082095

0053756

Meeting Minutes Transmittal/Approval
Unit Managers' Meeting
200 Area Groundwater and Source Operable Units
3350 George Washington Way, Richland, Washington
January 2000

APPROVAL: _____ Date 8/10/00
Bryan Foley, 200 Area Unit Manager, RL (A5-13)

APPROVAL: _____ Date 8-14-00
Wayne Soper, 200 Area Unit Manager, Ecology (B5-18)

APPROVAL: _____ Date 8-14-00
Dennis Faulk, 200 Area Unit Manager, EPA (B5-01)

APPROVAL: _____ Date 8/14/00
Arlene Tortoso, Groundwater Unit Manager, RL (H0-12)

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HANFORD PROJECT OFFICE
AUG 29 2000
ENVIRONMENTAL PROTECTION AGENCY

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

Attachment 1	--	Agenda
Attachment 2	--	Attendance Record
Attachment 3	--	200 Area UMM Minutes – January 2000
Attachment 4	--	Characterization Activities at Gable Mountain and B Ponds, 216-B-3-3 Ditch, and 216-2-2 Trench
Attachment 5	--	Well Summary for Borehole B8817 (S Pond)
Attachment 6	--	Draft Letter and Rebound-monitoring Plan for 200-UP-1
Attachment 7	--	Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites

Prepared by: Chloe Brewster (HO-19) Date 6/22/00

Concurrence by: Bruce Ford, BHI Groundwater/Vadose Zone Integration (H0-19) Date 6/19/00

082095 Attachment 1

UNIT MANAGERS' MEETING AGENDA

3350 George Washington Way
January 27, 2000

8:00 – 10:00 a.m. 200 Area Room1B40

- Groundwater Monitoring Plans
  - Discussion on Ecology's role and responsibilities relative to the 200 Area Units

- 200-CW-1 Gable/B Pond and Ditches Cooling Water OU (20 minutes)
  - Status Work Plan and Discuss Additional Ecology Comments
  - Status Characterization Activities
  - Discuss 216-B-3 Pond TSD Unit Part A
  - Discuss/Approval of Diesel Spill SAP
  - Discuss TPA Change Package

- 200-CS-1 Chemical Sewer OU (10 minutes)
  - Status Work Plan and Discuss Additional Ecology Comments
  - Status Characterization Activities

- 200-CW-5 U Pond/Z Ditches Cooling Water OU (10 minutes)
  - Status Work Plan

- 200-TW-1 and 200-TW-2 Operable Units (10 minutes)
  - DQO Status

- 200-UP-1 (10minutes)
  - Report Status

- 200-ZP-1 (5 minutes)
  - Report Status

- 200-ZP-2 (30 minutes)
  - Carbon Tetrachloride Rebound Monitoring Discussion
  - Passive Soil Vapor Extraction
  - Carbon Tetrachloride ITRD
  - USC Geophysical Status
  - CRESP

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Attachment 2

200 Area Unit Manger's Meeting
January 27, 2000
8:00 a.m. – 10:00 a.m.
3350 George Washington Way, Conference Room 1B-40

ATTENDEE	ORGANIZATION	PHONE NUMBR
Craig Swanson	CHI	372-9353
Mary Furman	DOE-GW/VZ	373-9630
Stuart Luttrell	PNNL	376-6023
Curt Wittreich	ERC/200 Area	372-9586
Ted Wooley	Ecology	736-3012
Bryan L. Foley	DOE-RL	376-7087
Chris Clearlock	CHI	372-9574
Wayne Soper	Ecology	736-3049
Mary E. Todd	ERC	372-9030
Dennis Faulk	EPA	376-8631
Garrett Day	BHI	372-9052
Brenda Becker-Khalil	Ecology	736-3003
George C. Henckel	BHI	372-9381
Arlene Tortoso	DOE-RL	373-9631

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MEETING MINUTES
200 AREA GROUNDWATER AND SOURCE OPERABLE UNITS
UNIT MANAGERS' MEETING --200 AREA
January 27, 2000

Attendees: **See Attachment #2b.**

Agenda: **See Attachment #1b.**

Topics of Discussion:

1. Groundwater Monitoring Plans – The Washington State Department of Ecology (Ecology) clarified the project leads responsible for review and approval of plans for each operable unit (OU) as follows: 200-CS-1 is Brenda Becker-Khaleel, 200-CW-1 is Ted Wooley, and 200-TW-1 & -2 is Zelma Jackson. If a monitoring plan is not specific to an OU, if an OU has not yet been assigned a project lead, or the plan is of a general nature or includes more than one OU, contact Wayne Soper or Dib Goswami. Ecology (Wayne) took the action to provide Craig Swanson with Ecology's responsibility chart. Wayne will discuss with Dib whether they want to be copied on all documents.

2. 200-CW-1 Gable/B Pond and Ditches Cooling Water OU – Ecology is currently discussing global issues with the U.S. Environmental Protection Agency (EPA) (land use, treatment, storage, and disposal (TSD) boundary, and other issues of long-term nature). Ecology recommended proceeding with the work plan if there are schedule constraints. The global issues should be resolved, however, before the risk assessment is performed, but not prior to characterization. The remedial investigation (RI) is in progress at the first OU (200-CW-1). It was recommended to modify the document according to the work plan-specific comments. U.S. Department of Energy, Richland Operations Office (RL) doesn't want to continue proceeding with the fieldwork without the work plan being approved. There were mixed feelings as to whether the global issues could be worked out quickly or not. A meeting needs to be set up the second week of February to further discussions on the global issues. Since the draft change package needs to be submitted with revision 0 of the work plan, it was agreed to wait until after this meeting before proceeding. Ecology wants the Part A permit corrected before the work plan is issued. EPA would like to see engineering evaluation/cost analyses (EECAs) and action memos instead of records of decision (RODs) for TSDs, for legal reasons. It is awkward for EPA to issue a CERCLA ROD on TSDs when the Permit conditions and ROD don't match.

   A **handout** was provided and reviewed regarding the characterization activities at Gable Mountain and B Ponds, 216-B-3-3 Ditch, and 216-2-2 Trench. It was noted that the data are incomplete and preliminary.

   The diesel spill sample and analysis plan (SAP) was discussed in length. There was concern about what applicable regulatory standards for cleanup (if any) to use. There is no clear regulatory guidance for petroleum. It was noted that Bechtel Hanford, Inc. (BHI) is currently trying to put together a policy on how to resolve these types of spills, and one opinion was to wait for this policy before proceeding with the SAP. Another opinion was that the M-14 Procedure was the applicable policy, and whether the site needs to be entered into the waste identification data system (WIDS). The SAP specifies *Model*

Toxics Control Act (MTCA) will be used. EPA offered a comment that three samples should be taken instead of two, for quality control.

The draft TPA change package was provided and reviewed. There was a suggestion by EPA and Ecology that the work plan should include a schedule with a number of activities listed. The TPA change package presented listed only the RI report, due to current funding. It was thought that the schedule in the work plan may be as enforceable as TPA milestones if the revision 0 of the work plan is signed.

3. 200-CS-1 Chemical Sewer OU – The work plan is currently in Tribal review. One comment was received from the public review, but it did not pertain to this document. A meeting will be set up during the second week in February to discuss the additional Ecology comments. The characterization activities are complete and results are expected in February. A **handout** on borehole B8817 (S-Pond) was distributed and discussed. Ecology will review whether the work plan can be issued even though the fieldwork has not been complete. The waste control plan will need signatures before final issuance of the work plan.

4. 200-CW-5 U Pond/Z Ditches Cooling Water OU – The regulator review period ends 1/31. A tentative meeting is set up to review comments, but will be rescheduled if more time is needed. EPA took the action to follow up with a reminder to the EPA reviewer.

5. 200-TW-1 and 200-TW-2 OUs – The scheduled data quality objective (DQO) meeting needs to be rescheduled, due to Ecology conflicts. It was recommended that Doug and Zelma both participate. DQO activities are currently two weeks behind schedule.

6. 200-UP-1 – Arlene provided a **handout** of the draft letter and proposed rebound-monitoring plan. RL is waiting for Ecology comments and feedback. The points of discussion were whether the shutdown should be six months or one year; the need for an approved groundwater model; and that only 56 days remain where the Effluent Treatment Facility (ETF) will accept water. RL strongly recommended one full year of shutdown to collect data for evaluation.

7. 200-ZP-1 – Up and running after minor sample equipment glitch during Y2K shutdown. Old equipment is currently being replaced. Radiological (RAD) sampling data was provided for tritium, iodine, and technetium. A request was made by EPA to update the sampling plan to include changes for the RAD sampling.

8. 200-ZP-2 – A **handout** was provided and briefly reviewed on the comparison of maximum carbon tetrachloride rebound concentrations for soil vapor extraction sites. The results are consistent with previous years.

   Passive Soil Vapor Extraction was installed on eight deep wells. Not all the results have been received for evaluation yet.

   The Carbon Tetrachloride Innovative Treatment Remediation Demonstration (ITRD) workshop is scheduled for March 8 and 9. The N-Springs ITRD is scheduled for February 9 and 10. EPA requested that RL present recommended Partitioning Interwell Tracer Test (PITT) scenarios before the March workshop. EPA would like a couple of days to review these before the ITRD workshop.

University of South Carolina (USC) Geophysical status – still hoping to come out and do some boring. Working out a joint proposal with other sources of money/work.

Consortium for Risk Evaluation and Stakeholder Participation (CRESP) – Lisa Johnson of the University of Washington is still working on the thesis.

General Comments:

The Pacific Northwest National Laboratory (PNNL) model supporting carbon tetrachloride technology evaluations for the ITRD began late, so no results are available yet. Information is wanted for the March workshop.

EMSP – There is a question on what to do with the waste. The thought was that this is considered a removal action under CERCLA.

EPA reported that the new Hanford Site budget criteria are: essential site services, safety, and TPA compliance.

It was requested that time be allotted on the next agenda for discussion on the five-year review of the groundwater remediation systems. Dave Einan of EPA will provide the discussion.

Arlene wants In Situ Redox Manipulation (ISRM) added to the five-year review if this is the correct mechanism.

Actions:

1. Ecology to provide Craig Swanson with Ecology's responsibility chart. **(Action assigned to Wayne Soper.)**

2. A meeting will be set up for the second week of February to further discuss the global issues to enable the 200-CW-1 work plan to be issued. **(Action assigned to Bryan Foley.)**

3. A meeting will be set up for the second week in February to discuss the additional Ecology comments on the 200-CS-1 work plan. **(Action assigned to Curt Wittreich.)**

4. Ecology will review whether the 200-CS-1 work plan can be issued as though the fieldwork has not been complete. **(Action assigned to Brenda Becker-Khaleel.)**

5. EPA took the action to follow up with a reminder to the EPA reviewer of the 200-CW-5 work plan. **(Action assigned to Dennis Faulk.)**

6. EPA requested an update to the 200-ZP-1 sampling plan to include changes for the RAD sampling. **(Action assigned to George Henckel.)**

7. EPA requested RL present recommended PITT scenarios before the March ITRD workshop for their review. **(Action assigned to Scott Peterson.)**

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Analyte		Background Concentrations	Maximum Detections			
			Gable Mt. Pond	B-Pond	216-B-3-3 Ditch	216-B-2-2 ~~Ditch~~ Pond
Radiological Constituents, in pCi/g						
Americium-241		NA	1.28	12.7	0.078 J	1.32
Cesium-137		1.05	7180	1070	40.5	746
Cobalt-60		0.008	0.118	0.0317	ND	ND
Europium-152		NA	ND	ND	ND	ND
Europium-154		0.033	3.37	ND	ND	2.34
Europium-155		0.054	1.18	ND	ND	2.04
Neptunium-237		NA	ND	0.0671 J	-	-
Nickel-63		NA	ND	ND	ND	ND
Plutonium-238		0.004	ND	0.954	0.077 J	ND
Plutonium-239/240		0.025	1.14	46	0.225 J	01.26 J
Radium-228			1.37	1.07	0.983	0.994
Total radioactive strontium		0.18	49.7	46.9	0.310 J	12100
Technetium-99		NA	0.458 J	1.57 JB	1.62 JB	ND
Tritium		NA	ND	0.089J	ND	
Thorium-232		1.3	1.37	1.07	0.983	1.0
Total uranium			2.19	9.29	0.848 J	1.33
Uranium-233/234		1.1	0.858 J	5.17	-	0.585 J
Uranium-235/236		0.11	0.067 J	0.578 J	ND	0.040 J
Uranium-238		1.1	0.733 J	4.18	ND	ND
Inorganic Chemicals, in mg/kg[c]						
Arsenic		6.5	33.8	7.8	7.8	6.0
Barium		132	140	114	119	130
Beryllium		1.51	1.6	0.67	0.41 B	0.40
Cadmium		NA	1.7	18	0.21 B	0.47
Chromium (III)		18.5	24.3	24.5	14.4	13.7
Hexavalent chromium		NA	ND	ND	ND	ND
Copper		22	58.8	70.3	17.3	18.5
Lead		10.2	35.5	592	79.9	163
Mercury		0.33	0.24	11.9	0.16	0.98
Nickel		19.1	15.9	15.6	16.2	44.8
Selenium		NA	1.5	1.1	0.97	ND
Silver		0.73	ND	9.6	0.79 B	8.4
Vanadium		85.1	78.2	94.5	92.1	89.5
Zinc		67.8	554.2	204	86.6	127
Ammonia		9.23	17	31.8	2.5	2.1
Chloride		100	65.8	108	53	10.9
Cyanide		NA	ND	0.54	ND	ND
Fluoride		2.81	56.1	ND	ND	ND
Nitrate and nitrate/nitrite as N		52	500	150	130	330
Nitrite and nitrate/nitrite as N		NA	3	ND	ND	ND
Phosphate		0.79	5.6	3.8	4.3	2.7

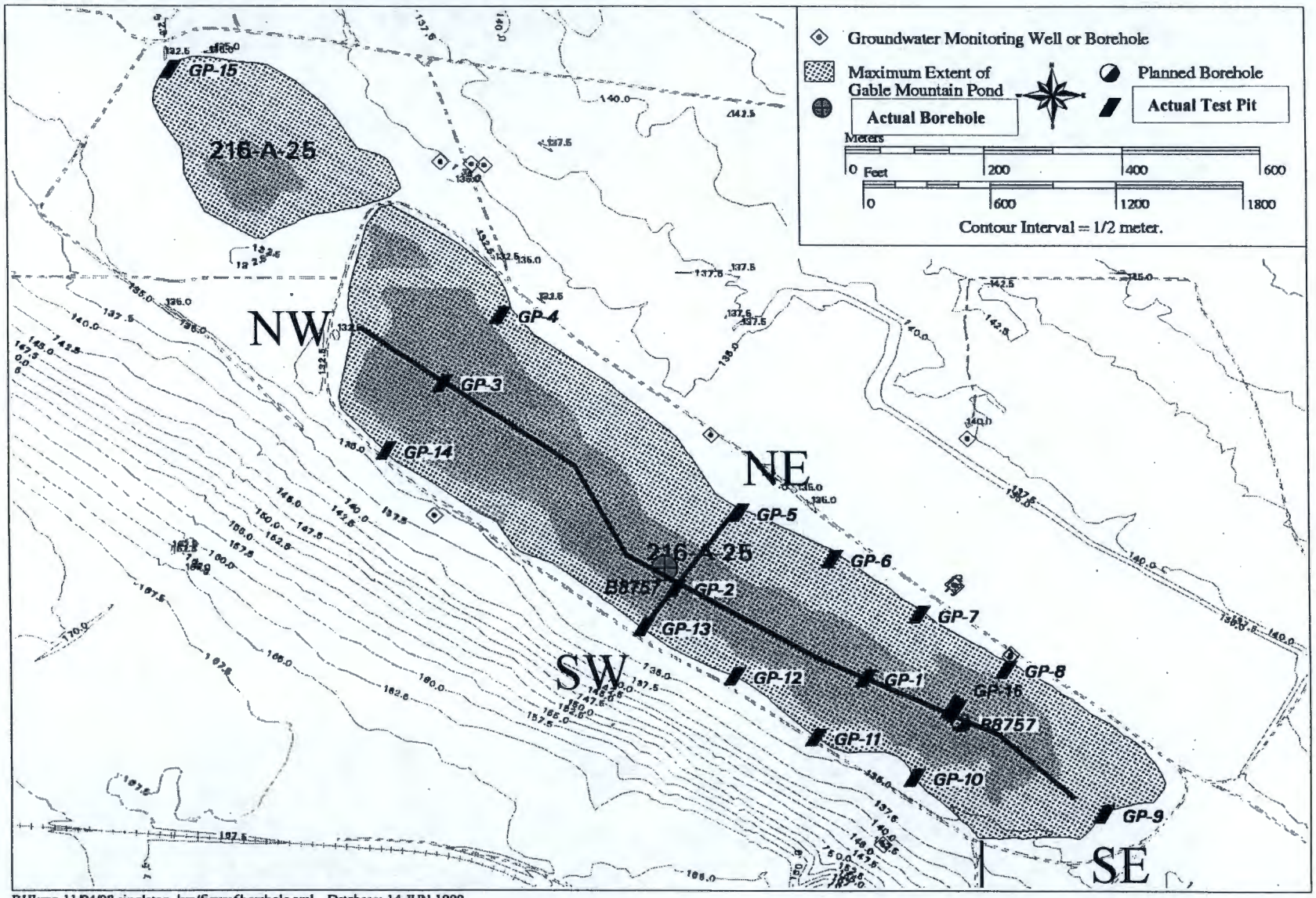
Analyte		Background Concentrations	Maximum Detections			
			Gable Mt. Pond	B-Pond	216-B-3-3 Ditch	216-B-2-2 Ditch
Sulfate		237	3640	1950	269	678
Sulfide		NA	12.4	4.6	4.7	8.8
pH			9.6	9.7	8.8	8.8
Organic Chemicals, in mg/kg						
Acetone		NA	0.008 JB	0.290	ND	0.013 B
1-butanol (butyl alcohol)		NA	ND	ND	ND	ND
2-butanone (MEK)		NA	0.002 J	0.260	ND	ND
Carbon tetrachloride		NA	ND	ND	ND	ND
Chloroform (trichloromethane)		NA	ND	ND	ND	ND
Decane		NA	ND	ND	ND	ND
Dichloromethane (methylene chloride)		NA	0.032 B	0.029 B	0.011 B	0.018 B
Ethanol		NA	ND	ND	ND	ND
Halogenated hydrocarbons		NA	ND	ND	ND	ND
Methyl isobutyl ketone (MIBK)		NA	ND	ND	ND	ND
Propanol (isopropyl alcohol)		NA	ND	ND	ND	ND
Toluene		NA	ND	ND	ND	ND
Xylene		NA	ND	ND	ND	ND
1,1,1-trichloroethane		NA	ND	ND	ND	ND
1,1,2-trichloroethane		NA	ND	ND	ND	ND
Tributyl phosphate		NA	ND	ND	ND	ND
Polychlorinated biphenyls		NA	ND	0.230	0.460	33
Kerosene, normal paraffin hydrocarbons, paraffin hydrocarbons, Shell E-2342 (napthalene and paraffin), Soltrol-170 ($C_{10}H_{22}$ to $C_{16}H_{34}$), purified kerosene, and diesel fuel		NA	ND	ND	ND	1100 (Motor Oil)

[c] This project is subject to Phase IV *Resource Conservation and Recovery Act of 1976* (RCRA) implementation. Therefore, if any of the toxicity characteristic (TC) metals exceed the land disposal restriction threshold values as expressed by 20 times the toxicity characteristic leachate procedure (TCLP) limits, the remaining sample media, or drummed drill cuttings will be analyzed using TCLP for the TC metals. The TCLP analysis will also include antimony and thallium as potential underlying hazardous constituents.

[d] Based on Hanford Site background values.

