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Distribution

Unit Managers' Meeting: 100 Areas Remedial Action Unit/Source Operable Units

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Rich Carlson	BHI (X0-17)
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Rick Donahoe	BHI (X5-57)
Jon Fancher	CHI (X0-17)
Ella Feist	CHI (X0-17)
Kim Koegler	BHI (X9-08)
Rex Miller	BHI (X3-40)
Annie Smet	BHI (X0-17)
Dean Strom	CHI (X3-40)
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Additions or deletions to this distribution list should be forwarded to Pat Ellsworth (BHI).
Phone 372-9355, MSIN H9-03, plellswo@bhi-erc.com

114449

Meeting Minutes Transmittal/Approval
Unit Managers' Meeting
100 Area Remedial Action and Waste Disposal Unit/Source Operable Unit
3350 George Washington Way, Richland, Washington
February 26, 2004

APPROVAL: ______________________________ Date 3/25/04
Chris Smith/Jamie Zeisloft, 100 Area Unit Managers, RL (A3-04)

APPROVAL: ______________________________ Date 3/25/04
Michael Thompson/ Arlene Tortoso, Waste Management Division, RL (A6-38)

APPROVAL: ______________________________ Date 6/15/04
John Price, 100 Aggregate Area Unit Manager, Ecology (B5-18)

APPROVAL: ______________________________ Date 3-25-04
Dennis Faulk, 100 Aggregate Area Unit Manager, EPA (B5-01)

Meeting minutes are attached. Minutes are comprised of the following:

Attachment 1	--	Attendance Sheet
Attachment 2	--	Agenda
Attachment 3	--	100 Area Meeting Minutes
Attachment 4	--	Sampling Design, Sampling Objective, Frequencies, and Basis Table
Attachment 5	--	100 Area RDR and SAP Review Schedule
Attachment 6		WIDS Site CVP Closeout Summary Table
Attachment 7	--	Closeout Samples Associated with the Overburden Material of the 1607-B9 Septic System
Attachment 8	--	Pipeline Drawing
Attachment 9	--	Map of 188-B-1 Waste Staging Location Map
Attachment 10	--	Closure Summary for the 105-DR Sodium Fire Facility
Attachment 11	--	Ecology Approval Email for 100-N Ancillary Facilities RAWP
Attachment 12		Ecology Approval Email to Move Waste to the 1330-N Waste Pad
Attachment 13	--	Groundwater Activities
Attachment 14	--	K Basin Activities
Attachment 15	--	100-FR-3 Trend Plots
Attachment 16		100-BC-5 Trend Plots

Prepared by: Pat Ellsworth Date 6/15/04
Pat Ellsworth (H9-03)

Concurrence by: Richard A Carlson Date 6/15/04
Richard A. Carlson
BHI Remedial Action Project (X0-17)

ATTACHMENT 1

Attendance Sheet

Remedial Action and Waste Disposal Unit Managers' Meeting
Official Attendance Record – 100 Area
February 26, 2004

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
Jack Donnelly	BHI	Env. Lead	373-9299
Chris Smith	DOE/AMRC	100 Area Project Lead	372-1544
Dean Strom	CHI	100-BC	373-5519
Mark Buckmaster	BHI	Eng	521-2089
Alex Nazarali	BHI	CVP	373-1915
Jon Fancher	CHI	100N-RA	373-9556
KENT R. WESTOVER	DOE/AMRC	100N-RA	376-3967
PAM DOCTOR	BHI	RISK/CVP	372-9570
Larry Gadbois	EPA		
Steven Clark	CHI	Risk/CVP	372-9531
Ella Feist	CHI	RA	373-2130
Eileen Murphy-Fitch	FH TPAT	—	376-8868
BOB PETERSON	PNNL GW	KR4	373-9020
Arlene Tortoso	DOE	GW Unit Mgr.	373-9631
Mary Hartman	PNNL	BC-5, FR-3	~~943~~ 373-0028
John Price	Ecology	Proj. Mgr	736-3029
Dennis Faulk	EPA		
Van Johnson	FH	100 Task Lead	373-3987
Lorna Dittmer	BHI	Reg Support	372-9295

ATTACHMENT 2

Agenda

Attachment 2

100 AREA
UNIT MANAGERS MEETING AGENDA

3350 George Washington Way
February 26, 2004

<u>1:00 – 3:00 p.m.   3350 GWW (Room 1B45)</u>

Administrative

- Meeting minutes status
- Review and approve last UMM minutes
- Next 100 UMM is February 26, 2004, at 1:00 – 4:00

Remedial Action

100 Area Common

- Remaining Sites ESD Status
- Remaining Sites Sampling Efforts Status
  - B/C Area Remaining Sites
  - 600 Area Remaining Sites
- Burial Ground SAP revision – language acceptable for compositing
- 100 Area RDR & SAP revisions status
- CVP status
- River Corridor Risk Assessment
- B/C Pilot
- N Eco Study

100 F, K, and Group 4

- 100 F General Status
- 100 F Design/Procurement Status
- 100 K General Status

100 N

- Procurement update
- Overburden Sampling Results

100 B/C

- Burial Ground status
- Pipeline backfill status
- 118-B-10 paint/soil treatability status
- Remaining Sites RFP (100-C-9 and 100-B-14)

D&D

- Project Status

General Crossover Items

-

Review Open Action Items Log

100-NR-2 Groundwater OU

- Remediation treatment status

100-KR-4 Groundwater OU

- Remediation treatment status
- 100 K Burial Ground Soil Gas Investigation

100-HR-3 Groundwater OU

- Remediation treatment status

100-FR-3 Groundwater OU

-

100-BC-5 Groundwater OU

- Status of quarterly sampling at wells 199-B3-46 and -47

Groundwater

- 100 Area Open Action Items
- 100-Area Open forum and discussion
- Recent change in tritium concentration near KE Fuel Storage Basin
- Status of aquifer tube installation project

Other

ATTACHMENT 3

100 Area Meeting Minutes

UNIT MANAGERS MEETING MINUTES

3350 George Washington Way, Assembly Room
February 26, 2004

1:00 – 3:00 p.m. **100 Area** **3350 GWW, Assembly Room**

Administrative

- Meeting Minute Status – January meeting minutes were approved and signed by those in attendance.
- The next 100 Area Unit Managers Meeting will be announced at a later date,as the 3350 Building is no longer available.
- Action Item Update:

  All outstanding action items are complete.

Remedial Action

100 Area Common

Remaining Sites ESD – Chris Smith, DOE, requested a status of Ecology's Attorney General review of the Explanation of Significant Difference. John Price, Ecology, stated the proposed ESD is acceptable to Ecology's AG, and that approval by Mr. Michael Wilson would be obtained. John requested a clean copy of the ESD be provided, including all the signature pages.

Remaining Sites Sampling Efforts Status

- B/C Area Remaining Sites – Ella Feist, CHI, stated that Remaining Sites Verification Packages (RSVPs),Draft A were provided to Dennis Faulk, EPA, for review. EPA comments have been received and revisions are in progress to resolve the comments. Additionally, Ella indicated that EPA comments on the pipeline matrix modeling evaluation were received, but Ecology's comments have not been received. John Price noted that Ecology's comments are forthcoming.
- 600 Area (IU-2 and IU-6 Operable Units) Remaining Sites – Ella Feist stated sampling designs are being developed and preparations are in progress to sample the sites in March 2004. A kickoff meeting with DOE and EPA will be scheduled within the next few weeks. Ella clarified that the scope of this effort was just confirmatory sampling, not remediation.

- Burial Ground SAP Revisions – Chris Smith requested Ecology's approval on the revisions to the 100 Area Burial Ground SAP that were presented at the January UMM (Attachment 4). John Price approved the changes. EPA approval was also obtained.

- 100 Area RDR and SAP Comments – Ella Feist stated that incorporation of the regulatory comments is complete, and handed out the review schedule (Attachment 5). The largest effort was to merge the remaining sites SAP elements into the 100 Area SAP. The RDR and SAP are planned to be given to the regulators the week of March 8, 2004. Dennis Faulk noted the merging of the remaining sites sampling protocol is the primary language to review, and asked for an electronic and/or hard copy of the revisions before transmitting formally. Chris Smith agreed to the request.

- CVP Status – Alex Nazarali, BHI, distributed the Closeout Verification Package (CVP) Summary Table (Attachment 6). Alex anticipated two CVPs to be completed by the end of February, 2004, and nearly 100 CVPs have been issued. Additionally, Alex requested EPA approval of the backfill concurrence for the 100-B/C (1607-B-9 septic tank) overburden, and provided the sample data (Attachment 7). EPA approved the request.

- River Corridor Risk Assessment – Pam Doctor, BHI, reported that workshops for the Tri-Parties, as well as the Trustees and tribal nations is scheduled for March 16 and 17, 2004. Larry Gadbois, EPA, reported the assessment has begun for some work in the Columbia River. Also, Larry commented that he has received good feedback from the tribes concerning interaction of the River Corridor Risk Assessment team with tribal members.

- B/C Pilot – Dennis Faulk requested a briefing at some point on the relationship or tie between the 100-B/C Pilot Project and the River Corridor Risk Assessment. Larry Gadbois iterated the same point. Dennis' concern is the 100-B/C Pilot Project needs to be adequate for final decision making, and that this assumption needs to be checked. Dennis further noted that the tribal comments and responses on this effort need to be provided to EPA for review and input. EPA approval will not be granted unless these are provided.

- N Eco Study – John Price noted that the Washington State Department of Health (DOH) will be tied into this study. John requested DOE provide a schedule and process for meeting the study deadline date as specified in the 100-N Record of Decision.

100-F, -K, and Group 4

- 100-F General Status – Mark Buckmaster, BHI, noted the 100-F borrow pit revegetation activity is complete, and that initial design on the burial grounds and remaining sites has begun.

- 100-K General Status – Mark Buckmaster provided a general status of remediation activities at 100-K. Remediation continues at the 116-KE-4 Retention Basin and effluent pipelines. Overburden removal activities were initiated on the 116-K-2 Mile Long Trench. Remediation activities were completed on the Acid Tank Saddles, 128-K-1 Burn Site and 100-K-29 sandblast Sites. Excavation activities were completed on the 116-KE-1 and 116-KW-1 Condensate Cribs. Backfill activities will be completed the first week in March. Mark provided the attached pipeline drawing showing a 14-inch pipeline that paralleled the main effluent pipelines (Attachment 8). Several potholes were excavated to locate the pipeline. The results did not locate the pipeline. Reviewing the historical drawings indicated the pipeline was designed in the late 1960's and was apparently not constructed. No additional activities to locate the pipeline will be conducted. EPA did not have any issue with the approach. The CVP will document that the pipeline does not exist. EPA raised no objection.

  Larry Gadbois requested the status of the 118-K-1 burial ground Request for Proposal. Chris Smith commented that BHI drafted a Baseline Change Request (BCP), but the BCP is on hold. Dennis Faulk stated that EPA was under the assumption that remediation of this burial ground was to be funded and that agreement between the EPA manager and DOE had been reached. Dennis took the action to notify his manager, and that additional discussions on priorities may be coming.

100-N

- Procurement update – Jon Fancher, CHI, reported that the new contract should be awarded by April 1, 2004, and that remediation may been in late May or early June 2004.

- 1324-N/1324-NA Certification of Closure – Jon Fancher asked if Ecology approved the Certification of Closure. John Price noted that as soon as DOE transmits the revised groundwater-monitoring plan that Ecology would approve the certification.

- Air Monitoring Plan – Jack Donnelly, BHI, informed Ecology that a review of the 116-N-1 data was in progress to determine if the air monitoring plan needed to be updated. If the total effective dose equivalent is close to the existing calculation, no revision to the plan would be necessary. Ecology concurred with the approach.

100-B/C

- Update – Dean Strom, CHI, reported that overburden removal on the 118-B-1 burial ground was in progress. Removal of surface material at the 600-232 waste site began such as telephone poles and scrap metal.

- Backfill Operations – The 100-B/C pipelines area backfilling is still progressing and should be completed in April 2004.

- Drummed Waste – Lead-contaminated paint chips mixed with soil are being stored in 10 drums awaiting sampling and/or treatment prior to disposal. Jack Donnelly stated that Dave Einan, EPA, agreed to sample the soil and paint chips as a matrix to determine if treatment is necessary. Dennis Faulk agreed with the approach but requested his involvement prior to contacting Dave Einan.

- Waste Staging Locations – Jack Donnelly provided a map of the 118-B-1 waste staging location for EPA approval (Attachment 9). Dennis Faulk approved the waste staging locations.

- Dean Strom provided details on closeout of the overburden pile associated with the 1607-B9 septic system. Verification data indicated elevated levels of PAH's in the overburden soils. A visual inspection of the area indicated the presence of small pieces of asphalt. Verification data was compared with known asphalt data. The correlation between the samples was very good. Data were provided to EPA for review. Based on the information, Dennis Faulk agreed to eliminate PAH's as a COC for the waste site.

D&D

- Jim Golden, BHI, provided a closure summary to Ecology on the 105-DR Sodium Fire Facility (Attachment 10). Additionally, Jim provided documentation of Ecology's approval to make changes to portions of the 100-N Ancillary Facilities Removal Action Workplan, as well as waste movement to the 1330-N waste pad, also known as the "less than 90-day accumulation pad" (Attachment 11 and Attachment 12).

Cross Over Item(s)

- No report

Groundwater

- 100-NR-2, KR-4, and HR-3 – Vern Johnson, FH, provided an update on the 100-NR-2, 100-KR-4, and 100-HR-3 Operable Unit (OU) groundwater activities (Attachment 13). Larry Gadbois requested to have input to the focus group on the chromium plume in the 100-KR-3 area. Scott Petersen (FH) is coordinating this focus group. Additionally, Bob Peterson (PNNL) provided a handout on groundwater monitoring at K Basins (Attachment 14).

- 100-HR-3 ISRM – A focus group will meet the first week in March, 2004, to discuss the ISRM (separate from the focus group for pump-and-treat mentioned above). Arlene Tortoso, DOE, will notify the Tribes and State of Oregon informally. Arlene asked Vern Johnson, FH, for the most recent data from ISRM barrier wells; Vern will send it to Arlene.

- John Price requested a written explanation of why DOE needs the 182-D reservoir to remain in use, as well as a repair schedule. There are plans to renovate the reservoir to repair the leaks. Arlene Tortoso has the action to provide a schedule for this work by the next 100 Area UMM.

- 100-FR-3 Groundwater OU – Mary Hartman, PNNL, provided a handout with trend plots requested by Larry Gadbois at the January UMM (Attachment 15). Larry gave verbal approval to change sampling frequency from quarterly to annually at the aquifer tubes. Mary will prepare a letter with page changes to the Sampling and Analysis Plan. Mary informed EPA that well 699-62-31, scheduled for sampling per the Sampling and Analysis Plan, could not be sampled because it has gone dry. Larry agreed this was not a major impact and the plan can be modified to remove this well via the same letter covering sampling frequency.

- 100-BC-5 Groundwater OU – Mary Hartman, PNNL, provided a handout with trend plots requested by EPA at the January UMM (Attachment 16). Dennis Faulk gave verbal approval to change sampling frequency from quarterly to annually at wells 199-B3-46 and -47 and aquifer tubes. The quarterly frequency initially was established to monitor for possible effects of surface remediation. Mary will prepare a letter with page changes to the Sampling and Analysis Plan. Those changes also will include removing well 699-72-88, which was decommissioned (as reported at the January UMM).

- Aquifer Tube Installation – Bob Peterson reported that new tubes have been installed in 100-D, 100-H, 100-K, and 300 Areas. Installation is in progress at 100-B/C Area; the new tubes provide additional coverage in an area that formerly had no tubes. Tubes will be installed next in 100-F Area. Sampling of previously installed tubes is finished in 100-B/C and 100-K Areas and will proceed to 100-D and other areas. New data from the recently sampled tubes are becoming available. Bob will give an update on the results at the next 100 Area UMM.

- Annual Groundwater Report – Mary Hartman stated that the groundwater monitoring report for fiscal year 2003 had been delivered to DOE for transmittal to Ecology and EPA. Two copies will be transmitted to meet the March 1 deadline, and the full distribution will be made later in March. This was the first year that regulators reviewed the draft report, and that process went smoothly and helped improve the report.

Outstanding and New 100 Area Unit Manager's Meeting Action Items

February 2004 Actions

- Patty Krueger, CHI, to change the EPA approval signature on the meeting minutes from Dennis Faulk to Larry Gadbois.
- Patty Krueger to notify UMM participants on the location of the next meeting since 3350 George Washington Way is no longer available. (Done)
- DOE to send EPA and Ecology the 100 Area Remedial Design Report/Remedial Action Workplan (RDR/RAWP) and the 100 Area Sampling and Analysis Plan electronically before transmitting formally.
- John Sands, DOE, to provide a copy to Dennis Faulk of the tribal comments received and the proposed responses on the 100-B/C Pilot Project Conceptual Model.
- John Price to meet with Mike Thompson, DOE, on the 100-N ecological study schedule and process to meet the due date.
- DOE to provide John Price at the next UMM, a schedule for the 100-D reservoir repair.

ATTACHMENT 4

Sampling Design, Sampling Objective, Frequencies, and Basis Table

Table III-1. Sampling Design, Sampling Objectives, Frequencies, and Basis. (2 Pages)

Sampling Objectives	Decision Boundaries	Physical Samples	
		Number of Samples	Basis
Excavation guidance – gridded radiological surveys	N/A	No physical samples. Number of measurements consistent with MARSSIM Class 3 survey.	Excavation continues until radiological levels meet survey criteria. Indicates that verification sampling should be satisfied for radiological COCs.
Excavation guidance and site verification – focused chemical sampling	Table III-5	One randomly selected grab sample from specific locations within the burial grounds that contained stained soils, buried liquid wastes, mercury-containing components, beneath inventories of dangerous/hazardous wastes (e.g., lead bricks), and from areas where waste designation characterization showed chemical COC concentrations above the RAGs.	Excavation continues until chemical RAGs are met. Indicates that verification sampling should be satisfied for chemical COCs.
Excavation guidance and site verification – focused radiological sampling	Table III-5	One randomly selected grab sample(s) from specific locations where process knowledge or radiological surveys indicates potential for elevated alpha or beta contamination levels.	Excavation continues until radiological RAGs are met. Indicates that verification sampling should be satisfied for radiological COCs.
Area-wide site verification (shallow) (0 to 4.6 m [15 ft])	Table III-5	Minimum of four random composite samples per subunit: divide decision unit into subunits, collect four aliquots per composite.	Shallow zone cleanup verification samples for statistical evaluation.
Area-wide Site verification (deep) (>4.6 m [>15 ft])	Table III-5	Four random composite samples from each subunit: divide decision unit into subunits, collect four aliquots per composite.	Deep zone cleanup verification samples for statistical evaluation.
Overburden/ layback	Table III-5	EPA Lead Sites: Four random composite samples from each subunit: divide pile into subunits, collect four aliquots per composite. Ecology Lead Sites: Four random non-composited samples from each subunit: divide pile into subunits, collect individual samples.	Overburden pile sampling for statistical evaluation.
Backfill	N/A	No physical samples.	Radiation survey.

Table III-2. Sampling Frequencies and Analytical Methods for Overburden/ Backfill and Imported Backfill.

