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DOE/RL-89-28
Revision 1
Copy No. 023

216-B-3 Expansion Ponds Closure Plan

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United States
Department of Energy
Richland, Washington

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DOE/RL-89-28
Revision 1

UC-630, 721

216-B-3 Expansion Ponds Closure Plan

Date Published
December 1993

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

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STATE ENVIRONMENTAL POLICY ACT (SEPA)

ENVIRONMENTAL CHECKLIST FORM

FOR THE CLOSURE OF THE 216-B-3 EXPANSION PONDS

REVISION 1

OCTOBER 1993

WASHINGTON ADMINISTRATIVE CODE
ENVIRONMENTAL CHECKLIST FORMS
[WAC 197-11-960]

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STATE ENVIRONMENTAL POLICY ACT ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable:

Closure of the 216-B-3 Expansion Ponds. This State Environmental Policy Act (SEPA) Checklist is being submitted concurrently with the Resource Conservation and Recovery Act of 1976 (RCRA) Closure/Postclosure Plan for the 216-B-3 Expansion Ponds, which consist of the 216-B-3A, 216-B-3B, and 216-B-3C Ponds. The entire 216-B-3 Pond System consists of these expansion ponds and the 216-B-3-3 feeder ditch and 216-B-3 Pond.

The designation "216-B-3 Pond" in this Checklist refers to the original pond that was placed into service in 1945. Information contained in this checklist pertains only to the 216-B-3 Pond System. In the context of the document, "site" refers to only the physical area covered by the pond system, whereas "Site" refers to the Hanford Site.

2. Names of applicants:

U.S. Department of Energy-Richland Operations (DOE-RL); and Westinghouse Hanford Company (Westinghouse Hanford)

3. Address and phone number of applicants and contact persons:

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

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

Contact persons:

J. D. Bauer, Program Manager
Office of Environmental Assurance,
Permits and Policy
(509) 376-5441

R. E. Lerch, Deputy Director
Restoration and Remediation
Westinghouse Hanford Company

4. Date checklist prepared:

October, 1993

5. Agency requesting checklist:

State of Washington
Department of Ecology (Ecology)
Mail Stop PV-11
Olympia, Washington 98504-8711

6. Proposed timing or schedule (including phasing, if applicable):

A phased soil and sediment sampling and analysis program was completed to assess the presence and extent of contamination within the 216-B-3 Pond System. Based on the results of the sampling and analysis program, a decision has been made to clean close the expansion ponds, 216-B-3A, 216-B-3B, and 216-B-3C while integrating closure of the remainder of the 216-B-3 Pond System with RCRA Corrective Measures for the 200-BP-11 Operable Unit

Clean closure of the expansion ponds is being initiated to meet the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement), Milestone M-17-10 for June 1995 which requires that liquid discharges to hazardous land disposal units cease unless such units have been clean closed in accordance with RCRA. Following clean closure, the expansion ponds will continue to receive nondangerous waste water from the 200 East Area facilities.

Pending approval by Ecology and EPA, the 216-B-3 Pond and the 216-B-3-3 Ditch will be decommissioned and wastes stabilized in place to minimize risks to human health and the environment. Final closure of the 216-B-3-3 Ditch and the 216-B-3 Pond will be coordinated with the 200-BP-11 operable unit. The work plan for this unit is planned for completion in Fiscal Year 1995.

7. Do you have any plans for future additions, expansions, or further activity related to or connected with this proposal? If yes, explain.

Following clean closure, the expansion ponds will continue to receive nondangerous waste water from the 200 East Area facilities.

Future activities related to this proposal include a RCRA facility Investigation/Corrective Measures Study (RFI/CMS) of the 200-BP-11 operable unit, of which the 216-B-3 Pond System is a part. Final disposition of the 216-B-3-3 Ditch and the 216-B-3 Pond will be coordinated with the final closure of the 200-BP-11 operable unit.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- **This SEPA Checklist is being submitted to Ecology concurrently with the RCRA 216-B-3 Expansion Ponds Closure Plan, DOE/RL 89-28 Revision 1 .**

- **In 1987, the U.S. Department of Energy submitted the 216-B-3 Pond Preliminary Closure/Postclosure Plan to Ecology. An updated Closure /Post Closure Plan, DOE/RL 89-28, was submitted in 1990.**

- **A RCRA Part A Permit Application for the 216-B-3 Pond System was submitted to Ecology on August 1, 1986. Revisions to the Part A**

Permit Application were submitted to Ecology in August and November of 1987, and a third revision was submitted concurrently with the 216-B-3 Pond System Closure/Postclosure Plan in 1990. Currently, the unit specific Part A permit application is being modified to separate the three expansion ponds (3A, 3B, and 3C) from the remainder of the 216-B-3 Pond System.

- An RFI/CMS will be conducted for the 200-BP-11 operable unit.

- NEPA documentation for the interim stabilization of the 216-B-3 Pond, the 216-B-3-3 Ditch, and the 216-B-3A Pond has been completed and the work has been categorically excluded by the DOE from further NEPA review.

Additional environmental information regarding the 200 Area plateau and the Hanford Site in general can be found in *Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415 Rev. 5, Pacific Northwest Laboratory, 1992, Richland, Washington.

9. Do you know whether applications are pending for government approvals of other proposals directly affecting property covered by your proposal?

   No such applications are known to be pending.

10. List any government approvals or permits that will be needed for your proposal, if known.

    Ecology is the lead agency authorized to approve the 216-B-3 Expansion Ponds Closure Plan under requirements authorized by RCRA and Chapter 173-303 of the Washington Administrative Code (WAC). Following clean closure of the expansion ponds, a State Waste Discharge Permit under WAC 173-216 will be required from Ecology for discharge of nondangerous waste water to the 216-B-3B and 3C Ponds.

    No other permits are known to be required at this time.

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

    The closure plan for the 216-B-3 Expansion Ponds is summarized as follows.

    - Soil and sediment sampling and analysis (This program has been completed). Vadose zone soil and sediment sampling and analysis was conducted at the 216-B-3 Pond System. Analytical results were evaluated to define any constituents of concern, defined as constituents derived from dangerous waste disposal in the expansion

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ponds that statistically are above background levels. Action levels were established for constituents of concern based on background levels and health based limits and are defined as concentration thresholds that soil composition should not exceed for clean closure. Analytical results from the samples taken from the expansion ponds and the 216-B-3 Pond System showed that dangerous waste constituents of concern were below action levels. Details of the sampling and analysis and the results are contained in Chapter 7 of the closure plan submitted with this checklist.

- Clean close the expansion ponds (216-B-3A, -3B, -3C). "Clean close," as used in this context, means that no waste or waste-contaminated soil, structures, or equipment that could pose a threat to human health or the environment will remain onsite following completion of closure activities. When certification of clean closure has been accepted by Ecology, the expansion ponds will not be subject to regulation under RCRA or WAC 173-303. Following clean closure, the expansion ponds will continue to receive nondangerous waste water from the 200 East Area facilities.

- Decommission the 216-B-3-3 Ditch and the 216-B-3 Pond. The pond and ditch will be removed from service and interim actions (e.g., placement of soil fill over waste) will be taken to stabilize the waste in place. Final closure of these two units will be coordinated with the 200-BP-11 operable unit due to the proximity of other nearby inactive waste management units (i.e., the 216-B-3-1 Ditch and the 216-B-3-2 Ditch).

- Decontaminate and remove structures and associated equipment. If clean closure is approved for the 3A and 3B ponds, the dikes around the ponds will be retained in the current configuration and the existing piezometer network will continue to monitor seepage through the dike. The piezometers associated with the 216-B-3 Pond and a groundwater monitoring well will be plugged and abandoned in accordance with Chapter 173-160 of the WAC.

  There are four flow control and spillway structures that monitor and control the flow of water from the 216-B-3 Pond to the 3A Pond and from the 3A to the 3B and 3C Ponds. When 216-B-3 Pond is removed from service, these four structures will be demolished and removed in conjunction with the interim stabilization of 216-B-3 and 216-B-3A. Details of the demolition and disposal of the wastes are in Chapter 7 of the closure plan submitted with this checklist.

- Interim stabilize the 216-B-3A pond. This pond will not be used for future water disposal because of the proximity of the 216-B-3 Pond. The 3A Pond may not be contaminated with hazardous or radioactive constituents above proposed action levels. If this is determined, it may not be necessary to interim stabilize this pond. If contamination is present, it will be removed and consolidated , if

possible, in the 216-B-3 Pond. The pond may then have a clean soil layer or other suitable cover placed over it and be revegetated. If the pond must be interim stabilized, it will be done following stabilization of the 216-B-3 Pond and 216-B-3-3 Ditch. Details of the interim stabilization are in Chapter 7 of the closure plan submitted with this checklist.

The 216-B-3 Pond covers approximately 35 acres. The 216-B-3A and 216-B-3B Ponds each cover approximately 11 acres, while the 216-B-3C Pond covers approximately 41 acres. The 216-B-3-3 Ditch is approximately 3,700 feet long, 30 feet wide at ground level, 6 feet wide at the bottom, and 4 to 8 feet deep.

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12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

    The 216-B-3 Pond is located approximately 3,700 feet east of the Hanford Site 200 East Area perimeter fence, on the 200 Area Plateau. The 200 East Area is linked to B Pond by the 216-B-3-3 Ditch and the 216-A-29 Ditch. The 216-B-3A, 3B, and 3C Ponds are adjacent to the 216-B-3 Pond on the east. Maps and plans of the area are contained in the RCRA closure/postclosure plan submitted with this Checklist. The facility is located in the NE 1/4 of Section 1, T12N, R26E, and the NW 1/4 of Section 6, T12N, R27E of the Willamette Base and Meridian.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site: Flat, rolling, hilly, steep slopes, mountainous, other.

    Flat.

b. What is the steepest slope on the site (approximate percent slope)?

    The approximate slope of the land at the facility is less than two percent.

c. What general types of soil are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

The soil found at the 216-B-3 Pond System consists mostly of a sand and pebble conglomerate, and pebble conglomerate. No farming is permitted on the site.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate the source of the fill.

Earthen fill material will be placed in the 216-B-3 Pond to stabilize and contain contamination known to exist in that pond. If removal of contaminated soil is required for clean closure of the 216-B-3A Pond, the contaminated soil will be consolidated and placed in the 216-B-3 Pond. Any such deposit will be covered with soil and sediment fill material for stabilization. Earthen fill material also will be placed in the 216-B-3-3 Ditch.

Some fill material will be obtained from stockpiles along the north and south shores of the 216-B-3 Pond. Sources for additional fill material, if required, have not been identified at this time.

f. Could erosion occur as a result of clearing, construction, or use? If so, describe.

Significant erosion is not expected because of the flat topography, dry climate, and soil type present at the site.

g. About what percentage of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

None at this time.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The potential for wind erosion will be mitigated by wetting any soil excavation surfaces and reestablishing vegetation over backfilled surfaces of the 216-B-3 Pond and the 216-B-3-3 Ditch.

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2. **Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Minor amounts of exhaust will be generated by vehicles used to gain access to the site and for groundwater monitoring. Heavy equipment and trucks used to remove contaminated soil and to backfill the 216-B-3 Pond, the 216-B-3-3 Ditch, and the 216-B-3A pond (if necessary) will generate dust and minor amounts of exhaust.

b. Are there any offsite sources of emissions or odors that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to the air, if any:

To reduce the potential for dust generation during closure activities, water trucks will be available onsite periodically to spray effected areas if required and sprinklers will be used if any areas become dry.

3. **Water**

a. Surface

1) Is there any surface water body in or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

No natural surface water bodies or wetlands exist on or in the vicinity of the site. However, the 216-B-3 Pond System contains fluctuating levels of standing process water.

2) Will the project require any work over, in, or adjacent to (within 200 feet of) the described waters? If yes, please describe and attach available plans.

Earthen fill material will be placed in the 216-B-3 Pond, 216-B-3-3 Ditch, and the 216-B-3A Pond during interim stabilization. Detailed information is included in the closure plan submitted with this checklist.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area that would be affected. Indicate the source of the fill.

No fill material will be placed in or removed from natural surface waters or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste material to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground

1) Will groundwater be withdrawn, or will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Nondangerous process and cooling water is discharged to the 216-B-3 Pond System from various Hanford Site 200 East Area facilities. The ponds are not lined; therefore, this waste water eventually migrates into the groundwater beneath the facility. The volume of water discharged to the system is currently monitored in the supply ditch (216-B-3-3 Ditch) approximately 2,500 feet out from the 200 East Area perimeter fence (approximately 1,500 feet from the inlet to the main lobe). Discharged volumes in the past have varied from 7 million to 22 million gallons per day, depending on the operating status of plants discharging to the system. Natural precipitation, averaging approximately 6 inches per year, also accumulates in the unlined ponds and migrates into the subsurface. Following the clean closure of the expansion ponds and removal of the 216-B-3 Pond and 216-B-3-3 Ditch from service, this nondangerous waste water will discharge directly to the 3B and 3C ponds. This discharge rate is expected to average about 3.6 million gallons per day.

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Small quantities of groundwater are withdrawn from monitoring wells. During the first year after completion of groundwater monitoring wells, groundwater is withdrawn from the wells on a quarterly basis and submitted for laboratory analysis. During subsequent years, groundwater is withdrawn on a semiannual basis, unless otherwise specified by Ecology. Before sample collection from a well, at least three borehole volumes of water must be purged from the well to ensure a representative groundwater sample is collected.

2) Describe waste materials that will be discharged into the ground from septic waste tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be intentionally discharged to the ground as a result of closure activities.

The 216-B-3 Pond is located approximately 3,700 feet east of the 200 East Area perimeter fence. From the 200 East Area, waste water flows via the 216-B-3-3 Ditch and via the 216-A-29 Ditch, which intersects the 216-B-3-3 Ditch, to the 216-B-3 Pond. The 216-B-3 Pond System is comprised of the 216-B-3-3 Ditch, the 216-B-3 Pond, and three expansion lobes (216-B-3A, -3B, and -3C). The 216-B-3 Pond System receives nondangerous waste water from the 200 East Area facilities. Following the clean closure of the expansion ponds and removal of the 216-B-3 Pond and 216-B-3-3 Ditch from service, this nondangerous waste water will discharge directly to the 3B and 3C ponds.

Detailed information on the constituents contained in the waste water is contained in Chapters 3.0 and 4.0 of the RCRA closure/postclosure plan submitted with this Checklist.

c. Water Run-off (including storm water):

1) Describe the source of run-off (including storm water) and methods of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The only source of run-off that will be associated with the 216-B-3 Pond System closure activities will be precipitation. All precipitation will be allowed to infiltrate the surrounding porous soil or mingle with standing water in expansion ponds that are clean closed and that will continue to be used for waste water disposal.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Discharges to ground and surface waters are discussed in the answers to Checklist questions B.3.a.6, and B.3.b.1 and 2.

d. Proposed measures to reduce or control surface, ground, and run-off water impacts, if any:

The flow of water between the ponds is controlled by spillways equipped with overflow control barriers. Manually operated slide gates on the overflow control structures regulate the amount of water discharged to the culverts that carry water between the ponds. The slide gates normally are set to allow overflow water from one pond to pass into the next pond. Excess capacity is designed into the facility to prevent the escape of overflow water from the Ponds.

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4. **Plants**

a. Check the types of vegetation found on the site:

_X_ deciduous trees: alder, maple, aspen, other
___ evergreen trees: fir, cedar, pine, other
_X_ shrubs
_X_ grass
___ pasture
___ crop or grain
_X_ wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
___ water plants: water lily, eelgrass, milfoil, other
___ other types of vegetation

Standing water in the 216-B-3 Pond System lobes, and the 216-B-3-3 Ditch supports a variety of vegetation typical of a riparian habitat. Poplar, willow, and Russian olive trees grow along the edges of the lobes, along with cattail, bulrush, various small shrubs, and grass.

b. What kind and amount of vegetation will be removed or altered?

Small vegetated areas adjacent to the site may be affected by closure activities. Areas denuded of vegetation as a result of this project will be revegetated as appropriate.

c. List threatened or endangered species known to be on or near the site.

No threatened or endangered species are known to exist on or near the site. A biological survey has been completed for the 216-B-3 Pond System. Additional information concerning endangered and

threatened plants on the Hanford Site can be found in the documents referred to in the answer to Checklist question A.8.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

To minimize erosion, stabilized portions of the 216-B-3-3 Ditch and the 216-B-3 Pond System will be revegetated appropriately with species well-suited to the local climate.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other
mammals: deer, bear, elk, beaver, other
fish: bass, salmon, trout, herring, shellfish, other

Process discharges to the 216-B-3 Pond System provide a source of water to nesting, wintering, and migratory waterfowl, as well as to many locally common mammal species. Birds commonly sighted in the area include heron, ducks, songbirds, and pigeons. Other animals seen in the area include deer, coyote, lagomorphs, and various small rodents. Goldfish and unidentified small minnows have also been seen in B Pond. Additional information on birds and animals on the Hanford Site can be found in the documents referred to in the answer to Checklist question A.8.

b. List any threatened or endangered species known to be on or near the site.

The facility is not known to be used by any threatened or endangered species. A biological survey has been completed for the 216-B-3 Pond System. Additional information concerning endangered and threatened species on the Hanford Site can be found in the documents referred to in the answer to Checklist question A.8.

c. Is the site part of a migration route? If so, explain.

The adjacent Columbia River is part of the broad Pacific Flyway for waterfowl migration and other birds also migrate along the river. Process discharges to the 216-B-3 Pond System provide a source of water to nesting, wintering, and migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any:

None at this time.

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6. **Energy and Natural Resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Gasoline, diesel fuel, and/or motor oil may be used to power equipment necessary for groundwater monitoring and the closure activities described in this checklist.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

None.

7. **Environmental Health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

There may be some potential for exposure to hazardous chemicals and radioactive waste during groundwater monitoring and other sampling activities, and the closure activities described in this checklist. Procedures to prevent and manage hazards are presented in the RCRA Closure/Postclosure plan.

1) Describe special emergency services that might be required.

Fire, ambulance, and patrol assistance might be required in the event of an unexpected emergency. These services are available on the Hanford Site.

2) Proposed measures to reduce or control environmental health hazards, if any:

Closure activities will be performed in a manner that minimizes impacts to human health and the environment. Personnel will receive radioactive and hazardous waste worker training and will be cognizant of applicable health and safety measures. All personnel conducting soil sampling, soil removal, and stabilization activities will wear appropriate protective

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clothing. Such personnel will be monitored for contamination upon leaving the facility.

The RCRA closure/postclosure plan and plans specific to closure activities (e.g., the health and safety plan for soil sampling) address specific training requirements and measures to reduce or control environmental health hazards. Identified training requirements include Occupational Safety and Health Administration (OSHA) training. Decontamination solutions, cleanup debris, protective clothing, and groundwater monitoring well purgewater will be collected and appropriately disposed of.

b. Noise

1) What type of noise exists in the area which may affect your project (for example: traffic, equipment, operation, other)?

None.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Soil and groundwater sampling activities, groundwater monitoring, and waste stabilization/soil removal activities temporarily will increase noise levels during normal day shift hours.

3) Proposed measures to reduce or control noise impacts, if any:

None at this time.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

The 216-B-3 Pond System is currently being used for disposal of nondangerous waste water from various 200 East Area facilities. Waste water is transferred to the system via the 216-B-3-3 Ditch. The B Pond is a part of the U.S. Government-owned Hanford Site, which is used for the production of special nuclear materials and the management of wastes associated with the production of those materials.

b. Has the site been used for agriculture? If so, describe.

No portion of the Hanford Site, including the 216-B-3 Pond System site, has been used for agricultural purposes since 1943.

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c. Describe any structures on the site.

A detailed description of the 216-B-3 Pond and 216-B-3-3 Ditch structures is provided in the closure/postclosure plan with which this Checklist is being submitted. The following general description is provided for informational purposes.

Process water flows from the Hanford Site 200 East Area to the 216-B-3 Pond via the 216-B-3-3 Ditch. At the head end of the 216-B-3-3 Ditch are feeder pipelines and a headwall structure. The PUREX Plant process discharge is discharged to the 216-A-29 Ditch, which intersects the 216-B-3-3 Ditch upstream from the 216-B-3 Pond. Along the 216-B-3-3 Ditch, approximately 1,500 feet from the inlet to the main lobe, is a small flume and flowmeter, used to measure the flow of process discharge water to the system. Discharge water flows unimpeded to the 216-B-3 Pond.

Two gated overflow outlets allow water to drain through culverts from the 216-B-3 Pond to the 216-B-3A Pond. One of these is a nonoperational culvert that at one time discharged to a cement-lined ditch leading to the 216-B-3A Pond. The other overflow outlet directs water directly to the 216-B-3A Pond through two buried pipes. From the 216-B-3A Pond, one gated overflow outlet leads to each of the remaining two lobes. All overflow from the 216-B-3A Pond is currently routed to the 216-B-3C Pond; the 216-B-3B Pond is dry.

Earthen dikes separate the 216-B-3 Pond from the 216-B-3A Pond, and the 216-B-3A Pond from the 216-B-3B Pond. Piezometers have been placed in both of these dikes to track water table elevations beneath the lobes.

d. Will any structures be demolished? If so, what?

All structures immediately associated with the 216-B-3-3 Ditch and the 216-B-3 Pond will be removed from operation as part of the interim stabilization of the ditch and pond. Such structures include the headwall and piping at the head end of the 216-B-3-3 Ditch, the flume and flowmeter along the 216-B-3-3 Ditch, and the two outlets from the 216-B-3 Pond to the 216-B-3A Pond. The concrete 216-B-3-3 Ditch headwalls will be demolished and buried in place. The associated piping will be plugged and backfilled with concrete. Cement structures and rock-containing wire baskets associated with the flume will be demolished and buried in place. The flowmeter and all three pipes from the 216-B-3 Pond to the 216-B-3A Pond will be removed and properly disposed of, depending on the type of residual contamination. The cement lining of the nonoperational ditch leading to the 216-B-3A Pond and the cement headwall of the overflow control structures will be demolished and buried in the 216-B-3 Pond. The piezometers and/or groundwater

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monitoring wells on the dike separating the 216-B-3 Pond and the 216-B-3A Pond will be sealed and abandoned. The two flow control and spillway structures from the 216-B-3A Pond to the 3B and 3C Ponds will be demolished and disposed of. Details of this proposed work are in the RCRA Closure/Postclosure Plan submitted with this checklist.

e. What is the current zoning classification of the site?

The Hanford Site is zoned by Benton County as an Unclassified Use (U) district.

f. What is the current comprehensive plan designation of the site?

The 1985 Benton County Comprehensive Land Use Plan designates the Hanford Site as the "Hanford Reservation." Under this designation, land on the Hanford Site may be used for "activities nuclear in nature." Nonnuclear activities are authorized "if and when DOE approval for such activities is obtained."

g. If applicable, what is the current master shoreline program designation of the site?

Does not apply.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

None.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None; Does not apply.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

None; Does not apply. (See answer to Checklist question B.8.f.)

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9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

Does not apply.

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Does not apply.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Does not apply.

11. **Light and Glare**

a. What type of light or glare will the proposal produce? What time of the day would it mainly occur?

None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing offsite sources of light and glare may affect your proposal?

None.

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d. Proposed measures to reduce or control light and glare impacts, if any:

Does not apply.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

None.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Does not apply.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Does not apply.

13. **Historic and Cultural Preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No places or objects listed on, or proposed for, national, state, or local preservation registers are known to be on or next to the site. A cultural resource review has been conducted for the site. Additional information on the Hanford Site environment can be found in the documents referred to in the answer to Checklist question A.8.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

There are no known archaeological, historical, or native American religious sites at or next to the facility. A cultural resource review has been conducted for the site. Additional information on the Hanford Site environment can be found in the documents referred to in the answer to Checklist question A.8.

c. Proposed measures to reduce or control impacts, if any:

A cultural resource review will provide the vehicle for necessary approvals required under the National Historic Preservation Act.

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The site lies within the controlled access area of the Hanford Site and is not publicly accessible.

b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest stop?

Does not apply. (See answer to Checklist question B.14.a.)

c. How many parking spaces would the completed project have? How many would the project eliminate?

None.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

None.

g. Proposed measures to reduce or control transportation impacts, if any:

Does not apply.

15. **Public Services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any:

Does not apply.

16. **Utilities**

a. List utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

None.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

None.

C. SIGNATURES

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

J. D. Bauer, Program Manager
Office of Environmental Assurance,
Permits and Policy
U.S. Department of Energy
Richland Operations Office

Date 12/15/93

R. E. Lerch, Deputy Director
Restoration and Remediation
Westinghouse Hanford Company

Date 12/14/93

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216-B-3 EXPANSION PONDS CLOSURE PLAN

FOREWORD

The Hanford Site is owned and operated by the U.S. Department of Energy, Richland Operations Office. The Hanford Site manages and produces radioactive, dangerous, and mixed waste (containing both radioactive and dangerous components). The radioactive waste and radioactive component of mixed waste is interpreted by the U.S. Department of Energy to be regulated under the *Atomic Energy Act of 1954*; dangerous waste and the nonradioactive dangerous waste components of mixed waste are interpreted to be regulated under the *Resource Conservation and Recovery Act of 1976* and the Washington State Department of Ecology *Dangerous Waste Regulations*, Washington Administrative Code 173-303.

For the purposes of the *Resource Conservation and Recovery Act*, the Hanford Site is considered to be a single facility. A single dangerous waste permit identification number issued to the Hanford Site by the U.S. Environmental Protection Agency and Washington State is Environmental Protection Agency/State Identification Number WA890008967. This identification number encompasses a number of waste management units within the Hanford Facility. Waste management units that are no longer operating will be closed under interim status (using final status standards in Washington Administrative Code 173-303-610).

Since 1987, Westinghouse Hanford Company has been a major contractor to the U.S. Department of Energy, Richland Operations Office and has served as co-operator of the 216-B-3 Pond System, the waste management unit addressed in this closure plan. For the purposes of the *Resource Conservation and Recovery Act*, Westinghouse Hanford Company is identified as "co-operator" and signs in that capacity. Any identification of Westinghouse Hanford Company as an operator elsewhere in this closure plan is not meant to conflict with Westinghouse Hanford Company's designation as co-operator but is rather based on Westinghouse Hanford Company's contractual status (i.e., as a management and operations contractor) for the U.S. Department of Energy, Richland Operations Office.

The 216-B-3 Expansion Ponds Closure Plan (Revision 1) consists of a Part A Dangerous Waste Permit Application and a *Resource Conservation and Recovery Act* Closure Plan. An explanation of the Part A submitted with this document is provided at the beginning of the Part A Section. The closure plan consists of nine chapters and five appendices.

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PART A

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B THE B POND GROUNDWATER CHEMISTRY

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E 216-B-3 POND SYSTEM PHASE 3 VADOSE ZONE SAMPLING

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GLOSSARY

BCP	B Plant Process Condensate
BCS	B Plant Steam Condensate
BNA	base/neutral/acid
B Plant	221-B Plant
B Pond	216-B-3, 3A, 3B, and 3C Ponds
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act OF 1980*
CFR	*Code of Federal Regulations*
CLP	contract laboratory program
CRQL	contract required quantitation limit
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
HLW	high-level liquid waste
HVAC	heating, ventilating, and air conditioning
MTCA	*Model Toxics Control Act*
NRC	Nuclear Regulatory Commission
PCB	polychlorinated biphenyl
PNL	Pacific Northwest Laboratory
PUREX	plutonium/uranium extraction (plant)
RCRA	*Resource Conservation and Recovery Act of 1976*
RPD	relative percent difference
TIC	tentatively identified compound
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TSD	treatment, storage, and/or disposal
WAC	Washington Administrative Code
WESF	Waste Encapsulation and Storage Facility
Westinghouse Hanford	Westinghouse Hanford Company

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METRIC CONVERSION CHART

The following conversion chart is provided to the reader to aid in conversion.

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

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PART A

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3
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PART A

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Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 character/inch).

FORM 3

DANGEROUS WASTE PERMIT APPLICATION

1. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED *(mo., day, & yr.)*	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

MO.	DAY	YR.
1 0		8 3

FOR EXISTING FACILITIES, PROVIDE THE DATE *(mo., day, & yr.)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

☐ 2. NEW FACILITY *(Complete item below)*

MO.	DAY	YR.

FOR NEW FACILITIES, PROVIDE THE DATE, *(mo., day, & yr)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Section I above)*

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☐ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES - CODES AND CAPACITIES

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the *(Section III-C)*.

B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.

1. AMOUNT - Enter the amount.

2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D82	*ACRES OR HECTARES*
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING SECTION III *(shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons.* The facility also has an incinerator that can burn up to 20 gallons per hour.

LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	B. 2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	B. 2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	T 0 2	27,960,000	U		7				
2	D 8 4	27,960,000	G		8				
3					9				
4					10				

CONTINUE ON REVERSE

Continued from the front.

PROCESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

T02, D84

The 216-B-3 Expansion Ponds (Expansion Ponds) consist of three interconnected ponds called the 216-B-3A (3A) Pond, the 216-B-3B (3B) Pond, and the 216-B-3C (3C) Pond. These ponds were constructed to receive the increased discharges to the 216-B-3 Pond System, which includes the 216-B-3 Main Pond (Main Pond), a separate dangerous waste treatment and disposal unit as a result of the restart of the Plutonium Uranium Extraction (PUREX) Plant in 1983 and the decommissioning of the Gable Mountain Pond in 1987. The 3A Pond was placed into service in October 1983 and remains in service today. The 3A Pond receives effluent from the Main Pond through a spillway in the dike separating the two ponds. A similar spillway allowed the 3B Pond, which was operational from June 1984 to May 1985, to receive effluent from the 3A Pond. The 3A and 3B Ponds each cover an area of approximately 11 acres (4.4 hectares). The 3C Pond began operation in 1985 and is still in service today. The 3C Pond was constructed by excavating 6 feet (1.8 meters) of soil over a 41-acre (16-hectare) surface area. A spillway similar to the ones used for the 3A and 3B Ponds conveys effluent from the 3A Pond to the 3C Pond.

Waste water (primarily process and cooling water) from the PUREX Plant, the B Plant Complex, the 242-A Evaporator, and other 200 East Area units is received by the expansion ponds through the Main Pond. The Expansion Ponds received corrosive waste as a result of the regeneration of the PUREX Plant demineralizer columns (D84). Treatment of the waste occurred by the successive discharge of acidic and caustic waste, which served to neutralize the corrosivity of the waste before and upon reaching the Expansion Ponds. Residual corrosivity was neutralized by the calcareous nature of the Expansion Ponds soil (T02).

The process design capacities given for the waste process codes T02 [27,960,000 gallons (105,840,000 liters) per day] and D84 [27,960,000 gallons (105,840,000 liters)] represent the Expansion Ponds proportional share (based on percolation capacity) of the process design capacity of the entire B Pond System. At the peak of operations, approximately 22,000,000 gallons (83,280,000 liters) per day of liquid was discharged to the entire 216-B-3 Pond System. Presently, approximately 1,500 gallons (5,678 liters) to 6,000 gallons (22,712 liters) per minute of nondangerous liquid effluent are being sent to the 216-B-3 Pond System.

