a component of the last CERCLA 5-year review. No issues were identified and no agreements or action items were documented.

ADDITIONAL DOCUMENTS ENTERED INTO THE MEETING MINUTES

> Agreement 1: Attachment 21 provides DOE approval of a Waste Control Plan to manage waste generated from transition zone sampling activities at various locations in the River Corridor.
>
> Agreement 2: Attachment 22 provides DOE approval to use Air Monitoring Plans to perform waste site transition zone sampling.

Attachment A

100/300 AREA UNIT MANAGER MEETING
ATTENDANCE AND DISTRIBUTION
July 14, 2011

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Attachment B

100/300 Area UMM
Action List
May 12, 2011

Open (O)/ Closed (X)	Action No.	Co.	Actionee	Project	Action Description	Status
X	100-180	RL	M. Thompson	100-HR	DOE will provide EPA and Ecology with a CD containing the documents produced using EM-22 funding.	Open: 4/14/11; Action: Closed 5/12/11
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	100-182	RL	J. Hanson	100-HR	DOE will provide Ecology with data from the recently installed RI/FS borehole at 100-H-33/183-H Solar Evaporation Basin (when it becomes available).	Open: 4/14/11; Action: Closed 5/12/11
X	100-183	RL	M. Thompson	100-N	DOE will meet with Ecology to discuss phytotesting.	Open: 4/14/11; Action: Closed 5/12/11
X	100-184	RL	G. Sinton	All	DOE will revise the RAOs per the UMM discussion and route to management and agencies with the intent of documenting approval at the May 12, 2011, UMM.	Open: 4/14/11; Action: Closed 4/12/11
O	100-185	RL	G. Sinton	All	The Tri-Parties will review RAOs 6 and 7 for inclusion into the RAO document.	Open: 5/12/11; Action:
O	100-186	RL	M. Thompson	All	DOE will set up a substantive briefing to be held before the next UMM with EPA and Ecology to outline their modeling approach for determining cleanup levels to protect groundwater in the river corridor.	Open: 5/12/11; Action:

Attachment C

100/300 Area Unit Manager Meeting
July 14, 2011
Washington Closure Hanford Building
2620 Fermi Avenue, Richland, WA 99354
Room C209; 1:30-4:30 p.m.

1:30 - 1:45 p.m. **Administrative:**

- Approval and signing of previous meeting minutes (June 2011)
- Update to Action Items List
- Next UMM (8/11/2011, Room C209)

1:45 - 4:00 p.m. **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/Chris Smith/Rudy Guercia)
- Regulatory Closeout Documents Overall Schedule (John Neath, Mike Thompson)
- Mission Completion Project (John Sands)

4:00 - 4:15 p.m. **Special Topics/Other**

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

4:15 - 4:30 p.m. **Adjourn**

100/300 Area UMM
Action List
July 14, 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	100-185	RL	G. Sinton	All	The Tri-Parties will review RAOs 6 and 7 for inclusion into the RAO document.	Open: 5/12/11; Action: Closed 6/9/11
X	100-186	RL	M. Thompson	All	DOE will set up a substantive briefing to be held before the next UMM with EPA and Ecology to outline their modeling approach for determining cleanup levels to protect groundwater in the river corridor.	Open: 5/12/11; Action: Closed 6/9/11
O	100-187	RL	G. Sinton	All	DOE will revise RAO 6 and delete RAO 7 and distribute to the Tri-Parties for review.	Open: 6/9/11; Action:
O	100-188	RL	J. Hanson	100-HR	DOE will provide Ecology with a maintenance schedule for any wells impacted by the high water levels	Open: 6/9/11; Action:

Attachment 1

100/300 Areas Unit Managers Meeting
July 14, 2011

100-FR-3 Groundwater Operable Unit – Nathan Bowles / 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 - On schedule to meet the TPA milestone. Field investigations are complete and the Internal Draft of the RI/FS Report was reviewed internally. Updates are being incorporated into a Decisional Draft for DOE/RL review scheduled to begin in mid August.

Three wells scheduled for sampling in April (new RI wells) were sampled in June. Cr(VI) results are consistent with previous results. The wells are scheduled to be sampled again in July.

Columbia River Pore Water Sampling in 100-F Area, February 2011 (SGW-49575) was released in late June. It will be available in the Administrative Record. Reports on slug testing and aquifer testing are in preparations. These all support the RI/FS.

100-HR-3 Groundwater Operable Unit – Fred Biebesheimer / 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 - On schedule to meet the TPA milestone. Drilling and sampling continue and are complete with the exception of on replacement RI/FS well at the 100-D-12 waste site (a TPA change notice is being prepared to support the drilling and sampling of this well). The Decisional Draft was delivered for review by DOE-RL on July 7th, 2011.

- HR-3 Treatment System
  - For the period June 1 through 30, 2011:
    - The HR-3 system is in the process of layup and placement in cold standby.

- DR-5 Treatment System
  - For the period June 1 through 30, 2011:
    - The DR-5 shut down is complete. Work to realign the DR-5 wells to the DX system was completed on 6/30, 2011.

- DX Pump and Treat system
  - For the period June 1 through 30, 2011:
    - The DX pump and treat system is operating.
    - Total average flow through the system is 495 gpm.
    - The average influent hexavalent chromium concentration was 227 µg/L. July concentrations have begun increasing with the addition of the DR-5 wells.
    - DR-5 wells added to the system on June 30, 2011.

- HX Pump and Treat System,
  - Construction of the facility is complete; Construction Acceptance Testing is underway (65% complete) and scheduled to complete by 7/30/11.
  - Acceptance Testing is scheduled for August and September 2011.
  - The plant will be operational, and in Operations Testing from October through December 2011.

- ISRM Pond Sealing
  - The ISRM pond is largely dry (muck and wet sediment is remaining).
  - CHPRC is evaluating decommissioning path forward. Upon completion of the evaluation a meeting will be held to present recommendations.

- Currently recommend adding an ISRM pond decommissioning schedule to the RD/RA WP revision underway.

- RI/FS Activities
  - Fieldwork has been complete, with the exception of the replacement well to be installed at the 100-D-12 waste site location (well R5). Drilling is expected to begin by late July, or early August.
  - The RI/FS report decisional draft wad delivered for review by DOE-RL on July 7, 2011.

100-NR-2 Groundwater Operable Unit – Nathan Bowles / Deb Alexander

(M-015-60 - Six months after the ROD amendment [03/29/2011], if an amendment to the 100-NR-1/2 Record of Decision for Interim Action is issued, DOE shall submit an RD/RA Work Plan.)
Schedule Status - TPA milestone met by DOE/RL submittal of Rev. 1 Draft A document to Ecology on March 25, 2011. The submitted document remains under review by Ecology. An additional thirty days were requested by Ecology making the anticipated comment return date be June 14, 2011. Comments have not yet been received. Ecology indicated on July 14th that their comments will be provided to DOE-RL by the end of July.

(M-015-62-T01, 9/17/2012, Submit a Feasibility Study [FS] Report and Proposed Plan [PP] for the 100-NR-1 and 100-NR-2 Operable Units including groundwater and soil. The FS Report and PP will evaluate the permeable reactive barrier technology and other alternatives and will identify a preferred alternative in accordance with CERCLA requirements.)
Schedule Status – On schedule. The due date for this TPA Target Date changed to September 17, 2012 under TPA CN M-015-11-1, approved on March 12, 2011. Field investigations are underway with only well-drilling/sampling work remaining to be completed (discussed further below).

- RI/FS Activities
  - Well drilling/sampling:
    - C8185/#2 and C8187/#R2 – Field activities were completed in previous months.
    - C8184/#R1 (RUM well down-gradient of 1301-N and in the Sr-90 hot spot) – Well drilling resumed. The Ringold Upper Mud (RUM) unit was encountered at 102 ft bgs, and the borehole reached total depth at 154 ft bgs on July 13th. Samples for this well began in the RUM per the SAP. Geophysical logging was conducted from ground surface to the bottom of the unconfined aquifer. The well was originally planned to be screened within the Ringold Upper Mud (RUM), however, no water-producing interval was encountered. As a result the proposed well design called for the screened interval at the bottom of the unconfined aquifer. This design was approved by both DOE-RL and Ecology on July 14th.
    - C8188 #3 (well at the former head works of the remediated 1301-N Trench) – Well drilling began in May, but elevated field radiological readings at 19 ft bgs caused drilling to be suspended until additional radiological controls are in place. Drilling of this well will remain on hold for a longer period of time to allow for these additional controls to be put in place. Planning is set to resume drilling on July 19th.
    - C8191 #6 (well between 100-N and 100-K to further delineate the extent of the Cr(VI) plume which may be coming in 100-K Area) – Well drilling began on June 14 and the borehole was advanced to 114.8 ft bgs by July 14th.

- 100-N Integrated Groundwater Sampling and Analysis Plan – The Draft A document was submitted to Ecology by RL on June 2, 2010, and Ecology review of this document is continuing. Ecology comments were anticipated on June 14, 2011 alongside comments on the draft revision to the RD/RA

Work Plan (discussed above), but comments have not yet been received. Ecology indicated on July 14th that their comments will be provided to DOE-RL by the end of July.

- Apatite PRB Performance Monitoring
  The high-river stage performance monitoring at the existing apatite PRB began in May and was completed on June 27, 2011. The results of this sampling May/June sampling event will be provided when all of the analytical date are available (most likely at the September UMM meeting). Next event will be in the fall at low-river stage.

100-KR-4 Groundwater Operable Unit – Bert Day

- RI/FS Activities:
  - Transmitted for RL review the *Proposed Plan for Remediation of the 100-KR-1, 100-KR-1, and 100-KR-4 Operable Units*, Decisional Draft, on June 23.
  - Received RL comments on *Remedial Investigation/Feasibility Study for the 100-KR-1, 100-KR-2, and 100-KR-4 Operable Units*, Decisional Draft, on July 6.

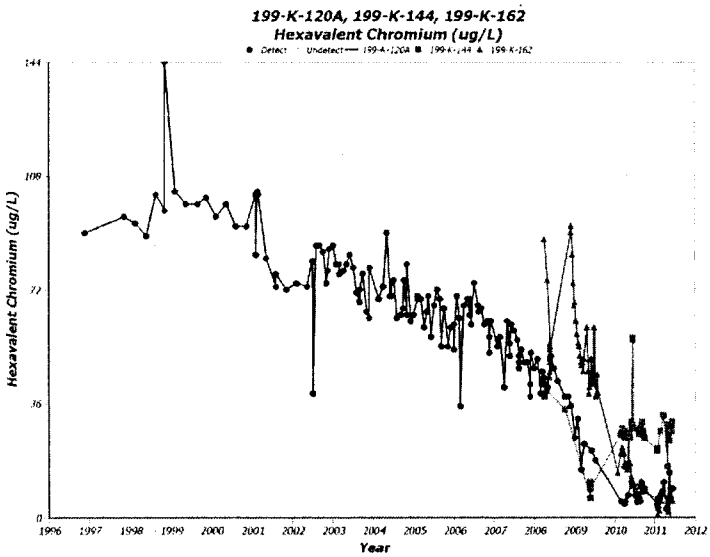
- Pump and Treat Systems Expansions and Modifications:
  - Phase 3 Realignment: in progress; currently completing 199-K-197.
  - ResinTech SIR-700: The NFPA 1, Fire Code, action regarding controls for increased sulfuric acid use at the facility has been resolved by reducing the concentration to 50% with a maximum allowable quantity of 500 gallons. The Test Plan is being updated to incorporate these changes and develop the revised schedule.

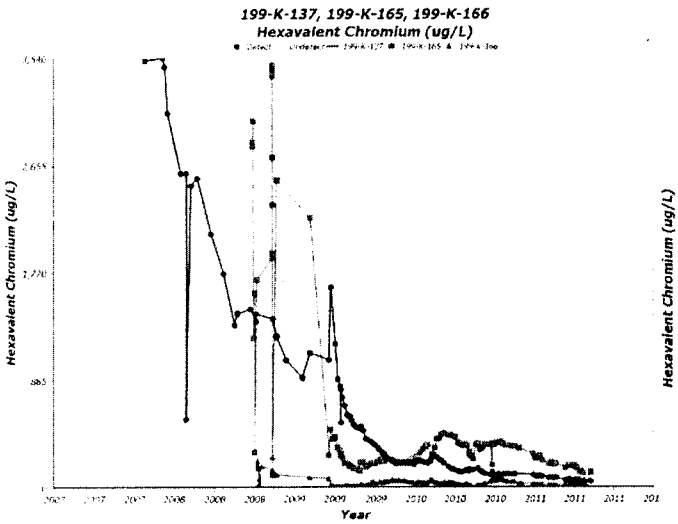
- Pump and Treat Operations:
  - KR-4, KX, and KW pump and treat systems are operating normally. The following provides data from 6/1/2011 – 6/30/2011:

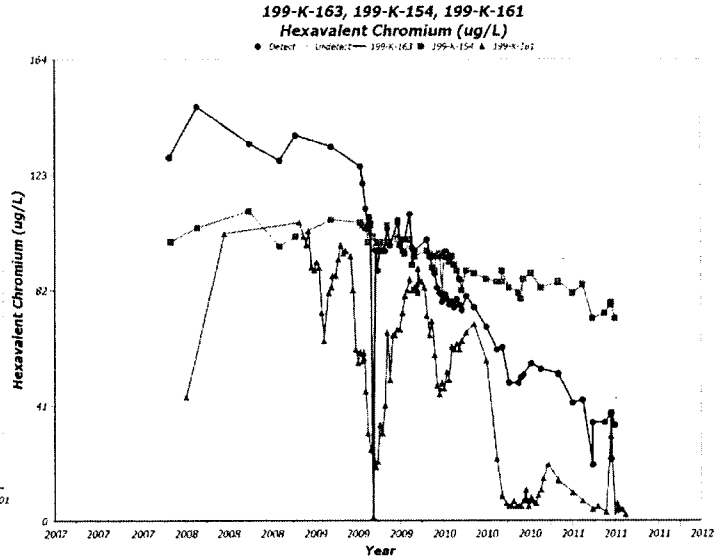
System	Average Flow Rates gpm	Cr(VI) Removed lbs	Average Influent Cr(VI) Concentration ppb
KX	493	6.6	41.9
KW	147	2.9	57.1
KR-4	122	0.7	23.9

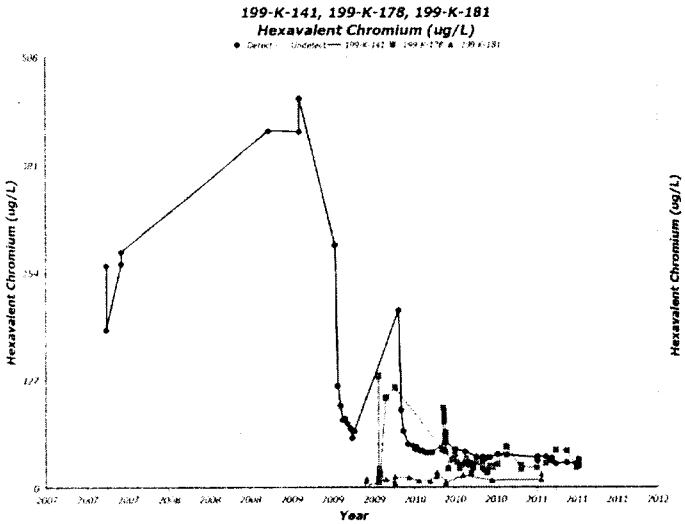
- Monitoring Activities:
  - Monthly Cultural Monitoring: The monitoring was conducted on Friday June 17th. No tribal representatives participated in this monitoring session. Three instances of off-road driving were observed during this monitoring session, all of which were located in close proximity to well 199-K-171. Reminder sent to Project personnel to stay on gravel roads in culturally sensitive posted areas. No additional instances of off road driving were observed during the remainder of monitoring activities.
  - Routine Monitoring:
    - Thirteen wells were sampled with 96 samples collected for June sampling. No 100-K aquifer tubes were sampled in June. No significant changes overall from last month except for slight increase in Cr(VI) concentrations observed at extraction wells 199-K-144 and 199-K-148.
    - Well 199-K-152 has been connected to the KX P&T system as an extraction well. Average hexavalent chromium concentration (field data) at this well is around 70 mg/L.

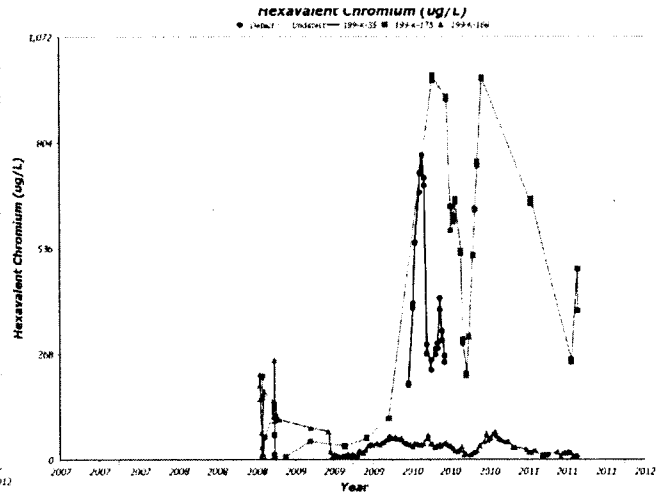
- Broad, long-term decreases in overall Cr6+ levels have been observed at KR4 and KX extraction wells at Northeast end of the K-2 Trench over the last 15 months. New shallow RI/FS well 199-K-201 at 116-K-2 trench is the only well show continuing high values above 100 µg/L Well 199-K-22, which has gradually declined Cr6+ from 164 µg/L in 2000, decreased sharply to April values of 58.9 and 86.3 µg/L. Well 199-K-18, which has shown an increasing Cr6+ concentration trend since December 1996, has been showing decreasing Cr6+ concentrations since peaking at 190-200 µg/L in Spring 2010. Concentrations have declined to 97 µg/L in April 2011. Hexavalent chromium concentrations at the downgradient extraction wells 199-K-162 and K-120A remained below 10 µg/L for April. Extraction well 199-K-145 declined from 62 to 46 µg/L between early October 2010 to 46 µg/L in January 2011. Farther upgradient, Cr6+ at well 199-K-111A has risen to 101 µg/L.
- Well 199-K-36, at the KE headhouse increased by over 300%, to 115 µg/L in June 2011 sampling. The KE headhouse and sedimentation basin structures are being demolished.
- Hexavalent chromium at KW monitoring well 199-K-173 has begun rising from a February 2011 low of 247 µg/L and rose to 483 µg/L in June, 2011.
- Hexavalent chromium results for 3 of the 5 new RI wells sampled in June 2011 have been posted. Initial sampling for all RI wells is now complete. Hexavalent chromium concentrations were below 3 µg/L at wells 199-K-183 (west of extraction well 199-K-138) and 199-K-191 (East of KE Reactor). Well 199-K-188, at the KE headhouse, detected Cr6+ concentrations of 41.1 µg/L, compared to a high vertical profile sampling result of 10.7 µg/L.
- Strontium-90 concentrations at KX extraction well 199-K-141 increased from 9.7 pCi/L in February to 14 pCi/L in May sampling. The Sr-90 DWS is 8 pCi/L.











100-BC-5 Groundwater Operable Unit – Nathan Bowles / Mary Hartman

(M-015-68-T01, 11/30/2011, Submit CERCLA RI/FS Report and Proposed Plan for the 100-BC-1, 100-BC-2 and 100-BC-5 Operable Units for groundwater and soil.)

Schedule Status - On Schedule to meet TPA milestone. Field investigations are complete and the Internal Draft of the RI/FS Report was reviewed internally. Updates are being incorporated into a Decisional Draft for DOE/RL review scheduled to begin in late July.

Four wells where sampling was delayed (from January or April) were sampled in June. Seven wells are scheduled to be sampled again in July.

We received data from wells sampled in April. Sr-90 in well 199-B3-47 was in trend with previous data (30 pCi/L). Sr-90 was barely detectable in bottom-of-aquifer well 199-B2-51 (2.9±2.3 pCi/L). Sr-90 was unexpectedly detected at 5.3 ±.8 pCi/L in RUM well 199-B2-15. This is a suspected false positive, so the sample is being reanalyzed. Other constituents are in line with previous data. VOA data have not yet been received.

Columbia River Pore Water Sampling in 100-BC Area, February 2011 (SGW-49368) was released in late June. It will be available in the Administrative Record. Reports on slug testing and aquifer testing are in preparations. These all support the RI/FS.

300-FF-5 Groundwater Operable Unit – Mark Kemner / Kelly Johnson

(M-015-72-T01, 12/31/2011, Submit CERCLA RI/FS Report and Proposed Plan for the FF-5 Operable Units for groundwater and soil.)

Schedule Status - On Schedule to meet TPA milestone. Field investigations are complete. The 11 monitoring wells and 5 temporary wells in the RI/FS work plan are complete. The four IFRC wells in the South Pond are complete.

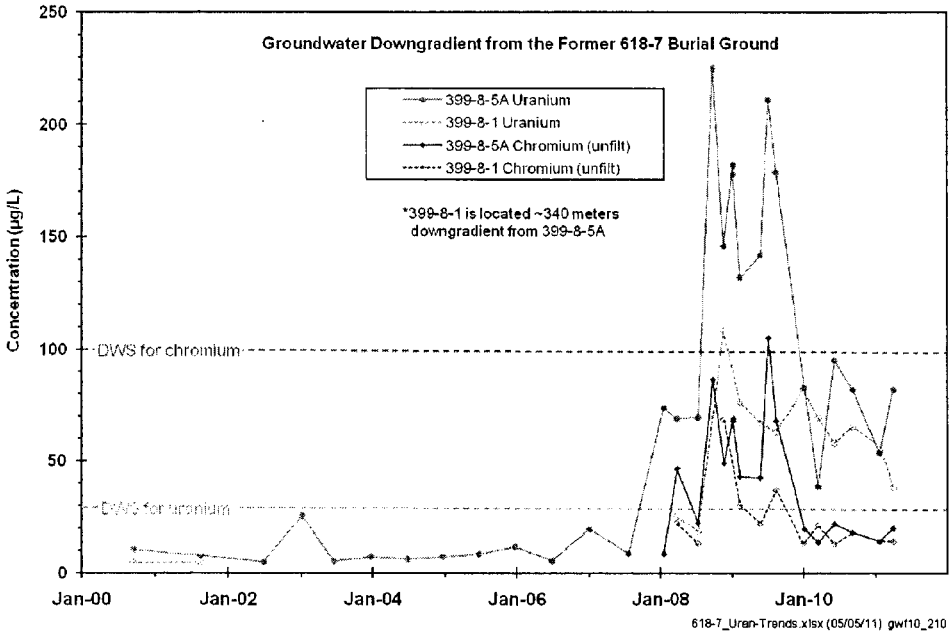
- All three rounds of RI/FS spatial and temporal groundwater sampling for 300-FF-5 have been completed.

- 300 Area RI/FS Activities (DOE/RL-2009-30, Rev. 0, 2010)
  - *300 Area Drilling:* All eleven of the planned characterization boreholes have been drilled, completed as monitoring wells, and accepted for use in February. They are in the scheduling queue for quarterly sampling. The five 'temporary wells' have been drilled, completed, and accepted for use in early April, and are also in the scheduling queue. At the IFRC research site in the former South Process Pond, four boundary condition wells have been completed and accepted for use by that project.
    - *300 Area RI/FS Report:* **Chapter 1 (Introduction)** - Review of author draft complete; revisions incorporated; tech pubs formatting and editing complete. **Chapter 2 (Remedial Investigation Activities)** - author review complete; revisions incorporated; new RI data needs to be incorporated prior to internal review. **Chapter 3 (Physical Characteristics)** - Author review complete; some revisions incorporated. PNNL to address comments related to geology and groundwater. Tech pubs began to format/edit the chapter in advance of comments being addressed. **Chapter 4 (Nature and Extent) -** Work continues by WCH on the soils portion of Chapter 4, which is approximately 100% complete. No groundwater text completed as of 4/30/11; four draft tables completed. Additional summaries include tables showing recent groundwater monitoring results for all COPC's identified in the Work Plan, and maximum values for various waste indicator constituents by well for each year since the remedial investigation began in 1992. The annual report will be used as a starting point for the Chapter 4 text and a number of the figures; 30% complete. **Chapter 5 (Fate and Transport)** - draft of uranium discussion complete; awaiting final list of soil COPCs and modeling write up to complete remaining discussion; 65% complete **Chapters 6 and 7 (Human Health and Risk Assessment)** risk assessment team is proceeding with preliminary tasks. Preliminary list of waste sites for FS evaluation provided on 3/2/11. Awaiting CVP data from remaining interim closed sites to finalize waste site list. Preliminary groundwater COPCs provided on 4/1/11. Approximately 25% complete. **Chapter 8 (Identification and Screening of Technologies) -** text and technology screening tables (Tables 8-5 and 8-6) 95% complete; awaiting final COPCs and PRGs prior to completing draft. **Chapter 9 –** preliminary work began based on 100K report. 90% of model runs conducted to evaluate groundwater alternatives. Draft waste binning table submitted in late April; waste sites will need to be binned prior to proceeding with alternative development; 25% complete. **Chapter 10 –** Not started.

- 300-FF-5 Operations and Maintenance Plan Activities (DOE/RL-95-73, Rev. 1, 2002)
  - *300 Area Subregion:*
    - The most recent analytical results are for samples collected in May 2011 from wells scheduled for monthly sampling, and April 2011 for wells scheduled at less frequent

intervals. In general, results are on trend and within expectations. Gradually decreasing concentrations for waste indicator constituents is common for results since ~2006. Results for aquifer tube sampling conducted during March are also available, and are consistent with historical trends and expectations.

- Special sampling downgradient of the 618-7 Burial Ground remediation site: The most recent sampling at wells that monitor the plume occurred in early April (see trend chart below). The concentration trends for chromium reveal essentially complete passage of the groundwater impacted by activities at the burial ground. Because uranium interacts with sediment, concentrations are slower to fall back to pre-burial ground activity levels.



- Special sampling near the 618-1 Burial Ground/Acid Neutralization Pit remediation site: No new information since the April unit manager meeting. The most recent sampling at two wells that monitor conditions downgradient of these remediation sites took place in early May. Monthly sampling continues at wells 399-1-2 and 399-1-21A, although remediation activities are essentially complete at these waste sites. No groundwater impacts attributable to remediation have been observed.
- 324 Building issue: No new information since the April unit manager meeting. The most recent sampling of a well that monitors conditions near the building took place in May. To date, monitoring results do not reveal evidence of groundwater impacts from releases at the building.

— *618-11 Burial Ground Subregion:* No new information to report since the March and April 2011 unit manager meetings. The most recent results are for samples collected in May 2011.
— *618-10 Burial Ground/316-4 Cribs Subregion:* The most recent analytical results are from two wells situated adjacent to the burial ground that was sampled in May 2011. Concentrations for waste indicator constituents remain consistent with historical trends and below their respective drinking water standards.

Annual Reports

- Groundwater Annual Report - The 2010 site-wide annual groundwater report is in external review.

- 100 Area Annual Report - 100 Areas pump-and-treat performance report is in external review. Once comments are received and incorporated, the report will be published. The target date for publication is 31 July, 2011. A meeting will be held with to discuss the KR-4 OU on July 13th. A meeting will be held on July 20th to discuss the NR-2 and HR-3 OUs.

General Discussion

The Stop work for the use of dedicated submersible pumps has been lifted. The well access list was revised to include the electrical bonding requirements for each well. Additionally, the groundwater sampling procedure was revised to require the use of a temporary grounding strap pending permanent electrical bonding of the wells.

Attachment 2

July 14, 2011 Unit Manager's Meeting
Field Remediation Status

100-B/C

- Completed concrete demo load-out to U Canyon
- 210,000 tons

- Continued remediation efforts at 100-C-7 & 100-C-7:1
- 100-C-7, 87,000 bank cubic meters removed
- 100-C-7:1, 295,000 bank cubic meters removed

100-D

- Continued demo, processing and load-out at 100-D-50:4 and 100-D-50:6 and 100-D-65 contingent on river levels
- Continued demo, processing and stockpiling at 100-D-62 and 100-D-77
- Relocating 100-D-31:9 stockpile to gain access to 100-D-104
- Continued anomaly processing at 118-D-3

100-F

- Continued demolishing and loading the western deeper portion of 100-F-57
- Collected closeout samples from 100-F-45, 100-F-48, 100-F-55 and 100-F-62

100-H

- Preparing for remediation of 100-H-28:4
- Continued load-out of plume at 132-H-3
- Completed plume chasing and load-out of material from 128-H-1 and 600-151
- Conducted verification sampling of 118-H-3 stockpile and staging area
- Continued backfill of 118-H-3
- Completed backfill of 100-H-3, 100-H-4, 116-H-9, 118-H-2, and 1607-H3
- Continued stockpiling backhauled material from ERDF

100-K

- Continued excavation and load-out at trenches I, N and H
- Conducting final cleanup activities (downposting/surveying/sampling/spot removal) at trenches C/F, K and O

100-N

- Continued phase II design for UPR-100-N-17, insitu bioremediation site
- Continued excavation, processing and load-out of 100-N-61 and 100-N-64

- Completed excavation and stockpiling of shallow petroleum sites UPR-100-N-18, UPR-100-N-20 and UPR-100-N-24. Began tapping and draining adjacent pipelines
- Continued load-out activities at 100-N-47
- Initiated truck and pup loadout at 128-N-1 and 124-N-4

618-10 Trench Remediation

- Continued excavation of waste trenches and processing of anomalies (drums and bottles)
- Repair door hinges on new drum punch.