Field Activity	Analysis Objective	Analytical Parameters	Routine Sample Frequency	Duplicates/ Splits	Laboratory/ Method
Overburden/ layback sampling	Verify as clean	COCs	Four samples (Table III-1); approximately 5%; SFL	5%; minimum of one per waste site	SFL (Table II-2)
Imported backfill scan	Verify as clean	Radiological control	Scan	N/A	Onsite radiological control surveys

Table III-3. Sampling Frequencies and Analytical Methods for Overburden/ Backfill and Imported Backfill.

Field Activity	Analysis Objective	Analytical Parameters	Routine Sample Frequency	Duplicates/ Splits	Laboratory/ Method
Overburden/ layback sampling	Verify as clean	COCs	Four samples (Table III-1); approximately 5%; SFL	5%; minimum of one per waste site	SFL (Table II-2)
Imported backfill scan	Verify as clean	Radiological control	Scan	N/A	Onsite radiological control surveys

II.1.2.1.2.1 Shallow Zone Verification. The approach for closeout sampling of the shallow zone will follow an area-wide statistically based design augmented with focused sampling from locations with visual stains, buried liquid wastes, mercury-containing piping and equipment, locations beneath large inventories of dangerous/hazardous wastes (e.g., lead bricks), and from areas where waste designation characterization showed chemical or radioactive concentrations above the RAGs.

For area-wide sampling, the shallow zone of each site will be considered a single decision unit. However, decision units will be divided into smaller decision subunits depending on exposed surface area after excavation. The area-based number of decision subunits is summarized in Table III-4. The number of samples needed for each decision subunit was calculated based on the approach presented in the EPA guidance document *Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media* (EPA 1989). The calculation is presented in Appendix C of this SAP. Tables III-5 and III-6 summarize the number of samples to be collected for shallow zone verification and field QC.

The locations of the focused samples will be selected on a randomized basis within the footprint of the waste forms: visual stains, buried liquid wastes, mercury-containing piping and equipment, and locations beneath inventories of dangerous/hazardous wastes (e.g., lead bricks). The focused sampling results reported for site verification will be the last excavation guidance sample result that shows that the concentrations of the appropriate COCs are below the cleanup level.

II.1.2.1.2.2 Deep Zone Verification. The approach for closeout sampling of the deep zone will follow an area-wide statistically based design augmented with focused sampling similar to the shallow zone.

For area-wide sampling, the deep zone of each site will be considered a single decision unit. However, decision units will be divided into smaller decision subunits depending on exposed surface area after excavation. The area-based number of decision subunits is summarized in Table III-4. The number of samples needed for each decision subunit was calculated based on the approach presented in the EPA guidance document *Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media* (EPA 1989). The calculation is presented in Appendix C of this SAP. Tables III-5 and III-6 summarize the number of samples to be collected for deep zone verification and field QC.

The locations of the focused samples will be selected on a randomized basis within the footprint of the waste forms: visual stains, buried liquid wastes, mercury-containing piping and equipment, and locations beneath inventories of dangerous/hazardous wastes (e.g., lead bricks). The focused sampling result reported for site verification will be the last excavation guidance sample result that shows that the concentrations of the appropriate COCs are below the cleanup level.

II.1.2.1.3 Overburden/Layback. The approach for verification sampling of the overburden/layback will follow the same statistically based design used for cleanup verification. The overburden/layback verification process includes the following steps:

- A radiological control technician performs radiological surveys at the excavation site between each lift. Overburden removal ceases when the measured activity in the exposed soil is equal to, or above, the cleanup levels, or when buried waste is observed.

- A radiological control technician monitors the overburden piles with a NaI detector as new lifts are added.

- When a new overburden lift reaches a depth of 1 m, gridded radiological surveys are performed over the pile surface.

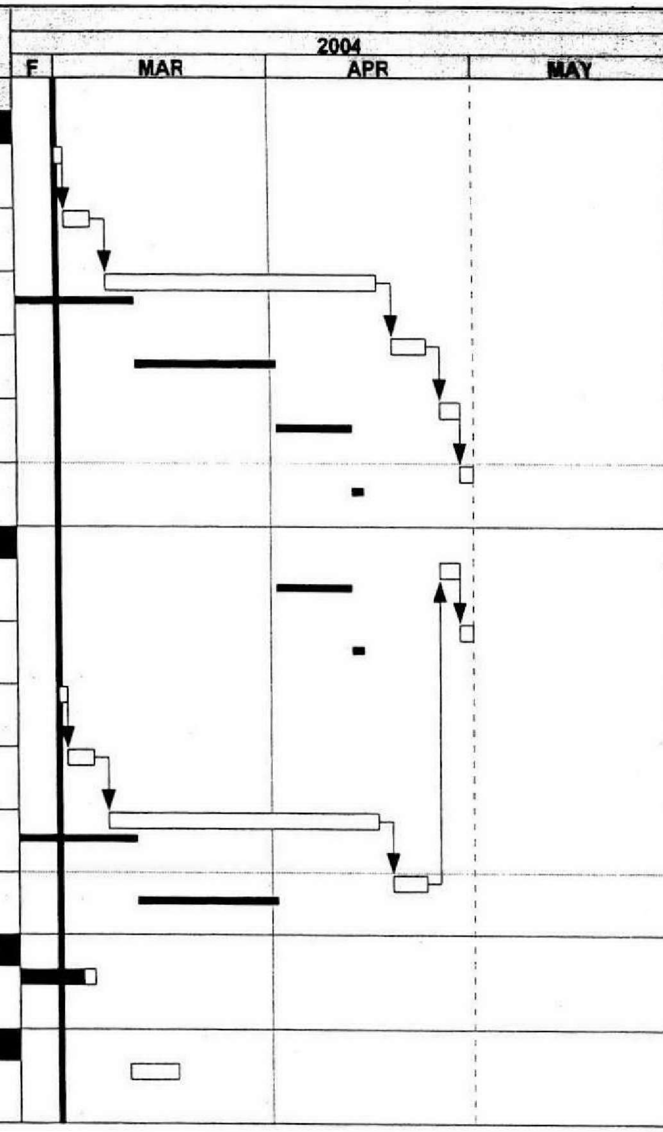
- The overburden pile verification sampling requirements are developed based on the subunit sampling requirements (see Part III of this SAP).

- From each decision subunit, four samples are collected. The samples are analyzed for the full suite of COCs for the specific waste site.

ATTACHMENT 5

100 Area RDR and SAP Review Schedule

Activity ID	Activity Description	Orig Dur	Rem Dur	% Comp	Early Start	Early Finish
100 NPL Common Update Design Documents - RDR/SAP						
A0130840	Submit SAP to RL for Review	1	1	0	01MAR04	01MAR04
A0130850	RL transmit SAP to Regulators for Review	10	4	0	02MAR04	05MAR04
A0130860	RL/Regulator Review of SAP	30	30	0	08MAR04	16APR04
A0130880	Address RL/Regulator Comments	15	5	0	19APR04	23APR04
A0130975	TECH EDIT/DOCUMENT PRODUCTION	7	3	0	26APR04	28APR04
A0130980	ISSUE REV 4	2	2	0	29APR04	30APR04
A0MX0690	TECH EDIT/DOCUMENT PRODUCTION	7	3	0	26APR04	28APR04
A0MX0700	ISSUE REV 5	2	2	0	29APR04	30APR04
A0MX0840	Submit RDR to RL for Review	1	1	0	01MAR04	01MAR04
A0MX0850	RL transmit RDR to Regulators for Review	10	4	0	02MAR04	05MAR04
A0MX0860	RL/Regulator Review of RDR	30	30	0	08MAR04	16APR04
A0MX0880	Address RL/Regulator Comments	15	5	0	19APR04	23APR04
A0W10C98	ISSUE ESD	5	5	95	02FEB04A	05MAR04
A0W10C108	RL/REG REVIEW/APPROVE SAMPLE DESIGNS (2)	5	5	0	11MAR04*	17MAR04



Start Date 01OCT03 Finish Date 03NOV04 Data Date 01MAR04 Run Date 26FEB04 11:23	Early Bar Target Bar Progress Bar	RC04 Sheet 1 of 1 **100 AREA COMMON** **REGULATORY DOCUMENTS**	

ATTACHMENT 6

WIDS Site CVP Closeout Summary Table

WIDS Site CVP Closeout Summary Table

WIDS Site Closeout	CVP Doc. No. documenting WIDS site closeout	EPA/ Ecology WIDS Signoff	Issue Rev. 0 CVP
100 B/C Area			
116-B-13	CVP-1999-00002	7/22/99	7/1999
116-B-14	CVP-1999-00003	7/22/99	7/1999
116-C-1	CVP-1998-00006	1/21/99	1/1999
116-B-1	CVP-1999-00012	12/8/1999	12/1999
116-B-11	CVP-1999-00001	12/8/1999	12/1999
116-C-5	CVP-1999-00004	12/8/1999	12/1999
116-B-4	CVP-1999-00014	2/24/2000	3/3/2000
116-B-5	BHI-00752	10/1/1999	10/1/1999
116-B-6B	CVP-1999-00017	2/24/2000	3/3/2000
116-B-9	CVP-1999-00009	2/24/2000	3/3/2000
116-B-2	CVP-1999-00015	2/24/2000	3/3/2000
116-B-3	CVP-1999-00013	2/24/2000	3/3/2000
116-B-10	CVP-1999-00010	2/24/2000	3/3/2000
116-B-12	CVP-1999-00008	2/24/2000	3/3/2000
116-C-2A	CVP-1999-00019	3/15/2000	3/28/1999
116-C-2B			
116-C-2C			
116-B-6A	CVP-1999-00011	5/17/2000	5/26/2000
116-B-16			
116-B-7	CVP-2002-00003	7/25/2002	8/6/2002
132-B-6			
132-C-2			
BC Pipeline (North)	CVP-2002-00019	12/4/2003	2/17/2004
BC Pipeline (South)	CVP-2003-00022	2/23/2004	
100-B-5	CVP-2003-00014	6/18/2003	9/11/2003
1607-B7	CVP-2003-00004	5/27/2003	7/29/2003
1607-B8	CVP-2003-00005	5/27/2003	7/29/2003
1607-B9	CVP-2003-00006	6/19/2003	8/28/2003
1607-B10	CVP-2003-00007	5/27/2003	7/29/2003
1607-B11	CVP-2003-00008	5/27/2003	7/29/2003
100-C-3	CVP-2003-00009	5/27/2003	7/28/2003
118-C-4	CVP-2003-00015	6/25/2003	9/11/2003
118-B-9	0100-B-CA-V0171	2/10/2004	
100-B-11	0100-B-CA-V0167	2/10/2004	
100-B-16	0100-B-CA-V0169		
118-B-4			
118-B-5			
118-B-10			
118-C-2			
100 D Area			
100-D-4 (107D5)	CVP-1998-00004	3/25/1999	3/1999
100-D-20 (107D3)	CVP-1998-00003	3/25/1999	3/1999
100-D-21(107D2)	CVP-1998-00002	3/25/1999	3/1999
100-D-22 (107D1)	CVP-1998-00001	3/25/1999	3/1999
1607-D2		closed	
1607-D2:1 Tile Field	CVP-1998-00005	3/25/1999	3/1999
Septic Pipelines	CVP-2000-0004	9/26/2000	9/2000
Septic Tank	CVP-1999-00005	11/23/1999	12/1999
116-DR-9	CVP-1999-00006	1/6/2000	1/2000
100-D-25			
116-D-7	CVP-1999-00007	8/15/2000	8/2000
100-D-18 (107D4)	CVP-2000-00001	9/26/2000	10/2/2000
116-DR-1	CVP-2000-00002	9/26/2000	9/27/2000
116-DR-2			
100-D-48		closed	
100-D-48:1 (Grp 2 North Pipelines)	CVP-2000-00003	3/14/2001	3/2001
100-D-48:2 (Grp 2 West Pipelines)	CVP-2000-00005	9/26/2000	10/2/2000
100-D-48:3 (Grp 3 Large Pipelines)	CVP-2000-00034	4/20/2001	4/20/2001
100-D-48:4 (Grp 3 Small Pipelines)	CVP-2000-00033	4/17/2001	4/20/2001
100-D-19	CVP-2000-00003	3/14/2001	3/2001
UPR-100-D-4			
100-D-49		closed	
100-D-49:1 (Grp 2 North Pipelines)	CVP-2000-00003	3/14/2001	3/2001
100-D-49:2 (Grp 2 East Pipelines)	CVP-2000-00005	9/26/2000	10/2/2000

WIDS Site CVP Closeout Summary Table

WIDS Site Closeout	CVP Doc. No. documenting WIDS site closeout	EPA/ Ecology WIDS Signoff	Issue Rev. 0 CVP
100 D Area (cont.)			
UPR-100-D-2	CVP-2000-00005	9/26/2000	10/2/2000
UPR-100-D-3			
100-D-5	CVP-2000-00034	4/20/2001	4/20/2001
100-D-6			
116-D-3	no CVP site rejected	5/17/2000	N/A
116-D-4	CVP-2000-00008	10/23/2000	10/31/2000
116-D-6	CVP-2000-00009	11/7/2000	11/9/2000
116-D-1A	CVP-2000-00010	3/12/2001	3/2001
116-D-1B			
100-D-46			
116-D-2	CVP-2000-00013	10/23/2000	10/25/2000
116-DR-6	CVP-2000-00014	10/23/2000	10/24/2000
116-DR-4	CVP-2000-00015	10/23/2000	10/25/2000
100-D-12	CVP-2000-00016	10/23/2000	10/26/2000
100-D-52	CVP-2000-00018	11/7/2000	11/9/2000
116-DR-7	CVP-2000-00019	9/26/2000	10/2/2000
116-D-9	CVP-2000-00012	3/23/2001	3/23/2001
105-DR Reactor	CVP02003-00016	12/15/2003	1/15/2004
118-DR-2:2			
100-D-49:4			
117-DR	CVP-2003-00018	1/29/2004	
100-D-23			
100-D-54			
100 H Area			
1607-H2	CVP-2000-00024	2/5/2001	2/2001
1607-H4	CVP-2000-00025	2/26/2001	2/26/2001
116-H-1	CVP-2000-00026	4/4/2001	4/11/2001
116-H-7	CVP-2000-00027	7/24/2001	8/1/2001
100-H-5	CVP-2000-00028	12/21/2000	12/21/2000
100-H-17	CVP-2000-00031	3/6/2001	3/8/2001
116-H-2			
100-H-2			
100-H-30			
100-H-21	CVP-2000-00029	3/29/2001	3/29/2001
100-H-22			
100-H-1			
100-H-24	CVP-2000-00030	5/9/2001	5/2001
116-H-3	CVP-2000-00032	4/3/2001	4/11/2001
100 N Area			
120-N-1 120-N-2 100-N-58	CVP-2001-00021	3/28/2002	4/18/2002
116-N-3	CVP-2002-00002	9/26/2002	12/23/2002
100 Area Misc. & 300 Area			
JA Jones	CVP-2001-00019	11/8/2001	12/10/2001
600-23	CVP-2001-00020	11/30/2001	12/17/2001
300-49 (Landfill 1A)	CVP-2000-00020	1/12/2003	6/9/2003
300-50 (Landfill 1B)	CVP-2000-00021	1/27/2003	6/9/2003
628-4 (Landfill 1D)	CVP-2003-00001	4/10/2003	7/23/2003
316-1(South Process Pond) & 300-262	CVP-2003-00002	4/10/2003	7/23/2003
UPR-300-FF-1, 300 RFBP			
UPR-300-32, 33, 34, 35, 36, & 37			
300 Ashpit	BHI-01132	12/1/1997	12/1/1997
300-44 UPR	BHI-01135	12/1/1997	12/1/1997
316-2 (North Process Pond), 618-12, and UPR-300-7	BHI-01298	8/19/1999	8/19/1999
316-5 (Process Trench)	BHI-01164	3/30/1998	3/30/1998
UPR-300-15, and UPR-300-19			
UPR-300-20 Through UPR-300-30, UPR-300-47, UPR-300-8, and UPR-300-9			

WIDS Site CVP Closeout Summary Table

WIDS Site Closeout	CVP Doc. No. documenting WIDS site closeout	EPA/ Ecology WIDS Signoff	Issue Rev. 0 CVP
300-45	BHI-01136	12/1/1997	12/1/1997
618-4	CVP-2003-00020	1/16/2004	
618-5	CVP-2003-00021	1/29/2004	
100 F Area			
116-F-4	CVP-2001-00006	11/8/2001	11/15/2001
116-F-5	CVP-2001-00007	8/16/2001	8/23/2001
1607-F6	CVP-2001-00010	11/8/2001	11/15/2001
UPR-100-F2	CVP-2001-00011	4/22/2002	5/7/2002
100-F-19:1	CVP-2001-00002	5/21/2002	6/10/2002
100-F-19:3			
100-F-34			
116-F-12			
100-F-40	site closed (No CVP)	2/15/2002	2/15/2002
116-F-14	CVP-2001-00009	7/11/2002	7/18/2002
100-F-2	CVP-2001-00001	7/25/2002	8/5/2002
100-F-15	CVP-2002-00001	7/25/2002	8/6/2002
100-F-4			
100-F-11			
100-F-16			
116-F-9	CVP- 2001-00008	10/16/2002	10/22/2002
116-F-2	CVP- 2001-00005	1/13/2003	3/11/2003
126-F-1	CVP- 2002-00002	1/13/2003	TBD
100-F-35	CVP-2002-00007	4/15/2003	6/16/2003
116-F-1	CVP-2002-00009	5/22/2003	11/3/2003
116-F-3	CVP-2002-00008	4/15/2003	6/16/2003
116-F-6	CVP-2002-00010	5/19/2003	11/3/2003
116-F-10	CVP-2002-00006	4/15/2003	6/16/2003
1607-F2	CVP-2002-00005	1/13/2003	3/11/2003
100-F-19:2	CVP-2001-00003	5/27/2003	9/15/2003
116-F-11			
UPR-100-F-1			
100-F-29			
UPR-100-F-3	CVP-2003-00010	6/9/2003	8/14/2003
100-F-25			
100-F-23	CVP-2003-00011	6/9/2003	8/14/2003
100-F-24	CVP-2003-00012	6/9/2003	8/14/2003
105-F Reactor	CVP-2003-00017	2/12/2004	
100 K Area			
116-K-1 Crib	CVP-2003-00024	2/17/2004	
116-KW-3 Retention Basin	CVP-2003-00023	2/23/2004	
116-KE-1			
116-KW-1			
100-K-29			
100-K-31			
100-K-32			
100-K-33			
128-K-1			

ATTACHMENT 7

Closeout Samples Associated with the Overburden Material of the 1607-B9 Septic System

Close-out Samples Associated with the Overburden Material of the 1607-B9 Septic System

During April 2003, the 100-BC Pipeline Remediation Project remediated five septic system sites within the 100-BC Area. Remediated sites included 1607-B7, 1607-B8, 1607-B9, 1607-B10, and 1607-B11. These sites were "interim closed-out" in accordance to the 100-Area Sampling and Analysis Plan (SAP), DOE/RL-96-22, Rev. 3. However, the overburden material associated with these sites was not sampled and "interim closed-out." The strategy agreed upon between the project and the regulators was to combine all of the overburden piles together into one sample design, and verify the soil as clean separately from the excavations. The surface area of the combined overburden piles consisted of approximately 2,100 square meters. Combining the overburden piles saved the project roughly $70K.