Construction was begun on a new pipeline in 1990 that will allow waste water to bypass the 216-B-3 Main Pond and discharge directly to the Expansion Ponds.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER - Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all tha non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
	K 0 6 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2			T 0 3 D 8 0	*included with above*

 CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

I.D. NUMBER *(entered from page 1)*: WA789000897

DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	D002	117,200,000	P	T02	D84			Neutralization/Percolation
2	WT02	2,573,000	↓	↓	↓			included with above
3	U133	1,478,000	P	T02	D84			Neutralization/Percolation
4	WT01	484,000	P	T02	D84			Neutralization/Percolation
5	D006	149,000	↓	↓	↓			included with above
6								
7								
8								
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Continued from the front.

DESCRIPTION OF DANGEROUS WASTES (continued)

USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

The 216-B-3 Expansion Ponds (Expansion Ponds) received dangerous waste from two main sources: (1) corrosive and toxic dangerous waste resulting from the regeneration of demineralizer columns at the PUREX Plant, and (2) spills of dangerous or mixed waste at the PUREX Plant. Backwash from the regeneration of the demineralizer columns was frequently corrosive (D002) and sometimes contained toxic concentrations of chemicals used in the regeneration process, including nitric acid, sulfuric acid, sodium hydroxide, and potassium hydroxide (WT02). Spills at the PUREX Plant included hydrazine (U133), cadmium nitrate (WT01/D006), and ammonium fluoride/ammonium nitrate (WT01). Since 1984, administrative and engineering barriers have been put in place at the PUREX Plant to prevent dangerous waste from being discharged into the Expansion Ponds.

The quantity of waste listed for D002/WT02 is an estimated annual quantity based on the Expansion Ponds proportional share (based on percolation capacity) of the amount of corrosive and toxic dangerous waste received by the entire 216-B-3 Pond System (which includes the 216-B-3 Main Pond, a separate dangerous waste treatment and disposal unit). The quantities of waste listed for U133 and WT01/D006 represent the Expansion Ponds' proportional share (based on percolation capacity) of the total recorded amount of hydrazine, cadmium, and ammonium fluoride/ammonium nitrate received by the entire B Pond System from the time the PUREX Plant resumed operations in 1983 until the last known chemical discharge occurred in 1987.

The quantities of waste listed for U133 and WT01/D006 include the water in which the chemicals were discharged. Water makes up most of the weight of these discharges.

FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawings and photos.

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*

VIII. FACILITY OWNER

[x] A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
John D. Wagoner, Manager U.S. Department of Energy Richland Operations Office	John D. Wagoner	12/16/93

OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

John D. Wagoner — 12/16/93

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date

Thomas M. Anderson — 12/1/93

Co-operator
Thomas M. Anderson, President
Westinghouse Hanford Company

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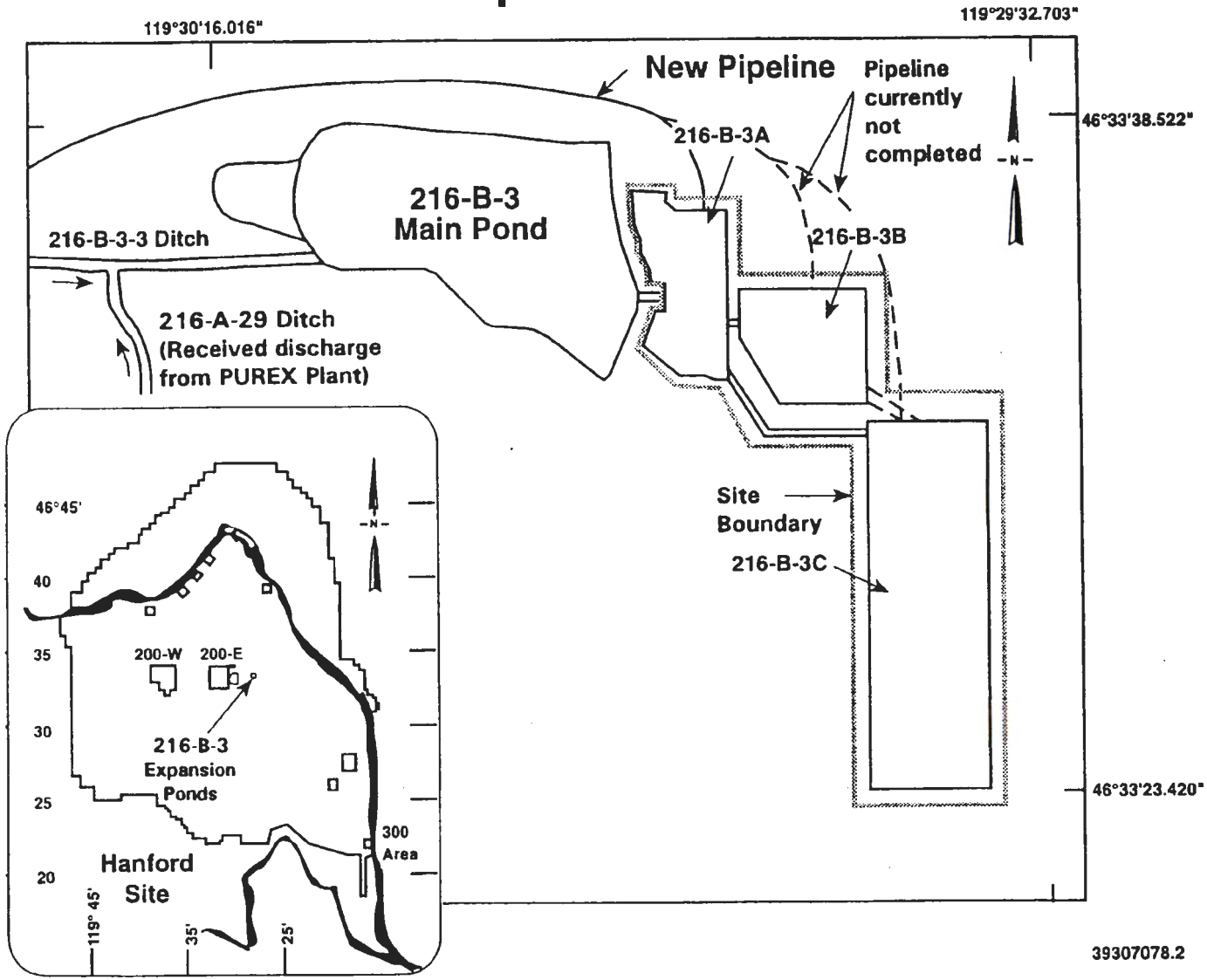
216-B-3 Expansion Ponds



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216-B-3 Expansion Ponds

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1.0 INTRODUCTION

This document describes the activities for clean closure of the expansion ponds associated with 216-B-3 Pond System. The 216-B-3 Pond System is operated by the U.S. Department of Energy, Richland Operations Office (DOE-RL) and co-operated by Westinghouse Hanford Company (Westinghouse Hanford). Although the U.S. Government holds legal title to this facility, the DOE-RL, for purposes of defining *Resource Conservation and Recovery Act of 1976* (RCRA) facilities, is considered the legal owner of the facility under existing U.S. Environmental Protection Agency (EPA) interpretive regulations (51 FR 7722).

The 216-B-3 Pond System consists of a series of four earthen, unlined, interconnected ponds and the 216-B-3-3 Ditch that receive waste water from various 200 East Area operating facilities. These four ponds, collectively referred to in this document as 'B Pond', are designated the 216-B-3, 216-B-3A (3A), 216-B-3B (3B), and the 216-B-3C (3C) Ponds. These ponds were placed in service in 1945, 1983, 1984, and 1985, respectively. The 3A, 3B, and 3C ponds are referred to as expansion ponds. Location information and a detailed description of the 216-B-3 Pond System are provided in Chapter 2.0.

Waste water (primarily cooling water, steam condensate, and sanitary water) from various 200 East Area facilities is discharged to the 216-B-3-3 Ditch. Water discharged to the 216-B-3-3 Ditch flows directly into the 216-B-3 Pond. Water overflows from the 216-B-3 Pond into the 3A Pond and from the 3A Pond into the 3C Pond. The 3B Pond has not received waste water since May 1985; however, when in operation, the 3B Pond received overflow from the 3A Pond. Two other ditches, 216-B-3-1 and 216-B-3-2, previously transmitted waste water to the 216-B-3 Pond. These ditches were decommissioned and the waste stabilized in place (i.e., backfilled) before 1980.

In the past, waste water discharges to B Pond and the 216-B-3-3 Ditch contained mixed waste (radioactive waste and dangerous waste). The radioactive portion of mixed waste has been interpreted by the U.S. Department of Energy (DOE) to be regulated under the *Atomic Energy Act of 1954*; the nonradioactive dangerous portion of mixed waste is regulated under RCRA. Mixed waste also may be considered a hazardous substance under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) when considering remediation of waste sites.

1.1 PERMITTING HISTORY

As a result of dangerous waste discharges to B Pond, a RCRA Part A permit application (Rev. 0) was submitted to the Washington State Department of Ecology (Ecology) in 1986. Revision 1 of the Part A permit application was submitted in August 1987 and Revision 2 was submitted in November 1987. The permit application was submitted under the single Dangerous Waste Permit Identification Number, WA7890008967, issued to the Hanford Site by the EPA and Ecology. The permit application designates the 216-B-3 Pond System a surface

impoundment, subject to RCRA regulations for treatment, storage, and/or disposal (TSD) units. Revision 3 of the Part A permit application is included in Section 1.3.

Currently, the unit-specific Part A permit application is being modified to separate the three expansion ponds (3A, 3B, and 3C Ponds) from the remainder of the unit (216-B-3 Pond and 216-B-3-3 Ditch). This modification is made to allow clean closure of the expansion ponds while integrating closure activities for the 216-B-3 Pond and 216-B-3-3 Ditch with RCRA corrective action for the 200-BP-11 Operable Unit. Clean closure of the expansion ponds is being initiated to meet the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), Milestone M-17-10, "Cease all liquid discharges to hazardous land disposal units unless such units have been clean closed in accordance with RCRA (Ecology et al. 1992). The date associated with this milestone is June 1995.

A closure/postclosure plan was submitted in 1990 (DOE-RL 1990). Based on the 1990 closure plan strategy and sampling and analysis results, a decision was made to clean close the expansion ponds while integrating closure of the remainder of the 216-B-3 Pond System with the activities for the operable unit. The current closure plan is based on this decision and is being submitted to provide current site characterization information and closure strategy for the 3A, 3B, and 3C Ponds.

1.2 CLOSURE STRATEGY

The Hanford Site has been divided into operable units to facilitate cleanup under CERCLA, the *State of Washington Hazardous Waste Management Act of 1976*, and RCRA corrective action provisions. An operable unit is a grouping of individual waste management units based primarily on geographic area, common waste sources, and similar geohydrologic properties. The Hanford Site waste management units have been categorized into past practice units and TSD units. A past practice unit is a waste management unit where waste has been disposed of (intentionally or unintentionally) but is not subject to regulation as a TSD unit. *All waste management units, including TSD units, within an operable unit generally will undergo investigation and remediation (closure) at the same time.*

The 216-B-3 Pond System is located within the 200-BP-11 Operable Unit. Two other major waste management units located within this operable unit are the inactive 216-B-3-1 and 216-B-3-2 Ditches. These two ditches cover an extensive area that extends from immediately west of the 216-B-3 Pond to the 200 East Area perimeter fence.

The following summarizes the closure strategy proposed in this plan for the 216-B-3 Pond System.

- Clean close the 3A, 3B, and 3C Ponds (expansion ponds). Clean close as used in this context means that no dangerous waste or dangerous waste contaminated soil, structures, or equipment will remain onsite that pose a threat to human health or the environment. The ponds will continue to receive nondangerous waste water.

- Remove the 216-B-3 Pond and 216-B-3-3 Ditch from service.

1.3 PART A PERMIT APPLICATION

Currently, the unit-specific Part A permit application is being modified to separate the three expansion ponds (3A, 3B, and 3C Ponds) from the remainder of the unit (the 216-B-3 Pond and 216-B-3-3 Ditch). This modification is being made to allow clean closure of the expansion ponds while integrating closure activities for the 216-B-3 Pond and 216-B-3-3 Ditch with RCRA corrective action for the 200-BP-11 Operable Unit.

Revision 3 of the Part A, Form 3, for the 216-B-3 Pond System was submitted in 1990 with the 216-B-3 Pond System Closure/Postclosure Plan. The original Part A (Rev. 0) was submitted to Ecology in 1986. Revision 1 was submitted in August 1987 and Revision 2 was submitted in November 1987. The reasons for Revision 3 were twofold. First, new information was obtained that allowed for the development of a detailed chemical discharge history for the years 1983 to 1987. The last known reportable chemical discharge occurred in April 1987. Second, the chemical discharges were evaluated at the point of discharge into the environment. The chemical discharge history, which this Part A is based on, is from the Plutonium/Uranium Extraction (PUREX) Plant. Other facilities that discharged to B Pond either did not have the potential to discharge dangerous waste or a record search did not reveal documentation of dangerous waste discharges. A summary of the PUREX Plant chemical discharges is located in Chapter 4.0, Table 4-3.

The PUREX Plant chemical discharge history was developed by first comparing previous chemical discharge histories to construct one complete discharge history. The discharges then were matched with various Hanford Site records (e.g., off-normal/event reports, unusual occurrence reports, CERCLA/Ecology hazardous substance release reports, or event fact sheets) to substantiate the discharge. If records documenting the discharge could not be located or if the information in the records was inadequate to allow an evaluation, and processing knowledge could not be substituted, the discharge was not incorporated into Revision 3 of the Part A permit application.

To evaluate the discharges at the point of introduction into the environment, the following information was required to determine the

concentration in the PUREX Plant chemical sewer (chemical discharges from the PUREX Plant would have originated from the PUREX Plant chemical sewer, Chapter 4.0, Section 4.1.1):

- Plant processing conditions or, more accurately, the chemical sewer flow rate at the time of the discharge
- Duration of the discharge
- Mass (weight) of the chemical discharged.

For a number of discharges, the actual flow rate through the chemical sewer at the time of the occurrence was documented on Hanford Site records. In the event that daily records could not be located, an average flow rate was calculated from either a published cumulative weekly or a monthly volume.

For several discharges, chemical sewer flow rates could not be located or calculated. Best estimates were determined based on PUREX Plant operating conditions.

The duration of the discharge for a majority of the discharges was obtained directly from CERCLA/Ecology hazardous substance release reports. However, this type of record was not in existence for earlier discharges; in these cases, best estimates based on processing knowledge were used.

The mass (weight) of the chemicals discharged was obtained from Hanford Site records. However, for several of these discharges, the mass (weight) could not be determined because of plant configuration. These discharges were not incorporated in Revision 3 of the Part A because of the substantial lack of information.

When the information on flow rate, duration, and weight was obtained, the concentration in the chemical sewer was calculated, and the discharge was evaluated to determine if the discharges were designated as a dangerous or extremely hazardous waste in accordance with the state and federal *Dangerous Waste Regulations*. A majority of the discharges were either acidic or basic in nature. The pH of these discharges was determined, and the limits for corrosivity were applied to determine if the discharge should be designated as a dangerous waste in accordance with Washington State Department of Ecology "Dangerous Waste Regulations," *Washington Administrative Code* (WAC) 173-303-090(6). The second largest category of discharges were chemical makeups (mixtures) that did not meet plant specifications and could not be used in the process. The mixtures were evaluated by calculating the equivalent concentration and comparing the concentration with the toxic dangerous waste mixtures graph to determine if the discharge should be designated as a dangerous waste or as an extremely hazardous waste per WAC 173-303-084. The next category was discharged mixtures containing hydrazine. These discharges automatically were designated because hydrazine is a listed constituent per WAC 173-303-081. The final category was discharged mixtures containing cadmium. These discharges were designated for the characteristic of extraction procedure (EP) toxicity per WAC 173-303-090(8).

The discharges designated as dangerous waste or extremely hazardous waste were assigned the appropriate waste designation code. The designation code and the quantity of waste in pounds corresponding with the code were placed in the Part A, Section IV, "Description of Dangerous Wastes." [Note: water makes up most of the weight (pounds) of the discharge.] Table 4-3 in Chapter 4.0 provides a summary of chemical discharges that includes actual pounds of pure chemical and the waste designation codes. The following paragraphs describe how the discharges were designated, how the designation codes were selected, and how the pounds of chemicals discharged were determined.

The annual quantity of corrosive waste designated D002 per WAC 173-303-090(6) was determined by combining the quantity of corrosive waste discharged from demineralizer regeneration for the calendar year with the most generations (115,109,823 pounds taken from the 1987 records) with the annual average of corrosive waste discharged during unusual events that occurred periodically between 1983 and 1987 (22,086,642 pounds/4 years = 5,521,660 pounds). These two quantities (115,109,923 pounds and 5,521,660 pounds) totalled an annual discharge of 120,700,000 pounds. Some of the corrosive waste (D002) discharged during the unusual events indicated previously also was designated as WT02 dangerous waste per WAC 173-303-084. The annual average of WT02 dangerous waste was determined by averaging the discharges that were designated both D002 and WT02 during operations from 1983 to 1987 (10,549,226 pounds/4 years = 2,637,306 pounds per year).

From 1983 to 1987, there were five discharges that contained hydrazine. Because hydrazine is a listed constituent per WAC 173-303-081, it was decided to report the total amount discharged to B Pond rather than report an annual discharge. The quantity of hydrazine (U133) discharged was determined by totaling the five discharges that occurred from 1983 to 1987.

Several of the discharges were designated as WT01 extremely hazardous waste per WAC 173-303. Specifically, there were several cadmium spills and one ammonium fluoride/ammonium nitrate spill that fell into this category. The quantity of extremely hazardous waste was determined by totalling the cadmium discharges (318,000 pounds) with the ammonium fluoride/ammonium nitrate discharge (185,000 pounds). Cadmium also is designated as a D006 dangerous waste per WAC 173-303-084(8). The cadmium discharges were listed in the Part A under both the D006 and WT01 designations.

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2.0 FACILITY DESCRIPTION AND LOCATION INFORMATION

This chapter briefly describes the Hanford Site, the B Pond and discharge ditches, and the current security program.

2.1 THE HANFORD SITE

The Hanford Site covers approximately 560 square miles of semiarid land that is owned by the U.S. Government and managed by the DOE-RL. The Hanford Site is located northwest of the city of Richland, Washington, in the Columbia Basin (Figure 2-1). The city of Richland adjoins the southernmost portion of the Hanford Site boundary and is the nearest population center. In early 1943, the U.S. Army Corps of Engineers selected the Hanford Site as the location for reactor, chemical separation, and related facilities, and activities for the production and purification of plutonium.

Activities at the Hanford Site are centralized in numerically designated areas. The reactor facilities are located along the Columbia River in what are known as the 100 Areas. The reactor fuel processing and waste management facilities are in the 200 Areas, which are on a plateau approximately 7 miles from the Columbia River.

The 300 Area, located adjacent to Richland, contains the reactor fuel manufacturing facilities and the research and development laboratories. The 400 Area, 5 miles northwest of the 300 Area, contains the Fast Flux Test Facility used in the testing of liquid metal reactor systems. The 600 Area covers all locations not specifically given an area designation. Adjacent to north Richland, the 1100 Area contains facilities associated with administration, maintenance, transportation, and materials procurement and distribution. The 3000 Area, between the 1100 and 300 Areas, contains engineering and administrative offices. Administrative buildings also are located in the 700 Area, which is in downtown Richland.

2.2 THE 216-B-3 POND SYSTEM

The locations of the 3A, 3B, and 3C Ponds, the 216-B-3 Pond, and the 216-B-3-3 Ditch are shown in Figure 2-2. Also shown in this figure are nearby waste management units: the 216-E-28 Contingency Pond and the 216-B-3-1, 216-B-3-2, and 216-A-29 Ditches. An aerial photograph of the subject area is shown in Figure 2-3. All of the previously mentioned ponds and ditches are part of the 200-BP-11 operable unit, with the exception of the 216-A-29 Ditch. The 216-A-29 Ditch is a separate TSD unit that is currently part of the 200-PO-05 operable unit. The closure/postclosure plan for the 216-A-29 Ditch currently is scheduled to be submitted to Ecology and EPA in May 1996 in accordance with the Tri-Party Agreement (Ecology et al. 1992). The 216-B-3 Pond and the 216-B-3-3 Ditch are scheduled to be closed as part of an integrated effort with RCRA past practice activities at the 200-BP-11 Operable Unit. The work plan for this integrated effort currently is planned to be completed in fiscal year 1995.

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2.2.1 Operational History of the 216-B-3 Pond and Discharge Ditches

This closure plan only addresses closure of the expansion ponds and the structures that interconnect them. The 216-B-3 main pond, 216-B-3-3 ditch and associated concrete structures for flow measurement and control into and out of the main pond to the 3A, 3B, and 3C ponds will be addressed in the integrated effort for closure of the 216-B-3 Pond and RCRA past practice activities of the 200-BP-11 Operable Unit. This section on the operation history of the 216-B-3 Pond and discharge ditches is provided for information only.

The 216-B-3 Pond, in service since 1945, is located in a natural topographic depression. From 1945 through 1964, waste water was discharged to the 216-B-3 Pond via the unlined, earthen 216-B-3-1 Ditch. The ditch widened towards the inlet to the pond, and as a result, the ditch covered a fairly large, swampy surface area that terminated in a small, shallow pond (216-B-3 Pond).

In 1955, the 216-A-29 Ditch was placed in service to receive PUREX Plant chemical sewer waste water. The 216-A-29 Ditch discharged directly into the 216-B-3-1 Ditch. The 216-B-3-1 Ditch was decommissioned and backfilled with soil in 1964 after an accidental release of mixed fission products from the PUREX Plant. This release was discharged to the 216-B-3-1 Ditch via the PUREX Plant cooling water line rather than the 216-A-29 Ditch.

The unlined, earthen 216-B-3-2 Ditch was excavated in 1964 to replace the 216-B-3-1 Ditch. The 216-A-29 Ditch discharged into the 216-B-3-2 Ditch approximately 1,000 feet west of the 216-B-3 Pond. The 216-B-3-2 Ditch was decommissioned and backfilled with soil in 1970 after an accidental release of strontium-90 from B Plant. As a result of this release, the contaminated 216-B-3 Pond bank soil was consolidated into the pond, and the north, south, and west shorelines were diked with 3 feet of sand and gravel.

The unlined, earthen 216-B-3-3 Ditch was excavated in 1970 to replace the 216-B-3-2 Ditch, and the 216-A-29 Ditch was routed to discharge into the 216-B-3-3 Ditch approximately 1,500 feet west of the inlet to the 216-B-3 Pond. The 216-B-3-3 Ditch is approximately 3,700 feet long, 30 feet wide at ground level, 6 feet wide at the bottom, and 4 to 8 feet deep. A fiberglass-reinforced polyester flume and flowmeter were installed downstream from the 216-A-29 Ditch and 216-B-3-3 Ditch confluence. The 216-A-29 Ditch was removed from service in 1991. As it was removed from service, the 216-A-29 Ditch was interim stabilized to maintain the ditch in a stable configuration until closure actions are initiated. Interim stabilization consists of placing soil over the radioactively contaminated ditch bottom. This soil covering satisfies shielding requirements and forms a physical barrier against wind dispersion.

In December 1970, the dike along the eastern shore of the 216-B-3 Pond failed, and in 1971, major construction work was initiated to extend and raise the earthen dike. Construction materials were obtained from a borrow pit located near the pond, and were laid in 8-inch-(or less) thick layers. The

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dike now is approximately 1,380 feet long and 42 feet wide near the top, with basalt riprap added for erosion protection.

An area of approximately 4.1 acres immediately west of the 216-B-3 Pond was diked during the 1970's to provide an overflow area for the 216-B-3 Pond. This overflow area was decommissioned and backfilled in 1985.

The 216-B-3 Pond currently covers a surface area of approximately 35 acres, and is between 2 and 18 feet deep. Historical records indicate that the surface area of the pond has varied from 19 to 46 acres.

Most of the 200 East Area waste water was discharged to both B Pond and Gable Mountain Pond (216-A-25 Pond) until 1987, when decommissioning of Gable Mountain Pond was completed. Most of the 200 East Area waste water, exclusive of the PUREX Plant chemical sewer and a few other facilities, was routed to the cooling water line that runs parallel to the 200 East Area perimeter fence. From the cooling water line, the waste water could have been diverted to either the 216-B-3 Pond or Gable Mountain Pond. Since the decommissioning of Gable Mountain Pond, all waste water is discharged to the 216-B-3 Pond.

2.2.2 Operational History of the 216-B-3A and 216-B-3B Ponds

The 216-B-3A (3A Pond) and 216-B-3B (3B Pond) Ponds were constructed to receive increased discharges that would result from restart of the PUREX Plant. The ponds were constructed using a cut-and-fill construction method over a 22-acre surface area (11 acres each). Eight-millimeter polyethylene plastic was placed along the slope of the pond banks and covered with approximately 3 inches of pit run gravel. The plastic was extended approximately 3 feet out onto the pond bottom and 2 feet back from the top of the dike.

Spillway 216-B-351, which included a 24-inch-diameter culvert, a headwall with a manually operated slide gate, and a ditch with a flume and flowmeter, was constructed in the dike between the 216-B-3 Pond and the 3A Pond. The spillway was designed so that water would flow through the culvert, down a 2-foot-wide ditch lined with concrete and erosion-control fabric, through a fiberglass-reinforced polyester 12-inch flume and into the 3A Pond.

A spillway consisting of an open ditch lined with erosion-control fabric was constructed in the dike between the 3A and 3B Ponds. Erosion-control fabric is constructed of two layers of heavy-duty industrial nylon filled with fine aggregate concrete. The spillway was designed so that the 3A Pond overflowed into the 3B Pond when the 3A Pond reached its maximum operating capacity of approximately 3.5 feet.

The 216-B-351 spillway, in the dike between the 216-B-3 Pond and 3A Pond, was modified in 1983 to accommodate anticipated flow rates (Figures 2-4, 2-5, 2-6, and 2-7). The 24-inch-diameter culvert was replaced by a 36-inch-diameter, 12-gauge, spiral-corrugated, galvanized steel pipe.

The fiberglass flume liner was removed, the concrete support walls were recast to widen the water flow area, and the flowmeter was removed. A steel-reinforced concrete overflow control structure was constructed at the inlet to the pipe. The following structures were installed on the overflow control structure:

- Manually operated 42- by 36-inch downward opening slide gate
- Trash guard constructed of 2-inch-woven, diamond-mesh, galvanized wire
- Staff gauge for measuring water surface elevation
- Metal grating over the surface to allow personnel access.

This spillway operated in the same manner as the original--water flowed from the 216-B-3 Pond through the 36-inch pipe, down the ditch, and into the 3A Pond.

The 3A Pond was placed into service in October 1983. The pond was operated until January 1984, when the dike between the 3A and 3B Ponds failed at the connecting spillway. All discharge from the dike failure was contained in the 3B Pond, which had remained unused until this time. The dike failure is suspected to be the result of water seeping through the dike under the erosion-control fabric lining the spillway.

In response to this incident, flow to the 216-B-3 Pond was reduced and the 3A and 3B Ponds were isolated. A trench, oriented north-south and approximately 600 feet long, 30 feet wide, and 5 feet deep, was excavated into a permeable sand and gravel layer beneath the 3A Pond bottom to provide an area of increased infiltration. Discharge to the 3A Pond was resumed, but at a reduced rate, to contain flow and infiltration to the newly constructed trench.

A new spillway (216-B-353) was designed and constructed to replace the open ditch between the 3A and 3B Ponds (Figures 2-8, 2-9, and 2-10). Shortly afterwards, a second spillway (216-B-352) was constructed in the dike between the 216-B-3 Pond and 3A Pond (Figures 2-11, 2-12, and 2-13). This spillway was constructed to handle the increased water flow resulting from the decommissioning of Gable Mountain Pond.

Both new spillways were constructed to the same design: two 30-inch-diameter corrugated metal pipes through the existing dikes, a steel-reinforced concrete overflow control structure, and a stilling basin. The following structures were installed on the overflow control structure:

- Control weir and manually operated, downward-opening slide gate for each 30-inch-diameter pipe

- Trash guard constructed of 2-inch diamond-mesh, 9-gauge, galvanized wire supported by a 2-inch-diameter pipe

- Staff gauge for measuring water surface elevation

- Continuous 6-inch rubber dumbbell-type water stop

- Metal grating over the surface to allow personnel access.

A generalized cross section of the overflow control structure is shown in Figure 2-14. The overflow control structure was designed to provide automatic overflow, regardless of slide gate setting, before the upstream pond reached maximum liquid levels.

Stilling basins were constructed at the spillway outfall in the bottom of the ponds to control erosion. The basins were lined with erosion-control fabric and filled with riprap. The riprap extended beyond the basins and was placed over the pipes on the lower dike slopes.

The debris from the dike failure was removed from the 3B Pond and a series of trenches were excavated in the 3B Pond bottom to increase the infiltration rate. The excavated material was placed along the shores of the 216-B-3 Pond as diking.

The 3A and 3B Ponds were fully operational by June 1984. The 3B Pond was taken out of service in May 1985, and up to 7 feet of material was excavated from the pond bottom, to a depth below the bottom of the trenches. The excavated material was placed as diking on the north shore of the 216-B-3 Pond. The 3B Pond has not been used since it was taken out of service in May 1985.

2.2.3 Operational History of the 216-B-3C Pond

The 216-B-3C Pond (3C Pond) was constructed to accommodate increased flow resulting from the decommissioning of Gable Mountain Pond. A plan view sketch of the 3C Pond is shown in Figure 2-15.

The 3C Pond was constructed by excavating 6 feet of soil over a 41-acre surface area. Eight parallel north-south trenches, approximately 8 to 14 feet wide and 4 feet deep, were constructed in the pond bottom to increase infiltration. An east-west trench in the 3C Pond bottom connects the 216-B-354 outfall with the eight north-south trenches. The excavated material was placed in a spoil mound along the east and part of the north and south sides of the pond. The slopes of the pond were stabilized with 3 inches of 1-to 6-inch-size gravel. A gravel maintenance road was constructed along the edge of the pond.

A spillway (216-B-354) similar in design to the spillways that control flow into the 3A and 3B Ponds, as discussed previously, was constructed to convey water from the 3A Pond to the 3C Pond (Figures 2-16, 2-17, and 2-18). The spillway consists of two 30-inch-diameter corrugated-metal pipes, a steel-reinforced concrete overflow control structure, and a stilling basin, and was designed for a maximum flow capacity of 20,000 gallons a minute or 28,800,000 gallons a day. The two 30-inch-diameter pipes were installed by

excavating a ditch approximately 950 feet in length from the 3A Pond to the 3C Pond. A 4-inch-thick cushion of sand was placed under the pipe and backfill was placed over the pipe to the existing grade.

The areas disturbed by the construction of the pond and spillway, except for the pond bottom, spoil mound, and gravel-stabilized areas, were revegetated by mulching and crimping with straw, then applying seed.

2.2.4 Dike Piezometers

In 1984, 22 piezometers were installed in a total of 10 boreholes in the earthen dikes impounding the 216-B-3 Pond and 3A Pond (Figure 2-19). These piezometers were installed in response to the dike failure that occurred between the 3A and 3B Ponds. By design, the 10- to 20-foot-thick earthen dikes permit a certain amount of saturated flow through and beneath the fill material from which they are constructed. The function of the piezometers is to monitor this saturated flow. Water level measurements are made at least once a month with an electric water level tape.