100-IU-2/6 (milestone sites)

- 600-176 (White Bluffs Paint Disposal Area)
  - Site is closed.
- 600-120 (White Bluffs Spare Parts Burn Pit)
  - Site is closed.
- 600-109 (Hanford trailer camp Landfill)
  - Site is closed.
  - Continue/finish backfill.
- 600-124 (White Bluffs Burn Site & Paint Disposal Area)
  - Site is closed.
- 600-127 (White Bluffs Loading Docks & Fuel Storage Area)
  - Site is closed.
  - Start backfill.
- 600-125 (White Bluffs Waste Disposal Trench 1)
  - Site is closed.
  - Site is re-vegetated.
- 600-5 (White Bluffs Waste Oil Dump)
  - Site is closed.
  - Site is re-vegetated.
- 600-182 (White Bluffs Asbestos Pipe Lagging)
  - Site Closed.
- 600- 3 (Hanford Townsite Excess Material Storage Yard, Paint Pit)
  - Continuing the closure process.
- 600- 280 (Hardened Tar Site)
  - Site is closed.
- 600-188 (White Bluffs Waste Disposal Trench 2)
  - Site is closed.
- 600- 205 (Hanford Townsite Landfill 2)
  - Site is closed.
- 600- 202 (Hanford Townsite Burn and Burial Pits)

- Site is closed.
- Hauled 1,000 BCMs of cover material from ERDF to the site.

- 600-108 (Pu-Vaults)
  - Continued the closure process.
- 600-178 (Guard House Toilet Pit)
  - Continued the closure process.
- 600-146 (Steel Structure on the Northwest side of Gable Mountain)
  - Site is closed.
  - Site is re-vegetated.
- 600-100 (White Bluffs Landfill)
  - Site is closed.
  - Site is re-vegetated.
- 600-149:1 (Small Arms range - UXO)
  - Continued the closure process.
- 600-186 (Hanford Construction Camp Septic and Pipelines)
  - Continued the closure process.

100-IU-2/6 (non-milestone sites)

- (PNL Mounds)
  - Preparing backfill concurrence.
- (Hanford townsite sub sites 2, 2, &4)
  - Began and complete remediation.
- (Hanford townsite area sub site 2)
  - Began and completed remediation.
- 600-328 (Hanford townsite area sub site 1)
  - Began and complete remediation.

Attachment 3

From: Saueressig, Daniel G
Sent: Thursday, July 14, 2011 6:43 AM
To: ^WCH Document Control
Subject: FW: 100-F-44:8 Plume Chase:

Attachments: Summary of 100-F-44-8 re-sample locations that exceed direct exposure.doc

Summary of 00-F-44-8 re-sampl.

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

Thanks,

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

-----Original Message-----
From: Post, Thomas [mailto:Thomas.Post@rl.doe.gov]
Sent: Wednesday, July 13, 2011 3:14 PM
To: Christopher Guzzetti; Jakubek, Joshua E
Cc: Dobie, Chad H; Saueressig, Daniel G; Fancher, Jonathan D (Jon)
Subject: RE: 100-F-44:8 Plume Chase:

I concur.

Thanks.

Tom

-----Original Message-----
From: Christopher Guzzetti [mailto:Guzzetti.Christopher@epamail.epa.gov]
Sent: Wednesday, July 13, 2011 3:13 PM
To: Jakubek, Joshua E
Cc: Dobie, Chad H; Saueressig, Daniel G; Fancher, Jonathan D (Jon); Post, Thomas
Subject: Re: 100-F-44:8 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

From: "Jakubek, Joshua E" <jejakube@wch-rcc.com>
To: Christopher Guzzetti/R10/USEPA/US@EPA, "Post, Thomas C" <thomas.post@rl.doe.gov>
Cc: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>, "Fancher, Jonathan D (Jon)" <JDFANCHE@wch-rcc.com>, "Dobie, Chad H"

<chdobie@wch-rcc.com>
Date: 07/13/2011 03:00 PM
Subject: 100-F-44:8 Plume Chase:

Gentlemen, we have completed the latest plume chase campaign at 100-F-44:8 and have received the verification samples back. We still have a few Direct Exposure RAG exceedences that are an issue. Attached is a spreadsheet with the data results as well as a plan of attack for the proposed plume chase. (Thanks to Chad Dobie for his work on this!) Please look over this information and let me know if you have any questions. If you concur with the plan just let me know and we will get it done. Have a great afternoon!

Thanks,

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

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

[attachment "winmail.dat" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "message_body.rtf" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "Summary of 100-F-44-8 re-sample locations that exceed direct exposure.doc" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "Re-samples exceeding RAGs.xls" deleted by Christopher Guzzetti/R10/USEPA/US]

Attachment 4

From: Saueressig, Daniel G
Sent: Thursday, July 14, 2011 6:40 AM
To: ^WCH Document Control
Subject: FW: 600-351 Plume Chase:

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

Thanks,

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

-----Original Message-----
From: Post, Thomas [mailto:Thomas.Post@rl.doe.gov]
Sent: Wednesday, July 13, 2011 9:10 AM
To: Saueressig, Daniel G
Subject: RE: 600-351 Plume Chase:

I concur.

Tom

-----Original Message-----
From: Saueressig, Daniel G
Sent: Wednesday, July 13, 2011 6:55 AM
To: Post, Thomas
Subject: FW: 600-351 Plume Chase:

Tom, can you reply to Chris's email below with your concurrence and then I'll document at the next UMM.

Thanks,

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

-----Original Message-----
From: Christopher Guzzetti [mailto:Guzzetti.Christopher@epamail.epa.gov]

Sent: Wednesday, July 06, 2011 12:48 PM
To: Jakubek, Joshua E
Cc: Saueressig, Daniel G; Berezovskiy, Inna B; Fancher, Jonathan D (Jon); Post, Thomas C
Subject: RE: 600-351 Plume Chase:

No...sounds good. I'm ok with chasing the TPH and resampling as indicated in your earlier email.

Thanks!

Christopher J. Guzzetti
U.S. EPA Region 10
Hanford Project Office
Phone: (509) 376-9529
Fax: (509) 376-2396

From: "Jakubek, Joshua E" <jejakube@wch-rcc.com>
To: Christopher Guzzetti/R10/USEPA/US@EPA
Cc: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>, "Berezovskiy, Inna B" <ibberezo@wch-rcc.com>, "Fancher, Jonathan D (Jon)" <JDFANCHE@wch-rcc.com>, "Post, Thomas C" <thomas.post@rl.doe.gov>
Date: 07/06/2011 12:35 PM
Subject: RE: 600-351 Plume Chase:

Chris, The map/data showing the site in an orchard area is in the VWI (0600X-WI-G0066). Right now the excavations are just about a meter deep.
The sample design called for the excavations to be cut in half and a sample of each half consisted of 25 aliquots. Some of the aliquots came from the bottom (about 1m deep), but many came from the side slopes (0-1m deep.) I hope this helps. Please let me know if you need anything else.

Thanks,

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

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

-----Original Message-----
From: Christopher Guzzetti [mailto:Guzzetti.Christopher@epamail.epa.gov]
Sent: Wednesday, July 06, 2011 7:31 AM
To: Jakubek, Joshua E
Cc: Saueressig, Daniel G; Berezovskiy, Inna B; Fancher, Jonathan D (Jon); Post, Thomas C
Subject: Re: 600-351 Plume Chase:

How deep in the excavation are we failing for lead and arsenic? Do we have the map that shows this site is a former orchard?

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

From: "Jakubek, Joshua E" <jejakube@wch-rcc.com>
To: Christopher Guzzetti/R10/USEPA/US@EPA, "Post, Thomas C" <thomas.post@rl.doe.gov>
Cc: "Fancher, Jonathan D (Jon)" <JDFANCHE@wch-rcc.com>, "Saueressig, Daniel G" <dgsauere@wch-rcc.com>, "Berezovskiy, Inna B" <ibberezo@wch-rcc.com>
Date: 06/30/2011 07:43 AM
Subject: 600-351 Plume Chase:

Gentlemen, we have received the verification sample results back from the 600-351 site. (Small site south of 100-F Reactor) The samples show high levels of lead and arsenic,

which are consistent with Pre-Hanford orchard sites. There is an agreement in place that covers these results, but we also have a high TPH hit in the southern excavation. The result is 210 mg/kg and the MCA 1996 threshold is 200 mg/kg. Because of this I would like to propose removing another 3 ft. of soil from the southern excavation solely, which should bring our TPH levels under the RAG. The plan is to re-sample only for the analytes that failed in that area (ICP Metals and TPH). Please let me know if you concur.

I hope you all have a safe and happy Independence Day!

Thanks,

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

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

[attachment "winmail.dat" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "message_body.rtf" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "600-351 Plume.PDF" deleted by Christopher Guzzetti/R10/USEPA/US]

Attachment 5

160002

^WCH Document Control

From: Saueressig, Daniel G
Sent: Thursday, July 14, 2011 6:39 AM
To: ^WCH Document Control
Subject: FW: REQUEST ADDITION OF 100-F-64 TO 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 [mailto:Thomas.Post@rl.doe.gov]
Sent: Wednesday, July 13, 2011 1:58 PM
To: Saueressig, Daniel G
Subject: FW: REQUEST ADDITION OF 100-F-64 TO 100-F AIR MONITORING PLAN

Dan,

I also concur on this.

Tom

-----Original Message-----
From: Christopher Guzzetti [mailto:Guzzetti.Christopher@epamail.epa.gov]
Sent: Wednesday, July 13, 2011 7:25 AM
To: Saueressig, Daniel G
Cc: Post, Thomas
Subject: Re: REQUEST ADDITION OF 100-F-64 TO 100-F AIR MONITORING PLAN

I concur with adding this site to the 100-F AMP.

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

From: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>
To: Christopher Guzzetti/R10/USEPA/US@EPA, "Post, Thomas C" <thomas.post@rl.doe.gov>
Date: 07/11/2011 08:00 AM
Subject: REQUEST ADDITION OF 100-F-64 TO 100-F AIR MONITORING PLAN

Chris/Tom, I'd like to request your approval to add 100-F-64 to the existing air monitoring plan for 100-F. I've attached the Total Effective Dose Equivalent (TEDE) calculation documenting the low TEDE to the maximally exposed individual (1.06E-05 mrem/yr). I've also included the approved air monitoring plan for your information.

Let me know if you concur with adding this site to the existing air monitoring plan and I'll document the agreement at the next UMM.

Thanks,

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

[attachment "winmail.dat" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "message_body.rtf" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "100-F AMP.pdf" deleted by Christopher Guzzetti/R10/USEPA/US] [attachment "100-F-64 TEDE.pdf" deleted by Christopher Guzzetti/R10/USEPA/US]

Attachment 6

^WCH Document Control

159177

From: Saueressig, Daniel G
Sent: Monday, June 13, 2011 1:20 PM
To: ^WCH Document Control
Subject: FW: Offsite request

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: Einan.David@epamail.epa.gov [mailto:Einan.David@epamail.epa.gov]
Sent: Monday, June 13, 2011 1:17 PM
To: Saueressig, Daniel G
Cc: Guzzetti.Christopher@epamail.epa.gov; Post, Thomas C
Subject: RE: Offsite request

Dan--

Burlington Environmental is acceptable for shipments through August 13, 2011.

Dave Einan
EPA Region 10
Hanford/INL Project Office
309 Bradley Blvd, Ste 115
Richland, WA 99352
509-376-3883

From: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>
To: David Einan/R10/USEPA/US@EPA, Christopher Guzzetti/R10/USEPA/US@EPA
Cc: "Post, Thomas C" <thomas.post@rl.doe.gov>
Date: 06/09/2011 06:04 AM
Subject: RE: Offsite request

Dave, Laura said you would be the one to approve this request. Shipment is scheduled for July 12, 2011, the last offsite request you approved for this facility ended on July 11.

Can you let me know if you approve of sending this material to Burlington Environmental?

Thanks,

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

-----Original Message-----
From: Saueressig, Daniel G
Sent: Thursday, May 26, 2011 3:57 PM

159177

To: Buelow, Laura; Einan, David R
Cc: Post, Thomas C
Subject: Offsite request

Laura, I also need to request an offsite acceptability determination in order to ship 4 drums of sodium silicate and 6 drums of sodium dichromate that are currently stored at 100-F to the same place that the oils below are going, Burlington Environmental, LLC.

Please let me know if you concur with sending this material offsite for treatment and disposal. Shipment is scheduled for either June 14 or July 12, 2011.

Dave, thanks for your help with the oils below, I wanted to clarify that one of the drums contains sludge, not oil, which shouldn't affect the approval. I just want to make sure you're aware of what we're sending offsite.

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

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

-----Original Message-----
From: Einan.David@epamail.epa.gov [mailto:Einan.David@epamail.epa.gov]
Sent: Thursday, May 12, 2011 10:53 AM
To: Faulk, Darrin E
Subject: Re: Offsite request

Darrin--

I have heard back and the facility is acceptable for shipments through July 11, 2011.

Dave Einan
EPA Region 10
Hanford/INL Project Office
309 Bradley Blvd, Ste 115
Richland, WA 99352
509-376-3883

From: "Faulk, Darrin E" <defaulk@wch-rcc.com>
To: David Einan/R10/USEPA/US@EPA
Date: 05/03/2011 06:41 AM
Subject: Offsite request

Hi Dave

I need an offsite acceptability determination in order to ship 2 drums of nonradioactive oil from 100F. They will be shipped to:

Burlington Environmental, LLC, 20245 77th Ave., South, Kent, WA 98302 EPA ID #: WAD991281767

Please let me know if you need any additional information.

THANKS

Darrin Faulk
509-392-2932

[attachment "winmail.dat" deleted by David Einan/R10/USEPA/US] [attachment "message_body.rtf" deleted by David Einan/R10/USEPA/US]

[attachment "winmail.dat" deleted by David Einan/R10/USEPA/US] [attachment "message_body.rtf" deleted by David Einan/R10/USEPA/US]

Attachment 7

160021

^WCH Document Control

From: Yasek, Donna M
Sent: Thursday, July 14, 2011 12:00 PM
To: ^WCH Document Control
Cc: Saueressig, Daniel G
Subject: FW: 100-D-30 Path forward
Attachments: 100-D-30 agreement.doc

Please chron, including the attached file, as a regulatory agreement for 100-D-30.

Once it has been chroned, please print a copy for Dan Saueressig to pick up this afternoon.

Thanks -
Donna

From: Post, Thomas [mailto:Thomas.Post@rl.doe.gov]
Sent: Thursday, July 14, 2011 11:55 AM
To: Boyd, Alicia
Cc: Yasek, Donna M
Subject: RE: 100-D-30 Path forward

Donna,

DOE concurs with the attached approach as well.

Thanks for completing this UMM submittal.

Tom

From: Boyd, Alicia (ECY) [mailto:aboy461@ecy.wa.gov]
Sent: Thursday, July 14, 2011 11:18 AM
To: Yasek, Donna M; Post, Thomas
Cc: Laurenz, Julian E; Menard, Nina (ECY); Seiple, Jacqueline (ECY); Welsch, Kim (ECY); Varljen, Robin (ECY)
Subject: RE: 100-D-30 Path forward

The approach outlined in the attached document (100-D-30 agreement) is an accurate representation of the path forward for sampling at 100-D-30 discussed on June 2, 2011. Ecology finds this path forward acceptable.

Alicia L. Boyd
Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354
Ph – 509-372-7934
Fx – 509-372-7971

In order to focus on completing important work in a timely manner I may limit checking

my e-mail. If there is an urgent matter please mark the message as "urgent" or make a phone call. Thank you for your understanding and patience.

From: Yasek, Donna M [mailto:dmyasek@wch-rcc.com]
Sent: Monday, June 27, 2011 6:56 AM
To: Boyd, Alicia (ECY); Post, Thomas C
Cc: Laurenz, Julian E
Subject: 100-D-30 Path forward

I was tasked with getting the 100-D-30 agreement documented. I have attached the notes that Dave Martin prepared from your meeting earlier this month. He sent it out for review but when I talked to him last week he hadn't received any comments.

If DOE and Ecology have no comments on the agreement, could you please drop me an email concurring with the approach? Then I'll get it entered into the July UMM as an agreement.

Please let me know if you have any questions or concerns.

Thanks -
Donna
372-9229

<<100-D-30 agreement.doc>>

Meeting was held at the Ecology Offices at 1130, June 2, 2011.

Attendees were Tom Post (DOE), Dave Martin (WCH), and Jacqui Seiple, Nina Menard, Kim Welsch, Robin Varljen, and Alicia Boyd (all representing Ecology).

On the subject of the C6446 sample point in 100-D-30, the following agreement was reached:

WCH will excavate the C6446 sample location and resample.

Soil and material removed from below the existing bottom of the 100-D-30 excavation will be sent to ERDF.

Soil removed to support this excavation that is above the existing bottom of the 100-D-30 excavation will be stockpiled for later use as fill material.

WCH will excavate down to a point 15' below the bottom of the existing 100-D-30 excavation. The bottom of the excavation will be a 4'x 4' square.

Samples will be taken at the bottom of this excavation, one in the center and one at the toe of the excavation in each direction.

Samples will be taken in the sidewalls 3' above the toe in each direction.

Once these samples are taken, WCH will excavate down to 20' below existing 100-D-30 excavation, and take one sample.

All of these samples will be analyzed for Metals, Hex Chrome, and Mercury.

Attachment 8

159276

^WCH Document Control

From: Saueressig, Daniel G
Sent: Tuesday, June 21, 2011 11:17 AM
To: ^WCH Document Control
Subject: FW: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN
Attachments: ENW01_13A.PDF

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

Thanks,

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

From: Welsch, Kim (ECY) [mailto:KIWE461@ECY.WA.GOV]
Sent: Monday, June 20, 2011 7:15 AM
To: Saueressig, Daniel G
Cc: Boyd, Alicia
Subject: RE: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN

Dan,

As we discussed in the 100 Area UMM, I agree with your path forward to correct. Sorry I did not respond earlier.....have a great day!

Kim Welsch
WA State Dept. of **Ecology**
Nuclear **W**aste **P**rogram
3100 Port of Benton Blvd
Richland, WA 99354-1670
MSIN: H0-57
(509) 372-7882
kim.welsch@ecy.wa.gov

From: Saueressig, Daniel G [mailto:dgsauere@wch-rcc.com]
Sent: Monday, June 20, 2011 7:03 AM
To: Welsch, Kim (ECY)
Subject: RE: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN

Kim, have you had a chance to look this over?

Thanks,

159276

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

From: Saueressig, Daniel G
Sent: Thursday, June 09, 2011 6:31 AM
To: 'Welsch, Kim (ECY)'
Cc: Post, Thomas C; Woolard, Joan G; Boyd, Alicia
Subject: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN

Kim, a typo was found on the 100-D air monitoring plan and I'd like to make sure Ecology is aware of it. The figure included in the plan (attached) contained the wrong air monitoring number (also called an EDP code) for monitors N514 and N515. They were erroneously listed as N478 and N479.

I believe the mistake occurred because MSA was systematically bringing in monitors to their shop and upgrading them to new NEC standards. During the time the 100-D air monitoring plan was being revised, monitors with different numbers were placed at 100-D during this upgrade and we used those numbers in the figure included in the air monitoring plan. I'm told these numbers, or EDP codes, are like street addresses and are used for the site wide near-field monitoring program to track emissions across the site. Needless to say, I can't change these numbers to the ones listed in the plan, they need to remain listed as N514 and N515. Note that regardless of the numbers that are listed in the plan, we have been monitoring emissions at 100-D as discussed in the approved plan.

The next time the 100-D air monitoring plan is revised, we'll ensure that the correct monitoring number, or EDP code, is listed in the plan.

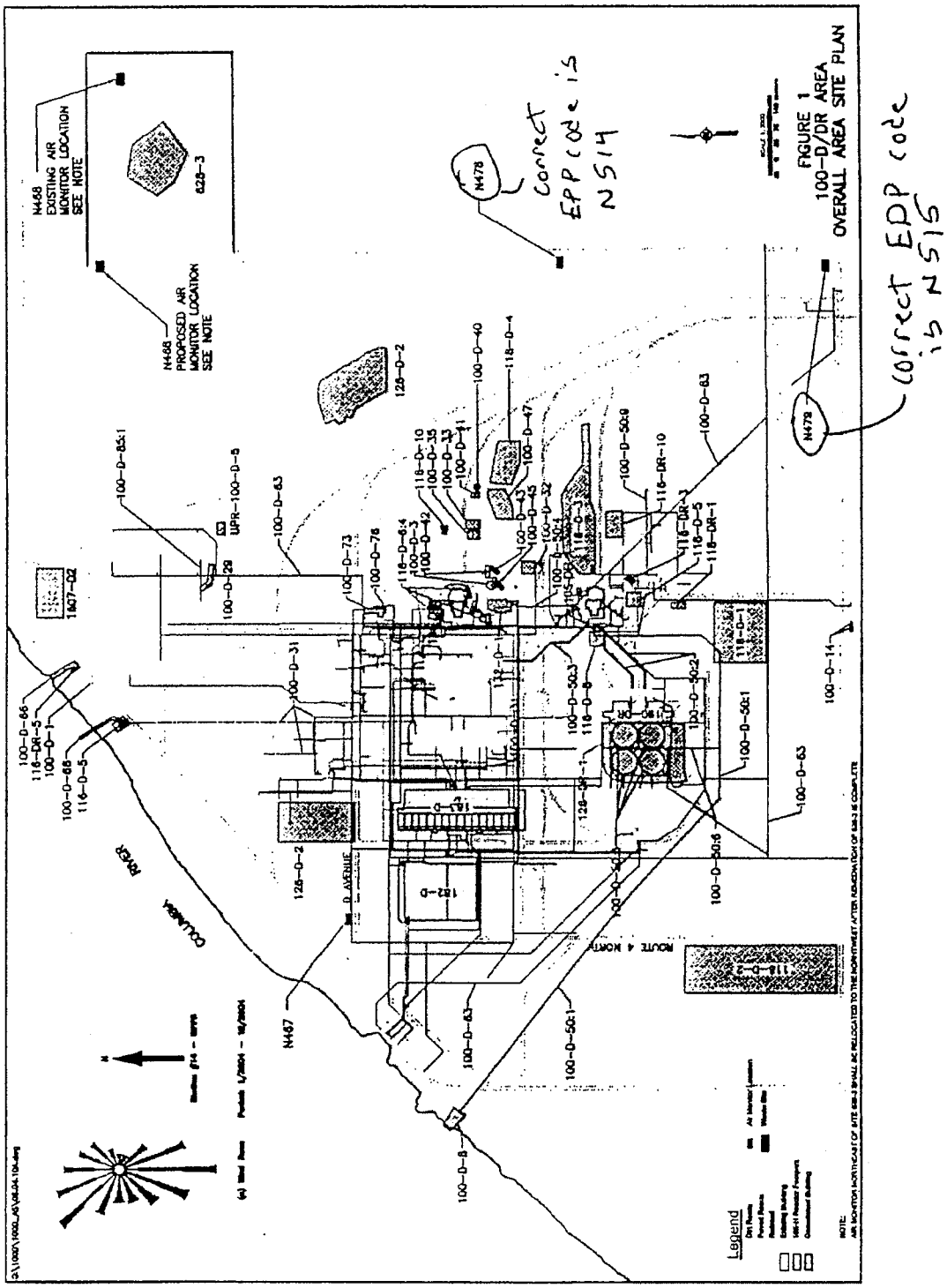
Let me know if you are okay with this path forward.

Thanks,

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

<< File: ENW01_13A.PDF >>

Figure 1. 100-D/DR Area Overall Site Plan.



Attachment 9

Figure 6-24 gwf10133. Gross Beta Trend Plot for Middle Upper Section of Apatite Permeable Reactive Barrier.

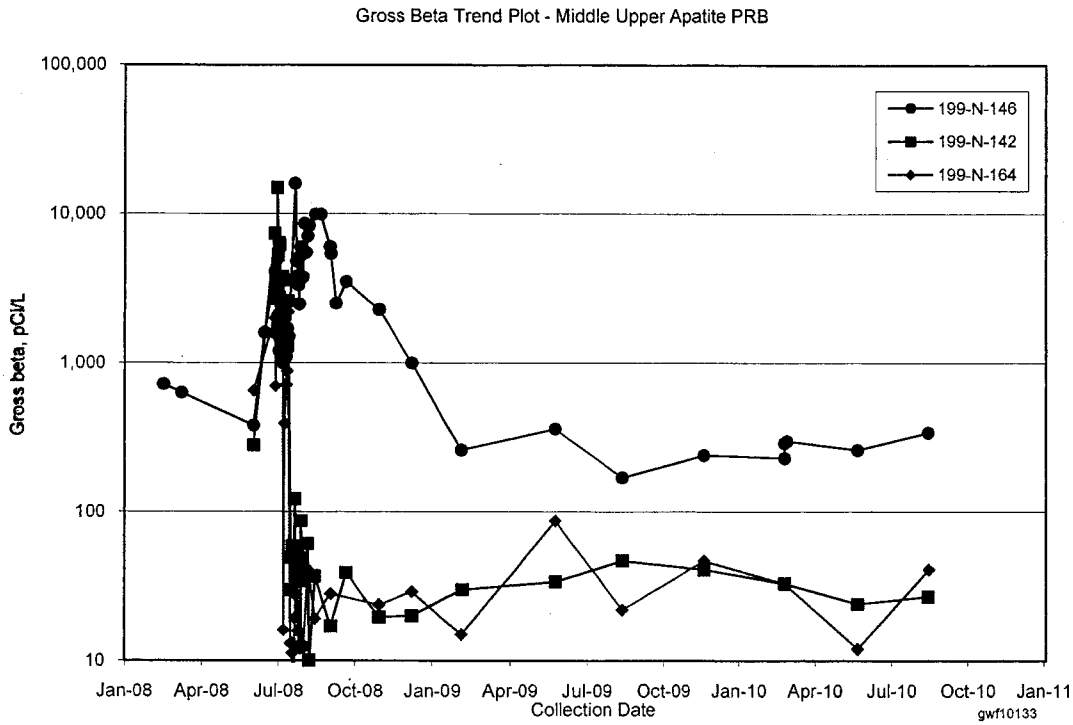


Figure 6-25 gwf10134. Gross Beta Trend Plot for Middle Lower Section of Apatite Permeable Reactive Barrier.

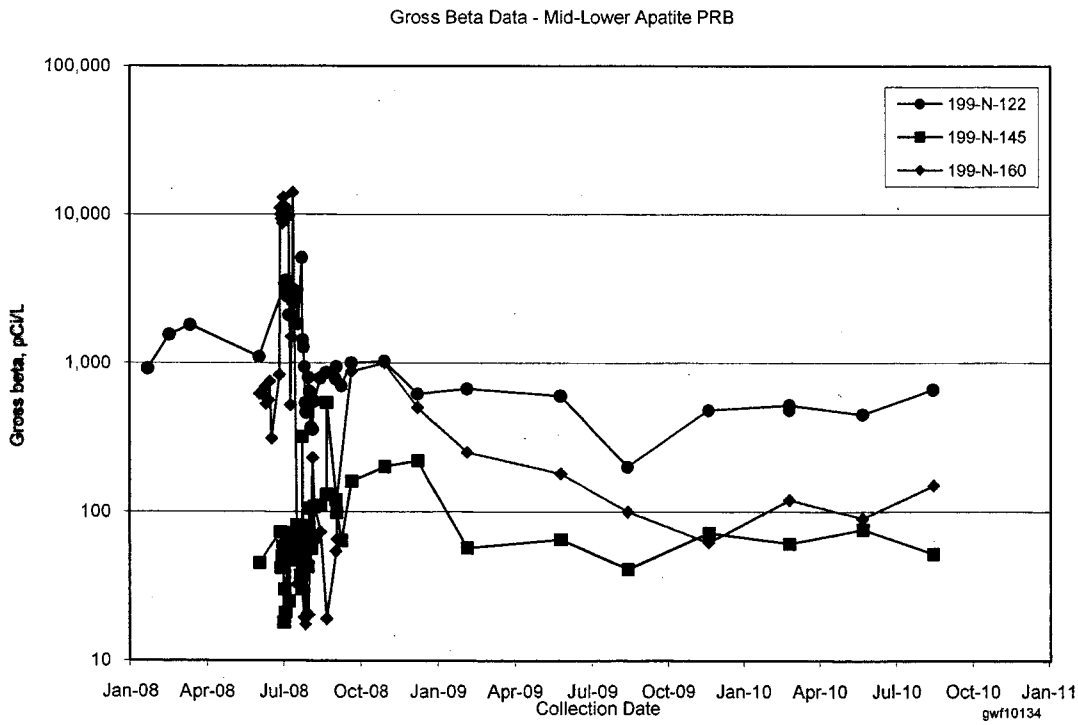
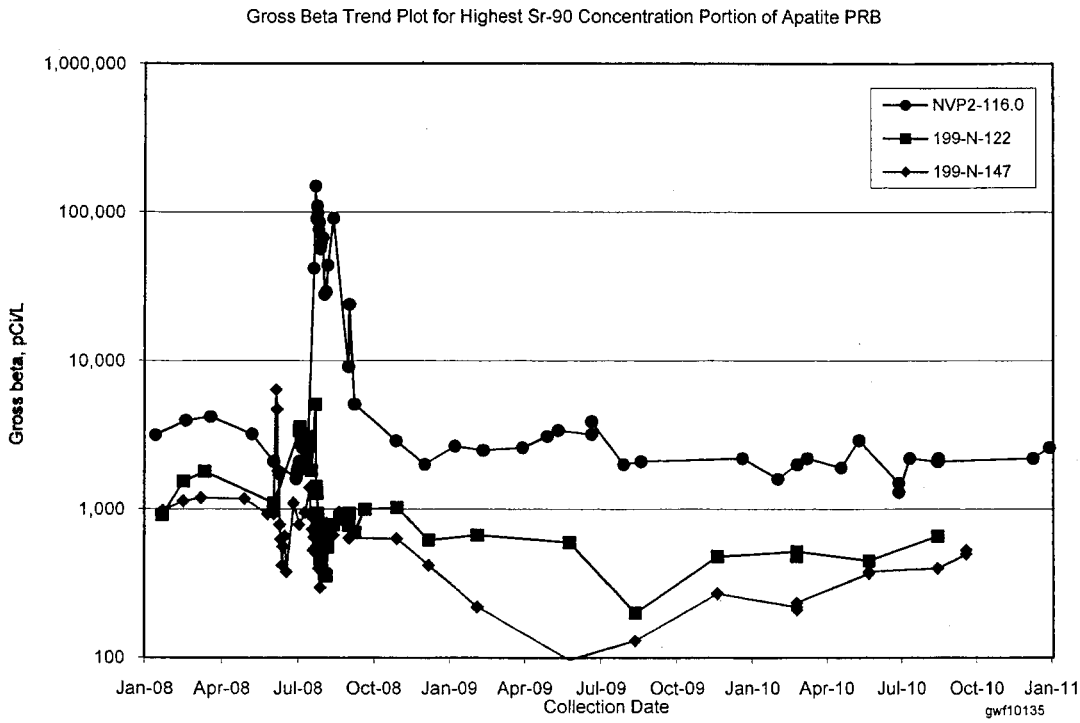


Figure 6-26 gwf10135. Gross Beta Trend Plot for the Highest Strontium-90 Concentration Portion of Apatite Permeable Reactive Barrier.