In October 2003, the septic system overburden piles were sampled. The following Contaminants of Potential Concern (COPCs) were used to evaluate the material: Semivolatile Organic Analysis (SVOA), pesticides, Polychlorinated Biphenyl (PCBs), *Resource Conservation and Recovery Act of 1976* (RCRA) metals, lead, and arsenic. Additionally, gross alpha/beta, Gamma Energy Analysis (GEA), hexavalent chromium, and mercury were analyzed as part of the evaluation.

The verification SVOA/ Polycyclic Aromatic Hydrocarbon (PAHs) sample data (Appendix A) indicated elevated results in one sample, J010B8. Within the Sample Design calculation brief, 0100B-CA-V0200, Rev. 0, the sampling location is B8, which is associated with the 1607-B9 site (Appendix B). A comparison of the detected PAHs in the 1607-B9 soil sample to a known asphalt sample (Appendix C) shows a good correlation, as presented with the Ratio column within Table 1. The PAHs in the overburden material are consistent with the chemical composition of asphalt. Based on the results, there is no reason to suspect the PAHs that were detected are anything other than asphalt.

The table below compares the chemical analyses of a known asphalt sample from 100-H Area and the 1607-B9 overburden SVOA sample.

Table 1. Asphalt comparison.

Analyte	Asphalt Sample		Overburden Sample		Ratio
	ug/kg	Q	ug/kg	Q	
Acenaphthene	1,782,521	J	3,300	U	1.85E-03
Phenanthrene	10,975,220		5,200		4.74E-04
Benzo(a)anthrancene	5,792,449	J	5,000		8.63E-04
Fluorene	1,755,609	J	3,300	U	1.88E-03
2-Methylnaphthalene	394,381	J	3,300	U	8.37E-03
Carbazole	2,049,318	J	1,100	J	5.37E-04
Naphthalene	1,916,750	J	3,300	U	1.72E-03
Anthracene	3,698,607	J	560	J	1.51E-04
Benzo(b)fluoranthrene	4,618,607	J	3,400		7.36E-04
Dibenz[a,h]anthracene	1,531,340	J	370	J	2.42E-04
Benzo(a)pyrene	5,532,959	J	2,200	J	3.98E-04
Chrysene	5,579,809	J	6,900		1.24E-03
Fluoranthrene	10,664,890		13,000		1.22E-03
Indeno(1,2,3,-cd)pyrene	2,750,698	J	1,000	J	3.64E-04
Benzo(g, h, i)perylene	2,839,076	J	1,100	J	3.87E-04
Dibenzofuran	1,135,298	J	3,300	U	2.91E-03
Pyrene	10,205,060		8,600		8.43E-04
Benzo(k)fluoranthene	4,526,906	J	3,200	J	7.07E-04
"U" - Undetect					
"J" - Estimated Value					

The likelihood of miscellaneous surface asphalt debris near the 1607-B9 site is high. When reviewing the area's historic photos, it is apparent that numerous supplies and equipment were staged near the site during the construction of C-Reactor (Appendix D). Parking lots and buildings are also observed in the vicinity of the 1607-B9 site. Upon the completion of C-Reactor, the entire area was bladed level. When walking the area today, it is hard not to find a piece of construction debris littered within the surface soil. A walkdown of the site after remediation found pieces of asphalt within the site boundaries and at the bottom of the excavation. Photos are also captured in Appendix D.

According to WAC 173-303-071(3)(e), Excluded Categories of Waste, asphalt is excluded as dangerous waste material (Appendix E).

Based on the comparison presented in Table 1, correlating PAH detections in sample J010B8 to the chemical profile of asphalt, asphalt found at the site, and based on the exclusion of asphalt as a dangerous waste as stated in WAC 173-303-071(3)(e), the project recommends the exclusion of SVOAs as a COPC in the evaluation of soil data from the 100-B/C septic system overburden piles. This recommendation is consistent with the previous asphalt concern at 100-H Area.

Appendix A
1607-B-9 SVOA Overburden Sample Results

Lionville Laboratory, Inc.
Semivolatiles by GC/MS, HSL List   Report Date: 11/06/03 15:47

RFW Batch Number: 0310L839   Client: TNUHANFORD B01-054 H2396   Work Order: 11343606001   Page: 2a

11-10-03 10:15am From-LIONVILLE LABORATORY INCORPORATED 6102803041 T-177 P.04/18 F-825

	Cust ID:	J010B4		J010B5		J010B6		J010B7		J010B8		J010B9	
Sample Information	RFW#:	005		006		007		008		009		010	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		10.0		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	86	%	45	%	59	%	56	%	73	%	71	%
	2-Fluorobiphenyl	86	%	49	%	62	%	58	%	82	%	69	%
	Terphenyl-d14	106	%	65	%	85	%	74	%	85	%	84	%
	Phenol-d5	85	%	48	%	61	%	57	%	78	%	71	%
	2-Fluorophenol	88	%	46	%	61	%	55	%	81	%	72	%
	2,4,6-Tribromophenol	84	%	50	%	62	%	58	%	66	%	61	%
			fl		fl		fl		fl		fl		fl
Phenol		330	U	330	U	330	U	330	U	3300	U	330	U
bis(2-Chloroethyl)ether		330	U	330	U	330	U	330	U	3300	U	330	U
2-Chlorophenol		330	U	330	U	330	U	330	U	3300	U	330	U
1,3-Dichlorobenzene		330	U	330	U	330	U	330	U	3300	U	330	U
1,4-Dichlorobenzene		330	U	330	U	330	U	330	U	3300	U	330	U
1,2-Dichlorobenzene		330	U	330	U	330	U	330	U	3300	U	330	U
2-Methylphenol		330	U	330	U	330	U	330	U	3300	U	330	U
2,2'-oxybis(1-Chloropropane)		330	U	330	U	330	U	330	U	3300	U	330	U
3- and/or 4-Methylphenol		330	U	330	U	330	U	330	U	3300	U	330	U
N-Nitroso-di-n-propylamine		330	U	330	U	330	U	330	U	3300	U	330	U
Hexachloroethane		330	U	330	U	330	U	330	U	3300	U	330	U
Nitrobenzene		330	U	330	U	330	U	330	U	3300	U	330	U
Isophorone		330	U	330	U	330	U	330	U	3300	U	330	U
2-Nitrophenol		330	U	330	U	330	U	330	U	3300	U	330	U
2,4-Dimethylphenol		330	U	330	U	330	U	330	U	3300	U	330	U
bis(2-Chloroethoxy)methane		330	U	330	U	330	U	330	U	3300	U	330	U
2,4-Dichlorophenol		330	U	330	U	330	U	330	U	3300	U	330	U
1,2,4-Trichlorobenzene		330	U	330	U	330	U	330	U	3300	U	330	U
Naphthalene		330	U	330	U	330	U	330	U	3300	U	330	U
4-Chloroaniline		330	U	330	U	330	U	330	U	3300	U	330	U
Hexachlorobutadiene		330	U	330	U	330	U	330	U	3300	U	330	U
4-Chloro-3-methylphenol		330	U	330	U	330	U	330	U	3300	U	330	U
2-Methylnaphthalene		330	U	330	U	330	U	330	U	3300	U	330	U
Hexachlorocyclopentadiene		330	U	330	U	330	U	330	U	3300	U	330	U
2,4,6-Trichlorophenol		330	U	330	U	330	U	330	U	3300	U	330	U
2,4,5-Trichlorophenol		840	U	830	U	830	U	830	U	8300	U	830	U

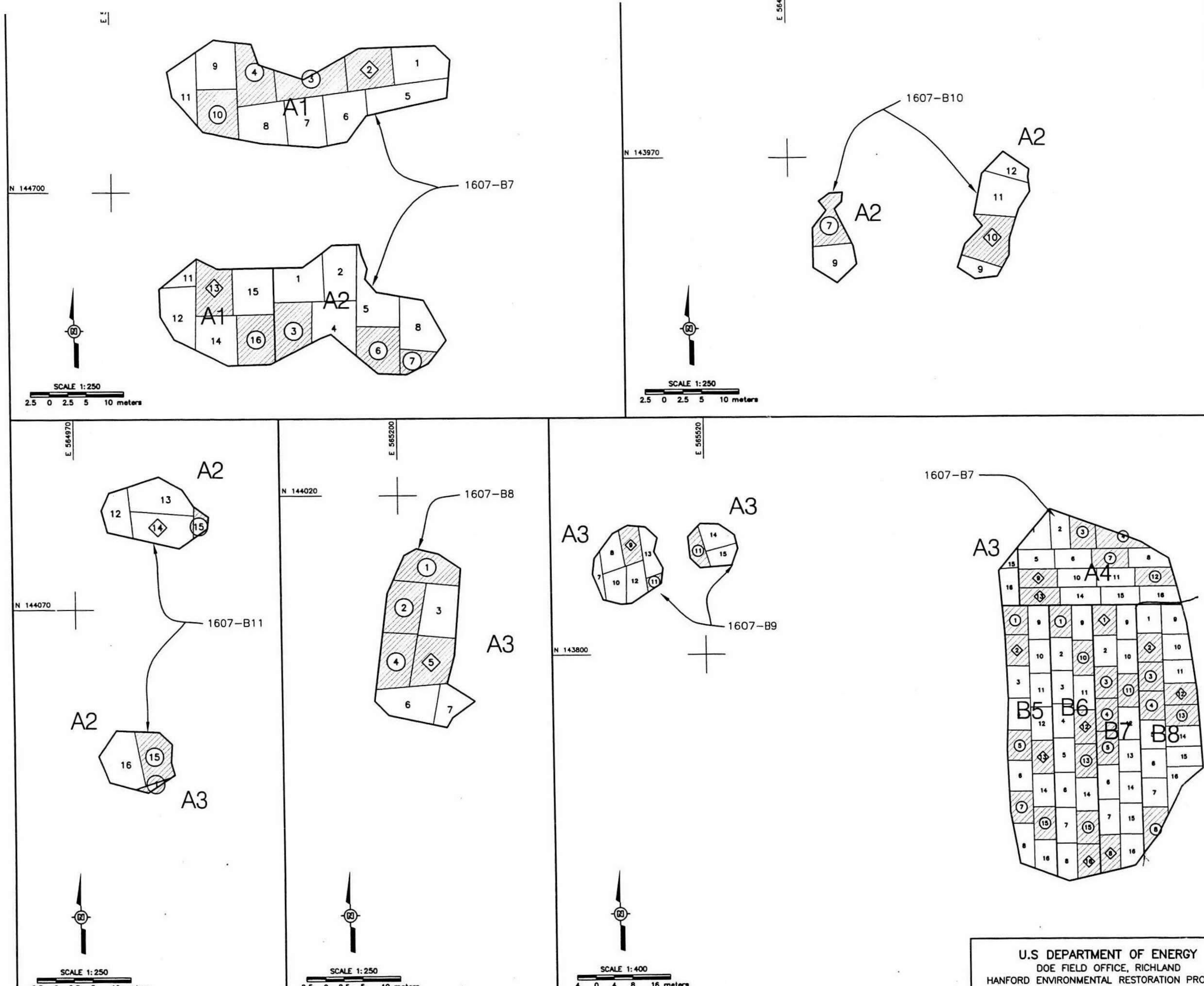
*= Outside of EPA CLP QC limits.

RFW Batch Number: 0310L839 Client: TNUHANFORD B01-054 H2396 Work Order: 11343606001 Page: 2b

Cust ID:	J010B4		J010B5		J010B6		J010B7		J010B8		J010B9	
RFW#:	005		006		007		008		009		010	
2-Chloronaphthalene	330	U	330	U	330	U	330	U	3300	U	330	U
2-Nitroaniline	840	U	830	U	830	U	830	U	8300	U	830	U
Dimethylphthalate	330	U	330	U	330	U	330	U	3300	U	330	U
Acenaphthylene	330	U	330	U	330	U	330	U	3300	U	330	U
2,6-Dinitrotoluene	330	U	330	U	330	U	330	U	3300	U	330	U
3-Nitroaniline	840	U	830	U	830	U	830	U	8300	U	830	U
Acenaphthene	330	U	330	U	330	U	330	U	3300	U	330	U
2,4-Dinitrophenol	840	U	830	U	830	U	830	U	8300	U	830	U
4-Nitrophenol	840	U	830	U	830	U	830	U	8300	U	830	U
Dibenzofuran	330	U	330	U	330	U	330	U	3300	U	330	U
2,4-Dinitrotoluene	330	U	330	U	330	U	330	U	3300	U	330	U
Diethylphthalate	330	U	330	U	330	U	330	U	3300	U	330	U
4-Chlorophenyl-phenylether	330	U	330	U	330	U	330	U	3300	U	330	U
Fluorene	330	U	23	J	330	U	330	U	3300	U	330	U
4-Nitroaniline	840	U	830	U	830	U	830	U	8300	U	830	U
4,6-Dinitro-2-methylphenol	840	U	830	U	830	U	830	U	8300	U	830	U
N-Nitrosodiphenylamine (1)	330	U	330	U	330	U	330	U	3300	U	330	U
4-Bromophenyl-phenylether	330	U	330	U	330	U	330	U	3300	U	330	U
Hexachlorobenzene	330	U	330	U	330	U	330	U	3300	U	330	U
Pentachlorophenol	840	U	830	U	830	U	830	U	8300	U	830	U
Phenanthrene	330	U	500		270	J	110	J	5200		330	U
Anthracene	330	U	100	J	44	J	330	U	560	J	330	U
Carbazole	330	U	86	J	36	J	19	J	1100	J	330	U
Di-n-butylphthalate	330	U	330	U	330	U	330	U	3300	U	52	J
Fluoranthene	38	J	810		290	J	190	J	13000		330	U
Pyrene	29	J	650		200	J	160	J	8600		330	U
Butylbenzylphthalate	330	U	330	U	330	U	330	U	3300	U	330	U
3,3'-Dichlorobenzidine	330	U	330	U	330	U	330	U	3300	U	330	U
Benzo(a)anthracene	22	J	270	J	69	J	87	J	5000		330	U
Chrysene	27	J	280	J	98	J	110	J	6900		330	U
bis(2-Ethylhexyl)phthalate	330	U	330	U	330	U	330	U	3300	U	330	U
Di-n-octyl phthalate	330	U	330	U	330	U	330	U	3300	U	330	U
Benzo(b)fluoranthene	330	U	160	J	44	J	61	J	3400		330	U
Benzo(k)fluoranthene	330	U	140	J	38	J	49	J	3200	J	330	U
Benzo(a)pyrene	330	U	130	J	29	J	44	J	2200	J	330	U
Indeno(1,2,3-cd)pyrene	330	U	44	J	330	U	330	U	1000	J	330	U
Dibenz(a,h)anthracene	330	U	20	J	330	U	330	U	370	J	330	U
Benzo(g,h,i)perylene	330	U	47	J	330	U	330	U	1100	J	330	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Appendix B
Septic System's Overburden Sample Design



1. OVERBURDEN NODE AREAS ARE APPROXIMATELY 32.90 SQUARE METERS.
2. SAMPLES WILL BE TAKEN FROM THE APPROXIMATE CENTER OF EACH NODE.
3. THE OVERBURDEN CONSISTS OF SAMPLING AREAS A1, A2, A3, AND A4 WITHIN DECISION SUBUNIT 1. AREAS B5, B6, B7, AND B8 WITHIN DECISION SUBUNIT 2.

LEGEND

- GAMMA ENERGY ANALYSIS/CLOSEOUT VERIFICATION SAMPLING NODE
- GAMMA ENERGY ANALYSIS SAMPLING NODE

SAMPLE LOCATION TABLE

DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING
1	A1	O–A1–2	144716.17	564874.75
		O–A1–3	144714.93	564866.91
		O–A1–4	144715.87	564859.49
		O–A1–10	144710.29	564854.53
		O–A1–13	144687.35	564853.80
		O–A1–16	144680.43	564859.21
	A2	O–A2–3	144681.56	564864.17
		O–A2–6	144678.94	564875.42
		O–A2–7	144677.51	564879.90
		O–A2–7	143960.96	564755.40
		O–A2–10	143959.34	564777.00
		O–A2–14	144081.00	564981.22
		O–A2–15	144081.11	564986.72
		O–A2–15	144050.51	564980.35
	A3	O–A3–1	144046.91	564980.47
		O–A3–1	144010.38	565203.67
		O–A3–2	144005.02	565200.60
		O–A3–4	143997.82	565199.44
		O–A3–5	143997.71	565204.03
		O–A3–9	143823.44	565504.22
		O–A3–11	143815.56	565509.12
		O–A3–11	143822.12	565518.52
	A4	O–A4–3	143825.74	565600.36
		O–A4–4	143824.81	565608.89
		O–A4–7	143820.12	565606.09
		O–A4–9	143815.87	565590.84
		O–A4–12	143816.13	565615.79
		O–A4–13	143811.97	565591.10
2	B5	O–B5–1	143806.89	565585.78
		O–B5–2	143800.49	565586.06
		O–B5–5	143780.24	565586.39
		O–B5–7	143767.24	565586.59
		O–B5–13	143777.81	565591.28
		O–B5–15	143763.82	565591.51
	B6	O–B6–1	143806.60	565595.43
		O–B6–10	143798.83	565600.13
		O–B6–12	143784.16	565600.34
		O–B6–13	143776.98	565600.45
		O–B6–15	143762.91	565600.65
		O–B6–16	143755.72	565600.73
	B7	O–B7–1	143806.90	565604.63
		O–B7–3	143793.65	565604.87
		O–B7–4	143786.79	565604.95
		O–B7–5	143779.77	565605.03
		O–B7–8	143757.41	565605.28
		O–B7–11	143791.88	565609.62
	B8	O–B8–2	143800.94	565614.41
		O–B8–3	143794.78	565614.53
		O–B8–4	143788.63	565614.65
		O–B8–8	143762.39	565615.16
		O–B8–12	143791.09	565620.91
		O–B8–13	143786.49	565621.00

ATTACHMENT 3

U.S DEPARTMENT OF ENERGY
DOE FIELD OFFICE, RICHLAND
HANFORD ENVIRONMENTAL RESTORATION PROGRAM

100 B/C AREA
1607–B7, B8, B9, B10, & B11
SEPTIC SYSTEM OVERBURDEN

Appendix C
100-H Area Known Asphalt Sample

100 H Area

TAR/Asphalt Sample

SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	86-30-6	N-Nitrosodiphenylamine	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	83-32-9	Acenaphthene	1782521	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	85-68-7	Butylbenzylphthalate	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	85-01-8	Phenanthrene	10975220	ug/kg	