The piezometers were installed in 6-inch-diameter boreholes that ranged from 8 to 75 feet in depth. Single or multiple piezometers were constructed in each borehole (Figure 2-20). Single piezometer completions are noted as P, dual completions as Q, and triple completions as R (Table 2-1). The piezometer tube consists of a polyethylene screen (12 inches in length) attached to an 1-inch inside diameter polyvinyl chloride tubing that extends to the surface. The annular space around the screen is packed with sand to provide good transmissivity, while bentonite clay above and below each screened section prevents vertical water movement along the outside of the piezometer tube.

The following scheme was used to situate the screened intervals within each borehole. The deepest piezometer was placed within the uppermost saturated zone, if present less than 75 feet from the surface, to monitor flow through the dike. A second piezometer was placed within the dike if the water table was well below the dike fill material. A third, intermediate piezometer was installed in several wells to provide better vertical resolution.

Although most of the wells originally intersected zones of saturation in or beneath the dikes, water levels dropped soon after installation, leaving most piezometers dry. A decline in the infiltration rate of the first expansion pond (3A) may have caused this phenomenon. Based on current water level observations, little or no saturated flow is occurring through the dikes. However, bentonite clay, used to seal the piezometer tubes, is present at the bottom of several piezometers and may be plugging the screens, thereby causing inaccurate readings. Integrity testing of the piezometers conducted in 1986 indicated restricted flow in some of the deeper piezometers. But the shallower piezometers, those monitoring the dike material, appeared to be functioning properly.

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2.2.5 Future Use

The 216-E-28 Contingency Pond was constructed in 1987 north of B Pond (see Figure 2-3) to provide emergency overflow capability for B Pond. The Contingency Pond is not a part of the subject TSD unit, nor is it a separate TSD unit because it has not received influent. A 48-inch-diameter-corrugated-metal pipeline was constructed from the PUREX Plant cooling water line (discharging to the 216-B-3-3 Ditch) to the Contingency Pond.

To support the 216-B-3 Pond closure process, a prior project, W-019, 'B Pond Influent Control Upgrades', installed a pipeline bypass around the 216-B-3 Pond to discharge the waste water directly into the 3A Pond. A 36-inch-diameter, high-density polyethylene pipeline was constructed in early 1990 from the Contingency Pond pipeline to the 3A Pond. The purpose of this pipeline was to convey all B Pond waste water discharges from the cooling water line directly to the 3A Pond, thus bypassing the 216-B-3 Pond, 216-B-3-3 Ditch, and 216-A-29 Ditch. An outfall structure (stilling basin), similar in design to the existing stilling basins, was constructed outside the north edge of the 3A Pond.

Current closure planning requires the 3A Pond to be clean closed along with the clean closure of the 3B and 3C Ponds. However, because of the proximity of the 3A Pond to the 216-B-3 Pond, it has been agreed to take the 3A Pond out of service along with the 216-B-3 Pond. To accomplish this, a bypass is required to divert the waste water around the 3A Pond and into the 3B and/or the 3C Pond. Project X-009, currently in construction, will provide the capability to bypass the 3A Pond and reroute the waste water to either the 3B Pond, the 3C Pond, or both simultaneously. A pipeline equipped with control gates will also be installed from the 3B Pond to the 3C Pond to provide capability to drain waste water from 3B Pond into the 3C Pond.

2.3 SECURITY INFORMATION

An effective security program is maintained at the Hanford Site because of the presence of several facilities that handle dangerous and radioactive materials and the continuing activities associated with these materials. Staffed barricades are maintained around the clock at checkpoints on vehicular access roads leading to the 216-B-3 Pond System. All personnel accessing these and other Hanford Site areas must have a DOE-issued security identification badge indicating the appropriate authorization. Personnel also might be subject to a random search of items carried into or out of the Hanford Site.

Site personnel receive training on Hanford Site security regulations in the form of required security education and on-the-job training. Procedures for ensuring personnel compliance with security requirements and provisions for security training are maintained at the Hanford Site. Periodic security-compliance audits and inspections ensure that these procedures are followed.

The 216-B-3 Pond System boundaries are currently enclosed by a single-strand chain and post fence that has appropriate radiological warning signs.

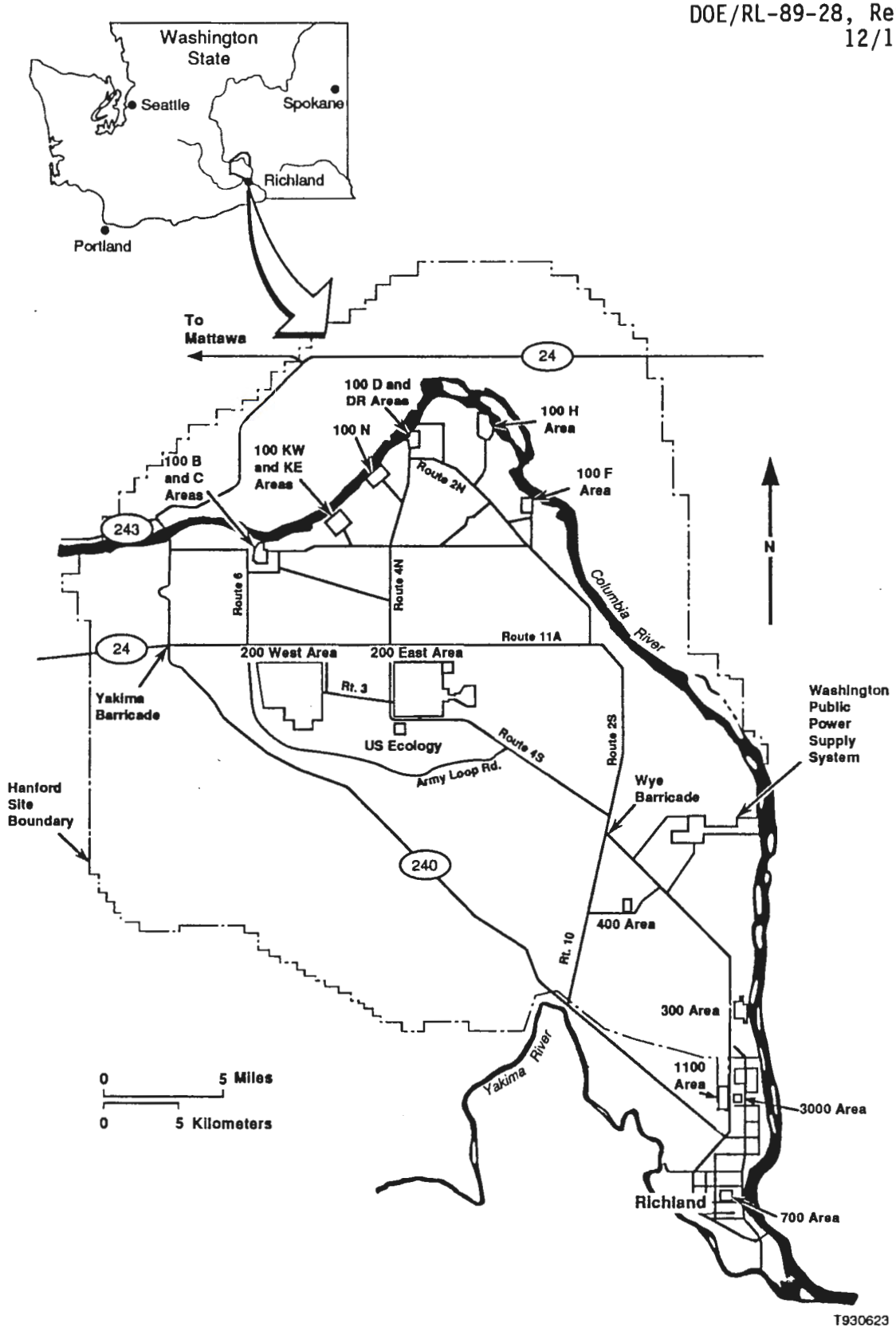

Figure 2-1. Hanford Site and Regional Map.

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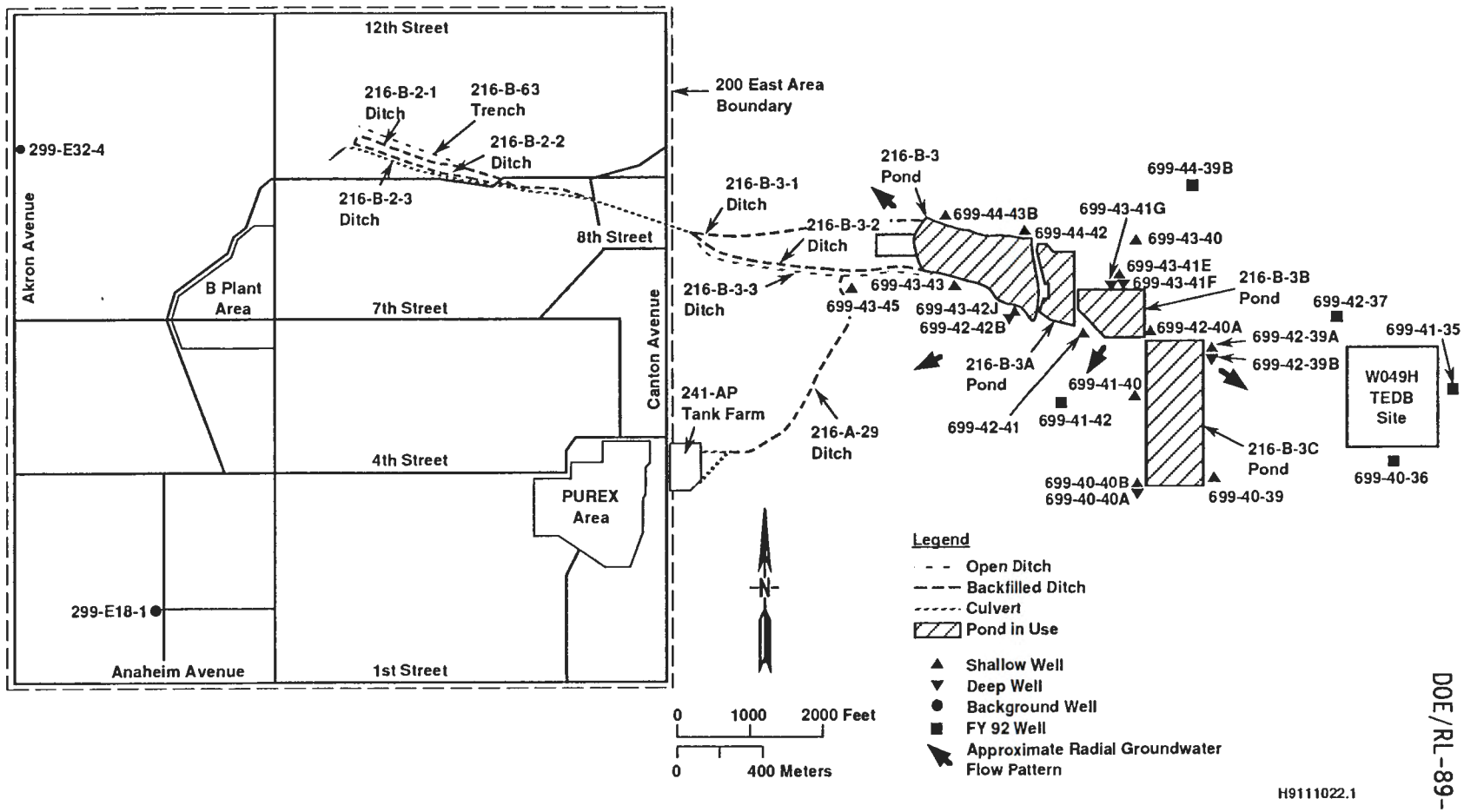

Figure 2-2. The 216-B-3 Pond System Location Map.

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Figure 2-3. Aerial Photograph of the B Pond Area (1988).

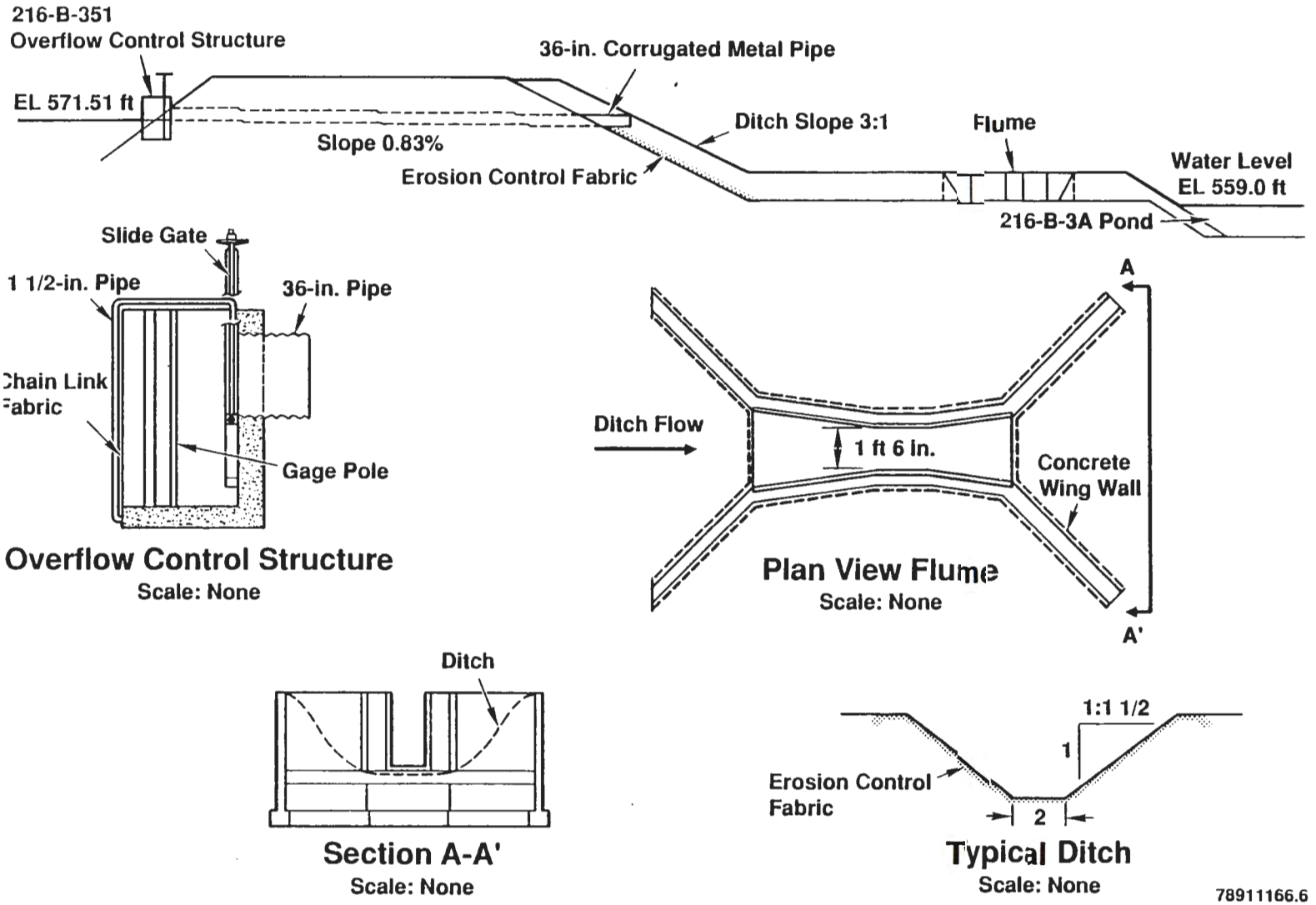

Figure 2-4. Sketch of the 216-B-351 Spillway.

9413095.0219

(PHOTOGRAPH TAKEN 1989)

Figure 2-5. Photograph of the 216-B-351 Overflow Control Structure.

9413095.0750

(PHOTOGRAPH TAKEN 1989)

Figure 2-6. Photograph of the 216-B-351 Spillway.

9413095.0251

(PHOTOGRAPH TAKEN 1989)

Figure 2-7. Photograph of the 216-B-351 Spillway Outfall.

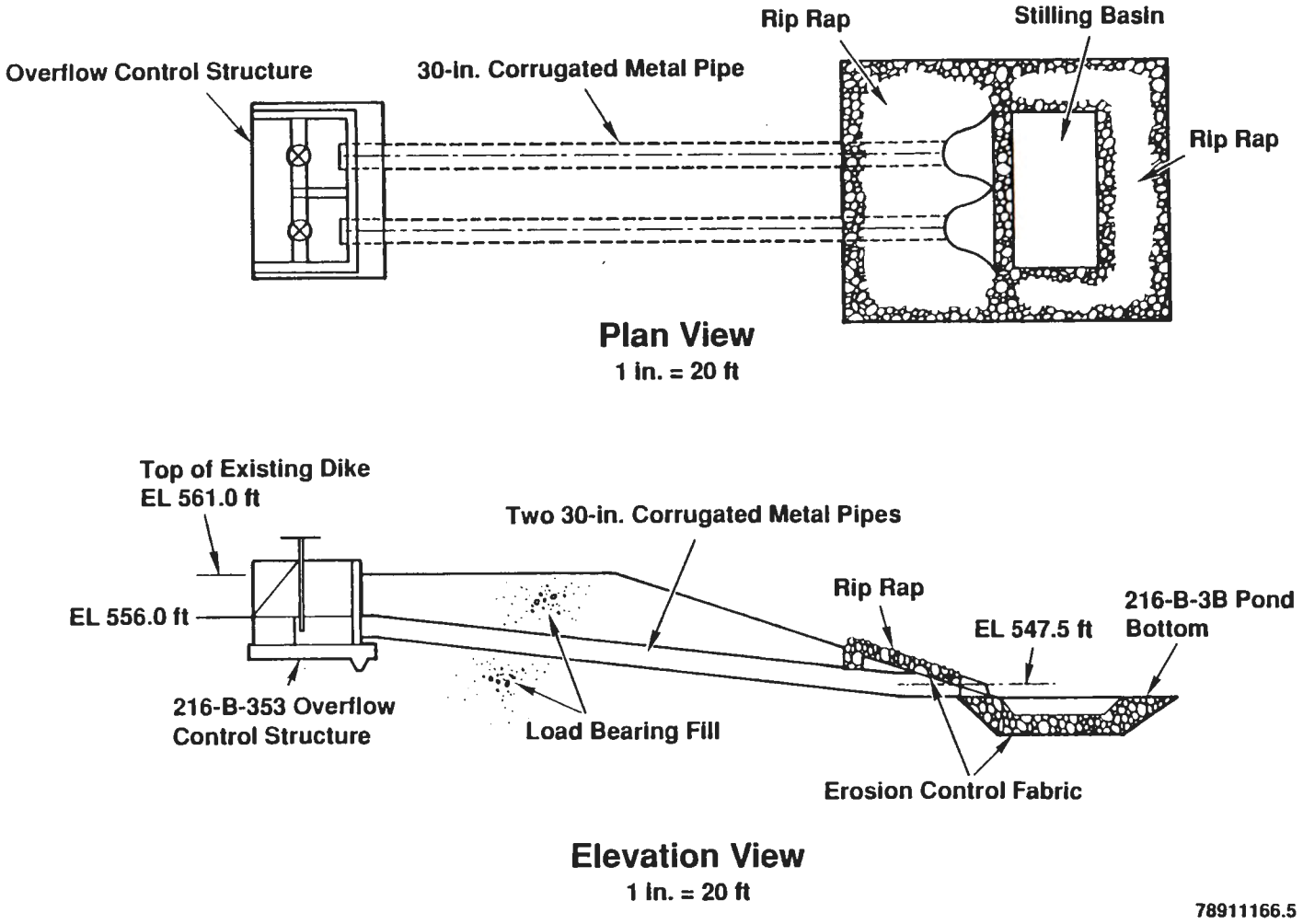

Figure 2-8. Sketch of the 216-B-353 Spillway.

9413095.0353

(PHOTOGRAPH TAKEN 1989)

Figure 2-9. Photograph of the 216-B-353 Overflow Control Structure.

9413095.0259

(PHOTOGRAPH TAKEN 1989)

Figure 2-10. Photograph of the 216-B-353 Stilling Basin.

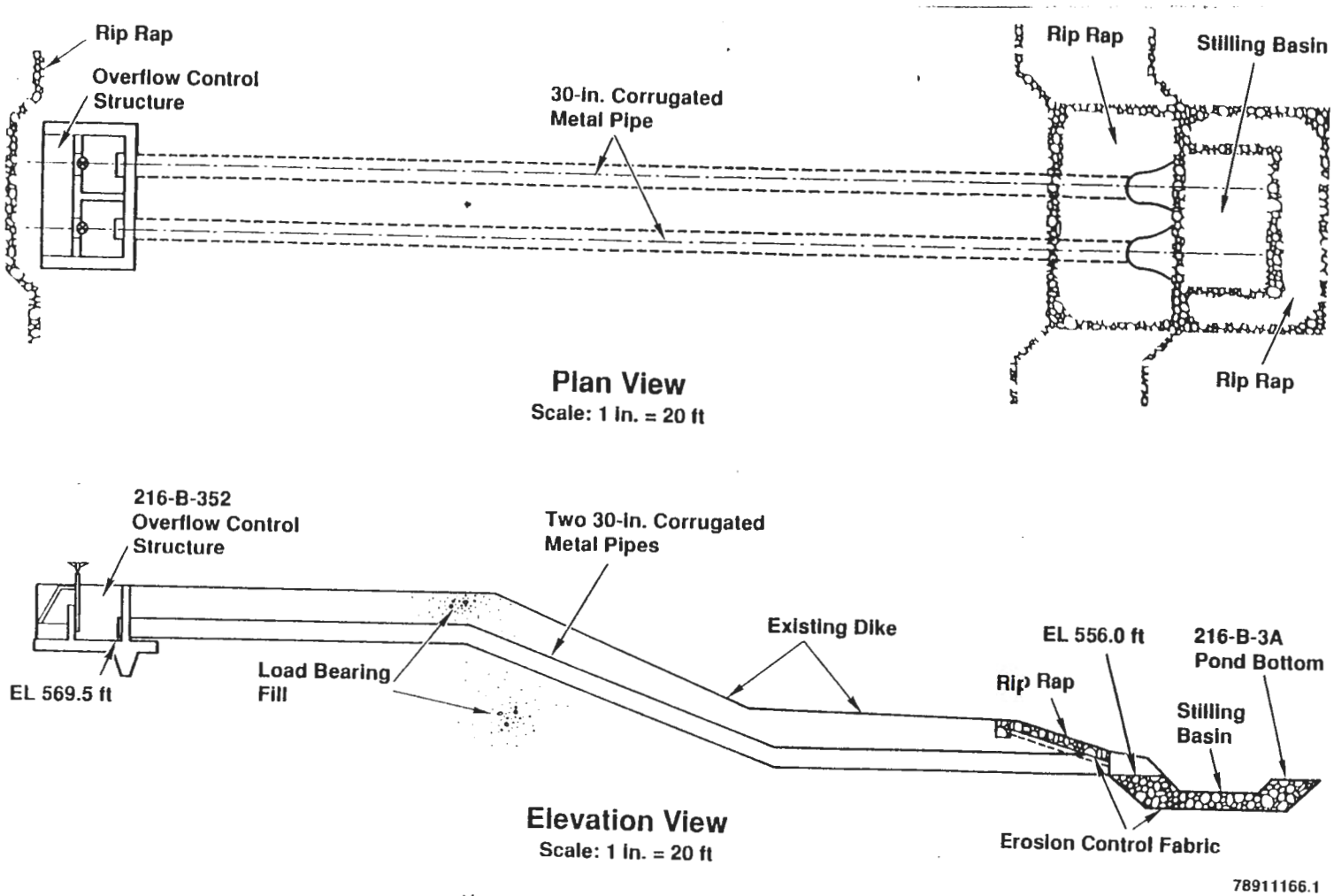

Figure 2-11. Sketch of the 216-B-352 Spillway.

9413095.0256

(PHOTOGRAPH TAKEN 1989)

Figure 2-12. Photograph of the 216-B-352 Overflow Control Structure.

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(PHOTOGRAPH TAKEN 1989)

Figure 2-13. Photograph of the 216-B-352 Overflow Control Structure.

9413095.0258

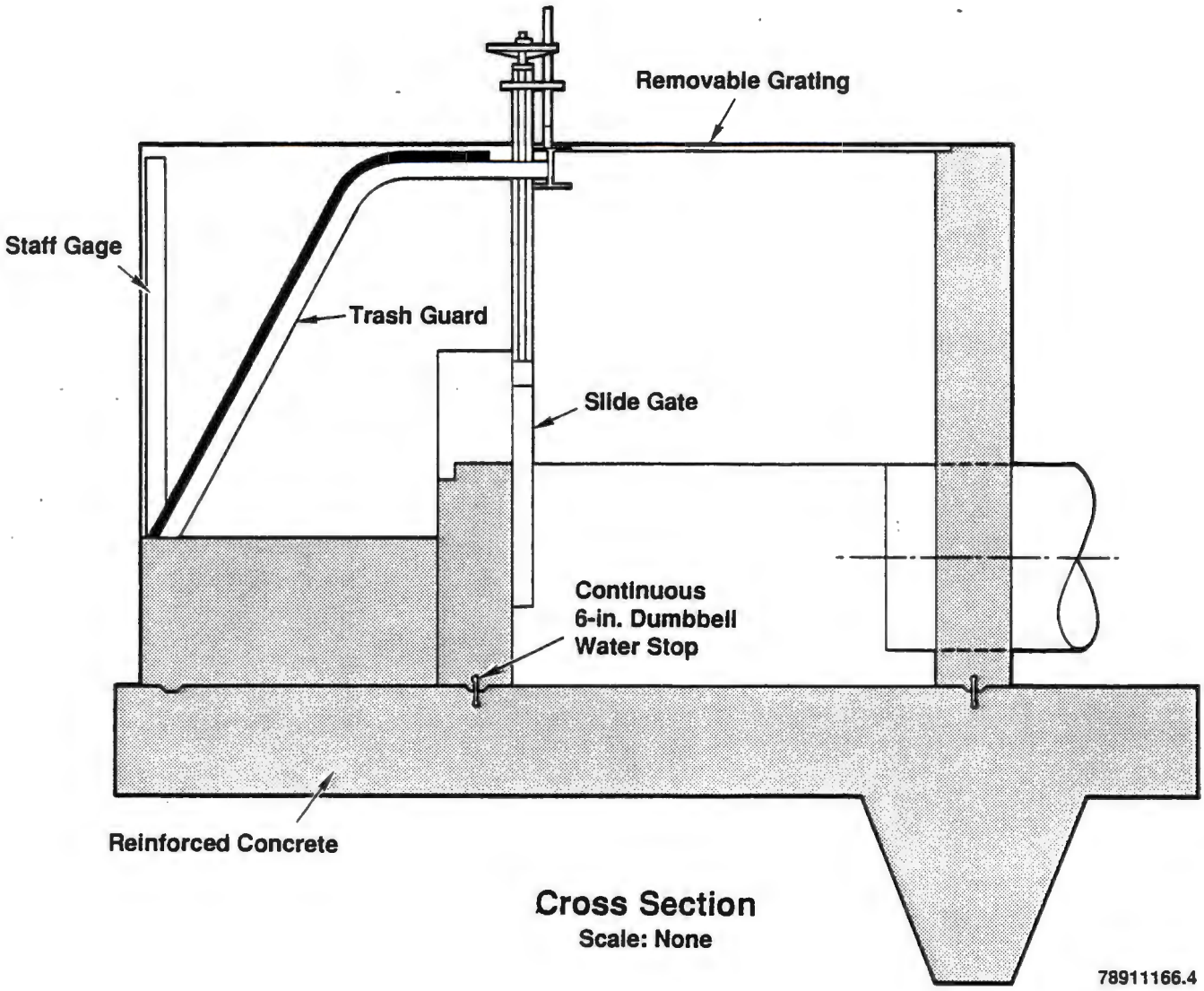

Figure 2-14. Generalized Cross Section of the 216-B-352, 215-B-353, and 216-B-354 Overflow Control Structure.

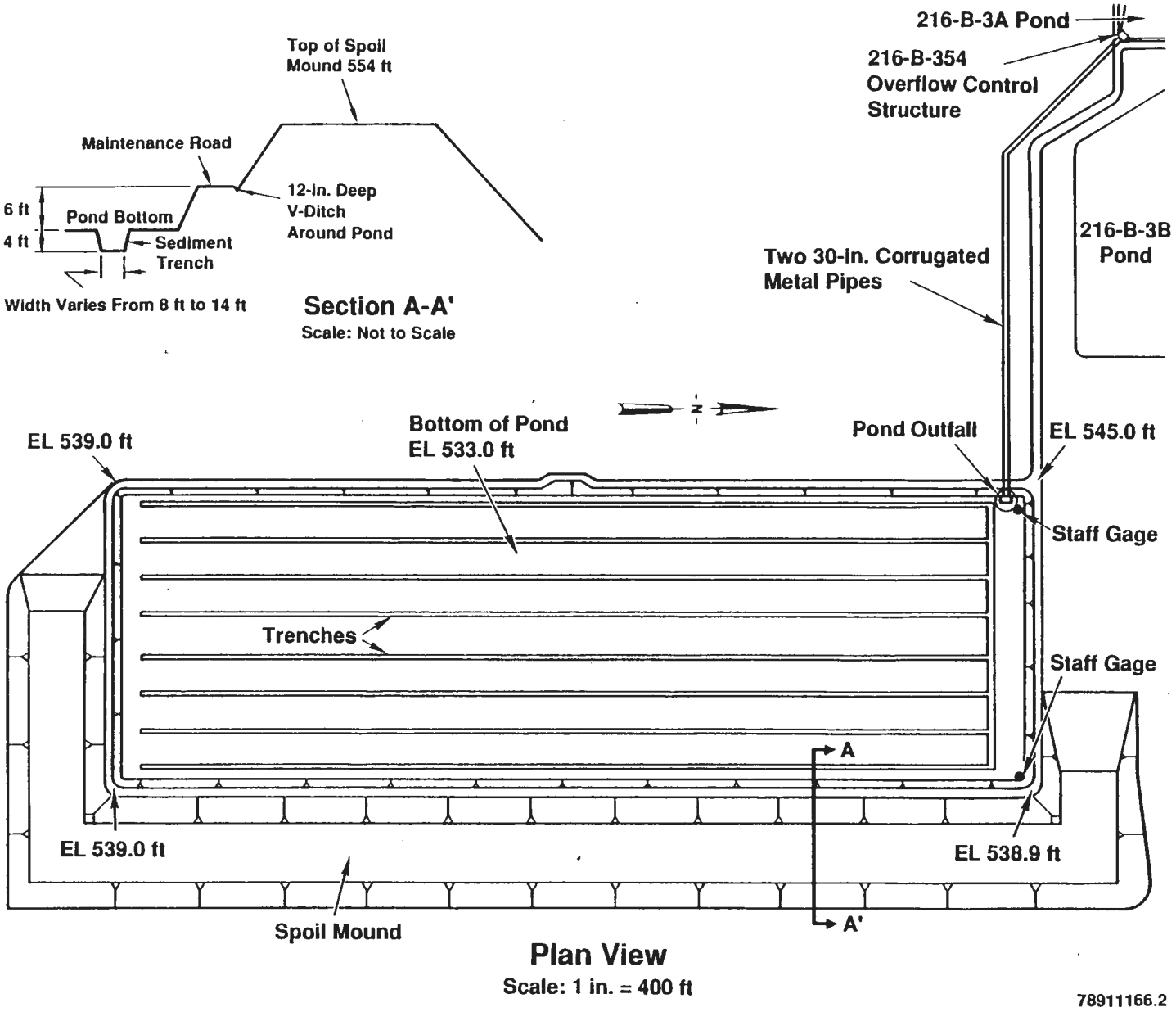

Figure 2-15. Plan View Sketch of the 216-B-3C Pond.