Attachment 10

100 Area D4/ISS Status
July 14, 2011

D4 (WCH)

100-N River Structures (181-N, 181-NE, 1908-NE): Sediment removal system was successfully established adjacent to 181-NE intake structure and began removing sediment from the floor of that facility late last week. Sediment removal activities are scheduled to proceed to the 1908-NE and terminate at the 181-N in mid August. Deliveries of fill material (rip rap) for bench construction are scheduled to commence next week as well as the installation of anchors, diversion curtains and turbidity curtains. Bench installation is scheduled to commence on the August 1 start of the "in water" work window provided the turbidity curtains are installed and functional.

NMFS has approved, with conditions, the installation of diversion and turbidity curtains prior to the in-water work window and verbally approved for bench construction to proceed as planned. They have also issued a Final Biological Opinion which has been shared informally with the USACOE. Review and approval of the DQO/SAP has been completed by DOE and is currently with Ecology for final review and approval.

182-N High Lift Pumphouse: Asbestos abatement activities almost 50% complete.

105-N Fuel Storage Basin (FSB): Recent activities have focused on soil and debris load out instead of demolition to provide ISS crews time to install the roof on the adjacent 105-N rod room. Installation of that roof should be sufficiently complete by the end of this month to allow D4 crews to again begin to demolition activities on the FSB in August.

117-N Exhaust Air Filter House: Approximately 150 feet of RCRA TSD pipelines adjacent to and west of 117-N is being demolished this week. Demolition work will then continue further below grade on west side of facility basement and proceed east including the remaining portions of the tunnels between the facility and former 116-N stack. Completion expected in August with start of 105-NE Fission Product Trap in September.

400 Area Buildings: To date, six buildings (i.e., 4791TC, 4843, and 4831, 4760, 4814, and 4727), including slabs, have been demolished and removed from the 400 Area. Demolition and load out of building 4719 is near completion. Building 4706 is scheduled to be demolished next pending confirmation that migratory birds have abandoned nearby trees.

ISS/SSE (Intermech):

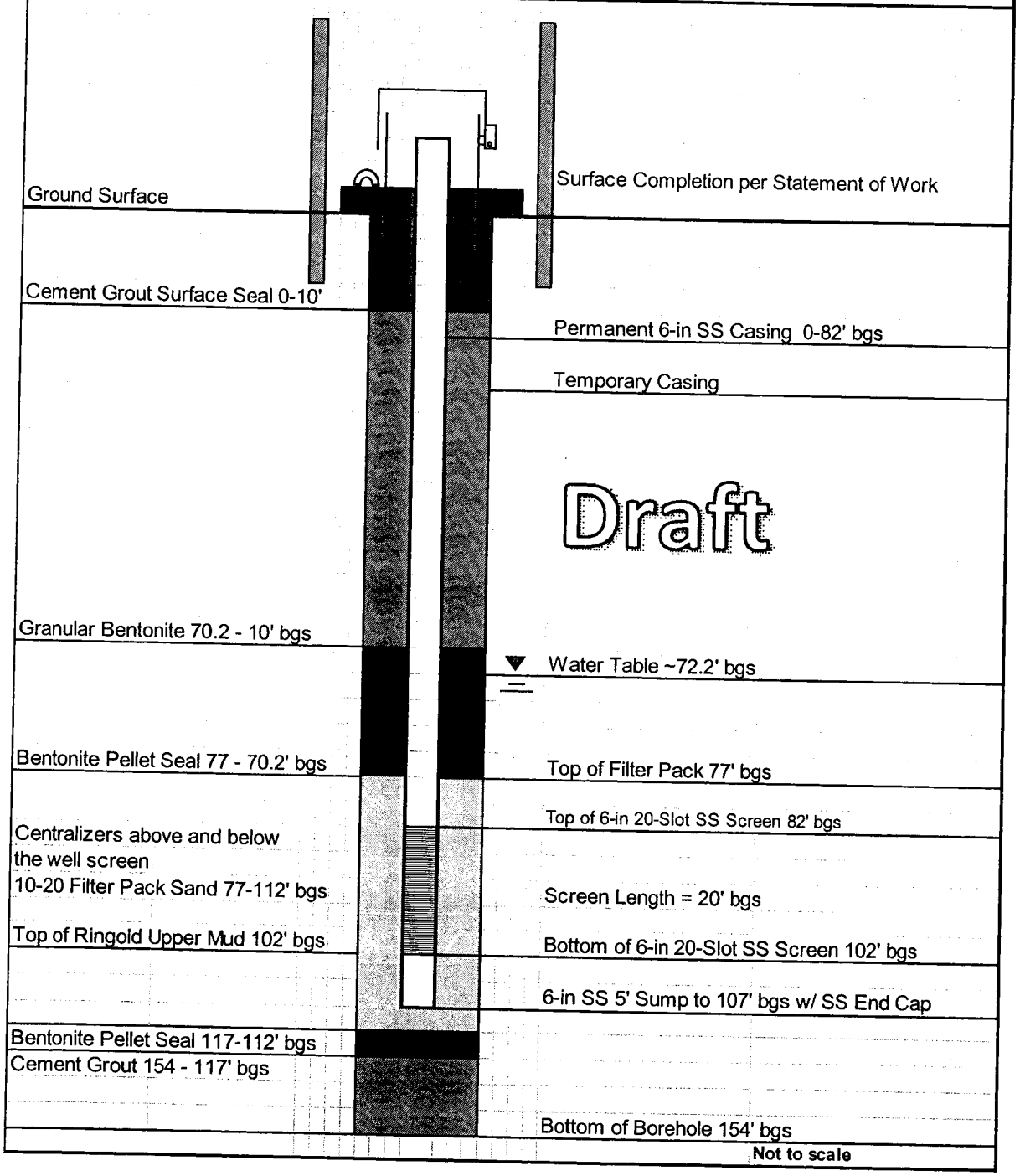
105-N Reactor Building: South side of 105-N roof completed soon after last UMM. This allowed FR to begin remediation activities on south side of 109-N. ISS crews have recently been concentrating efforts on completing the roof section over the west side rod room to allow D4 to resume demolition activities in the Fuel Storage Basin. Once the rod room roof is sufficiently complete, ISS will concentrate their efforts on the 105-N roof.

109-N Heat Exchanger Building: Roof is complete. Final inspection is pending.

Attachment 11

Well Design: 199-N-182

Drilling Method:	**Cable Tool**	Well Name:	**199-N-182**
Drilling Fluid:	**none**	Well I.D.:	**C8184**
Drillers name:		State Coordinates:	
Drilling Company:			
Date Started:	**4/19/2011**	Start Card #:	N.D.
Design Doc:	**SGW-48469 and DOE/RL-2009-42**	Elevation Ground Surface:	N.D.



Not to scale

Attachment 12

Control Number:	TPA Agreement/Change Control Form	Date Submitted:
TPA-CN-434	___ Change _X___ Agreement ___ Information	March 10, 2011
	Operable Unit(s): 400 Area Removal Action	Date Approved: March 10, 2011

Document Number/Title:	Date Document Last Issued:
Removal Action Work Plan for River Corridor General Decommissioning Activities, (DOE/RL-2010-34, Rev. 0)	May 2010
Originator: Rudy Guercia	**Phone:** 376-5494

Summary Discussion:

Removal Action Work Plan for River Corridor General Decommissioning Activities (RAWP), DOE/RL-2010-34, Rev. 0, documents activities to be performed to achieve the non-time-critical removal action (NTCRA) for surplus facilities located in various areas within the scope of the River Corridor project on the Hanford Site. The removal process is achieved through the deactivation, decontamination, decommissioning, and demolition (D4) of surplus facilities. Both the RAWP and *Action Memorandum for General Hanford Site Decommissioning Activities*, DOE/RL-2010, Rev. 0, allow for inclusion of additional buildings provided they are sufficiently similar to buildings/structures already included in the NTCRA scope.

The 4734D facility is added to the RAWP for *River Corridor General Decommissioning Activities*, based on potential for contamination. This facility was initially included in the Engineering Evaluation/Cost Analysis for General Site Hanford Decommissioning Activities (Table 2-1) and the corresponding Action Memo, but was not included in Section 1.1, Table 1.1, of the RAWP. The 4734D Facility is sufficiently similar to other 400 Area buildings/structures already included in the River Corridor NTCRA scope and a reasonable basis exists to include it in the RAWP, Table 1-1, Building/Structure list.

Justification and Impact of Change:

Both the RAWP and *Action Memorandum for General Hanford Site Decommissioning Activities*, DOE/RL-2010, Rev. 0, allow for inclusion of additional buildings provided they are sufficiently similar to buildings/structures already included in the NTCRA scope. The 4734D facility is sufficiently similar to buildings/structures already included in the River Corridor NTCRA scope and a reasonable basis exists to include it in the RAWP, Table 1-1, Building/Structure list. Additionally, the facility had been evaluated in the *Action Memorandum for General Hanford Site Decommissioning Activities.*

RAWP, Section 1.1, Table 1-1., Building/Structure List and Location:

Add the following:

Building Number	Area	Approximate Waste Quantity (tons)
4734D	400	1,290

DOE Project Manager:	**Date:** 3/10/11
EPA Project Manager:	**Date:** 3/10/11
Ecology Project Manager:	**Date:** 3/10/11

Per Action Plan for Implementation of the Hanford Consent Order and Compliance Agreement Section 9.3

Attachment 13

TRI-PARTY AGREEMENT

Change Notice Number TPA-CN- 450	TPA CHANGE NOTICE FORM	Date: April 20, 2011
Document Number, Title, and Revision: DOE/RL-2005-93, Remedial Design Report/Remedial Action Work Plan for the 100-N Area, Rev. 0		Date Document Last Issued: October 2006
Originator: Dan Saueressig, WCH		Phone: 509-521-5326

Description of Change:
Text is being added to allow water found in pipelines, which is determined to meet clean water criteria (WAC-173-200 and WAC-173-340-720), to be used as dust suppression. In addition, when known clean water lines are encountered, the water in these lines may be used for dust suppression with process knowledge and field screening

Mark French (**DOE**) and Nina Menard (**Lead Regulatory Agency**) agree that the proposed change modifies an approved workplan/document and will be processed in accordance with the Tri-Party Agreement Action Plan, Section 9.0, *Documentation and Records,* and not Chapter 12.0, *Changes to the Agreement.*

Additional text is being added to Section 4.2.4.3 to allow the use of liquids remaining in pipelines to be used for dust suppression. The additional text is denoted with double underlined text.

Revised text is attached.

Note: Include affected page number(s)

Justification and Impacts of Change:
The change will result in allowing water found in pipelines to be used for dust suppression. This is consistent with the approach that is implemented at the other 100 Area sites, which are remediated in accordance with the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE/RL-96-17).

Approvals:

Mark A French DOE Project Manager	5/6/11 Date	[X] Approved [ ] Disapproved
N/A EPA Project Manager	Date	[ ] Approved [ ] Disapproved
Nina M. Menard Ecology Project Manager	5/12/11 Date	[X] Approved [ ] Disapproved

Attachment to TPA CN-

Additional text to be added to DOE/RL-2005-93.

4.2.4.3 **Liquids Remaining in Pipes.**

4.2.4.3.1 Clean Water Pipelines

Numerous clean water pipelines are expected to be encountered during remediation activities at the 100-N Area. A standard protocol will be followed to open and check the lines for water. Verification that a clean water pipeline is encountered will be made by reviewing historical process information, engineering drawings, the size and construction of the line, and the presence of connected clean water appliances like fire hydrants. The as-built drawings for the 100-N area are more complete than other 100 Area reactor sites and clean water pipelines are well documented. Once a determination has been made that a clean water pipeline has been encountered, field pH, radiological field surveys of the pipe and/or soil around the pipe, and industrial hygiene field monitoring (i.e., organic vapor monitoring) may be used to confirm the liquid is water. Once confirmed that a clean water line has been encountered based on the field screening discussed above, the water may be used as dust suppression. When employing these more flexible screening requirements for clean water pipelines, Ecology will be contacted and informed of the screening results.

4.2.4.3.2 All Other Pipelines

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. If liquid is water and contains contaminants in levels below those listed in WAC 173-200, or groundwater cleanup standards in WAC 173-340-720, it may be used as dust suppressant in an active remediation area. Water above WAC 173-200 limits and the WAC 173-340-720 groundwater cleanup standards may be used as dust suppressant following approval by the lead regulatory agency.

Pipeline removal may be a planned remedial action or an activity made necessary by an unplanned discovery. Projects perform historical research to locate buried pipelines and learn as much as possible about their past functions and what liquids they may currently hold. Based upon that research, and observations and data gathered during remedial action, a graded approach will be taken to spill control practices implemented during pipeline removal. The most stringent efforts will be used for pipes containing or expected to contain dangerous waste liquids. Those pipelines will be hot tapped and liquids drained, containerized and properly disposed.

Mitigative measures required in most cases will lie somewhere between those extremes. Spill control practices (spill kits, absorbents, liners, catch basins, etc.) will be used to minimize the quantities of non-dangerous waste liquids that may be released to the soil. Pipelines will not be deliberately breached unless their contents are known or measurements are in place to positively contain any liquids that may be discharged. Proposed pipeline remediation will be discussed with the regulators so they understand the approach to be used, spill controls that will be employed, and uncertainties or risk of unknown liquids or inadvertent discharges.

Attachment 14

TRI-PARTY AGREEMENT

Change Notice Number TPA-CN-465	TPA CHANGE NOTICE FORM	Date: May 31, 2011
Document Number, Title, and Revision: DOE/RL-2002-70, Rev. 2, Removal Action Work Plan for 100-N Area Ancillary Facilities		Date Document Last Issued: March 2006
Originator: Clay McCurley		Phone: 942-8928

Description of Change:
Add text to allow sediment to be removed from the floors of the 181-N, 181-NE and 1908-NE facilities prior to backfill with clean fill material.

Rudolph Guercia (**DOE**) and Nina Menard (**Lead Regulatory Agency**) agree that the proposed change modifies an approved workplan/document and will be processed in accordance with the Tri-Party Agreement Action Plan, Section 9.0, *Documentation and Records,* and not Chapter 12.0, *Changes to the Agreement.*

Add the following paragraph to the end of Section 4.6 on page 4-16:

Regarding removal of the sediment within the structures, divers will perform two vacuuming sweeps to remove sediment from the interior floor of each of the 181-N, 181-NE, and 1908-NE structures. The removed sediment from each structure will be pumped to a filtering system. Loose objects too large for vacuuming will be hand removed. A minimum of 12 hours will elapse between vacuuming sweeps to allow particulates to settle. The water will be returned to the inside of the structure. When the vacuuming process is complete, the sediment and filter media will be disposed at the ERDF.

Note: Include affected page number(s)

Justification and Impacts of Change:

Inclusion of this change will ensure completeness of removal actions at N Area.

Approvals:

DOE Project Manager	6/7/11 Date	[✓] Approved [ ] Disapproved
N/A EPA Project Manager	Date	[ ] Approved [ ] Disapproved
Nina M. Menard Ecology Project Manager	6/8/11 Date	[✓] Approved [ ] Disapproved

Attachment 15

^WCH Document Control

159325

From: Saueressig, Daniel G
Sent: Thursday, June 23, 2011 2:20 PM
To: ^WCH Document Control
Subject: FW: REQUEST FOR APPROVAL TO SEND SNF FROM 118-K-1 TO K BASINS

Please provide a chron number, this email documents a regulatory agreement.

Dan

-----Original Message-----
From: Guzzetti.Christopher@epamail.epa.gov [mailto:Guzzetti.Christopher@epamail.epa.gov]
Sent: Thursday, June 23, 2011 11:12 AM
To: Saueressig, Daniel G
Cc: Einan.David@epamail.epa.gov; Zeisloft, Jamie
Subject: RE: REQUEST FOR APPROVAL TO SEND SNF FROM 118-K-1 TO K BASINS

Dan -

Dave is on vacation this week so I talked to Rod and others and you can consider this email your approval.

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: David Einan/R10/USEPA/US@EPA
From: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>
Date: 06/20/2011 06:57AM
Cc: Christopher Guzzetti/R10/USEPA/US@EPA, "Zeisloft, Jamie" <jamie.zeisloft@rl.doe.gov>
Subject: RE: REQUEST FOR APPROVAL TO SEND SNF FROM 118-K-1 TO K BASINS
==========
Hi Dave, have you had a chance to evaluate this request?

Thanks,

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

> _____
> From: Saueressig, Daniel G
> Sent: Thursday, June 09, 2011 3:36 PM
> To: Einan, David R
> Cc: Guzzetti, Christopher; Zeisloft, Jamie
> Subject: REQUEST FOR APPROVAL TO SEND SNF FROM 118-K-1 TO K
> BASINS
>
> Hi Dave, we have 2 pieces of SNF stored at the 118-K-1 and I need your
> approval per section 4.3.3 of the 100 Area RDR (DOE/RL-96-17) to send
> this material to K Basins and ultimately to the Canister Storage
> Building.
>
> Shipment of this material is scheduled for June 27, 2011. Let me know

159325

> if you approve and give me a call if you have any questions.
>
> Thanks,
>
> Dan Saueressig
> 521-5326
>

[attachment(s) "winmail.dat","message_body.rtf" removed by Christopher Guzzetti/R10/USEPA/US]

Attachment 16

159975

^WCH Document Control

From: Saueressig, Daniel G
Sent: Wednesday, July 13, 2011 6:49 AM
To: ^WCH Document Control
Subject: FW: REQUEST FOR EXPANDED STAGING/STOCKPILE AREA FOR 100-C-7;1

Importance: High

Attachments: Picture (Enhanced Metafile)

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: Christopher Guzzetti [mailto:Guzzetti.Christopher@epamail.epa.gov]
Sent: Tuesday, July 12, 2011 2:26 PM
To: Post, Thomas C
Cc: Beach, Christopher L; Saueressig, Daniel G; Strom, Dean N; Laura Buelow
Subject: RE: REQUEST FOR EXPANDED STAGING/STOCKPILE AREA FOR 100-C-7;1

Dan/Tom -

I concur as well.

Thanks,

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

From: "Post, Thomas" <Thomas.Post@rl.doe.gov>
To: "Saueressig, Daniel G" <dgsauere@wch-rcc.com>, Laura Buelow/R10/USEPA/US@EPA, Christopher Guzzetti/R10/USEPA/US@EPA
Cc: "Beach, Christopher L" <clbeach@wch-rcc.com>, "Strom, Dean N" <dnstrom@wch-rcc.com>
Date: 07/12/2011 01:41 PM
Subject: RE: REQUEST FOR EXPANDED STAGING/STOCKPILE AREA FOR 100-C-7;1

Dan,

I concur.

Tom

159975

From: Saueressig, Daniel G
Sent: Tuesday, July 12, 2011 12:41 PM
To: 'Buelow.Laura@epamail.epa.gov'; Guzzetti, Christopher
Cc: Post, Thomas C; Beach, Christopher L; Strom, Dean N
Subject: REQUEST FOR EXPANDED STAGING/STOCKPILE AREA FOR 100-C-7;1
Importance: High

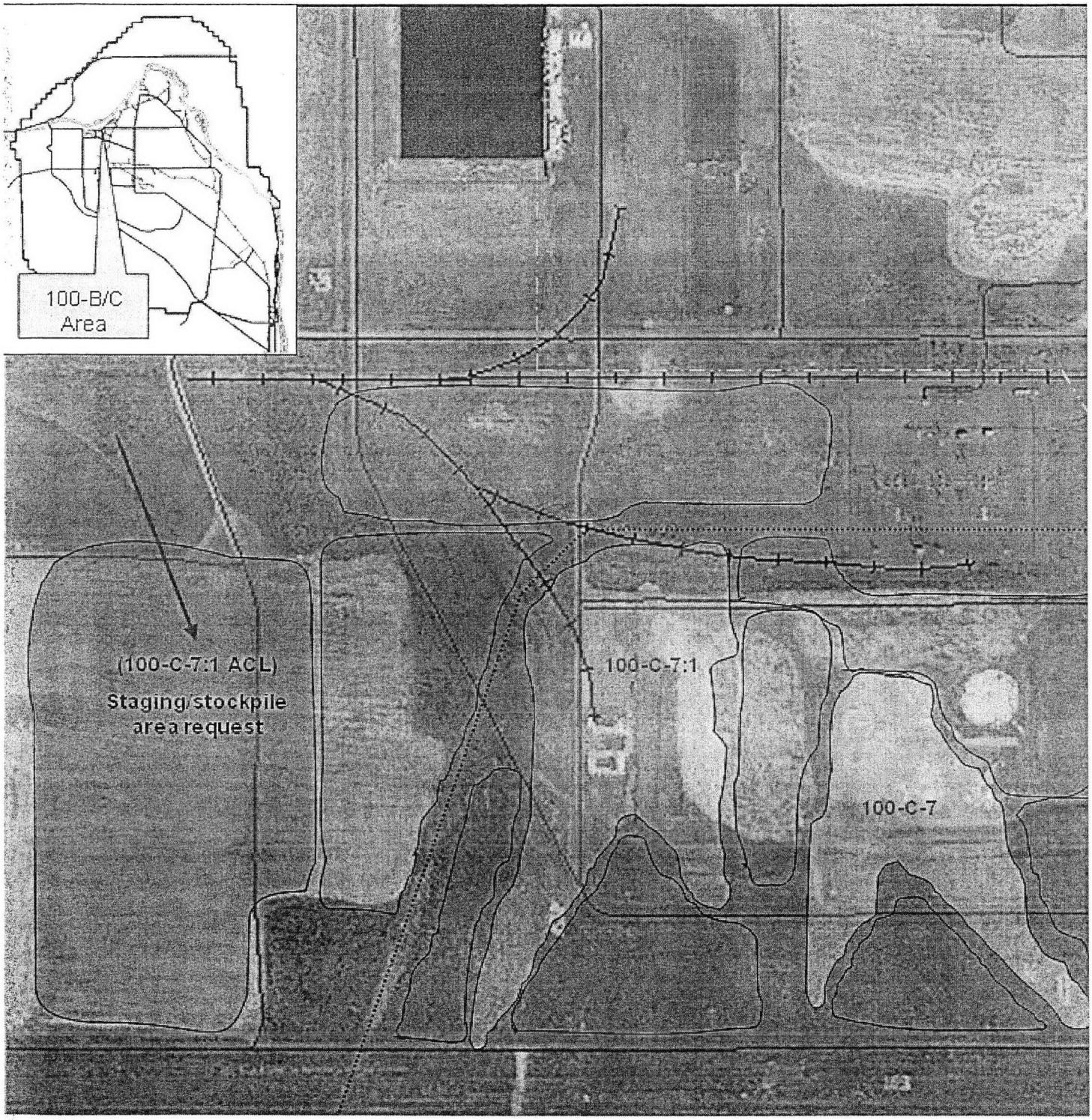
Hi Laura, we need to expand our staging area for waste coming out of 100-C-7:1. The map below depicts the area we'd like to add (lower left). Let me know if you concur, unfortunately, operations would like to start using the area soon.

Chris, I'm including you on this request in case Laura has already taken maternity leave.

Thanks,

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

100-C-7 Area Addition



Attachment 17

300 Area D4 Status
July 14, 2011
100/300 Area Combined Unit Manager Meeting

Ongoing Activities

- 324 – Retrieved two samples of 300-296 waste site soils beneath 324. Samples are being analyzed at the 325 Laboratory.
- 327 – Removing lower SERF cell and dry carousel from basement, balance of below-grade demolition to follow.
- 309 – Removing remainder of containment structure to grade. Engineering on reactor core removal ongoing. RFP issued for reactor core removal.
- 308 – Completing final demolition preparations, 308-A to be removed first.
- 340 – Initiated decontamination and hazardous material removal. Preparing to stabilize (grout) vault and vault tanks.
- Size reduction and processing of 337 High Bay demolition debris nearly complete.
- Completing demolition preparations for 320.

Current Demolition Preparations & Activities

- Continue 327 below-grade demolition.
- Complete preparations for 308-A demolition
- Continue preparations for 309 reactor core removal
- Complete preparations for 320 demolition
- Continue preparations for start of demolition at 340 Complex

60-Day Project Look Ahead

- Continue evaluation/characterization of source-term beneath 324 Building, evaluation of remediation technique and technologies.
- Complete 308 Zone 1 duct removal, removal of ACM duct on roof and balance of demolition preparations, and complete 308-A demolition.
- Continue planning and engineering on final group of delayed release facilities from PNNL (326, 329, 331C, D, H &G). Initiated planning, documentation, and characterization activities for demolition.
- Continue 327 below-grade demolition.
- Initiate demolition of 340B.

Attachment 18

Hadley, Karl A

From: Thompson, Kenneth [Kenneth.Thompson@rl.doe.gov]
Sent: Friday, July 15, 2011 7:54 AM
To: Hadley, Karl A
Cc: Kemner, Mark L
Subject: FW: FW: 300-FF-5 Sampling Frequency - Wells 399-1-2 & 399-1-21A

Attachments: Sampling_frequency_change_11jul11.docx

Sampling_frequency_change_11ju...

Mark - The UMM meeting minutes will reflect agreement from EPA & RL to reduce sampling frequency for Wells 399-1-21A and 399-1-2 from monthly to quarterly.

-----Original Message-----
From: Larry Gadbois [mailto:Gadbois.Larry@epamail.epa.gov]
Sent: Tuesday, July 12, 2011 2:44 PM
To: Thompson, Kenneth
Cc: Kemner, Mark L
Subject: Re: FW: 300-FF-5 Sampling Frequency - Wells 399-1-2 & 399-1-21A

I'm OK with going to quarterly for these two wells, for just the reasons laid out in the emails and attachment. Also, I don't have the sampling frequency info for the other 300 Area wells handy, but I would like to make sure that if the closest wells downgradient from 618-10 (now active remediation with dust suppression water) are on something less than quarterly, that they be increased to quarterly at a minimum. And if there is even a hint of an impact, including mobile contaminants like tritium or hex-chrome, we jump to monthly.

Is there a master list of all wells, sampling frequency, and analytes on the web or a spreadsheet that would be worth a UMM conversation? This won't be easy, but it could be productive to have a site-wide discussion of sampling optimization. If which operable unit, lead regulator agency or personality, DOE project manager, regulatory authority, or some other thing is causing us to over or under sample, this would be good to lay out the whole picture. I've got to believe our respective managements would support doing the right thing, but it ought to start with the staff.
--Larry--

From: "Thompson, Kenneth" <Kenneth.Thompson@rl.doe.gov>
To: Larry Gadbois/R10/USEPA/US@EPA
Cc: "Kemner, Mark L" <mark_l_kemner@rl.gov>
Date: 07/12/2011 08:17 AM
Subject: FW: 300-FF-5 Sampling Frequency - Wells 399-1-2 & 399-1-21A

Larry – I am inclined to support my contractor's request to return to quarterly sampling; the monthly sampling has served its objective and continued monthly sampling provides little value. Let's discuss this at the UMM this week.

From: Kemner, Mark L
Sent: Monday, July 11, 2011 4:22 PM
To: Thompson, Kenneth
Cc: Johnson, Kelly J
Subject: FW: 300-FF-5 Sampling Frequency - Wells 399-1-2 & 399-1-21A

Mike,
Based on a review of our routine sampling, some events can be changed to reflect current

data needs. Would you review an d comment/approve the attached summary and justification please?

Thanks,

Reply by Mark Kemner
CHPRC
509-373-5353

From: Johnson, Kelly J
Sent: Monday, July 11, 2011 4:14 PM
To: Kemner, Mark L
Subject: 300-FF-5 Sampling Frequency - Wells 399-1-2 & 399-1-21A

Hi Mark,

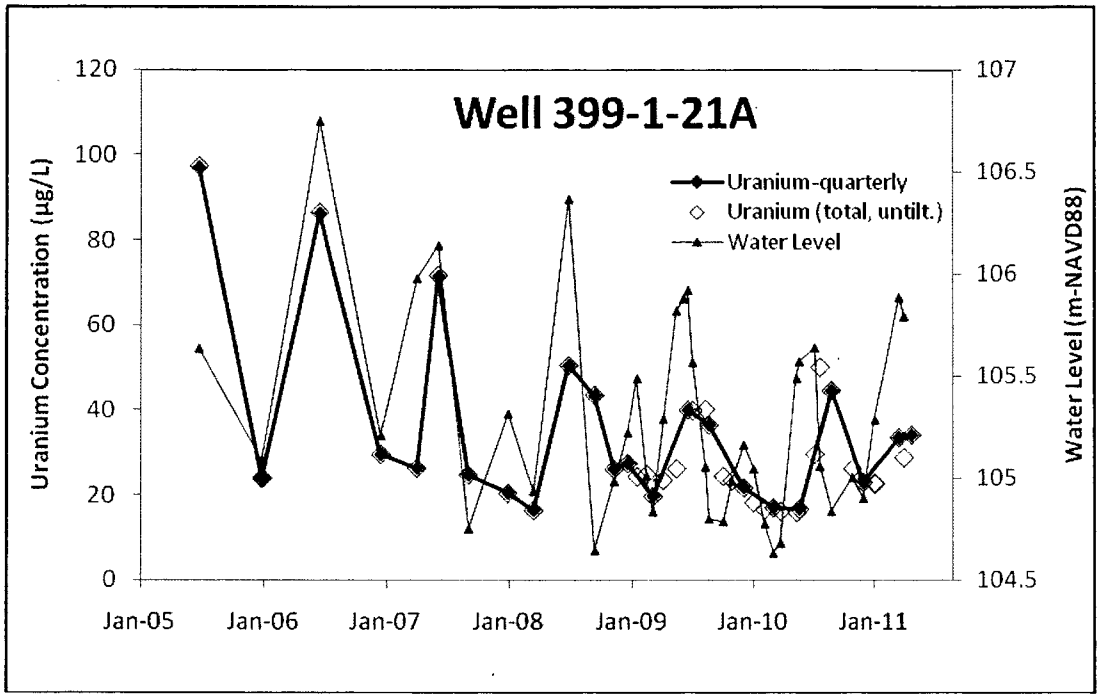
Could you please share the attached data with DOE?