CLASS	SDG_N	SAMP_NU	SAMPLE_LOCATION	SAMP_DATE_TIME	METH	CON_ID	CON_LONG_NAME	VALUE_	ANAL_	LAB
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	84-74-2	Di-n-butylphthalate	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	84-66-2	Diethylphthalate	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	78-59-1	Isophorone	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	77-47-4	Hexachlorocyclopentadiene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	7005-72-3	4-Chlorophenylphenyl ether	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	67-72-1	Hexachloroethane	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	621-64-7	N-Nitroso-di-n-dipropylamine	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	606-20-2	2,6-Dinitrotoluene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	56-55-3	Benzo(a)anthracene	5792449	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	86-73-7	Fluorene	1755609	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	59-50-7	4-Chloro-3-methylphenol	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	91-57-6	2-Methylnaphthalene	394380.9	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	120-82-1	1,2,4-Trichlorobenzene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	98-95-3	Nitrobenzene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	541-73-1	1,3-Dichlorobenzene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	95-57-8	2-Chlorophenol	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	95-50-1	1,2-Dichlorobenzene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	95-48-7	2-Methylphenol (cresol, o-)	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	95-95-4	2,4,5-Trichlorophenol	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	91-58-7	2-Chloronaphthalene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	86-74-8	Carbazole	2049318	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	91-20-3	Naphthalene	1916750	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	88-75-5	2-Nitrophenol	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	88-74-4	2-Nitroaniline	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	88-06-2	2,4,6-Trichlorophenol	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	87-86-5	Pentachlorophenol	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	87-68-3	Hexachlorobutadiene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	91-94-1	3,3'-Dichlorobenzidine	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	106-47-8	4-Chloroaniline	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	121-14-2	2,4-Dinitrotoluene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	117-84-0	Di-n-octylphthalate	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	117-81-7	Bis(2-ethylhexyl) phthalate	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	111-91-1	Bis(2-Chloroethoxy)methane	6600000	ug/kg	U

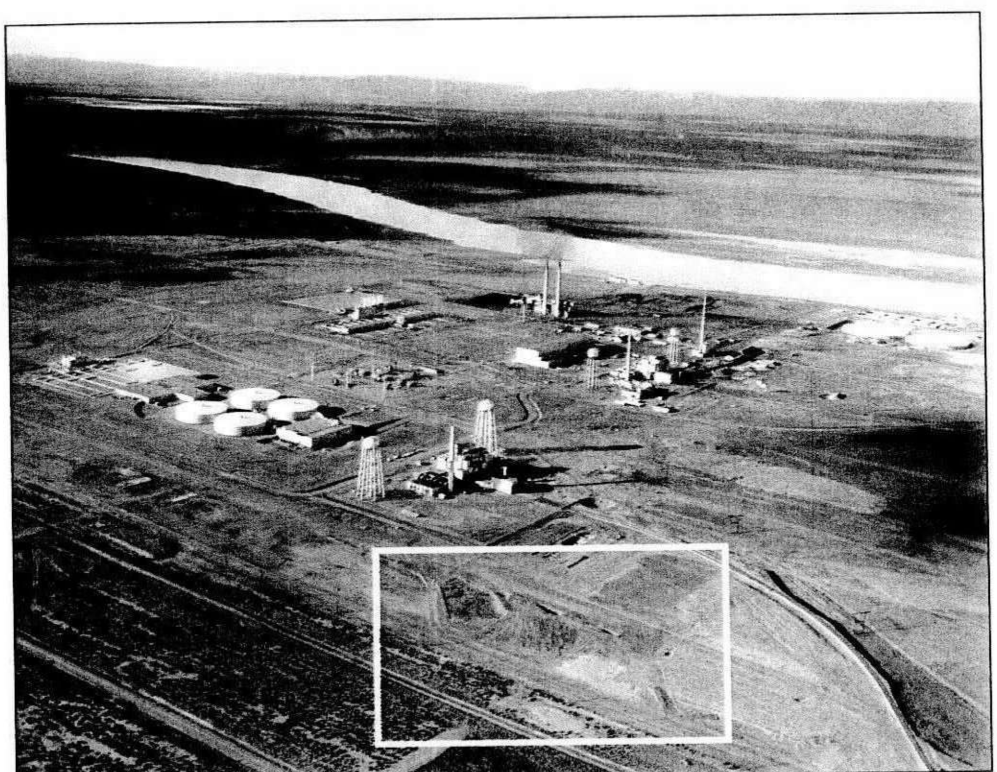
CLASS	SDG_N	SAMP_NU	SAMPLE_LOCATION	SAMP_DATE_TIME	METH	CON_ID	CON_LONG_NAME	VALUE_R	ANAL_	LAB
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	111-44-4	Bis(2-chloroethyl) ether	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	120-12-7	Anthracene	3698607	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	108-60-1	Bis(2-chloro-1-methylethyl)eth	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	99-09-2	3-Nitroaniline	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	106-46-7	1,4-Dichlorobenzene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	106-44-5	4-Methylphenol (cresol, p-)	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	105-67-9	2,4-Dimethylphenol	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	101-55-3	4-Bromophenylphenyl ether	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	100-02-7	4-Nitrophenol	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	100-01-6	4-Nitroaniline	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	108-95-2	Phenol	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	205-99-2	Benzo(b)fluoranthene	4618607	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	53-70-3	Dibenz[a,h]anthracene	1531340	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	51-28-5	2,4-Dinitrophenol	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	50-32-8	Benzo(a)pyrene	5532959	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	218-01-9	Chrysene	5579809	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	208-96-8	Acenaphthylene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	118-74-1	Hexachlorobenzene	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	206-44-0	Fluoranthene	10664890	ug/kg	
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	534-52-1	4,6-Dinitro-2-methylphenol	25000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	193-39-5	Indeno(1,2,3-cd)pyrene	2750698	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	191-24-2	Benzo(ghi)perylene	2839076	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	132-64-9	Dibenzofuran	1135298	ug/kg	J
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	131-11-3	Dimethyl phthalate	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	129-00-0	Pyrene	10205060	ug/kg	
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	120-83-2	2,4-Dichlorophenol	6600000	ug/kg	U
SVOA	H0978	B0YYV9	100-H-21 PIPELINE EB-4	8/9/2000 12:35:00 PM	8270	207-08-9	Benzo(k)fluoranthene	4526906	ug/kg	J

Appendix D
100-BC Area Historic Photos

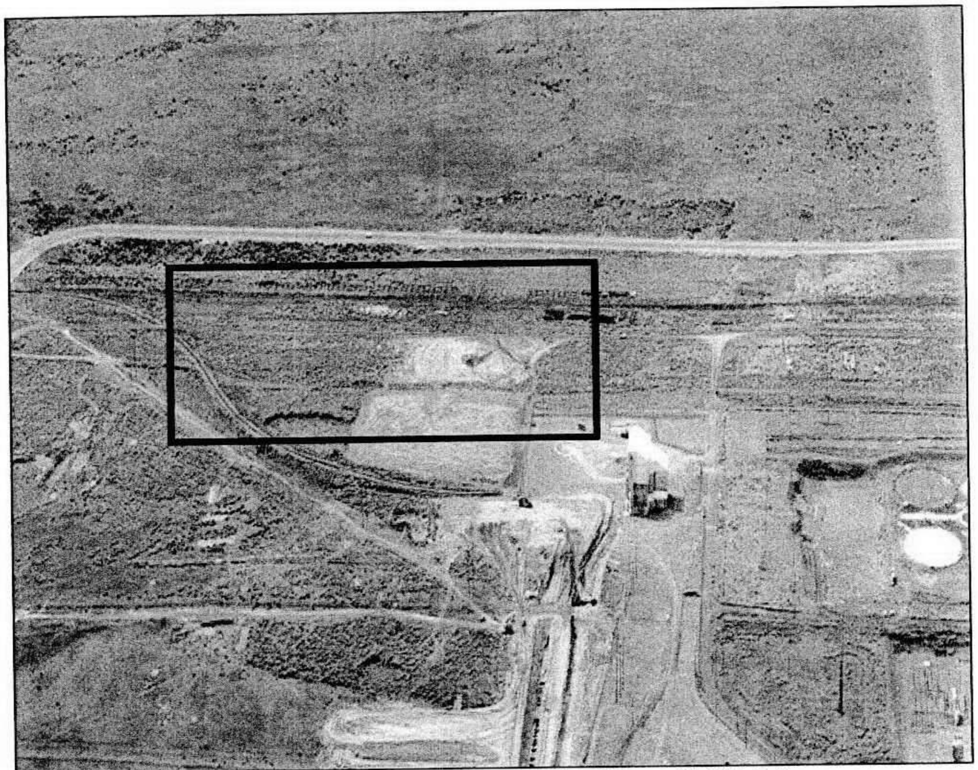
Aerial Photo 1: 100 BC

Aerial Photo 2: 100 BC

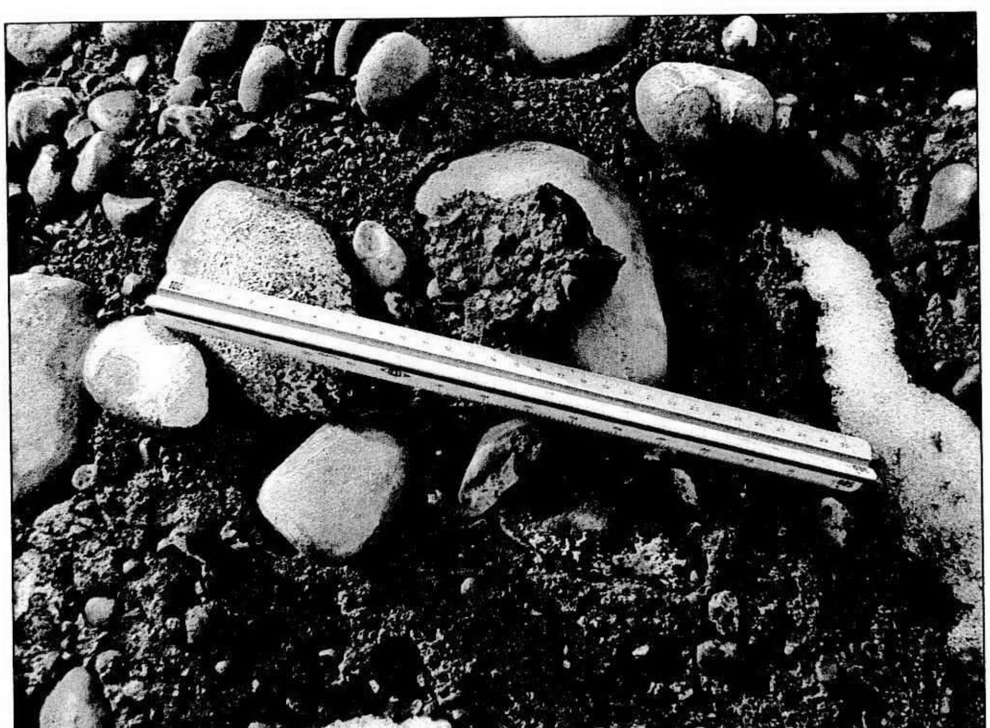
Aerial Photo 3: 100 BC



Aerial Photo 4: 100 BC



Aerial Photo 5: 100 BC Current Condition of 1607-B-9



Excavation Photo 6: Bottom of Excavation at 1607-B9

Overburden Pile Photo 7: Material found on the Overburden Pile

Near Site Photo 8: Discolored Road Surface Material

Appendix E
WAC 173-303-071 Excluded Categories of Waste

[Statutory Authority: Chapters 70.105 and 70.105D RCW. 95-22-008 (Order 94-30), § 173-303-070, filed 10/19/95, effective 11/19/95; 94-01-060 (Order 92-33), § 173-303-070, filed 12/8/93, effective 1/8/94. Statutory Authority: Chapter 70.105 RCW. 93-02-050 (Order 92-32), § 173-303-070, filed 1/5/93, effective 2/5/93. Statutory Authority: Chapters 70.105 and 70.105D RCW, 40 CFR Part 271.3 and RCRA § 3006 (42 U.S.C. 3251). 91-07-005 (Order 90-42), § 173-303-070, filed 3/7/91, effective 4/7/91. Statutory Authority: Chapter 70.105 RCW. 89-02-059 (Order 88-24), § 173-303-070, filed 1/4/89; 87-14-029 (Order DE-87-4), § 173-303-070, filed 6/26/87; 86-12-057 (Order DE-85-10), § 173-303-070, filed 6/3/86; 84-14-031 (Order DE 84-22), § 173-303-070, filed 6/27/84. Statutory Authority: Chapter 70.105 RCW and RCW 70.95.260. 82-05-023 (Order DE 81-33), § 173-303-070, filed 2/10/82.]

WAC 173-303-071 Excluded categories of waste.

(1) Purpose. Certain categories of waste have been excluded from the requirements of chapter 173-303 WAC, except for WAC 173-303-050, because they generally are not dangerous waste, are regulated under other state and federal programs, or are recycled in ways which do not threaten public health or the environment. WAC 173-303-071 describes these excluded categories of waste.

(2) Excluding wastes. Any persons who generate a common class of wastes and who seek to categorically exclude such class of wastes from the requirements of this chapter must comply with the applicable requirements of WAC 173-303-072. No waste class will be excluded if any of the wastes in the class are regulated as hazardous waste under 40 CFR Part 261.

(3) Exclusions. The following categories of waste are excluded from the requirements of chapter 173-303 WAC, except for WAC 173-303-050, 173-303-145, and 173-303-960, and as otherwise specified:

(a)(i) Domestic sewage; and

(ii) Any mixture of domestic sewage and other wastes that passes through a sewer system to a publicly owned treatment works (POTW) for treatment provided:

(A) The generator or owner/operator has obtained a state waste discharge permit issued by the department, a temporary permit obtained pursuant to RCW 90.48.200, or pretreatment permit (or written discharge authorization) from a local sewage utility delegated pretreatment program responsibilities pursuant to RCW 90.48.165;

(B) The waste discharge is specifically authorized in a state waste discharge permit, pretreatment permit or written discharge authorization, or in the case of a temporary permit the waste is accurately described in the permit application;

(C) The waste discharge is not prohibited under 40 CFR Part 403.5; and

(D) The waste prior to mixing with domestic sewage must not exhibit dangerous waste characteristics for ignitability, corrosivity, reactivity, or toxicity as defined in WAC 173-303-090, and must not meet the dangerous waste criteria for toxic dangerous waste or persistent dangerous waste under WAC 173-303-100, unless the waste is treatable in the publicly owned treatment works (POTW) where it will be received. This exclusion does not apply to the generation, treatment, storage, recycling, or other management of dangerous wastes prior to discharge into the sanitary sewage system;

(b) Industrial wastewater discharges that are point-source discharges subject to regulation under Section 402 of the Clean Water Act. This exclusion does not apply to the collection, storage, or treatment of industrial waste-waters prior to discharge, nor to sludges that are generated during industrial wastewater treatment. Owners or operators of certain wastewater treatment facilities managing dangerous wastes may qualify for a permit-by-rule pursuant to WAC 173-303-802(5);

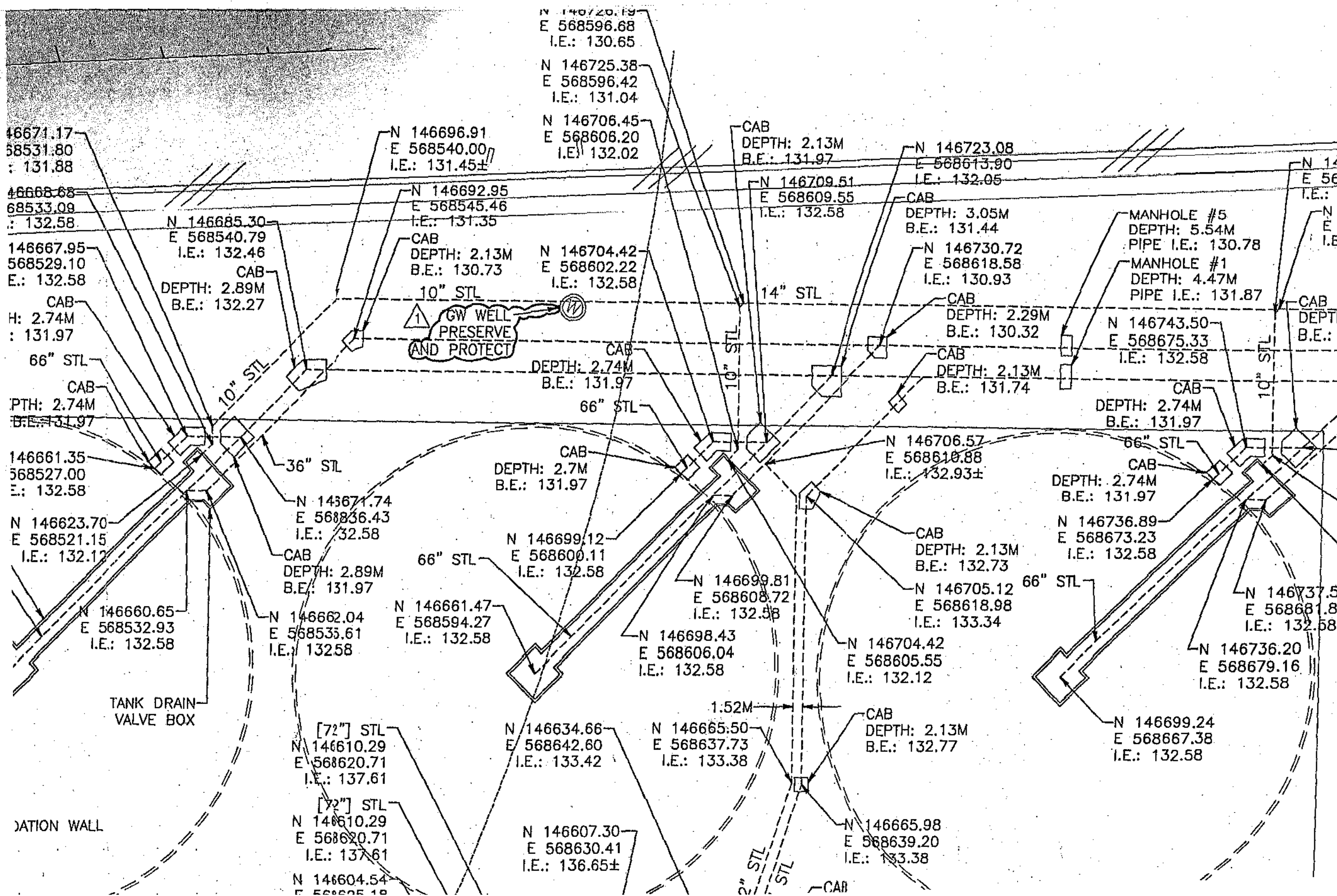
(c) Household wastes, including household waste that has been collected, transported, stored, or disposed. Wastes which are residues from or are generated by the management of household wastes (e.g., leachate, ash from burning of refuse-derived fuel) are not excluded by this provision. "Household wastes" means any waste material (including, but not limited to, garbage, trash, and sanitary wastes in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas);

(d) Agricultural crops and animal manures which are returned to the soil as fertilizers;

(e) Asphaltic materials designated only for the presence of PAHs by WAC 173-303-100(6). For the purposes of this exclusion, asphaltic materials means materials intended and used for structural and construction purposes (e.g., roads, dikes, paving) which are produced from mixtures of oil and sand, gravel, ash or similar substances;