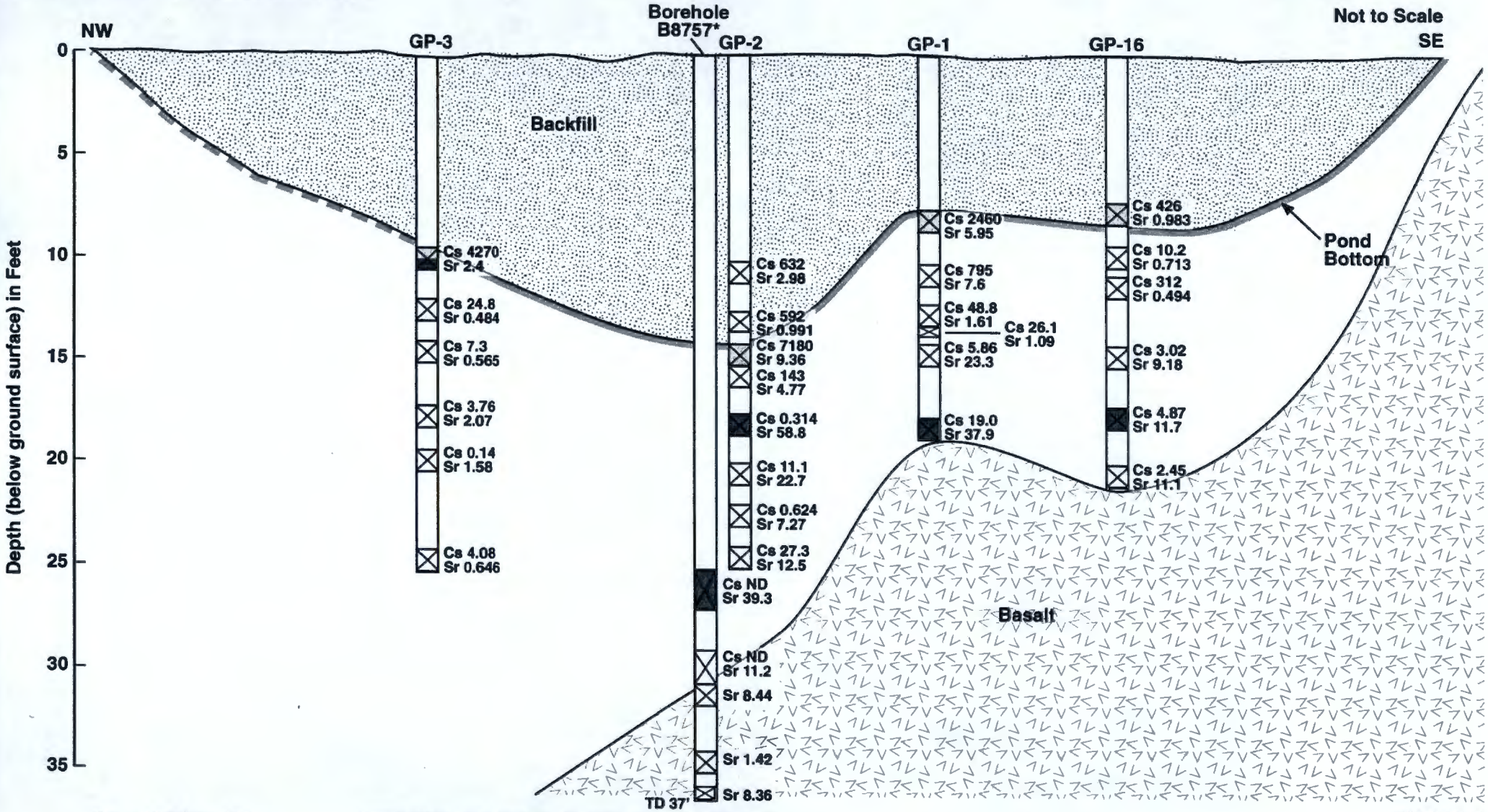
[e] First value shown is via routine inductively coupled plasma (ICP), second value via "trace" ICP.

Data are incomplete and preliminary.



BHI:rpp 11/04/98 singleton_km/figure6borehole.aml Database: 14-JUN-1999

Gable Mountain Pond

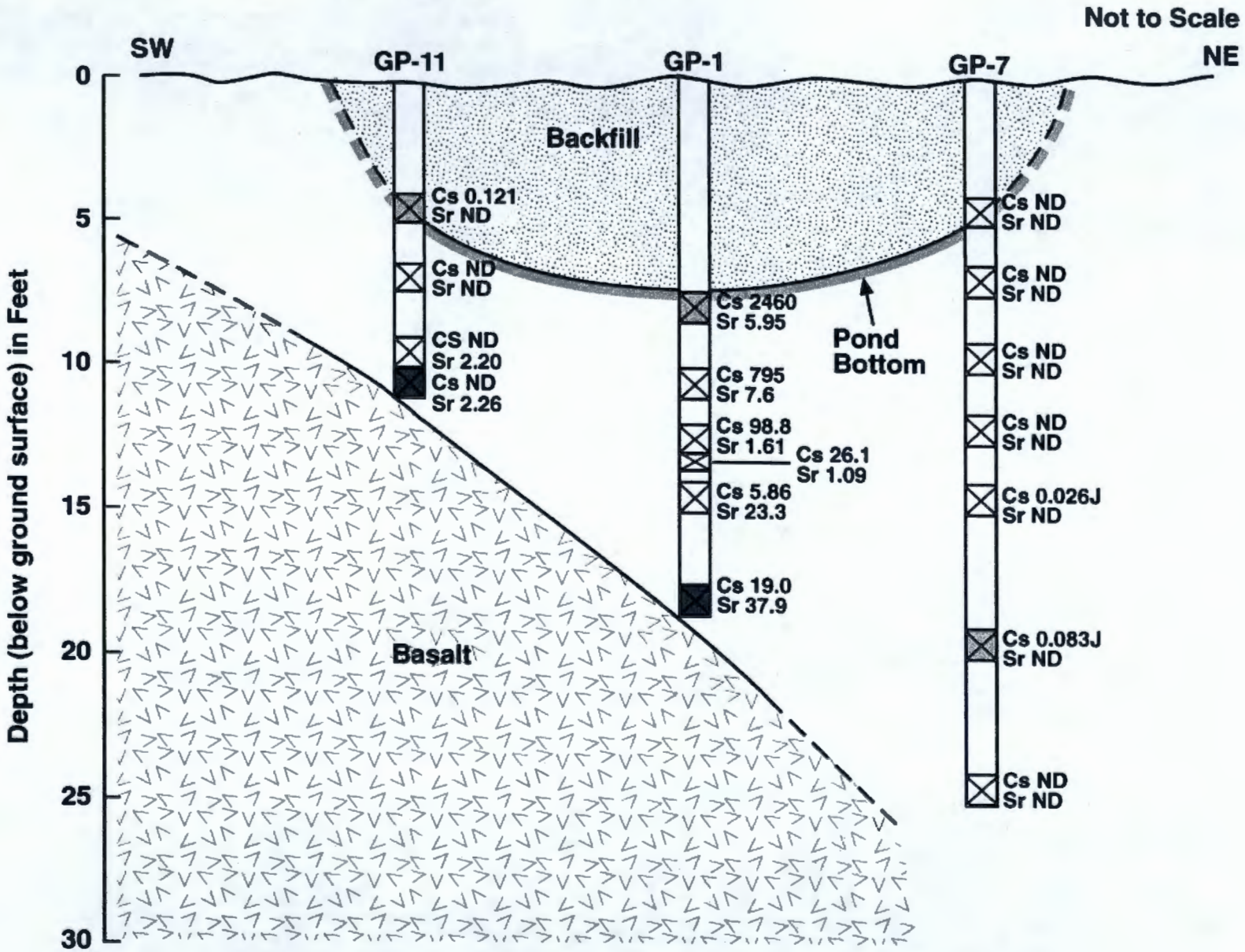


Cs – Cesium 137
Sr – Total Strontium
ND – Not Detected
TD – Total Depth
GP – Test Pit ID

Highest CesiumConcentration in pCi/g
Highest Strontium Concentration in pCi/g

* Data has not been received for these samples.

Gable Mountain Pond



Cs – Cesium 137
Sr – Total Strontium
ND – Not Detected
J – Estimated Quantity
GP – Test Pit ID

Highest Cesium Concentration in pCi/g
Highest Strontium Concentration in pCi/g

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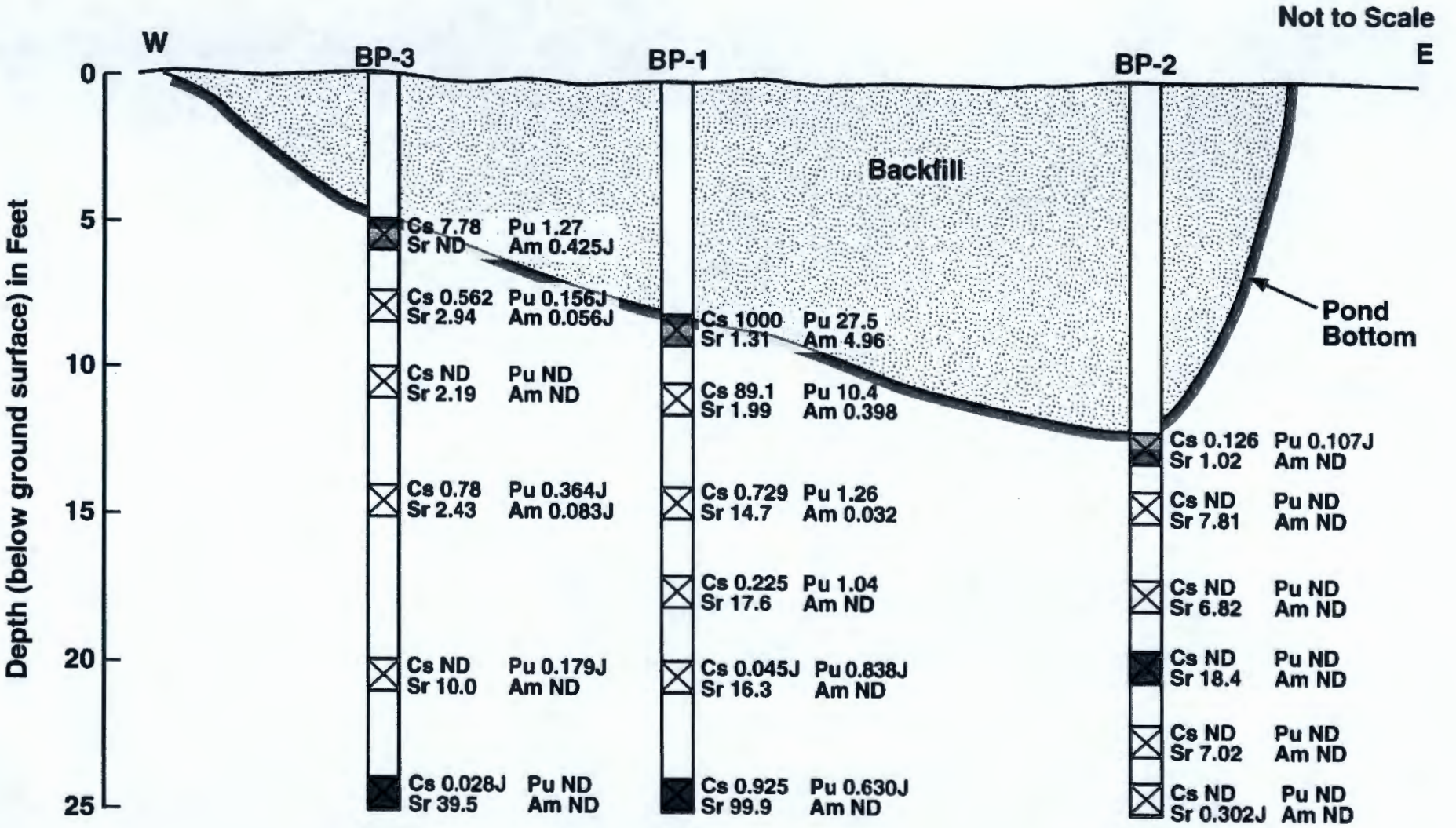
216-B-3 Pond



Cs – Cesium 137
Sr – Total Strontium
Pu – Plutonium 239/240
Am – Americium 241
ND – Not Detected
J – Estimated Quantity

Highest Cesium Concentration in pCi/g
Highest Strontium Concentration in pCi/g
Highest Plutonium Concentration in pCi/g
Highest Americium Concentration in pCi/g

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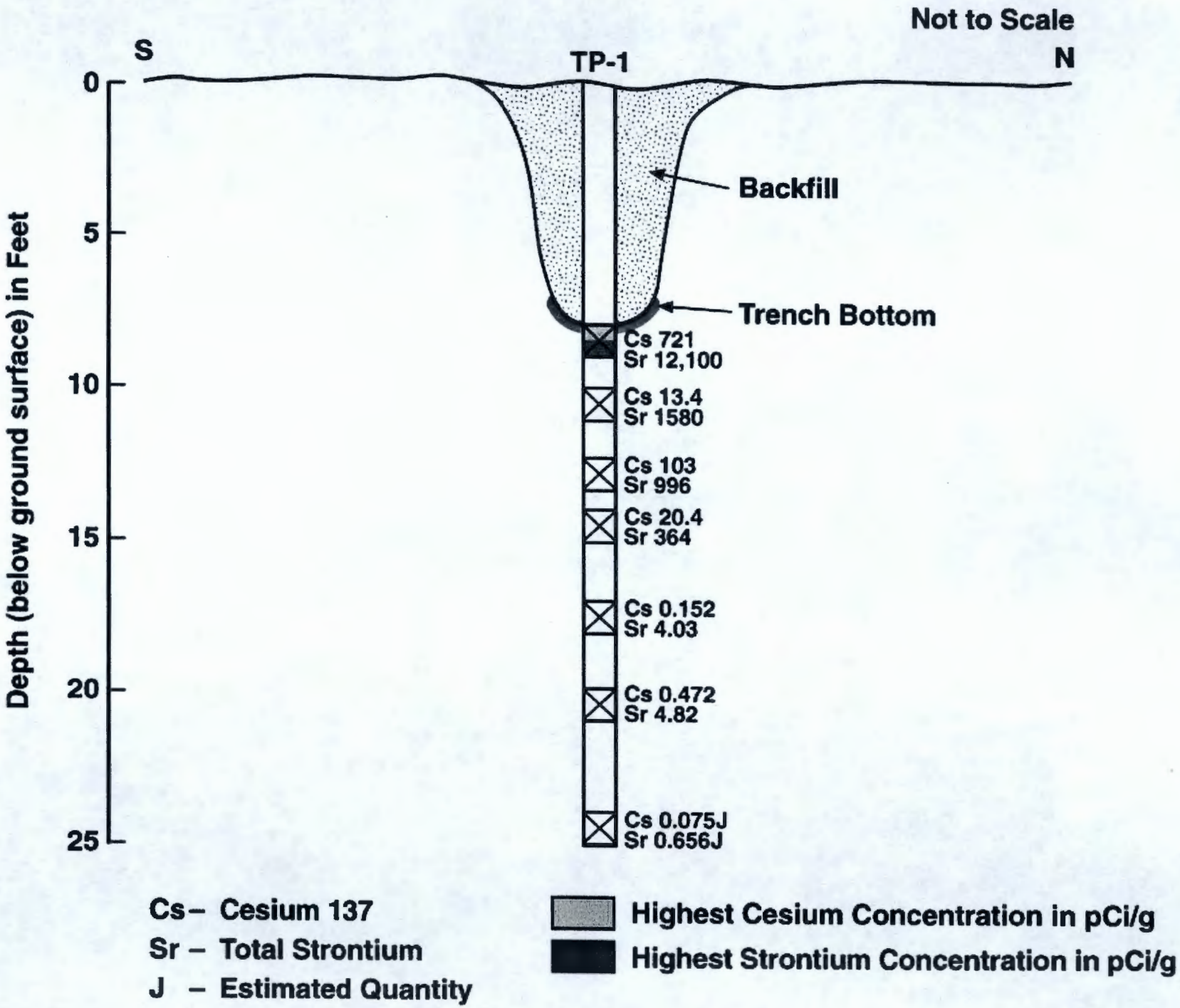
216-B-2-2 Trench



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Change Number	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink. DRAFT	Date
M-13-00-xx		January 18, 2000

Originator DOE **Phone**

Class of Change
[ ] I – Signatories [X] II – Executive Manager [ ] III – Project Manager

Change Title
Interim Milestones for the 200-CW-1 Operable Unit Assessment Activities

Description/Justification of Change

The 200 Areas RI/FS Implementation Plan (DOE/RL-98-28, Rev.0) established the framework for characterization of ER soil waste sites (approximately 700) in the 200 Areas and grouped the waste sites into 23 process-based operable units. Based on the Implementation Plan, Tri-Party Agreement M-13 milestones were established (TPA change number M-13-97-01) for the submittal of RI/FS workplans for individual operable units. The 200-CW-1 Gable Mountain/B Pond and Ditches Cooling Water Group Operable Unit was the first operable unit to submit a workplan. The 200-CW-1 work plan (DOE/RL-99-07, Draft A) milestone (M-13-20) was met in April 1999.

As specified in Section 11.6 of the Action Plan to the Tri-Party Agreement, the work plan must specify interim milestones for the OU. To fulfill that requirement, the following interim milestone is proposed for the 200-CW-1 OU:

M-13-20A: Submit Draft A Remedial Investigation Report – August 15, 2000

Additional interim milestones may be proposed in the future as they are identified through the annual work planning process.

Impact of Change.
Addition or interim milestones to the M-13-20 Milestone.

Affected Documents
The Hanford Federal Facility Agreement and Consent Order, as amended, and 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan.

Approvals

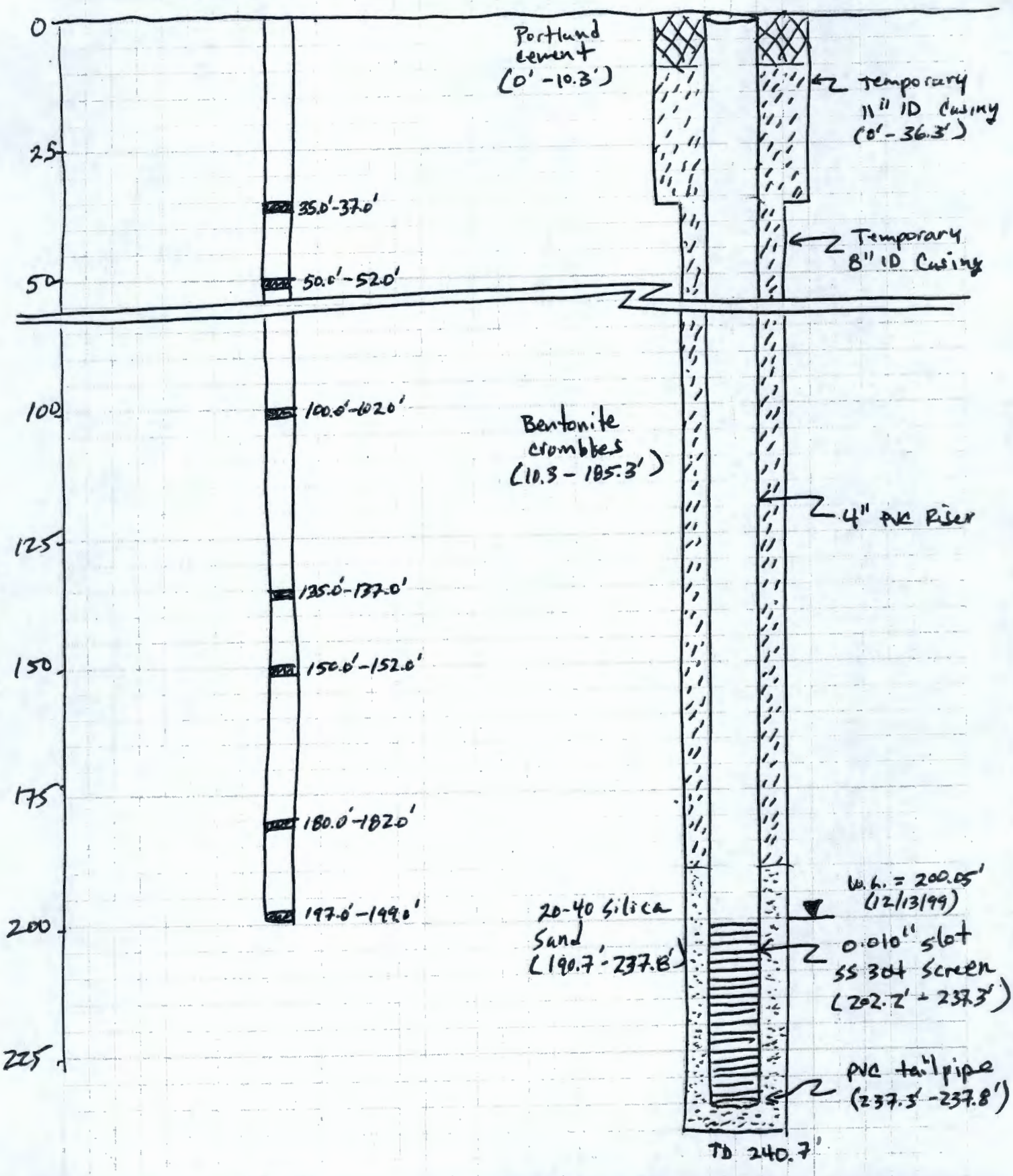
_____	_____	_____ Approved	_____ Disapproved
DOE	Date		
_____	_____	_____ Approved	_____ Disapproved
EPA	Date		
_____	_____	_____ Approved	_____ Disapproved
Ecology	Date		

CH2MHILL SUBJECT 082095 BY
SHEET NO. of
PROJECT NO.