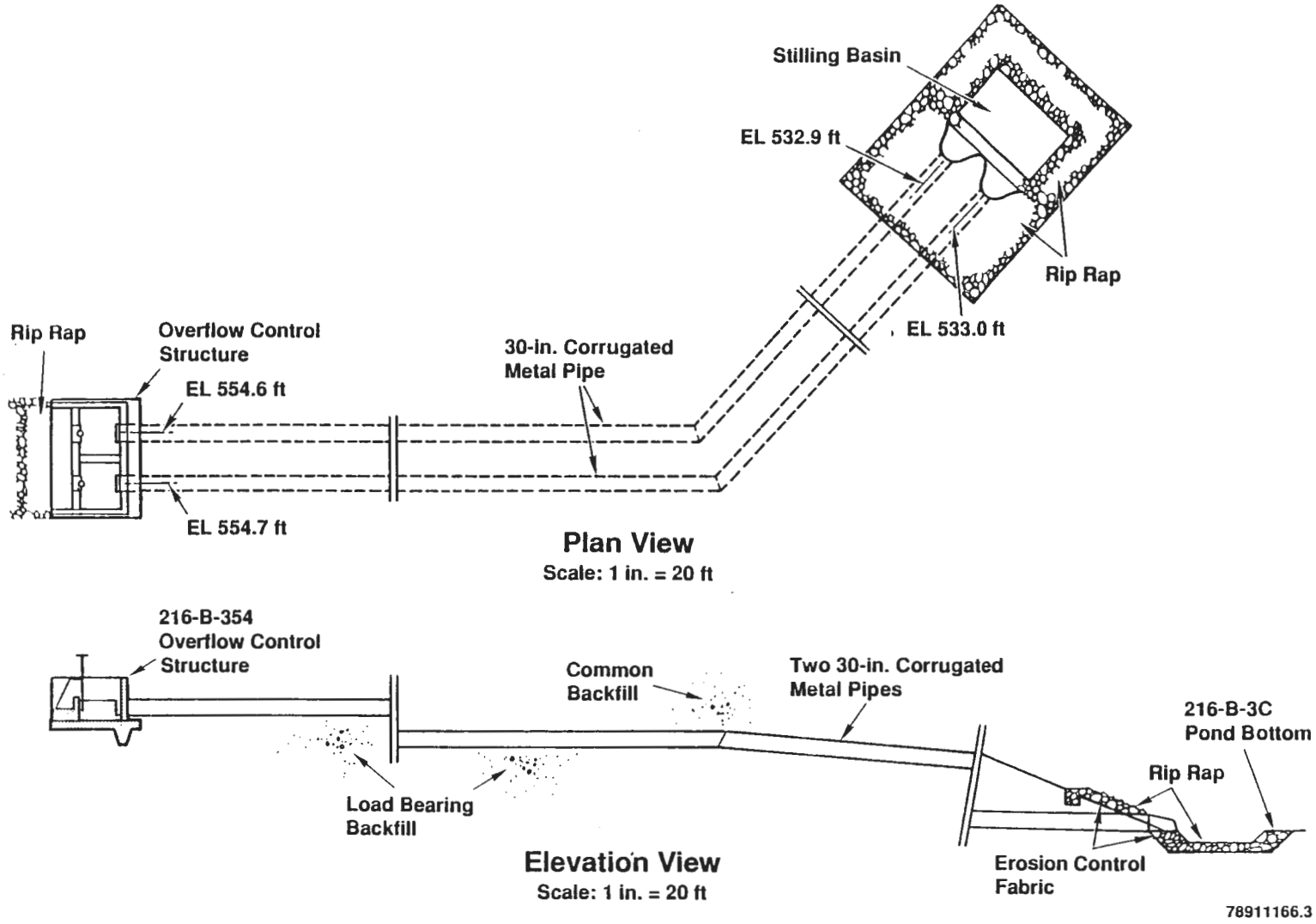

Figure 2-16. Sketch of the 216-B-354 Spillway.

9413095.0761

(PHOTOGRAPH TAKEN 1989)

Figure 2-17. Photograph of the 216-B-354 Overflow Control Structure.

9413095.0752

(PHOTOGRAPH TAKEN 1989)

Figure 2-18. Photograph of the 216-B-354 Spillway Outfall.

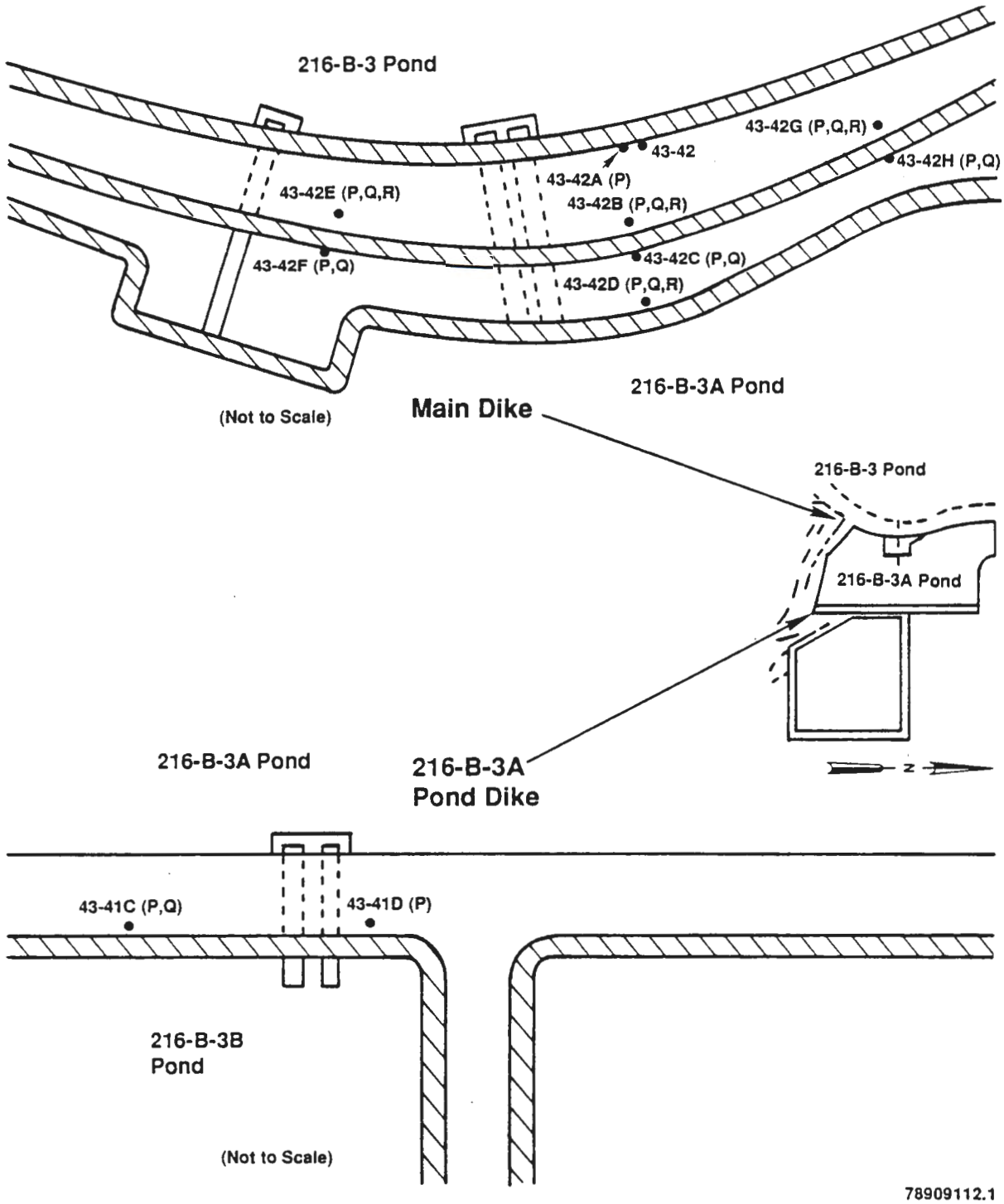

Figure 2-19. Piezometer Location Map.

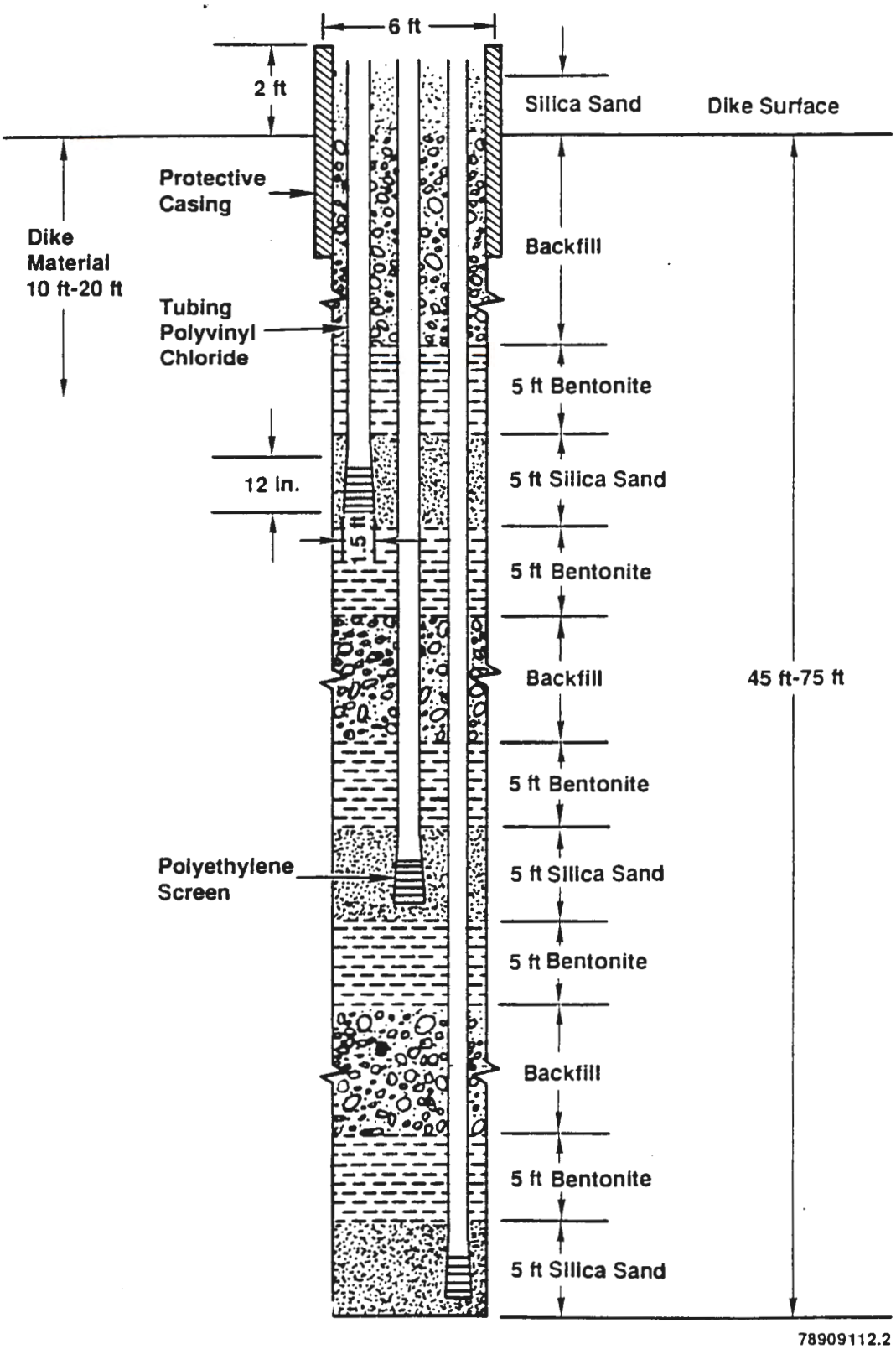

Figure 2-20. Typical Multiple Piezometer Installation.

Table 2-1. Piezometer Coordinates, Dimensions, and Water Levels.

Piezometer number	Piezo-meter	Plant coordinates		Elevation (feet above mean sea level)		Depth from top to bottom (feet)	Depth to water (feet)
		North	West	Top of pipe	Piezometer bottom		
699-43-42A	P	N43110.33	W41812.50	578.8	568.4	10.4	9.7
699-43-42B	P	N43117.46	W41772.55	577.6	529.3	50.6	48.1
	Q			577.7	527.1	21.2	Dry
	R			577.7	556.5	11.3	Dry
699-43-42C	P	N43125.08	W41747.37	566.5	515.2	51.3	Dry
	Q			566.5	531.4	35.1	Dry
699-43-42D	P	N43131.33	W41726.12	564.8	517.6	47.3	Dry
	Q			564.8	532.2	32.65	Dry
	R			564.8	549.6	15.3	Dry
699-43-42E	P	N42892.14	W41705.14	578.6	501.3	77.4	Dry
	Q			578.6	525.9	52.8	Dry
	R			578.6	563.6	15.1	Dry
699-43-42F	P	N42893.96	W41666.49	565.9	494.4	71.5	Dry
	Q			565.9	528.4	37.5	Dry
699-43-42G	P	N43362.37	W41828.35	578.8	513.3	65.5	Dry
	Q			578.8	532.0	46.8	Dry
	R			578.8	564.5	14.3	Dry
699-43-42H	P	N43368.19	W41789.84	565.1	513.3	51.8	Dry
	Q			565.1	542.7	22.4	Dry
699-43-41C	P	N42676.73	W41171.57	563.5	546.7	16.8	Dry
	Q			563.5	554.4	9.1	Dry
699-43-41D	P	N42834.80	W41172.21	563.4	552.6	10.8	Dry

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3.0 PROCESS INFORMATION

This chapter describes the processes that generate the waste streams discharged to the 216-B-3 Pond System. The 216-B-3 Pond System receives cooling water from the 221-B Building (B Plant), 242-A Evaporator, 241-A Aging Waste Ventilation System Complex, and 244-AR Vault. In addition, the 216-B-3 Pond System receives discharges from the B Plant chemical sewer, PUREX Plant chemical sewer, 283-E Water Treatment Facility, and 284-E Powerhouse. In the past, the 216-B-3 Pond received waste water from PUREX cooling water, 244-CR Vault, 242-B Evaporator, 244-BXR Vault and 241-BY Tank Farm. The 216-B-3 Pond System has also received waste water from several miscellaneous sources, such as construction activities. Other waste streams may be discharged to the 216-B-3 Pond System in the future. Table 3-1 provides a summary of the waste streams discharged to the 216-B-3 Pond System and the associated discharge dates.

Since 1970, the waste streams have been discharged to the 216-B-3 Pond via the 216-B-3-3 Ditch. The flow was divided between 216-B-3 Pond and 216-A-25 (Gable Mountain) Pond via a diversion valve near the head end of the 216-B-3-3 Ditch. This practice was discontinued when the 216-A-25 Pond was decommissioned in 1987. Figure 3-1 depicts the various flow routes to the 216-B-3 Pond System.

Effluents entering the 216-B-3 Pond System consist primarily of atmospheric condensate, cooling water, sanitary (i.e., potable) water, and steam condensate. Cooling water and steam condensate discharged to the 216-B-3 Pond System have the potential to become radioactive if there is a breach in the tubes separating the cooling water or steam from the process solutions. Cooling and heating operations, unless otherwise specified, are open-loop systems. That is, the cooling water or steam is not reused after accomplishing the cooling or heating operation. All streams that have the potential to receive radionuclides are monitored for radiation in order to automatically divert the stream to a basin when a predetermined radiation level is reached, alert personnel that alternate cooling routes need to be valved in, or shut down the process.

3.1 THE PUREX PLANT FEED STREAMS

The PUREX Plant was used to process irradiated nuclear fuel. The supply of nuclear fuel was obtained from the 100 Area Fuel Basins where it was stored after it was discharged from the N Reactor. Plutonium and uranium were the primary product materials recovered from the irradiated fuel.

The PUREX Plant began operation in January 1956 and operated until June 1972, when the facility was placed on standby. After upgrading the plant, the facility was restarted in November 1983 and operated until 1991. It was transitioned from operational to standby mode in 1992 and is now being

transitioned to shutdown mode. During shutdown, the facility will not be staffed and will produce no liquid effluent streams. The facility will remain in a deactivated state for several years until final decontamination and decommissioning.

Discharge from the PUREX Plant to the 216-B-3 Pond System comes from the chemical sewer. The cooling water and steam condensate streams were shut down and diverted to the chemical sewer during the 1992 transition to standby. In the past, the steam condensate stream could be sent to the 216-B-3 Pond System after being diverted to the 216-A-42 Diversion Basin. The steam condensate stream normally was discharged to the 216-A-30 Crib and the 216-A-37-2 Crib. The steam condensate flow was split in a diversion box on the 216-A-30 Crib so that two-thirds of the flow went to the 216-A-30 Crib and the remaining effluent went to the nearby 216-A-37-2 Crib.

Diversion of the chemical sewer to the 216-A-42 Diversion Basin occurs automatically when a high radionuclide content is detected or when an electrical failure occurs. The chemical sewer discharge must be diverted manually to the 216-A-42 Diversion Basin whenever the pH is greater than or equal to 12.5 or less than or equal to 2.0. An audible alarm is received in the PUREX Plant central control room and dispatch office that alerts the process operators to an abnormal condition that may require a diversion of the chemical sewer discharge to the 216-A-42 Diversion Basin.

After a stream has been diverted to the 216-A-42 Diversion Basin, the basin is sampled to determine the pH and radionuclide content of the liquid. The pH of the basin contents is measured because the most likely dangerous waste constituent would be a corrosive material. If sample analyses indicate the solution in the basin is out of range (with respect to dangerous waste characteristics and/or radioactivity), the following options exist.

- Send the material back to the PUREX Plant for reprocessing.
- Route the material to the Tank Farms via the PUREX Plant.

Liquid in the basin is pumped to the 216-B-3 Pond via the 216-B-3-3 Ditch when the sample analysis indicates the material is within the proper specifications for disposal to the environment.

Composite samples of the stream are taken weekly. A composite sample consists of numerous small samples that are obtained automatically during one week by the flow-proportional sampler and stored in a small tank. This sample is a representative average of the stream discharge over a one-week interval. An operator obtains the composite sample weekly for analysis. The cooling water and steam condensate are analyzed for pH, total alpha, and total beta; the chemical sewer is analyzed for pH, total alpha, total beta, and nitrate.

Approximate flow rates for the chemical sewer, cooling water, and steam condensate discharge for the PUREX Plant are provided in Table 3-2.

3.1.1 Chemical Sewer

The chemical sewer stream was the most likely source for discharge of a dangerous material, in liquid form, to the 216-B-3 Pond System. Since 1984, numerous administrative and engineering barriers have been implemented to prevent dangerous waste from being disposed of to the chemical sewer.

Administrative controls consist of the following:

- Maintaining operating procedures to ensure that chemicals are not improperly disposed of
- Regenerating simultaneously (i.e., co-regeneration) the anion and cation beds for the demineralized water system (now shut down)
- Requiring an operator at each tank (when making transfers between tanks not within the vicinity of each other) to prevent overfilling
- Verifying (double) of valving to minimize inadvertent transfers or draining of tanks.

Physical barriers include the following:

- pH monitors and alarms
- Containment dikes
- Liquid-level instrumentation with interlocking inlet isolation valves to prevent overfilling tanks
- Catch tanks established within the aqueous makeup area to contain spills
- B-669 elementary neutralization system (now shut down)
- Pancake blanks installed on chemical headers in the processing and operating gallery. Pancake blanks are circular metal plates with a projecting tab. The blanks are designed to be inserted at flange joints in chemical headers to prevent the flow of liquids and gases. The projecting tab serves as physical evidence that a line has been blanked off.

To assist in detecting dangerous materials being released to the environment, a pH meter was installed in November 1985 in the chemical sewer line monitoring system. The pH meter monitors the chemical sewer line monitoring system for radiation and corrosion.

The chemical sewer can receive liquid from the following sources:

- Heating and ventilation condensate
- Carrier water
- Vacuum pump seal water

- Pipe and operating gallery
- Miscellaneous floor drains
- Recovered nitric acid system (no longer a source)
- Aqueous makeup area
- 203-A (former) uranium storage area
- 211-A chemical storage area
- Flash tank Tk-618-1
- Distilled water systems
- Tank Tk-2901A overflow
- Sanitary pipe trench condensate.

3.1.1.1 Heating and Ventilation Condensate. In addition to establishing necessary pressure gradients to prevent the spread of radionuclides throughout the PUREX Plant, the heating and ventilation system is used to condition air (e.g., to remove dust, humidify, and adjust to final desired temperature) for personnel comfort. Air enters the building through an inlet damper and is preheated with low-pressure steam (nominally 10 pounds per square inch) to minimize moisture accumulation in the filter. Following the heating operation, the air passes through a filter used to eliminate coarse dirt and dust particles. After filtering, the air goes into a chamber where it is humidified and washed simultaneously. Water flowing through the air washes away fine dirt and dust particles. Washing air with water accomplishes the simultaneous humidification. The clean and humidified air then is reheated to a desired temperature using low-pressure steam.

Condensate from steam heating and water used for air washing and humidification are routed to the chemical sewer line. Because these operations are performed on ambient outside air, the resulting liquid streams should not adversely affect the composition in the chemical sewer discharge.

To provide for local temperature control, steam heaters are installed in ductwork leading to control rooms, offices, laboratory, and locker rooms. The steam condensate generated from these units also is routed to the chemical sewer line.

3.1.1.2 Carrier Water. The purpose of carrier water is to ensure that adequate flow is available to prevent the accumulation of material in the chemical sewer line during low flow periods. Carrier water is supplied continuously to the chemical sewer line via the raw water line at approximately 30 gallons per minute. This ensures that continuous monitoring is available for immediate detection of abnormal conditions. Raw water is unfiltered and untreated water obtained from the river. Therefore, any constituents found in the raw water supply would have existed before extraction from the river.

3.1.1.3 Vacuum Pump Seal Water. A vacuum system provides a vacuum source for the continuous air samplers located throughout the facility. Continuous air samplers are used to detect potential radioactive contamination in ambient (building) air that is exhausted via the facility stacks. A continuous air sampler is a standpipe with a paper filter holder. Air is pulled through the filter at a uniform rate and the filter is removed at fixed intervals and counted for radioactive contamination. Consistent, abnormally high radiation

counts on a filter indicate a possible radiation leak in the vicinity of the sampler. The vacuum is provided by one of two vacuum pumps (P-CV-94-1 and P-CV-94-2) that discharge the air to the atmosphere. Water is provided to the seals of these vacuum pumps to carry away excess heat from the seals and to serve as a lubricant. The uncontaminated water then is discharged to the chemical sewer.

3.1.1.4 Pipe and Operating Gallery. The pipe and operating gallery provides space for the electrical switchgear, instrument racks, nonradioactive chemical piping (or headers), several batch chemical addition tanks, and associated gang valves that serve the in-cell equipment. Because most of the valves are controlled from control panels, only a few operations are required in the gallery.

The pipe and operating gallery floor drains in the PUREX Plant were potential pathways for chemicals into the chemical sewer. Several upgrades have been installed to preclude chemicals from entering the chemical sewer line.

In 1986, all possible routes from the pipe and operating gallery tanks and the nonradioactive chemical headers to the floor drains were identified. Engineering barriers, such as pancake blanks and blind flanges, were installed to prevent chemicals from reaching the floor.

Administratively, the pipe and operating gallery floor drains normally are diverted to tanks in the canyon.[1] When the pipe and operating gallery floor is cleaned, the floor drains initially are flushed to the canyon to ensure that any chemicals that are present have been flushed to the canyon. After initial flushing, the drains are diverted to the chemical sewer. Diversion of the pipe and operating gallery drains from the canyon to the chemical sewer requires supervisory authorization.

To prevent overfilling the pipe and operating gallery tanks, liquid-level capacitance probes were installed inside the tanks with three alarm functions:

- Low-level (20 percent of tank capacity)
- High-level (85 percent of tank capacity)
- High-high level (90 percent of tank capacity).

The 'low-level' alarm was installed to alert personnel that a tank is losing liquid; indicating a drain valve is open, leaking through, or that a transfer had taken or is taking place. A 'high-level' alarm was installed to alert operations personnel that a tank is filling up and is almost full. If an anticipated transfer is not taking place, this serves as a warning that

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[1]The use of 'canyon' in Hanford Site facilities refers to that portion of a nuclear fuel processing building where remotely controlled radioactive processing of materials takes place.

something is leaking into the tank (i.e., there is a leaking inlet valve or an inadvertent transfer). On a 'high-high level' alarm, motor-operated valves installed on all the inlet lines to a tank will close to prevent further liquid additions as the overflow point is approached.

3.1.1.5 Miscellaneous Floor Drains. Floor drains located in the PUREX Plant that are not in radiation areas and are not in the vicinity of the drains for dangerous waste are routed directly to the chemical sewer line. The floor drains receive water from draining condensate from the steam lines, safety showers, showers, and water coolers throughout the facility. The floor drain locations are as follows:

- Battery room
- Compressor room
- Laboratory change rooms
- Laboratory ventilation room
- Locker and shower rooms
- Instrument and maintenance shops
- Building supply ventilation rooms.

3.1.1.6 Recovered Nitric Acid System. Nitric acid was used at the PUREX Plant to dissolve uranium and to enhance solvent extraction performance and operations. The use of nitric acid was preferred for economic reasons. Nitric acid was recovered easily without generating large volumes of contaminated liquid waste. This resulted in minimizing the amount of fresh nitric acid required for the PUREX Plant process. The recovery was performed by breaking down nitric acid into oxides of nitrogen (gas composed of various nitrous oxides) and recovering the gas by absorption into water. The acidic water was recovered and concentrated to 50 weight percent nitric acid using a fractionator (a distillation column).

The acid fractionator (T-U6) was comprised of four main streams: feed, distillate, recycle, and bottoms. The feed was the dilute acidic water obtained in the recovery of nitrous oxide, the bottoms were the 50 weight percent (approximately 10 to 12 molar) nitric acid (product), and the distillate was the acidic water vapor (approximately 0.005 molar nitric acid) driven off from concentrating the feed.

The distillate (vapor form) was cooled (condensed) via a heat exchanger (condenser) using raw water as a coolant. This resulted in the vapor changing phases from a gas to a liquid. A condenser consists of tubes which cooling water flows through and this is surrounded by a shell that directs vapor flow around the tubes. The two streams are physically separated by the wall thickness of the tubes. For mixing to occur, a tube in the condenser would have had to develop a hole. Because of the pressure difference between the cooling water header and the vacuum conditions that existed in the condenser shell, water would have flowed into the condenser shell instead of the slightly radioactive acidic solution flowing into the cooling water.

The condensed liquid was routed to a condensate collection tank (Tk-U8) where the distillate was routed to the following:

- Tank Tk-F10 for use in the condensate recycle system
- The backup facility for the recovery of nitrous oxides
- The recycle stream to the acid fractionator.

A significant portion of the flow to the chemical sewer was attributed to the cooling water used to condense the distillate. Thus, cooling water flow to the condenser resulted in a large flow increase to the chemical sewer while the PUREX Plant was operating.

The reboiler section of a distillation column is the point where heat is supplied to vaporize the volatile portion of the feed. A reboiler is a heat exchanger that is used for heating solutions. Steam that is used to provide the heat is routed through the shell of the heat exchanger and condensed on the outside of the tubes. The feed stream to be heated is routed through the inside of the tubes. Physical contact between the two streams does not occur. Steam condensate is routed to the chemical sewer line and the recovered nitric acid is reused in the process.

Before 1986, effluents from the acid fractionator went through a diversion box that was designed to divert flow to the chemical sewer or the 216-A-9 Crib. The crib was undersized for the fractionator flow; thus, flow to the crib was blanked off and the valve to the chemical sewer was left open. Fractionator overflow to the chemical sewer was eliminated in September 1986. If tank Tk-U8 should overflow, the solution is routed to tank Tk-U3 and tank Tk-U4 where it is neutralized and routed to Tank Farms.

3.1.1.7 Aqueous Makeup Area. Before modifications in the PUREX Plant to eliminate dangerous waste discharges, the 216-B-3 Pond System received occasional batches of spilled materials and out-of-specification chemicals. Recent facility upgrades have been incorporated to allow the rerouting of chemical makeups (that are not within the proper tolerances for use) elsewhere and to minimize unintentional releases to the chemical sewer line. To accomplish these goals, aqueous makeup-area catch tanks and liquid-level instrumentation systems have been installed that cut off flow to makeup tanks when the liquid levels approach overflow.

To prevent overfilling makeup tanks, liquid-level capacitance probes were installed inside the tanks with three alarm functions:

- Low-level (20 percent of tank capacity)
- High-level (85 percent of tank capacity)
- High-high level (90 percent of tank capacity).

The 'low-level' alarm was installed to alert personnel that a tank is losing liquid; indicating a drain valve is open, leaking through, or that a transfer had taken or is taking place. A 'high-level' alarm was installed to alert operations personnel that a tank is filling up and is almost full. If

an anticipated transfer is not taking place, this serves as a warning that something is leaking into the tank (i.e., there is a leaking inlet valve or an inadvertent transfer). On a 'high-high level' alarm, motor-operated valves installed on all the inlet lines to a tank will close to prevent further liquid additions as the overflow point is approached.

In organizing the catch tank system for the aqueous makeup area, compatibility of various chemicals was considered. This resulted in establishing catch tanks for acidic, basic, and reductant type solutions. Floor drains are routed to the appropriate catch tank for the area of the aqueous makeup that is serviced by them. Catch tanks in the aqueous makeup area are monitored every 8 hours and have high-level instrumentation associated with them. When the level in a catch tank reaches about 10 percent of tank capacity, a 'high-level' alarm sounds. The solution then is sampled to determine where in the process the tank contents could be used. If a use for the solution cannot be determined, the tank contents are pumped to a drum and properly shipped under the appropriate waste regulations. A 'high-high level' alarm serves as a backup to the 'high-level' alarm. The 'high-high level' alarm sounds when the catch tank reaches approximately 50 percent of the tank capacity.

The catch tanks (Tk-103A, -104, -107A, -108, -110, -111, -112, and -113) serve as a backup to the makeup tanks and offer protection against leaks and overflows. Furthermore, catch tanks are used for rerouting chemical makeups that are out of tolerance for reuse. This results in minimizing the amount of waste generated at the PUREX Plant. Surveillance of all aqueous makeup tanks, in addition to catch tanks, is performed every 8 hours to detect abnormal problems that could result in a catch tank overflowing a potential dangerous waste solution.

3.1.1.8 The 203-A Uranium Storage Area. Sump waste from the 203-A uranium storage area is collected in a sump collection tank, Tk-P1. When the appropriate level is reached, the tank is sampled for radionuclide content. The contents of this tank are routed to the double-shell tank farm system where eventual evaporation and long-term storage of the radionuclides occurs. A route exists to transfer solution to the chemical sewer line if the radionuclide content is low enough. However, this route has been isolated and is no longer used.

3.1.1.9 The 211-A Chemical Storage Area. The 211-A chemical storage area is used to store and transfer bulk liquid chemicals. In addition, it houses the demineralizers for production of demineralized water used in chemical makeups and processes.