ATTACHMENT 8

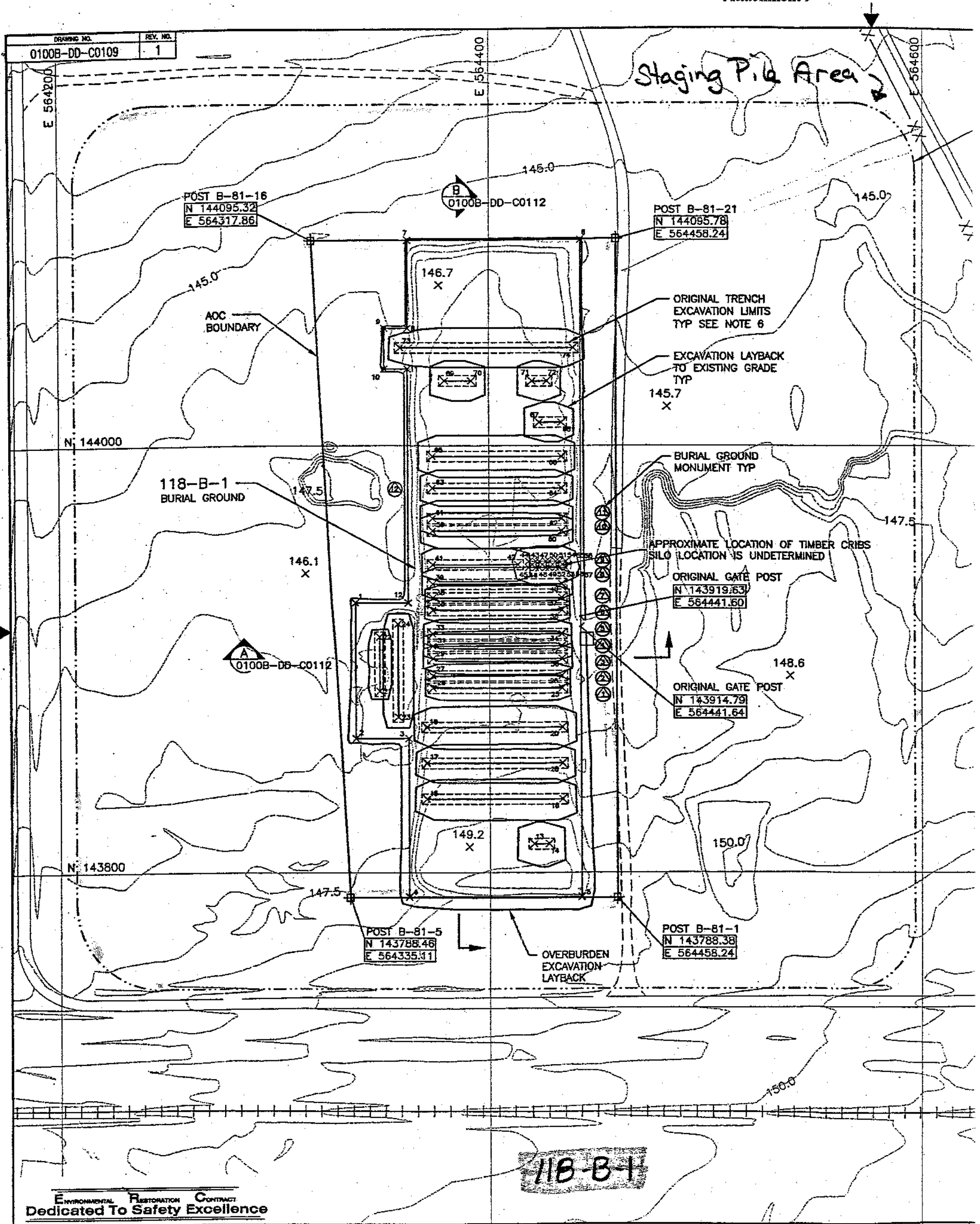
Pipeline Drawing



Attachment 8

ATTACHMENT 9

Map of 188-B-1 Waste Staging Location Map


DRAWING NO.
0100B-DD-C0109
REV. NO.
1
Staging Pile Area
E 564200
E 564400
E 564600
145.0
B
0100B-DD-C0112
POST B-81-16
N 144095.32
E 564317.86
POST B-81-21
N 144095.78
E 564458.24
145.0
146.7
145.0
ORIGINAL TRENCH
EXCAVATION LIMITS
TYP SEE NOTE 6
AOC
BOUNDARY
EXCAVATION LAYBACK
TO EXISTING GRADE
TYP
145.7
N 144000
BURIAL GROUND
MONUMENT TYP
118-B-1
BURIAL GROUND
147.5
147.5
APPROXIMATE LOCATION OF TIMBER CRIBS
SILO LOCATION IS UNDETERMINED
146.1
ORIGINAL GATE POST
N 143919.63
E 564441.60
A
0100B-DD-C0112
148.6
ORIGINAL GATE POST
N 143914.79
E 564441.64
149.2
150.0
N 143800
147.5
POST B-81-5
N 143788.46
E 564335.11
OVERBURDEN
EXCAVATION
LAYBACK
POST B-81-1
N 143788.38
E 564458.24
150.0
118-B-1
Environmental Restoration Contract
Dedicated To Safety Excellence

ATTACHMENT 10

Closure Summary for the 105-DR Sodium Fire Facility

0557012

Proposed Closure Path for the Remaining Portion of the 105-DR / LSFF Exhaust Tunnel

Background

The Large Sodium Fire Facility (LSFF) is a *Resource Conservation and Recovery Act of 1976* (RCRA)-permitted waste treatment, storage, and disposal unit (TSD), which was operated from 1972 to 1986 under RCRA TSD Permit No. T-1-1. The LSFF was used to study the fire and safety aspects associated with sodium and other alkali metal fires for application to liquid metal reactors. The LSFF occupied the former supply/exhaust fan room of the 105-DR Reactor Building and used the 105-DR Reactor Building exhaust system, which includes the 117-DR Filter Building, exhaust tunnels, exhaust stack, exhaust stack sampling building, and exhaust stack sampling building drywell.

To ease management of closure activities, the TSD was divided into seven "subunits." Four of the seven subunits are already closed. These subunits include the exhaust fan room, small fire room, large fire room, sodium handling room, and an office area (122-DR-1:1); the gravel scrubber (122-DR-1:3); the 116-DR-8 Crib and associated piping (122-DR-1:6); and the outdoor storage area (122-DR-1:7). Certification of closure for these LSFF TSD subunits is documented in the *105-DR Large Sodium Fire Facility Soil Sampling Data Evaluation Report* (WHC 1996) and in a Washington State Department of Ecology letter regarding closure certification for 122-DR-1 subunits 1, 3, 6, and 7 (Ecology 1996).

The LSFF Closure Plan deferred the remaining three LSFF TSD subunits (122-DR-1:2, 122-DR-1:4, and 122-DR-1:5) to the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Interim Safe Storage (ISS) process (EPA et al. 1998) for the 105 DR Reactor Building for final closure. These subunits include the 117-DR Exhaust Filter Building (122-DR-1:4), which also includes the downstream (post-filter) tunnel between the filter building and the exhaust stack; the underground exhaust tunnel between the 105-DR Building and the 117-DR Building (100-DR-1:2); and the 116-DR Exhaust Stack (122-DR-1:5).

Status of Remaining LSFF Subunits

As previously stated, the LSFF closure plan deferred the remaining three TSD subunits to the CERCLA process, and directed that the subunits be addressed with the 105-DR Reactor Building for final closure. As such, they were included with other below-grade 105-DR reactor components under CERCLA for ISS.

With the exception of the deep foundation of the exhaust stack (subunit 5), recent decontamination and decommissioning (D&D) activities removed subunits 4 and 5. With regards to subunit 2, the upper exhaust tunnel and approximately the top 3 feet of the lower exhaust tunnel were removed. Before removal of the top portion, the lower exhaust tunnel was sampled for the radionuclides and lead as specified in the 105-DR SAP, and met all applicable remedial action goals, as presented in the 105-DR Cleanup Verification Package (CVP) (DOE-RL 2004).

LSFF Subunit 2 (lower exhaust tunnel)

During a recent review of the CVP for the 2, 4, and 5 LSFF subunits, a question was raised with regards to the potential residual concentrations of the LSFF contaminants of concern (lithium and sodium) in the remaining lower exhaust tunnel. As stated above, the exhaust tunnel verification samples collected during recent D&D activities were analyzed for radionuclides and lead only.

From the *105-DR Large Sodium Fire Facility Closure Plan* (closure plan) (DOE-RL 1995), scale samples from the exhaust tunnel were collected and analyzed for lithium and sodium carbonate in 1987. The 1987 samples were analyzed by Pacific Northwest Laboratories. The 1987 laboratory report is included as an attachment. The sodium carbonate and lithium exhaust tunnel scale concentrations are summarized in Table 1.

Table 1 – 1987 Lower Exhaust Tunnel Scale Sodium and Lithium Analytical Data.

Sample Location	Soluble Alkalinity (as sodium carbonate)	Lithium
	Reported by lab as %	mg/kg
1	57% (570,000 mg/kg)	7,500
2	62% (620,000 mg/kg)	1,600
3	0.2% (2,000 mg/kg)	105
4	63% (630,000 mg/kg)	11,000
5	0.4% (4,000 mg/kg)	2,400
6	67% (670,000 mg/kg)	10,000
7	0.3% (3,000 mg/kg)	2,100

A sample location diagram from the closure plan is also attached. During the 1987 sampling, scale deposits were generally identified only on the floor of the exhaust tunnel in areas where the exhaust changed its flow path. Scale was identified on the floor of the baffle or plenum immediately beneath where the exhaust exited the LSFF burn rooms. Scale was also identified on the floor of the exhaust tunnel immediately below where the exhaust transitioned from the lower tunnel to the former upper tunnel. The floor of the remaining lower exhaust tunnel is approximately 16.5 ft (DOE-RL 2000) below the ground surface.

The Washington State dangerous waste designation criteria for sodium and lithium carbonate are 10,000 mg/kg and 100,000 mg/kg, respectively. The lithium scale concentrations are well below the dangerous waste criteria. When the mass of the concrete is included into the waste matrix, the concentration of lithium drops even further.

The analytical method followed in 1987, would not be the same followed today. The 1987 activity utilized a Soluble Alkalinity test to determine the amount of sodium carbonate present in the plenum. Since the Soluble Alkalinity test does not have the ability to differentiate sodium carbonate from other similar contaminants in the waste matrix, the analytical results are extremely conservative (high). Still, when using the 1987 results from the soluble alkalinity test as an input to the waste calculation, the plenum does not designate as dangerous.

Considering the mass of the remaining concrete and making a conservative assumption that the scale covers the interior portion of the remaining tunnel at a thickness of 0.64 cm (0.25 inch), the resulting concrete-scale waste would not be a dangerous waste. The calculated concrete-scale sodium carbonate concentration is 8,096 mg/kg, which is below the sodium carbonate dangerous waste designation level of 10,000 mg/kg. The scale and exhaust tunnel sodium carbonate calculation is attached. Assuming that the scale covers the interior portions of the remaining tunnel at a thickness of 0.64 cm (0.25 inch) is also very conservative. The 1987 investigation identified scale in localized areas on the floor of the tunnel. Scale was not identified as uniform throughout the interior surfaces of the tunnel.

In addition, the Washington State dangerous waste designation criteria also requires "a person whose waste contains one or more toxic constituents must determine the equivalent concentration for the waste (WAC 173-303-100(5)(b)(ii))." If the result is <.001%, the waste is not a toxic dangerous waste. Using the formula provided in the regulation, the equivalent concentration of the waste equals (=) lithium (1.1%/10,000) + sodium carbonate (.8%/1000) =.0009%. Again, this number is extremely conservative, because the numbers used are "worst case."

Proposed Closure Path for Subunit 2 (lower exhaust tunnel)

Considering the relatively small amount of scale identified in 1987 and the large volume of concrete associated with the tunnel structure, the remaining concrete-scale waste matrix is well below the lithium carbonate and sodium carbonate dangerous waste designation criteria. On this basis, the remaining below-grade exhaust tunnel is acceptable to leave in place and should not require additional sampling or removal to obtain RCRA clean closure.

If there is a desire to remove the plenum, due to the physical constraints, it should be addressed as part of the final ISS decision for the 105-DR Reactor Building. Still, since the exhaust plenum waste matrix is well below the lithium carbonate and sodium carbonate dangerous waste designation criteria, the project should proceed with the RCRA clean closed certification. The cover signature page documents concurrence with this proposed closure path.

Attachments

Attachment 1 – 1987 Analytical Data and Sample Location Diagram for Scale Samples Collected from the Lower Exhaust Tunnel.

Attachment 2 – Sodium Carbonate Scale and Exhaust Tunnel Concentration Calculation

References

DOE-RL 1995, *105-DR Large Sodium Fire Facility Closure Plan,* DOE/RL-90-25, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL 2000, *Sampling and Analysis Plan for the 105-F and 105-DR Phase III Below Grade Structures and Underlying Soils,* DOE/RL-99-35, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL 2004, *Cleanup Verification Package for the 118-DR-2:2, 105-DR Reactor Below-Grade Structures and Underlying Soils, and the 100-D-49:4 Reactor Cooling Water Effluent Underground Pipeline,* CVP-2003-00016, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology 1996, Letter from the Washington State Department of Ecology to the U.S. Department of Energy and Westinghouse Hanford Company, regarding the clean closure certification for Areas 1, 3, 6, and 7 of the 105-DR Large Sodium Fire Facility, CCN 9601918.

EPA, Ecology, and DOE, 1998, "Action Memorandum for the 105-F and 105-DR Reactor Buildings and Ancillary Facilities, Hanford Site, Benton County, Washington," U.S. Environmental Protection Agency Region 10, Washington State Department of Ecology, and U.S. Department of Energy, Richland Operations Office, Richland, Washington.

WHC 1996, *105-DR Large Sodium Fire Facility Closure Activities Evaluation Report,* WHC-SD-EN-EV-034, Rev. 1, Westinghouse Hanford Company, Richland, Washington for the U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Attachment 1

Battelle
Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington U.S.A. 99352
Telephone (509) 376-3564
Telex 15-2874

August 18, 1987

7 Seal Pit sludge
6 Tunnel Dead end
5 Tunnel Near Batch Tank Room
4 Batch Tank entry chamber floor
3 Water Pool in Lead Tunnel
2 Small Fire Room entry chamber ([illegible])
1 Animal Room " "

John Biglin
W/221T
Westinghouse Hanford Company
P. O. Box 1970
Richland, WA 99352

Dear Mr. Biglin:

ANALYSIS OF CLEANUP RESIDUES

All materials had been exposed to air long enough prior to sampling that any hydroxide had reacted with carbon dioxide of the air to form carbonate.

pH of 0.1% Solution:

1 = 10.1, 2 = 10.2, 3 = 9.5, 4 = 10.1, 5 = 10.1, 6 = 10.0, 7 = 9.4

Soluble Alkalinity (as sodium carbonate)

1 = 57%, 2 = 62%, 3 = 0.2%, 4 = 63%, 5 = 0.4% (scrape), 6 = 67%, 7 = 0.3% (sludge)

Total Lead (ppm)

1 = 125, 2 = 60, 3 = <0.5, 4 = 40, 5 = 1300 (scrape), 6 = 35, 7 = 780

Total Lithium (ppm)

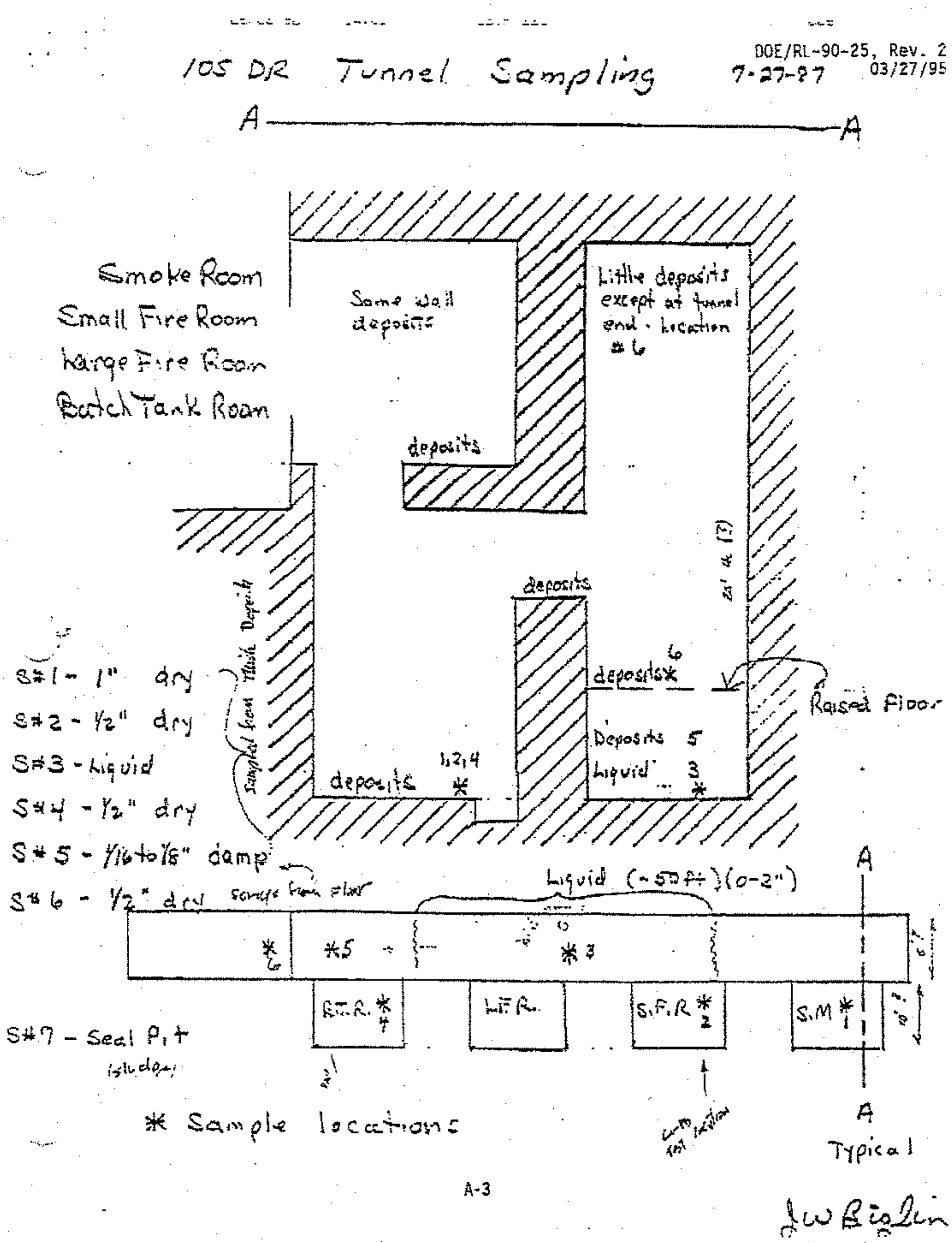
1 = 7500, 2 = 1600, 3 = 105, 4 = 11000, 5 = 2400, 6 = 10000, 7 = 2100

Very truly yours,

Bob Keough
R. F. Keough

RFK/tts

Attachment 1: Sample Location Diagram



Attachment 2

Exhaust Tunnel Sodium Carbonate Concentration

Remaining Tunnel Components	Quantity	Surface Area Dimensions			Volume Dimensions			Surface Area		Volume		Concrete Mass	Contaminated Concrete Mass	Sodium Carbonate Mass
		Surfaces	Length (ft)	Width (ft)	Length (ft)	Width (ft)	Depth (ft)	(ft^2)	(m^2)	(ft^3)	(m^3)	(kg)	(kg)	(kg)
316 East/West Walls	3	3	84.75	13.5	86.25	15	1.5	3432.4	318.9	5821.9	164.9	396171.1	4865.3	3259.8
316 South Wall	1	1	5	13.5	5	15	1.5	67.5	6.3	112.5	3.2	7655.5	95.7	64.1
316 Slab	1	1	84.75	5	84.75	5	1.5	423.8	39.4	635.6	18.0	43253.5	600.7	402.4
315 East/West Walls	8	8	10	13.5	11.5	15	1.5	1080.0	100.3	2070.0	58.6	140860.8	1530.9	1025.7
315 Stem Walls	4	4	16.5	9.25	7.5	9.25	1.5	610.5	56.7	416.3	11.8	28325.3	865.4	579.8
315 Slab	1	0.5	84.75	11.5	84.75	11.5	1.5	487.3	45.3	1461.9	41.4	99483.0	690.8	462.8
Totals								**6101.4**	**566.8**	**10518.2**	**297.9**	**715749.1**	**8648.7**	**5794.6**

Assumptions -

- Concrete density = 2402.8 kg/m^3
- Thickness of surface contaminated concrete = 0.635 cm
- Sodium carbonate concentration = 670,000 mg/kg Concentrations ranged from 2,000 mg/kg to 670,000 mg/kg.
- Reference drawings: HW72035, HW72036, HW72037

Exhaust Tunnel Concrete Sodium Carbonate concentration = $\frac{\text{Sodium Carbonate Mass}}{\text{Concrete Mass}}$ = **8,096 mg/kg**

CONCURRENCE PAGE

Title: Proposed Closure Path for the Remaining Portion of the 105-DR / LSFF Exhaust Tunnel

Concurrence: U.S. Department of Energy, Richland Operations Office

[signature] 1/26/04

Signature Date

Washington State Department of Ecology

[signature: Frederick A. Ford] 1-26-04

Signature Date

ATTACHMENT 11

Ecology Approval Email for 100-N Ancillary Facilities RAWP

Golden, James W

From: Bond, Rick (ECY) [FBON461@ECY.WA.GOV]
Sent: Monday, February 09, 2004 12:26 PM
To: 'Golden, James W'
Subject: RE: Change to table 1-2 of the N RAWP.