Attachment 5

B8817 (S-POND)

WELL SUMMARY



Day, Garrett A

From: Tortoso, Arlene C
Sent: Monday, January 10, 2000 10:23 AM
To: Maine, Zelma
Cc: Soper, Wayne W
Subject: Draft Proposal for 200-UP-1 Rebound

Zelma:
Attached is a draft letter and rebound-monitoring plan for 200-UP-1 for Ecology's concurrence. Please provide comments as soon as you can and I will finalize and "officially" send to Ecology for concurrence. If you have any questions, please let me know.
Thanks,

Arlene Tortoso

373-9631

[redacted]

UP1shutdown_act.doc

Ms. Jane Hedges
Cleanup Section Manager
Nuclear Waste Program
State of Washington Department of Ecology
1315 West 4th Avenue
Kennewick, Washington 99336-6018

Dear Ms. Hedges:

PROPOSAL FOR SHUTDOWN OF THE 200-UP-1 PUMP AND TREAT SYSTEM FOR REBOUND STUDY

The U.S. Department of Energy, Richland Operations Office (RL) requests concurrence from the State of Washington Department of Ecology (Ecology) to suspend the extraction and remediation of groundwater at the 200-UP-1 Operable Unit (extraction well 299-W19-39) and implement the attached Rebound-Monitoring Program through calendar year 2000. The suspension of the pump and treat system will proceed as planned and described in FY-2000 Detailed Work Plan and in discussions held with Ecology during the months of October through December 1999. Monitoring of the groundwater plume at the operable unit will continue in order to assess potential contaminant rebound and plume movement. This information is necessary to further evaluate the remediation by pump and treat against the remedial action objectives (RAO) as stated in the 200-UP-1 interim action Record of Decision.

Original system operation analysis anticipated that groundwater concentrations in the 200-UP-1 Operable Unit targeted area would meet the RAOs by January 1998 (after the extraction and removal of one pore volume of water in the capture area). However, as of October 1999 the selected remediation technology has only been partially successful in meeting the RAOs. The majority of the technetium-99 plume within the target area has been remediatied to concentrations at or below the RAO. In contrast, there has been little or no success in remediating the uranium plume to attain the RAO. The overall concentration of uranium remains relatively unchanged after nearly five years of pump and treat remediation. The remediation appears to be constrained by adsorption of uranium to the saturated sediments. While this hampers the success of selected remedy, adsorption of uranium combined with a declining water table, decreases the potential for uranium to be a threat to human health or the environment by reaching off site receptors.

Based on the current data, a re-evaluation of the selected remedation strategy is warranted, as continuing the current strategy does not appear to achieve the RAOs for the uranium plume. During re-evaluation, groundwater monitoring will continue, at selected wells, with the alternative to reinstate extraction at well 299-W19-39 if the concentration of technetium exceeds the RAO for two consecutive quarters. Current system performance data, and continued collection of groundwater plume concentration rebound data will provide the necessary information for RL, Ecology, and the U.S. Environmental Protection Agency (EPA) to determine a technically sound path forward for groundwater remediation at the 200-UP-1 Operable Unit, and any future impacts to human health or the environment at off site receptors.

Please indicate Ecology's concurrence below and return to RL by January 31, 2000. If you have any questions please contact

Sincerely,

Cc: U.S. Environmental Protection Agency

REBOUND-MONITORING PLAN

Introduction: The Record of Decision (ROD) for interim remedial action for the 200-UP-1 Operable Unit, 200 Area, Hanford Site, was signed by the U.S. Department of Energy (DOE), Washington State Department (Ecology), and U.S. Environmental Protection Agency (EPA) in February 1997. The selected remedy consists of pumping the highest concentration zone of uranium and technetium-99 groundwater plumes and routing the groundwater to ETF in the 200 East Area for treatment. Before issuance of the ROD, groundwater was treated onsite using ex situ ion-exchange technology and granular activated carbon. After treatment, the water was returned to the aquifer through the upgradient injection well. Since March 31, 1997, contaminated groundwater has been pumped from the extraction well and transported via pipeline to the ETF in the 200 East Area for treatment. Treated groundwater is discharged to the State-Approved Land Disposal Site (SALDS) north of the 200 West Area.

The scope of the remediation efforts outlined in the interim ROD was to address potential risks to offsite receptors posed by technetium-99 and uranium in the groundwater beneath a portion of the 200 West Area of the Hanford Site. To accomplish this, a groundwater pump-and-treat system was installed and is currently operating (Figure 1). The interim action was designed to reduce risk, but was not intended to fully address the statutory mandate for performance and treatment to the maximum extent practicable. The remedial action objectives (RAO) outlined from the ROD include:

- Reducing contamination in the area of highest contamination of uranium to below ten times the cleanup level under MTCA and ten times the MCL for technetium-99.
- Reducing potential adverse human health risks through reduction of contaminant mass.
- Preventing further movement of these contaminants from the highest concentration area.
- Providing information that will lead to development and implementation of a final remedy that will be protective of human health and the environment.

Based on predictive modeling, supported by field data, it was anticipated that groundwater concentrations in the targeted area would meet the RAOs by 1998 (after removal of one pore volume of water in the capture area). However, as of October 1999 and after removal of one pore volume of water, the RAOs have only been partially met (Figure 2 and Figure 3).

In the case of technetium-99, current analytical data indicates the majority of the plume has been remediated to below the RAO in the target area (Figure 4). In contrast, data for uranium indicates there has been little or no progress towards meeting the RAO (Figure 5). It appears that remediation efforts have been hampered by the sorption of uranium to the aquifer sediments. While the sorption of uranium to the aquifer sediments hinders the progress of the pump-and-treat, it also indicates the uranium plume may not reach offsite receptors. Based on these analytical results and the ineffectiveness of pumping to remove uranium, a re-evaluation of the remediation strategy presented in the ROD is warranted.

Implementation of the rebound-monitoring plan calls for ceasing of the extraction and treatment of groundwater using pump-and-treat technology at the 200-UP-1 Operable Unit for a period of approximately one-year. (The completion of this one-year study would be a decision point for future pump-and-treat operation criteria.) The current monitoring program would continue as planned. Groundwater wells would continue to be sampled to monitor plume movement. If contaminant concentrations in designated wells exceed the threshold level (technetium-99 RAO) for two consecutive quarters, the pumping system would be turned on again to achieve hydraulic containment and remove contaminants.

This change will not compromise the protection of human health or the environment. The DOE would still maintain institutional controls to restrict groundwater use in the 200 West Area of the Hanford Site. Continued monitoring will be evaluated to further confirm modeling results, as well as evaluation of alternative remedial technologies to provide information that will lead to development and implementation of a final remedy that will be protective of human health and the environment.

Technical Bases: Operational change to the 200-UP-1 Operable Unit consists of turning off the extraction well pump for the remainder of calendar year 2000. The results from groundwater sampling would be used to track plume movement and to evaluate changes in uranium and technetium-99 concentrations. The DOE would continue to maintain institutional controls to restrict groundwater use in the 200 West Area of the Hanford Site. Groundwater samples and monitoring, and evaluation of alternative remedial technologies, would assist with selecting remediation options, possibly leading to a final ROD. If the concentrations of technetium-99 reach a threshold level of ten times the MCL for technetium-99 during two consecutive sampling quarters at the extraction well or nearby monitoring wells, pumping would be restarted at the extraction well to capture the contamination.

The current pump-and-treat configuration of one extraction well successfully captures and hydraulically controls both technetium-99 and uranium plumes within the targeted baseline area of capture (Figure 6), removing and treating groundwater at a rate of approximately 190 L/min (50 gpm). The decision leading to the technical baseline change for this one-year period was based on the results of nearly five years of active groundwater treatment activities, groundwater monitoring results, and contaminant prediction modeling.

The majority of the technetium-99 plume has been remediated to the interim remedial action goal of 9,000 pCi/L (ten times the MCL). Only two small areas remain where technetium-99 concentrations are above the remediation goal: in the vicinity of well 299-W19-26 and well 299-W19-29 (Figure 4 and Appendix A).

- Well 229-W19-26 is located upgradient of the extraction well. The concentration of technetium-99 is slightly elevated above the RAO of 9,000 pCi/L. Fiscal year 1999 sampling data indicates a downward trend, which is expected to trend below the RAO in fiscal year 2000. This portion of the plume is expected to move past monitoring well 200-W19-20 prior to extraction well interception.
- Well 299-W19-29 is the only location where technetium-99 concentrations are expected to be above the RAO at the end of fiscal year 2000. This well is located

downgradient of the former injection well. The high technetium-99 concentrations in this well are believed to represent a localized slug of contaminants. It is estimated that this slug would take two to three years to migrate to the extraction well under operating conditions. Several monitoring wells are ideally located between this contaminant slug and the extraction well, allowing for plume monitoring and tracking.

The surface area of the contaminant slugs equals about 10% of total targeted remediation baseline area, resulting in 90% of the original targeted area being remediated below the RAO for technetium-99.

In contrast to technetium-99, little or no progress has been made in reducing uranium concentrations to the remediation goal of 480 ug/L, even after nearly five years of pumping (Figure 5). It appears that pumping would have to continue for an extended period of time before there would be any significant impact on uranium concentrations (Appendix B). The inability to remove uranium is believed to be due to the high degree of sorption to the aquifer sediments, retarding the rate of movement and extraction.

Based on the response of the contaminant plumes to remediation, changes in groundwater concentrations and prior regional modeling results, the following conclusions are drawn to substantiate the proposed year-long rebound monitoring and evaluation study.

- By fiscal year 2000, technetium-99 will have remediated to below the RAO of 9,000 pCi/L within the target area, with the exception of the localized plume identified at monitoring well 299-W19-29. Approximately 90% of the targeted remedial area will have met the technetium-99 RAO.
- The localized slug of technetium-99 at well 299-W19-29 will take two to three years to migrate to the extraction well.
- Little or no progress has been made remediating the uranium plume because of its strong sorption to the soils, and hence very slow rate of migration. Where technetium-99 concentrations have declined, uranium has shown no real change in overall concentrations.
- Previous regional modeling results indicated that without remediation and without the application of a retardation factor, both plumes would decay to below the MCL for technetium-99 and the MTCA for uranium before reaching the 200 East Area. Neither contaminant is predicted to intercept offsite receptors or the Columbia River at concentrations potentially harmful to human health or the environment.

For these reasons, it does not appear that continuous operation of the 200-UP-1 pump-and-treat system provides additional significant risk reduction for technetium-99 and uranium, or provide any additional benefit in protecting the public health and environment.

Remedial action objectives for uranium will not be met in the foreseeable future. Remediation of uranium at this site appears technically infeasible using the current pump-and-treat technology. Additional pumping to capture the last small upgradient slug of technetium-99 will not contribute immediately to further risk reduction because of the two to three year travel time to the extraction well.

The timing of the rebound monitoring program (January 2000 to January 2001) will not increase risk and would allow a timely opportunity to collect additional data and evaluate

alternative remedial technologies options, leading to a technically sound path forward for groundwater remediation at the 200-UP-1 Operable Unit. In addition, the current treatment of groundwater generates nearly eight hundred, 55-gallon drums of secondary waste each year. The waste requires special handling and disposal in an approved hazardous/radioactive landfill. This yearly waste stream would be eliminated while the proposed rebound-monitoring program is implemented.

Rebound-Monitoring Program: Approximately seventeen wells were historically included in the 200-UP-1 Operable Unit monitoring program (Figure 1). This included the previously used injection well, the downgradient extraction well, twelve intermediate plume monitoring wells, two lateral plume monitoring wells, and an additional monitoring well down gradient of the extraction well. Due to a declining water table (closure of surface trenches and cribs), approximately half of the monitoring wells have gone dry or are in the process of going dry if the water table continues to decline as predicted. Therefore nine wells have been identified as priority wells. These wells are expected to have screen intervals remaining below the water table in fiscal year 2000 (Figure 7):

- The former injection well (299-W19-36) and extraction well (299-W19-39).
- Four intermediate monitoring wells (299-W19-34A, -37, -23, and -20).
- Two lateral plume boundary monitoring wells (299-W19-2 and 299-W19-35).
- Monitoring well 299-W19-40, located downgradient of the extraction well.

The remain 200-UP-1 Operable Unit monitoring wells will be sampled and analyzed as long as physically practicable or until the well is dry.

At the completion of the one-year study, an evaluation report will be presented, recommending whether to initiate pumping or continue the monitoring program. Recommendations will be discussed with the Tri-Parties for concurrence.

Contingency Plan: In lieu of the pump-and-treat system, the following contingencies would be implemented to ensure continued protection of human health and the environment while the one-year monitoring study is implemented. Extraction well 299-W19-39 and monitoring wells 299-W19-38 (south-southwest of the extraction well and potentially going dry), 299-W19- 20 (just upgradient of the extraction well), and 299-W19-40 (downgradient of the extraction well) have been selected as operable unit "action wells" (Figure 7). Groundwater data will be collected from additional upgradient and side gradient monitoring well to evaluate plume migration and trends.

- Groundwater sampling will continue, in order to track changes in configuration of the plumes, plume concentrations, and plume movement.
- If the concentration of technetium-99 exceeds the RAO of 9,000 pCi/L at an "action well" for two consecutive quarters, the extraction well pump will be reactivated.
- If uranium concentration levels significantly increase at an "action well" for two consecutive quarters, the extraction well pump will be reactivated. (A significant increase has been arbitrarily selected as five times the average fiscal year 1999 well concentration.)
- The pumping system and pipeline will undergo periodic surveillance and maintenance, as needed, so it can be reactivated if the above threshold values are exceeded.

- Additional groundwater modeling may be performed when the standard Hanford Site groundwater model is completed, to confirm that the plumes decay to less than the MCL and MTCA levels before reaching the 200 East Area.