Even though all tanks in the 211-A chemical storage area have high-level alarms, additional steps were taken to minimize overflowing a tank to the chemical sewer line. In 1986, dikes were installed around the storage tanks at the 211-A chemical storage area to contain spilled liquids. When a dike fills with liquid, the contents are sampled to make a determination concerning disposal/use of the material. If the material is nondangerous (e.g., rainwater) and requires disposal, the solution is transferred to the chemical sewer line using a portable pump. If the material is dangerous, the

solution is transferred into drums for proper disposal or used in the plant processes. Before 1986, drains around the tanks and tank overflow lines went to the chemical sewer line. Floor drains now have been covered with concrete and the overflow lines are rerouted to the dike area that surrounds the tank.

Demineralizers are ion-exchange resin beds that remove dissolved minerals from the sanitary (i.e., potable) water supply. A demineralizer consists of two ion-exchange resin beds. One bed is for the removal of cations (positively charged) and the other bed removes anions (negatively charged). When the beds become exhausted (i.e., breakthrough occurs), regeneration is accomplished using sulfuric acid for the cation bed and sodium hydroxide for the anion bed. During regeneration, sulfuric acid and sodium hydroxide are routed to a catch tank for elementary neutralization. The catch tank contents are sampled to ensure the solution pH is between 2 and 12.5. If necessary, the pH can be adjusted chemically to within proper tolerances before disposal into the chemical sewer.

Before the installation of the neutralization system in September 1989, regeneration of the two beds was done simultaneously (co-regeneration), starting in February 1986. Co-regeneration resulted in self-neutralization of the two regeneration streams, thus minimizing the potential for adding corrosive substances to the chemical sewer line. Simultaneous regeneration successfully decreased the amount of corrosive material discharged to the 216-B-3 Pond System. Before February 1986, the demineralizers were regenerated separately, which resulted in discharging corrosive waste to the 216-B-3 Pond System.

3.1.1.10 Flash Tank Tk-618-1. This tank is used to receive steam condensate and spray water from heating coils located in the pipe and operating gallery. The steam condensate is generated from heating the outside air supply and the spray water is used to wash and humidify the incoming air. The nondangerous effluent from Tank Tk-618-1 is routed to the chemical sewer.

3.1.1.11 Distilled Water Systems. There were two primary distilled water systems at the PUREX Plant that have now been shut down. One of the systems was used for chemical makeups associated with the final plutonium cycle. Specifications required for the final plutonium product were too restrictive to permit the use of demineralized water. The other system was for use in the PUREX Plant laboratory. Distilled water was used in the laboratory to perform sample analyses without introducing contaminants found in demineralized water.

Distilled water was produced by boiling demineralized water and collecting the condensate overhead. The condensate was routed to a distilled water holding tank until needed. Demineralized water with remaining minerals was discarded. Steam condensate generated from the production of distilled water, the residual demineralized water, and tank overflow associated with the storage of distilled water for both systems, was discharged to the chemical sewer. There was no dangerous waste associated with the production of distilled water from demineralized water.

3.1.1.12 The Tank Tk-2901A Overflow. The Tank Tk-2901A is a 50,000-gallon water tower that provides an emergency supply of sanitary (i.e., potable) water in the event of a failure at the 283-E Water Treatment Facility or a

rupture in the 200 East Area distribution system. This tank continually overflows to the chemical sewer line. In the summer months, overflow is necessary to ensure that the tank remains full due to evaporation losses. In the winter months, overflow is maintained to prevent the tank from freezing.

3.1.1.13 Sanitary Pipe Trench Condensate. To prevent pipes from freezing, many of the sanitary lines outside of the PUREX Plant are heated. The source of heating for these lines is steam. A steam line, usually composed of copper tubing, is attached and insulated next to the sanitary line. Condensate from these steam lines is routed to the chemical sewer line.

3.1.2 Cooling Water Line

The cooling water line primarily received cooling water discharges from most equipment used in the PUREX Plant process. The cooling water stream was shut down in June 1992. The cooling water or steam passed through a coil inside a piece of equipment. Unless there was a breach in the coil, the cooling water or steam never physically contacted radioactive or dangerous material; therefore, the cooling water stream usually was nonradioactive and did not contain dangerous waste.

The cooling water line received liquid from the following sources:

- Uranium concentrator (E-K4)
- Concentrator condensers
- Dissolver down-draft towers
- PUREX Plant tunnel's water-fillable doors
- Miscellaneous process tanks.

3.1.2.1 Uranium Concentrator (E-K4). In the PUREX Plant process, solutions were concentrated to obtain the proper product concentration or to be reused as a feed stream. The concentration of these solutions was accomplished by using vessels called concentrators. A concentrator was essentially a large tank containing a steam heating coil with a tower on top. The tower was used for the following purposes:

- Strip organic material from the feed material via steam vapors to prevent a potential explosion in the concentrator

- Absorb fission products contained in the rising vapor.

Steam condensate and cooling water from the final uranium-cycle concentrator coil were routed to the cooling water line. Even though steam was commonly used for concentration, water could be routed to the coil to check the integrity of the coil and to cool material in the concentrator for emptying by using a jet pump.

3.1.2.2 Concentrator Condensers. In a concentrator, after the vapor stream (commonly referred to as overheads) rises through the tower, the vapor stream passes through a condenser to be cooled. Raw water is used as the cooling medium for the condenser and is sent to the cooling water line after cooling the vapor stream. The overheads (condensate) were recycled and the excess was routed to the 216-A-45 Crib.

3.1.2.3 Dissolver Down Draft Towers. Dissolvers were used in the cladding removal (declad) and fuel dissolution processes. In the declad process, Zircaloy[1] (a metal jacket surrounding fuel) is dissolved using an ammonium fluoride/ammonium nitrate solution that resulted in the liberation and production of ammonia gas. The fuel dissolution process involved dissolving the solid fuel (uranium and plutonium). The fuel was dissolved using nitric acid, which resulted in the liberation of oxides of nitrogen. Offgases from both the declad and dissolution processes were routed through the dissolver down draft towers. Cooling water was used as the cooling medium to condense the water vapor that, in turn, absorbed the rising ammonia (during declad) or nitrous oxide (during dissolution) vapors. The cooling water was routed to the cooling water line, the ammonia condensate was routed to a receiver tank for further processing, and the dilute nitric acid was routed back to the dissolver for further participation in the dissolution process.

3.1.2.4 The PUREX Plant Tunnels' Water-Fillable Doors. Large failed equipment from the PUREX Plant was stored in the PUREX Plant tunnels. Currently, there are two tunnels. The doors on the tunnels could be filled with water. The water-fillable doors served as shielding from the dose rates of the failed equipment. Currently, neither tunnel door contains water nor are they expected to be filled in the future. However, should the water-fillable doors ever be filled, this water would be discharged into the cooling water line.

3.1.2.5 Process Tanks. Temperature control of processing tanks was important to ensure that the process was operating safely and efficiently. Cooling water, steam, or both, were used in maintaining proper tank temperatures. Unless there was a breach in a coil, the cooling water or steam did not come into physical contact with the processing solutions. Should a breach occur, the coil was pressurized so that steam or cooling water would leak into the tank. The only time that contamination could enter the coil was when the coil momentarily was depressurized when switching from cooling to heating or heating to cooling.

3.1.3 Steam Condensate Discharge

The steam condensate discharge primarily received cooling water and steam condensate discharges from most of the equipment that required heating during normal use in the PUREX Plant process. The steam condensate stream was shut down in June 1992. The cooling water or steam passed through a coil inside a

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[1]Zircaloy is a trademark for alloys of zirconium with low percentages of antimony, iron, chromium, and nickel (Sax and Lewis 1987).

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piece of equipment. Unless there was a breach in the coil, the cooling water or steam never came into physical contact with radioactive or dangerous material; therefore, the steam condensate discharge usually was nonradioactive and did not contain dangerous waste.

Unless the steam condensate discharge stream was diverted to the 216-A-42 Diversion Basin because of high radiation or an electrical failure, the steam condensate discharge normally was discharged to the 216-A-30 Crib and the 216-A-37-2 Crib.

The steam condensate discharge consisted of steam condensate and water from the following sources:

- Concentrator coils
- Dissolver coils
- Quench water.

3.1.3.1 Concentrator Coils. All concentrators, with the exception of the final uranium-cycle concentrator, had the coil outlet routed to the steam condensate discharge. These concentrators were used for the concentration of product materials, preparation for waste treatment, recycling of materials, and feed preparation by breaking down polymer material.

3.1.3.2 Dissolver Coils. As mentioned previously, the dissolvers were used for performing the 'declad' and 'dissolution' steps. Steam coils in these tanks for supplied the necessary heat to initiate the declad and dissolution reactions.

3.1.3.3 Quench Water. In the event that a hole formed in a tube bundle, radioactive material could have entered the steam condensate discharge stream. To prevent the potential spread of radioactive material to the ground surface via manholes and the pump pit by the rising steam vapors, quench water was added immediately outside the facility to cool the stream contents. The quench water was supplied from the main raw water line to the facility.

3.2 TANK FARM WASTE MANAGEMENT OPERATIONS

The waste management program at the Hanford Site provides for the segregation, concentration, and solidification of liquid radioactive waste. The processing of irradiated fuel rods to recover useful materials is accompanied by the production of radioactive waste. Because some of this waste remains radioactive for decades, it must be handled, contained, and disposed of in a manner that provides optimum protection for personnel and the environment.

The Tank Farm waste management operations have several facilities that currently supply or previously have supplied effluent to the 216-B-3 Pond System. These facilities are listed below:

- 242-A Evaporator
- 244-AR Vault

- 244-BXR Vault
- 241-BY Tank Farm
- 242-B Evaporator
- 244-CR Vault
- 241-A Aging Waste Ventilation System Complex.

Continuous effluent streams from the 242-A Evaporator, 244-AR Vault, and 241-A Aging Waste Ventilation System Complex are sampled using composite samplers. A composite sample consists of numerous small samples that are obtained automatically by the sampler during a specified time frame and stored in a small tank. This sample is a representative average of the stream discharge over a predetermined sample-interval period. At the end of a sampling-interval period, an operator obtains the composite sample for analysis. The samples are analyzed for total alpha and beta radionuclides and solution pH. Samples are not obtained from the 241-BY Tank Farm and the 244-CR Vault since these facilities are no longer operating.

The average flow rates discharged to the 216-B-3 Pond System from the various tank farm facilities, along with the composite sampling period, are provided in Table 3-3.

3.2.1 The 242-A Evaporator

The 242-A Evaporator is used for the concentration of low-level radioactive solutions at the Hanford Site. Feed is supplied to the evaporator from the 241-102-AW tank, the evaporator feed tank. Radioactive liquid waste that has been identified for concentration is transferred to Tank 241-102-AW. Feed is supplied from the 241-102-AW tank in the range of 90 to 140 gallons per minute.

Concentration of the feed stream results in the production of two liquid process streams. The outlet streams consist of a process condensate stream, which is condensed water vapor evaporated from the feed, and a slurry stream containing concentrated feed. Additionally, the process condensate stream contains steam condensate from the vacuum jets used to maintain the evaporator under vacuum.

Process condensate was sent through an ion-exchange column to reduce the final cesium and strontium levels. The condensate was then routed to a retention basin where it was sampled to determine if the composition was suitable for transfer to the 216-A-37-1 Crib. If the condensate was not within proper specifications, it was routed back to the 241-102-AW tank for reprocessing. Discharge to the 216-A-37-1 Crib was halted in 1989 during evaporator shutdown activities. Future process condensate discharge will be routed to the Liquid Effluent Retention Facility for temporary storage.

Steam is used to heat the feed solution contained in the reboiler (E-A-1). Because the reboiler is essentially a large heat exchanger, steam never is in contact with the process material. The steam is condensed, routed to a flow-measurement tank, and monitored for radiation levels while flowing to a retention basin. If a high radiation level is detected, the stream

automatically is diverted from the retention basin to the 241-102-AW tank. The steam condensate in the retention basin is sampled to determine total radiation levels (alpha and beta) before being sent to the 216-B-3 Pond system.

The cooling water used to condense the process condensate is routed through a radiation monitor on its way to the 216-B-3 Pond system. Because of the low potential of radionuclide contamination, there is no automatic diversion capability on this stream. Should a small leak occur in the tube bundle that separates the cooling water from the process condensate, the large pressure differential between the two streams will prevent the process condensate from contaminating the cooling water. This is because the cooling water is maintained under 30 pounds of positive pressure, while the process condensate is maintained under a vacuum. The presence of contaminated cooling water would indicate a massive failure of the condenser, and the evaporator would be shut down.

The concentrated stream (slurry) is routed to a predesignated, 1,000,000-gallon, underground, double-shell storage tank. In the underground storage tank, the slurry separates into liquid and solid phases by the settling of solids. The liquid layer eventually is transferred back to tank 102-AW for further concentration.

Additional sources of nondangerous liquid effluent to B Pond from the 242-A Evaporator are attributed to steam condensate from the standby steam turbine exhaust fan, building heating and ventilation steam condensate, building air wash water, air compressor system cooling water, and steam condensate from compressed air dryers.

The standby steam turbine exhaust fan serves as a back up to the electric exhaust fans for the potentially radioactive atmosphere portions ('hot areas') of the 242-A Evaporator. In order to prevent the spread of radionuclides from the 'hot area' of the facility to the 'cold area' (nonradioactive contaminated atmosphere), the 'hot area' of the facility is maintained at a lower pressure (vacuum conditions) than normal atmospheric conditions. Should the electric exhaust fans shut down because of failure or loss of electrical power, the standby steam turbine exhaust fan will be operated to prevent the spread of radionuclides to other portions of the facility.

In addition to establishing necessary pressure gradients to prevent the spread of radionuclides throughout the 242-A Evaporator, the heating and ventilation system is used to condition air (e.g., to remove dust, humidify, and adjust to final desired temperature) for personnel comfort. Air initially enters the building through an inlet damper and is preheated with low-pressure steam (nominally 10 pounds per square inch) to minimize moisture accumulation in the filter. Following the heating operation, the air passes through a filter used to eliminate coarse dirt and dust particles. After filtering, the air goes into a chamber where it is humidified and washed simultaneously. Water flowing through the air washes fine dirt and dust particles from the

supplied air. Washing air with water accomplishes the simultaneous humidification. The clean and humidified air then is reheated to a desired temperature using low-pressure steam.

Condensate from steam heating and water used for air washing and humidification are routed to B Pond. Because these operations are performed on ambient outside air, the resulting liquid streams should not adversely affect the composition of the liquid effluent to B Pond.

The compressed air system uses cooling water to cool the air compressors and to act as a coolant for the after-cooler. There are two air compressors in the 242-A Evaporator that operate in parallel, each delivering 1,000 standard cubic feet per minute of air at 100 pounds per square inch-gage. The after-cooler is a heat exchanger used to remove heat from compressed air following discharge from the compressor.

After compressing and cooling the air, the air is routed through an air dryer that contains a desiccant (moisture-absorbing material). The desiccant absorbs most of the water that is contained in the compressed air. This process is similar to the process by which an ion-exchange column absorbs ions. The efficiency of moisture removal from the compressed air depends on how much moisture already has been absorbed by desiccant material. As the desiccant absorbs water, less material is available to absorb moisture.

To increase the efficiency of water removal from the air, two air dryers are installed in parallel. While one dryer is online removing water from the air supply, the other air dryer is regenerating. Regeneration involves heating the desiccant material to evaporate the water contained within the desiccant material. Steam is used as a heating source to regenerate the desiccant material through a heat exchanger.

3.2.2 The 244-AR Vault

The 244-AR Vault began operation in 1969 and continued to operate through 1978. The 244-AR Vault facility was originally used to prepare radioactive waste for transfer to B Plant for removal of cesium and strontium. The radioactive waste was generated by other Hanford Site activities and was temporarily stored in underground storage tanks before being transferred to the 244-AR Vault tanks. Currently, the 244-AR Vault is in standby with no radioactive waste operations in progress. However, to maintain the facility for future use, some operational requirements are being met. Cooling water is used to cool the compressors that supply instrument air to the facility. Additionally, cooling water and heating steam are also supplied to the ventilation system to control the temperature of the inlet air to the facility. Discharges from these systems comprise the facility's current (standby mode) waste stream. At present, no record sampling or radiation monitoring instruments are associated with this waste stream. This is because of the inactive nature of the facility, and the fact that the waste stream is discharged from a closed system that has minimal potential for contamination.

Modifications have been undertaken in order for the 244-AR Vault to become an interim storage and transfer facility for neutralized current acid waste (NCAW). The *244-AR Vault Cooling Water Stream-Specific Report* (WHC 1990a) indicates that all necessary modifications to support this usage are tentatively scheduled for completion in 1994. One important completed modification has been the installation of the closed-loop cooling system for the vault tanks. During facility operation, the waste stream will be continuously monitored and sampled at the 2904-AR Building after combining all waste streams at Manhole No. 1. A small portion of the effluent stream will be split, with part flowing to the proportional sampler and part flowing through the continuous radiation monitor. During normal operation, if radioactivity is detected, the flow is automatically diverted to a retention basin by a three-way valve and the uncontaminated water would flow to 216-B-3 Pond.

Since fiscal year 1985, upgrades have been made to 244-AR Vault systems to reduce potential radioactive discharges for facility operation. These changes are described as follows.

Cooling and heating coils have been pressurized with process air during facility standby/shutdown conditions at a pressure higher than the tank pressure to force any coil leakage toward the liquid waste and prevent contamination of the inside of the coil. A loss of process air will cause an alarm to annunciate in the control room and at the Computerized Automated Surveillance System panel to alert operators of a potential coil leak.

Floor drains in the vicinity of the Jet Gang Valves have been blanked. In the unlikely event that the jet gang valves leak or siphon, the effluents that drip to the floor would not flow to the 216-B-3 Pond. Collection and disposal of these leakages will be under administrative control (i.e., collected and disposed of according to written procedure rather than being sent to the cooling water waste stream).

The condensate from the K-1 (operating areas) and K-2 (canyon/process areas) inlet air systems is surveyed regularly in accordance with established procedures to ensure that the steam condensate and the cooling water are not contaminated.

The liquid effluent sampler has been upgraded to include a detector failure alarm.

Preventive maintenance and plant operating procedures have been implemented to ensure the integrity of the barriers that prevent contamination of the liquid effluents.

A closed-loop cooling system has been installed to replace the once-through vessel cooling system. To date, this closed-loop system has not been used because the facility is inactive. The once-through cooling has been retained as an emergency backup to the closed-loop cooling system.

3.2.3 The 244-BXR Vault

The 244-BXR Vault is a deactivated facility that will eventually be decommissioned. This facility was used to store liquids and sludges sluiced from the single-shell tanks located at 241-B, 241-BX, and 241-BY Tank Farms before the material was transferred to 221-U Plant for uranium recovery. Cooling water used for cooling the holding tanks was routed to B Pond.

3.2.4 The 241-BY Tank Farm

The 241-BY Tank Farm contains in-tank solidification Units 1 and 2. The units were used to concentrate liquid contained inside tanks 241-102-BY and 241-112-BY. In-tank solidification Unit 1 began operation in January 1965 and in-tank solidification Unit 2 began operation in February 1968. The in-tank solidification units' operations ceased in July 1973.

In-tank solidification Unit 1 concentrated the contents of tank 241-102-BY using hot air. Heated air was routed inside the tank to boil off the liquid fraction. In-tank solidification Unit 2 had electric cal-rods (electric resistance heating elements) inserted in the tank. When the cal-rods were energized, the contents of tank 241-112-BY would boil. Vapor generated from the in-tank solidification units was filtered and condensed. Process condensate from in-tank solidification Unit 1 went to the 216-B-50 Crib and the process condensate from in-tank solidification Unit 2 went to the 216-B-57 Crib. Cooling water used for cooling the process condensate stream was sent to the 216-B-3-3 Ditch and the 216-B-3 Pond.

3.2.5 The 242-B Evaporator

The 242-B Evaporator is a deactivated facility that eventually will be decommissioned. This facility was used to concentrate solutions primarily contained in single-shell tanks located at 241-B, 241-BX, and 241-BY Tank Farms. Cooling water used for cooling the condenser was routed to B Pond.

3.2.6 The 244-CR Vault

The 244-CR Vault is a deactivated facility that eventually will be decommissioned. This facility was used for uranium and strontium recovery from radioactive waste in the 241-C Tank Farm. Uranium recovery required transferring the recovered solution to U Plant and strontium recovery required routing the solution to B Plant.

Water used to cool the facility air compressor was discharged to the 216-B-3 Pond System. This source was terminated in 1986.

3.2.7 The 241-A Aging Waste Ventilation System Complex

The 241-A Aging Waste Ventilation System Complex is used to perform the following activities.

- Maintain vacuums on the high-level radioactive waste storage tanks (241-AY and -AZ Tank Farms).
- Condense radioactive vapors generated from these tanks.
- Filter the tank exhaust before discharging to the environment.

As mentioned previously, high-level radioactive waste storage tanks are self-boiling. This results in the generation of large quantities of condensible, radioactive vapors.

Vapors generated from the boiling tanks are liquified in condensers E-413, -414, and -415, using raw water as a cooling medium. Condensate is routed to a condensate holdup tank (241-A-417) and sent back to a self-boiling tank in the 241-AY or -AZ Tank Farm to maintain the liquid level. The cooling water then is routed to B Pond after passing through a proportional sampler and monitor.

An emergency cooling system (closed loop) exists to provide the necessary cooling water to the surface condensers in the event that the raw water supply from 241-C Farm fails or the radiation level in the exit cooling water stream exceeds a preset level on the radiation monitor. The emergency cooling system consists of a warm water sump, cooling tower, cold water sump, and a deep well pump.

The warm water sump receives cooling water after it has cooled the surface condensers. The warm water is routed to the cooling tower that cools water by using the cooling effects associated with partial evaporation of warm water (latent heat of evaporation). The remaining cooled water is sent to the cold water sump to be reused as the cooling water supply stream for the surface condensers. The deep well pump provides makeup water to the cold water sump in order to maintain the sump volume because part of the water is lost due to evaporation occurring in the cooling tower.

Should the cold water sump overflow, liquid would be routed to the warm water sump. If the warm water sump overflows, this liquid would be routed to the proportional sampler and would be monitored with the normal cooling water supply before being sent to B Pond.

3.3 THE 283-E WATER TREATMENT FACILITY

The 283-E Water Treatment Facility purifies and treats raw water and produces sanitary (i.e., potable) water for the 200 East Area. As mentioned previously, raw water is pumped unfiltered from the Columbia River. Raw water initially enters a reservoir near the 284-E Powerhouse where it is stored before treatment. Treating this water involves adding a coagulant (aluminum

sulfate hydrate) that allows particulate settling to occur in the basin. After settling, the water is routed through a filter for final purification. The filter layers consist of porcelain beads, gravel, sand, and anthracite coal.

Average effluent flow rates from this facility are not available because a flowmeter has not been installed. The 283-E Water Treatment Facility is a nonradioactive facility; thus, radiation monitoring equipment is not used on the discharge of this stream. Waste water sources to the 216-B-3 Pond System from the 283-E Water Treatment Facility include the following:

- Reservoir overflow
- Settling basin flushing
- Filter backflush water.

3.3.1 Reservoir Overflow

Water is pumped from the Columbia River to a reservoir located at the 283-E Water Treatment Facility. Flow into the reservoir is controlled by manually adjusting an inlet valve. Should the reservoir overfill, the water goes to the 216-B-3 Pond System via the powerhouse ditch and pipeline.

3.3.2 Settling Basin Flushing

There are four settling basins used to purify raw water. The basins periodically are flushed to remove the solids that accumulate in the bottom during the settling period following coagulation. The flushwater containing the solids is sent to the 216-B-3 Pond System for final disposal.

3.3.3 Filter Backflush Water

Water passes through a filter that removes the coarse particles first and the finer particles last. This is done to minimize plugging of the filter. The first stage of the filter is the porcelain beads, followed by gravel, sand, and anthracite coal. Anthracite coal is used for removing noxious odors present in the water.

When the filter starts to plug, water is run through the filter in the reverse direction. This dislodges the fine and coarse particulates from the filter. The backflush water containing the particulates is sent to the 216-B-3 Pond System.

3.4 THE 284-E POWERHOUSE

The 284-E Powerhouse is a coal-fired plant used to generate steam. Electricity normally is not generated at this facility; however, there is a standby steam-driven electrical generator at the powerhouse that provides standby power to the powerhouse and certain other facilities during power

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outages. There are five coal-fired boilers and a backup oil-fired boiler. The maximum production of steam is approximately 350,000 pounds per hour at 225 pounds per square inch.

Steam generated at this facility is used at other process facilities (i.e., B Plant, the PUREX Plant, and the 242-A Evaporator) for heating and process operations.

One liquid effluent stream, which goes to the 216-B-3 Pond System, is generated at the 284-E Powerhouse. Currently, a flowmeter has not been installed to monitor this flow. The 284-E Powerhouse is a nonradioactive facility; thus, radiation monitoring equipment is not used on the discharge of this stream. Sources that produce this effluent stream are as follows:

- Boiler blowdown
- Cooling water
- Floor drains
- Water softener regeneration solution.

3.4.1 Boiler Blowdown

During the production of steam, minerals not removed in the water softener collect in the boiler. The boiler blowdown is used to bleed off this material. The boiler blowdown also contains antiscaling and water oxygen scavenger compounds (Deartrol 4812 and Dearborn 66, respectively[1]) that are added to the water. Antiscaling chemicals are added to minimize scale formation on the boiler tubes and to maintain efficient boiler operation. Oxygen scavenger compounds are added for corrosion protection against free oxygen. The antiscaling and oxygen scavenger chemicals present in the boiler blowdown are nondangerous wastes.

3.4.2 Cooling Water

Cooling water is used to cool pump bearings and the faces of the boilers during boiler operation. The cooling water does not come into contact with any dangerous materials.

3.4.3 Floor Drains

Floor drains are located throughout the facility. Sources of liquid to the drains include safety showers, sanitary water, and steam condensate.

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[1]Deartrol 4812 and Dearborn 66 are trademarks of W.R. Grace & Co.

3.4.4 Water Softener Regeneration Solution

Sanitary water passes through a water softener to remove calcium and magnesium contained in the water before use in the boiler. This minimizes scaling on the tube bundles. A water softener unit consists of an ion-exchange column containing an organic resin and a sodium chloride (salt) crystal holding tank. This equipment is similar to that which is found in homes, but it is constructed on a larger scale. The salt tank is used to regenerate the column. Resin in an ion-exchange column initially is loaded with sodium ions. When sanitary water passes through the resin, calcium and magnesium are preferentially extracted and the sodium ions are released. When the resin becomes saturated with calcium and magnesium ions, extraction no longer occurs. To rejuvenate the resin, a concentrated sodium chloride solution is passed through the column. Sodium ions are able to displace the calcium and magnesium ions from the resin because the equilibrium coefficient for the resin prefers sodium extraction at high sodium concentrations.

3.5 THE B PLANT FEED STREAMS

The B Plant has had a number of missions since its construction in 1943. Its first mission was the recovery of plutonium using a bismuth phosphate chemical separation process. The process was carried out from April 1945 to October 1952. The B Plant was shut down after REDOX and the PUREX Plant came online. The B Plant was modified to begin its second mission in 1968--the recovery, purification, and encapsulation of cesium and strontium. Encapsulated cesium and strontium capsules currently are stored at the facility.

Discharge to the 216-B-3 Pond System from B Plant originated from three sources: B Plant cooling water [including the Waste Encapsulation and Storage Facility (WESF)[1]], B Plant steam condensate, and B Plant chemical sewer.

The B Plant cooling water is the source of some radionuclides and potential chemical contaminants in the 216-B-3 Pond System. As discussed in Chapter 4.0, Section 4.2.1, B Plant cooling water is essentially free of radioactive contamination. The B Plant cooling water also includes cooling water discharged from heat exchangers at the WESF. The cooling water discharged from the WESF does not come into direct contact with the stored cesium and strontium capsules, but is circulated through heat exchangers, cooling the pool cell water.

Pool cell water, which is used to cool the cesium and strontium capsules, normally is disposed of by an alternate method. Currently, B Plant cooling water and the B Plant chemical sewer are discharged to the 216-B-3 Pond System. The average flow rate of B Plant cooling water is about 1,500 to 1,800 gallons per minute.

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[1]Waste Encapsulation Storage Facility cooling water mixes with B Plant cooling water (from 1974 to present).

The B Plant steam condensate was discharged to the 216-B-3 Pond between 1945 and 1967. The steam condensate was sent to the 216-B-55 Crib from 1967 to 1990. The steam condensate stream consisted of cooling water from the 200 East Area line, steam condensate from the E-23-3 concentrator, and discharge from cooling coils in process tanks (tanks Tk 28-4, Tk 31-1, and Tk 31-6).

Starting in 1945, the B Plant chemical sewer was discharged to the 216-B-3 Pond. The chemical sewer was diverted to the 216-B-63 Trench on May 7, 1970, after a radionuclide release that occurred because of an equipment failure (Chapter 4.0, Section 4.2.2.). In February 1992, the chemical sewer was combined with the B Plant cooling water and discharged to the 216-B-3 Pond.

The major contributors to the chemical sewer are the 2902-B High Tank [which contains potable (i.e., sanitary) water], cooling water from B Plant and WESF air compressor after-coolers, and some 221-B steam condensate. The chemical sewer also receives minor contributions from air conditioning units and space heaters (radiators). The chemical sewer has an average flow rate of approximately 150 gallons per minute.

According to B Plant emergency procedures, if B Plant cooling water becomes radioactively contaminated, it would be diverted away from the 216-B-3 Pond System to the 216-B-59 Retention Basin. If contamination reaches the 207-B diversion facility, the cooling water could be diverted to the 216-B-63 Trench. In addition, the chemical sewer would be diverted to the 216-B-63 Trench.

3.5.1 The B Plant Cooling Water

The B Plant cooling water comes from the 200 East Area raw water line and is passed through cooling coils in the plant process tanks and vessels. The cooling water is discharged from the plant as two separate streams. Each stream is monitored continuously for compliance with radiological standards.

The first stream is collected in a 24-inch header and receives discharge from those processing vessels that are considered to have a low potential for possible contact with radioactive solutions. Should one of these vessels leak, the effect on the environment would be minimal. Feed for this stream includes several processing condensers, B Plant steam condensate condenser, effluent from the 212-B cask station, and all cooling water from the 225-B encapsulation facility pool cell heat exchangers.

The first stream is monitored continuously for radioactivity using separate beta and gamma monitors. Signals from the monitor transmitter are received in the dispatcher's office by the Facility Process Monitoring Control System. The system sounds an alarm if high radiation is detected. In the event that high radiation levels are detected, the first stream can be diverted manually to the 216-B-63 Ditch.

The second stream receives feed primarily from cooling coils on process tanks in B Plant.

The second stream is continuously monitored for radiation (beta, gamma) activity. The stream is diverted automatically to the 216-B-59 Retention Basin if found to exceed radiological control limits. As with the first stream, signals from the monitor transmitter are received in the dispatcher's office. If the second stream meets requirements for discharge to the environment, it is combined with the first stream.

The combined stream is sampled continuously on a flow proportional basis before entering one of two 565,000-gallon basins (207-B facility), and the aliquot is deposited into a five-gallon holding tank. The contents of the holding tank are agitated weekly and a sufficient volume of sample is withdrawn to provide weekly analytical determinations for process control (pH, total beta, total alpha, and individual isotopes, if necessary). A separate volume of sample also is withdrawn weekly and samples collected are combined for a monthly composite. Analyses are performed by the 222-S Laboratory. Reported results become the 'record' data for the combined stream.