Jim,
You have approval from Ecology to make the change to Table 1-2 in the RAWP.

Rick Bond
Facilities Transition Project Manager
Washington State Department of Ecology
(509) 736-3007

-----Original Message-----
From: Golden, James W [<mailto:jwgolden@mail.bhi-erc.com>]
Sent: Friday, February 06, 2004 8:50 AM
To: Bond, Rick (ECY)
Cc: Golden, James W; Smith, Douglas C (Chris)
Subject: Change to table 1-2 of the N RAWP.

Rick:

I'd like to change the status of building number 1714NA, identified on line #98 in Table 1-2 of the Removal Action Work Plan (RAWP) for 100 N Facilities. I'd like to change the status in the "Included for D&D" column to yes.

The process for making changes to the table is outlined in section 1.3.1.2, of the RAWP for 100 N Facilities. Per the process, a copy of your return email documenting agreement with this change will be documented/ included in the Unit Managers Meeting. The table (1-2) of the RAWP will be revised to include this change, the next time the document is revised.

Please respond via email your approval for the change.

Also, here is the list of facilities I'm fairly certain we will be D&Ding in FY04. The only facility not currently showing a "yes" in the Included for D&D" column in Table 1-2 of the Removal Action Work Plan (RAWP) for 100 N Facilities is 1714NA.

- 11N
- 13N
- 1712N
- 1714N
- 1714NA
- 1714NB

Thanks in advance,
Jim

ATTACHMENT 12

Ecology Approval Email to Move Waste to the 1330-N Waste Pad

Golden, James W

From: Golden, James W
Sent: Tuesday, January 13, 2004 11:48 AM
To: Bond, Rick
Subject: RE: Approval to move waste to the 1330N pad

Thanks Rick!

-----Original Message-----
From: Bond, Rick (ECY) [mailto:FBON461@ECY.WA.GOV]
Sent: Tuesday, January 13, 2004 8:54 AM
To: 'Golden, James W'
Cc: Nielson, Robert R; Faulk, Dennis A
Subject: RE: Approval to move waste to the 1330N pad

Jim,
Ecology approves moving the waste drums to the 1330N pad/facility as described below.

Rick Bond
Facilities Transition Project Manager
Washington State Department of Ecology
(509) 736-3007

-----Original Message-----
From: Golden, James W [<mailto:jwgolden@mail.bhi-erc.com>]
Sent: Monday, January 12, 2004 1:36 PM
To: Bond, Rick (ECY)
Cc: Nielson, Robert R; Faulk, Dennis A; Golden, James W
Subject: Approval to move waste to the 1330N pad

Rick:

Per our conversation yesterday....Robert Nielson had discussions with Dennis Faulk, with regards to adding the 1330N pad/ facility as part of the CERCLA onsite area for the F, D, DR and H Reactors and Ancillary Facilities. Dennis said he was in agreement with considering the 1330N pad as part of the reactor(s) on site, but would limit his approval to a "case by case basis."

Since D and H are Ecology lead sites, we need your approval to move a specific population of waste drums to the 1330N pad/facility. The approval will be limited to the 4 drums of mixed waste currently being managed at D and 6 drums of mixed waste currently being managed at H. The drums are destined to be shipped to the CWC, but would make a stop at the 1330N pad/ facility for final package preparation, weighing, and storage, until they are approved for shipment to the CWC.

Allowing the 1330N pad/ facility to be considered as part of the CERCLA onsite area for this activity, will allow for some centralization of waste container management activities amongst the Reactors and Ancillary Facilities. Any CERCLA waste placed at the 1330N pad/ facility, will be clearly identified as such.

Please call if you have any questions,

Jim

373-0089

ATTACHMENT 13

Groundwater Activities

100 AREA UMM – February 2004
Groundwater Remedial Actions

Groundwater operations and related highlights for the period of 5 January through 15 February are summarized as follows:

100-NR-2

- The pump and treat system operated normally during the report period. Average flow rate was 64 gpm.

- Interviews for the DQO to determine additional data needs for determining aquatic and riparian impacts continued.

- Initial laboratory scoping results (PNNL) to determine the feasibility of in situ formation of calcium phosphate to sequester strontium-90 using Hanford aquifer sediments were favorable.

100-KR-4

- After recovery from the weather related shutdown in January, the system operated normally during the remainder of the report period. Average operating flow rate during the report period was 227 gpm.

- Installation work at six new aquifer tubes locations was completed. Maximum hexavalent chromium concentrations in the 30 to 40 ppb range (specific conductance 370 to 490 uS/cm) were observed at the most distant downstream locations during development pumping of the tubes.

- Based on the new tube results, the location for a new monitoring well was chosen near the northeast corner of the 100 N fenceline. The location was staked and cultural review scheduled for early March. Drilling is planned for spring or early summer.

- Hexavalent chromium and specific conductance results for the January monthly sample from well K-130 were 86 ppb and 328 uS/cm, respectively.

- The pump in well K-126 will be lowered by 5 ft to determine the maximum sustainable pumping rate. This work is part of a feasibility study to increase the extraction rate of the system from 260 gpm to the maximum design capacity of 300 gpm to enhance the capture zone at the northeastern end of the KR-4 chromium plume.

- The Technical Assistance grant noted above will also be used to review the overall performance and long-term strategy for addressing the widespread KR-4 chromium plume. The focus group will meet at Hanford for this topic in May or June 2004.

100-HR-3

- The HR-3 pump and treat system operated normally from January 20 through the end of the report period (The system was shutdown for most of January due to a combination of scheduled maintenance, power outages and frozen water lines). Average operating flow rate during report period was 173 gpm.

- ISRM:

  - Monthly operational data continue to suggest a loss of reducing capacity in some of the injection wells.

  - A Technical Assistance grant to address ISRM and pump and treat performance issues was approved by the DOE Office of Science and Technology. As a result, an ISRM focus group will meet at Hanford this March 2, 3 and 4th to review existing conditions and make recommendations.

  - The ISRM annual and quarterly reports and a revised sampling and analysis plan are going through the review/approval process.

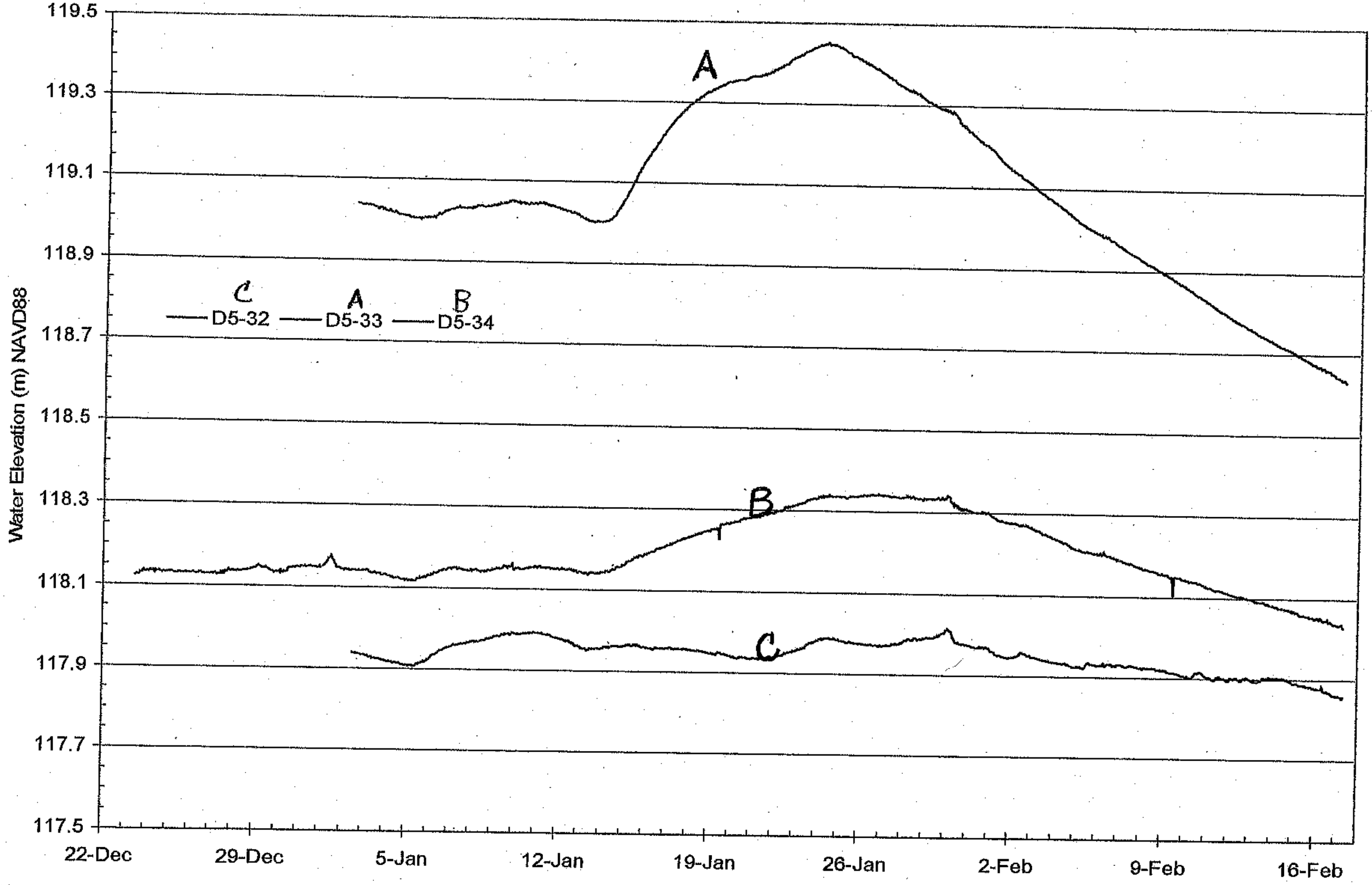
  - Preparations for installation of the first phase of the ISRM extension continued. The drilling bid package was completed and drilling is expected to begin in March. Grading and pad prep work is planned for early March.

- Cutting and capping work on the pressurized water lines covering the D Area was completed. Approximately 75% of the lines were isolated which should greatly reduce the potential driving force for mobilizing residual hexavalent chromium in the soil column.

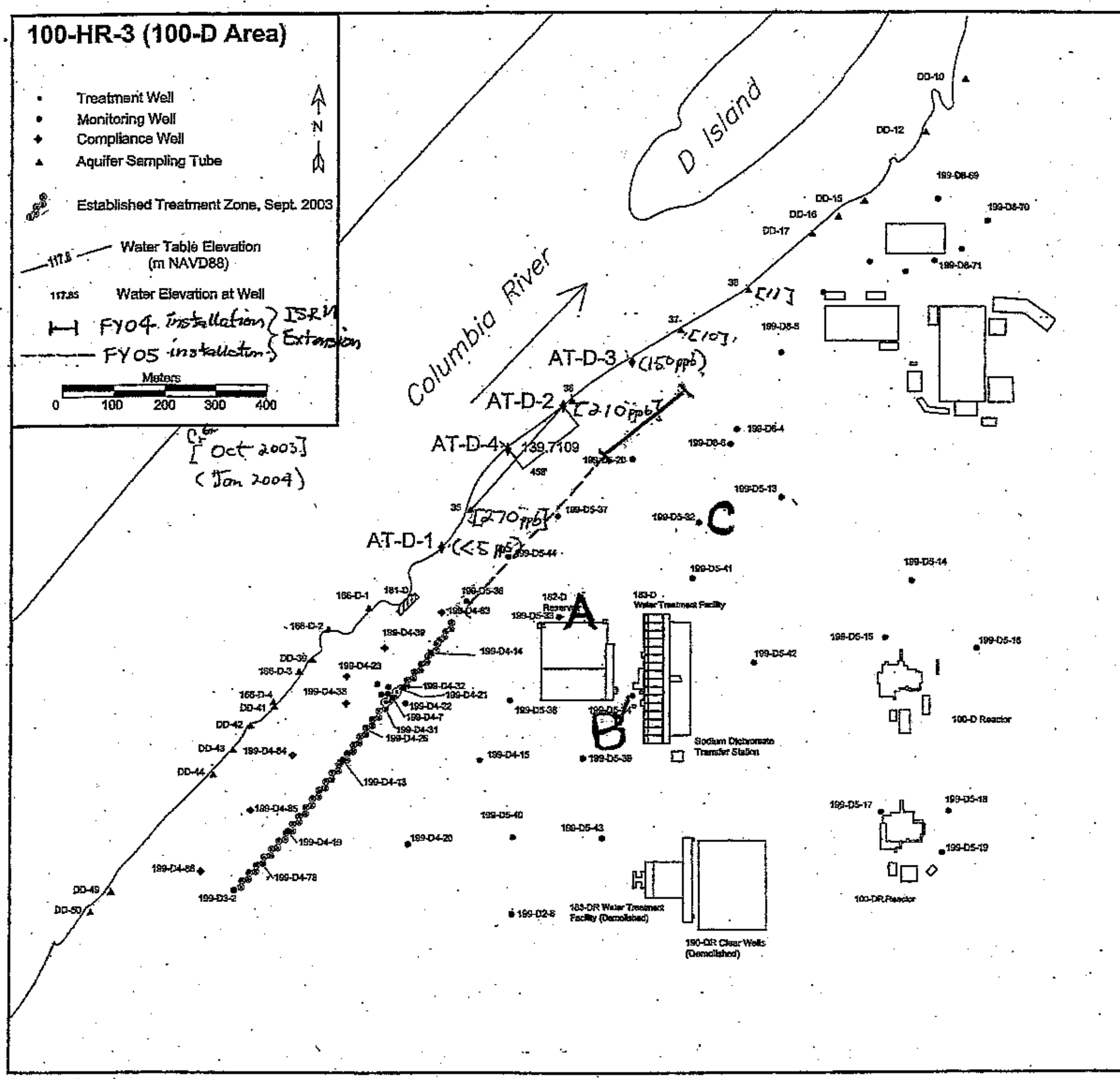
- BHI is preparing a plan to explore suspect source areas.

- Continuous monitoring of water levels (Attachment) in the new wells near the 182 D reservoir confirms a suspected major leak that appears to be located at the north end of the reservoir. The mound created by the leak is changing groundwater flow directions in that area.

182-D area Water level monitoring



Attachment 13



100-HR-3 (100-D Area)
Treatment Well
Monitoring Well
Compliance Well
Aquifer Sampling Tube
Established Treatment Zone, Sept. 2003
Water Table Elevation (m NAVD88)
Water Elevation at Well
FY04 installation
FY05 installation
ISRM Extension
Meters
0 100 200 300 400
N
D Island
Columbia River
AT-D-3
AT-D-2
AT-D-4
AT-D-1
A
B
C
100-D Reactor
100-DR Reactor
Sodium Dichromate Transfer Station

ATTACHMENT 14

K Basin Groundwater Activities

100-K Area Spent Nuclear Fuels Project (K Basins) Groundwater Monitoring
(Monitoring Plan is PNNL-14033, September 2002)

☞ *The information contained in this periodic report represents an initial interpretation of monitoring results by a PNNL Groundwater Monitoring Project scientist. Subsequent new results and facility information may warrant changes to these initial interpretations.*

Synopsis of Current Conditions and Key Issues:

- Sampling and Analysis Activities: The most recent analytical results are available for the regularly scheduled groundwater sampling event that occurred between October 16 and November 13, 2003. Additional samples were collected from wells where recent increases in tritium were observed, and were analyzed on a rapid turnaround basis to better monitor these trends. Aquifer sampling tubes at two sites along the river adjacent to the reactors were sampled on December 18, 2003. A riverbank spring (SK-063), located immediately downstream of the KW pumphouse, was sampled in October 2003.
  - The next regularly scheduled sampling event will occur during the third week of January 2004, with results are expected by mid-March. Wells that are nearest the K Basins are on a quarterly monitoring schedule.
  - Two new sites along the shoreline downgradient of the KE and KW reactors were equipped with aquifer sampling tubes in early January 2004, thus providing very good coverage of the aquifer near the river.

- Monitoring for Shielding Water Loss: There are no conclusive indications that tritium levels in groundwater at wells adjacent to the KE and KW fuel storage basins indicate recent loss of shielding water to the ground (tritium is a key indicator for shielding water).
  - KE Basin: Recent results for two wells near the KE Basin do not follow historical trends. An abrupt increase in tritium concentrations started in January 2003 and concentrations remain elevated. There is no information to date from facility operations that indicates an abnormal loss rate, so other past-practices waste sites are assumed to be the source.