During the excavation of the 618-1 Burial Ground, EPA requested that the monitoring frequency for Well 399-1-2 be increased from semi-annual to monthly and Well 399-1-21A be increased from quarterly to monthly.
Please see the attached document for a summary on reducing the sampling frequency for both wells to quarterly.

Thank you,
Kelly

Kelly J. Johnson
Technical Reporting
Soil & Groundwater Remediation Project
CH2M Hill Plateau Remediation Company
Phone: (509)373-3395
Fax: (509)373-7711
(See attached file: Sampling_frequency_change_11jul11.docx)

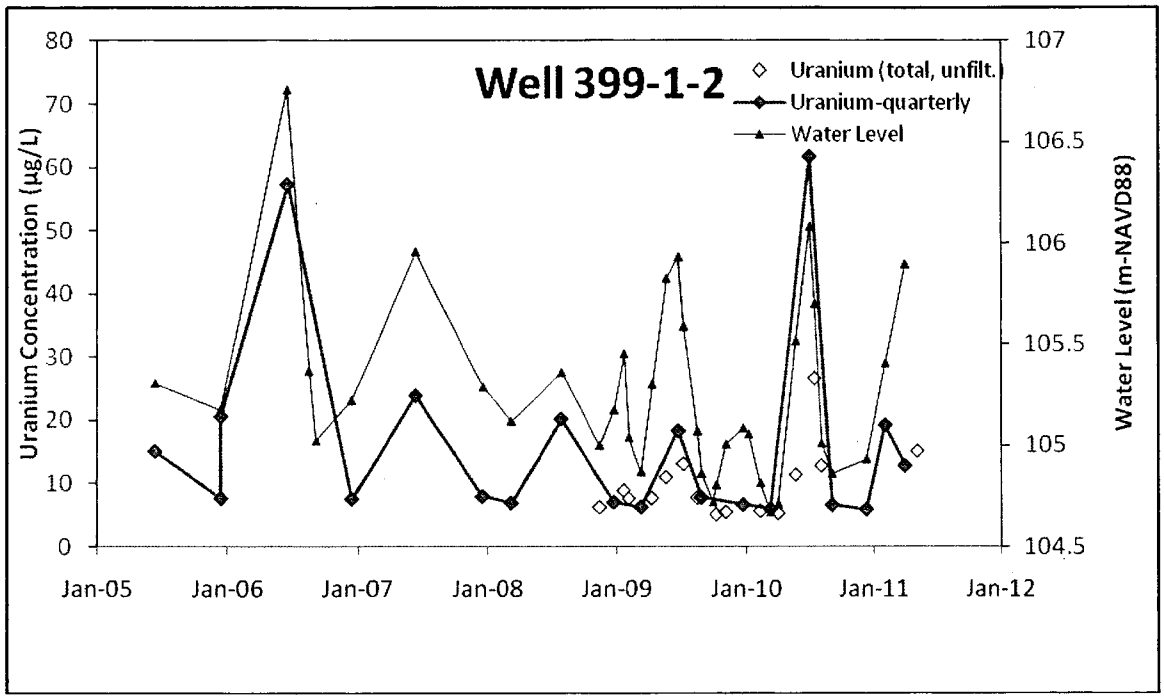
399-1-21A



If we compare the sampling data (solid and open diamonds), the conclusions are:

- There are no significant changes related to activities at the 618-1 Burial ground and associated excavations. Variability in the uranium concentration is related to long-standing correlation with water table elevation.
- Increases in the uranium concentration lag increases in water table elevation, suggesting the uranium being remobilized during high water table conditions is from locations away from the well.
- The well shows a long-term gradual decrease in contamination.
- The plotted quarterly sampling frequency (Dec, Mar, June, Sept events) adequately captures the uranium concentration trend.

399-1-2



If we compare the sampling data (solid and open diamonds), the conclusions are:

- Variability in the uranium concentration is closely correlated to changes in the water table.
- The July 6, 2010 uranium concentration is uncharacteristically high, however the subsequent July 20, 2010 and Aug 2010 results are on trend with previous sampling events. Note: this reduction will not take place until Oct 2011. Should new monitoring results indicate an unexpected increase in uranium concentration, we will return the frequency to monthly.
- The plotted quarterly sampling frequency (Dec, Mar, June, Sept events) adequately captures the uranium concentration trend.

Attachment 19

Environmental Protection Mission Completion Project
July 14, 2011

Orphan Sites Evaluations

- The 100-F/IU-2/IU-6 Area – Segment 4 Orphan Sites Evaluation Report will be transmitted to RL for review and subsequent submittal to EPA for review in late-July.
- Meetings to review the findings of the 100-F/IU-2/IU-6 Area – Segment 5 orphan sites process will be scheduled for July.

Long-Term Stewardship

- RL comments on the consolidated (CHPRC, MSA, and WCH) 100-F/IU-2/IU-6 - Segment 1 turnover and transition package to support transition of interim surveillance and maintenance responsibilities between contractors were received on 7/11/11.
- The 100-F/IU-2/IU-6 Segment 1 Interim Remedial Action Report was submitted to RL on 5/24/11.
- The Draft A 100-BC-1 OU Interim Remedial Action Report is in the process of being transmitted from WCH to RL for review and subsequent submittal to EPA for review.

River Corridor Baseline Risk Assessment

- The Draft C Ecological Risk Assessment report (Volume I) is being finalized to reflect RL pre-concurrence review comments.
- The Rev 0 Human Health Risk Assessment report (Volume II) is being finalized to reflect EPA and Ecology review comments.

Remedial Investigation of Hanford Releases to Columbia River

- The Draft A screening level ecological risk assessment is being developed to reflect RL comments.
- RL comments on the Decisional Draft Human Health risk assessment were received on July 8. The Draft A human health risk assessment will be developed to reflect RL comments.

Document Review Look-Ahead

Document	Regulator Review Start	Duration
100-F/IU-2/IU-6 Area – Segment 1 Interim Remedial Action Report	May 25, 2011	30 days
100-BC-1 Operable Unit Interim Remedial Action Report	July 2011	30 days
100-F/IU-2/IU-6 - Segment 4 Orphan Sites Evaluation Report	July 2011	30 days
River Corridor Baseline Risk Assessment – Ecological Report (DOE/RL-2007-21, Volume I)	September 2011	45 days
Columbia River Component Risk Assessment – Screening Level Ecological Risk Assessment Report (DOE/RL-2010-117, Volume I)	September 2011	45 days
Columbia River Component Risk Assessment – Baseline Human Health Risk Assessment Report (DOE/RL-2010-117, Volume II)	September 2011	45 days

Attachment 20

CERCLA Five-Year Review Action Items

7/14/2011

Point of Contact	*Action No.*	*Deliverables*	*Due Date*	*Status*
100 Area				
WCH/RL	1-3	Reassess and resubmit to EPA the protectiveness determinations for operable units 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-HR-3, 100-IU-2, 100-IU-6, 100-KR-1, 100-KR-2, 100-KR-4, 100-NR-1, 300-FF-1 and 300-FR-2 using new information from the River Corridor Baseline Risk Assessment and submit to EPA an addendum with, as appropriated, updated Protectiveness Determinations, Issues, and Follow-Up Actions.	2/15/2008	This action was to be coordinated with the finalization of the Risk Assessment. A Draft B Risk Assessment is now projected to be submitted early 2010.

Attachment 21

WASTE CONTROL PLAN

Work Scope Description:
Work includes sample collection to evaluate the presence and extent of residual shallow zone contamination, if any, at specific locations in soil adjacent to previously remediated waste sites, an area referred to as the "transition zone." The emphasis for the sampling is placed on both liquid effluent and solid waste disposal sites at multiple locations in the River Corridor. Understanding whether residual contamination is present in the transition zone through transition zone sampling activities will provide additional information evaluating residual risk at waste sites in the ongoing remedial investigation/feasibility study. All waste generated from transition zone sampling activities will be managed according to Section 4.0 ("Waste Management") of their appropriate RDR/RAWP. These documents include; the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE/RL-96-17, Rev. 6), the *Remedial Design Report/Remedial Action Work Plan for the 300 Area* (DOE/RL-2001-47, Rev. 3), and the *Remedial Design Report/Remedial Action Work Plan for the 100-NR-1 Treatment, Storage, and Disposal Units* (DOE/RL-2000-16, Rev. 2). All waste shall be disposed of in the Environmental Restoration Disposal Facility (ERDF), provided that the waste meets the ERDF Waste Acceptance Criteria. For disposal purposes, waste will be managed as IDW.

List of Constituents of Concern:
The constituents to be analyzed at some or all of the waste sites include various radionuclides, metals, mercury, PCBs, SVOCs, nitrate, and hexavalent chromium. See Table 1-3 in Section 1.0 of the *Sampling and Analysis Plan for Waste Site Transition Zone Sampling*, DOE/RL-2010-115, Rev. 0, for identification of specific analytes at each sampling location.

Site Description:
The activity will be conducted at various locations within the River Corridor. Specific waste sites include: 100-B-19, 116-B-6A, 116-B-11, 116-C-1, 116-DR-1&2, 118-DR-1, 116-F-1, 116-F-6, 118-F-6, 1607-H2, 116-N-1, 116-N-3, 316-5, and 618-7. Appendices A and B of the *Sampling and Analysis Plan for Waste Site Transition Zone Sampling*, DOE/RL-2010-115, Rev. 0, provide information on specific sample locations, including coordinates, in Appendices A and B .

Reference:	Rev.	Date Approved:
Sampling and Analysis Plan for Waste Site Transition Zone Sampling, DOE/RL-2010-115, Rev. 0	0	March 11, 2011

SIGNATURES

J. D. Skoglie Preparer (Type/Sign Name)	John Skoglie	7-11-11 Date	Impact Level: N/A
C. W. Hedel Project Task Lead	Charles W. Hedel	I.L. Siddoway IDW Coordinator	Ingrid Siddoway

Planned Drilling Start and Finish Dates: From: Approx. August 1, 2011 To: December 31, 2011

Waste Storage Facility ID Numbers: N/A

FIELD SCREENING METHODS

Method	Frequency	Reference	Detection Range	Analyst
None planned for in Sampling and Analysis Plan	N/A	*Sampling and Analysis Plan for Waste Site Transition Zone Sampling*, DOE/RL-2010-115	N/A	N/A

WASTE CONTROL PLAN

LABORATORY METHODS (Constituents of Concern)

Method	Frequency	Reference	Detection Range	Analyst
See Sampling and Analysis Plan, Table 2-1	See Sampling and Analysis Plan, Section 1.4	*Sampling and Analysis Plan for Waste Site Transition Zone Sampling*, DOE/RL-2010-115, Rev. 0	See Sampling and Analysis Plan, Table 2-1	See Sampling and Analysis Plan, Table 2-2

WASTE CONTROL PLAN

Drill Site Coordinate Location:

See Appendix B, Table B-1, in the *Sampling and Analysis Plan for Waste Site Transition Zone Sampling*, DOE/RL-2010-115, Rev. 0, for coordinates of sampling locations

Waste Container Storage Area(s) Coordinate Location(s):

100-B/C: Waste pad near corner of B Avenue & Beebe Road (N144683, E565138).
100-D: Waste pad near corner of Pacific Avenue & Paddock Street (N151484, E573661).
100-F: Waste pad 500 feet North of Reactor Road, next to F Avenue (N147788, E580660).
100-H: Waste pad near corner of Hayes Avenue & Herron Street (N152603, E577853).
100-N: FR Drum Storage Area is 820 ft NE of the 1120-N bldg (N149390, E571843)
300 Area: Storage Area at north end of 300 Area between former waste sites 300-45 and 618-2 (N116420, E594021)

Requirements for Soil Pile Sampling (if any):

N/A

Nonregulated Material Disposal Location(s):

Miscellaneous solid waste (MSW) will be disposed of at the Environmental Restoration Disposal Facility (ERDF).

Sketch of Work Site:

See site description above and Appendices A and B of the *Sampling and Analysis Plan for Waste Site Transition Zone Sampling*, DOE/RL-2010-115, Rev. 0, for maps of specific sample locations.

WASTE CONTROL PLAN

APPROVALS

Not Applicable	I.L. Siddoway
Lead Regulatory Agency Representative	IDW Coordinator
M.S. French B.E. Chadbourne	S.J. Gale
DOE-RL	Cognizant Field Engineer

Attachment 22

DOE-RL APPROVAL PAGE

Approval to Use Air Monitoring Plans to Perform Waste Site Transition Zone Sampling

In accordance with May 9, 2011, correspondence from DOE-RL to WCH on *Direction to Proceed with Transition Zone Sampling* (Attachment 1), DOE-RL approves Washington Closure Hanford to use the provisions of air monitoring plan documentation for the 100-BC, 100-D/DR, 100-H, 100-N, 100-F and 300 Area (Attachments 2-10) to perform transition zone sampling as described in the *Sampling and Analysis Plan for Waste Site Transition Zone Sampling*, DOE/RL-2010-115, Rev. 0.

Approval: B. L. Charboneau
U.S. Department of Energy, Richland Operations Office

Signature Date 7/13/11

Attachments:

1. Letter, from Jewel J. Short, Contracting Officer, to M.N. Brosee, President, Contract No. DE-AC06-05RL14655, "*Direction to Proceed with Transition Zone Sampling*," dated May 9, 2011 (CCN 158535), 1 pp.
2. Email, from Daniel G. Saueressig to WCH Document Control, "*Proposed Modification to the 100-B/C Air Monitoring Plan*," dated April 18, 2011 (CCN 157915), 2 pp.
3. Air Monitoring Plan for the 100-B/C Burial Grounds and Remaining Sites Remedial Action, June 2008 (CCN 0589736), 8 pp.

4-A. Air Monitoring Plan for the 100-D/DR Area Remaining Sites and Burial Grounds Remedial Action, October 2010 (CCN 157902), 10 pp.

4-B. Email, from Dan G. Saueressig to WCH Document Control, "Correction/Typo on 100-D Air Monitoring Plan" dated June 21, 2011 (CCN 159276), 3 pp

5. Air Monitoring Plan for the 100-HArea Remaining Sites and Burial Grounds Remedial Action, October 2010 (CCN 157902), 10 pp.
6. Email, from Joan G. Woolard to WCH Document Control , "*Modification to the 100-N and 100-F Area Air Monitoring Plans to Support Transition Zone Sampling*" dated July 5, 2011 (CCN 159407), 1 pp.
7. Air Monitoring Plan for the 100-N Remedial Action, July 2010 (CCN 152263), 10 pp.
8. Air Monitoring Plan for the 100-F Remedial Action, June 2010 (CCN 152262), 8 pp.
9. Email, from Joan G. Woolard to WCH Document Control , "*Modification to the 100-N and 100-F Area Air Monitoring Plans to Support Transition Zone Sampling*" dated July 5, 2011 (CCN 159407), 1 pp
10. Air Monitoring Plan for the 300 Area Central Waste Sites Remedial Action, March 2011 (CCN 157961), 12 pp.

Attachment 1

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

11-AMRC-0128

MAY 09 2011

158535

Mr. M. N. Brosee, President
Washington Closure Hanford LLC
Richland, Washington 99354

Dear Mr. Brosee:

CONTRACT NO. DE-AC06-05RL14655 – DIRECTION TO PROCEED WITH TRANSITION ZONE SAMPLING

The purpose of this letter is to provide direction to Washington Closure Hanford (WCH) to proceed with Transition Zone sampling following the U.S. Department of Energy Richland Operations Office (RL) approval of the "Sampling and Analysis Plan for Waste Site Transition Zone Sampling," DOE/RL-2010-115, and associated implementation plans.

Transition Zone sampling shall be performed as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activity, and will be authorized by RL as the lead agency pursuant to Executive Order 12580. Prior to performing this work, WCH shall present for RL approval, Revision 0 of the Sampling and Analysis Plan (SAP), a Waste Control Plan (WCP) describing requirements for managing and disposing of any waste generated by the sampling activity, and an Air Monitoring Plan (AMP) or plans. WCH may revise existing AMPs as appropriate, to cover this scope of work associated with Transition Zone sampling. RL approval of the SAP, WCP, and AMPs will constitute approval to proceed with this work under CERCLA.

If you have questions, please contact me or your staff may contact John Sands, Office of the Assistant Manager for the Central Plateau, at (509) 372-2282.

Sincerely,

Jewel J. Short
Contracting Officer

AMRC:JPS

cc: S. L. Feaster, WCH
T. A. Harris, WCH
J. A. Lerch, WCH

Attachment 2

157915

^WCH Document Control

From: Saueressig, Daniel G
Sent: Monday, April 18, 2011 10:02 AM
To: ^WCH Document Control
Subject: FW: PROPOSED MODIFICATION TO THE 100-B/C AIR MONITORING PLAN

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

Thanks,

Dan Saueressig
521-5326

-----Original Message-----
From: Post, Thomas [mailto:Thomas.Post@rl.doe.gov]
Sent: Monday, April 18, 2011 9:26 AM
To: Buelow.Laura@epamail.epa.gov; Saueressig, Daniel G
Cc: Landon, Roger J; Wilkinson, Stephen G
Subject: RE: PROPOSED MODIFICATION TO THE 100-B/C AIR MONITORING PLAN

Dan,

I have reviewed the proposed modification and approve.

Thanks.

Tom

-----Original Message-----
From: Buelow.Laura@epamail.epa.gov [mailto:Buelow.Laura@epamail.epa.gov]
Sent: Monday, April 18, 2011 8:28 AM
To: Saueressig, Daniel G
Cc: Landon, Roger J; Wilkinson, Stephen G; Post, Thomas
Subject: Re: PROPOSED MODIFICATION TO THE 100-B/C AIR MONITORING PLAN

This is fine.

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, "Post, Thomas C" <thomas.post@rl.doe.gov>
Cc: "Wilkinson, Stephen G" <sgwilkin@wch-rcc.com>, "Landon, Roger J" <RJLANDON@wch-rcc.com>
Date: 04/14/2011 08:39 AM
Subject: PROPOSED MODIFICATION TO THE 100-B/C AIR MONITORING PLAN

Hi Laura, per our conversation moments ago, I'd like to request your and Tom's approval to modify the air monitoring plan for 100-B/C to support the upcoming coal ash sampling effort. The modification being proposed is similar to changes just approved for the 300 Area.

The following text is proposed to be added to the end of the first paragraph of Section 1.1;

"Characterization sampling (e.g. confirmatory sampling, remedial investigation sampling) at radiological contaminated sites is included in the scope of this plan since the emissions from these activities (e.g., surface sampling, potholing) will generate negligible emissions.
The EPA will be notified of confirmatory sampling activities at the 100-B/C Area via the confirmatory sampling work instruction approval process."

In addition, the following text is proposed to be added to the end of Section 4.0;

"Characterization (e.g., test pitting and trenching, or surface sampling) may be conducted prior to the start of remediation, or as needed to support confirmatory or risk assessment activities. Since near field monitoring is not being conducted at the 100-B/C Area, only routine radiological control surveys will be performed."

If you and Tom are amenable to the changes above, I'd like to request documenting your approval via the next UMM.

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

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

Attachment 3

0589738

AIR MONITORING PLAN FOR THE 100-B/C AREA BURIAL GROUNDS AND REMAINING SITES REMEDIAL ACTION
June 2008

1.0 INTRODUCTION

Remedial action (i.e., cleanup) of the burial grounds and remaining sites in the 100-B/C Area has the potential to emit radioactive particulates. This activity is being conducted under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) and the associated *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* approved by the U.S. Environmental Protection Agency (EPA) (DOE-RL 2005). Quantification of radioactive emissions, implementing best available radionuclide control technology (BARCT) pursuant to *Washington Administrative Code* (WAC) 246-247(3), and air monitoring pursuant to WAC 246-237-075(3) and (8) have been identified as substantive requirements (i.e., applicable or relevant and appropriate requirements) for the remedial action. This air monitoring plan describes how the substantive portions of these requirements will be implemented for this removal action. .

1.1 PLANNED ACTIVITIES

This remedial action work scope is for the removal and disposal of waste material and associated soil and debris from burial grounds and remaining waste sites located at the 100-B/C Area. The remedial action operations include characterizing, excavating, sorting, size reducing, stockpiling, treating (if necessary), decontaminating, containerizing, staging, loading, and transporting materials from the waste sites. The equipment being used is considered standard equipment for excavating, size reduction (e.g., shears, cutting torch), segregating, loading, and hauling. Decontamination activities such as scabbling (e.g., removal of the surface layer) may be employed to remove radioactive contamination. Characterization activities may include, but are not limited to, sampling, test pitting, trenching, and drilling to further define the waste and/or determine the limits of some of the waste sites. Characterization activities may begin before remediation to assist in verifying design parameters, and will continue for the life of the remediation project.

The loading of contaminated soil and debris into waste containers may result in soil spilled on the waste containers and/or haul trucks. Haul trucks with loaded containers will be surveyed to detect exterior contamination. A decontamination station may be established to decontaminate containers, haul trucks, and equipment, as required. Waste containers, haul trucks, and/or equipment will be decontaminated by conventional means such as brushing or wiping, or with high-efficiency particulate air (HEPA)-filtered vacuum cleaners. The HEPA-filtered vacuum cleaners may also be used (as needed) to

decontaminate other equipment or to pick up other loose contaminated materials. More aggressive decontamination methods (e.g., grinding or wet-grit blasting) may be used for decontamination if the other methods fail. Decontaminated trucks and containers will then proceed to the container staging area where the transportation subcontractor will pick up the containers for transport to the Environmental Restoration Disposal Facility (ERDF) or other approved disposal location. A portable temporary radioactive air emissions unit (PTRAEU) may be used in the characterization of anomalies.

Most of the burial grounds and remaining sites in the 100-B/C Area have been remediated. The only remaining waste sites in the 100-B/C Area that are radioactively contaminated are 100-B-21 and 100-B-25 (Figure 1). The 100-B-21 site consists of a radioactive chemical waste pipeline. The 100-B-25 site consists of a spillway. Remediation of other remaining waste sites in the 100-B/C Area are not included in this air monitoring plan because no radioactive contamination is associated with them.

2.0 AIRBORNE SOURCE INFORMATION

There is a potential for particulate radioactive airborne emissions to result from remediation of the waste sites at the 100-B/C Area. The concentrations of isotopes listed in Attachment 1 represent those that were determined to exist in the waste sites. Other isotopes may also be encountered in negligible amounts during remedial action activities. However, it is expected that the isotopic concentrations listed in Attachment 1 represent the upper bound of what will actually be found during remedial actions and that the estimates provided are conservative.

2.1 INVENTORY

The radionuclide inventory and subsequent potential emission calculations are summarized in Attachment 1. The inventory was developed based on the *Determination of Material at Risk and Hazard Screening for 100-BC Area FY07 Design Waste Sites* (WCH 2007).

The 100-B-21 and 100-B-25 waste sites are likely to contain contaminated soil, concrete, and pipe. For conservatism, it was assumed that the inventory for this material is generally in the form of particulates (soil, pipe scale, debris). A release fraction of 1.0×10^{-3} is applied for particulates for most radionuclides. For calculation purposes, it is conservatively assumed that tritium is present as a gas and a release fraction of 1 is applied.

It is assumed that decontamination of equipment using a HEPA filtered vacuum cleaner may occur at each site. It is assumed that one tenth percent (0.1%) of the soil or pipe scale will be collected in the HEPA filter vacuum cleaners. The HEPA filtered vacuum cleaners have a release fraction of 1. The calculation is conservative because it assumes the HEPA filter vacuum cleaner inventory in addition to the soil and pipe scale, not as part of the soil.

The CAP88-PC model (Version 2) was used to determine the annual total effective dose equivalent (TEDE) to the maximally exposed individual (MEI). The appropriate release fraction was applied to the inventory of the various wastes to calculate the potential-to-emit. The calculated potential-to-emit (curies per year) was input to the computer model, and the model generated the annual unabated dose. The distance to the ME1 used in the model was approximately 9,042 m to the northwest of the remediation sites. The CAP88-PC model summary and synopsis for the remediation of the sites are presented in Calculation No. 0100B-CA-V0304 (WCH 2008) The calculated total unabated annual TEDE to the MEI from the 100-B/C Area remedial action is 4.43×10^{-3} mrem/yr.

3.0 BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY (BARCT)

The following is the BARCT to be implemented during the remedial actions.

- Water will be applied during excavation, container loading, and backfilling processes to minimize and control airborne releases.

- Soil fixatives will be applied to any contaminated soils and debris that will be inactive for more than 24 hours. Periodic monitoring (visual observation) should be performed of the contaminated soils and debris that remain inactive for greater than 1 month. Re-application of fixatives shall be performed if warranted by the periodic monitoring.

- Fixatives will be applied to contaminated soils and debris that will be inactive less than 24 hours at the end of work operations, if the sustained wind speed is predicted overnight to be greater than 32 km/hr (20 mph), based on the Hanford Meteorological Station morning forecast. This will allow the project enough time, if necessary, to prepare for the application of dust control measures. If a soil fixative has already been applied and the soil will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated soils are frozen, or it is raining, snowing, or other freezing precipitation is falling at the end of work operations.

- Appropriate documentation on the application of fixatives to comply with BARCT shall be maintained to support a compliance demonstration (e.g., logbook or other project-specific documentation).

- The haul trucks will be covered to contain the materials while in transit to ERDF.

- Vacuum cleaners and PTRAEUs will be used when needed and are equipped with HEPA filters, which are considered BARCT for radioactive emissions at the

Hanford Site. HEPA filters are efficiency tested upon installation and on an annual basis thereafter and must be demonstrated to have a 99.95% removal efficiency.

4.0 MONITORING

The *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005) in section 3.4.6, "Air Monitoring Plans," notes the following:

"The substantive requirements applicable to radioactive air emissions resulting from remediation activities are to quantify potential emissions, monitor the emissions, and identify and employ best available radionuclide control technology. Exemptions from these requirements may be requested if the potential-to-emit for the activity or emission unit would result in a total effective dose equivalent of less than 0.1 mrem/year."

Section 2.1 above quantifies the potential emissions that may result from this remediation activity. Because the calculated total unabated annual TEDE to the MEI from the 100-B/C Area remedial action is 4.43×10^{-3} mrem/yr, which is less than 0.1 mrem/year, the remediation of the 100-B-21 and 100-B-25 sites is exempt from the requirement to monitor emissions. The best available radionuclide control technology specified in section 3.0 above shall be implemented to control any emissions that may result from the remedial activity.

5.0 REFERENCES

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 601, et seq.

DOE-RL, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

WAC 246-247-040, "Radiation Protection-Air Emissions," *Washington Administrative Code,* as amended.