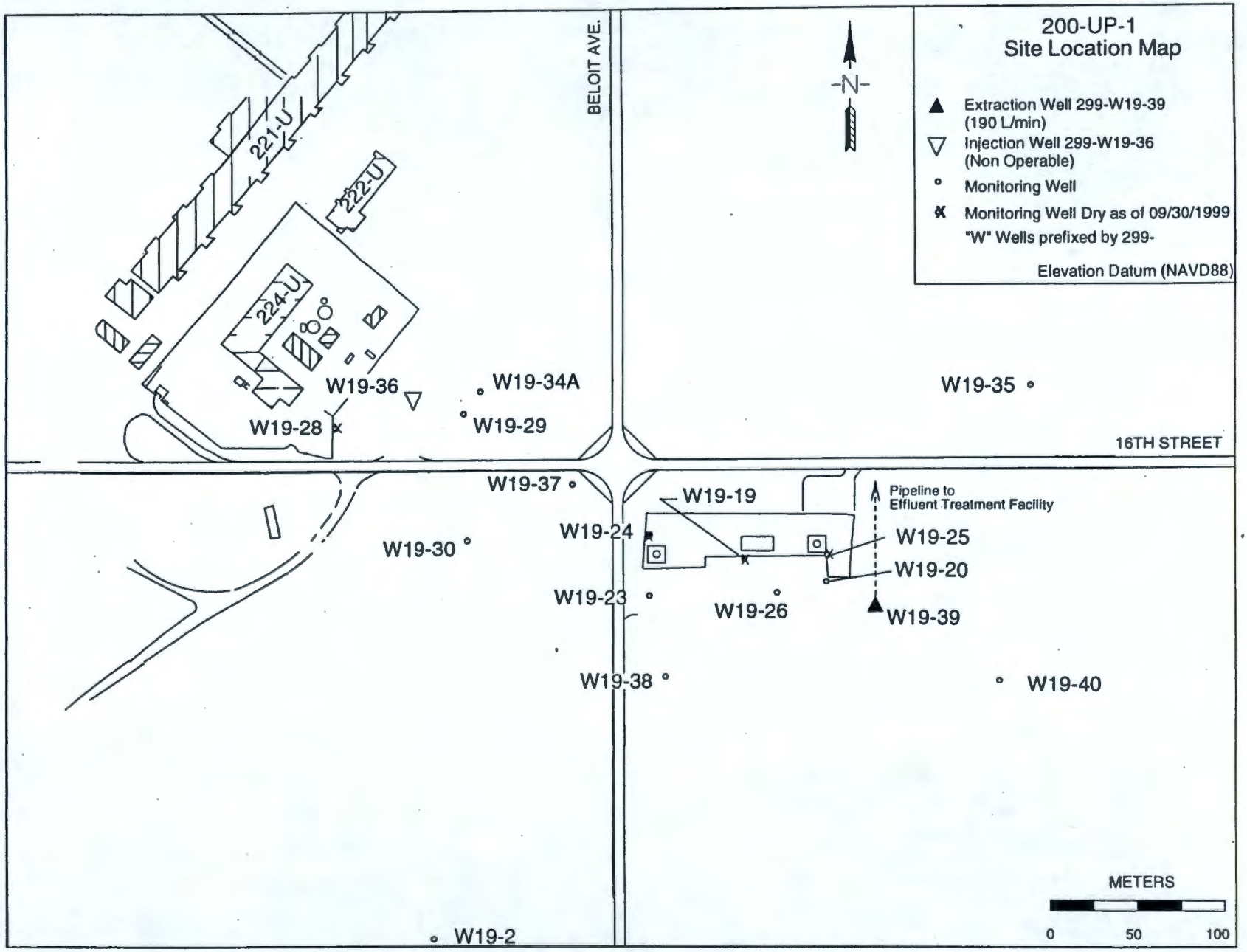


FIGURE 1: 200-UP-1 Operable Unit Well Location Map

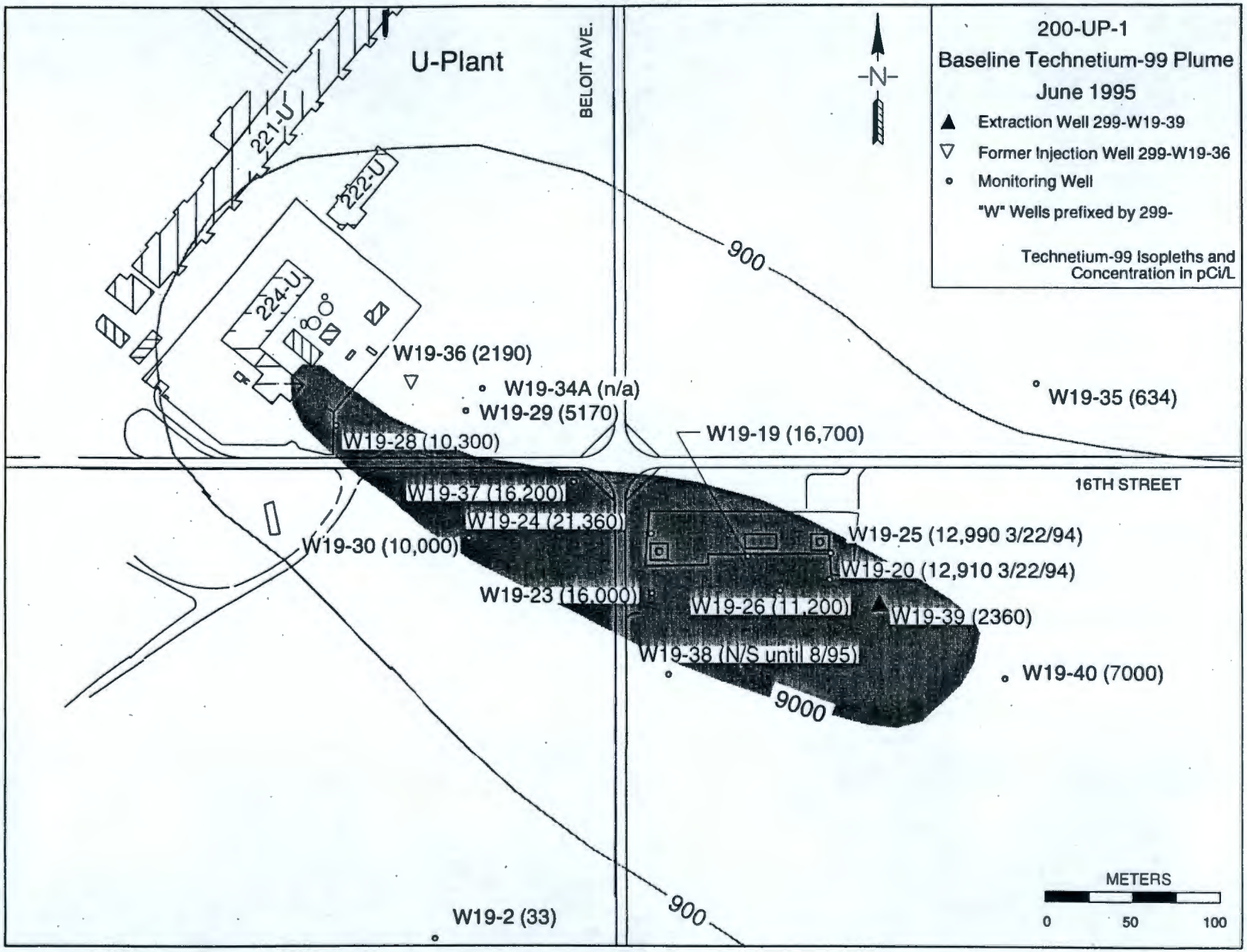


FIGURE 2: 200-UP-1 Operable Unit Baseline Technetium-99 Groundwater Plume

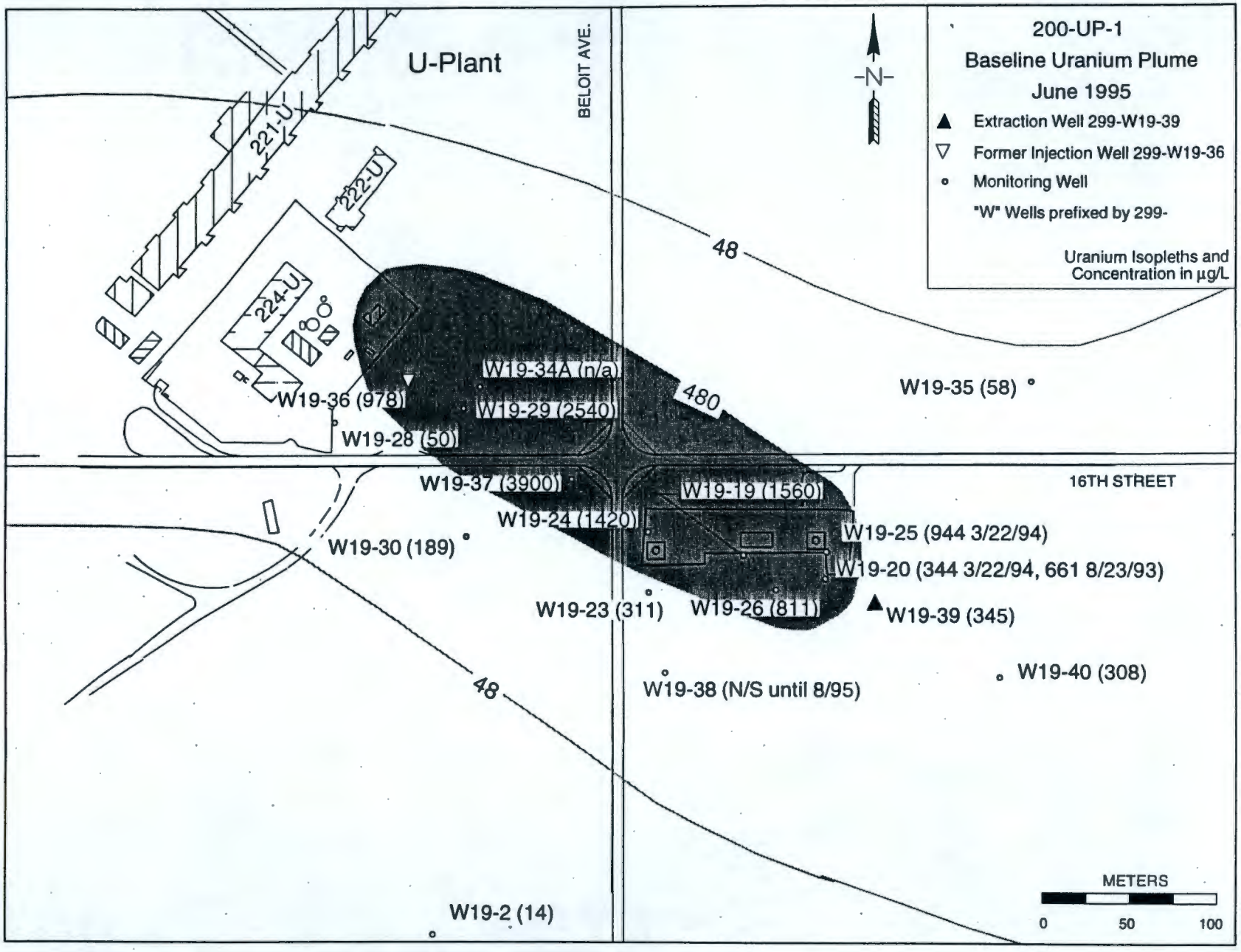
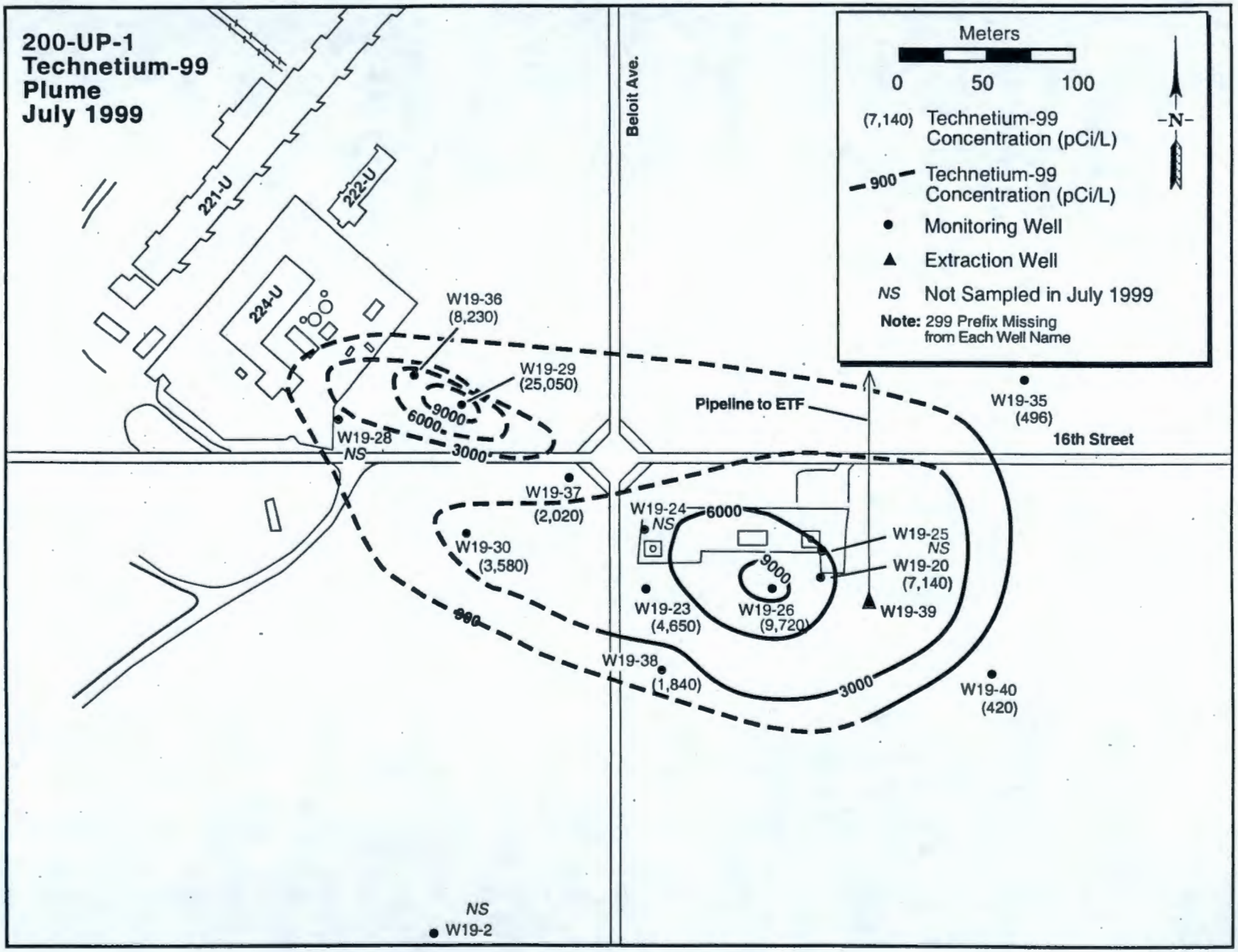
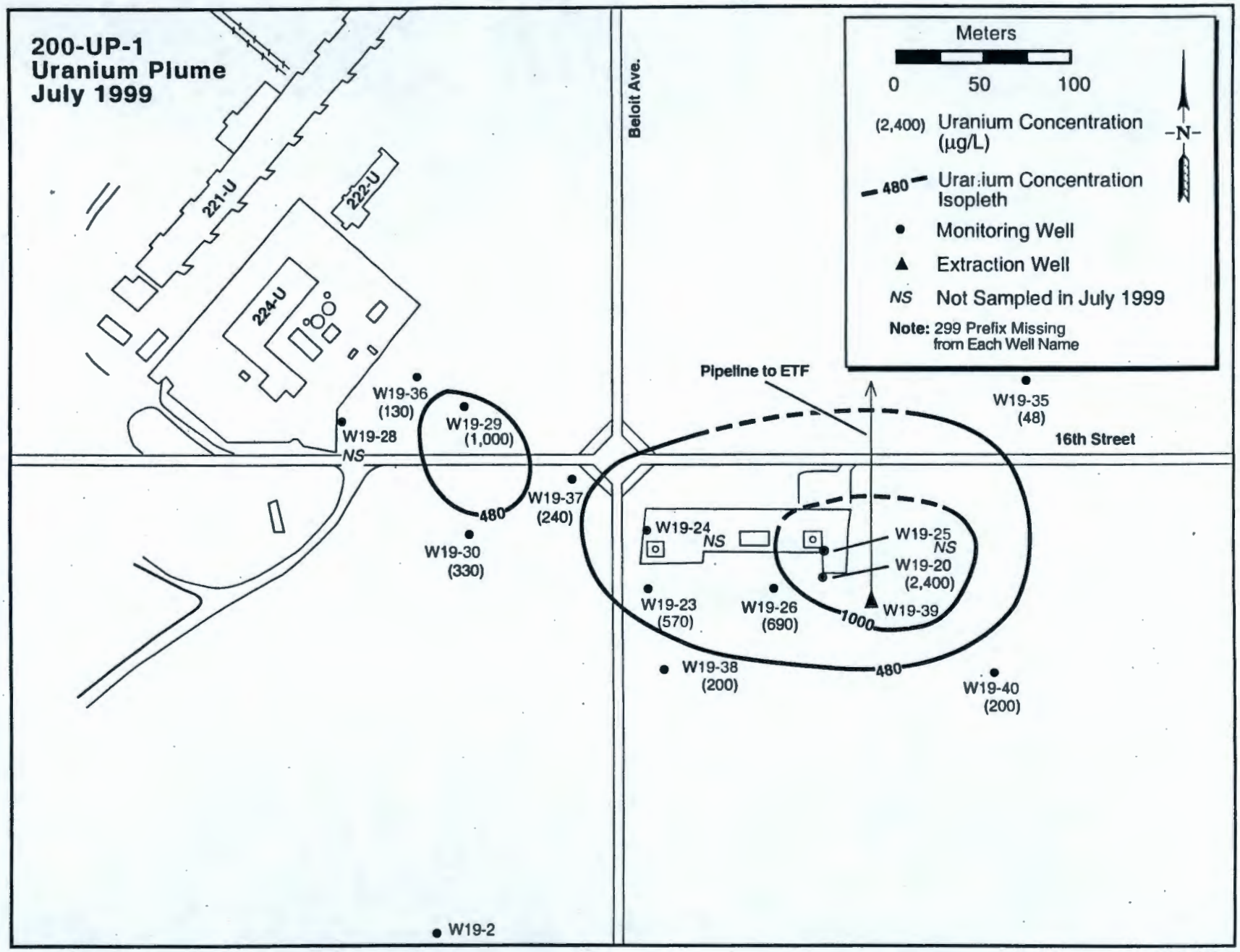


FIGURE 3: 200-UP-1 Operable Unit Baseline Uranium Groundwater Plume



E9910117_3

FIGURE 4: 200-UP-1 Operable Unit Technetium-99 Groundwater Plume (July 1999)



E9910117_2

FIGURE 5: 200-UP-1 Operable Unit Uranium Groundwater Plume (July 1999)

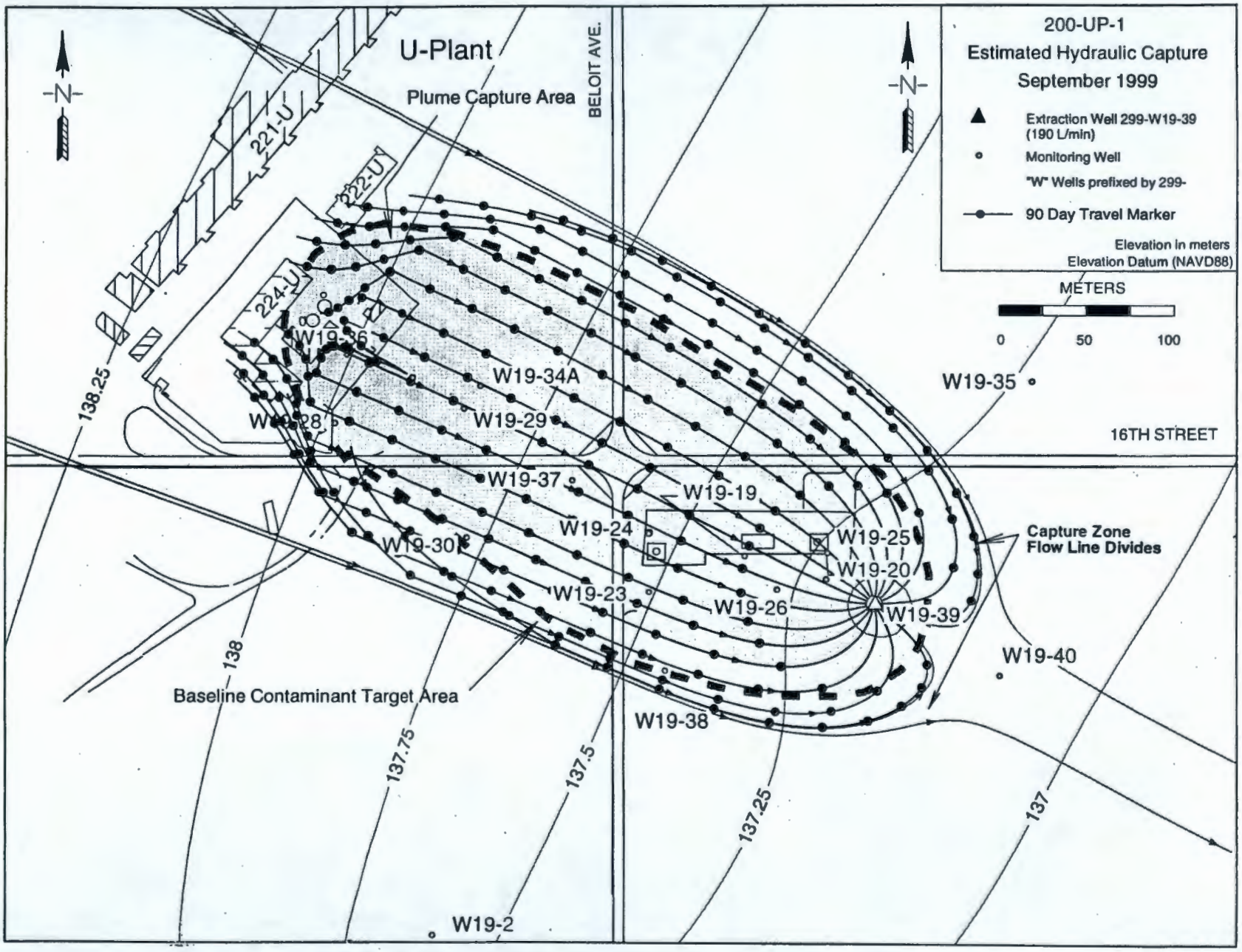


FIGURE 6: 200-UP-1 Operable Unit
Estimated Hydraulic Capture Area, Extraction Well 299-W19-39