- Groundwater Contamination from Past Basin Leaks and Other Sources: Tritium in groundwater downgradient of the KE and KW reactors comes from multiple sources, including liquid effluent disposal to waste facilities during the reactor operating years (1955-1971) and past leakage from the KE Basin (1976-79; 1993).
  - KE and KW Condensate Cribs: Groundwater plumes containing tritium and carbon-14 extend downgradient from these past-practices waste sites, which are located on the east side of each reactor building. Excavation of these cribs started in December 2003 and is expected to be completed in February 2004.
  - KW Condensate Crib: Tritium, nitrate, and groundwater temperature at a monitoring well downgradient of the KW crib increased sharply starting January 2003, with no cause yet identified. Concentrations are now declining from peak values observed in mid-2003.
  - KE and KW Basin Drain Fields: The vadose zone beneath the drain fields/injection wells associated with each basin's sub-basin drainage collection system is believed to contain contaminants from past disposal during the operating years. Infiltration of water from the surface may remobilize this contamination and impact groundwater.
  - KE Basin, Plume from 1993 Leak: The tritium plume created by the 1993 construction joint leak has migrated downgradient to and beyond a well located mid-way between the

basin and the river. The plume is expected to arrive at the river shoreline in 10-12 years; new aquifer sampling tubes have been installed to monitor the plume's arrival.

- 100-K Burial Ground: Tritium concentrations in groundwater at a well near the burial ground increased rapidly starting in mid-January 2000, peaked during 2001/2002 at ~100,000 pCi/L, and are currently declining. The well is not in the direct downgradient flow path from known sources for tritium (such as the KE Basin and KE Condensate Crib), thus suggesting a previously unmapped plume located east of the KE reactor complex. Source for the tritium is believed to involve tritium release from materials in the burial ground.

Other 100-K Area News…

- The 100-K Section of the annual groundwater report has been completed (PNNL-14548, Section 2.3). The report (PNNL-14548, Section 2.3) will be released by the end of February 2004.
- Source remedial action excavation activities continue in the vicinity of the KE and KW reactors.
  - The 107-KW Retention Basins (116-KW-3 waste site) tank bottoms and associated contaminated soils have been removed, along with the feeder pipes that lead to the 100-K Trench. These activities necessitated the removal of well 199-K-33 in June 2003. Planning for a replacement well is in progress.
  - The KE and KW Condensate Cribs have been excavated and backfilled as of late February 2004, thus removing a potential source for continued input of tritium and carbon-14 to groundwater.

Figure 1. Tritium in Groundwater Near the KE Reactor Building

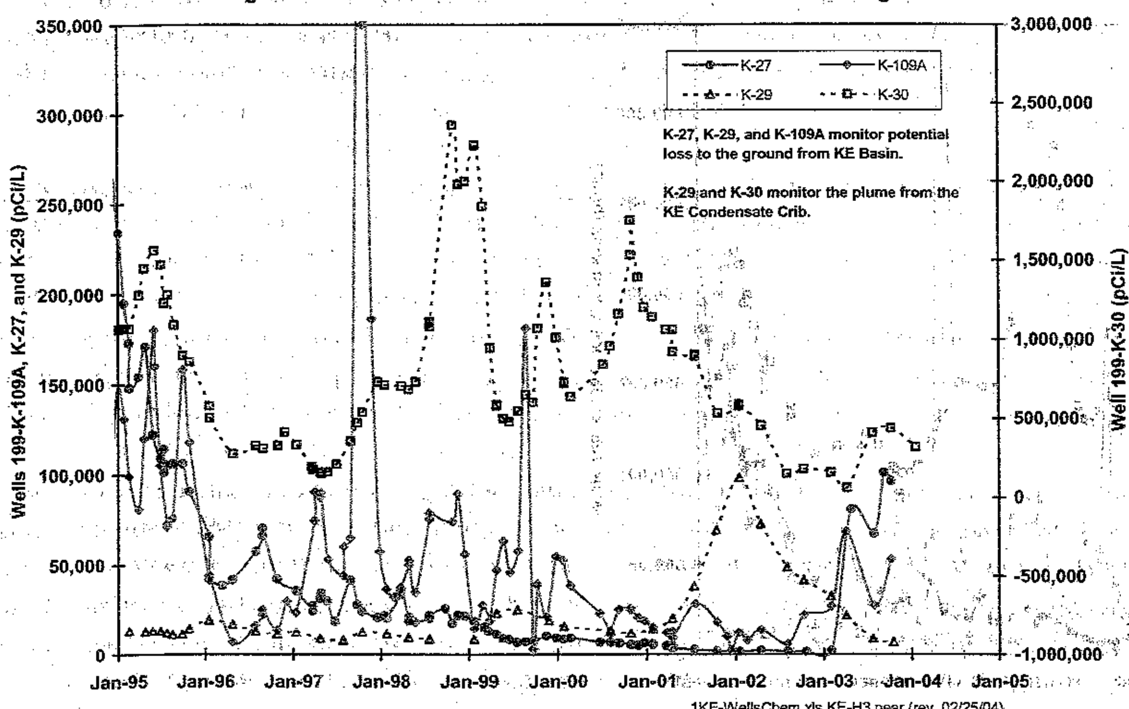
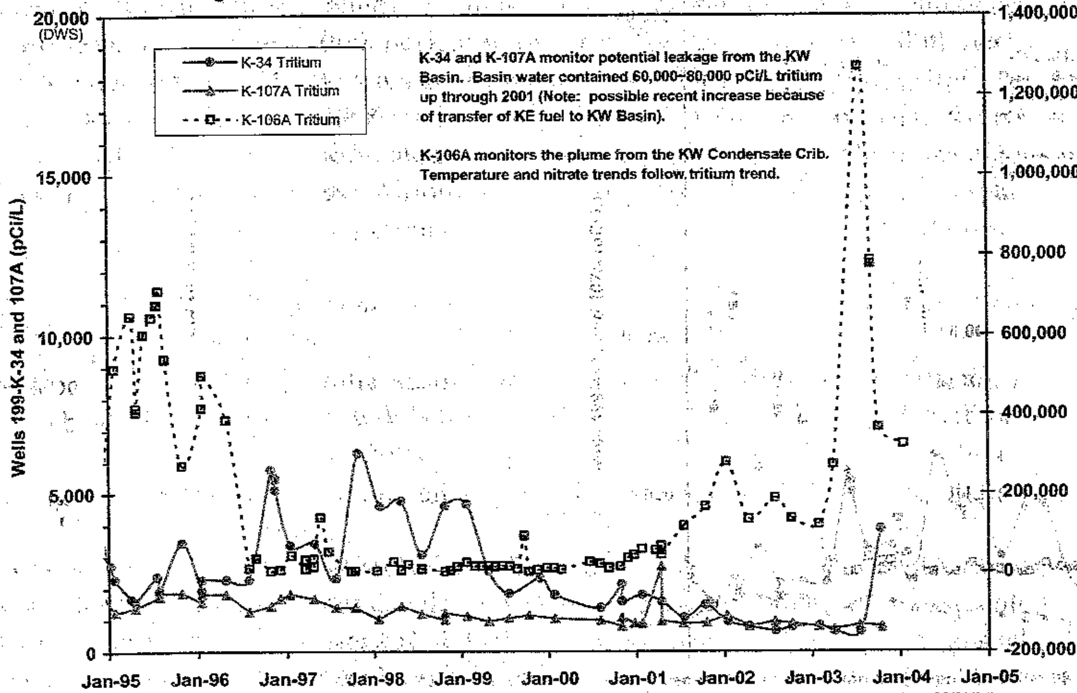
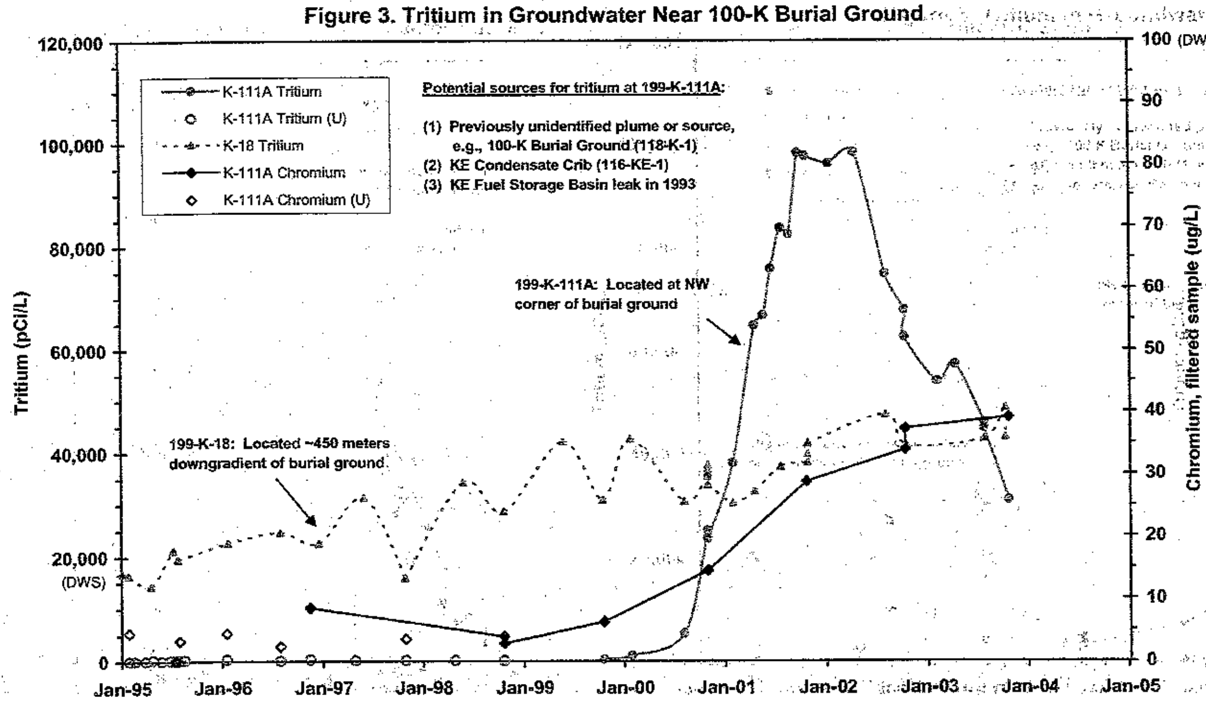


Figure 2. Tritium in Groundwater Near the KW Reactor Building



1KW-WellsChem.xls KW-H3 near (rev. 02/25/04)

Figure 3. Tritium in Groundwater Near 100-K Burial Ground



1KE-WellsChem.xls (02/25/04)

ATTACHMENT 15

100-FR-3 Trend Plots

Sampling frequency for 100-FR-3 aquifer tubes

Summary:

The sampling and analysis plan (DOE/RL-2003-49) calls for annual or biennial sampling of wells. Frequency for all the aquifer tubes is quarterly for one year for hexavalent chromium. Four tube sites (3 existing, one planned), are scheduled quarterly for strontium-90. The rationale for quarterly sampling is to evaluate whether there is seasonal variation in contaminant concentrations.

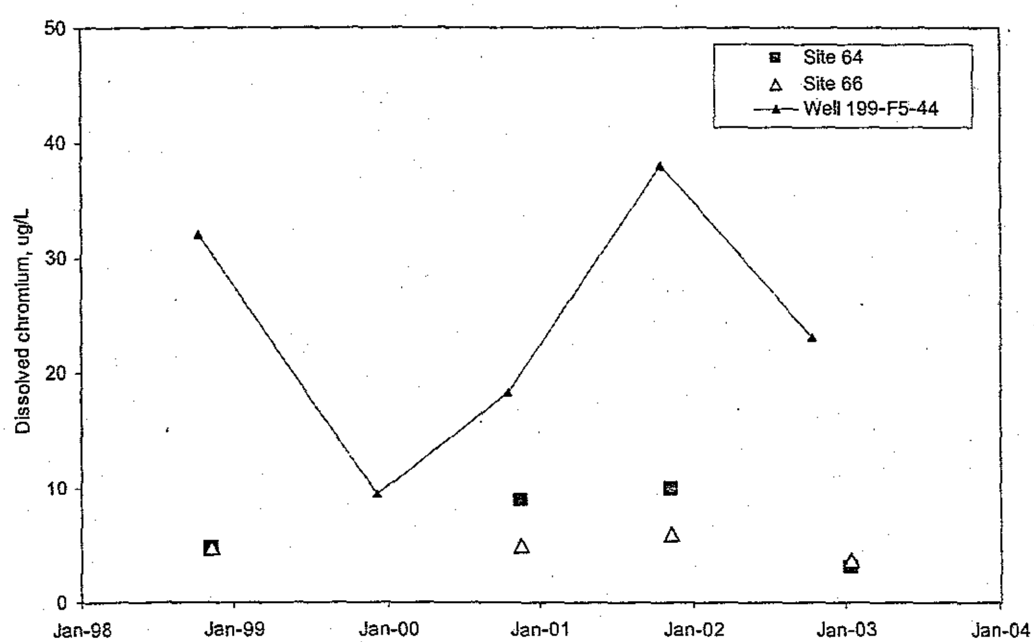
We don't have data to evaluate seasonal variability in aquifer tubes directly. Near-river well 199-F5-44 shows an inverse relationship between contaminant concentration and water level.

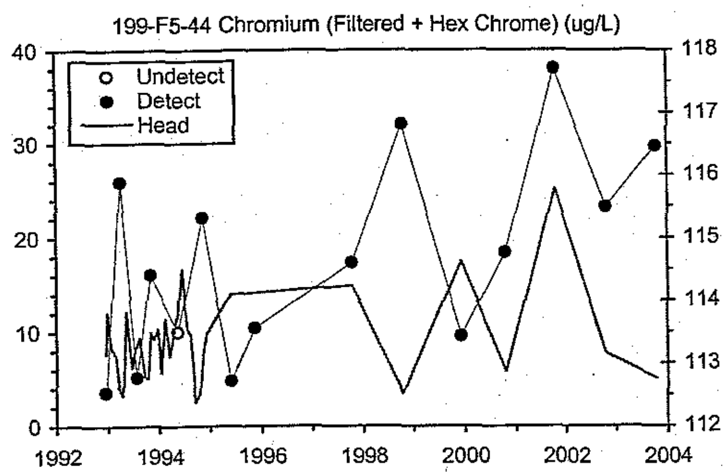
Quarterly sampling of all the aquifer tubes probably is not necessary to evaluate variability. The aquifer tubes typically have chromium concentrations less than the 11 ug/L aquatic standard during fall/winter sampling events. Based on data from nearby wells, we would expect the highest contaminant concentrations during periods of low river stage (i.e., fall/winter). Thus, annual sampling during low river stage should be sufficient. An alternative is to sample a selected few aquifer tubes quarterly for one year if conditions permit. Sites 64, 65, and 66 are good candidates because they are located near the most contaminated area of the aquifer and were successfully sampled last year.

Contaminant Trends

Near-river wells and aquifer tubes

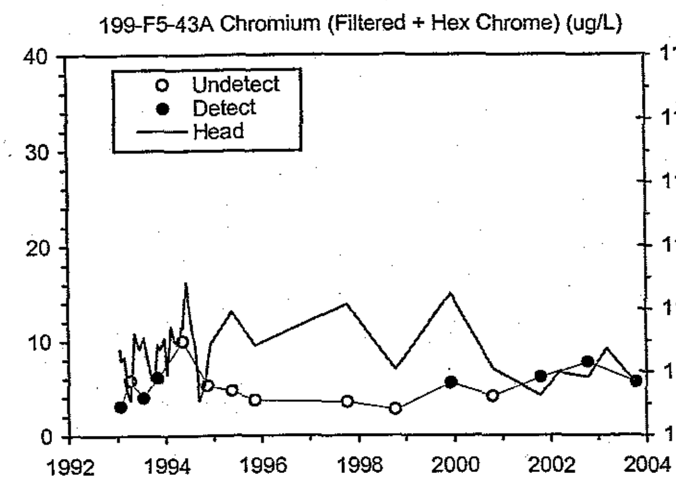
The figure below shows dissolved chromium concentrations in two aquifer tube sites in the 100-F Area and in a nearby monitoring well (figure from PNNL-14444). Note that all the samples were collected between October and January of each year, representing low river stage. Chromium concentrations in aquifer tubes are approximately one-fourth to one-half the concentrations in the monitoring well.

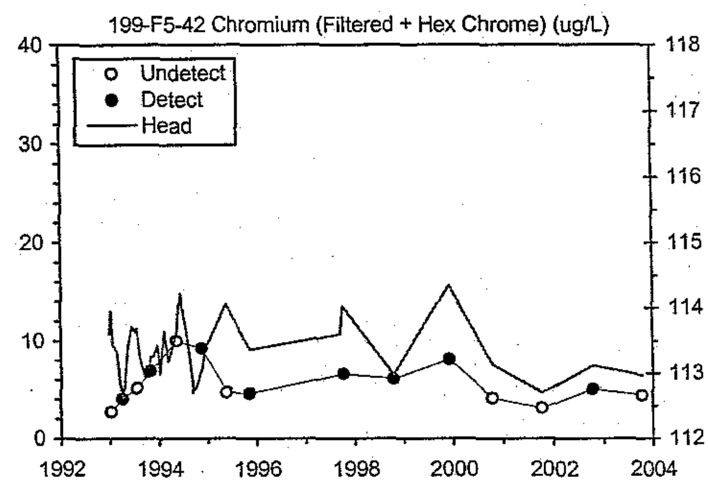


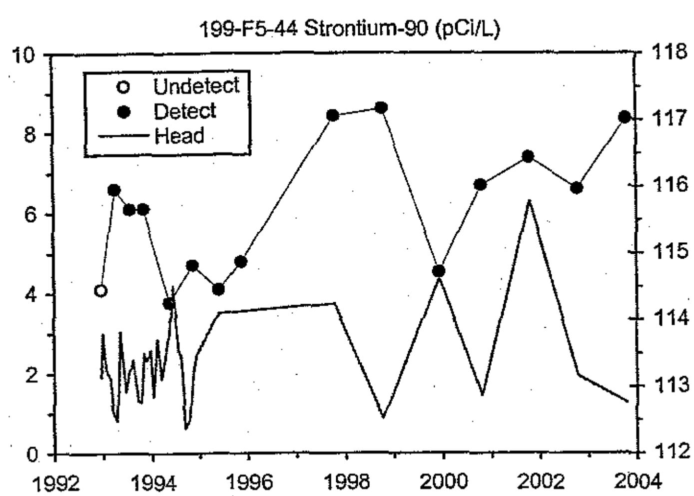


Several of the near-river wells were sampled quarterly during their first year and semiannually for the next two years. Well 199-F5-44 appears to show an inverse relationship between water level and chromium concentration. (the high water level in late 2001 may be an error; we don't see similar spikes in water levels in nearby wells).

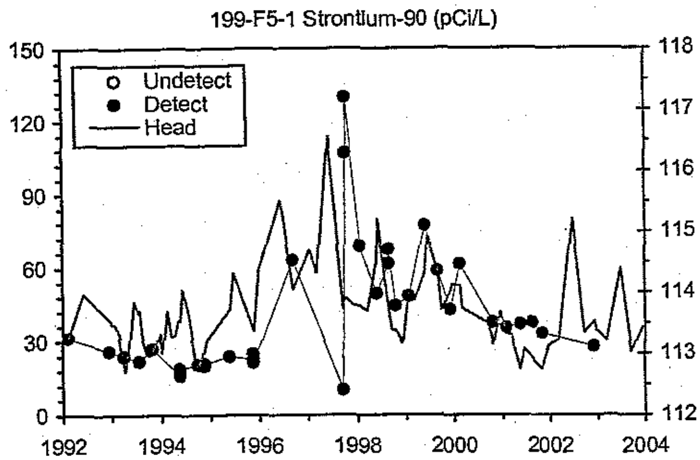
Wells 199-F5-42 and -43A have low chromium concentrations, and no clear relation between concentrations and water levels.