WCH 2007, *Determination of Material at Risk and Hazard Screening for 100-BC Area FY07 Design Waste Sites,* 0100B-CA-N0039, Rev. 0, Washington Closure Hanford, Richland, Washington

WCH 2008, *Total Effective Dose Equivalent for the Remedial Action of the 100B/C Area Waste Sites*, 0100B-CA-V0304, Rev. 0, Washington Closure Hanford, Richland, Washington

Concurrence:

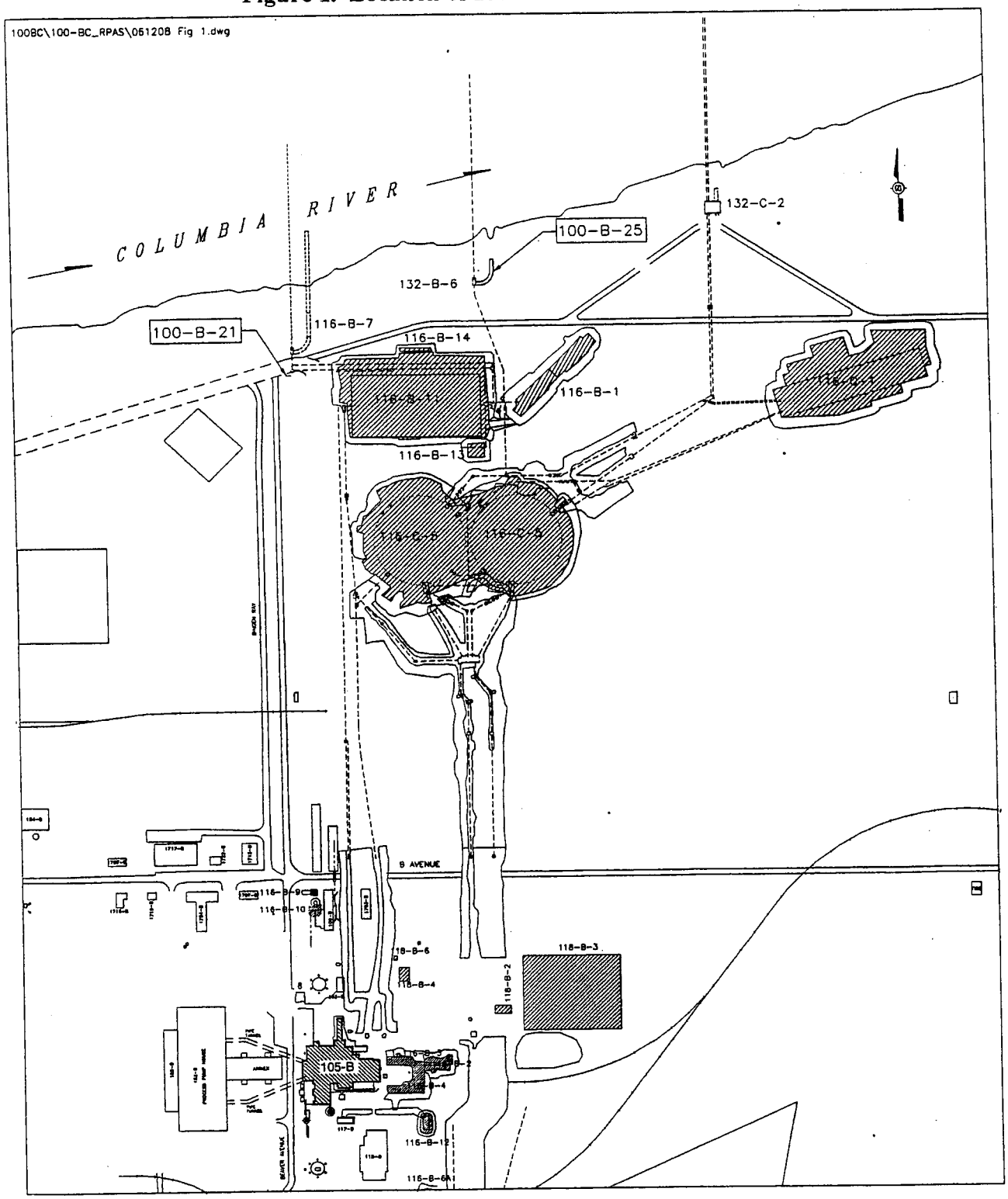
6/26/08

L. Buelow Date
U.S. Environmental Protection Agency

6/26/08

C. Smith Date
U.S. Department of Energy
Richland Operations Office

Figure 1. Location of 100-B-21 and 100-B-25 Waste Sites



ATTACHMENT 1

Summary of radionuclide inventory and potential emission calculations for remediation of 100-B-21 and 100-B-25

Isotope	MAXIMUM VALUES					Unabated TEDE to the MEI[3] (mrem/yr)
	Inventory[1], Ci		Potential to Emit, Ci/yr			
	Particulates	HEPA Vacuum	Particulates (1E-3 RF)[2]	HEPA Vacuum (1RF)	Total (Ci/yr)	
Co-60	9.33E+00	9.33E-03	9.33E-03	9.33E-03	1.87E-02	2.48E-03
Cs-134	4.15E-06	4.15E-09	4.15E-09	4.15E-09	8.30E-09	6.02E-10
Cs-137	3.29E-01	3.29E-04	3.29E-04	3.29E-04	6.59E-04	2.09E-05
Ba-137m	3.12E-01	3.12E-04	3.12E-04	3.12E-04	6.23E-04	7.69E-13
Eu-152	5.49E-01	5.49E-04	5.49E-04	5.49E-04	1.10E-03	1.40E-04
Eu-154	5.49E-01	5.49E-04	5.49E-04	5.49E-04	1.10E-03	1.13E-04
Eu-155	4.42E-02	4.42E-05	4.42E-05	4.42E-05	8.84E-05	4.01E-07
H-3	1.05E-02	1.05E-05	1.05E-02	1.05E-05	1.05E-02	3.28E-07
Na-22	1.08E-03	1.08E-06	1.08E-06	1.08E-06	2.16E-06	1.62E-07
Ni-63	6.33E-01	6.33E-04	6.33E-04	6.33E-04	1.27E-03	3.44E-07
Pu-238	1.43E-02	1.43E-05	1.43E-05	1.43E-05	2.85E-05	1.98E-04
Pu-239/240	5.22E-02	5.22E-05	5.22E-05	5.22E-05	1.04E-04	7.78E-04
Sr-90	2.72E-02	2.72E-05	2.72E-05	2.72E-05	5.45E-05	4.87E-06
Y-90	2.72E-02	2.72E-05	2.72E-05	2.72E-05	5.45E-05	1.05E-08
U-233/234	2.68E-03	2.68E-06	2.68E-06	2.68E-06	5.37E-06	1.53E-05
U-235	2.75E-03	2.75E-06	2.75E-06	2.75E-06	5.49E-06	1.47E-05
U-238	1.32E-01	1.32E-04	1.32E-04	1.32E-04	2.64E-04	6.63E-04
Total						4.43E-03

[1] Radionuclide inventories are presented in 0100B-CA-V0304, *Total Effective Dose Equivalent for the Remedial Action of the 100-B/C Area FY07*, Rev. 0, February 2008

[2] Release fraction for H-3 is assumed to be 1 in all cases.

[3] The annual unabated total effective dose equivalent was determined using the CAP88-PC, Version 2 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 100-B/C Area Remedial Action is 9,042 m northwest. The CAP88-PC model summaries and synopses are presented in above referenced calculations from footnote 1.

MEI = Maximally exposed individual

TEDE = Total effective dose equivalent

RF = Release fraction

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Attachment 4-A

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AIR MONITORING PLAN FOR THE 100-D/DR AREA REMAINING SITES AND BURIAL GROUNDS REMEDIAL ACTION OCTOBER 2010

1.0 INTRODUCTION

Remedial action (i.e., cleanup) of the remaining sites and burial grounds located in the 100-D Area has the potential to emit radionuclides. These activities are being conducted under two Comprehensive *Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Record of Decisions (EPA 1999, 2000). Quantification of radioactive emissions, implementation of best available radionuclide control technology (BARCT) pursuant to *Washington Administrative Code* (WAC) 246-247-040(3) and air monitoring pursuant to WAC 246-247-075(3) and (8) have been identified as substantive requirements (i.e., applicable or relevant and appropriate requirements) for the remedial action.

This air monitoring plan describes how the substantive portions of these requirements will be implemented for this removal action.

1.1 PLANNED ACTIVITIES

This remedial action work scope is for the removal and disposal of waste material and associated soil and debris from burial grounds and remaining waste sites located in the 100-DR-1 and 100-DR-2 Operable Units. The remedial action operations include characterizing, excavating, sorting, size reducing, stockpiling, treating (if necessary), decontaminating, containerizing, staging, loading, and transporting materials from the waste sites. The equipment being used is considered standard equipment for size reduction (e.g., shears, cutting torch), as well as excavating, segregating, loading, and hauling. Decontamination activities such as scabbling (e.g., removal of the surface layer) may be employed to remove radioactive contamination. Characterization activities may include, but are not limited to, sampling, test pitting, trenching, and drilling to further define the waste and/or determine the limits of some of the waste sites. Characterization activities may begin before remediation to assist in verifying design parameters, and will continue for the life of the remediation project.

The loading of contaminated soil and debris into waste containers may result in soil spilled on the waste containers and/or haul trucks. Haul trucks with loaded containers will be surveyed to detect exterior contamination. A decontamination station may be established to decontaminate containers, haul trucks, and equipment, as required. Waste containers, haul trucks, and/or equipment will be decontaminated by conventional means such as brushing or wiping, or with high-efficiency particulate air (HEPA)-filtered vacuum cleaners. The HEPA-filtered vacuum cleaners may also be used (as needed) to decontaminate other equipment or to pick up other loose contaminated materials. More aggressive decontamination methods (e.g., grinding or wet-grit blasting) may be used for decontamination if the other methods fail. Decontaminated trucks and containers will then proceed to the container staging area where the transportation subcontractor will pick up the containers for transport to the Environmental Restoration Disposal

Facility (ERDF) or other approved disposal location. Portable HEPA filtered enclosures may be used in the characterization of anomalies.

The work scope includes, but is not limited to, remediation of the following waste sites in the 100-D Area: 100-D-1, 100-D-3, 100-D-8, 100-D-14, 100-D-29, 100-D-31, 100-D-32, 100-D-33, 100-D-35, 100-D-40, 100-D-41, 100-D-42,100-D-43, 100-D-45, 100-D-47, 100-D-50:1, 100-D-50:2, 100-D-50:3, 100-D-50:4, 100-D-50:6 and 100-D-50:9, 100-D-63, 100-D-65, 100-D-66, 100-D-73, 100-D-76, 100-D-85:1, 116-D-5, 116-DR-3, 116-DR-5, 116-D-8, 116-DR-8, 116-D-10, 116-DR-3, 116-DR-10, 118-D-1, 118-D-2, 118-D-3, 118-D-4, 118-D-5, 118-DR-1, 118-D-6:4, 126-D-2, 128-D-2, 132-D-1, 1607-D2, 126-DR-1, 128-D-2, UPR-100-D-5, and 628-3. The locations of the sites discussed in this AMP are shown in Figure 1.

Characterization sampling (e.g., confirmatory sampling, remedial investigation sampling) at radiological contaminated sites is included in the scope of this plan since the emissions from these activities (e.g., surface sampling, potholing) will generate negligible emissions. The Washington State Department of Ecology (Ecology) will be notified of confirmatory sampling activities at 100-D via the confirmatory sampling work instruction approval process already in place. Additional sites may be added to this air monitoring plan through agreement in the Unit Managers' Meeting. Additionally, if any of the nonradioactive sites in 100-D Area are determined to contain radioactive contamination based on additional information, this air monitoring plan will cover those sites based on concurrence from Ecology.

2.0 AIRBORNE SOURCE INFORMATION

There is a potential for particulate radioactive airborne emissions to result from remediation of waste sites in the 100-D Area. The concentrations of the isotopes listed in Attachment 1 represent those that were determined to exist in the waste sites. Other isotopes may also be encountered in negligible amounts during remedial action activities; however, it is expected that the total estimated dose listed in Attachment 1 is conservative and represents the upper bound of what will actually be found during remedial actions.

2.1 INVENTORY

The radionuclide inventory and subsequent potential emissions calculations are summarized in Attachment 1. Attachment 1 is a compilation of the inventories and associated estimated dose rates from the following calculations: (1) *Total Effective Dose Equivalent for the Remedial Action of the 100-D Area Supplemental Design Sites*, Calculation 0100D-CA-V0273 (WCH 2006), (2) *Total Effective Dose Equivalent for the 100D/ DR Area Burial Grounds and Remaining Sites*, Calculation 0100D-CA-V0267 (WCH 2007); and (3) *Total Effective Dose Equivalent for the Remedial Action of the 100D Area Waste Sites-FY2008,* Calculation 0100D-CA-V0283, Rev. 1 (WCH 2010).

The waste sites are likely to contain contaminated soil or soil mixed with piping and other debris. For conservatism, it was assumed that the inventory for this material is generally in the form of particulates (soil, debris, oxides). The particulate form of the inventory, for calculation purposes,

is assumed to have rubbed off into the soil and a release fraction of 1.0×10^{-3} is applied. For calculation purposes, it is conservatively assumed that tritium and krypton-85 are present as a gas and a release fraction of 1 is applied. There is the potential that objects may need to be size-reduced prior to transportation to ERDF. In addition, it is conservatively assumed that all size reduction for most waste sites will be accomplished with a cutting torch or shears. A release fraction of 1 is applied for torch cutting and would represent 0.21% of the overall inventory (for size reduction in 10 ft lengths), and 0.12% of the overall inventory (for size reduction in 17 ft lengths).

It is assumed at this time that no scabbling will be performed, but is an activity that may be necessary. Should this be necessary, concurrence from Ecology will be necessary. In addition, it is assumed that 0.1% of the particulate inventory will be picked up through a HEPA-filtered vacuum. A release fraction of 1 is applied to the HEPA vacuum inventory.

The potential for spent nuclear fuel elements is possible. It is assumed that 99.9% of the fuel element is metal with a release fraction of 1.0×10^{-6} and 0.1% is an oxide with a release fraction of 1.0×10^{-3}.

The CAP88-PC model (Version 2 or Version 3.0, depending on when the calculation was prepared) was used to determine the annual total effective dose equivalent (TEDE) to the maximally exposed individual (MEI). The appropriate release fraction was applied to the inventory of the various wastes to calculate the potential-to-emit. The calculated potential-to-emit (curries per year) was the input used for the computer model, and the model generated the annual unabated dose. The distance to the MEI used in the model was approximately 9,713 m west-northwest. The CAP88-PC model summary and synopsis are presented in calculations cited above in the first paragraph of this section. The calculated total unabated annual TEDE to the MEI for the inventory in the combined calculations is 8.79 E-01 mrem/yr. This dose estimate is conservative because it assumes all the waste sites will be remediated in 1 year. Additionally, some of the waste sites have already been remediated.

3.0 BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY

The following is the BARCT to be implemented during the remedial actions:

- Water will be applied during excavation, container loading, and backfilling processes to minimize and control airborne releases.

- Soil fixatives will be applied to any contaminated soils and debris that will be inactive for more than 24 hours. Periodic monitoring (visual observation) should be performed of the contaminated soils and debris that remain inactive for greater than 1 month. Re-application of fixatives or other control measures shall be performed if warranted by the periodic monitoring.

- Fixatives will be applied to contaminated soils and debris that will be inactive less than 24 hours at the end of work operations if the sustained wind speed is predicted overnight to be

greater than 32 km/hr (20 mph) based on the Hanford Meteorological Station morning forecast. This will allow the project enough time, if necessary, to prepare for the application of dust control measures. If a soil fixative has already been applied and the soil will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated soils are frozen or it is raining, snowing, or other freezing precipitation is falling at the end of work operations.

- Appropriate documentation on the application of fixatives to comply with BARCT shall be maintained (e.g., logbook or other project-specific documentation).

- The haul trucks will be covered to contain the materials while in transit to ERDF.

- Vacuum cleaners and ventilated enclosures for radiological work will be used when needed and are equipped with HEPA filters, which are considered BARCT for radioactive emissions at the Hanford Site. HEPA filters are efficiency tested upon installation and on an annual basis thereafter, and must be demonstrated to have a 99.95% removal efficiency.

- Additional measures for controlling small debris in waste piles may be prudent based on waste site conditions as determined by project personnel. Additional measures that may be used are as follows: (1) application of a thin layer of contaminated soil from the same waste site (that is free of debris) on the surface and follow normal fixative application, (2) apply a thin layer of uncontaminated soil on the surface and follow normal fixative applications, (3) apply bonded fiber fixative, and (4) cover the area containing small debris that is easily re-suspended with a tarp or other appropriate material.

4.0 MONITORING

Monitoring activities will consist of establishing near-facility (NFM) monitoring stations upwind and downwind of the 100-D Area. There will be four downwind air monitors. The locations of these monitors (Figure 1) are based on the predominant wind directions. The existing air monitoring station at the Yakima Barricade (not shown in Figure 1) will be used as the upwind air monitoring station. The existing air monitor located northeast of 628-3 will be moved west of 628-3 once remediation of that site is complete as depicted in Figure 1.

Near-facility air monitoring is the means/methods to measure emissions. These monitors will be operated in accordance with Hanford Site protocol established for near-facility monitors (DOE-RL 2008). The air samples will be collected every 2 weeks and analyzed for total alpha and total beta. The data from the 2 week total alpha and total beta air samples will be evaluated for unusual trends. The samples will be composited semi-annually and analyzed for gamma energy analysis (GEA), strontium-90, americium-241, plutonium-238, plutonium-239/240, and isotopic uranium. Environmental soil samples will be collected before, during, and after remediation near the downwind air monitors and analyzed for GEA, strontium-90, isotopic plutonium-238, plutonium-239/240, and isotopic uranium. The soil samples will be taken to evaluate the long-term trends in the environmental accumulation of radioactivity. The data from these activities will be included in the appropriate annual reports prepared for the Hanford Site.

As part of the site-wide evaluation of NFM data, the electronic release summary (ERS) database compares NFM composite air sample results to 10% of the values in 40 CFR 61, Appendix E, Table 2. The database identifies results that exceed these values. Results from the downwind air monitors identified in this plan that are above these values will be investigated and the adequacy of the controls evaluated as appropriate.

HEPA ventilated enclosures may be used during the characterization of anomalies. It is anticipated that an insignificant portion of the overall inventory will be processed through an enclosure. HEPA filtered vacuums may also be utilized infrequently during remediation activities. Exhaust points from HEPA filters (and any duct work, seams, or other potential release locations from enclosures) will be monitored on a routine basis for potential radionuclide releases and the results recorded (e.g., post survey results negative) during vacuuming or exhauster operations. Any positive survey results will require appropriate maintenance on the unit to ensure that continued releases do not occur. Records of routine monitoring and necessary maintenance will be provided to Ecology staff upon request.

Air monitor downtime will be minimized and all air monitors shall be operated as described in the following text. However, if a downwind air monitor is out of operation for more than 48 hours during normal work operations (e.g., excavating and loading radioactive contaminated material), Ecology will be notified. If two or more air monitors are out of operation during normal work operations, excavation and loading activities shall be temporarily suspended until operation of at least 3 downwind air monitors are restored or backup equipment is deployed. Normal work operations are not allowed if two downwind monitors are not operating. Air monitoring will no longer be required when excavation of the waste sites has been completed.

Characterization (e.g., test pitting and trenching, or surface soil sampling) may be conducted prior to the start of remediation, or as needed to support confirmatory or risk assessment activities. If near-facility air monitoring is not being conducted during these characterization activities, then only routine radiological control surveys will be performed.

5.0 REFERENCES

40 CFR 61, "Protection of Environment," *Code of Federal Regulations* as amended.

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

DOE-RL, 2008, *Environmental Monitoring Plan*, DOE/RL-91-50, as revised, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1999, *Interim Action Record of Decision, 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2,100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6 and 200-CW-3,* U.S. Environmental Protection Agency, July 13, 1999.

EPA, 2000, *Declaration of the Record of Decision, 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-2, 100-HR-2 and100-KR-2,* U.S. Environmental Protection Agency, September 25, 2000.

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

WCH, 2006, *Total Effective Dose Equivalent for the Remedial Action of the 100-D Area Supplemental Design Sites*, Calculation 0100D-CA-V0273, Rev. 0, Washington Closure Hanford, Richland, Washington

WCH, 2007, *Total Effective Dose Equivalent for the 100D/ DR Area Burial Grounds and Remaining Sites,* Calculation 0100D-CA-V0267, Rev. 1, Washington Closure Hanford, Richland, Washington

WCH, 2010, *Total Effective Dose Equivalent for the Remedial Action of the 100D Area Waste Sites-FY2008*, Calculation 0100D-CA-V0283, Rev. 1, Washington Closure Hanford, Richland, Washington

ATTACHMENT 1

Summary of Total Effective Dose Equivalent For 100-D Area Waste Sites. (2 Pages)

Isotope	0100D-CA-V0283, Rev. 1	0100D-CA-V0267, Rev. 1	0100D-CA-V0273, Rev. 0	COMBINED TOTAL
	Unabated TEDE to the MEI (mrem/yr)[1]			
Ac-228	8.40E-08			**8.40E-08**
Ag-108m				**0.00E+00**
Am-241	2.44E-05	1.53E-01	2.65E-04	**1.53E-01**
Ba-133		3.12E-04	2.32E-05	**3.35E-04**
Ba-137m	4.63E-06	9.32E-10	4.16E-04	**4.21E-04**
Bi-212	2.52E-08			**2.52E-08**
Bi-214	1.72E-07			**1.72E-07**
C-14	8.24E-05	6.06E-05	4.13E-06	**1.47E-04**
Ca-41		3.43E-09	2.36E-10	**3.67E-09**
Cd-113m		0.00E+00		**0.00E+00**
Co-60	4.96E-06	4.80E-01	4.22E-02	**5.22E-01**
Cs-134	9.96E-09	1.65E-08		**2.65E-08**
Cs-137	1.83E-04	5.55E-02	1.25E-04	**5.58E-02**
Eu-152	4.35E-06	3.13E-02	3.01E-03	**3.43E-02**
Eu-154	2.47E-07	2.52E-02	2.60E-03	**2.78E-02**
Eu-155	2.77E-09	1.12E-05		**1.12E-05**
H-3[2]	1.84E-06	2.03E-02	6.78E-05	**2.04E-02**
I-129	7.91E-08			**7.91E-08**
K-40	2.76E-05	1.36E-03	5.92E-05	**1.45E-03**
Kr-85[2]		1.73E-06		**1.73E-06**
Na-22		2.24E-06		**2.24E-06**
Nb-94		2.35E-04		**2.35E-04**
Ni-59		3.46E-05	1.69E-06	**3.63E-05**
Ni-63	6.46E-07	5.50E-03	2.21E-04	**5.72E-03**
Pa-234	3.13E-10			**3.13E-10**
Pa-234m	1.05E-08			**1.05E-08**
Pb-210	6.03E-08			**6.03E-08**
Pb-212	1.51E-08			**1.51E-08**
Pb-214	2.86E-08			**2.86E-08**
Pd-107		2.22E-13		**2.22E-13**
Po-214	9.42E-12			**9.42E-12**
Po-216	1.82E-12			**1.82E-12**

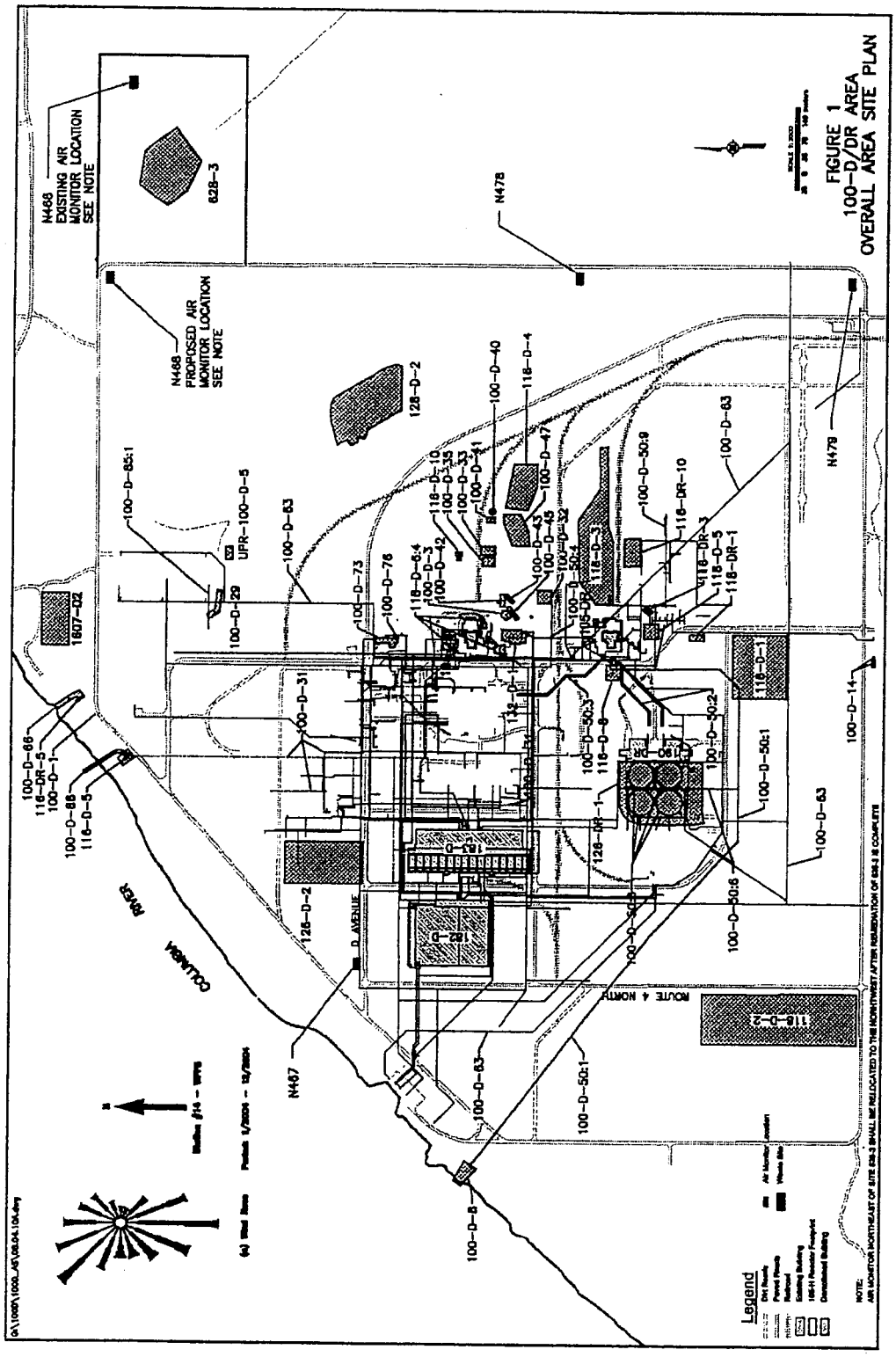
Summary of Total Effective Dose Equivalent
For 100-D Area Waste Sites. (2 Pages)

Isotope	0100D-CA-V0283, Rev. 1	0100D-CA-V0267, Rev. 1	0100D-CA-V0273, Rev. 0	COMBINED TOTAL
	Unabated TEDE to the MEI (mrem/yr)[1]			
Po-218	1.03E-12			**1.03E-12**
Pu-238	1.80E-06	7.28E-03		**7.28E-03**
Pu-239[3]	4.48E-05	1.83E-02	1.73E-04	**1.85E-02**
Pu-240[3]		7.19E-05		**7.19E-05**
Pu-241	1.01E-06	4.15E-05		**4.25E-05**
Ra-224	6.03E-08			**6.03E-08**
Ra-226	1.37E-05	1.70E-04	9.45E-06	**1.93E-04**
Ra-228	1.48E-05		6.12E-06	**2.09E-05**
Rn-220	2.42E-16			**2.42E-16**
Rn-222	2.94E-16			**2.94E-16**
Se-79		0.00E+00		**0.00E+00**
Sm-151		7.68E-09		**7.68E-09**
Sr-90	3.57E-04	4.50E-03	3.38E-04	**5.20E-03**
Tc-99	4.54E-08	2.47E-05	1.88E-06	**2.66E-05**
Th-228	8.70E-05		1.55E-04	**2.42E-04**
Th-231	1.16E-10			**1.16E-10**
Th-232	6.83E-05		2.62E-04	**3.30E-04**
Th-234	1.18E-08			**1.18E-08**
Tl-208	1.20E-07			**1.20E-07**
U-233[3]	7.79E-06	1.28E-03	1.22E-03	**2.51E-03**
U-235	4.46E-07	2.86E-03	1.51E-05	**2.88E-03**
U-238	6.76E-06	1.79E-02	1.24E-03	**1.91E-02**
Y-90	1.31E-06	9.73E-06	7.38E-07	**1.18E-05**
Zr-93		7.82E-11		**7.82E-11**
TOTAL	**9.39E-04**	**8.25E-01**	**5.24E-02**	**8.79E-01**

[1] The annual unabated total effective dose equivalent was determined using the CAP88-PC. 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 100-D Area is 9,714 m west-northwest.
[2] Release fraction for H-3 and Kr-85 is assumed to be 1 in all cases.
[3] For some sites, the MAR calculations presented combined data (i.e., Pu-239/Pu-240); all Pu-239/Pu-240 and U-233/U-234 combined values are assumed to be Pu-239 and U-233 respectively.

MAR = Material at Risk
MEI = Maximally Exposed Individual
RF = Release Fraction
TEDE = Total Effective Dose Equivalent

Figure 1. 100-D/DR Area Overall Site Plan.



Concurrence:

M. S. French
U.S. Department of Energy,
Richland Operations Office

10/21/10
Date

Nina Menard
Washington State Department of Ecology

10-25-10
Date

Distribution:

Administrative Record	H6-08
Nina Menard	H0-57
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Tom Post	A3-04
Joan Woolard	H4-21
Dave Martin	X9-08
Dan Saueressig	N3-30
Steve Wilkinson	X4-08

Attachment 4-B

159276

^WCH Document Control

From: Saueressig, Daniel G
Sent: Tuesday, June 21, 2011 11:17 AM
To: ^WCH Document Control
Subject: FW: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN
Attachments: ENW01_13A.PDF

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

Thanks,

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

From: Welsch, Kim (ECY) [mailto:KIWE461@ECY.WA.GOV]
Sent: Monday, June 20, 2011 7:15 AM
To: Saueressig, Daniel G
Cc: Boyd, Alicia
Subject: RE: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN

Dan,

As we discussed in the 100 Area UMM, I agree with your path forward to correct. Sorry I did not respond earlier.....have a great day!

Kim Welsch
WA State Dept. of **Ecology**
Nuclear **W**aste **P**rogram
3100 Port of Benton Blvd
Richland, WA 99354-1670
MSIN: H0-57
(509) 372-7882
kim.welsch@ecy.wa.gov

From: Saueressig, Daniel G [mailto:dgsauere@wch-rcc.com]
Sent: Monday, June 20, 2011 7:03 AM
To: Welsch, Kim (ECY)
Subject: RE: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN

Kim, have you had a chance to look this over?

Thanks,

159276

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

From: Saueressig, Daniel G
Sent: Thursday, June 09, 2011 6:31 AM
To: 'Welsch, Kim (ECY)'
Cc: Post, Thomas C; Woolard, Joan G; Boyd, Alicia
Subject: CORRECTION/TYPO ON 100-D AIR MONITORING PLAN

Kim, a typo was found on the 100-D air monitoring plan and I'd like to make sure Ecology is aware of it. The figure included in the plan (attached) contained the wrong air monitoring number (also called an EDP code) for monitors N514 and N515. They were erroneously listed as N478 and N479.

I believe the mistake occurred because MSA was systematically bringing in monitors to their shop and upgrading them to new NEC standards. During the time the 100-D air monitoring plan was being revised, monitors with different numbers were placed at 100-D during this upgrade and we used those numbers in the figure included in the air monitoring plan. I'm told these numbers, or EDP codes, are like street addresses and are used for the site wide near-field monitoring program to track emissions across the site. Needless to say, I can't change these numbers to the ones listed in the plan, they need to remain listed as N514 and N515. Note that regardless of the numbers that are listed in the plan, we have been monitoring emissions at 100-D as discussed in the approved plan.

The next time the 100-D air monitoring plan is revised, we'll ensure that the correct monitoring number, or EDP code, is listed in the plan.