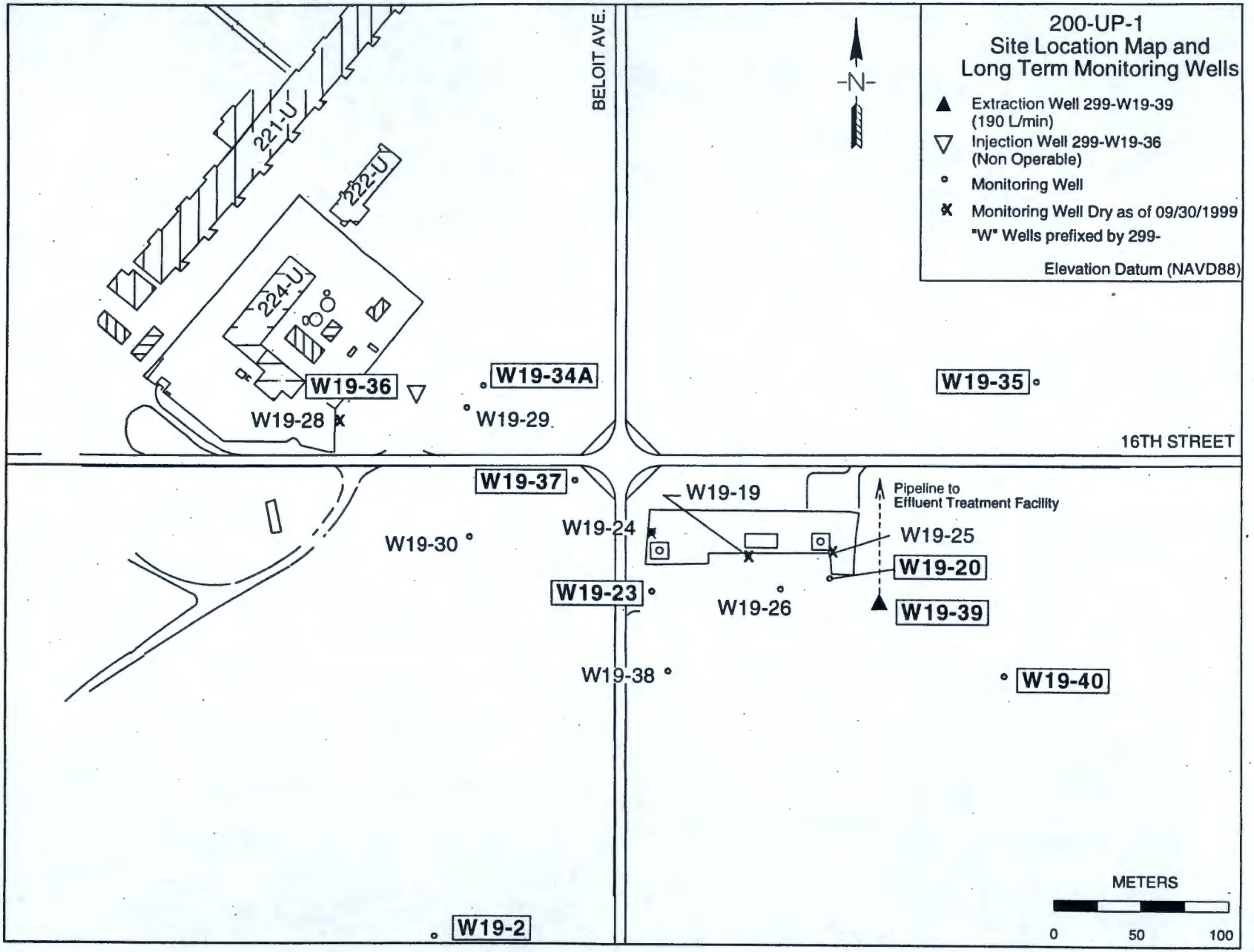
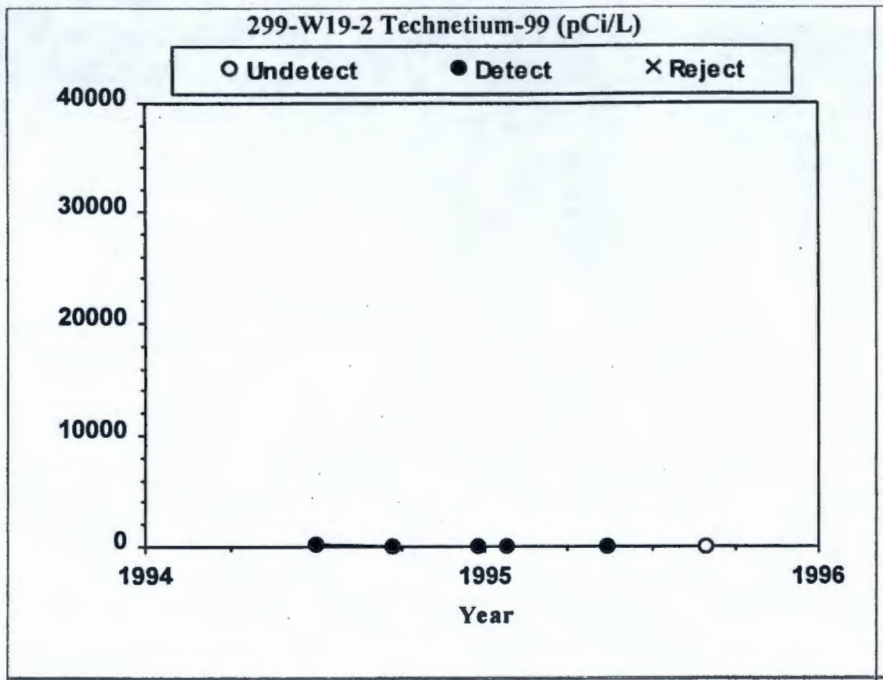


FIGURE 7: 200-UP-1 Operable Unit Long Term-Monitoring Well Location Map

APPENDIX A:

200-UP-1 Operable Unit
Technetium-99 Concentration Trends
Selected Monitoring Wells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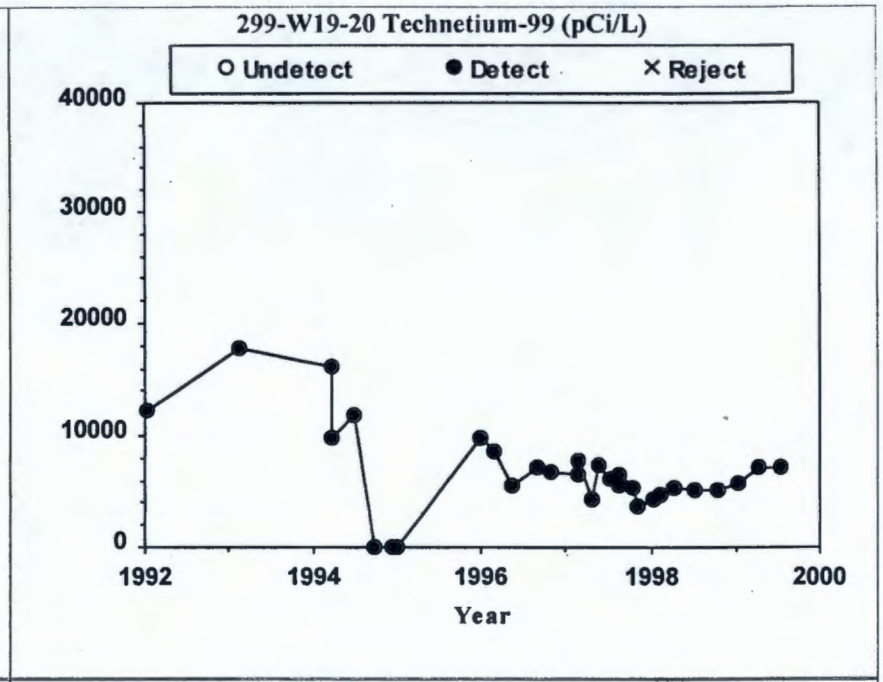
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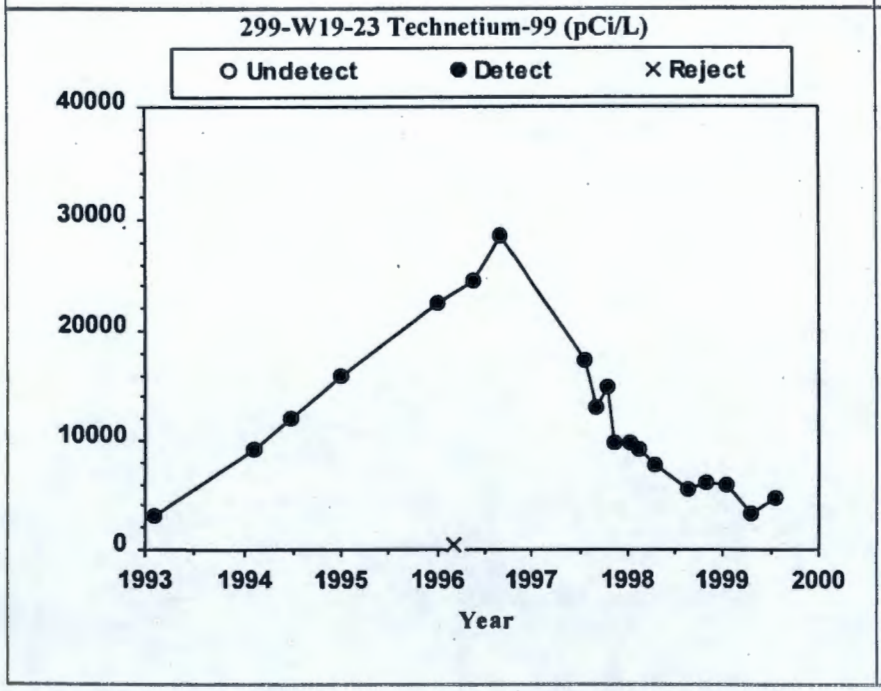
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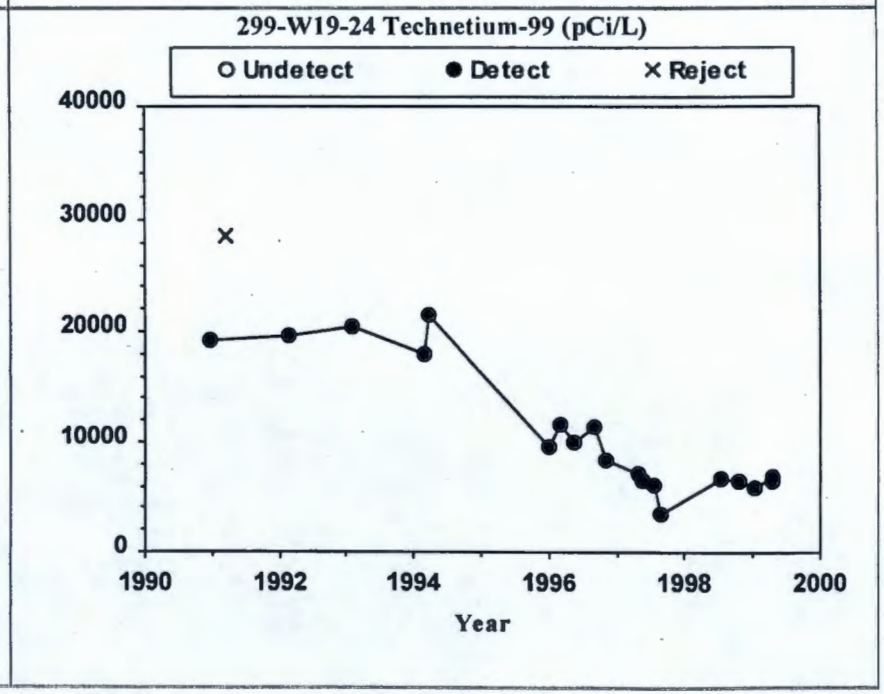
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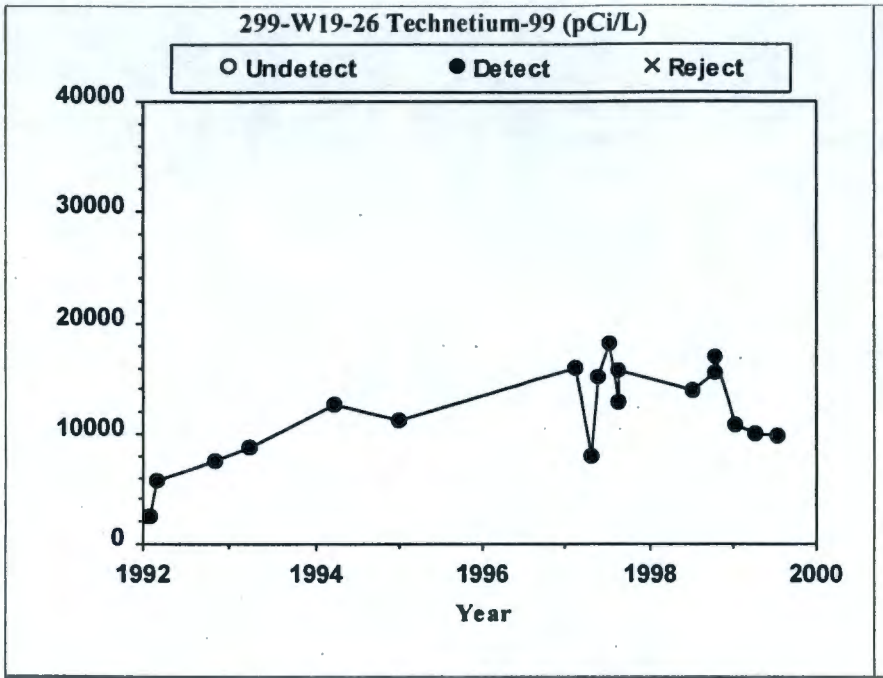
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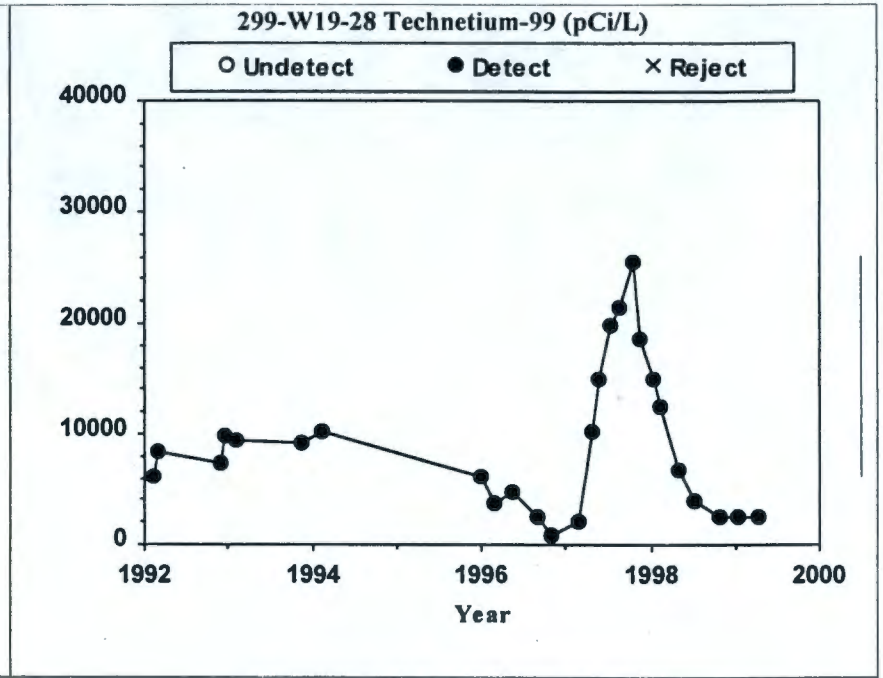
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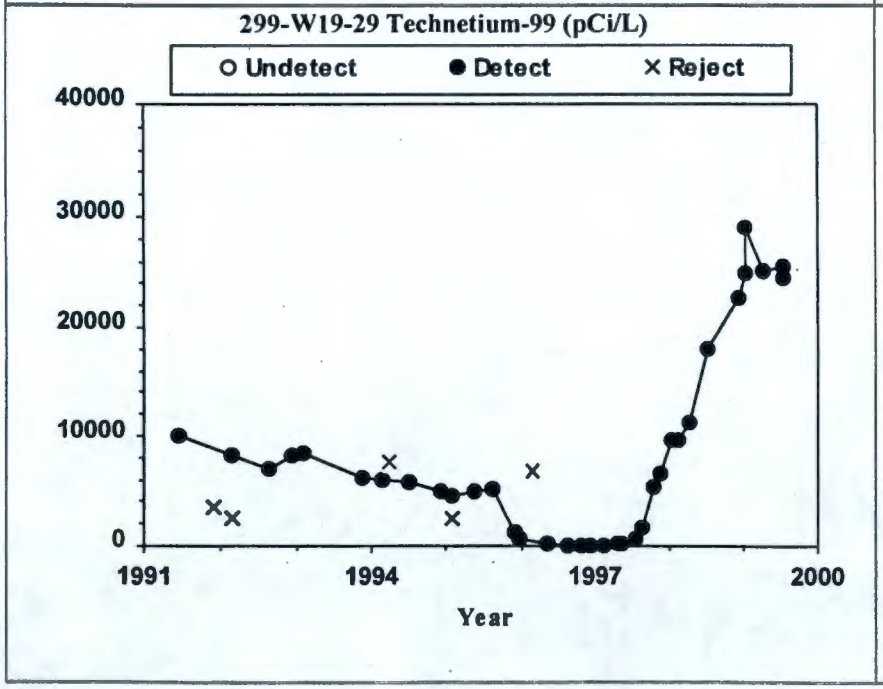
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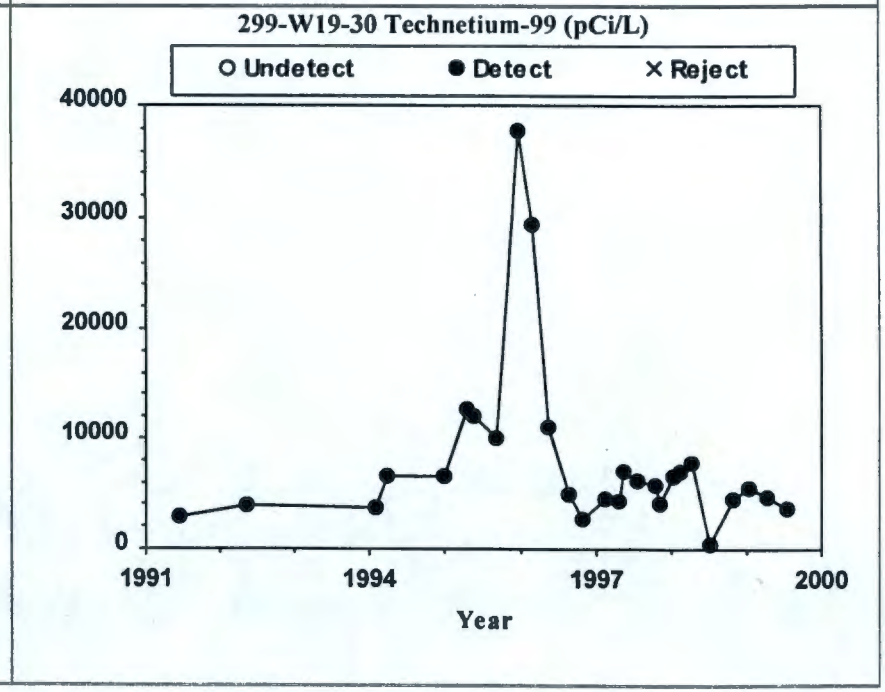