The strontium-90 trend in well 199-F5-44 is similar to the chromium trend, with perhaps a general inverse relationship to water level (excluding the apparently anomalous water level in 2001). Wells 199-F5-42 and -43A have lower strontium-90 concentrations so relationships are harder to see.



The highest strontium-90 concentrations in 100-F Area groundwater are currently in well 199-F5-1, located ~100 meters from the river, slightly farther inland than wells F5-42, -43A, and -44. Strontium-90 concentrations appear to show a direct relationship with long-term changes in water levels, but short-term, seasonal changes are not evident.

Strontium-90 data from aquifer tubes are sparse. Of four results available from tube sites 64, 65, or 66, the only detections were in tube 64-D (1.7 in 11/00 and 1.9 in 1/03).

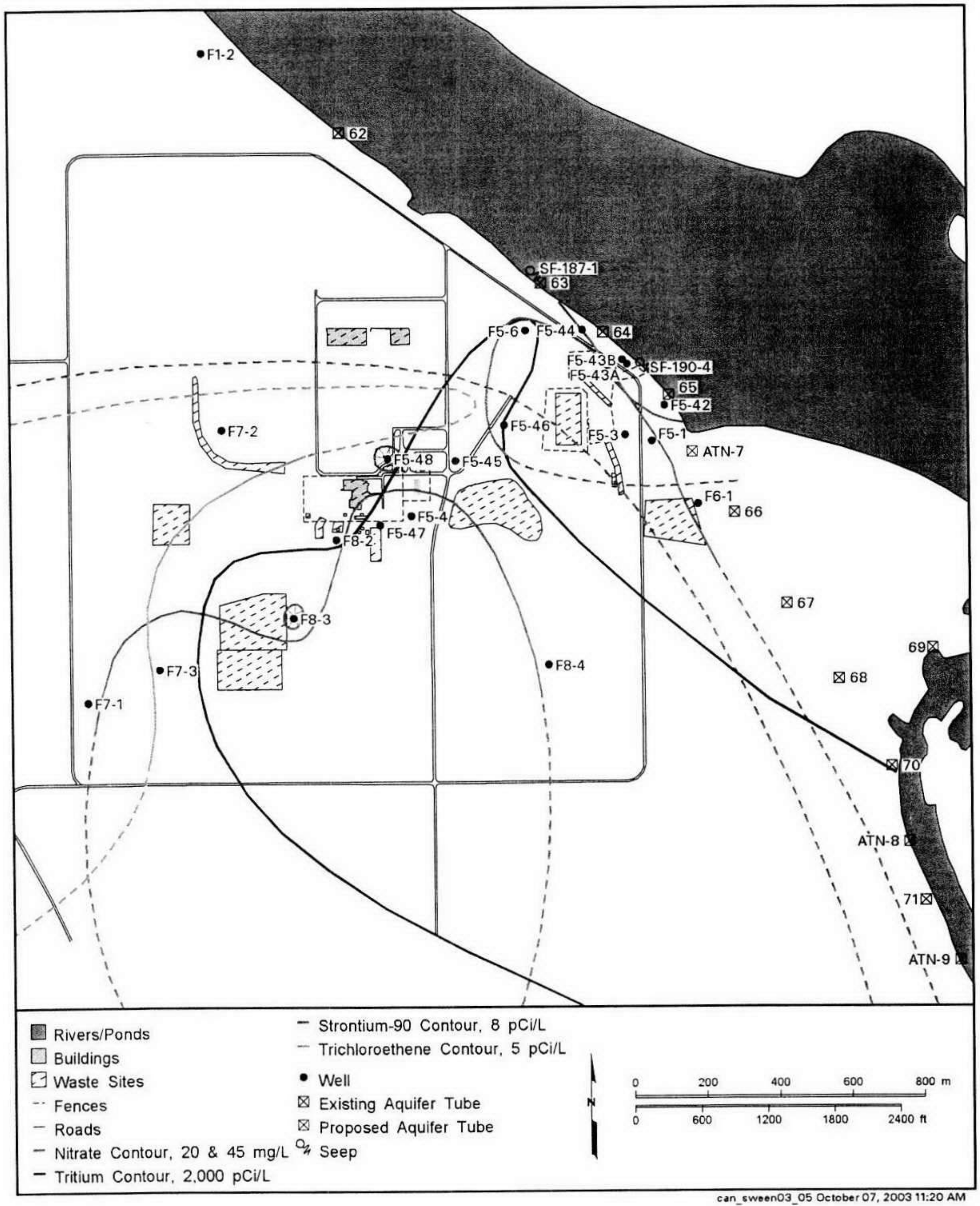


Figure 3. Monitoring Network Location Map Showing 100-F Area Wells

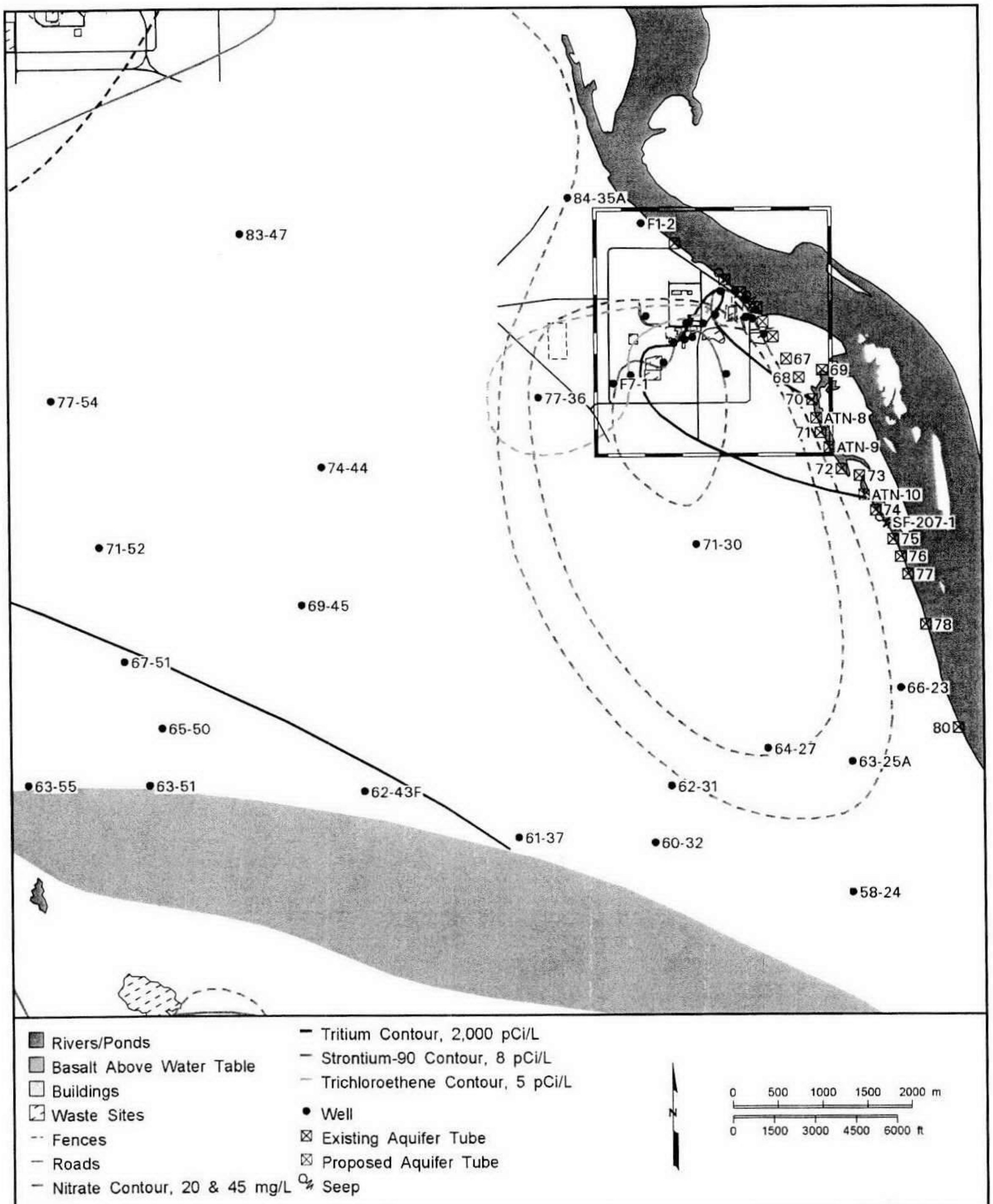


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Figure 2. Sampling Boundaries and Monitoring Network for the 100-FR-3 Operable Unit Showing Wells, Seeps, and Aquifer Tubes (See Figure 3 for enlargement of area inside box.)

ATTACHMENT 16

100-BC-5 Trend Plots

Sampling Frequency in 100-BC-5 Wells and Aquifer Tubes

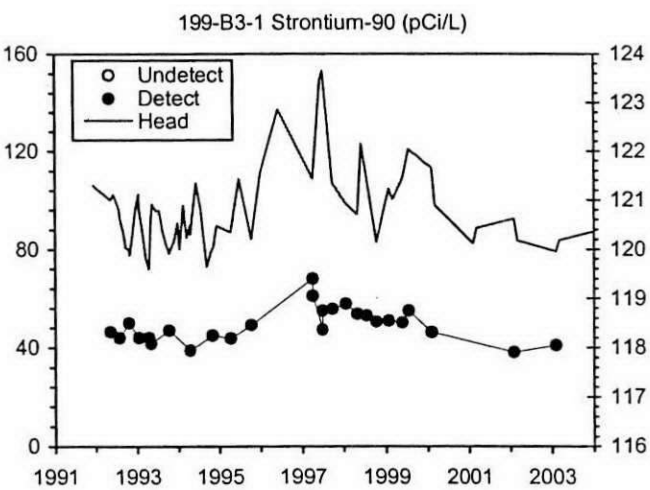
Summary

The sampling and analysis plan (DOE/RL-2003-38) calls for annual to biennial sampling of most wells and aquifer tubes. Two wells, one existing aquifer tube, and four of the proposed aquifer tubes are supposed to be sampled quarterly for one year to evaluate seasonal variability in strontium-90 concentration. The quarterly wells are 199-B3-46 and 199-B3-47; the quarterly tubes are existing tube site 6 and new tube sites ATN-1, -2, -3, and -4.

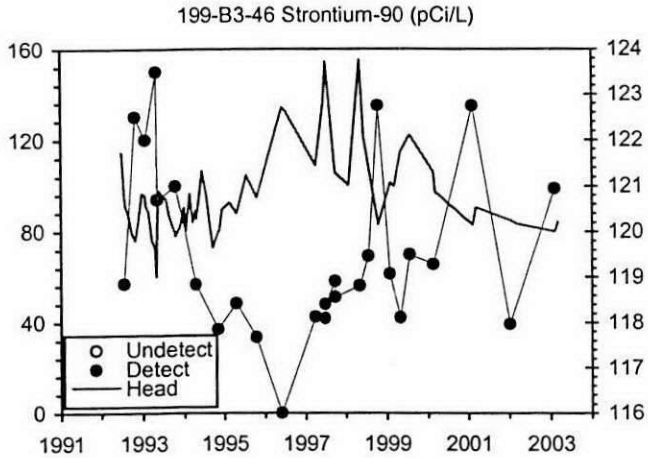
Wells 199-B3-46 and -47 and nearby well 199-B3-1 have been sampled quarterly in the past (discussed and illustrated below). Long-term water level changes may have an impact on strontium-90 concentrations in some wells, but not the short-term, seasonal changes. We recommend changing the sampling frequency for wells 199-B3-46 and -47 and all of the aquifer tubes from quarterly to annual.

An alternative is sampling existing aquifer tube site 6 and only those new tube sites that are within the strontium-90 plume quarterly for one year. Tubes will only be sampled if conditions permit (i.e. the tube is not flooded, produces enough water to sample, and sampled water has a conductivity ≧160uS/cm).

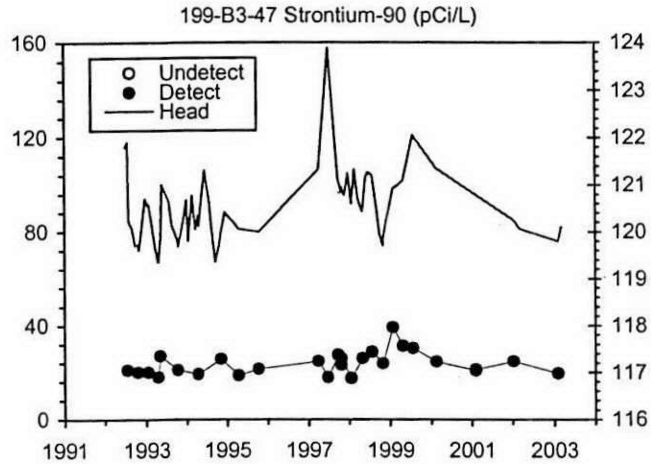
Contaminant Trends



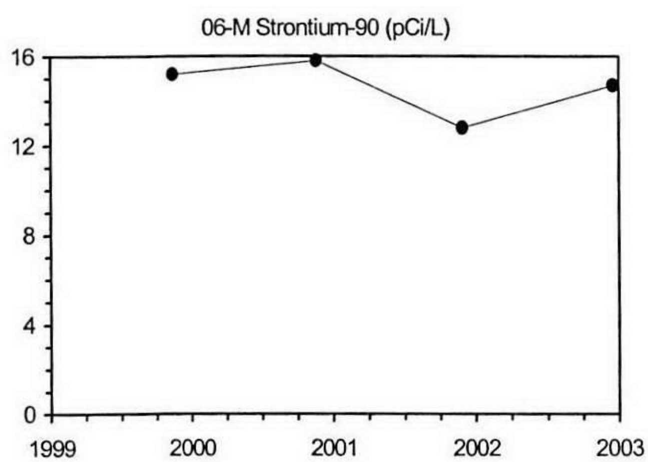
Stronium-90 concentration appears to respond to long-term, changes in water level in near-river well 199-B3-1 (~125 meters from shore). Note the rise in both parameters in 1996-1998. However, strontium-90 concentrations do not appear to respond to short term fluctuations in water level, as seen in the early 1990s and late 1990s when the well was sampled approximately quarterly.



There may be a general, inverse relationship between strontium-90 concentration and water level in well 199-B3-46 (located ~200 meters from shore). Sustained, high water levels in the mid-to-late 1990s were accompanied by relatively low strontium-90 concentrations. However, spikes in strontium-90 concentrations occurred around 1993, 1998, and 2000 when there were no dramatic changes in water level.



Well 199-B3-47 (~75 meters from shore) shows lower strontium-90 levels and less variability in concentration than does B3-46. There is no clear relation to water levels.



Aquifer tube 6-M is located near well 199-B3-47 and consistently detects strontium-90. The samples were collected in November or December (low river stage).

New tube sites ATN-1 and ATN-2 are not within the strontium-90 contaminant plume. Existing tube site 4 has been sampled for strontium-90 and has detected none.

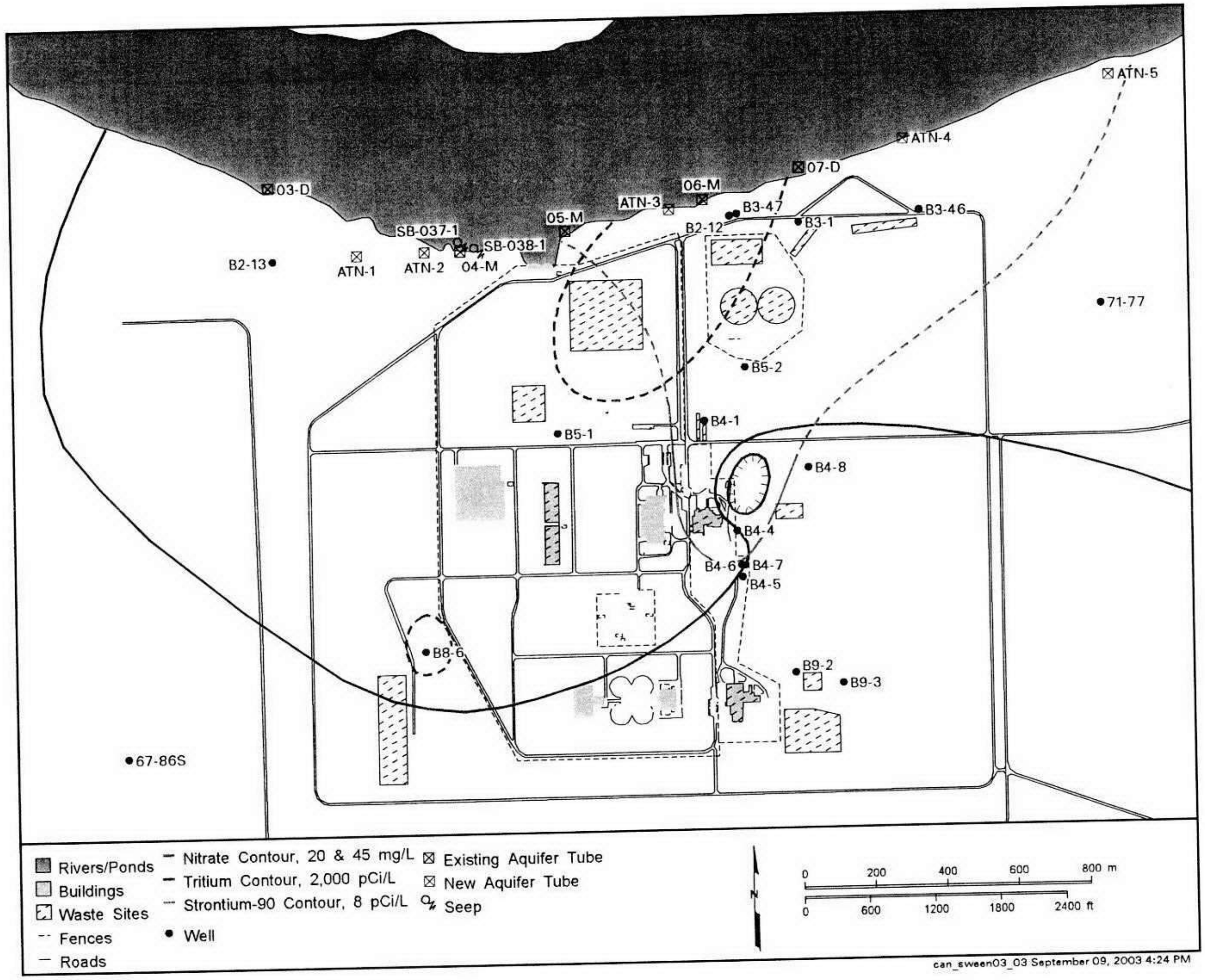


Figure 3. Monitoring Network Location Map Showing 100-B/C Area Wells