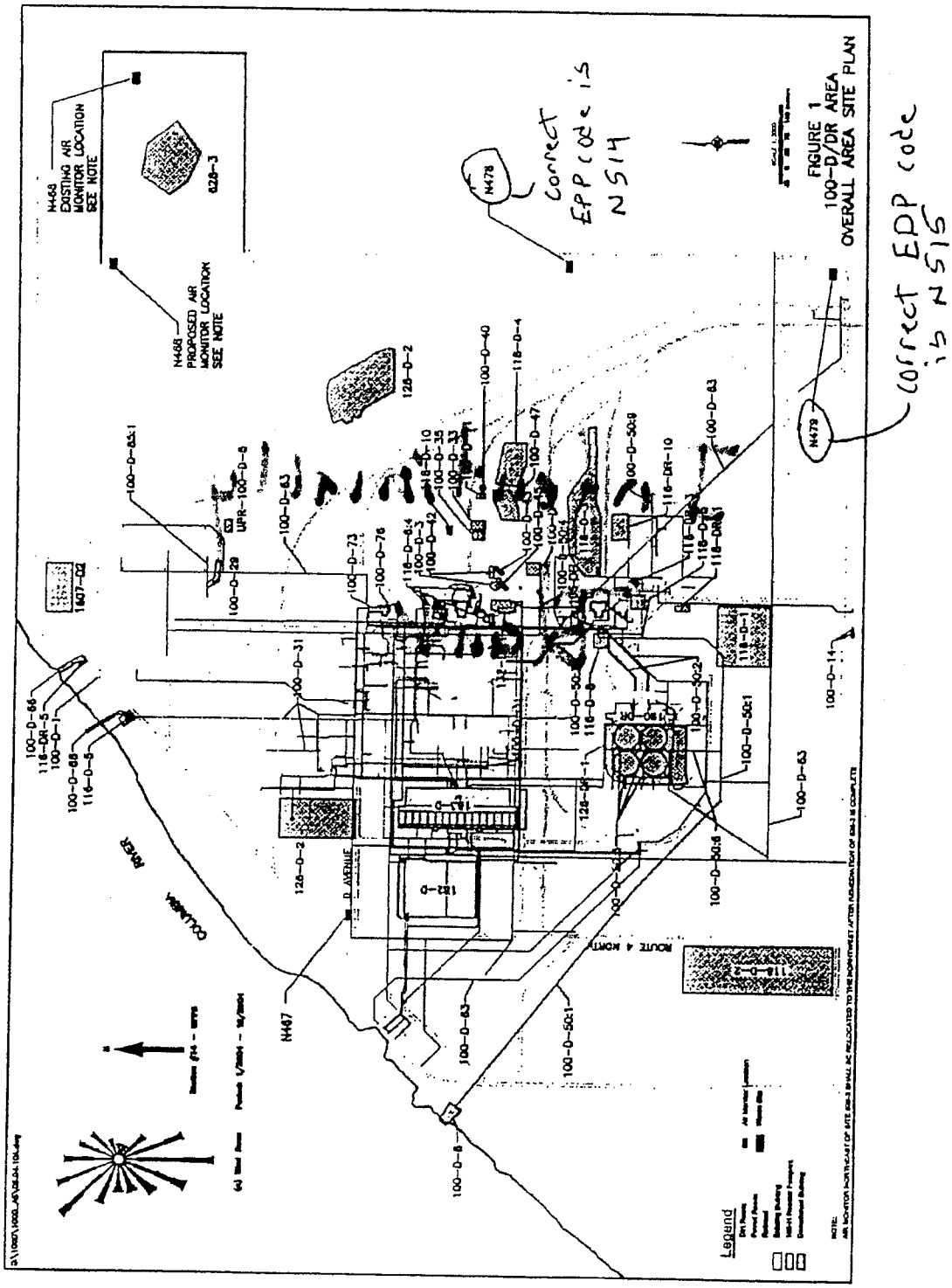
Let me know if you are okay with this path forward.

Thanks,

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

<< File: ENW01_13A.PDF >>

Figure 1. 100-D/DR Area Overall Site Plan.



4-B-3

Attachment 5

157903

AIR MONITORING PLAN FOR THE 100-H AREA REMAINING SITES AND BURIAL GROUNDS REMEDIAL ACTION

OCTOBER 2010

1.0 INTRODUCTION

Remedial action (i.e., cleanup) of the remaining sites and burial grounds located in the 100-H Area has the potential to emit radionuclides. These activities are being conducted under two *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Record of Decisions (EPA 1999, 2000).

Quantification of radioactive emissions, implementation of best available radionuclide control technology (BARCT) pursuant to *Washington Administrative Code* (WAC) 246-247-040(3) and air monitoring pursuant to WAC 246-247-075(3) and (8) have been identified as substantive requirements (i.e., applicable or relevant and appropriate requirements) for the remedial action.

This air monitoring plan describes how the substantive portions of these requirements will be implemented for this removal action.

1.1 PLANNED ACTIVITIES

This remedial action workscope is for the removal and disposal of waste material and associated soil and debris from burial grounds and remaining waste sites located in the 100-H Operable Units. The remedial action operations include characterizing, excavating, sorting, size reducing, stockpiling, treating (if necessary), decontaminating, containerizing, staging, loading, and transporting materials from the waste sites. The equipment being used is considered standard equipment for size reduction (e.g., shears, cutting torch), as well as excavating, segregating, loading, and hauling. Decontamination activities such as scabbling (e.g., removal of the surface layer) may be employed to remove radioactive contamination. Characterization activities may include, but are not limited to, sampling, test pitting, trenching, and drilling to further define the waste and/or determine the limits of some of the waste sites. Characterization activities may begin before remediation to assist in verifying design parameters, and will continue for the life of the remediation project.

The loading of contaminated soil and debris into waste containers may result in soil spilled on the waste containers and/or haul trucks. Haul trucks with loaded containers will be surveyed to detect exterior contamination. A decontamination station may be established to decontaminate containers, haul trucks, and equipment, as required. Waste containers, haul trucks, and/or equipment will be decontaminated by conventional means such as brushing or wiping, or with high-efficiency particulate air (HEPA)-filtered vacuum cleaners. The HEPA-filtered vacuum cleaners may also be used (as needed) to decontaminate other equipment or to pick up other loose contaminated materials. More aggressive decontamination methods (e.g., grinding or wet-grit blasting) may be used if the other decontamination methods fail. Decontaminated trucks and containers will then proceed to the container staging area where the transportation subcontractor will pick up the containers for transport to the Environmental Restoration Disposal Facility (ERDF) or other approved disposal location. Portable HEPA filtered enclosures may be used in the characterization of anomalies.

The work scope includes, but is not limited to, remediation of the following burial grounds in the 100-H Area: 118-H-1, 118-H-2, 118-H-3, 118-H-4, and 118-H-5. The workscope includes, but is not limited to, remediation of the following remaining sites in the 100-H Area: 600-152, 116-H-9, 116-H-5, 118-H-6:4, 118-H-6:5, 100-H-4, 100-H-28:2, 100-H-35,100-H-37, 100-H-41, 126-H-2, and 132-H-3. Additionally, 100-H-33 is being added to this AMP, but it is currently believed to be a nonradiological site. If radiological contamination is discovered during the remediation of the site, the monitoring and BARCT requirements of this AMP will be applied.

The locations of the sites discussed in this AMP are shown in Figure 1, with the exception of 100-H-37. 100-H-37 covers multiple locations where radiological contamination was spread through biological transport (mud daubers/wasps). It is currently believed that this contamination exists within a 25-acre area around the 105-H Interim Safe Storage (ISS) reactor building.

Characterization sampling (e.g., confirmatory sampling, remedial investigation sampling) at radiological contaminated sites is included in the scope of this plan since the emissions from these activities (e.g., surface sampling, potholing) will generate negligible emissions. The Washington State Department of Ecology (Ecology) will be notified of confirmatory sampling activities at 100-H via the confirmatory sampling work instruction approval process already in place. Additional sites may be added to this AMP through agreement in the Unit Managers' Meeting. Additionally, if any of the nonradioactive sites in the 100-H Area contain radioactive contamination based on additional information, this AMP will cover those sites based on concurrence from Ecology.

2.0 AIRBORNE SOURCE INFORMATION

There is a potential for particulate radioactive airborne emissions to result from remediation of waste sites in the 100-H Area. The concentrations of the isotopes listed in Attachment 1 represent those that were determined to exist in the waste sites. Other isotopes may also be encountered during remedial action activities; however, it is expected that the total estimated dose listed in Attachment 1 is conservative and represents the upper bound of what will actually be found during remedial actions.

2.1 INVENTORY

The radioactive inventory and subsequent potential emission calculations are summarized in Attachment 1. The complete inventory and dose calculation are contained in *Total Effective Dose Equivalent for the Remedial Action of the 100-H Area Burial Grounds and Remaining Sites*, Calculation 0100H-CA-V0088, Rev. 1 (WCH 2007); *Total Effective Dose Equivalent for the Remedial Action of the 118-H-6:4 and :5 Waste Sites,* Calculation 0100H-CA-V0096, Rev. 0 (WCH 2009b); *Total Effective Dose Equivalent for the Remedial Action of the 100-H Area FY 2009 Remaining Waste Sites,* Calculation 0100H-CA-V0100, Rev. 0 (WCH 2009a); and *Total Effective Dose Equivalent for the Remedial Action of the 132-H-3 Waste Site,* Calculation 0100H-CA-V0117, Rev. 0 (WCH 2009c).

The waste sites are likely to contain contaminated soil or soil mixed with piping and other debris. For conservatism, it was assumed that the inventory for this material is generally in the form of particulates (soil, debris, oxides). The particulate form of the inventory, for calculation purposes,

is assumed to have rubbed off into the soil and a release fraction of 1.0×10^{-3} is applied. For calculation purposes, it is conservatively assumed that hydrogen-3 and krypton-85 are present as a gas and a release fraction of 1 is applied. There is the potential that objects may need to be size-reduced prior to transportation to ERDF. For calculation purposes, it is conservatively assumed that all size reduction will be accomplished with cutting torch or shears, and a release fraction of 1 is applied for torch cutting for the sites identified in WCH (2007).

It is assumed at this time that no scabbling will be performed, but it is an activity that may be necessary. Should this be necessary, concurrence from Ecology will be necessary. In addition, it is assumed that 0.1% of the particulate inventory will be picked up through a HEPA-filtered vacuum for the sites identified in WCH (2007). A release fraction of 1 is applied to the HEPA vacuum inventory.

The potential for spent nuclear fuel elements is possible. An inventory and associated release fraction has been calculated that assumes 99.9% of the fuel element is metal with a release fraction of 1.0×10^{-6} and 0.1% is an oxide with a release fraction of 1×10^{-3}.

The CAP88-PC model (Version 2.0 or Version 3.0, depending on when the calculation was prepared) was used to determine the annual total effective dose equivalent (TEDE) to the maximally exposed individual (MEI). The appropriate release fraction was applied to the inventory of the various wastes to calculate the potential-to-emit. The calculated potential-to-emit (curies per year) was the input used for the computer model, and the model generated the annual unabated dose. The distance to the MEI used in the model is 10,480 m east at the site boundary. The CAP88-PC model summary and synopsis are presented in WCH (2007) and WCH (2009a, 2009b, 2009c), The calculated total unabated annual TEDE to the MEI is 1.21E-01 mrem/yr. This dose estimate is conservative because it assumes all the waste sites will be remediated in 1 year. Additionally, some of the waste sites have already been remediated.

3.0 BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY

The following is the BARCT to be implemented during the remedial actions:

- Water will be applied during excavation, container loading, and backfilling processes to minimize and control airborne releases.
- Soil fixatives will be applied to any contaminated soils and debris that will be inactive for more than 24 hours. Periodic monitoring (visual observation) shall be performed, as determined by the project, of contaminated soils and debris that remain inactive for greater than 1 month. Reapplication of fixative or other control measure shall be performed if warranted by the periodic monitoring.
- Fixatives will be applied to contaminated soils and debris that will be inactive less than 24 hours at the end of the work operations if the sustained wind speed is predicted overnight to be greater than 32 km/hr (20 mph) based on the Hanford Meteorological Station morning forecast; this will allow the project enough time (if necessary) to prepare for the application of dust control measures. If a soil fixative has already been applied and the soil will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated soils are frozen or it is raining, snowing, or other freezing precipitation is falling at the end of the work operations.

- Appropriate documentation on the application of fixatives to comply with BARCT shall be maintained (e.g., logbook or other project-specific documentation).
- Haul trucks will be covered to contain materials, while in transit to ERDF.
- Vacuum cleaners and ventilated enclosures used for radiological work will be used when needed and are equipped with HEPA filters, which are considered BARCT for radioactive emissions at the Hanford Site. The HEPA filters will be efficiency tested upon installation and on an annual basis thereafter, and must be demonstrated to have a 99.95% removal efficiency.
- Additional measures for controlling small debris in waste piles may be prudent based on waste site conditions as determined by project personnel. Additional measures that may be used are as follows: (1) apply a thin layer of contaminated soil from the same waste site (that is free of debris) on the surface and follow normal fixative application, (2) apply a thin layer of uncontaminated soil on the surface and follow normal fixative application, (3) apply a bonded fiber fixative, and (4) cover the area containing small debris that is easily resuspended with a tarp or other appropriate material.

4.0 AIR MONITORING

Monitoring activities will be performed using new and existing near-facility monitoring (NFM) stations upwind and downwind of the 100-H Area. The air monitoring configuration for the entire remediation scope is four downwind and one upwind particulate air monitors. The locations of these monitors (Figure 1) are based on the predominant wind directions. The minimum number of monitors used during remediation of any particular site will be three, which consists of the one upwind at the Yakima Barricade (not shown in Figure 1) and two downwind. At this point it is believed that the monitor located near 100-H-33, 116-H-5, and 126-H-1 will only be operated during remediation of these three waste sites. In all cases, the existing air monitoring station at the Yakima Barricade (not shown in Figure 1) will be used as the upwind air monitoring station.

NFM is the means/methods to measure emissions. These monitors will be operated in accordance with Hanford Site protocol established for near-facility monitors (DOE-RL 2008). The air samples will be collected every 2 weeks and analyzed for total alpha and total beta. The data from the 2 week total alpha and total beta air samples will be evaluated for unusual trends. The samples will be composited semi-annually and analyzed for gamma energy analysis (GEA), americium-241, strontium-90, plutonium-238, plutonium 239/240, and isotopic uranium. Environmental soil samples will be collected before, during, and after remediation near each downwind air monitor and analyzed for GEA, strontium-90, isotopic plutonium, and isotopic uranium. The soil samples will be taken to evaluate the long-term trends in the environmental accumulation of radioactivity. The data from these activities will be included in the appropriate annual reports prepared for the Hanford Site.

Tritium (H^3) monitoring will be performed, when excavation activities are being conducted on the following sites: 118-H-1, 118-H-2, 118-H-3, and 118-H-4. These are the only sites addressed within this AMP that have an estimated tritium inventory of 10% or greater of the TEDE to the MEI. One downwind tritium monitor will be used when excavation activities are

occurring at 118-H-1, 118-H-2, 118-H-3, and 118-H-4. Tritium samples shall be collected and analyzed monthly.

As part of the site-wide evaluation of NFM data, the electronic release summary (ERS) database compares NFM composite air sample results to 10% of the values in 40 CFR 61, Appendix E, Table 2. The database identifies results that exceed these values. Results from the air monitors identified in this plan that are above these values will be investigated and the adequacy of the controls evaluated as appropriate.

HEPA ventilated enclosures may be used during the characterization of anomalies. It is anticipated that an insignificant portion of the overall inventory will be processed through an enclosure. HEPA filtered vacuums may also be utilized infrequently during remediation activities. Exhaust points from HEPA filters (and any duct work, seams, or other potential release locations from enclosures) will be monitored on a routine basis for potential radionuclide releases and the results recorded (e.g., post survey results negative) during vacuuming or exhauster operations. Any positive survey results will require appropriate maintenance on the unit to ensure that continued releases do not occur. Records of routine monitoring and necessary maintenance will be provided to Ecology staff upon request.

Air monitor downtime will be minimized and all air monitors shall be operated as described in the following text. However, if a downwind air monitor is out of operation for more than 48 hours during normal work operations (e.g., excavating and loading radioactive contaminated material), Ecology will be notified. If two (or more than two at a site) air monitors are out of operation during normal work operations, excavation and loading activities shall be temporarily suspended until operation of at least two downwind air monitors are restored or backup equipment is deployed. Normal work operations are not allowed if two downwind monitors are not operating. Air monitoring will no longer be required when excavation of the waste sites has been completed.

Characterization (e.g., test pitting and trenching, or surface soil sampling) may be conducted prior to the start of remediation, or as needed to support confirmatory or risk assessment activities. If near-facility air monitoring is not being conducted during these characterization activities, then only routine radiological control surveys will be performed.

5.0 REFERENCES

40 CFR 61, "Protection of Environment," *Code of Federal Regulations* as amended.

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

DOE-RL, 2008, *Environmental Monitoring Plan United States Department of Energy Richland Operations Office,* DOE/RL-91-50, as revised, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1999, *Interim Action Record of Decision, 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2,100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6 and 200-CW-3,* U.S. Environmental Protection Agency, July 13, 1999.

EPA, 2000, *Declaration of the Record of Decision, 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-2, 100-HR-2 and100-KR-2,* U.S. Environmental Protection Agency, September 25, 2000.

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

WCH, 2007, *Total Effective Dose Equivalent Calculation for the Remedial Action of the 100-H Area Burial Grounds and Remaining Sites*, Calculation 0100H-CA-V0088, Rev. 1, Washington Closure Hanford, Richland, Washington.

WCH, 2009a, *Total Effective Dose Equivalent for the Remedial Action of the 100-H Area FY 2009 Remaining Waste Sites,* Calculation 0100H-CA-V0100, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2009b, *Total Effective Dose Equivalent for the Remedial Action of the 118-H-6:4 and :5 Waste Sites,* Calculation 0100H-CA-V0096, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2009c, *Total Effective Does Equivalent for the Remedial Action of the 132-H-3 Waste Site,* Calculation0100H-CA-V0117, Rev. 0, Washington Closure Hanford, Richland, Washington.

ATTACHMENT 1

Summary of the Total Effective Dose Equivalent for the 100-H Area Waste Sties. (2 Pages)

Isotope	0100H-CA-V0088, Rev. 1	0100H-CA-V0096, Rev. 0	0100H-CA-V0100, Rev. 0	0100H-CA-V0117, Rev. 0	COMBINED TOTAL
	Unabated TEDE to the MEI (mrem/yr)[1]				
Ac-228		3.13E-08			**3.13E-08**
Ag-108					**0.00E+00**
Am-241	3.96E-02	1.28E-05	9.68E-06	1.51E-04	**3.98E-02**
Ba-133	3.98E-05				**3.98E-05**
Ba-137m	2.50E-10	3.77E-07	4.72E-07	5.69E-07	**1.42E-06**
Bi-214		3.19E-08			**3.19E-08**
C-14	1.29E-05	2.71E-08	1.34E-07	1.27E-06	**1.43E-05**
Cm-244				1.61E-05	**1.61E-05**
Cd-113m	0.00E+00				**0.00E+00**
Ca-41	6.85E-10				**6.85E-10**
Co-60	3.31E-02	1.45E-07	2.12E-07	7.54E-07	**3.31E-02**
Cs-137	1.37E-02	1.49E-05	1.87E-05	2.24E-05	**1.38E-02**
Eu-152	1.16E-03	1.76E-07	1.46E-07	1.58E-07	**1.16E-03**
Eu-154	4.42E-04	6.26E-08	1.59E-07		**4.42E-04**
Eu-155	2.58E-06	3.55E-09	5.70E-07		**3.15E-06**
H-3[2]	1.09E-02		7.51E-05	3.67E-06	**1.10E-02**
Kr-85[2]	1.56E-06				**1.56E-06**
Nb-94	5.73E-05				**5.73E-05**
Ni-59	7.14E-06				**7.14E-06**
Ni-63	5.83E-04	1.20E-07			**5.83E-04**
Np-237	2.90E-07	5.76E-07			**8.66E-07**
Pa-233		2.37E-10			**2.37E-10**
Pa-234m		5.38E-09	2.07E-09		**7.45E-09**
Pb-214		5.32E-09			**5.32E-09**
K-40	3.79E-06	6.39E-06			**1.02E-05**
Pd-107	4.62E-13				**4.62E-13**
Po-214		1.75E-12			**1.75E-12**
Po-216		1.40E-12			**1.40E-12**
Po-218		1.92E-13			**1.92E-13**
Pu-238	1.61E-03	1.71E-06	6.95E-04		**2.31E-03**
Pu-239[3]	1.23E-02	5.66E-05	7.01E-04	1.24E-03	**1.43E-02**
Pu-240[3]	1.50E-04				**1.50E-04**
Pu-241	1.74E-04				**1.74E-04**
Ra-224		4.69E-08			**4.69E-08**

Summary of the Total Effective Dose Equivalent for the 100-H Area Waste Sties. (2 Pages)

Isotope	0100H-CA-V0088, Rev. 1	0100H-CA-V0096, Rev. 0	0100H-CA-V0100, Rev. 0	0100H-CA-V0117, Rev. 0	COMBINED TOTAL
	Unabated TEDE to the MEI (mrem/yr)[1]				
Ra-226	1.47E-06	2.56E-06			**4.03E-06**
Ra-228	1.25E-06	5.42E-06			**6.67E-06**
Rn-220		2.11E-16			**2.11E-16**
Rn-222		5.94E-17			**5.94E-17**
Se-79	0.00E+00				**0.00E+00**
Sm-151	1.60E-08				**1.60E-08**
Sr-90	1.67E-03	1.35E-05	3.65E-06	2.32E-05	**1.71E-03**
Tc-99	7.16E-06		3.45E-05		**4.17E-05**
Th-228	9.86E-06	7.08E-05			**8.07E-05**
Th-230	7.27E-06	1.52E-05			**2.25E-05**
Th-231		7.32E-11			**7.32E-11**
Th-232	1.39E-05	2.66E-05			**4.05E-05**
Th-234		6.08E-09	2.34E-09		**8.42E-09**
U-233/234[3]	4.38E-05	4.98E-06			**4.88E-05**
U-235	6.60E-04	2.85E-07			**6.60E-04**
U-238	1.70E-03	3.51E-06	1.35E-06		**1.70E-03**
Y-90	2.99E-06	4.96E-08	1.34E-08	8.54E-08	**3.14E-06**
Zr-93	1.09E-10				**1.09E-10**
TOTAL	**1.18E-01**	**2.37E-04**	**1.54E-03**	**1.46E-03**	**1.21E-01**

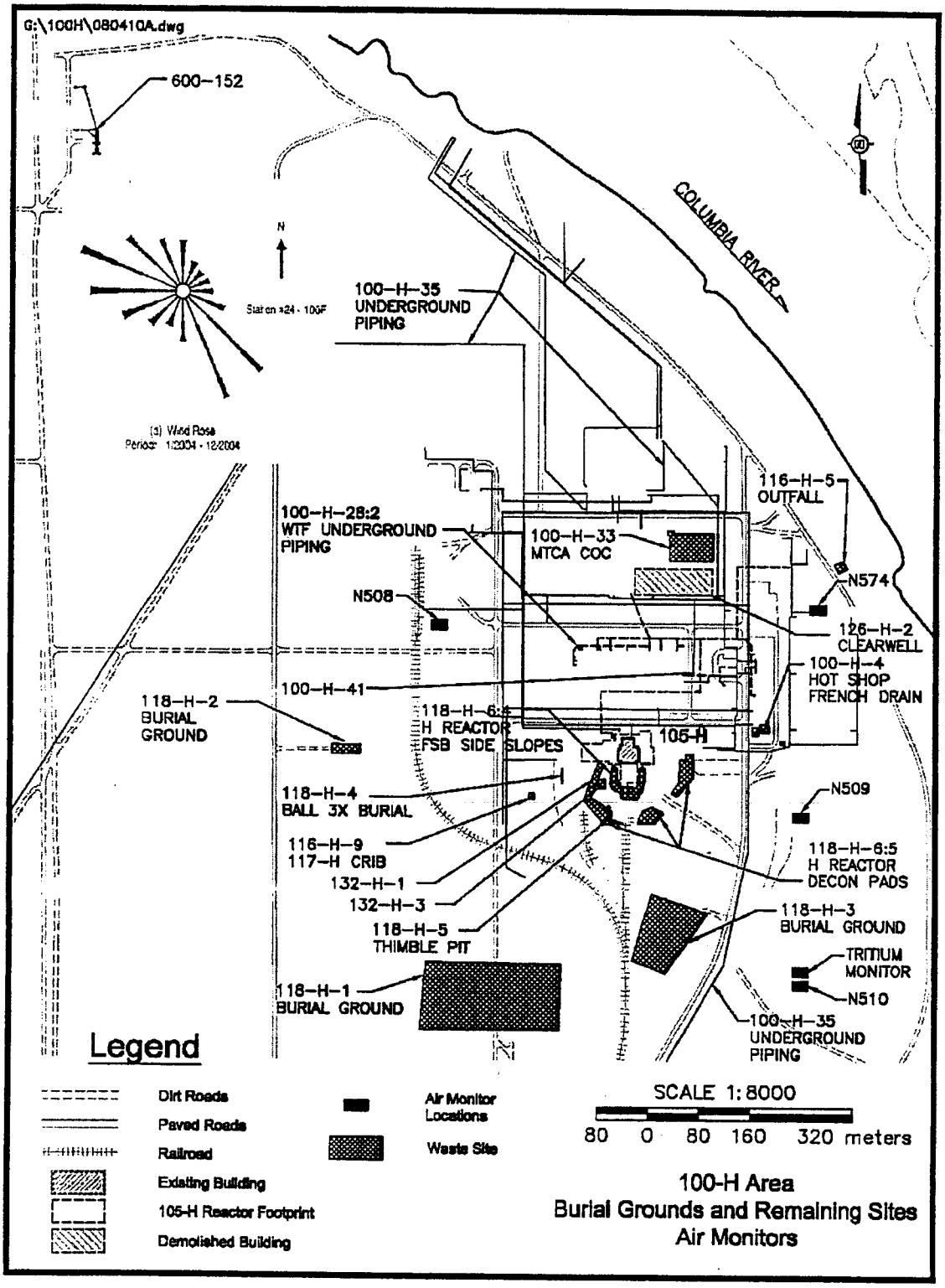
[1] The annual unabated total effective dose equivalent was determined using the CAP88-PC. The potential to emit (Ci/yr) was input to the model, and the model generated the annual unabated dose. The distance to the MEI for the 100-H Area is 10,480 m east.

[2] Release fraction for H-3 and Kr-85 is assumed to be 1 in all cases.

[3] For some sites, the MAR calculations presented combined data (i.e., Pu-239/Pu-240); all Pu-239/Pu-240 and U-233/U-234 combined values are assumed to be Pu-239 and U-233 respectively.

MAR = Material at Risk
MEI = Maximally Exposed Individual
RF = Release Fraction
TEDE = Total Effective Dose Equivalent

Figure 1. Proposed Locations of Air Monitors.



Concurrence:

M. S. French
U.S. Department of Energy,
Richland Operations Office

10/21/10
Date

Nina Menard
Washington State Department of Ecology

10-25-10
Date

Distribution:

Administrative Record	H6-08
Nina Menard	H0-57
Mandy Jones	H0-57
Joanne Chance	A3-04
Joan Woolard	H4-21
Dave Martin	X9-08
Dan Saueressig	N3-30
Steve Wilkinson	X4-08

Attachment 6

159407

^WCH Document Control

From: Woolard, Joan G

Sent: Tuesday, July 05, 2011 2:37 PM

To: ^WCH Document Control

Subject: FW: MODIFICATION TO THE 100-F AND 100-N AREA AIR MONITORING PLANS TO SUPPORT TRANSITION ZONE SAMPLING

Attachments: 100-F AMP.pdf; 100-N AMP.pdf ← See Attachments 8 and 7, respectively

Please chron the attached email, including attachments, and distribute to the following. This supersedes CCN 158707 (change highlighted in blue below).

- Joan Woolard
- Dan Saueressig
- Chuck Hedel

Thanks very much, please call if questions.

From: Woolard, Joan G
Sent: Tuesday, May 31, 2011 3:19 PM
To: Hedel, Charles W
Cc: Saueressig, Daniel G
Subject: MODIFICATION TO THE 100-F AREA AIR MONITORING PLAN TO SUPPORT TRANSITION ZONE SAMPLING

Chuck,

The following are text modifications to be approved by DOE/RL for the 100-F Area Air Monitoring Plan and 100-N Area Air Monitoring Plan to support transition zone sampling similar to revisions made to the other air monitoring plans.

Section 1.0, 4th paragraph, 2nd sentence, modified to read as follows:

"Characterization sampling (e.g., confirmatory sampling, remedial investigation sampling) at radiological contaminated sites is included in the scope of this plan since the emissions from these activities (e.g., surface sampling, potholing) will generate negligible emissions.

Section 4.0, 2nd paragraph, 1st sentence, modified to read as follows:

"Characterization (e.g., test pitting and trenching, or suface soil sampling) may be conducted prior to the start of remediation or as need to support confirmatory sampling or risk assessment activities. If near-facility air monitoring is not being conducted during these characterization activities, then only routine radiological control surveys will be performed. "

The plans that are the subject of the modification are attached.

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Attachment 7

152263

AIR MONITORING PLAN FOR THE 100-N AREA REMEDIAL ACTION

JULY 2010

1.0 INTRODUCTION

Remedial action (i.e., cleanup) of the waste sites located in the 100-N Area has the potential to emit radionuclides. These activities are being conducted under two *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) records of decision (EPA 1999, 2000). Quantification of radioactive emissions, implementation of Best Available Radionuclide Control Technology (BARCT), and air monitoring have been identified as substantive requirements (i.e., applicable or relevant and appropriate requirements) for the remedial action.

This air monitoring plan (AMP) is prepared to demonstrate compliance with these substantive requirements in accordance with *Washington Administrative Code* (WAC) 246-247.