From the 207-B facility, the water flows to the 216-B-3-3 Ditch leading to the 216-B-3 Pond System. Water exceeding requirements could be diverted to the 216-B-63 Trench or otherwise returned to B Plant.

3.5.2 The B Plant Process Condensate Stream

The B Plant Process Condensate (BCP) liquid effluent stream is generated only during operation of the B Plant low-level waste concentrator. The BCP consists of condensed water evaporated from low-level radioactive liquid waste by the B Plant concentrator. The major operating systems contributing to the BCP liquid effluent stream from the B Plant Facility are the systems for ventilating process vessels, and the building heating, ventilating, and air conditioning (HVAC) unit.

The BCP is currently inactive, as is the B Plant low-level waste concentrator. In the future, the BCP is to be connected to the Combined Cooling Water Header and ultimately discharged to B Pond if a 216 Permit is obtained.

The low-level waste concentrator (E-23-3) is a single-pass shell and tube heat exchanger with liquid waste on the tube side and saturated steam, flowing counter-currently, on the shell side. The heat, supplied by steam, raises the liquid waste feed from its initial temperature to the boiling temperature and vaporizes the solvent (water). As a result of the concentration process in the low-level waste concentrator, three waste streams are generated and routed outside of B Plant. They are the high-level liquid waste (HLW), BCP, and the B Plant Steam Condensate (BCS). The HLW is disposed of to underground storage in the 200 Area Tank Farms. Routing of the BCS is discussed in Section 3.5.3.

The process condensate from the low-level waste concentrator (the BCP) passes through the D-23-2 de-entrainment vessel and the demineralized water-cooled E-23-4 condenser. The BCP is drained to one of two holding tanks in the 221-BF via the BCP tank in the 221-BB Building. The BCP is produced at a rate of about 35 gallons per minute, or about 100,800 gallons per month. The flow rate of the BCP averages about 2.33 gallons per month for a typical month's operation.

The BCP liquid effluent stream has the potential for becoming radiologically contaminated. To protect against release of radiologically contaminated condensate to the BCP liquid effluent stream, the process condensate is collected in one of the two 13,000-gallon holding tanks in 221-BF, sampled, and retained until sample analysis has been completed. If not contaminated, the BCP is routed to the 24-inch-diameter B Plant Cooling Water Header and on to the 216-B-3 Pond. If radiologically contaminated, the BCP is routed to tank TK-24-1 in the 221-B Building for re-processing through the low-level radioactive liquid waste system or routed to the 200 East Tank Farms.

3.5.3 The B Plant Steam Condensate

Steam is supplied as a heat source to B Plant by the 284-E Powerhouse. The steam is routed through heating coils (primarily heat exchangers and evaporators) and collected in a header in the 221-B Building. The B Plant steam condensate was discharged to the 216-B-3 Pond between 1945 and 1967. The steam condensate is currently inactive.

Monitoring practices for the steam condensate system are discussed below. Though the system was designed to prevent the steam from contacting radioactively contaminated surfaces, it did have a potential for radiological contamination because of the possible failure of sealing gaskets or heat exchanger tubes.

To prevent radiologically contaminated discharges, the steam condensate was monitored constantly for gamma and beta activity. The flow was collected in a header in the 221-B building. If the steam condensate stream did not meet requirements, the flow was diverted automatically to the 216-B-64 Retention Basin or manually diverted to a 225-gallon tank that triggered an alarm in the B Plant dispatcher's office. Discharges of B Plant steam condensate not meeting requirements were recycled to B Plant and treated before being sent to double-shell storage tanks.

The steam condensate stream was sampled continuously by a proportional sampler or at an approved frequency if the sampler was inoperative. The sample was analyzed daily for pH, alpha, and beta concentrations.

The steam condensate will be collected in the 216-B-64 Retention Basin when the waste concentrator becomes operational. The stream will be sampled at the basin and batch discharged to the cooling water stream. If it does not meet discharge criteria, it will be routed back to B Plant for disposal to the 200 Area Tank Farms.

3.5.4 Chemical Sewer

From 1945 to 1970, contributors to B Plant chemical sewer generally included used steam and water from space heaters, tank heaters and air conditioning units, overflow from chemical tanks, and nonradioactive solutions used in housekeeping procedures. Overflow from aqueous makeup and scale chemical tanks was prevented by using tank-level monitors at the time the chemical sewer was discharged to the 216-B-3 Pond. The tank-level monitors for the aqueous makeup tanks also sounded an alarm to alert operators to high in-tank levels (80 percent capacity). Similarly, loss of chemical through aqueous makeup tank/coil leakage was prevented by a low-tank-level alarm that alerted operators when the tank dropped below 30 percent capacity. At this time, the chemical sewer was discharged to the 216-B-3 Pond and the stream was monitored for radiation using a sodium iodide counter. Sampling occurred in the 2904-EA sample facility, which was about 500 feet north of the 221-B Building.

A time-proportional sampler was used to gather samples for laboratory analysis. The sampler took a sample every six minutes and deposited the sample in a holding tank. Each week, five samples were removed from the holding tank and analyzed for chemical composition, pH, and total beta. Two samples were analyzed weekly for radiological characteristics. A separate sample was taken weekly and surveyed with a sodium iodide counter. The samples were gathered manually if the proportional sampler was inoperative.

In February 1992, the chemical sewer was joined to the cooling water stream. The combined stream is discharged to the 216-B-3 Pond. The chemical sewer is monitored in the 211-BA neutralization facility for pH, total beta, and total gamma. Sampling is performed using the B Plant cooling water sampling system. The 211-BA neutralization facility began operation in February 1992. The facility can neutralize up to 200 gallons per minute to a range between a pH of 5 and 9. The facility was built to eliminate pH discharges greater than 12.5 or less than 2 from reaching the environment.

The B Plant chemical sewer consists of the following:

- 221-B Drain System
- 271-B Drain System
- 211-B Tank Storage Area
- 217-B Demineralized Water Unit Building Drains
- 276-B Organic Makeup Building Drains
- 225-B Encapsulation Facility
- 212-B Cask Station
- 2902-B High Tank Overflow Drains
- 222-B Laboratory
- 224-B Facility
- 292-B Facility
- TK-900
- Five street and yard drains.

3.5.4.1 The 221-B Drain System. Drains from the 221-B building are discharged into a 6-inch stainless-steel header in the B Plant electrical

gallery. Flow is controlled by a three-way valve that normally diverts the effluent into a chemical sewer collection tank (Tk-900). Contents of Tk-900 are held until laboratory analysis of sample results confirm that the contents can be released as a batch to the chemical sewer. If the contents of tank Tk-900 do not meet requirements, the contents are diverted to tank Tk-10-1.

The chemical sewer stream is monitored continuously for radiation by a gamma monitor located upstream from the diversion valve on the 6-inch stainless-steel header. If the monitor detects high activity, the stream automatically is diverted to tank Tk-10-1 in B Plant.

Contributors to the 221-B drain system include floor drains and overflow from aqueous makeup tanks located in the operating gallery. The floor drains located throughout the operating and pipe galleries collect water from safety showers and other nonradioactive liquids used in housekeeping operations. These floor drains are connected to a 3-inch drain pipe that discharges into the 6-inch header in the electrical gallery.

Tanks in the aqueous makeup area contain various chemicals and are equipped with an overflow drainage system. Currently, acid-base overflow from the aqueous makeup tanks in the operating gallery is neutralized before being discharged into the chemical sewer. After neutralization, the overflow is discharged via a 3-inch pipe and collected in the same 6-inch header as the floor drains. In addition, neutralization is also carried out in the 211-BA Neutralization Facility.

The electrical gallery has a sump for each of its 18 sections. Each sump collects water and other nonradioactive liquids used in housekeeping operations. Each sump has a liquid detector that sounds in the dispatcher's office. If the possibility that high radioactive liquids are present in these sumps, their contents are remotely diverted in the 6-inch stainless steel header to tank Tk-10-1.

3.5.4.2 The 271-B Drain System. The effluent from 271-B that flows to the chemical sewer includes all cooling water from ventilation systems in the 271-B Building, waste water from all sink and floor drains, and waste water from heating and cooling coils in the aqueous makeup tanks. The system consists of a sump located in the southwest corner of the millwright's shop in 271-B and a 3-horsepower pump that directs the drain effluent to the chemical sewer via a 6-inch clay pipe. The 271-B area currently is used as a welding, instrument, and machine shop.

This sump also collects effluent from the HVAC unit. This unit discharges water from the air washer unit during summer operations and steam condensate via a condensate tank during winter operations. The condensate tank also receives condensate from the 271-B heating system (radiators) and from the hot-water (sanitary water) tank heating coil. Heating and cooling coils from the aqueous makeup tanks, Tk-101 and Tk-102, discharge water and steam condensate via the floor drain. The largest contributor to the chemical sewer is cooling water from air compressors located in the 271-B basement.

3.5.4.3 The 211-B Tank Storage Area. The only contributor to the chemical sewer from the 211-B Tank Storage Area is steam condensate from heating coils for the demineralized water tanks.

3.5.4.4 The 217-B Demineralized Water Unit Building Drains. This inactive facility used ion-exchange resin beds to remove minerals from potable (i.e., sanitary) water before June 1993. The demineralized water unit building drain system consisted of three sumps that collected effluent from tank drains and overflow lines. These drains, along with a steam condensate line, went to the chemical sewer via an 8-inch steel pipe.

Approximately two to four times a year, the ion-exchange resin beds were regenerated by flushing the beds with dilute sulfuric acid and sodium hydroxide. During the pre-1970 period when the chemical sewer was discharged to the 216-B-3 Pond System, these effluents were not neutralized before being discharged to the chemical sewer. This resulted in a discharge of up to 6 percent sulfuric acid and 4 percent sodium hydroxide into the chemical sewer. Currently, these effluents are buffered to a pH between 2 and 12, using sodium bicarbonate and monosodium phosphate solutions.

3.5.4.5 The 276-B Organic Makeup Building Drains. The organic makeup building drain system consists of several floor drains that collected and delivered overflow from three tanks in the facility. During the pre-1970 period when the chemical sewer was discharged to the 216-B-3 Pond, these three tanks contained normal paraffin hydrocarbons, tributylphosphate, and Di(2-ethylhexyl)phosphoric acid. These tanks have been out of service since 1990 but are still in operable condition. The 276-B space heater still discharges steam condensate to the chemical sewer.

3.5.4.6 The 225-B Encapsulation Facility. The encapsulation facility drain system consists of the 225-B Chemical Drain System, the truck port drains, and the aqueous makeup floor drains. The chemical and truck port drains currently are capped off to prevent release via these drains. The aqueous makeup drains provide a route for chemical makeup tank overflow, tank cooling water, and tank heater condensate to reach the chemical sewer.

3.5.4.7 The 212-B Cask Station. The 212-B Cask Station is a staging area used to receive liquids in casks with various radionuclide concentrations. The cask station drain system consists of a 2-inch floor drain pipe that exits the building and traverses the electrical gallery of 221-B discharging to the chemical sewer. Currently, two tanks are serviced by this drainage system. In most cases, these tanks contained water used to flush casks, and on rare occasions, these tanks may have contained weak acid or weak base solutions.

3.5.4.8 The 2902-B High Tank Overflow Drains. The 2902-B Water Tank contains potable water overflow. The water tank contributes approximately 15 gallons per minute of water to the chemical sewer flow.

3.5.4.9 The 222-B Laboratory. The laboratory facilities in this building were dismantled and converted into offices. The laboratory discontinued operation in the 1950's and it is not known what discharges may have occurred

from this facility. All floor drains currently are plugged and discharge to the chemical sewer is limited to water from an air conditioning unit and radiators.

3.5.4.10 The 224-B Facility. The processing facilities in the 224-B building were dismantled and converted into offices. All floor drains currently are plugged, and discharge to the chemical sewer is limited to water from an air conditioning unit and radiators. A survey of historical data indicates that the 224-B Facility was involved in the recovery of nonradioactive by-products during the plutonium recovery mission (1945 to 1952). Documentation of any chemical releases from this facility could not be located.

3.5.4.11 292-B Facility. Floor drains from the 292-B air sampler building are routed to the chemical sewer.

3.5.4.12 TK-900. Tank TK-900 is a collection tank for effluent from the 6-inch stainless steel header in the 221-B Electric Gallery. Once the tank is filled, the tank effluent is sampled. If the sample results are within established pH, total alpha, and total beta limits, the tank effluent is discharged to the chemical sewer. If these limits are exceeded, the tank effluent is sent to tank farms for disposal.

3.5.4.13 Five Street and Yard Drains. The five yard and street drains collect storm water runoff from around B Plant and route to the chemical sewer.

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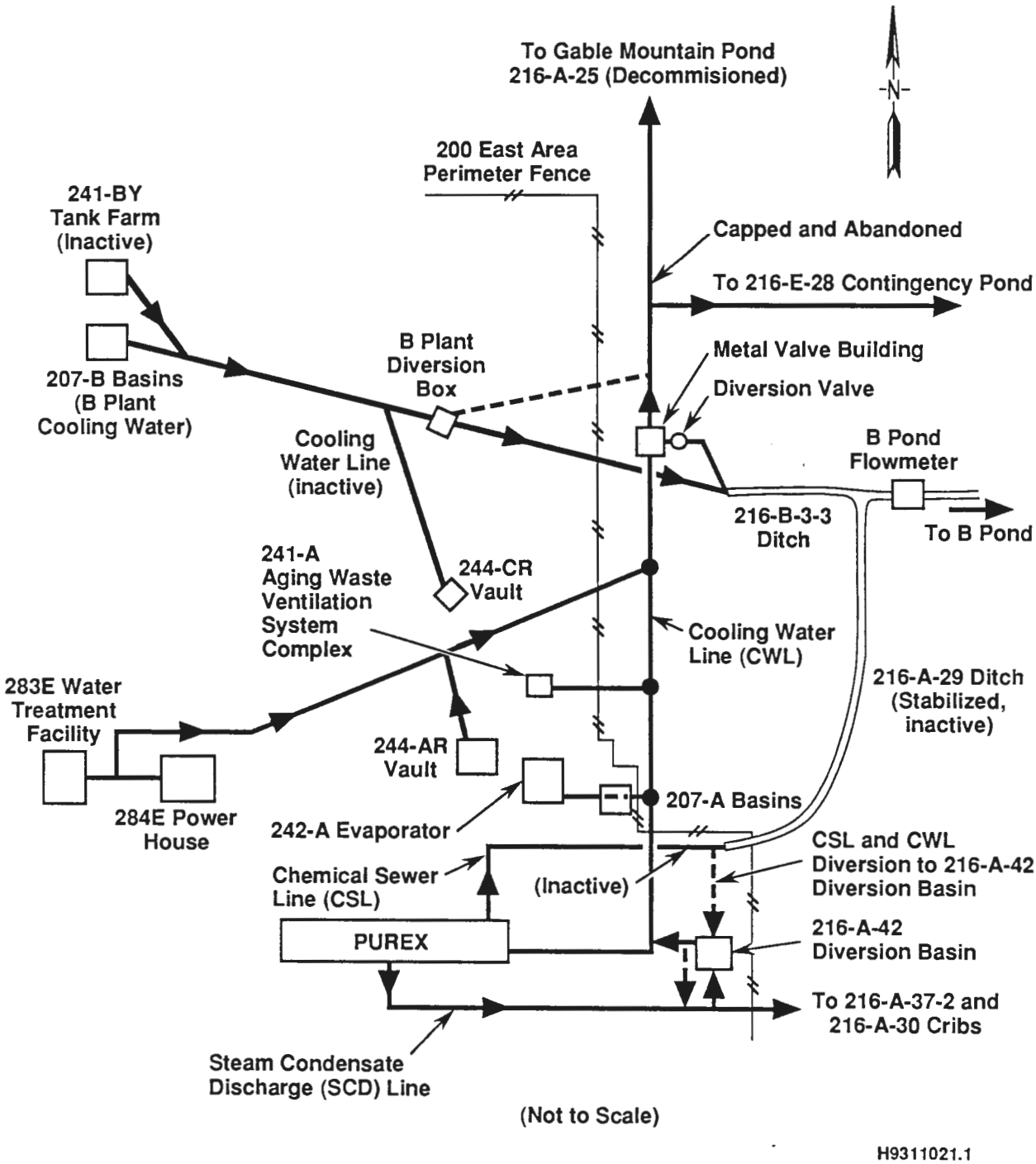

Figure 3-1. Flow Routes to B Pond.

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Table 3-1. Summary of Discharge Sources for the 216-B-3 Pond.
(sheet 1 of 2)

Waste water source	Transport routes[a] A	B	C	D	Dates source reported active (month/year)	Currently active
B Plant:						
Process cooling water	X	X	X		4/45 to present	X
Steam condensate	X	X			4/45 to 9/67	
Chemical sewer	X	X	X		4/45 to 5/70, 2/92 to present	X
WESF[b]			X		1974 to 1978	
284-E Powerhouse:						
Liquid effluent[c]	X	X	X		4/45 to present	X
283-E Water Treatment Facility:						
Filter backwash	X	X	X		4/45 to present	X
242-B Evaporator:						
Cooling Water	X				12/51 to 10/54	
244-CR Vault:						
Cooling water	X	X	X		3/52 to late 1983	
PUREX Plant:						
Chemical sewer			X	X	11/55 to present	X
Acid fractionator[d] condensate				X	2/58 to 9/86	
Process cooling water	X	X	X		11/55 to 6/92	
244-BXR Vault:						
Cooling Water	X				7/52 to 7/57	

Table 3-1. Summary of Discharge Sources for 216-B-3 Pond.
(sheet 2 of 2)

Waste water source	Transport routes[a] A	B	C	D	Dates source reported active (month/year)	Currently active
241-BY Tank Farm:						
ITS[e] Unit 1 cooling water		X	X		1/65 to 7/73	
ITS[e] Unit 2 cooling water		X	X		2/68 to 7/73	
244-AR Vault:						
Liquid effluent[c]		X	X		1/69 to present	X
241-A Aging Waste Ventilation System Complex:						
Cooling water			X		1/71 to present	X
242-A Evaporator						
Cooling water			X		3/77 to present	X
Steam condensate			X		3/77 to present	X

[a]Transport routes from diversion box:
A = 216-B-3-1 Ditch (active 4/45 to 7/64)
B = 216-B-3-2 Ditch (active 7/64 to 9/70)
C = 216-B-3-3 Ditch (active 9/70 to present)
D = 216-A-29 Ditch (active 11/55 to 7/91).
[b]Waste Encapsulation Storage Facility.
[c]Consists primarily of cooling water.
[d]Part of the chemical sewer discharge.
[e]In-tank solidification.

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Table 3-2. PUREX Plant Flow Rates.

	Operating (gallons per minute)	Shutdown (gallons per minute)	
Chemical sewer	1,100	300	typical; (600 TPA limit for max/min average)
Cooling water	9,100	0	
Steam condensate	600	0	
Total	10,800	300	

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Table 3-3. Average Flow Rates Discharged to the 216-B-3 Pond System.

	Composite sample period	Average flow rate operating (gallons per minute)	Average flow rate shutdown (gallons per minute)
242-A Evaporator Cooling Water	Daily	2,500	10
242-A Evaporator Steam Condensate	Daily	60	0
244-AR Vault	Daily	500	35
241-A Complex	Weekly	500	0

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4.0 WASTE CHARACTERISTICS

This chapter describes the characteristics of waste water discharged to the 216-B-3 Pond System. The 216-B-3 Pond System has received liquid mixed waste from various facilities operating in the 200 East Area. Administrative and physical controls have been implemented since 1984 to eliminate any potential to discharge dangerous waste to the 216-B-3 Pond System.

The 216-B-3 Pond System currently receives the majority of its waste water from the PUREX Plant and the 221-B Plant (B Plant). Specifically, the largest contributing streams are B Plant cooling water, B Plant chemical sewer, and PUREX Plant chemical sewer. Additional routine sources of effluent to the 216-B-3 Pond System are from the 242-A Evaporator, 244-AR Vault, 241-A Aging Waste Ventilation System Complex, 283-E Water Treatment Facility, and 284-E Powerhouse. Other waste streams may be discharged to the 216-B-3 Pond System in the future.

Historically, B Plant steam condensate discharge, 242-B Evaporator, 244-BXR Vault, 241-BY Tank Farm, and 244-CR Vault waste water discharges were routed to the 216-B-3 Pond. Additionally, the 216-B-3 Pond System has received waste water from several miscellaneous sources e.g., purge water from groundwater well development, miscellaneous construction activities, and operational discharges from temporary sources such as new tank farm and grout vault hydrotests.

Effluents entering the 216-B-3 Pond System consist primarily of atmospheric condensate, cooling water, sanitary (potable) water, and steam condensate. Cooling water is unfiltered Columbia River water that is supplied to the 200 East Area raw water distribution lines. Pumps at the 283-E Water Treatment Facility boost water pressures to adequate levels for facility operations and needs. Sanitary (i.e., potable) water consists of treated and filtered Columbia River water that is suitable for human consumption. The 284-E Powerhouse generates steam that enters the 200 East Area distribution system. Water used to produce steam consists of sanitary water that has been processed through a water softener and chemically treated to control corrosion rates and scale buildup.

The cooling water stream consists primarily of raw water used in cooling process equipment; however, it also receives some steam condensate from selected pieces of equipment. The steam condensate stream consists primarily of condensate from steam supplied to heat process equipment; however, it also receives some raw water used in cooling selected pieces of equipment.

Cooling water and steam condensate discharged to the 216-B-3 Pond System have the potential to become radioactive if there is a breach in the tubes separating the cooling water or steam from the process solutions. The waste streams that could potentially become radioactively contaminated have always been monitored for radionuclide content. These streams are monitored for radiation to automatically divert the stream to a basin when a predetermined radiation level is reached, to alert personnel that alternate cooling routes

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need to be valved in, or to shutdown the process. This includes all the facility waste streams listed previously with the exception of the 283-E Water Treatment Facility and 284-E Powerhouse. These two waste streams do not have the potential to become radioactively contaminated as they do not process radioactive materials.

A number of documents exist on both radiological and nonradiological constituents in the waste streams that discharge to the 216-B-3 Pond System. These include annual reports of radioactive liquid wastes discharged to the ground (Aldrich 1987; Cooney et al. 1988; and Thomas and Cooney 1989), a report evaluating dangerous characteristics of liquid discharges to the ground (Jungflesch 1988), and a recent report (Waste Stream Characterization Report, WHC-EP-0287, WHC 1989) that consolidates the information provided in these other documents.

The annual reports of radioactive liquid wastes discharged to the ground provide an estimate of the annual and cumulative radionuclide inventory discharged to the soil column. Table 4-1 provide an estimate of the cumulative decayed inventory of radionuclides discharged to the 216-B-3 Pond through 1987 (Cooney and Thomas 1989, pg D-4, WHC-EP-0414-1). The later reports, such as WHC-EP-0141-1, also provide estimates of the radionuclide contribution of each individual waste stream, and provides information on the quantities of airborne and liquid waste discharges of dangerous and radioactive materials.

The individual liquid-waste stream estimates are derived from samples of liquid effluents collected over a month's time, which are composited, and then analyzed for gross alpha and gross beta radioactivity, as well as for specific radioactive parameters. These monthly estimates then are used to derive the annual estimate of radionuclide contribution from that waste stream. In many cases, monthly liquid sample results are below the lower limit of detection. However, the values at the lower limit of detection are included in the calculation for annual average and annual activity values to avoid underestimating the actual concentration and annual activity. The monthly radioactive sample information for 1976 through 1988 has been consolidated in WHC-EP-0287 (WHC 1989). The radioactive waste discharge history before 1976 also is provided in WHC-EP-0287, Volume 3, pp. A11-39 (WHC 1989).

The Waste Stream Characterization Report, WHC-EP-0287 (WHC 1989), provides information on chemical characteristics of 33 waste streams that are discharged to the soil column at the Hanford Site. The report was compiled as part of a study that was undertaken by the DOE, at the request of Ecology and EPA, to document the history and characteristics of liquid discharges at the Hanford Site. This study is described in WHC-EP-0367, Rev. 0, Liquid Effluent Study Final Project Report (WHC 1990).

This study, undertaken to characterize the 33 waste streams discharged to the soil column at the Hanford Site, provided the data necessary to determine if any of the 33 liquid effluent streams were a dangerous waste according to WAC 173-303-070(4). An application for certification of this proposed designation was submitted to Ecology in accordance with WAC 173-303-075.

Of all the waste streams that have discharged to the 216-B-3 Pond System, B Plant and PUREX Plant chemical sewers were the most likely to contain dangerous wastes. Administrative and physical controls have been instituted to eliminate dangerous waste discharges from these two waste streams. In addition, the WHC-EP-0367 report proposed that all streams discharging to the B Pond, including B Plant and PUREX sewers, be classified as nondangerous.

The following sections discuss the chemical and some of the radionuclide releases to the 216-B-3 Pond. Very little data are available concerning chemical releases before the late 1980's because this type of information routinely was not maintained or reported before the determination was made that RCRA regulations applied to nuclear facilities (subject to the *Atomic Energy Act of 1954*, as amended). However, a fairly complete chemical discharge history has been compiled for the PUREX Plant chemical sewer since restart in 1983. The contribution of radionuclides to the 216-B-3 Pond from the plant waste streams is included in Table 4-1. The text also discusses some of the larger well-documented radionuclide releases to 216-B-3 Pond System that resulted from equipment failure.

4.1 THE PUREX PLANT

The PUREX Plant began processing irradiated nuclear fuel in 1956. Since that time, a variety of fuels have been processed. To meet the diversity of the fuel processing campaigns, a variety of chemicals have been used. Table 4-2 lists the chemicals that have been used at the PUREX Plant since 1955. The PUREX Plant laboratory chemicals have been excluded because there is no disposal pathway from the laboratory to the 216-B-3 Pond System. Because there is very little documentation during the years 1981 to 1983, and virtually no documentation before 1981, it is impossible to ascertain which chemicals on Table 4-2 could have been discharged to the 216-B-3 Pond System. Most of Table 4-2 is derived from the Inventory of Chemicals used at Hanford Site Production Plants and Support Operations (1944-1980) (Klem 1988a, pg. 15 and 17).

Currently, the 216-B-3 Pond System receives the PUREX Plant waste water discharges from the PUREX Plant chemical sewer. The probability of a chemical spill reaching the PUREX chemical sewer has been greatly reduced by PUREX shutdown activities such as the removal of most bulk chemicals.

Since approximately 1984, administrative and physical controls have been successfully implemented to eliminate dangerous waste discharges to the 216-B-3 Pond System from the PUREX Plant chemical sewer, with the last known reportable chemical discharge occurring in April 1987.

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4.1.1 The PUREX Plant Chemical Sewer

This section deals with the known chemical and radioactive discharges from the PUREX Plant to the 216-B-3 Pond System. Historically, for chemicals to reach the 216-B-3 Pond System via the chemical sewer, there were several mechanisms:

- Overflow of condensate from the acid fractionator
- Effluent discharges from regenerating the demineralizers
- Disposal of out-of-tolerance chemical makeups
- Accidental spills.

Before 1986, the acid fractionator condensate occasionally would overflow from tank U8 to the PUREX Plant chemical sewer. Based on process knowledge, the condensate would have been slightly acidic (0.005 molar). The calculated pH (pH=2.30) would not have caused the overflow to be designated as a dangerous waste during normal operation. If condensate overflowed because of a U8 pump failure, theoretically it is conceivable that the condensate would drop the pH of the chemical sewer below a pH of 2. However, continued plant operations under these conditions is unlikely. First, the loss of routine water additions from tank U8 would have impacted backup facility operation, and second, the loss of the acid fractionator recycle stream could have increased the radionuclide content of the condensate overflowing to the PUREX Plant chemical sewer. If the radionuclide content surpassed the radiation monitor threshold, the chemical sewer would have been diverted to the 216-A-42 Diversion Basin. Plant records reveal that the PUREX Plant chemical sewer has been diverted in the past to the 216-A-42 Diversion Basin. Administratively, diversions to the basin are addressed immediately so as not to limit the available space in 216-A-42 Diversion Basin. There is no documentation to substantiate that the overflow was corrosive during process upsets or during equipment failures. In 1986, tank U8 overflow lines were blanked and rerouted to tanks U3 and U4. Through the careful management of water additions to the process, overflow is no longer a problem.

The most frequent dangerous waste discharge to the 216-B-3 Pond System occurred during the regeneration of the PUREX Plant demineralizers. During regeneration with sulfuric acid and sodium hydroxide, the pH of the effluents routinely dropped below 2 and exceeded 12.5. These corrosive discharges continued frequently until co-regeneration practices were instituted in February 1986. Co-regeneration practices successfully reduced but did not eliminate the potential of discharging corrosive effluents to the chemical sewer. In September 1989, a catch tank was placed in service to hold the regeneration effluents. This catch tank allows the regeneration effluents to be neutralized as necessary before release to the PUREX Plant chemical sewer. Before co-regeneration practices, some neutralization would have occurred prior to and upon reaching the pond as a result of the successive discharge of acidic and caustic waste. Residual acidic waste would have been neutralized by the calcareous nature of the soil. The PUREX deionizers have been permanently shut down.

The final two mechanisms for chemicals to reach the chemical sewer were the disposal of out of tolerance chemical makeups and accidental spills. Chemical makeups that were out-of-tolerance and that could not be adjusted to the correct specifications were disposed to the chemical sewer. The sewering of a chemical makeup was deemed the safest method of disposal, rather than allowing the out-of-tolerance chemical makeups to produce unsafe operating conditions. The sewering of chemicals is no longer allowed, and the chemical makeup area has undergone extensive upgrades to allow for the storing of out-of-tolerance makeups. A majority of the accidental spills can be attributed to equipment failures, valving errors, and overflowing tanks. To preclude these accidental spills, physical and administrative controls have been successfully adopted. Since 1987, there has been only one known reportable chemical spill to the chemical sewer. There have been some small spills; however, these spills have been well below the CERCLA reportable quantity limits and would not have caused the chemical sewer to be designated as a dangerous waste.

Table 4-3 is a listing of sewered chemicals and accidental spills into the chemical sewer from mid-1983 to 1987. Before 1983, detailed release records were not maintained because RCRA was not considered applicable to nuclear facilities subject to the Atomic Energy Act of 1954. Table 4-3 provides a list of documented releases for which adequate information was available to determine if the release would have been designated as a dangerous waste. The releases listed in Table 4-3 were designated, in accordance with Ecology's Dangerous Waste Regulations, at the point the chemical sewer line enters the environment; the pounds of material listed represent the best estimate of pure material specified as being released. (A comparison of the quantities discharged as described by Table 4-3 and the Part A, Form 3 will differ significantly because the weight contribution of the water in the chemical sewer was excluded in Table 4-3.)

4.1.2 The PUREX Plant Steam Condensate

The PUREX Plant steam condensate did not contain dangerous wastes. A record search did not reveal any documentation to substantiate any dangerous waste discharges in the past. As stated previously, the steam condensate could have become radioactively contaminated if there was a breach in the tubes that separated the steam from the process solution.

The PUREX Plant steam condensate discharge was routed to the 216-B-3 Pond System only after the effluent had been diverted to the 216-A-42 Diversion Basin. The steam condensate discharge normally was routed to the 216-A-30 Crib. In the event that an incident occurred that resulted in the release of radionuclides above a preset level, the steam condensate discharge was diverted to the 216-A-42 Diversion Basin. After determining the radionuclide content, the diverted effluent was routed to one of three places, the 216-A-30 Crib, 216-B-3 Pond System, or back to PUREX Plant.