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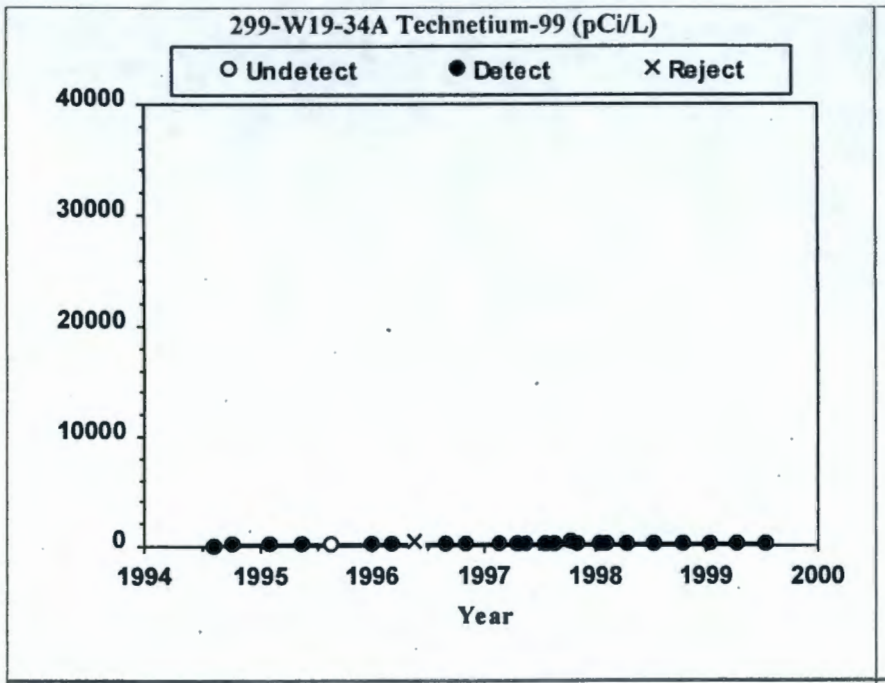
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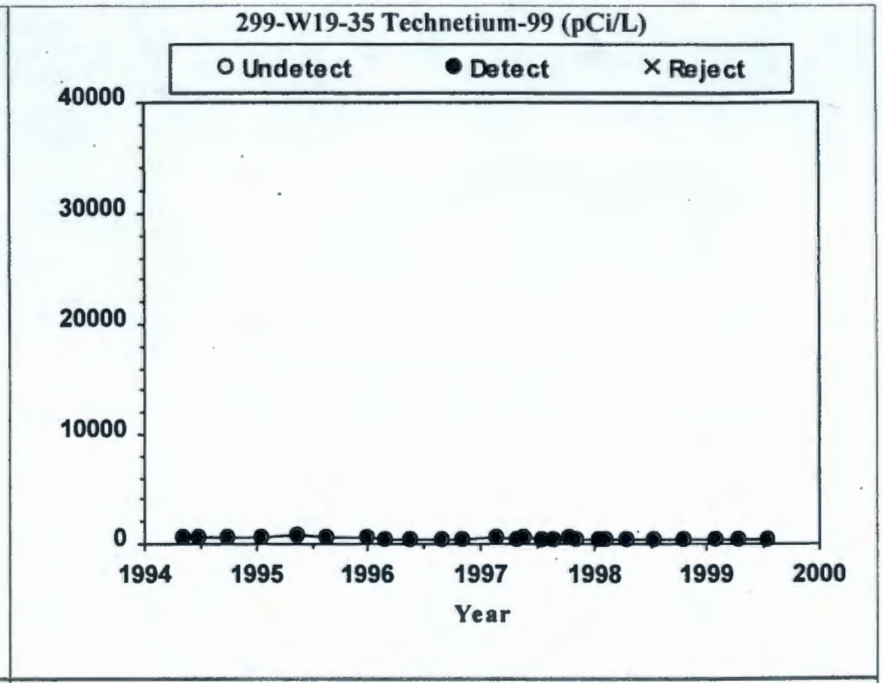
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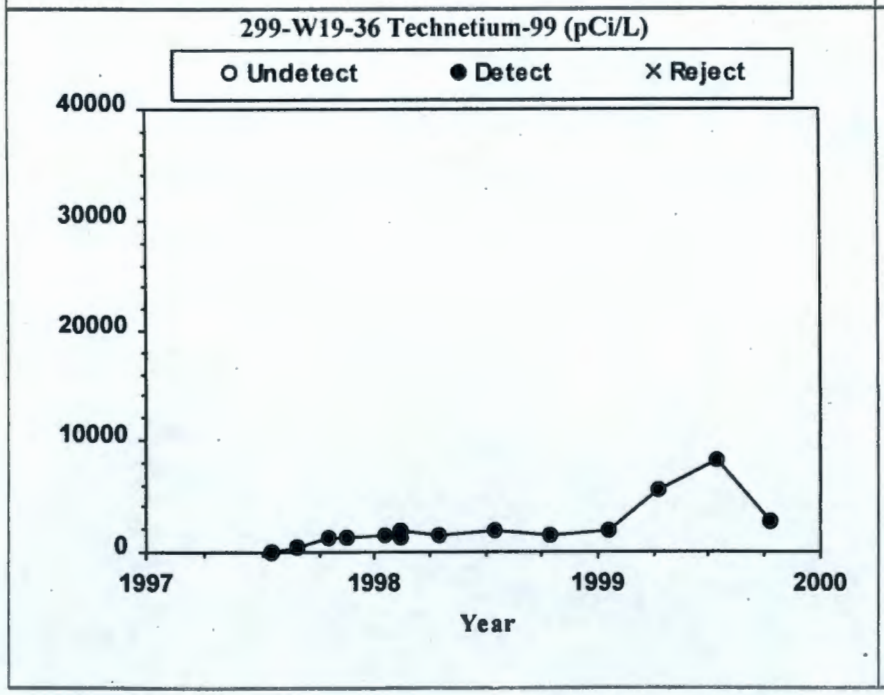
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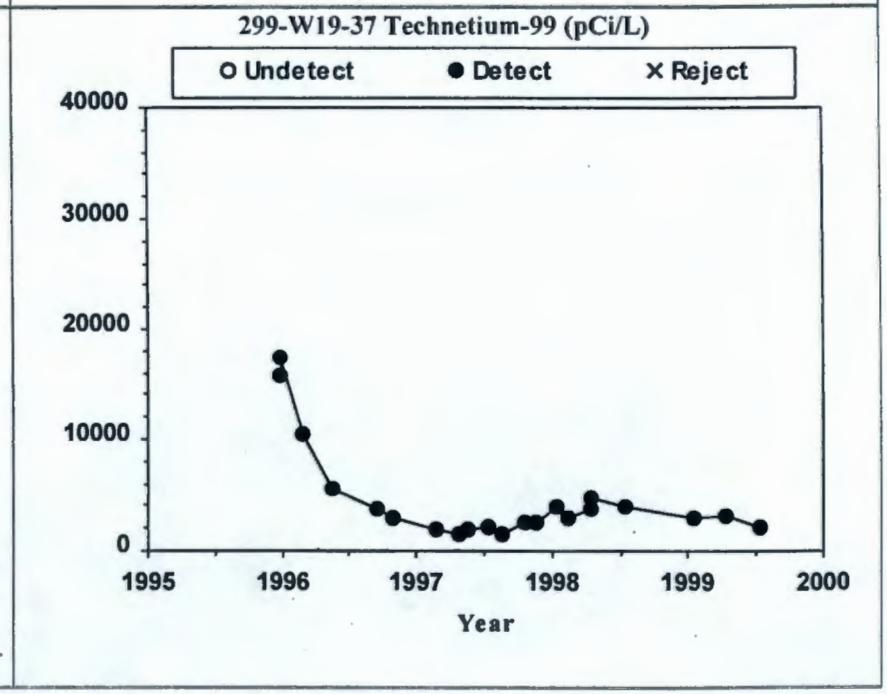
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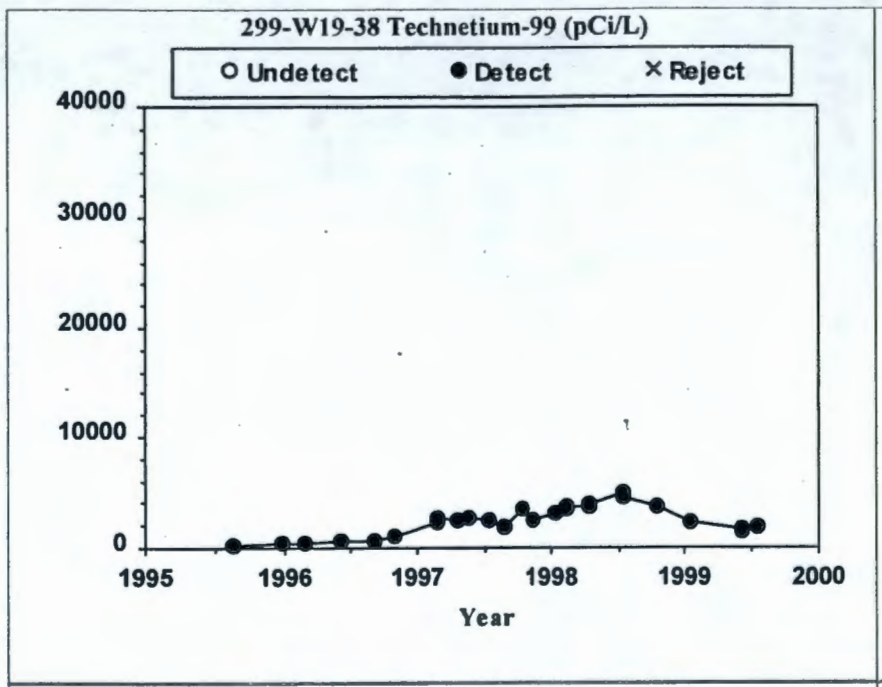
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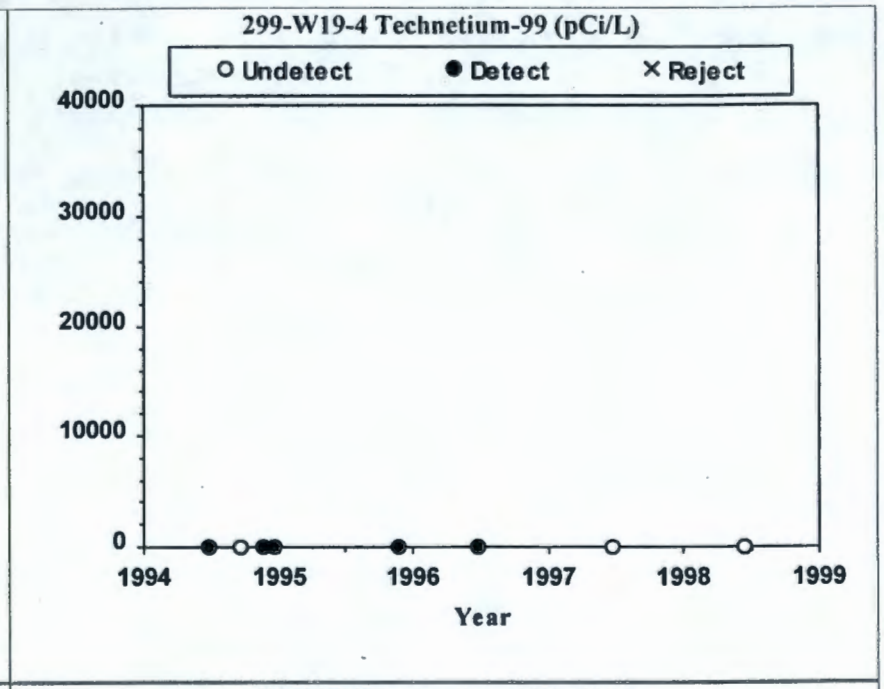
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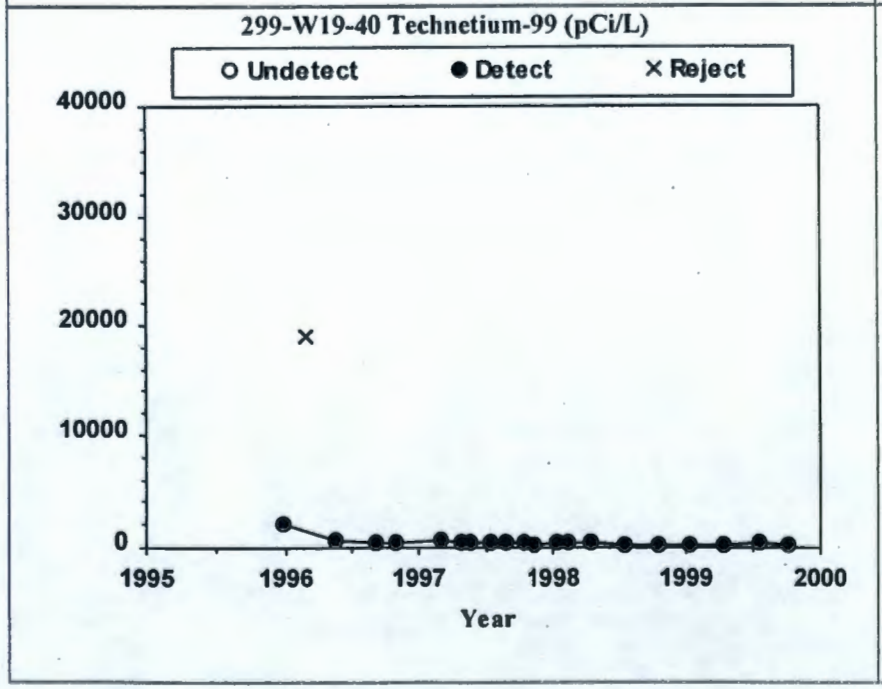
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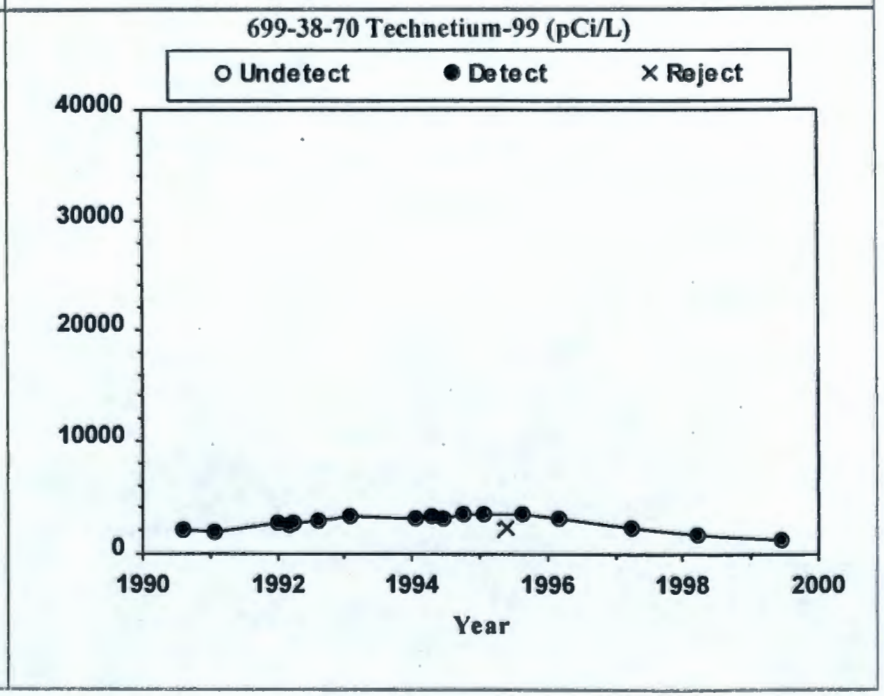
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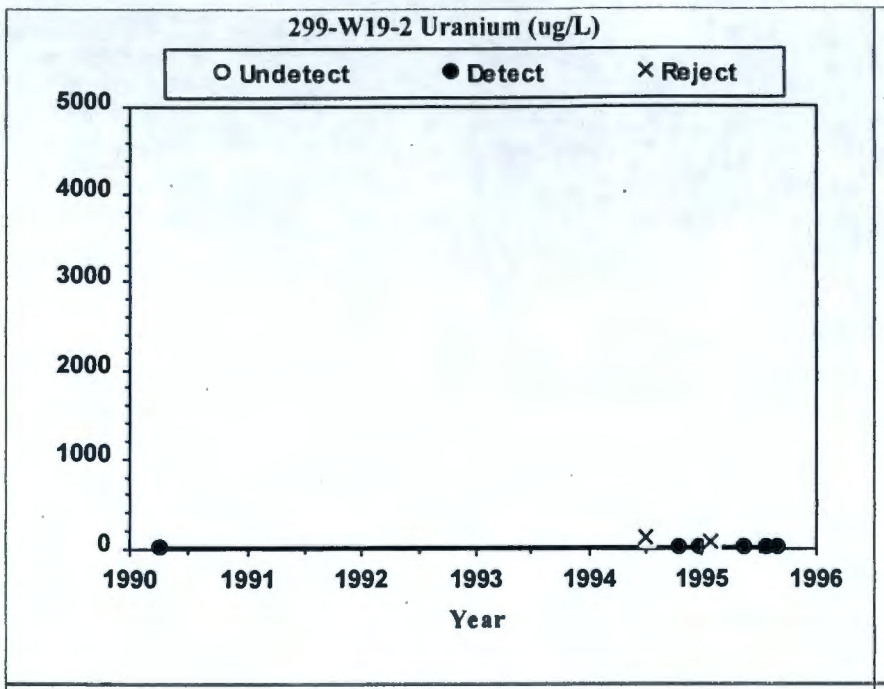
APPENDIX B:

200-UP-1 Operable Unit
Uranium Concentration Trends
Selected Monitoring Wells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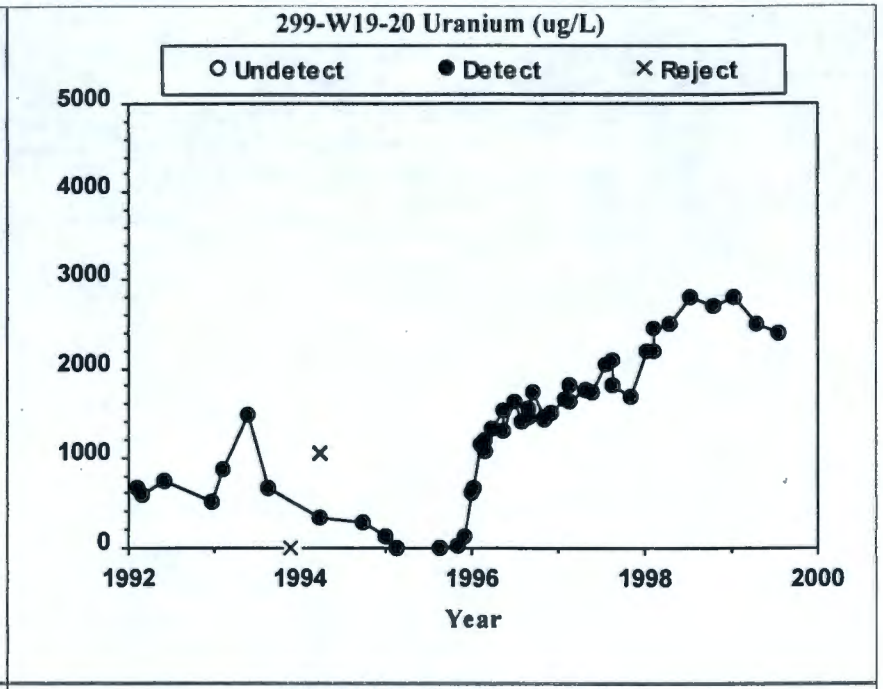
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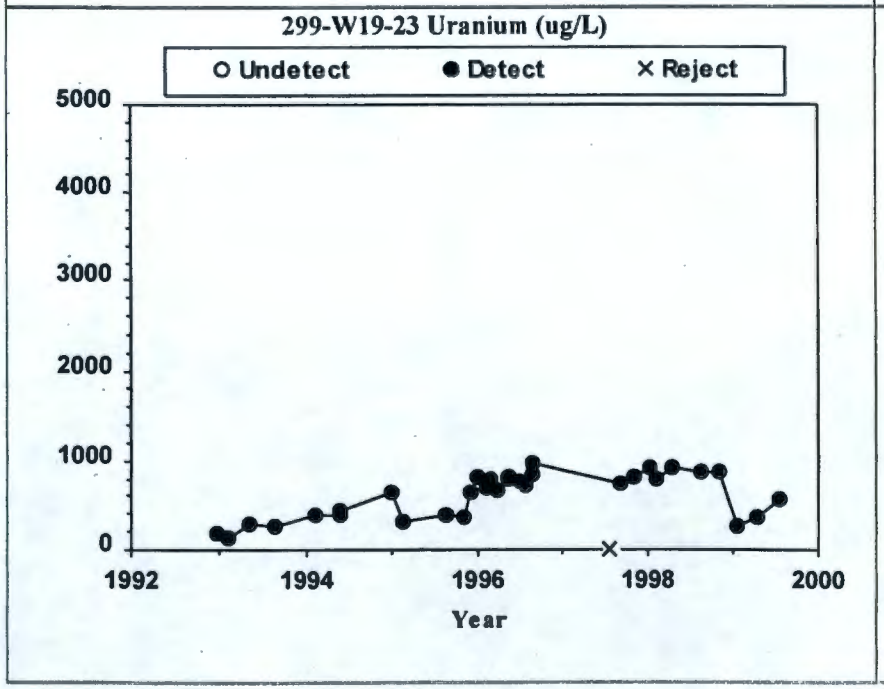
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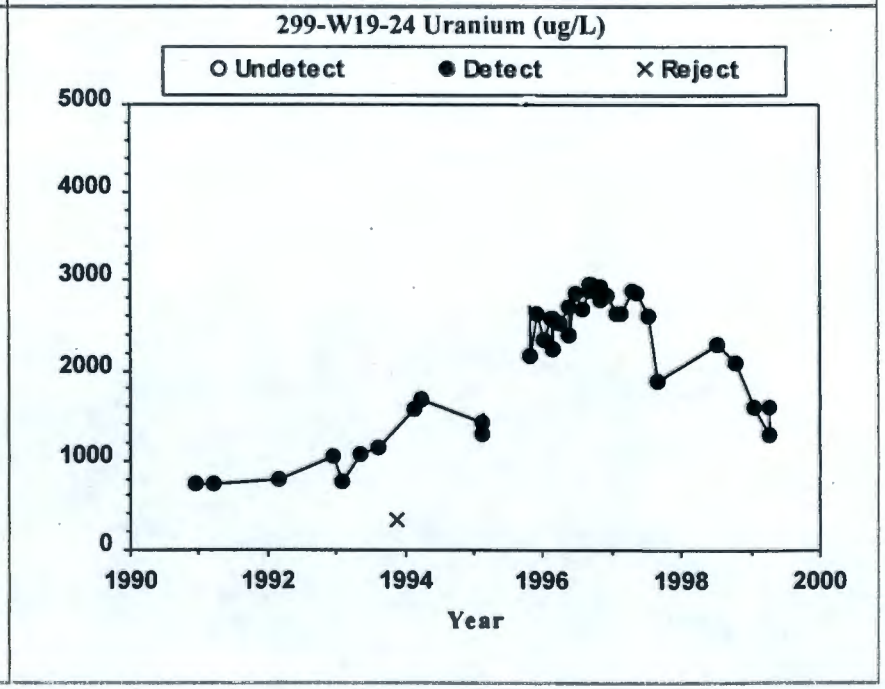
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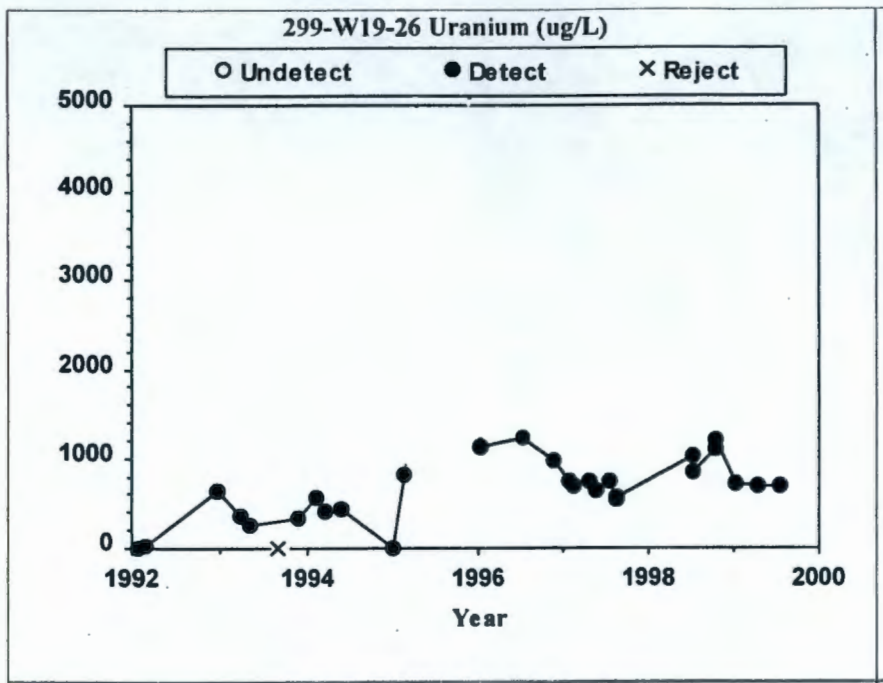
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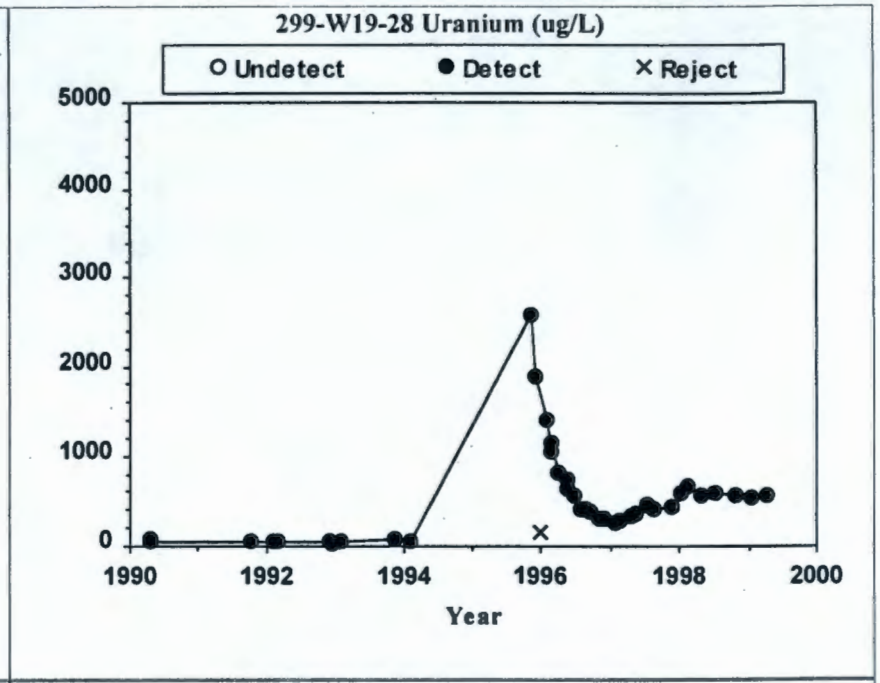
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● Detect
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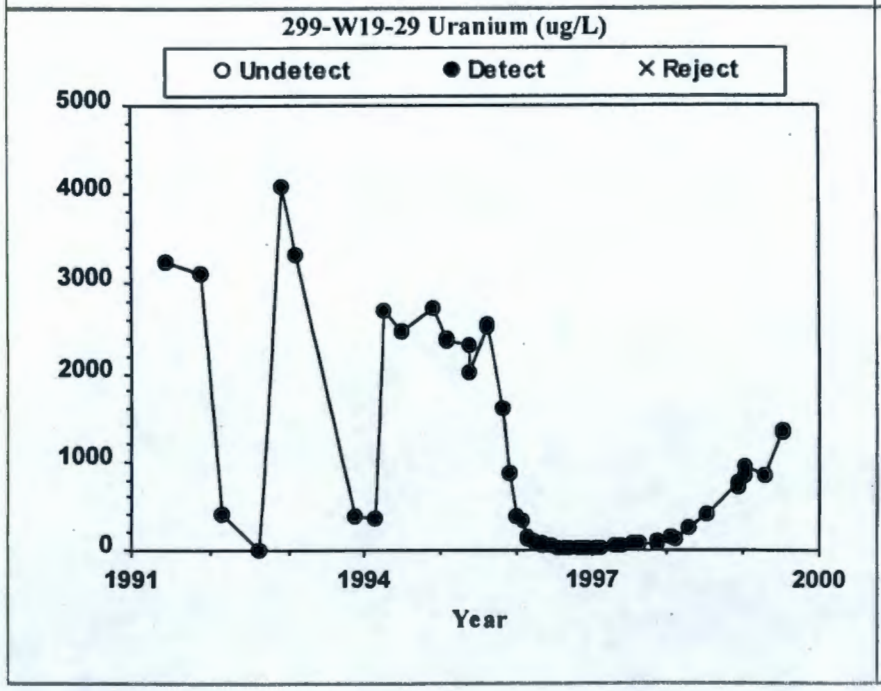
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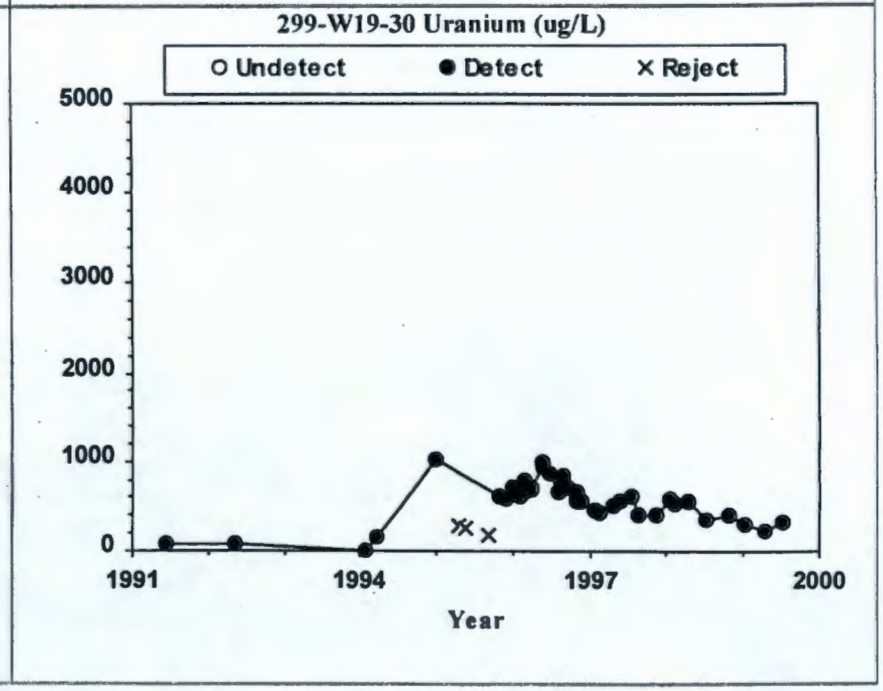
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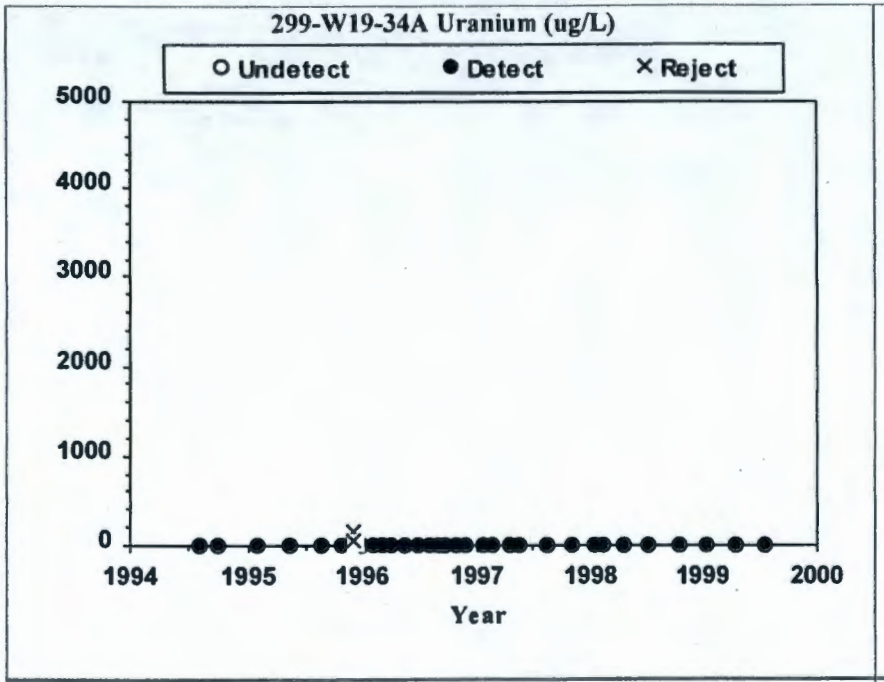
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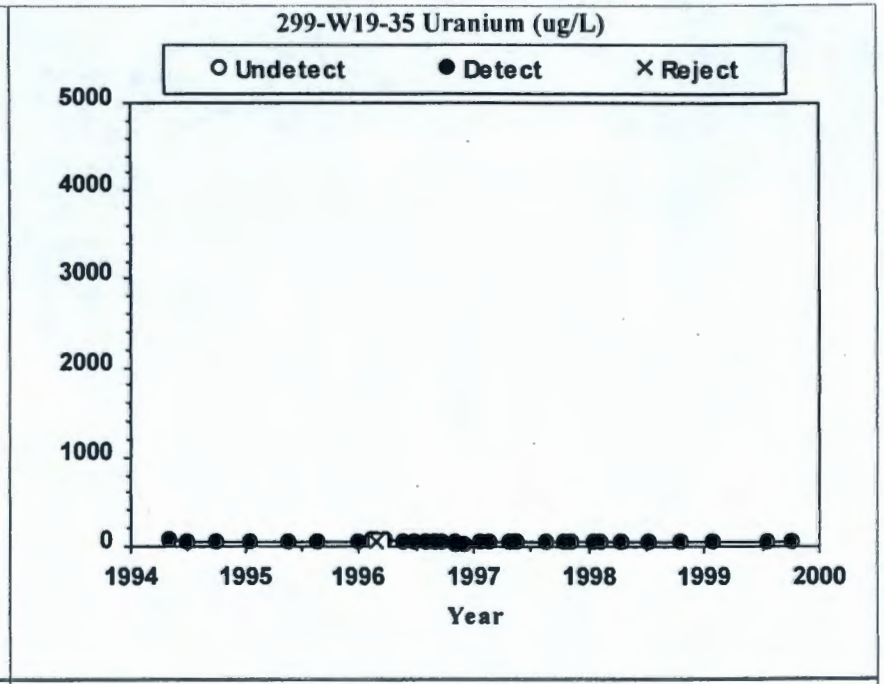
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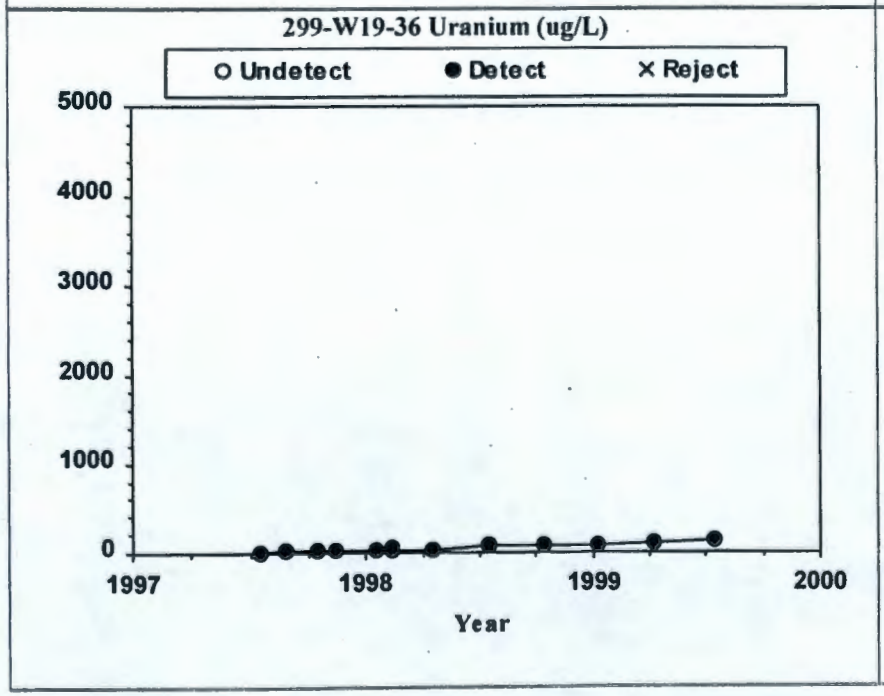
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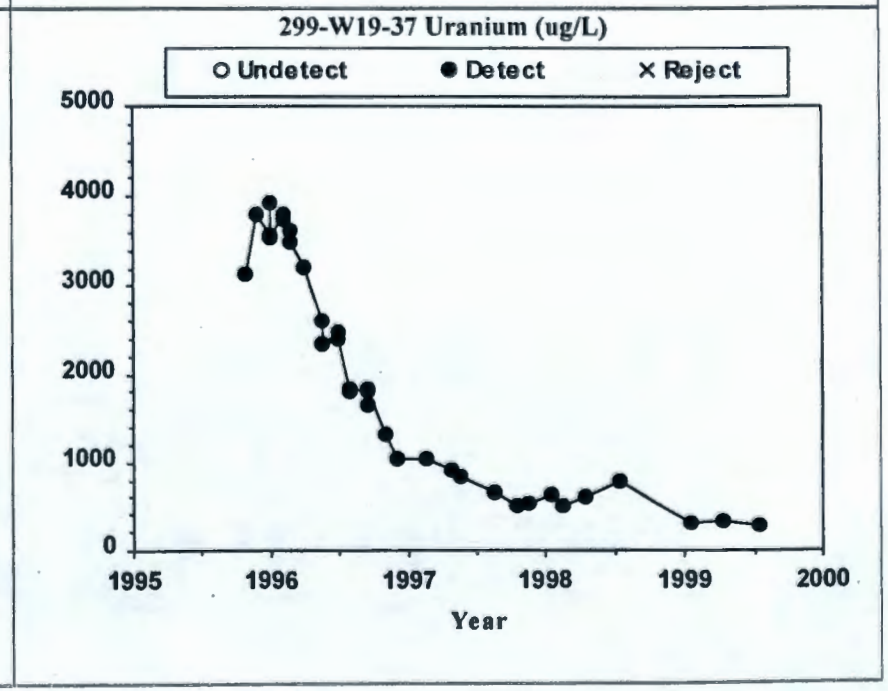
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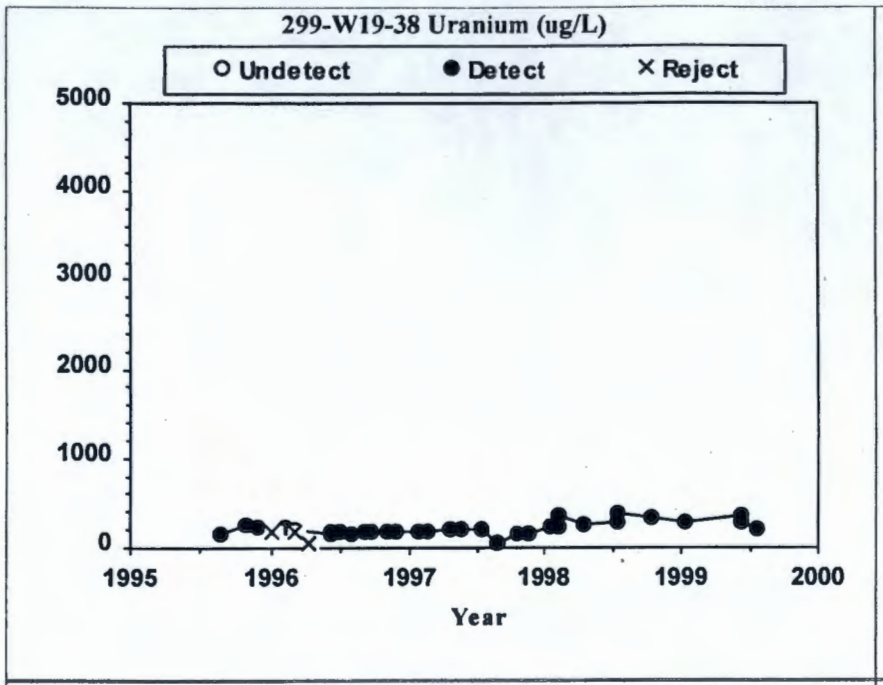
299-W19-38 Uranium (ug/L)
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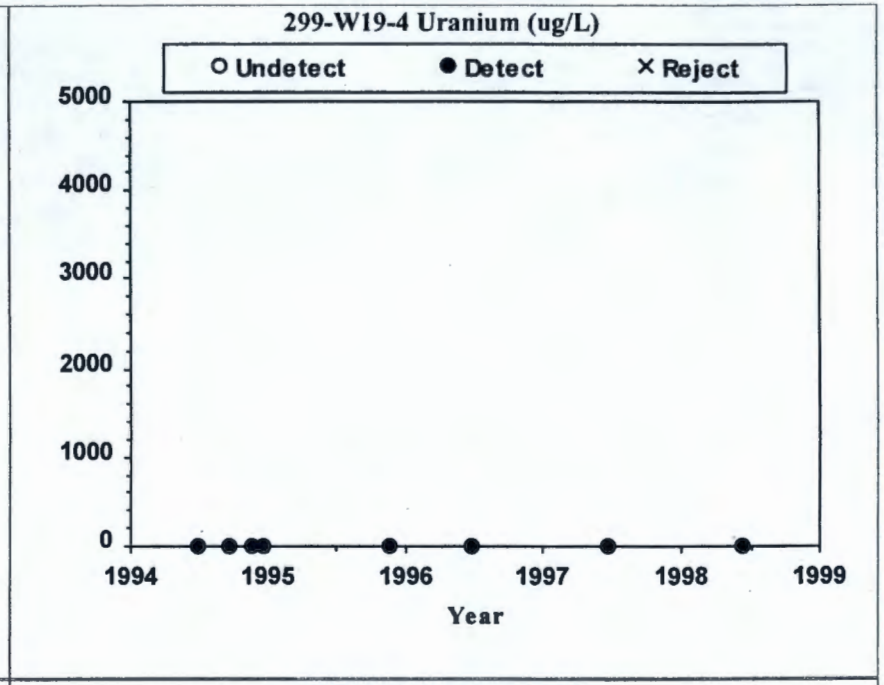
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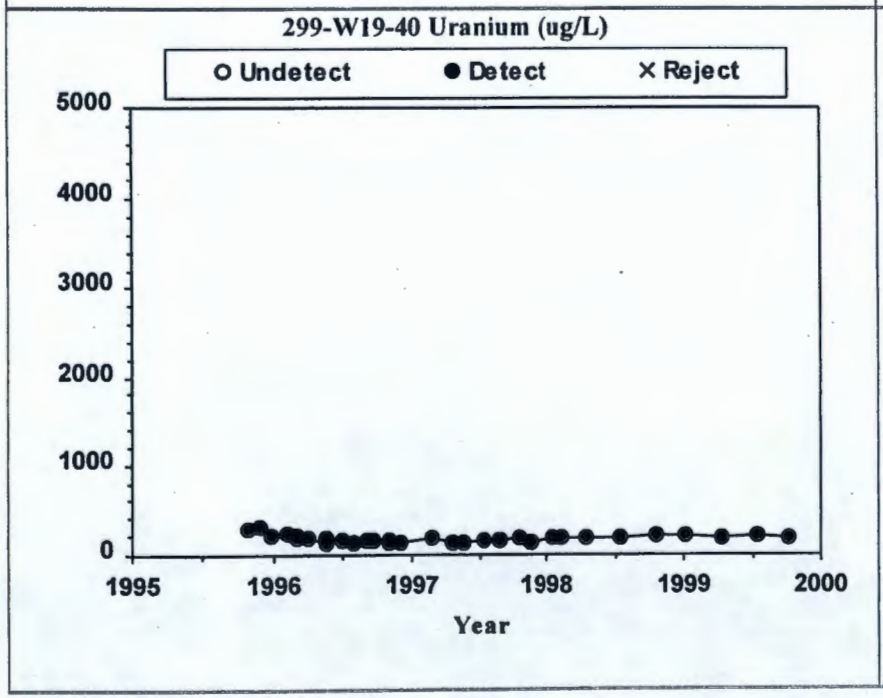
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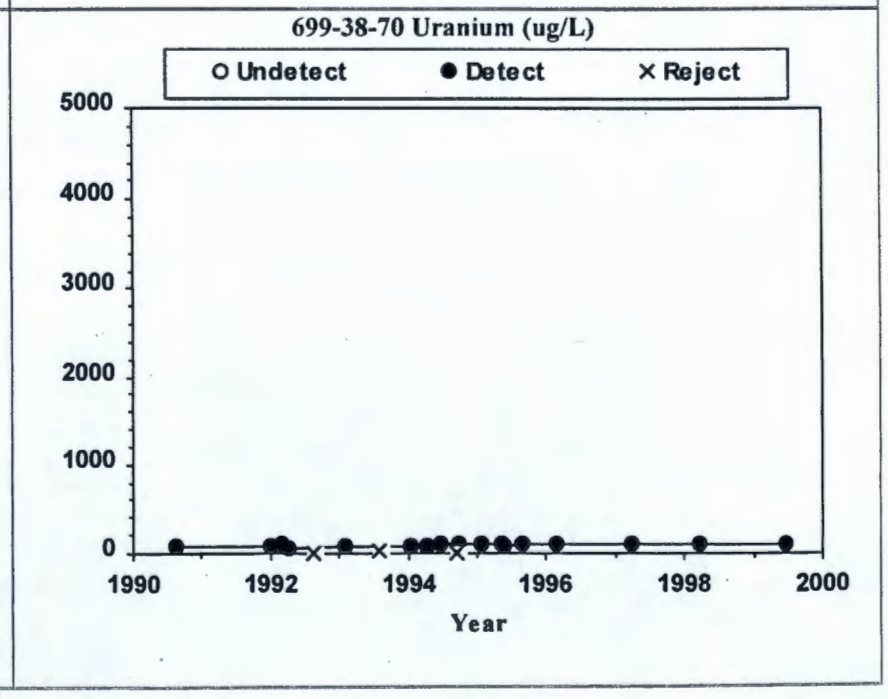
699-38-70 Uranium (ug/L)
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Attachment 7

Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites FY 1997 - FY 2000

082095

200-ZP-2 Location (Well or Probe) /feet bgs	Site	Zone	November 1996 - July 1997 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	October 1997 - September 1998 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	July 1998 - September 1999 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	July 1999 - December 1999 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound
79-03/ 5 ft	Z-18	1	0	8	0	3	0	12		
79-06/ 5 ft	Z-1A	1	not measured		not measured		1.4	12		
79-11/ 5 ft	Z-1A	1	0	8	0	6	2.9	12		
86-05/ 5 ft	Z-9	1	not measured		not measured		0	3		
86-05-01/ 5 ft	Z-9	1	not measured		not measured		0	3		
86-06/ 5 ft	Z-9	1	1.3	8	0	9	1.9	6		
87-05/ 5 ft	Z-1A	1	not measured		0	3	1.0	12		
87-09/ 5 ft	Z-1A	1	not measured		1.5	3	2.6	12		
94-02/ 5 ft	Z-9	1	0	8	not measured		1.4	3		
95-11/ 5 ft	Z-9	1	0	8	2.1	9	2.5	6		
95-12/ 5 ft	Z-9	1	1.1	8	1.5	9	1.3	6		
95-14/ 5 ft	Z-9	1	not measured		not measured		0	3		
CPT-13A/ 9 ft	Z-1A	2	not measured		0	6	1.0	12		
CPT-16/ 10 ft	Z-9	2	not measured		0	9	1.5	6		
CPT-17/ 10 ft	Z-9	2	not measured		4.2	9	5.1	6	3.1	6
CPT-18/ 15 ft	Z-9	2	not measured		6.5	9	5.0	6	4.3	6
CPT-31/25 ft	Z-1A	2	not measured		0	6	0	12		
CPT-16/ 25 ft	Z-9	2	not measured		not measured		not measured		0	6
CPT-32/ 25 ft	Z-1A	2	not measured		9.1	6	10	12	1.5	3
CPT-30/ 28 ft	Z-18	2	not measured		not measured		3.2	12	1.4	3
CPT-13A/ 30 ft	Z-1A	2	2.2	8	not measured		not measured		1.6	3
CPT-7A/ 32 ft	Z-1A	2	not measured		2.3	6	5.4	12	2.8	3
CPT-27/ 33 ft	Z-9	2	1.2	8	not measured		not measured		1.2	6
CPT-1A/ 35 ft	Z-18	2	2.0	8	1.4	3	3.0	12	3.1	3
CPT-33/ 40 ft	Z-1A	2	not measured		2.0	3	2.6	12		
CPT-34/ 40 ft	Z-18	2	2.3	8	not measured		1.7	12		
CPT-21A/ 45 ft	Z-9	2	65.6	8	52.7	9	57	3	78	6
W15-220ST/ 52 ft	Z-9	2	2	8	not measured		1.6	3		
CPT-28/ 60 ft	Z-9	2	not measured		1.5	0	3.7	3		
CPT-9A/ 60 ft	Z-9	2	45.5	8	41.1	0	44	3	44	6
CPT-30/ 68 ft	Z-18	2	1.7	8	not measured		3.0	12		
CPT-13A/ 70 ft	Z-1A	2	5.2	8	not measured		5.6	12		
CPT-24/70 ft	Z-9	2	not measured		3.2	9	3.6	3		
W15-219SST/ 70 ft	Z-9	2	14.6	8	not measured		7.6	3		
CPT-31/ 76 ft	Z-1A	2	4.0	8	not measured		4.2	12		
CPT-33/ 80 ft	Z-1A	2	5.8	8	not measured		9.2	12		
W15-82/ 82 ft	Z-9	2	28.9	8	5.5	9	46	6	43	6
W15-95/ 82 ft	Z-9	2	not measured		15.3	9	39	6	12	6
CPT-21A/ 86 ft	Z-9	2	221	8	206	9	148	6	133	6
CPT-34/ 86 ft	Z-18	2	36.3	8	5.9	3	0	12		
W15-218SST/ 86 ft	Z-9	2	not measured		not measured		0	3		
CPT-28/ 87 ft	Z-9	2	280	8	230	9	203	6	180	6
CPT-1A/ 91 ft	Z-18	2	3.9	8	not measured		4.2	12		
CPT-4A/ 91 ft	Z-1A	2	not measured		7.7	3	14	12		
CPT-9A/ 91 ft	Z-9	2	103	8	34.5	9	72	3		
W18-252SST/ 100 ft	Z-1A	2	38.2	8	17.8	3	24	12		
W18-152/ 113 ft	Z-12	2	46.8	8	11.1	3	33	12	25	3
W15-217/ 115 ft	Z-9	3	797	8	630	9	561	6	370	6
CPT-24/ 118 ft	Z-9	3	44.6	8	37.7	9	37	6		
W15-220SST/ 118 ft	Z-9	4	21.9	8	not measured		36	3		
W18-158L/ 123 ft	Z-1A	3	not measured		143	3	492	12	134	3
W18-167/ 123 ft	Z-1A	3	323	8	79.7	3	228	12	144	3
W15-219SST/ 130 ft	Z-9	4	298	8	not measured		47	3		
W18-249/ 134 ft	Z-18	3	206	8	20.4	3	215	12	173	3
W18-248/ 136 ft	Z-1A	3	288	8	86.3	3	177	12	130	3
W15-219SST/ 155 ft	Z-9	5	59.6	8	not measured		24	3		
W15-220SST/ 185 ft	Z-9	5	14.5	8	not measured		13	3		
W15-6L/ 189 ft	Z-9	6	22.6	8	17.8	9	1.3	6		
W15-9L/ 189 ft	Z-9	6	18.3	8	15.0	9	15	6	12	6
W18-7/ 200 ft	Z-1A	6	28.5	8	17.3	3	29	12		
W18-6L/ 208 ft	Z-1A	6	36	8	31.3	6	15	12		
W18-12/ 210 ft	Z-18	6	not measured		3.8	3	19	12		

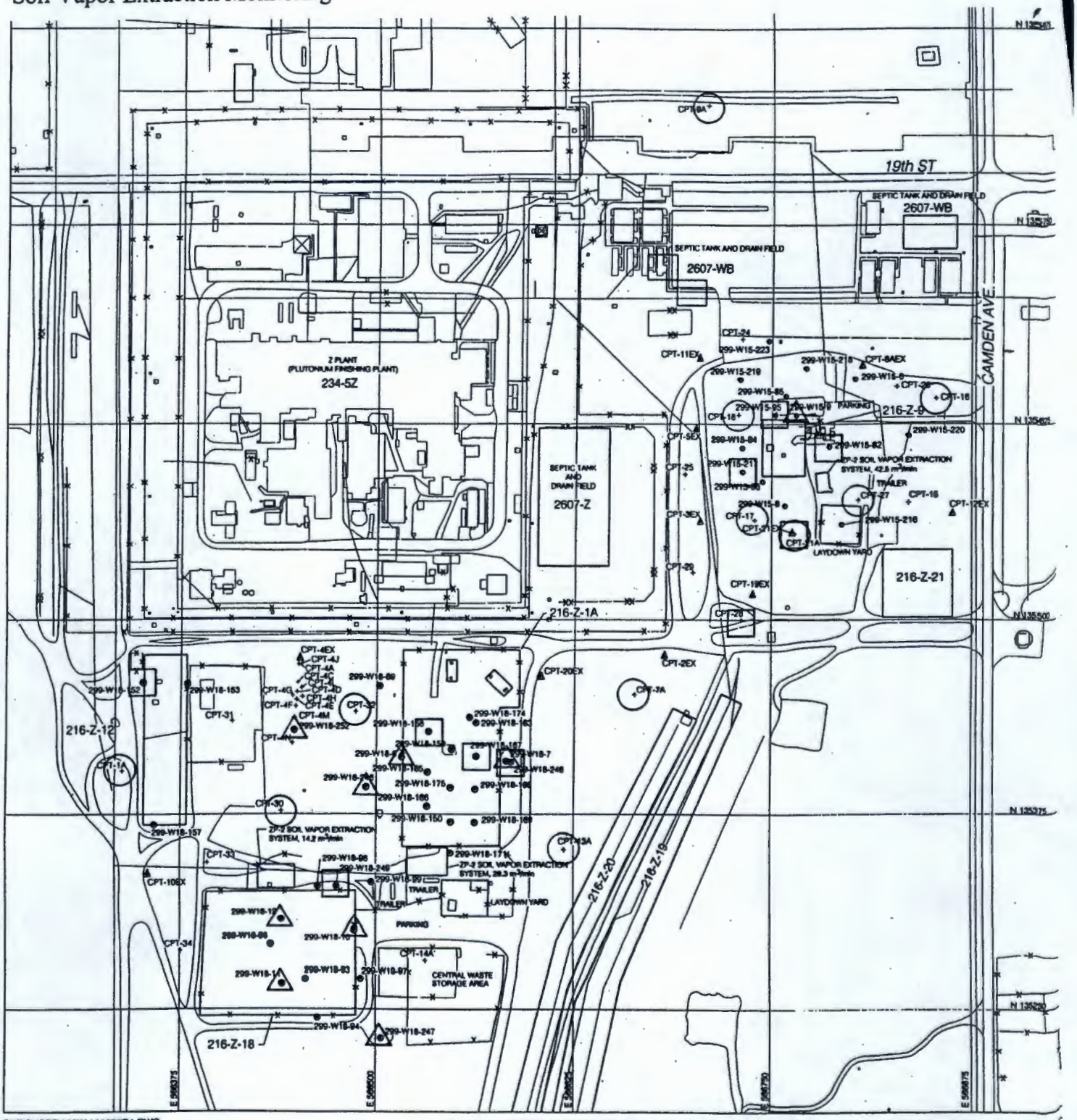
* - based on location (Z-1A/18/12 or Z-9) of monitoring point; specific points may be beyond SVE zone of influence during particular operating configurations

- Z-18 and Z-12 wells off-line Oct 96 - Apr 98
- CPT-1A, CPT-9A, and possibly CPT-7A appeared to be beyond SVE zone of influence in Oct 96 based on differential pressure (BHI-01105, p. 6-1)
- CPT-9A, CPT-21A, CPT-28 beyond SVE zone of influence in May 96 based on CCl4 concentrations and airflow modeling based on measured vacuums (BHI-01105, p. 6-1)

Carbon Tetrachloride Rebound Concentrations
Monitored at 200-ZP-2 Soil Vapor Extraction Sites
July 1999 - December 1999

200-ZP-2								
Location			07/30/99	09/14/99	9/28/99	10/26/99	11/30/99	12/29/99
(Well or Probe)	Site	Zone						
/feet bgs			CCl4	CCl4	CCl4	CCl4	CCl4	CCl4
			(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)
CPT-17/ 10 ft	Z-9	2	2.1	2.6	2.3	1.7	3.1	2.6
CPT-18/ 15 ft	Z-9	2	1.3	3.5	0	1.8	1.6	4.3
CPT-16/ 25 ft	Z-9	2				0	0	0
CPT-32/ 25 ft	Z-1A	2				0	0	1.5
CPT-30/ 28 ft	Z-1A	2				0	1.0	1.4
CPT-13A/ 30 ft	Z-1A	2				0	0	1.6
CPT-7A/ 32 ft	Z-1A	2				2.3	1.9	2.8
CPT-27/ 33 ft	Z-9	2				1.1	0	1.2
CPT-1A/ 35 ft	Z-12	2				2.5	3.1	2.8
CPT-21A/ 45 ft	Z-9	2	51.7	56.6	42	50.3	78	70.4
CPT-9A/ 60 ft	Z-9	2	----- (a)	43.9	44.0	32.9	39.3	43.5
W15-82/ 82 ft	Z-9	2	----- (a)	42.5	38.1	35.7	23.4	21.2
W15-95/ 82 ft	Z-9	2	----- (a)	8.3	7.6	9.0	11.2	12.0
CPT-21A/ 86 ft	Z-9	2	66.6	12.6	123	90.7	133	123
CPT-28/ 87 ft	Z-9	2	49.3	151	105	104	170	180
W18-152/ 113 ft	Z-12	2				1.8	22.1	24.7
W15-217/ 115 ft	Z-9	3	68.6	267	26.3	204	317	370
W18-158L/ 123 ft	Z-1A	3				79.6	103	134
W18-167/ 123 ft	Z-1A	3				88.8	115	144
W18-249/ 134 ft	Z-18	3				74.8	132	173
W18-248/ 136 ft	Z-1A	3				130	96.7	85.5
W15-9L/ 189 ft	Z-9	6	----- (a)	10.3	1.1	8.6	12.0	12.1
(a) sample pump failure								

Figure 1. Location of Wells and Probes Selected for Non-Operational Monitoring and Passive Soil Vapor Extraction Monitoring



G:\FIGURES\200W\111697D1.DWG

LEGEND

○ NEAR SURFACE (3 to 20 m below ground surface)

□ PLIO-PLEISTOCENE (25 to 45 m bgs)

△ GROUNDWATER (50-65 m bgs)

+ CPT-33 — CONE PENETROMETER SOIL VAPOR PROBE LOCATION AND NUMBER DESIGNATION

▲ CPT-4EX — CONE PENETROMETER SOIL VAPOR EXTRACTION WELL LOCATION AND NUMBER DESIGNATION

● 299-W15-82 — 200-ZP-2 SOIL VAPOR EXTRACTION/MONITORING WELL LOCATION AND NUMBER DESIGNATION

216-Z-18 — LIQUID WASTE DISPOSAL SITE

SCALE 1:3000

30 0 30 60 120 METERS

082095

DISTRIBUTION
UNIT MANGERS' MEETING
200 AREA GROUNDWATER AND SOURCE OPERABLE UNITS

Bryan Foley ..... DOE-RL RP (A5-13)
Marvin Furman ..... DOE-RL RP (A5-13)
Ellen Mattlin ..... DOE-RL EAP (A2-15)
Mike Thompson ..... DOE-RL RP (A5-13)
Arlene Tortoso ..... DOE-RL RP (H0-12)
Lisa Treichel ..... DOE-HQ (EM-442)

Dennis Faulk ..... EPA (B5-01)

Brenda Becker-Khaleel ..... WDOE (Kennewick) (B5-18)
Zelma Maine ..... WDOE (Kennewick) (B5-18)
Matt Mills ..... WDOE (Kennewick) (B5-18)
John Price ..... WDOE (Kennewick) (B5-18)
Tina Masterson-Heggen ..... WDOE (Kennewick) (B5-18)

Jeff Armatrout ..... BHI (H0-19)
Chloe Brewster ..... BHI (H0-19)
Garrett Day ..... BHI (H0-19)
Bruce Ford ..... BHI (H0-19)
Greg Mitchem ..... BHI (H0-21)
Joan Woolard ..... BHI (H0-02)

Tim Lee ..... CHI (H9-02)
Virginia Rohay ..... CHI (H0-19)
L. Craig Swanson ..... CHI (H9-02)
Mary Todd ..... CHI (H9-03)
Curtis Wittreich ..... CHI (H9-03)

Stuart Luttrell ..... PNNL (K6-96)
Mark Sweeney ..... PNNL (K6-81)

Administrative Record (2) ..... BHI (H0-09)

Please inform Chloe Brewster – BHI (372-9377)
of deletions or additions to the distribution list.