1.1 PLANNED ACTIVITIES

This remedial action work scope is for the removal and disposal of waste material and associated soil and debris from waste sites located in the 100-NR-1 Operable Unit. The remedial action operations include characterizing, excavating, sorting, size reducing, stockpiling, treating (if necessary), decontaminating, containerizing, staging, loading, and transporting materials from the waste sites. The equipment being used is considered standard equipment for excavating, size reduction (e.g., shears, cutting torch), segregating, loading, and hauling. Decontamination activities such as scabbling (e.g., removal of the surface layer) may be employed to remove radioactive contamination. Characterization activities may include, but are not limited to, sampling, test pitting, trenching, and drilling to further define the waste and/or determine the limits of some of the waste sites. Characterization activities may begin before remediation to assist in verifying design parameters and will continue for the life of the remediation project.

The loading of contaminated soil and debris into waste containers may result in soil spilled on the waste containers and/or haul trucks. Haul trucks with loaded containers will be surveyed to detect exterior contamination. A decontamination station may be established to decontaminate containers, haul trucks, and equipment, as required. Waste containers, haul trucks, and/or equipment will be decontaminated by conventional means such as brushing or wiping, or with high-efficiency particulate air (HEPA)-filtered vacuum cleaners. The HEPA-filtered vacuum cleaners may also be used (as needed) to decontaminate other equipment or to pick up other loose contaminated materials. More aggressive decontamination methods (e.g., grinding or wet-grit blasting) may be used for decontamination if the other methods fail. Decontaminated trucks and containers will then proceed to the container staging area where the transportation subcontractor will pick up the containers for transport to the Environmental Restoration Disposal Facility (ERDF) or other approved disposal location.

Attachment 7

The work scope includes, but is not limited to, remediation of the following remaining sites in the 100-N Area: 100-N-13, 100-N-14, 100-N-25, 100-N-26, 100-N-29, 100-N-30, 100-N-31, 100-N-32, 100-N-38, 100-N-57, 100-N-59, 100-N-60, 100-N-63, 100-N-64, 100-N-82, 116-N-2, 116-N-4, 118-N-1, 124-N-4, UPR-100-N-1, UPR-100-N-2, UPR-100-N-3, UPR-100-N-4, UPR-100-N-5, UPR-100-N-6, UPR-100-N-7, UPR-100-N-8, UPR-100-N-9, UPR-100-N-10, UPR-100-N-11, UPR-100-N-12, UPR-100-N-13, UPR-100-N-14, UPR-100-N-25, UPR-100-N-26, UPR-100-N-29, UPR-100-N-30, UPR-100-N-31, UPR-100-N-32, UPR-100-N-35, and UPR-100-N-39.

The locations of the sites discussed in this AMP are shown in Figure 1. Confirmatory sampling at radiological contaminated sites is included in the scope of this plan since the emissions from these activities (surface sampling, potholing, etc.) will generate negligible emissions. The Washington State Department of Ecology (Ecology) will be notified of confirmatory sampling activities at 100-N via the confirmatory sampling work instruction approval process already in place. Additional sites may be added to this AMP through agreement in the Unit Managers' Meeting. Additionally, if any of the nonradioactive sites in the 100-N Area contain radioactive contamination based on additional information, this AMP will cover those sites based on concurrence from Ecology.

2.0 AIRBORNE SOURCE INFORMATION

There is a potential for particulate radioactive airborne emissions to result from remediation of waste sites in the 100-N Area. The concentrations of the isotopes listed in Attachment 1 represent those that were determined to exist in the waste sites. Other isotopes may also be encountered during remedial action activities; however, it is expected that the total estimated dose listed in Attachment 1 is conservative and represents the upper bound of what will actually be encountered during remedial actions.

2.1 INVENTORY

The radioactive inventory and subsequent potential emission calculations are summarized in Attachment 1. The complete inventory and dose calculation are contained in *Total Effective Dose Equivalent for the Remedial Action of the 100-N Area Waste Sites*, Calculation 0100N-CA-V0091, Rev. 0 (WCH 2008).

The waste sites are likely to contain contaminated soil or soil mixed with piping and other debris. For conservatism, it was assumed that the inventory for this material is generally in the form of particulates (soil, debris, oxides). The particulate form of the inventory, for calculation purposes, is assumed to have rubbed off into the soil, and a release fraction of 1.0×10^{-3} is applied. For calculation purposes, it is conservatively assumed that hydrogen-3 is present as a gas and a release fraction of 1 is applied. There is the potential that objects may need to be size reduced prior to transportation to ERDF. Size reduction is usually achieved with the excavation equipment and cutting shears, and a release fraction of 1.0×10^{-3} is applied. Torch cutting was conservatively assumed for those sites with the potential to contain significant amount of steel (e.g., pipeline waste sites), and for calculation purposes a release fraction of 1 is assumed.

Other waste sites consist primarily of unplanned releases or smaller diameter pipeline leaks; therefore; torch cutting is not considered for these sites and other standard methods are assumed.

It is assumed at this time that no scabbling will be performed, but it is an activity that may be necessary. Should this be required, concurrence from Ecology will be necessary. In addition, it is assumed that 0.1% of the particulate inventory will be picked up through a HEPA-filtered vacuum for the sites identified in WCH (2008). A release fraction of 1 is applied to the HEPA vacuum inventory.

The CAP88-PC model (Version 2.0) was used to determine the annual total effective dose equivalent (TEDE) to the maximally exposed individual (MEI). The appropriate release fraction was applied to the inventory of the various wastes to calculate the potential-to-emit. The calculated potential-to-emit (curies per year) was the input used for the computer model, and the model generated the annual unabated dose. The distance to the MEI used in the model is 9,416 m west northwest at the site boundary. The CAP88-PC model summary and synopsis for are presented in the *Total Effective Dose Equivalent for the Remedial Action of the 100-N Area Waste Sites*, Calculation 0100N-CA-V0091, Rev. 0 (WCH 2008). The calculated total unabated annual TEDE to the MEI is 5.14E-02 mrem/yr.

3.0 BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY

The following is the BARCT to be implemented during the remedial actions:

- Water will be applied during excavation, container loading, and backfilling processes to minimize and control airborne releases.
- Soil fixatives will be applied to any contaminated soils and debris that will be inactive for more than 24 hours. Periodic monitoring (visual observation) shall be performed, as determined by the project, of contaminated soils and debris that remain inactive for greater than one (1) month. Reapplication of fixatives or other control measures shall be performed if warranted by the periodic monitoring.
- If sustained wind speed is predicted to be greater than 32 km/hr (20 mph) overnight, fixatives will be applied at the end of work operations to contaminated soils and debris that will be inactive less than 24 hours. This will be based on the Hanford Meteorological Station morning forecast to allow the project enough time (if necessary) to prepare for the application of dust control measures. If a soil fixative has already been applied and the soil will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated soils are frozen, or it is raining, snowing, or other freezing precipitation is falling at the end of the work operations.
- Appropriate documentation on the application of fixatives to comply with BARCT shall be maintained (e.g., logbook or other project-specific documentation).
- Haul trucks will be covered to contain materials while in transit to ERDF.

- Vacuum cleaners used for radiological work are equipped with HEPA filters, which are considered BARCT for radioactive emissions at the Hanford Site. The HEPA filters will be efficiency tested.
- Additional measures for controlling small debris in waste piles may be prudent based on waste site conditions as determined by project personnel. Additional measures that may be used are as follows: (1) apply a thin layer of contaminated soil from the same waste site (that is free of debris) on the surface and follow normal fixative application; (2) apply a thin layer of uncontaminated soil on the surface and follow normal fixative application; (3) apply a bonded fiber fixative; and (4) cover the area containing small debris that is easily resuspended with a tarp or other appropriate material.

4.0 AIR MONITORING

Monitoring activities will be performed using existing near-facility air monitoring stations N102, N103, and N106. The locations of these monitors, as identified in Figure 1, are based on the predominant wind directions.

Characterization (e.g., testing pitting and trenching or surface soil sampling) may be conducted prior to the start of remediation or as part of confirmatory sampling. If near-facility air monitoring is not being conducted during these characterization activities, or if the waste site is outside the air monitoring perimeter, then only routine radiological control surveys will be performed. Four of the waste sites (100-N-13, 100-N-14, UPR-100-N-11, and 100-N-82) that are to be remediated are outside the perimeter of the existing monitors. However, the radiological inventory is low and these waste sites are not a significant contributor to the overall dose, which is less than 0.1 mrem/yr for this project. Therefore, additional near-facility air monitors will not be established for these four waste sites; however, routine radiological control surveys will be performed.

Near-facility air monitoring is the means/methods to measure emissions. These monitors will be operated in accordance with Hanford Site protocol established for near-facility monitors (DOE-RL 2008 as revised). The air samples will be collected every 2 weeks and analyzed for total alpha and total beta. The data from the two week total alpha and total beta air samples will be evaluated for unusual trends. The samples will be composited semi-annually and analyzed for gamma energy analysis (GEA), strontium-90, plutonium-238, plutonium-239/240, americium-241, and isotopic uranium. The data from these activities will be included in the appropriate annual reports prepared for the Hanford Site.

Environmental soil samples will be collected before, during, and after remediation near each downwind air monitor, and analyzed for the same constituents as the composite air samples. The soil samples will be taken to evaluate the long-term trends in the environmental accumulation of radioactivity.

As part of the site-wide evaluation of near-facility monitoring (NFM) data, the electronic release summary (ERS) database compares NFM composite air sample results to 10% of the Table 2 values, Appendix E, 40 CFR 61. The database identifies results that exceed these values.

Results from the air monitors identified in this plan that are above these values will be investigated and the adequacy of the controls evaluated as appropriate.

Air monitor downtime will be minimized and all air monitors shall be operated as described below. However, if a downwind air monitor is out of operation for more than 48 hours during normal work operations (e.g., excavating and loading radioactive contaminated material), Ecology will be notified. If two (or more than two at a site) air monitors are out of operation during normal work operations, excavation and loading activities shall be temporarily suspended until operation of at least two air monitors is restored or backup equipment is deployed. Normal work operations are not allowed if two monitors are not operating. Air monitoring will no longer be required when excavation of the waste sites has been completed.

5.0 REFERENCES

40 CFR 61, "Protection of Environment," *Code of Federal Regulations* as amended.

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

DOE-RL, 2008, *Environmental Monitoring Plan United States Department of Energy Richland Operations Office*, DOE/RL-91-50, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1999, *Interim Remedial Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units of the Hanford 100-N Area, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington, September 30, 1999.

EPA, 2000, *Interim Remedial Action Record of Decision for the 100-NR-1 Operable Unit of the Hanford 100-N Area, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington, January 19, 2000.

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

WCH, 2008, *Total Effective Dose Equivalent for the Remedial Action of the 100-N Area Waste Sites*, Calculation 0100N-CA-V0091, Rev. 0, Washington Closure Hanford, Richland, Washington.

Attachment 1

Summary PTE/TEDE Data
From 0100N-CA-V0091, Rev. 0

Isotope	TOTAL VALUES							Unabated TEDE to the MEI[3] (mrem/yr)
	Inventory[1] (Ci/yr)			Potential to Emit (Ci/yr)				
	Particulates	Torch Cutting	HEPA Vacuum	Particulates (1E-3 RF)[2]	Torch Cutting (1 RF)	HEPA Vacuum (1RF)	Total	
Am-241	4.09E-01	4.03E-06	4.09E-04	4.09E-04	4.03E-06	4.09E-04	8.21E-04	1.07E-02
Ba-137m	9.25E+01	3.07E-04	9.25E-02	9.25E-02	3.07E-04	9.25E-02	1.85E-01	1.47E-10
Ce-144	1.51E-08	0.00E+00	1.51E-11	1.51E-11	0.00E+00	1.51E-11	3.03E-11	3.77E-13
Co-58	2.31E-05	7.07E-24	2.31E-08	2.31E-08	7.07E-24	2.31E-08	4.62E-08	1.68E-10
Co-60	3.36E+01	5.31E-04	3.36E-02	3.36E-02	5.31E-04	3.36E-02	6.77E-02	1.01E-02
Cs-134	1.19E-04	0.00E+00	1.19E-07	1.19E-07	0.00E+00	1.19E-07	2.39E-07	1.95E-08
Cs-137	9.77E+01	3.24E-04	9.77E-02	9.77E-02	3.24E-04	9.77E-02	1.96E-01	7.00E-03
Eu-152	1.46E+00	2.82E-05	1.46E-03	1.46E-03	2.82E-05	1.46E-03	2.95E-03	4.22E-04
Eu-154	4.42E-01	4.03E-06	4.42E-04	4.42E-04	4.03E-06	4.42E-04	8.88E-04	1.02E-04
Eu-155	1.67E-02	3.44E-07	1.67E-05	1.67E-05	3.44E-07	1.67E-05	3.38E-05	1.73E-07
H-3	4.33E+01	3.41E-08	4.33E-02	4.33E+01	3.41E-08	4.33E-02	4.34E+01	1.60E-03
K-40	5.28E-02	0.00E+00	5.28E-05	5.28E-05	0.00E+00	5.28E-05	1.06E-04	1.25E-05
Mn-54	2.31E-02	4.85E-07	2.31E-05	2.31E-05	4.85E-07	2.31E-05	4.67E-05	4.44E-07
Ni-63	3.27E+00	0.00E+00	3.27E-03	3.27E-03	0.00E+00	3.27E-03	6.53E-03	1.99E-06
Np-237	5.50E-04	0.00E+00	5.50E-07	5.50E-07	0.00E+00	5.50E-07	1.10E-06	1.19E-05
Pu-238	1.21E-01	5.50E-07	1.21E-04	1.21E-04	5.50E-07	1.21E-04	2.43E-04	1.91E-03
Pu-239/240	8.67E-01	3.61E-06	8.67E-04	8.67E-04	3.61E-06	8.67E-04	1.74E-03	1.47E-02
Pu-240	9.49E-04	0.00E+00	9.49E-07	9.49E-07	0.00E+00	9.49E-07	1.90E-06	1.61E-05
Pu-241	6.87E+00	1.17E-04	6.87E-03	6.87E-03	1.17E-04	6.87E-03	1.39E-02	1.84E-03
Pu-242	1.39E-05	2.91E-10	1.39E-08	1.39E-08	2.91E-10	1.39E-08	2.80E-08	2.25E-07
Ra-226	1.80E-02	2.12E-07	1.80E-05	1.80E-05	2.12E-07	1.80E-05	3.62E-05	1.69E-05
Ra-228	3.13E-03	0.00E+00	3.13E-06	3.13E-06	0.00E+00	3.13E-06	6.27E-06	1.20E-06
Sb-125	4.05E-05	0.00E+00	4.05E-08	4.05E-08	0.00E+00	4.05E-08	8.10E-08	1.22E-09
Sr-90	8.25E+00	1.66E-05	8.25E-03	8.25E-03	1.66E-05	8.25E-03	1.65E-02	1.66E-03
Tc-99	1.20E+01	2.04E-04	1.20E-02	1.20E-02	2.04E-04	1.20E-02	2.42E-02	5.12E-04
Th-228	2.84E-03	1.85E-09	2.84E-06	2.84E-06	1.85E-09	2.84E-06	5.69E-06	3.27E-05
Th-232	2.73E-02	3.22E-07	2.73E-05	2.73E-05	3.22E-07	2.73E-05	5.50E-05	4.53E-04
U-232	3.46E-08	7.27E-13	3.46E-11	3.46E-11	7.27E-13	3.46E-11	7.00E-11	7.97E-10
U-233	1.73E-03	3.03E-14	1.73E-06	1.73E-06	3.03E-14	1.73E-06	3.47E-06	1.12E-05
U-234	1.66E-02	2.21E-07	1.66E-05	1.66E-05	2.21E-07	1.66E-05	3.34E-05	1.07E-04
U-235	1.37E-02	2.49E-07	1.37E-05	1.37E-05	2.49E-07	1.37E-05	2.77E-05	8.37E-05
U-238	1.87E-02	2.36E-07	1.87E-05	1.87E-05	2.36E-07	1.87E-05	3.77E-05	1.07E-04
Y-90	6.36E+00	1.71E-05	6.36E-03	6.36E-03	1.71E-05	6.36E-03	1.27E-02	2.77E-06
Total								5.14E-02

[1] Inventory taken from Determination of Material at Risk and Hazard Screening for 100-N Waste Sites (Calculation 0100N-CA-V0091, Rev. 0 [WCH 2008]).

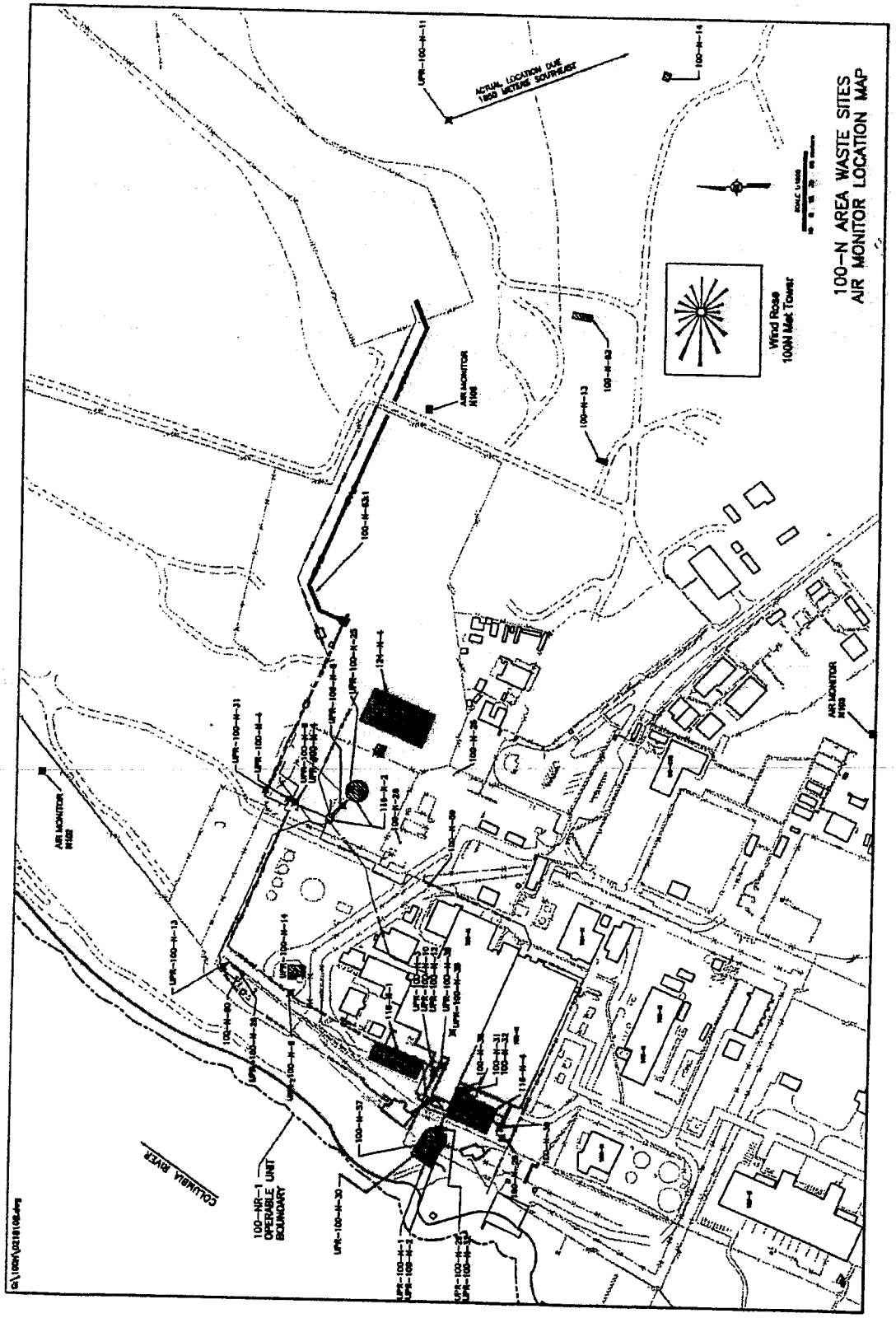
[2] Release fraction for H-3 is assumed to be 1 in all cases.

[3] The annual unabated total effective dose equivalent was determined using the CAP88-PC, Version 2 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 100-N Area waste sites remedial action is 9,416 meters west northwest. The CAP88-PC model summary and synopsis are presented in Calculation 0100N-CA-V0091, Rev. 0, *Total Effective Dose Equivalent for the Remedial Action of the 100-N Area Waste Sites* (WCH 2008).

[4] For some sites, the MAR calculations presented combined data (i.e., Pu-239/Pu-240, U-233/U-234). For this TEDE, all Pu-239/Pu-240 and U-233/U-234 combined values are assumed to be Pu-239, and U-233, respectively.

MAR = material at risk
MEI = maximally exposed individual
TEDE = total effective dose equivalent
RF = release fraction

Figure 1. Proposed Locations of Air Monitors.



Concurrence:

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Attachment 8

152262

AIR MONITORING PLAN FOR THE 100-F AREA REMAINING SITES REMEDIAL ACTION

JUNE 2010

1.0 INTRODUCTION

Remedial action (i.e., cleanup) of the remaining waste sites located in the 100-F Area has the potential to emit radionuclides. These activities are being conducted under a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Record of Decision (EPA 1999). Quantification of radioactive emissions, implementation of Best Available Radionuclide Control Technology (BARCT), and air monitoring have been identified as substantive requirements (i.e., applicable or relevant and appropriate requirements) for the remedial action.

This air monitoring plan (AMP) is prepared to demonstrate compliance with these substantive requirements in accordance with *Washington Administrative Code* (WAC) 246-247.

1.1 PLANNED ACTIVITIES

This remedial action workscope is for the removal and disposal of waste material and associated soil and debris from remaining waste sites located in the 100-FR-1 Operable Unit. The remedial action operations include characterizing, excavating, sorting, size reducing, stockpiling, treating (if necessary), decontaminating, containerizing, staging, loading, and transporting materials from the waste sites. The equipment being used is considered standard equipment for excavating, size reduction (e.g., shears), segregating, loading, and hauling. Decontamination activities such as scabbling (e.g., removal of the surface layer) may be employed to remove radioactive contamination. Characterization activities may include, but are not limited to, sampling, test pitting, trenching, and drilling to further define the waste and/or determine the limits of some of the waste sites. Characterization activities may begin before remediation, in order to assist in verifying design parameters, and will continue for the life of the remediation project.

The loading of contaminated soil and debris into waste containers may result in soil spilled on the waste containers and/or haul trucks. Haul trucks with loaded containers will be surveyed to detect exterior contamination. A decontamination station may be established to decontaminate containers, haul trucks, and equipment, as required. Waste containers, haul trucks, and/or equipment will be decontaminated by conventional means such as brushing or wiping. More aggressive decontamination methods (e.g., grinding or wet-grit blasting) may be used for decontamination if the other methods fail. Decontaminated trucks and containers will then proceed to the container staging area where the transportation subcontractor will pick up the containers for transport to the Environmental Restoration Disposal Facility (ERDF) or other approved disposal location.

The work scope includes, but is not limited to, remediation of the following remaining sites in the 100-F Area: 100-F-26:4, 100-F-44:9, 100-F-48, 100-F-51, and 100-F-63.

The locations of the sites discussed in this AMP are shown in Figure 1. Confirmatory sampling at radiologically contaminated sites is included in the scope of this plan since the emissions from these activities (e.g., surface sampling, potholing) won't add measurable emissions. The U.S. Environmental Protection Agency (EPA) will be informed of confirmatory sampling activities at 100-F via the confirmatory sampling work instruction approval process already in place. Additional sites may be added to this AMP through agreement in the Unit Managers' Meeting. Additionally, if any of the nonradioactive sites in the 100-F Area are determined to contain radioactive contamination based on additional information, this AMP will be utilized to cover those sites upon concurrence from the EPA.

2.0 AIRBORNE SOURCE INFORMATION

There is a potential for particulate radioactive airborne emissions to occur from remediation of the remaining waste sites in the 100-F Area. The concentrations of the isotopes listed in Attachment 1 represent those that were determined to exist in the waste sites. Other isotopes may also be encountered during remedial action activities; however, it is expected that the total estimated dose listed in Attachment 1 is conservative and represents the upper bound of what will actually be found during remedial actions.

2.1 INVENTORY

The radioactive inventory and subsequent potential emission calculations are summarized in Attachment 1. The complete inventory and dose calculation are contained in *Total Effective Dose Equivalent for the Remedial Action of the 100F Area Failed Confirmatory Waste Sites*, Calculation 0100F-CA-V0366, Rev. 1 (WCH 2010b).

The waste sites are likely to contain contaminated soil or soil mixed with piping and other debris. For conservatism, it was assumed that the inventory for this material is generally in the form of particulates (soil, debris, oxides). The particulate form of the inventory, for calculation purposes, is assumed to have rubbed off into the soil and a release fraction of 1.0×10^{-3} is applied. For calculation purposes, it is conservatively assumed that hydrogen-3 is present as a gas and a release fraction of 1 is applied. There is the potential that objects may need to be size reduced prior to transportation to ERDF. It is assumed that at this time no scabbling will be performed, but it is an activity that may be necessary. Should scabbling be required, concurrence from the EPA will be necessary.

The CAP88-PC model Version 3.0 was used to determine the annual total effective dose equivalent (TEDE) to the maximally exposed individual (MEI). The appropriate release fraction was applied to the inventory of the various wastes to calculate the potential-to-emit. The calculated potential-to-emit (curies per year) was the input used for the computer model, and the model generated the annual unabated dose. The distance to the MEI used in the model is 10,314 m east-southeast. The CAP88-PC model summary and synopsis are presented in WCH (2010b). The calculated total unabated annual TEDE to the MEI is 3.34E-04 mrem/yr.

3.0 BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY

The following is the BARCT to be implemented during remedial actions:

- Water will be applied during excavation, container loading, and backfilling processes to minimize and control airborne releases.

- Soil fixatives will be applied to any contaminated soils and debris that will be inactive for more than 24 hours. Periodic monitoring (visual observation) will be performed, as determined by the project, of contaminated soils and debris that remain inactive for greater than 1 month. Reapplication of fixative or other control measures shall be performed if warranted by the periodic monitoring.

- If the sustained wind speeds is predicted to be greater than 32 km/hr (20 mph) overnight, fixatives will be applied at the end of work operations to contaminated soils and debris that will be inactive less than 24 hours. This will be based on the Hanford Meteorological Station morning forecast to allow the project enough time (if necessary) to prepare for the application of dust control measures. If a soil fixative has already been applied and the soil will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated soils are frozen or it is raining, snowing, or other freezing precipitation is falling at the end of the work operations.

- Appropriate documentation on the application of fixatives to comply with BARCT shall be maintained (e.g., logbook or other project-specific documentation).

- Haul trucks will be covered to contain materials while in transit to ERDF.

- Additional measures for controlling emissions from small debris in waste piles may be prudent based on waste site conditions, as determined by project personnel. Additional measures that may be used are as follows:

  - Apply a thin layer of contaminated soil from the same waste site (that is free of debris) on the surface and follow normal fixative application

  - Apply a thin layer of uncontaminated soil on the surface and follow normal fixative application

  - Apply a bonded fiber fixative

  - Cover the area containing small debris that is easily resuspended with a tarp or other appropriate material.

4.0. AIR MONITORING

Monitoring activities will be performed using near-facility air monitoring stations upwind and downwind of the 100-F Area. The air monitoring configuration for the entire remediation scope is two downwind and one upwind particulate air monitors. The locations of these monitors (Figure 1) are based on the predominant wind directions.

Characterization (e.g., test pitting and trenching, or surface soil sampling) may be conducted prior to the start of remediation or as part of confirmatory sampling. If near-facility air monitoring is not being conducted during these characterization activities or if the waste is outside the air monitor perimeter, then only routine radiological-control surveys will be performed.

Near-facility air monitoring is the means/methods to measure emissions. These monitors will be operated in accordance with Hanford Site protocol established for near-facility monitors (DOE-RL 2008). The air samples will be collected every 2 weeks and analyzed for total alpha and total beta. The data from the two week total alpha and total beta air samples will be evaluated for unusual trends. The samples will be composited semi-annually and analyzed for gamma energy analysis (GEA), strontium-90, plutonium-238, plutonium-239/240, isotopic thorium, and isotopic uranium. The data from these activities will be included in the appropriate annual reports prepared for the Hanford Site.

Environmental soil samples will be collected before, during, and after remediation near each air monitor, and analyzed for GEA, strontium-90, isotopic plutonium, isotopic thorium, and isotopic uranium. The soil samples will be taken to evaluate the long-term trends in the environmental accumulation of radioactivity.

As part of the site-wide evaluation of near-field monitoring (NFM) data, the electronic release summary database compares NFM composite air sample results to 10% of the Table 2 values (40 *Code of Federal Regulations* [CFR] 61, Appendix E). The database identifies results that exceed these values. Results from the air monitors identified in this plan that are above these values will be investigated and the adequacy of the controls evaluated as appropriate.

Air monitor downtime will be minimized and all air monitors shall be operated as described below. However, if a downwind air monitor is out of operation for more than 48 hours during normal work operations (e.g., excavating and loading radioactive contaminated material), EPA will be notified. If two (or more than two at a site) air monitors are out of operation during normal work operations, excavation and loading activities shall be temporarily suspended until operation of at least two air monitors is restored or backup equipment is deployed. Normal work operations are not allowed unless at least one downwind monitor is operating. Air monitoring will no longer be required when excavation of the waste sites has been completed.

5.0 REFERENCES

40 CFR 61, "Protection of Environment," *Code of Federal Regulations*, as amended.

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

DOE-RL, 2008, *Environmental Monitoring Plan United States Department of Energy Richland Operations Office*, DOE/RL-91-50, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1999, *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

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

WCH, 2009, *Determination of Material at Risk for 100-F Area Failed Confirmatory Waste Sites*, Calculation 0100F-CA-N0037, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2010a, *Determination of Material at Risk for 100-F Area Failed Confirmatory Waste Sites Phase 3*, Calculation 0100F-CA-C0015, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2010b, *Total Effective Dose Equivalent for the Remedial Action of the 100F Area Failed Confirmatory Waste Sites*, Calculation 0100F-CA-V0366, Rev. 1, Washington Closure Hanford, Richland, Washington.