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4.1.3 The PUREX Plant Cooling Water

The PUREX Plant cooling water did not contain dangerous wastes. A record search did not reveal any documentation to substantiate any dangerous waste discharges in the past. As stated previously, cooling water could have become radioactively contaminated if there was a breach in the tubes that separated cooling water from the process solution.

The PUREX Plant cooling water supplied radionuclides to the 216-B-3 Pond as a result of a breach in a cooling coil on June 12, 1964. The breach released approximately 10,000 curies of mixed fissions products. An estimate of the relative percentages of radionuclides is presented in Table 4-4. Approximately 25 percent (2,500 curies) of the release went directly to the 216-B-3 Pond and the remainder to 216-A-25 Gable Mountain Pond. The volume associated with this release is unknown. Measured activity of the 216-B-3 Pond water declined rapidly with time, from a high of about 1,500 picocuries per cubic centimeter immediately following the release. As a result of this accidental discharge, the original 216-B-3-1 Ditch was closed and covered and replaced in July 1964 by the 216-B-3-2 Ditch. The shoreline sediments of the 216-B-3 Pond were bulldozed into the pond and the shoreline was built up with earth fill to elevate the pond water surface and cover contaminated soil.

4.2 THE B PLANT

Waste water streams discharged to the 216-B-3 Pond System included B Plant chemical sewer, B Plant steam condensate, and B Plant cooling water. Currently, cooling water and the chemical sewer are discharged to the 216-B-3 Pond System from B Plant. The following sections discuss the known (i.e., documented) and potential releases of dangerous and radioactive constituents from B Plant waste streams to the 216-B-3 Pond System.

4.2.1 Process Cooling Water

Process cooling water has been discharged to the 216-B-3 Pond System from B Plant since April 1945. Chemical discharges to B Plant process cooling water were estimated for calendar year 1969. This estimate, which is assumed to be typical of that time period, indicates that B Plant cooling water was essentially free of chemical contamination.

In November 1981, it became necessary to clean out the calcium carbonate scale that coated the 24-inch cooling water discharge line. On November 3 and 4, 1981, the scale was removed from the line using 4,100 gallons of a 28 percent hydrochloric acid solution and high pressure water. The acid solution was neutralized using 1,850 gallons of 50 percent sodium hydroxide. The majority of the calcium carbonate scale was removed manually through the inspection hole for the 24-inch line. In addition, 25 gallons of a scale inhibitor containing 45 percent potassium hydroxide was used to coat the 24-inch line.

The average concentration of alpha and beta in the cooling water for 1988 is 3.53 picocuries per liter (alpha) and 21.9 picocuries per liter (beta) (Coony and Thomas 1989, pg. C-21). At a flow rate of 3.1×10^8 (liters per month), the annual estimated radiation entering the 216-B-3 Pond System from B Plant is about 1,300 microcuries per year (alpha) and 8,100 microcuries per year (beta).

4.2.2 The B Plant Chemical Sewer

The B Plant chemical sewer was discharged to the 216-B-3 Pond System from April 1945 to May 1970. Chemical discharges to the chemical sewer were estimated for calendar year 1969. This estimate, which is the basis for Table 4-5, is assumed to be typical for the chemical sewer at the time. The chemical sewer was reconnected to the 216-B-3 Pond in February 1992 with comprehensive source controls that will prevent future chemical discharges.

On November 7, 1963, a coil leak developed in B Plant tank Tk-6-1. This leak resulted in the release of 1.3 million gallons of water containing approximately 30 curies of cesium-137 and 0.05 curies of strontium-90. Documentation of the incident indicates that no complexing agents were used for decontamination. Therefore, no dangerous waste contamination occurred as a result of this incident.

On March 22, 1970, approximately 1,000 curies of strontium-90 were released to the chemical sewer when a portable manometer system failed. The gallery and/or ventilation systems were treated/decontaminated with the chemicals listed in Table 4-6 following the radioactive release. These chemicals were released to the chemical sewer; quantities were not documented.

In an effort to precipitate the strontium released to the 216-B-3 Pond System in 1970, an additional 70,000 pounds of trisodium phosphate and 31,000 pounds of calcium chloride were sprayed on the 216-B-3 Pond in two separate aerial applications.

The March 22, 1970 radionuclide release was much larger than the 1963 release. Though about 1,000 curies of strontium-90 were released, the majority of the contamination was contained in the 216-B-2-2 Ditch, which was dammed 1,000 feet downstream from the spill. The 216-B-2-2 Ditch discharged into the 216-B-3-2 Ditch. As a result of this release, the 216-B-3-2 Ditch (which discharged to the 216-B-3 Pond) was closed and covered and replaced by the 216-B-3-3 Ditch. The estimated release to the 216-B-3 Pond is presented in Table 4-7.

Prior to January 1992, the B Plant chemical sewer included run-off from the pump pits in the 211-B storage tank area and sumps from inside the tank storage basins. The specific physical and administrative controls to limit dangerous waste discharged to the chemical sewer from 1945 to 1970 are not known. Therefore, during an emergency or upset condition (e.g., rupture of a storage tank), chemicals stored at the facility had a potential to be discharged to the chemical sewer. Though no record of such a discharge is

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documented, the chemicals stored at B Plant during the time the chemical sewer was discharged to the 216-B-3 Pond are listed in Table 4-8.

The majority of information in Table 4-8 was derived from the Inventory of Chemicals Used at the Hanford Site Production Plants and Support Operations (1944-1980) (Klem 1988a pg. 18-20). This document lists chemicals used in fuel separation (1945-1952) and chemicals used in the encapsulation process (1974-1976).

Although the chemical sewer was diverted from the 216-B-3 Pond System in 1970, the stream had a remote chance of discharging to the 216-B-3 Pond System during a cooling water emergency (Chapter 3.0, Section 3.5). Therefore, the chemicals used in processing after 1970 also are included in Table 4-8.

4.2.3 The B Plant Steam Condensate

The B Plant steam condensate, which is generated from a batch operated evaporator, was discharged to the 216-B-3 Pond System from April 1945 until September 1967. The steam condensate was diverted to the 216-B-55 Crib in 1967. Generally, the steam condensate stream is not radiologically or chemically contaminated. Although a heating coil failure could conceivably result in contamination of this stream, documentation of such an occurrence could not be located.

4.3 TANK FARM WASTE MANAGEMENT OPERATIONS

Liquid discharges from the 242-A Evaporator, 244-AR Vault, 242-B Evaporator, 244 BXR Vault, 241-BY Tank Farm, 244-CR Vault, and 241-A Aging Waste Ventilation System Complex consisted primarily of cooling water and steam condensate. The 242-A Evaporator, 244-AR Vault, and 241-A Aging Waste Ventilation System complex still discharge primarily cooling water and steam condensate to the 216-B-3 Pond System. Cooling water and steam condensate do not contain dangerous waste. Cooling water and steam condensate have the potential to become radioactively contaminated if there is a breach in the tubes separating the cooling water or steam from the process solutions. Additionally, a record search did not reveal any documentation to substantiate any dangerous waste discharges from these facilities to the 216-B-3 Pond in the past.

4.4 THE 283-E WATER TREATMENT FACILITY AND 284-E POWERHOUSE

The 283-E Water Treatment and the 284-E Powerhouse effluent streams have not and do not contain dangerous waste; additionally, these streams do not have the potential of becoming radioactively contaminated. The water for

these facilities is obtained from the Columbia River. The constituents present in the discharge streams (above the normal concentrations present in the Columbia River) are from treatment for various uses; these constituents are:

- Aluminum from the production of drinking water using aluminum sulfate as the flocculating agent

- Fines from backwashing filters used to filter treated Columbia River water to produce drinking water

- Chemical species contained in the boiler anti-scaling and dissolved-oxygen scavenger chemicals (i.e., Deartrol* 4812 and Dearborn 66, respectively.) Deartrol* 4812 contains sodium hydroxide and ethylenediaminetetraacetic acid (EDTA) and Dearborn* 66 contains sodium sulfite.

Although the boiler blowdown and cooling water do not come into contact with dangerous materials, there is a possibility of metals leaching from the system piping. A variety of heavy metals have been identified in both the cooling water and boiler blowdown from the 284-E Plant. The detected analytes are listed in specific report, Addendum 24 (WHC-EP-0342). The heavy metals include iron (Fe), chromium (Cr), copper (Cu), zinc (Zn), and lead (Pb). The values for Fe, Cu, and Zn are less than the values required under WAC 173-200. The values for Cr and Pb are less than the laboratory detection limits. Consequently, the actual values may be in a range between zero and the detection limit. The reported Cr values are for total Cr, which includes both hexavalent and trivalent chromium. Differentiation of the levels for the two types of chromium are not a requirement of the specific report, Addendum 24 (WHC-EP-0342).

Metals are analyzed by the ICP method in groundwater at the 216-B-3 Pond System Resource Conservation and Recovery Act (RCRA) monitoring wells. Total chromium was detected above the WAC 173-200 standard from unfiltered samples (from the July 1991 sampling effort). Chromium values ranged from 29 to 150 ppb for unfiltered samples and 32-40 ppb for filtered samples. Values for iron also exceeded the WAC 173-200 standard and ranged from 190 to 1100 ppb for unfiltered samples and from 34 to 640 ppb for filtered samples from the July 1991 sampling effort. Values for lead, copper, and zinc were below the WAC 173-200 standard. Ecology references groundwater contamination standards under the Ground Water Quality Criteria in Table 1 of WAC 173-200-040. RCRA facility closure activities are not regulated under these criteria, which may be applied as Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) operable unit cleanup standards. Groundwater contamination is addressed under applicable CERCLA regulations. Therefore, the above reference table and associated disposition are provided as a courtesy to Ecology to assist in illustrating the uncontaminated nature of the boiler blowdown and cooling water. Any evidence of chemical constituents in the groundwater above Ground Water Quality Criteria standards will be addressed when the facility is remediated under CERCLA operable unit status.

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Table 4-1. The 216-B-3 Pond Cumulative, Decayed Radionuclide Inventory.

Radionuclides	Inventory (curies)	Radionuclides	Inventory (curies)
Cumulative volume of water discharged: 2.26×10^{11} liters			
Total alpha	$<1.60 \times 10^{1}$	Total beta	$<3.93 \times 10^{2}$
Tritium (^{3}H)	8.29×10^{2}	Strontium-90 (^{90}Sr)	$<1.03 \times 10^{2}$
Ruthenium-106 (^{106}Ru)	$<1.34 \times 10^{-4}$	Cesium-137 (^{137}Cs)	$<9.49 \times 10^{1}$
Promethium-147 (^{147}Pm)	<1.03	Uranium (gross) (U)	<2.07
Plutonium-239 (^{239}Pu)	$<5.52 \times 10^{-1}$	Americium-241 (^{241}Am)	<3.52

< = values below detectable range.

Table 4-2. Chemicals Used at the PUREX Plant.

Compound name	
Acetic acid	Periodic acid
Aluminum nitrate nonahydrate	Phosphoric acid
Aluminum nitrate (mono basic)	Potassium fluoride
Ammonium fluoride	Potassium hydroxide
Ammonium nitrate	Potassium permanganate
Cadmium nitrate	Shell E-2342*[b]
Dibutyl butyl phosphonate	Silver nitrate
DOW Anti-Foam B*[a]	Sodium carbonate
Ferric nitrate	Sodium ferrocyanide
Ferrous sulfamate	Sodium fluoride
Formaldehyde	Sodium hydroxide
Hydrazine	Sodium nitrate
Hydrogen peroxide	Sodium nitrite
Hydroxyacetic acid	Sodium sulfate
Hydroxylamine nitrate	Sodium thiosulfate
Lanthanum nitrate	Soltrol-170*[c]
Lead nitrate	Sugar
Mercuric nitrate	Sulfamic acid
Nickel nitrate	Sulfuric acid
Nitric acid	Tartaric acid
Normal paraffin hydrocarbon	Tri-n-dodecylamine
Oxalic acid	Tributyl phosphate
	Trichloroethane

[a]Silicon emulsion. DOW Anti-Foam B is a trademark of Dow Corning Corporation.

[b]Napthalene and paraffins. Shell E-2342 is a trademark of Shell Oil Company.

[c]$C_{10}H_{22}$ to $C_{16}H_{34}$ paraffins. Soltrol-170 is a trademark of Phillips Chemical Company.

Table 4-3. Releases into The PUREX Plant Chemical Sewer Line.
(sheet 1 of 2)

Date	Chemical	Pounds	Designation[a]
05/20/83	Aluminum nitrate nonahydrate	17,725	NONE
10/17/83	Potassium permanganate	10,700	NONE
	Sodium carbonate	1,412	
02/09/84	Potassium hydroxide	83,000	D002
02/26/84	Sodium hydroxide	3,700	D002, WT02
05/16/84	Cadmium nitrate	25 - 50	D006, WT01
06/06/84	Hydrazine	332	U133
	Hydroxylamine nitrate	90	
08/22/84	Nitric acid	9,000	D002
10/02/84	Hydrazine	280	U133, WT02
	Hydroxylamine nitrate	407	
11/01/84	Sulfuric acid	3,482	NONE
11/27/84	Nitric acid	349	NONE
	Ferrous sulfamate	43	
	Sulfamic acid	68	
12/02/84	Potassium hydroxide	150	D002
12/02/84	Potassium hydroxide	62,683	D002, WT02
01/10/85	Hydroxylamine nitrate	100	
	Hydrazine	21	U133
	Nitric acid	66	
01/18/85	Nitric acid	6,236	D002, WT02
02/08/85	Sodium nitrate	160	NONE
04/04/85	Ferrous sulfamate	52	NONE
	Nitric acid	269	
	Sulfamic acid	132	
05/14/85	Nitric acid	190	
	Hydroxylamine nitrate	98	
	Hydrazine	0.4	U133
05/27/85	Nitric acid	223	NONE

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Table 4-3. Releases into The PUREX Plant Chemical Sewer Line.
(sheet 2 of 2)

Date	Chemical	Pounds	Designation[a]
06/25/85	Nitric acid	24,189	D002, WT02
07/01/85	Ammonium fluoride	5,368	WT01
	Ammonium nitrate	1,016	
08/06/85	Sodium hydroxide	42,440	D002, WT02
10/28/85	Nitric acid	1,181	D002
12/18/85	Cadmium nitrate	35	D006, WT01
12/28/85	Aluminum nitrate nonahydrate	650 - 730	NONE
02/12/86	Nitric acid	42	D002
	Sulfuric acid	276	
02/13/86	Sulfuric acid	77	D002
02/19/86	Sodium hydroxide	<100	D002, WT02
02/21/86	Sulfuric acid	<100	D002
03/24/86	Sulfuric acid	<100	D002
06/28/86	Sulfuric acid	121	D002
07/07/86	Hydrazine	6	U133
04/25/87	Sodium nitrite	1,275	NONE

[a]Ecology waste designation (WAC 173-303).

Table 4-4. Activity Percentage of Radionuclides from the PUREX Plant F-15 Tank Leak[a] (June 1964).

Radionuclide	Percent total activity	Radionuclide	Percent total activity
Strontium-89 (^{89}Sr)	9.5	[b]Tellurium-129 (^{129}Te)	0.21
Strontium-90 (^{90}Sr)	0.4	Cesium-137 (^{137}Cs)	0.33
Yttrium-90 (^{90}Y)	0.4	Barium-137 (^{137}Ba)	0.33
Yttrium-91 (^{91}Y)	11.5	Barium-140 (^{140}Ba)	0.28
Zirconium-95 (^{95}Zr)	14.8	Lanthanum-140 (^{140}La)	0.33
[b]Niobium-95 (^{95}Nb)	0.3	Cerium-141 (^{141}Ce)	4.7
[c]Niobium-95 (^{95}Nb)	23.2	Praseodymium-143 (^{143}Pr)	0.4
Ruthenium-103 (^{103}Ru)	5.6	Cesium-144 (^{144}Cs)	9.3
Rhodium-103 (^{103}Rh)	5.6	Praseodymium-144 (^{144}Pr)	9.3
Ruthenium-106 (^{106}Ru)	0.75	Promethium-147 (^{147}Pm)	1.35
Rhodium-106 (^{106}Rh)	0.75		

[a]Note: Percent totals do not add up to 100 percent.
[b]ground stable.
[c]meta stable.

Table 4-5. Potential Contaminants in the B Plant Chemical Sewer[a].

Chemical	Average concentration (parts per million)	Loss (grams per year)
Aluminum nitrate nonahydrate	4.73×10^{-5}	63.5
Ammonia	3.2	1.74×10^{6}
Di(2-ethylhexyl)phosphoric acid	0.57	7.52×10^{4}
Citric acid	11.2	1.48×10^{6}
Hydroxyacetic acid	13.6	1.80×10^{6}
Carbon dioxide	10.3	1.36×10^{6}
Hydroxyethyl ethylenediaminetetraacetic acid	12.0	1.59×10^{6}
Trisodium nitrilo triacetate	0.13	1.72×10^{4}
Normal paraffin hydrocarbons (kerosene)	0.53	2.02×10^{5}
Nitric acid	26.0	3.41×10^{6}
Oxalic acid	0.086	1.14×10^{4}
Sodium hydroxide	47.3	6.24×10^{6}
Sulfuric acid	0.62	8.22×10^{4}
Phosphotungstic acid	0.89	1.17×10^{5}
Sodium bisulfate	1.79	2.36×10^{5}
Sodium carbonate	3.75	4.95×10^{5}
Tartaric Acid	2.30	3.04×10^{5}
Tributylphosphate	0.33	4.35×10^{4}

[a]Chemical loss based on a flow rate of 1.32×10^{8} liters per year (3.48×10^{7} gallons per year) and a density of 1.0 gram per milliliter.

Table 4-6. Chemicals Used in Treatment/Decontamination Following the 1970 Release.

Chemical	Comments
Mantek "one stroke"*	Paint remover
Phosphoric acid	
Caustic tartrate	
Turco 4502*	contains 3% chromate
Turco 4518*	90% oxalic acid
Turco 4306*	50% sulfamic acid
	45% sodium bisulfate
Turco 4512A*	50% phosphoric acid
$H_2SO_4/Na_2Cr_2O_4$	Sulfuric acid/sodium dichromate

*Mantek "one stroke" is a trademark of Manville Building Materials Corporation.

Turco 4502*, Turco 4518*, Turco 4506*, Turco 4512A* are trademarks of Turco Products Incorporated.

Table 4-7. Estimated Radionuclides Released to the 216-B-3 Pond March 22, 1970.

Radionuclide	Curies
Total beta	154
Cesium-137 (^{137}Cs)	13
Strontium-90 (^{90}Sr)	50
Cerium praseodymium-144 (^{144}Ce-Pr)	54

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Table 4-8. Chemicals Used at the B Plant and the Waste Encapsulation Storage Facility.

Chemical	
Acetone	Nickel ferrocyanide
Aluminum	Nitric acid
Ammonia (anhydrous)	Normal paraffin hydrocarbons
Ammonium Carbonate	Oxalic acid
Ammonium nitrate	Phosphoric acid
Ammonium sulfite	Phosphotungstic acid
Ammonium silicofluoride	Potassium permanganate
Ammonium sulfate	Potassium hydroxide
Boric acid	Silver nitrate
Calcium chloride	Sodium phosphate
Carbon dioxide	Sodium nitrite
Ceric nitrate	Sodium nitrate
Cesium chloride	Sodium dichromate
Citric acid	Sodium hydroxide
Di(2-ethylhexyl) phosphoric acid	Sodium fluoride
Ferrous sulfate	Sodium sulfate
Hydrochloric acid	Sodium persulfate
Hydrogen fluoride	Sodium gluconate
Hydrogen peroxide	Sodium carbonate
Hydroxyacetic acid	Sodium acetate
[a]Hyflo-super-cel (contains silica)	Sodium bismuthate
Lanthanum nitrate	Strontium fluoride
Lanthanum-neodymium nitrate	Sugar
Lead nitrate	
Sulfuric acid	Trisodium hydroxyethylethylene-diaminetriacetic acid (HEDTA)
Tartaric acid	Trichloroethane
Tetrasodium ethylenediamine-tetraacetic acid (EDTA)	Zirconyl nitrate
Tributyl phosphate	

[a]Hyflo-super-cel is a trademark of Manville Building Materials Corporation.

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5.0 GROUNDWATER MONITORING

This chapter describes the groundwater monitoring program at the B Pond site, including well installation and design, hydrogeologic characterization, and data collection. Current knowledge of regional and site hydrogeology is summarized.

The B Pond System is located east of the Separations Area (Figure 5-1). The Separations Area includes the 200 East and 200 West Areas and all of the associated liquid waste disposal facilities.

5.1 INTERIM-STATUS PERIOD GROUNDWATER MONITORING

Installation of groundwater monitoring wells is required for compliance with interim status regulations (40 CFR 265, Subpart F). This section describes the interim status groundwater monitoring network at the B Pond site, hydrogeologic characterization methods, and results of groundwater monitoring to date.

The objectives of interim-status groundwater monitoring at B Pond (Luttrell et al. 1989, pp. 49) are as follows.

- Characterize the stratigraphy and the horizontal and vertical groundwater flow directions and rates beneath B Pond, with focus on the uppermost aquifer.

- Determine if any statistically significant amounts of dangerous waste constituents that originate from B Pond are detectable in the groundwater.

A network of groundwater monitoring wells has been established around B Pond to measure water levels, obtain groundwater samples, and evaluate aquifer properties. Analyses of data from downgradient wells will be compared to data from wells outside of the influence of B Pond ('background' wells) to determine whether contaminants from B Pond are present in the groundwater.

The RCRA groundwater monitoring at B Pond was initiated in 1988 as an contamination indicator evaluation program for an interim-status facility. The applicable monitoring requirements are described in 40 *Code of Federal Regulations* (CFR) 265.92 and 265.93 and WAC 173 303-645. Section 6.3.1 of the Tri-Party Agreement (Ecology et al. 1992) specifies, "Any demonstration for clean closure of a disposal unit, or selected treatment or storage units as determined by the lead regulatory agency, must include documentation that groundwater and soils have not been adversely impacted by that TSD group/unit, as described in WAC 173-303-645." The WAC 173-303-645 governs final-status facilities, with subsection (4)(a) requiring analysis of appropriate 40 CFR 264 Appendix IX constituents, and subsection (5)(a), Table 1, listing maximum concentration limits for certain constituents. To meet the intent of the Tri-Party Agreement, the B Pond monitoring wells will be sampled once for the 40 CFR 264 Appendix IX constituents to verify that none of these dangerous

waste constituents has migrated into the groundwater from B Pond. Any detected Appendix IX constituents will be added to the list of parameters to be monitored semiannually. In addition, the list of regular monitoring parameters includes those in Table 1 of WAC 173-303-645. Groundwater sampling is discussed in more detail in Section 5.1.2.

The groundwater monitoring program and the hydrologic system in the B Pond vicinity are described in the following documents:

- 216-B-3 Pond Preliminary Closure/Postclosure Plan (DOE-RL 1989)

- 40 CFR 265 Interim-Status Ground-Water Monitoring Plan for the 216-B-3 Pond (Luttrell et al. 1989)

- RCRA Groundwater Monitoring Progress Reports
  - RCRA Groundwater Monitoring Compliance Projects for Hanford Site Facilities: Progress Report for the Period October 1 to December 31, 1988 (Fruland et al. 1989)
  - RCRA Groundwater Monitoring Projects for Hanford Facilities: Progress Report for the Period January 1 to March 31, 1989 (Smith et al. 1989a).
  - RCRA Groundwater Monitor Projects for Hanford Facilities: Progress Report for the Period April 1 to June 30, 1989 (Smith et al. 1989b).

Additional progress reports will be published quarterly.

Chemical and hydrogeologic data for the Separations Area and vicinity (including B Pond) are available in annual environmental reports (e.g., Wilbur et al. 1983; Graham et al. 1984; Serkowski et al. 1988). A hydrogeologic characterization report that will assimilate collected data for B Pond is being prepared.

5.1.1 Well Locations and Construction

The groundwater monitoring network for B Pond includes 13 wells (Figure 5-2). Well locations and construction are discussed in the following sections.

5.1.1.1 Well Locations. Two wells are monitored for background water quality. These wells (299-E18-1 and 299-E32-4) were constructed for other RCRA monitoring projects. Another well in the vicinity of B Pond (699-42-40A) existed at the site before RCRA monitoring and is used as a downgradient well. Four other downgradient wells were installed for RCRA monitoring in 1988 and six more were installed in 1989. Well construction information is summarized in Table 5-1 and Appendix A. Geographic well coordinates are provided in Appendix A.

Artificial recharge to the groundwater system from B Pond has created a groundwater mound beneath the site (Section 5.1.3). Consequently, every location surrounding the facility is hydrologically downgradient.

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In the absence of upgradient locations, wells believed to be unaffected by B Pond are used to determine the background water chemistry. Well 299-E18-1 is located approximately 2.25 miles west-southwest of B Pond, and well 299-E32-4 is located approximately 2.75 miles west of B Pond (see Figure 5-2). These wells are located downgradient of the 200 West Area and along flow paths that presumably would move through the northern and southern parts of the 200 East Area if the groundwater mound beneath B Pond was not present. The wells are located as near to B Pond as possible yet outside the influence of the groundwater mound, as indicated by regional contaminant plume maps (Law et al. 1987, pp. 75-86, DOE 1992, Ford 1993, Johnson 1993) and the Separations Area water table map (Figure 5-3). The background wells are completed in the uppermost aquifer and are constructed to meet RCRA design requirements.

Five of the downgradient monitoring wells are located around the 216-B-3 Pond because it has a greater likelihood for contamination than do the expansion ponds. The well locations are 100 to 200 feet from the edge of the pond. This distance was chosen to keep drilling activities outside of zoned decommissioned radiation areas adjacent to the pond and because potential contaminants could have spread laterally in the vadose zone before reaching the water table. One well (699-43-45) is located west of B Pond. This well will provide information on the overflow area and the lower segment of the 216-B-3-3 Ditch, both of which are known to have received dangerous waste.

Most of the monitoring wells are completed at the top of the aquifer. Two wells were completed at the base of the aquifer to monitor groundwater quality and groundwater potential in the lower part of the aquifer. One of these deep wells (699-42-42B) was installed on the southeast side of B Pond, near shallow well 699-43-42J. Another deep well (499-43-41F) was installed north of the pond near shallow well 699-43-41E. Wells 699-42-42B and 699-43-41F will provide initial deep groundwater monitoring points in the central area of B Pond System, where vertical gradients are expected to be greatest.

As more data are collected, the adequacy of the monitoring network will be assessed. If necessary, additional wells will be installed to monitor the upper portion of the 216-B-3-3 Ditch or other potential 'gaps' in the network.

5.1.1.2 Details of Well Design and Construction. All of the wells in the B Pond monitoring network were drilled with the cable tool method. All but one of the wells (699-42-40A) are constructed of 4-inch-diameter stainless steel casing and screen. The screens are surrounded by quartz sand filter packs. The wells are sealed from above the filter pack with bentonite (to near land surface) and cement grout (to land surface). A concrete surface seal and well pad were emplaced around each well. Construction details are summarized in Table 5-1. Construction diagrams and lithologic diagrams for each well in the monitoring network are contained in Appendix A. Additional information on drilling, well installation, construction, well development, geophysical logging, and surveying is contained in Luttrell et al. (1989, pp. 49-68) and Fruland et al. (1989, pp. 12.1-12.6).

Well 699-42-40A was installed in 1981. It is constructed of carbon steel casing with a packer and stainless steel screen and has a surface seal of 18 feet of cement grout. The water table has risen since this well was constructed, and the screen is now 15 feet below the water table. This well was evaluated recently to assess whether it satisfies the requirements of WAC 173-303 for use as a resource protection well. The well does not fully satisfy those requirements. It will be remediated, if possible, or will be replaced with a new well.

5.1.2 Sampling and Analysis Plan

Hydrogeologic characterization studies are being conducted to define the geologic and hydrogeologic conditions and properties that control contaminant flow paths. Data collection and interpretation focus on geology, geochemistry, hydrogeology, hydrochemistry, and groundwater monitoring. Characterization work is summarized in the following sections and described more fully in Luttrell et al. (1989, pp. 62-72). The groundwater sampling and analysis plan for B Pond (Luttrell et al. 1989, Appendix D) describes sample collection, field chemical measurements, analytical methods, preservation techniques, chain-of-custody control, and quality control. Laboratory analytical methods are adapted from EPA (1986b). The procedures for groundwater sample collection, water-level measurements, and field chemical measurements are contained in Pacific Northwest Laboratory (PNL) (1989). Applicable procedures are listed in the following sections.

5.1.2.1 Geologic Sampling. Geologic samples are collected at 5-foot intervals or at changes in lithology during drilling. The samples are described in the field and archived for additional analyses. Additional samples may be collected for special analyses (e.g., hydraulic conductivity tests). Applicable procedures from PNL (1989) are as follows:

- DO-1 Collection and Documentation of Borehole Samples and Well Construction Data
- DO-2 Split-Barrel Auger Sediment Sampling.

5.1.2.2 Sample Analyses. Laboratory analyses, followed by procedures used on sediment samples, include the following:

- Sieve analysis (Gee and Bauder 1986, PNL 1989 (SA-2)
- Moisture content (ASTM 1988, Klute 1986)
- Calcium carbonate content (Allison and Moodie 1965, Nelson 1982)
- Petrography
- Hydrometer analyses of zones that contain much silt or clay (Gee and Bauder 1986)
- Saturated hydraulic conductivity (Klute and Dirksen 1986)
- Chemical analyses of contamination indicator parameters.

Moisture content data are available for several wells and are included in Fruland et al. (1989, pp. 12.4-12.6). Results of other laboratory analyses will be included in a hydrogeologic characterization report.

5.1.2.3 Borehole Logging. Gamma, neutron, and density logs were run in boreholes 699-43-42J, 699-43-43, and 699-42-42B. A gamma log was run in boreholes 699-44-42, 699-43-45, 699-44-43B, 699-43-41E, 699-40-39, 699-41-40, and 699-43-41F. Copies of logs from wells installed in 1988 are included in Fruland et al. (1989, Appendix C). Geophysical logging of the wells drilled in 1989 will be described in future quarterly reports. The PNL (1989) geophysical logging procedures include the following:

- GL-5 Neutron Probe Procedure
- GL-6 Bulk Density Probe Procedure
- GL-7 Gamma Ray Procedure.

5.1.2.4 Borehole Development and Aquifer Testing. Well development generally was conducted in two stages: initial development that sometimes included aquifer testing and final well development after the final well materials were installed. The purpose of borehole development is to remove drilling fluids from the well and fine-grained materials from around the well screens. Initial development also can provide information for determining the optimum pumping rates for subsequent aquifer tests. Boreholes 699-43-43 and 699-44-42 were developed before and after well completion activities. The other downgradient RCRA wells were developed after well completion.

The purpose of hydrologic testing is to determine estimates of transmissivity, hydraulic conductivity, and, if possible, storativity of the uppermost aquifer beneath B Pond. Estimates of transmissivity and hydraulic conductivity have been determined from data collected from constant-discharge tests, recovery tests, and slug injection and/or withdrawal tests. The intent was to determine storativity, if possible, from data collected from constant-discharge or recovery in multiple-well tests.