Attachment 1

Summary PTE/TEDE Data
From 0100F-CA-V0366, Rev. 1

Isotope	Inventory[1] (Ci)	Potential to Emit (Ci/yr) (1E-03)[2]	Unabated TEDE to the MEI[3, 4] (mrem/yr)
	Particulates	Total	
Am-241	5.60E-03	5.60E-06	2.99E-05
Ba-137m	2.00E-02	2.00E-05	7.77E-08
C-14	1.30E-03	1.30E-06	1.61E-09
Cs-137	2.10E-02	2.10E-05	3.88E-06
Co-60	6.00E-03	6.00E-06	3.04E-07
Eu-152	2.40E-01	2.40E-04	3.18E-06
Eu-154	4.40E-04	4.40E-07	6.89E-09
H-3	6.70E-02	6.70E-02	3.08E-06
Ni-63	1.10E+00	1.10E-03	1.10E-06
Pa-234			1.90E-09
Pa-234m			3.57E-08
Pu-238	1.40E-02	1.40E-05	8.28E-05
Sr-90	2.10-03	2.10E-06	6.95E-07
Th-230	8.00E-02	8.00E-05	1.49E-04
Th-233/Th-234	3.20E-03	3.20E-06	4.39E-08
U-233/234	7.80E-02	7.80E-05	3.70E-05
U-238	6.00E-02	6.00E-05	2.30E-05
Y-90	2.10E-03	2.10E-06	1.95E-09
Total			3.34E-04

[1] Inventory taken from 0100F-CA-N0037, *Determination of Material at Risk for 100-F Area Failed Confirmatory Waste Sites* (WCH 2009) and 0100F-CA-C0015, *Determination of Material at Risk for 100-F Failed Confirmatory Waste Sites Phase 3* (WCH 2010a).

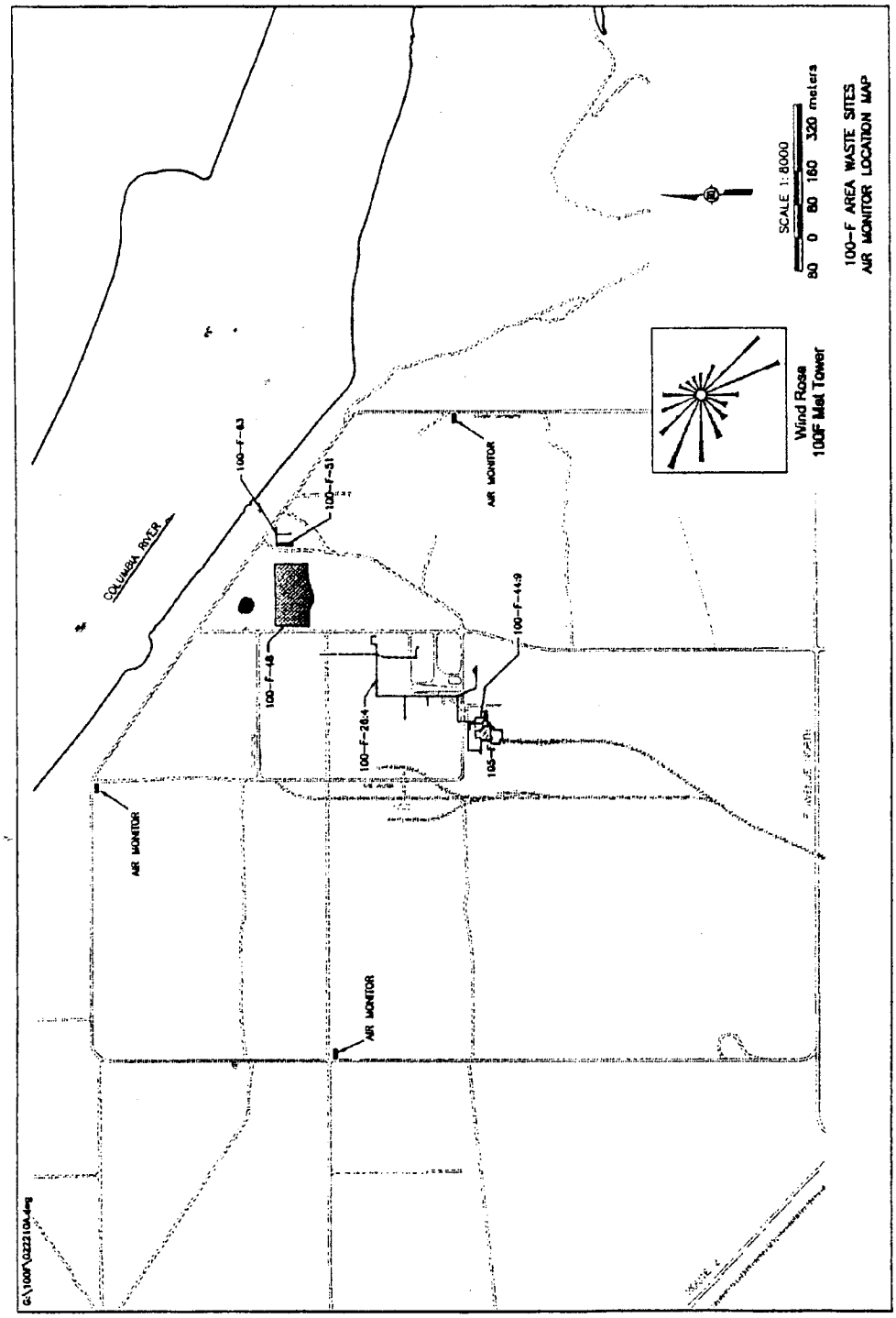
[2] Release fraction of 1E-03 assumed except for H-3. Release fraction for H-3 is assumed to be 1 in all cases.

[3] Isotopes with only unabated TEDE to the MEI values are progeny isotopes included by the CAP88-PC Version 3.0 model.

[4] The annual unabated TEDE was determined using the CAP88-PC Version 3.0 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 100-F Area waste sites is 10,374 m east-southeast. The CAP88-PC model summary and synopsis are presented in calculation 0100F-CA-V0366, *Total Effective Dose Equivalent for the Remedial Action of the 100F Area Failed Confirmatory Waste Sites* (WCH 2010b).

MEI = maximally exposed individual
TEDE = total effective dose equivalent

Figure 1. Proposed Locations of Air Monitors.



Concurrence:

Jamie Zeisloft
U.S. Department of Energy,
Richland Operations Office

7/6/10
Date

Chris Guzzetti
U.S. Environmental Protection Agency

7/8/10
Date

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Attachment 9

159409

^WCH Document Control

From: Woolard, Joan G

Sent: Tuesday, July 05, 2011 3:04 PM

To: ^WCH Document Control

Subject: FW: MODIFICATION TO THE AIR MONITORING PLAN FOR THE 300 AREA CENTRAL WASTE SITES REMEDIAL ACTION

Attachments: 300 AREA AIR MONITORING PLAN.pdf

Please cron this email as air quality, including the attachment, and distribute to the following:

- Joan Woolard
- Chuck Hedel

The following are text modifications to be approved by DOE/RL for the Air Monitoring Plan for the 300 Area Central Waste Sites Remedial Action
to support transition zone sampling similar to revisions made to the other air monitoring plans:

"Characterization (e.g., test pitting and trenching, or surface soil sampling) may be conducted prior to the start of remediation or as need to support confirmatory sampling or risk assessment activities. If near-facility air monitoring is not being conducted during these characterization activities, then only routine radiological control surveys will be performed. "

The plan that is the subject of the modification is attached.

Joan

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Attachment 10

157961

AIR MONITORING PLAN FOR THE 300 AREA CENTRALWASTE SITES REMEDIAL ACTION
March 2011

1.0 INTRODUCTION

The remedial action (i.e., cleanup) of 300-FF-2, 300 Area waste sites has the potential to emit (PTE) radionuclides. This remedial action is being conducted under a *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) Record of Decision (ROD) (EPA 2001). Quantification of radioactive emissions, implementing best available radionuclide control technology (BARCT), and air monitoring have been identified as substantive requirements (i.e., applicable or relevant and appropriate requirements) for the remedial action. A BARCT compliance demonstration is determined by the regulatory agency on a case-by-case basis. These substantive requirements are according to *Washington Administrative Code* (WAC) 246-247-040. This plan presents compliance with those requirements.

1.1 PLANNED ACTIVITIES

The work scope includes remediation of thirty four separate waste site groups consisting of contaminated soil, pipes, berms, pads, etc. in the central 300 Area (Table 1).

Table 1. Summary of 300 Area Central Waste Sites.*

Waste Site	General Description
300-2	Contaminated Light Water Disposal
300-6	366/366A Fuel Oil Bunker
300-15	300 Area Process Sewer System
300-22	309 Building B-Cell Cleanout Leak
300-33	306W Metal Fabrication Development Building Releases
300-34	300 Area Process Sewer Leak
300-39	309 Building Ex-Vessel Irradiated Fuel Storage Basin
300-41	306E Neutralization Tank
300-46	Soil Contamination Surrounding 3706 Building
300-214	300 Area Retention Process Sewer
300-255	309 Tank Farm Contaminated Soil
300-256	306E Fabrication and Testing Laboratory Releases
300-257	309 Process Sewer to River
300-258	Abandoned Pipe Trench Between 334 Tank Farm & 306E
300-263	324 Building Diversion Tank
300-264	327 Building, Post Irradiation Testing Laboratory (PTL)
300-265	Pipe Trench Between 324 and 325 Buildings
300-268	3741 Building Foundation
300-276	3607 Sanitary Sewer System Miscellaneous. Components
300-RLWS	300 Area Radioactive Liquid Waste System
300-RRLWS	300 Area Retired Radioactive Liquid Waste System
307-RB	307 Retention Basins
309 TW-1	309 Tank #1
309-TW-2	309 Tank #2
309-TW-3	309 Tank #3

309-WS-1	309 Plutonium Recycle Test Reactor Ion Exchange Vault
309-WS-2	Rupture Loop Ion Exchange Pit
316-3	307 Disposal Trenches
340 Complex	340 Radioactive Liquid Waste Handling Facility
UPR-300-1	307-340 Waste Line Leak
UPR-300-2	Releases at the 340 Facility
UPR-300-4	Contaminated Soil Beneath the 321 Building
UPR-300-5	Spill at 309 Storage Basin
UPR-300-11	Underground Radioactive Liquid Line Leak

*Note: Additional sites may be added to this air monitoring plan through agreement with the lead regulatory agency.

General remedial action operations include characterizing, excavating, sampling, sorting, size reducing, stockpiling, treating (if necessary), decontaminating, staging, containerizing, loading, backfilling, and transport of materials from the waste sites. Materials may include a wide range of chemically and/or radiologically contaminated soil, miscellaneous debris, and structural materials. Also included is test pitting, trenching, and other activities that may be performed before or during remediation to further characterize and/or determine the limits of the waste sites.

Scattered debris within some of the waste sites will be picked up by hand; however, standard construction equipment will be used for excavation, loading, and hauling. The loading of contaminated material into waste containers may result in soil spilled on the waste containers and/or haul trucks. Haul trucks with loaded containers will enter a survey area where they will be screened to detect exterior contamination. A decontamination station will be established to decontaminate containers and haul trucks, as required. Waste containers and/or haul trucks will be decontaminated by conventional means such as brushing or wiping, or with HEPA-filtered vacuum cleaners. More aggressive decontamination methods (e.g., grinding or wet-grit blasting) may be used for decontamination if the other methods fail. Decontaminated trucks and containers will then proceed to the container transfer area from which the containers will be transported to the ERDF. A combination of HEPA filtered vacuums, exhausters, and blowers may be used to support personnel and equipment decontamination activities, in egress tents, or glovebox type applications during the execution of the remedial action work scope. HEPA filtered vacuum cleaners, HEPA filtered enclosures, and gloveboxes may also be used for other applications during remediation as needed.

Excavated material will be sent primarily to the Environmental Restoration Disposal Facility (ERDF) for disposal. On a case-by-case basis, other EPA-approved disposal facilities may be used based on the specific waste stream designation.

Characterization sampling (e.g. confirmatory sampling, remedial investigation sampling) at radiological contaminated sites is included in the scope of this plan since the emissions from these activities (e.g., surface sampling, potholing) will generate negligible emissions. The U.S. Environmental Protection Agency will be notified of confirmatory sampling activities at the 300 Area via the confirmatory sampling work instruction approval process.

2.0 AIRBORNE SOURCE INFORMATION

There is a potential for radioactive airborne emissions resulting from remediation of waste sites in the 300-FF-2 Operable Unit. The concentration of the isotopes listed in Attachment 1 represent those that were determined to exist in the waste sites. Other isotopes may also be encountered during remedial action activities. It is expected that the isotopic concentrations listed in Attachment 1 represent the upper bound of what will actually be found during remedial actions, and that the estimates provided here are conservative.

2.1 INVENTORY

The radionuclide inventory and subsequent potential emission calculations for the 300 Area waste sites are summarized in Attachment 1.

The documents used to estimate total waste site volumes and radiological inventory are referenced in Calculation No. 0300X-CA-V0087, rev. 0 (WCH 2008). Estimations of soil dimensions for removal were determined from historical research findings, past practice lessons learned, and engineering judgments based on current understandings of the waste sites. The inventory calculations take into account the material that was processed within buildings, for those sites associated with specific facilities. As such, remaining foundations and slabs are accounted for.

To determine the potential-to-emit, the calculated waste site inventories were multiplied by release fractions according to the requirements from WAC 246-247-030. A release fraction of 1E-03 (for particulates) was applied to all soils, contaminated debris and pipes. For calculation purposes, it is conservatively assumed that H-3 is present as a gas and a release fraction of 1 is applied. In addition, it is assumed that some of the soil will be collected in HEPA filtered vacuums. A release fraction of 1 is applied to this inventory.

The CAP88-PC model (Version 3.0) was used to determine the total effective dose equivalent, or annual unabated offsite dose for each waste site. The potential-to-emit (curies per year) was the input for the computer model, and the model generated the annual unabated dose. The CAP88-PC model summary and synopsis are presented in WCH 2008. The calculated total annual unabated offsite dose for the remedial actions of the 300 Area Central Sites is 1.96E-01 mrem/yr. The distance to the maximally exposed individual is 1,584 m Northeast. The calculated total annual unabated offsite dose for use of a HEPA filtered vacuums is 6.27E-02 mrem/yr at 1,584 meters. This is based on use at a worst case waste site; however, HEPA filtered-vacuum use in anticipated to be limited if used at all.

3.0 BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY

The following is the BARCT to be implemented during the 300-FF-2 300 Area Central Waste Sites remedial action.

The following describes the controls to be implemented during the excavation, sorting, size reduction, stockpiling, and bulk material loading:

- Water will be applied during excavation, sorting, size reduction, container loading, stockpiling, and backfilling processes to minimize airborne releases.

- Soil fixatives will be applied to any contaminated soils and debris (including stockpiles) that will be inactive for more than 24 hours. Periodic monitoring (visual observation) shall be performed, as determined by the project, of contaminated soils and debris that remain inactive for great than one (1) month. Re-application of fixative or other control measure shall be performed if warranted by the periodic monitoring.

- Fixatives will be applied to contaminated soils and debris (including stockpiles) that will be inactive less than 24 hours at the end of work operations, if the sustained windspeed is predicted overnight to be greater than 32.2 kph (20 mph) based on the Hanford Meteorological Station morning forecast. This will allow the project enough time, if necessary, to prepare for the application of dust control measures. If a soil fixative has already been applied and the soil will remain undisturbed, further uses of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated soils are frozen, or if it is raining, snowing, or other freezing precipitation is falling at the end of work operations.

- An entry will be made in the project logbook or equivalent when the forecast predicts, sustained wind speeds of greater than 32.2 kph (20 mph) and dust control is to be applied at the end of the work shift.

- The haul trucks transporting bulk materials will be covered to contain the materials while in transit to the ERDF.

- HEPA filters (e.g., HEPA filtered vacuum cleaner) may be used during remediation activities. The use of HEPA filters has been generally accepted as BARCT. HEPA filters shall have efficiency testing performed upon installation and on an annual basis thereafter and must be demonstrated to be 99.95% removal efficiency.

- Additional measures for controlling small debris in waste piles may be prudent based on waste site conditions as determined by project personnel. Some additional measures that may be used are: 1) apply a thin layer of other contaminated soil from the same waste site that is free of debris on the surface and follow normal fixative application, 2) apply a thin layer of uncontaminated soil that is free of debris on the surface and follow normal fixative application, 3) apply a bonded fiber fixative, 4) cover the area containing small debris that is easily re-suspended with a tarp or other appropriate material.

4.0 MONITORING

During remediation of the 300-FF-2 central waste sites monitoring activities will consist of using existing air monitoring stations 300 Area Northeast, 300 Area Southwest #2, 300 Trench, and 300 Water Intake. The operation of these monitors will follow the protocol established for these programs and operate at approximately 2 cfm. Activities such as building demolition and field remediation may somewhat alter air monitor locations. Approximate locations are provided in Attachment 2. EPA approval will be obtained prior to moving any air monitor.

These air monitors are the means/methods to measure emissions. The operation of these monitors will follow the protocol established for these programs. The data from these monitors will be included in the annual reports prepared for the Hanford Site. Air samples are collected every two weeks and analyzed for total alpha and total beta. These samples are also composited quarterly and analyzed for isotopic uranium, isotopic plutonium, Am-241, Sr-90, and gamma emitting radionuclides (gamma energy analysis). In addition, monthly tritium samples are collected from these monitors. Isotopic results that exceed 10% of the Table 2 values, Appendix E, 40 CFR 61 will be investigated and the adequacy of controls evaluated as appropriate.

Air monitors are run continuously and air monitor downtime will be minimized. If any one of the air monitor stations is out of operation for more than 48 hours during normal work operations (excluding weekends and holidays), the regulatory agency will be notified. At least two air monitors must be operating for normal work operations, excavation and loading activities to continue at the site.

Exhaust points from HEPA filters (and any ductwork, seams, or other potential release locations from enclosures) will be monitored on a routine basis for potential radionuclide releases and results recorded (e.g., post survey results negative). Any positive survey results will require appropriate maintenance on the facility, exhauster, or vacuum to ensure that continued releases do not occur. Records of routine monitoring and necessary maintenance will be provided to EPA staff upon request.

There are other existing air monitors for other 300 area activities and thermoluminescent dosimeters (TLDs) in and near the perimeter of the 300 Area that provide information concerning air emissions and radiation fields. The location and data from these monitors and TLDs are reported each year in the Hanford Site Environmental Report and associated appendices.

5.0 REFERENCES

EPA, 2001, *Interim Action Record of Decision for the 300-FF-2 Operable Unit,* April 2001, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

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

WAC 246-247-040, "Radiation Protection-Air Emissions," *Washington Administrative Code,* as amended.

WCH 2008, *Total Effective Dose Equivalent for the Remedial Action of the 300 Area Central Waste Sites*, No. 0300X-CA-ZV0087, Rev. 0, Washington Closure Hanford, Richland, WA

APPROVAL PAGE

Title: Air Monitoring Plan for the 300 Area Central Waste Sites Remedial Action, dated March 2011

Approval:

RF Guercia
U.S. Department of Energy
Richland Operations Office

Signature

3/30/11
Date

LE Gadbois
U.S. Environmental Protection Agency

Larry Gadbois
Signature

3-30-2011
Date

Attachment 1 Dose Summaries

Isotope [1]	Annual Possession Quantity, Ci		Potential to Emit, Ci/yr		Total PTE (Ci/yr)	Unabated TEDE To The MEI
	Particulates	HEPA Vacuum	Particulates (RF=1E-3)	HEPA Vacuum (RF=1)		
Ac-228						5.58E-08
Am-241	1.25E+00	8.34E-04	1.25E-03	8.34E-04	2.08E-03	6.83E-02
Am-243	1.12E-09	0.00E+00	1.12E-12	0.00E+00	1.12E-12	0.00E+00
Ba-137m'	2.17E+01	5.01E-03	2.17E-02	5.01E-03	2.67E-02	8.26E-04
Bi-210						6.19E-11
Bi-212						1.84E-08
Bi-214						2.59E-07
C-14	1.02E+00	0.00E+00	1.02E-03	0.00E+00	1.02E-03	1.30E-05
Cm-243	2.61E-05	0.00E+00	2.61E-08	0.00E+00	2.61E-08	1.06E-06
Cm-244	1.18E-03	0.00E+00	1.18E-06	0.00E+00	1.18E-06	4.10E-05
Cm-246	8.35E-10	0.00E+00	8.35E-13	0.00E+00	8.35E-13	0.00E+00
Co-60	5.64E-02	0.00E+00	5.64E-05	0.00E+00	5.64E-05	2.79E-05
Cs-134	1.36E-02	1.48E-09	1.36E-05	1.48E-09	1.36E-05	3.12E-05
Cs-137	2.29E+01	5.29E-03	2.29E-02	5.29E-03	2.82E-02	4.13E-02
Eu-152	1.97E-02	0.00E+00	1.97E-05	0.00E+00	1.97E-05	2.60E-06
Eu-154	4.99E-02	0.00E+00	4.99E-05	0.00E+00	4.99E-05	7.79E-03
Eu-155	5.12E-02	0.00E+00	5.12E-05	0.00E+00	5.12E-05	7.25E-07
H-3	1.01E+01	0.00E+00	1.01E+01	0.00E+00	1.01E+01	2.82E-03
I-129	4.19E-05	0.00E+00	4.19E-08	0.00E+00	4.19E-08	5.08E-07
Mn-54	4.19E-04	0.00E+00	4.19E-07	0.00E+00	4.19E-07	3.45E-08
Nd-147	4.19E-04	0.00E+00	4.19E-07	0.00E+00	4.19E-07	1.54E-09
Np-237	2.71E-07	0.00E+00	2.71E-10	0.00E+00	2.71E-10	0.00E+00
Pa-234						1.89E-07
Pa-234m						3.51E-06
Pb-210						4.71E-08
Pb-212						1.10E-08
Pb-214						4.31E-08
Pm-147	3.52E-02	2.02E-05	3.52E-05	2.02E-05	5.54E-05	2.72E-07
Po-214						1.42E-11
Po-216						1.32E-12
Po-218						1.55E-12
Pu-236	1.39E-07	0.00E+00	1.39E-10	0.00E+00	1.39E-10	0.00E+00
Pu-238	1.04E-02	0.00E+00	1.04E-05	0.00E+00	1.04E-05	6.29E-04
Pu-239	4.97E-01	0.00E+00	4.97E-04	0.00E+00	4.97E-04	3.26E-02
Pu-240	6.27E-03	0.00E+00	6.27E-06	0.00E+00	6.27E-06	0.00E+00
Pu-241	7.45E-01	0.00E+00	7.45E-04	0.00E+00	7.45E-04	8.80E-04
Pu-242	1.10E-06	0.00E+00	1.10E-09	0.00E+00	1.10E-09	6.73E-08
Ra-224						5.55E-08
Ra-226	2.80E-03	0.00E+00	2.80E-06	0.00E+00	2.80E-06	2.28E-05
Ra-228						8.18E-06
Ru-106	1.41E-10	5.29E-14	1.41E-13	5.29E-14	1.94E-13	0.00E+00

Isotope [1]	Annual Possession Quantity, Ci		Potential to Emit, Ci/yr		Total PTE (Ci/yr)	Unabated TEDE To The MEI
	Particulates	HEPA Vacuum	Particulates (RF=1E-3)	HEPA Vacuum (RF=1)		
Rn-220						1.34E-16
Rn-222						3.14E-16
Sc-46	1.68E-04	0.00E+00	1.68E-07	0.00E+00	1.68E-07	1.16E-08
Se-79	9.67E-07	0.00E+00	9.67E-10	0.00E+00	9.67E-10	0.00E+00
Sm-145	1.13E-05	0.00E+00	1.13E-08	0.00E+00	1.13E-08	2.43E-11
Sr-89	2.10E-04	0.00E+00	2.10E-07	0.00E+00	2.10E-07	1.33E-08
Sr-90	1.07E+01	2.30E-03	1.07E-02	2.30E-03	1.30E-02	3.46E-02
Tc-99	8.96E-02	0.00E+00	8.96E-05	0.00E+00	8.96E-05	5.20E-05
Th-228	1.41E-03	0.00E+00	1.41E-06	0.00E+00	1.41E-06	7.24E-05
Th-230	1.27E-06	0.00E+00	1.27E-09	0.00E+00	1.27E-09	2.28E-08
Th-231						9.05E-08
Th-232	2.65E-02	0.00E+00	2.65E-05	0.00E+00	2.65E-05	8.74E-04
Th-234	9.03E-02	0.00E+00	9.03E-05	0.00E+00	9.03E-05	4.91E-06
Tl-208						8.73E-08
U-234	5.58E-01	0.00E+00	5.58E-04	0.00E+00	5.58E-04	2.65E-03
U-235	8.77E-02	0.00E+00	8.77E-05	0.00E+00	8.77E-05	3.71E-04
U-236	1.87E-04	0.00E+00	1.87E-07	0.00E+00	1.87E-07	8.19E-07
U-238	5.91E-01	0.00E+00	5.91E-04	0.00E+00	5.91E-04	2.32E-03
Y-90	1.07E+01	2.30E-03	1.07E-02	2.30E-03	1.30E-02	9.76E-05
				Totals	**1.02E+01**	**1.96E-01**

Notes:

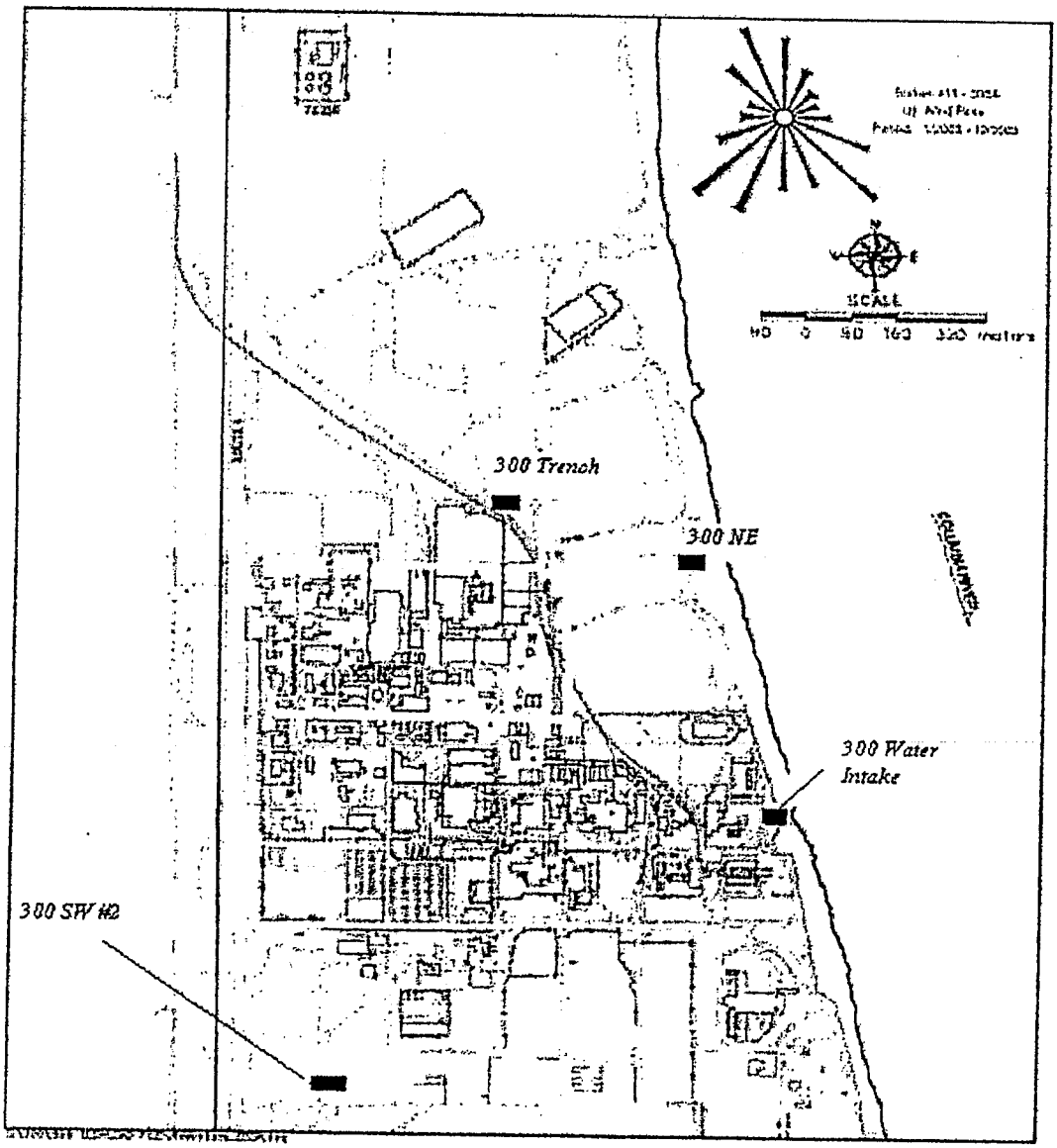
[1] Isotopes in table with no quantity or PTE values listed are progeny isotopes calculated in the CAP88-PC Version 3.0 model. These isotopes have to be listed and tabulated to reflect the TEDE to the MEI output value from the model.

[2] Radionuclide potential to emit values are presented in Calculation 0300X-CA-V0087, *Total Effective Dose Equivalent for the Remedial Action of the 300 Area Central Waste Sites*, Rev. 0.

[3] The annual unabated dose was determined using the CAP88-PC, Version 3 Model. The PTE was the input for the model, and the model generated the annual unabated dose. The CAP88-PC model summary and synopsis is presented in Calculation 0300X-CA-V0087, *Total Effective Dose Equivalent for the Remedial Action of the 300 Area Central Waste Sites*, Rev. 0.

Attachment 2

Air Monitor Locations
300 Area Central Sites Remediation



AIR MONITORING PLAN FOR THE 300 AREA CENTRALWASTE SITES REMEDIAL ACTION
March 2011

Distribution

Administrative Record	H6-08
Darrin Faulk	N2-02
John Ludowise	N2-02
Scott Myers	L6-06
Jason Olsson	L6-06
Joan Woolard	H4-21

Intentionally Blank

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