Hydrologic (aquifer pumping) tests were conducted in wells 699-42-42B, 699-43-43, and 699-44-42. Single-well constant-discharge aquifer tests and subsequent recovery tests were performed in wells 699-43-43 and 699-44-42. A constant-discharge test as well as a recovery test with one observation well (699-43-42J) were conducted in well 699-42-42B. Slug injection and/or withdrawal tests were performed in wells 699-44-43B, 699-40-39, and 699-43-41F. Results of these tests are summarized in Section 5.2.5. Aquifer testing is controlled by the following procedures from PNL (1989):

- AT-4 Well Development
- AT-5 Constant Discharge Test
- AT-6 Aquifer Slug Injection and Withdrawal Test.

5.1.2.5 Determination of Groundwater Flow Paths. Water levels are measured monthly in the monitoring wells and in several other nearby wells to determine hydraulic head distribution. Water-level data are discussed in Section 5.1.3. Water levels are monitored according to the following procedures (PNL 1989):

- WL-1 Water-Level Measurement Procedure
- WL-2 Procedure for Standardizing Steel Tapes.

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5.1.2.6 Groundwater Quality. Water samples were collected and analyzed quarterly from downgradient wells 699-42-40A, 699-42-42B, 699-43-42J, and 699-43-43 and background wells 299-E18-1 and 299-E32-4 for the first year of monitoring. Quarterly sampling of these wells began the fourth quarter of calendar year 1988, and these wells are now sampled semiannually. The wells installed in 1989 (i.e., 699-43-45, 699-44-43B, 699-43-41E, 699-40-39, 699-41-40, and 699-43-41F) were sampled quarterly for the first year and semiannually thereafter.

Groundwater samples are analyzed for parameters required by 40 CFR 265.92, and for volatile organic constituents, hydrazine, ammonia, and tritium ('regular' list of constituents). In addition, samples will be analyzed once for constituents listed in 40 CFR 264, Appendix IX and WAC 173-303-9905. If any Appendix IX or WAC 173-303-9905 constituents are detected and confirmed in groundwater samples from B Pond wells, these constituents will be added to the regular list.

Results of chemical analyses of groundwater samples are discussed in Section 5.1.3. The collection of groundwater samples are controlled by the following procedures (PNL 1989):

- GC-1 Groundwater Sample Collection Procedure
- GC-2 In-Line Sample Filtration Procedure
- FA-1 Temperature Measurement Procedure
- FA-2 Calibration of Conductivity Meter and Measurement of Field Conductivity
- FA-3 Calibration of pH Meter and Measurement of Field pH
- Laboratory Analyses Based on SW-846 (EPA 1986b)
- AD-2 Groundwater Sample Chain-of-Custody Procedure.

5.1.2.7 Statistical Evaluation. RCRA Groundwater monitoring at B Pond began in November 1988. Four quarters of background data have been collected, and statistical analyses are being performed to determine average concentrations of indicator parameters, as required by 40 CFR 265.93(b). Indicator parameters are pH, specific conductance, total organic carbon, and total organic halogen. Indicator parameters of the downgradient wells are compared semiannually to background wells. These data are analyzed periodically to evaluate whether groundwater quality is affected by discharges to B Pond.

Statistical methods to determine mean background groundwater quality, variance, and coefficient of variation will be based on the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (EPA 1986a, Appendix B).

5.1.3 Results of the B Pond Groundwater Monitoring

This section presents the results of groundwater monitoring to date, including potentiometric levels and groundwater quality.

5.1.3.1 Potentiometric Levels. The water table in the immediate vicinity of B Pond is approximately 125 to 150 feet below ground surface, near the contact between the Hanford and Ringold Formations. The thickness of the unconfined

aquifer ranges from approximately 30 feet to over 70 feet. Groundwater levels in the unconfined aquifer beneath B Pond have risen approximately 35 to 40 feet since waste disposal operations began. This groundwater mound is a major feature controlling the direction of groundwater flow near the 200 East Area. Figure 5-3 illustrates the water table in the vicinity of the Separations Area.

Variations in the volume of liquid disposed to B Pond cause a fluctuation in the artificial recharge and consequently, in the water table. However, the general 'topography' of the water table surface is relatively consistent, and groundwater flows radially from the mound beneath B Pond. Horizontal gradients near the pond range from approximately 0.002 to 0.007.

The B Pond groundwater mound also has altered vertical flow. A downward gradient of approximately 0.1 is observed between wells 699-43-42J and 699-42-42B. In most areas of the Hanford Site, groundwater potential in the Rattlesnake Ridge aquifer is higher than in the suprabasalt aquifer; therefore, groundwater tends to flow upward. Because the groundwater mound beneath B Pond has created an area where hydraulic head is greater in the suprabasalt aquifer, there is a potential for groundwater to flow from the suprabasalt sediments into deeper aquifers.

5.1.3.2 Groundwater Quality. Groundwater samples are analyzed for the constituents and parameters listed in Table 5-2, as required by 40 CFR 265.92 and WAC 173-303-645, and for hydrazine, ammonia, and tritium. Other radioactive constituents are analyzed on an ad hoc basis. Groundwater samples from all wells also have been or will be analyzed for the constituents listed in WAC 173-303-9905 and 40 CFR 264, Appendix IX. Results of chemical analyses are contained in quarterly progress reports (e.g., Fruland et al. 1989, pp. 12.7-12.17; Smith et al. 1989b pp 12.6-12.12) and in Appendix B. The following is a summary of water quality data from November 1988 through August 1989.

Groundwater Protection Constituents (40 CFR 264.97 and WAC 173-303-645)--All groundwater protection constituents were below the maximum concentration limits in filtered groundwater samples. Elevated levels of chromium were observed in unfiltered samples from several wells in the B Pond monitoring network. The highest value was 206 parts per billion in well 699-43-42J in August 1989. The drinking water standard for chromium is 50 parts per billion (40 CFR 141). Elevated chromium concentrations have been observed in various wells across the Hanford Site and appear to be residual from well drilling or construction (Fruland et al. 1989, pp. 1.5-1.6). Filtered samples contained no detectable chromium.

Indicator parameters--Results of indicator parameter analyses through April 1993 are presented in Table 5-3. An explanation of symbols used in this table is presented at the front of Appendix B. Specific conductance of the background wells, 299-E18-1 and 299-E32-4, was slightly higher than in the downgradient wells. Values ranged from 137 micromhos per centimeter in well 699-42-40A to 568 micromhos per centimeter in well 299-E18-1. The pH ranged from 7.0 to 8.2 and was comparable for background and downgradient wells. Total organic carbon was below the laboratory CRQL in all wells.

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Total organic halogen was generally below the CRQL (10 parts per billion), but was slightly above that level in several samples. One set of samples from well 699-42-42B showed total organic halogens between 60 and 70 parts per billion.

Manganese and Iron--Samples collected from well 699-42-40B in November 1988 exhibited iron and manganese concentrations one or two orders of magnitude greater than the other wells. This is a carbon-steel-casing well located next to well 699-42-40A and monitors essentially the same horizon. Well 699-42-40A did not show high manganese and iron concentrations. Samples from well 699-42-40B had high turbidity, and it appears the samples were not representative of true groundwater quality; this well is no longer included in the B Pond groundwater monitoring network.

Tritium--The highest tritium concentration observed in B Pond wells between November 1988 and August 1989 was 79,500 picocuries per liter in well 699-42-42B. The primary drinking water standard for tritium is 20,000 picocuries per liter (40 CFR 141). The adjacent shallow well (699-43-42J) had tritium concentrations over an order of magnitude smaller than well 699-42-42B. Tritium concentrations in the other wells in the B Pond network ranged over 4 orders of magnitude.

Section 6.3 of the Tri-Party Agreement (Ecology et al. 1992) states that a land disposal unit being closed in conjunction with an operable unit may be 'clean closed' under RCRA if it is shown not to contain hazardous waste or hazardous constituents, and "Any remaining CERCLA-only materials would be addressed as part of the past-practice process as designated for that operable unit." To minimize overlap between RCRA and CERCLA investigations for the operable unit that includes B Pond, tritium will be addressed with the 200-BP-11 operable unit.

Tritium is incorporated into water molecules, and is extremely mobile in groundwater. A recent tritium plume map is presented in Figure 5-4 (Connelly et al. 1992). This map does not include the most recent data from the B Pond monitoring wells. Recent groundwater data indicate the plume may extend further to the southwest than indicated in Figure 5-4. Tritium concentrations in groundwater in the 200 East Area and in the vicinity of B Pond were much higher in the 1960's and 1970's than they are currently. In 1964, concentrations greater than 3,000,000 picocuries per liter were observed in the southeastern corner of the 200 East Area, and concentrations beneath B Pond were probably between 300,000 and 3,000,000 picocuries per liter (Wilbur et al. 1983, Plate 4). At that time, there were no groundwater monitoring wells associated with B Pond, so historical data are limited. Tritium concentrations were about the same in 1968 and 1972, but the plume had migrated to the east and southeast.

The primary source of the tritium plume is associated with the PUREX Plant in the southeast corner of the 200 East Area; however, the shape of the plume through time indicates that the 216-B-3 Pond also contributed. By 1980, tritium concentrations beneath the B Pond area had decreased by about one order of magnitude [i.e., to between 30,000 and 300,000 picocuries per liter (Graham and Brown 1981, pp. 27-28)]. The map of the tritium plume for

1987 shows concentrations at about this same level (20,000 to 200,000 picocuries per liter) in the immediate vicinity of B Pond. The plume emanating from the 200 East Area is now distinct from the one emanating from B Pond, with lower concentrations in between (Figure 5-4).

The wells around B Pond that are completed in the finer grained sediments seem to contain higher concentrations of tritium than wells completed in the coarser grained sediments. These high levels of tritium are probably remnants of the higher levels of tritium seen in the aquifer in the past. Because the transmissivity of these sediments is low, the older, high-tritium water is not flushed out as quickly as it was from the coarser-grained sediments.

5.1.3.3 Quality Assurance and Quality Control. This section discusses the results of the quality control measures for groundwater samples collected for B Pond in November 1988 through August 1989. Quality assurance procedures for the collection and analysis of groundwater and geologic samples were presented in Section 5.1.2.

Duplicate, split, blank, and matrix spike samples are submitted regularly with groundwater samples to determine whether laboratory and field practices are yielding representative data. Quality control data are analyzed monthly and possible causes of any significant anomalies are assessed. Results of these assessments are summarized in quarterly progress reports. A summary of the quality control findings for B Pond is presented in the following paragraphs.

Duplicate--Duplicate samples were analyzed in the same laboratory to test precision. Results indicate that the data are within acceptable limits. Analytical results for duplicate samples are included in the chemical data in Appendix B.

Split--Some samples were split and analyzed by two different laboratories (United States Testing Company, Incorporated, and PNL) up until May 1990 to test accuracy. The results generally were consistent (i.e., within 2.8 standard deviations) but there were exceptions.

- There was a difference in potassium from well 699-42-40A in November 1988. Alkali metals such as potassium are not as accurately reflected by the inductively coupled plasma method as are other metals. Therefore, the differences between laboratories are seen as being of little significance.

- Results of radiological analyses (gross alpha and gross beta) were rather inconsistent in November 1988 and February 1989, presumably because the analytical methods of the two laboratories were different. Analytical methods of the laboratories have been reconciled.

- Slight differences in iron concentrations were noted between laboratories in samples from well 699-43-43 for March 1989. The U.S. Testing Company reported 31 and less than 30 parts per billion iron on duplicate samples; PNL reported 76 parts per billion iron. This difference may have been due to sample contamination.

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Blank--Blank samples taken between November 1988 and August 1989 were found to contain low concentrations of acetone (15 to 13 parts per billion, respectively). The presence of acetone was attributed to laboratory contamination. Some volatile organic constituents were found in the February 1989 blanks. These constituents were traced to a contaminated source of the water in the laboratory. This problem was corrected and did not affect the integrity of the groundwater samples. Blanks analyzed for metals in November 1988 showed small quantities of zinc, calcium, and iron; these may also represent laboratory contamination.

5.1.4 Groundwater Quality Assessment

If the indicator evaluation monitoring program demonstrates a significant change in one or more of the indicator parameters, groundwater quality assessment monitoring will be initiated 40 CFR 265.93(d). The purpose of assessment monitoring is to determine the concentration and distribution of any dangerous waste constituents migrating from the facility, and to estimate the rate and extent of contaminant migration. The program may involve additional well monitoring, new well installation, additional field and laboratory testing, or mathematical modeling. The groundwater quality assessment program is described in more detail in Luttrell et al. (1989, pp. 73-79).

5.2 AQUIFER IDENTIFICATION

This section describes the regional setting of the Hanford Site, including its physiography, climate, geology (i.e., stratigraphy, tectonic framework, seismicity), and hydrology. Hydrogeology of the B Pond site also is described.

5.2.1 Climate

Since 1945, climatological data have been collected at the Hanford Meteorological Station, located between the 200 East and West Areas. Temperature and precipitation data also are available from nearby locations for the period 1912 to 1943. A summary of these data through 1980 has been published by Stone et al. (1983). Data from the Hanford Meteorological Station are representative of the general climatic conditions for the region and describe the specific climate of the 200 Area Plateau.

The Cascade Range greatly influences the climate of the Hanford Site by causing a rain-shadow effect and by serving as a source of cold air drainage, both of which have a considerable effect on the wind conditions.

Prevailing wind directions on the 200 Area Plateau are from the northwest in all months of the year (Figure 5-5). Secondary maxima occur for southwesterly winds. Monthly average wind speeds are lowest during the winter months, averaging 6 to 7 miles an hour, and highest during the summer, averaging 9 to 10 miles an hour.

The DOE (1988b, p. 5.1-10-5.1-11) lists averages and extremes of temperatures measured at the Hanford Meteorology Station over a period from 1912 to 1980. The average daily maximum temperature ranges from 36.9 °F in January to 91.9 °F in July. Average daily minimum range from 22.1 °F in January to 61.1 °F in July. The record high temperature is 114 °F (July 27, 1939) and the record low is -27 °F (December 12, 1919).

The annual average relative humidity at the Hanford Meteorological Station is 54 percent. It is highest during the winter months, averaging about 75 percent, and lowest during the summer months, averaging about 35 percent.

Precipitation measurements have been made at the Hanford Meteorological Station since 1945. Average annual precipitation is 6.3 inches at the Hanford Meteorological Station. Most of the precipitation occurs during the winter, with nearly half of the annual amount occurring from November through February. Days with greater than 0.5 inch precipitation occur less than 1 percent of the year. Rainfall intensities of 0.5 inch per hour persisting for 1 hour are expected once every 10 years. Rainfall intensities of 1 inch per hour for 1 hour are expected only once every 500 years. The winter monthly average ranges from 0.3 inch in March to 5.3 inches in January. The record snowfall of 24.4 inches occurred in February 1916. Snowfall accounts for about 38 percent of all precipitation from December through February.

5.2.2 Physiography

The Hanford Site lies within the Central Plains and Yakima Folds physiographic regions within the Columbia Basin subprovince of the Columbia Intermontane Province (Figure 5-6). The Columbia Plateau is the portion of the Columbia Intermontane Province that is covered by the Columbia River Basalt Group (Thornbury 1965, pp. 442-470).

The physiography of the Hanford Site is dominated by the low-relief plains of the Central Plains region and basaltic ridges of the Yakima Folds region (Gable Mountain-Umtanum Ridge, Yakima Ridge, Saddle Mountains, and Rattlesnake Mountains-Rattlesnake Hills).

The surface topography of the Hanford Site is dominantly the work of two principal geomorphic processes:

- Pleistocene cataclysmic flooding
- Holocene eolian activity.

Cataclysmic flood deposits formed when ice dams in western Montana and northern Idaho were breached, allowing large volumes of water to spill across eastern and central Washington, forming the channeled scabland. The last major flood occurred about 13,000 years before present during the late Pleistocene Epoch. Landforms in the Pasco Basin, left behind as a result of late Pleistocene flooding, include anastomosing flood channels, giant current ripples, bergmounds, and giant flood bars. One of these flood bars forms a

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prominent terrace, referred to as the Cold Creek bar (Bretz et al. 1956, pp. 1010-1014). The Hanford Site 200 Areas are located along this flood bar.

Since the end of the Pleistocene, winds locally have reworked the flood sediments, depositing mostly dune sand in the Central Plains, and loess (windblown silt) around the margins of the Pasco Basin. Much of the dune sand has been stabilized by anchoring vegetation. However, stabilized dunes are reactivated easily in areas where vegetation has been disturbed by fire or man.

5.2.3 Regional Geology

This section describes the tectonic framework, structural geology, and stratigraphy of the Hanford Site.

5.2.3.1 Tectonic Framework. The Columbia Plateau is a part of the North American continental plate and lies in a back-arc setting east of the Cascade Range. It is bounded on the north by the Okanogan Highlands, on the east by the Northern Rocky Mountains and Idaho Batholith, and on the south by the High Lava Plains and the Snake River Plain.

5.2.3.2 Structural Geology. The Columbia Plateau can be divided into three informal structural subprovinces (Figure 5-7): Blue Mountains, Palouse, and Yakima Fold Belt. These structural subprovinces are delineated on the basis of their structural fabric, unlike the physiographic provinces that are defined on the basis of landforms. The Hanford Site is located near the junction of the Yakima Fold Belt and the Palouse subprovinces.

Yakima Fold Belt Subprovince--The principal characteristics of the Yakima Fold Belt are a series of segmented, narrow, asymmetric anticlines that have wavelengths between 3 and 19 miles and amplitudes commonly less than 0.6 mile. These anticlinal ridges are separated by broad synclines or basins that, in many cases, contain thick accumulations of Neogene- to Quaternary-age sediments. The Pasco Basin is one of the larger structural basins in the Columbia Plateau.

Thrust or high-angle reverse faults with fault planes that strike parallel or subparallel to the axial trends are found principally along the limbs of the anticlines (DOE 1988b, pp. 1.3-32-1.3-33). The amount of vertical stratigraphic offset associated with these faults varies but commonly exceeds hundreds of meters.

The deformation of the Yakima Folds occurred under north-south compression and was probably contemporaneous with the eruption of the basalt flows (DOE 1988b, pp. 1.3-32-1.3-33). The fold belt was growing during the eruption of the Columbia River Basalt Group and continued to grow through the Pliocene, into the Pleistocene and, perhaps, to the present.

Cold Creek Syncline--The DOE-RL waste management areas are located within the Cold Creek syncline. The Cold Creek syncline (Figure 5-8) lies between the Umtanum Ridge-Gable Mountain uplift and the Yakima Ridge uplift and is the

principal structural unit that contains the 200 Areas. The Cold Creek syncline is an asymmetric and relatively flat-bottomed structure. The 200 Areas lie on the northern flank, and the bedrock dips gently to the south (approximately 5 degrees).

Groundwater hydraulic heads in the Cold Creek syncline have been found to be affected by a geologic feature marked by the Yakima Barricade geophysical anomaly (Figure 5-8), which occurs on the west side of the Cold Creek syncline. This feature is marked by a west-to-east drop in hydraulic gradient in the confined aquifer. The data suggest that this feature is either a steeply dipping fold or a high-angle fault that formed during the late Miocene to early Pliocene. The absence of deformed Middle Ringold sediments indicates that movement ended by late Pliocene.

Umtanum Ridge-Gable Mountain Structural Trend--The Umtanum Ridge-Gable Mountain structural trend is a segmented anticlinal ridge extending for a length of 85 miles in an east-west direction and passing north of the 200 Areas (see Figure 5-8). This structure consists of five segments. From the west, Umtanum Ridge plunges eastward and joins the Gable Mountain-Gable Butte segment just east of the western boundary of the Hanford Site. The easternmost segment, the southeast anticline, trends southeast off the eastern boundary of the Gable Mountain-Gable Butte segment.

The Umtanum Ridge is an asymmetrical, north-vergent-to-locally-overturned anticline with a major thrust to high-angle reverse fault on the north side (Goff 1981, pp. 41-46; PSP&L 1982, pp. 2N-12-2N-14) that dies out eastward toward Gable Mountain. Gable Mountain and Gable Butte are two topographically isolated, anticlinal ridges that are composed of a series of northwest trending, doubly plunging, en echelon anticlines, synclines, and associated faults. Capable faulting has been identified on Gable Mountain (NRC 1982, pp. 2-27-2-29; PSP&L 1982, pp. 20-5).

Yakima Ridge--The Yakima Ridge uplift extends from west of Yakima, Washington, to the center of the Pasco Basin, where it forms the southern boundary of the Cold Creek syncline (see Figure 5-8). The easternmost surface expression of the Yakima Ridge uplift is represented by an anticline that plunges eastward into the Pasco Basin (Myers et al. 1979, Plate III). The eastern extension of Yakima Ridge is buried mostly beneath late Cenozoic sediments but is assumed to be similar to the exposed parts.

5.2.3.3 Stratigraphy. Geologic materials underlying the Hanford Site consist of numerous formally and informally recognized stratigraphic units (Figure 5-9). These units are discussed in three groups:

- Columbia River Basalt Group
- Ellensburg Formation
- Suprabasalt sediments.

Columbia River Basalt Group--The Columbia River Basalt Group (Figure 5-9) comprises an assemblage of tholeiitic, continental flood basalts of Miocene age. These flows cover an area of more than 63,000 square miles in Washington, Oregon, and Idaho, and have an estimated volume of about

170,000 cubic kilometers (DOE 1988b, pp. 1.2-3). Isotopic age determinations suggest flows of the Columbia River Basalt Group were erupted during a period from approximately 17 to 6 million years before present, with more than 98 percent by volume being erupted in a 2.5 million-year period (17 to 14.5 million years before present).

Columbia River basalt flows were erupted from north-northwest-trending fissures or linear vent systems in north-central and northeastern Oregon, eastern Washington, and western Idaho (Swanson et al. 1975, pp. 877-905). The Columbia River Basalt Group formally is divided into five formations, from oldest to youngest: Imnaha Basalt, Picture Gorge Basalt, Grande Ronde Basalt, Wanapum Basalt, and Saddle Mountains Basalt. Of these, only the Grande Ronde, Wanapum, and Saddle Mountains Basalts are known to be present in the Pasco Basin. The Saddle Mountains Basalt forms the uppermost basalt unit in the Pasco Basin except along some of the bounding ridges where Wanapum and Grande Ronde Basalts are exposed.

Ellensburg Formation--The Ellensburg Formation (see Figure 5-9) includes epiclastic and volcaniclastic sedimentary rocks that are interbedded with the Columbia River Basalt Group in the central and western part of the Columbia Plateau (Schmicke 1964, pp. 375-376; Swanson et al. 1979, p. G25). The age of the Ellensburg Formation is principally Miocene, although locally it may be equivalent to early Pliocene. The thickest accumulations of the Ellensburg Formation lie along the western margin of the Columbia Plateau where Cascade Range volcanic and volcaniclastic materials interfinger with the Columbia River Basalt Group. Within the Pasco Basin, individual interbeds have been named (i.e., Mabton, Selah, and Cold Creek) and these deposits are found primarily in the Wanapum and Saddle Mountains Basalts. The lateral extent and thickness of interbedded sediments generally increase upward in the section (Reidel and Fecht 1981, pp. 3-30). Two major facies, volcaniclastic and fluvial, are present as distinct or mixed deposits.

Suprabasalt Sediments--The suprabasalt sediments within and adjacent to the Hanford Site (see Figure 5-9) were derived from a variety of sedimentary environments, although the fluvial-lacustrine Ringold Formation and the glaciofluvial Hanford formation dominate the preserved stratigraphic record (DOE 1988b, pp. 1.2-63-1.2-72). The following discussion on the suprabasalt sediments is divided into three sections:

- Late Neogene deposits
- Plio-Pleistocene hiatus
- Quaternary deposits.

Late Neogene Deposits--Late Neogene (i.e., late Miocene to Pliocene) deposits, younger than the Columbia River Basalt Group, are represented by the Ringold Formation within the Pasco and Quincy basins of the central Columbia Plateau (Grolier and Bingham 1978, pp. 38-50; Newcomb et al. 1972, pp. 10-16; Rigby and Othberg 1979, pp. 15-17). The fluvial-lacustrine Ringold Formation was deposited in generally east-west-trending valleys by the ancestral Columbia River and its tributaries in response to the development of the Yakima Fold Belt. While exposures of the Ringold Formation are limited to the

White Bluffs within the central Pasco Basin, and to the Smyrna and Taunton Benches north of the Pasco Basin, extensive data on the Ringold Formation are available from boreholes.

The Ringold Formation is classified into three facies associations that represent variations in the paleogeography during Ringold time. Section Type I, composed of gravel and associated sand and silt, represents a migrating channel deposit of the major, throughgoing, ancestral Columbia and/or Snake River systems confined to the central portion of the Pasco Basin. Section Type II is composed mostly of overbank sand, silt, and clay deposited along the margins of the basin, beyond the influence of the main channel. Section Type III, a fanglomerate, occurs locally around the extreme margins of the basin and mostly is composed of angular basaltic debris derived from side-stream alluvium shed off bedrock ridges.

Two approaches have been used to subdivide Section Type I Ringold Formation deposits in the central Pasco Basin. One is based on lithofacies and the other on upward-fining cycles. Newcomb (1958, pp. 328-337) divided the Ringold into three lithofacies: a coarse-grained middle unit bounded above and below by fine-grained units. Tallman et al. (1979, pp. 18-19) describes a fourth lithofacies unit, the coarse-grained basal Ringold unit which underlies the fine-grained lower Ringold unit in the west-central Pasco Basin. The basal Ringold unit is further subdivided into coarse- and fine-grained subunits within the central Cold Creek syncline. A second approach is used by Puget Sound Power and Light Company (PSP&L 1981, pp. 2R-15-2R-19) south and east of Gable Mountain where they divided the subsurface Ringold Formation into four fluvial cycles (Units I through IV).

Plio-Pleistocene Hiatus--The late Pliocene to early Pleistocene generally is characterized as a period of regional incision on the Columbia Plateau. Within the Pasco Basin, this is reflected by the abrupt termination and eroded nature of the top of the Ringold Formation (Brown 1960, pp. 4-6; Bjornstad 1985, pp. 524; Newcomb et al. 1972, pp. 15-16). Following incision, a well-developed soil formed atop the eroded surface.

The exact timing and duration of incision is unknown; however, it probably occurred from 1 to 2 million years before present. Incision is bracketed between 0.9 million years before present and equal to, or younger than, 3.4 million years before present (Figure 5-9), the respective ages of the basalt from Haystack Butte (Bela 1982) and the youngest age reported from the Ringold Formation (DOE 1988b). Haystack Butte lava lies near river level within the Columbia River Gorge, approximately 90 miles southwest of the Pasco Basin, indicating that incision (as much as 492 feet in the Pasco Basin) had ceased by 0.9 million years before present.

Plio-Pleistocene Unit--A locally derived unit, consisting of either a sidestream alluvium or pedogenetic calcrete, occurs at the unconformity between the Ringold Formation and the Hanford formation (Bjornstad 1984, DOE 1988b). The sidestream alluvial facies are derived from Cold Creek and its tributaries and are characterized by relatively thick zones of unweathered

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basalt clasts, along with pedogenetically altered loess or colluvium. The pedogenic calcrete facies consists of one or more layers of carbonate-cemented Plio-Pleistocene detritus.

Early 'Palouse' Soil--Overlying the Plio-Pleistocene unit in the Cold Creek syncline area is a fine-grained sand-to-silt believed to be mainly of eolian origin, derived from an older reworked Plio-Pleistocene unit or the upper Ringold (DOE 1988b, Bjornstad 1990). The early Palouse soil is differentiated from the overlying slackwater flood deposits by a greater calcium carbonate content, a massive structure in core samples, and a high natural gamma response in geophysical logs.

Quaternary Deposits--Aggradation of sediments resumed during the Quaternary, following the period of late Pliocene to early Pleistocene incision. Quaternary deposits are associated with a variety of depositional processes, including those associated with volcanism, glaciation, lakes, rivers, wind, and mass wasting. In the central Columbia Plateau, the Quaternary record is dominated by proglacial cataclysmic flood deposits, with lesser amounts of fluvial and eolian deposits that lie below, between, and above flood deposits. Nonflooded areas on the Columbia Plateau often are mantled by alluvium, colluvium, or loess (i.e., wind-blown silt).

Cataclysmic Flood Deposits--Proglacial flood deposits blanket low-lying areas over most of the central Columbia Plateau. Most cataclysmic flood deposits that are preserved are late Pleistocene. The last major flood sequence is dated at about 13,000 years before present by the presence of Mount St. Helens 'S' tephra (Mullineaux et al. 1978, pp. 178) with these sediments. The largest and most frequent floods came from glacial Lake Missoula in northwestern Montana; however, smaller floods may have escaped down valley from glacial lakes Clark and Columbia along the northern margin of the Columbia Plateau (Waitt 1980, pp. 668-671). Another source of Pleistocene floodwaters came down the Snake River from glacial Lake Bonneville (Malde 1968). Lake Bonneville flood deposits have not been positively identified within the Pasco Basin. This may be because of erosion and/or burial by younger flood deposits from Lake Missoula. The last Lake Bonneville flood occurred about 14,000 to 15,000 years before present (Scott et al. 1982, pp. 582-586, O'Connor 1993).

Normally, two types of flood deposits are observed: a coarse-grained, main-channel facies and a finer-grained, slack-water facies. Within the Pasco Basin, these are referred to as the Pasco gravels and the Touchet beds, members of the Hanford formation (Myers et al. 1979, pp. III-66-III-68).

Deciphering the history of cataclysmic flooding in the Pasco Basin is complicated not only by floods from multiple sources, but also because paths of Lake Missoula floodwaters migrated and changed course with the advance and retreat of the Cordilleran ice sheet (Baker and Bunker 1985, pp. 32-34). Cataclysmic floods inundated the central Columbia Plateau several times during the Pleistocene. At least three major flooding episodes (early, middle, and late Pleistocene) are recognized in the Pasco Basin, although many more minor flood events probably occurred during each of these major episodes. The

evidence for the different ages of flooding include changes in magnetic polarity, truncated clastic dikes, and soil development atop flood sequences (Baker et al. 1987, pp. 413 to 437, Baker et al. 1991).

Clastic dikes commonly are associated with, but not restricted to, cataclysmic flood deposits on the Columbia Plateau. While there is general agreement that clastic dikes formed during cataclysmic flooding, a primary mechanism to satisfactorily explain the formation of all dikes has not been identified (Black 1979, WPPSS 1981, pp. 2.5-58-2.5-64). Among the more probable explanations are fracturing initiated by hydrostatic loading and hydraulic injection associated with receding floodwaters. Seismicity also may have a role in their formation, although there is no available evidence at the present to establish a connection.

Other Quaternary Deposits--Alluvium is present not only as a surficial deposit along major river and stream courses (Figure 5-10), but also in the subsurface, where it is found underlying and interbedded with proglacial flood deposits. Two types of alluvium are recognized in the Pasco Basin: quartzitic-mainstream and basalt-rich-sidestream alluvium. Colluvium (talus and slopewash) is a common Holocene deposit in moderate-to-high relief areas and, like dune sand that is found locally in the arid central plateau, commonly is not preserved in the stratigraphic record.

Varying thicknesses of loess or sand mantle much of the Columbia Plateau. Active and stabilized sand dunes are widespread over the Pasco Basin (Figure 5-10).

Landslide deposits in the Pasco Basin are of variable age and genesis. Most are associated with north limbs of the Yakima folds, such as on the north side of Rattlesnake Mountain, or along steep river embankments such as the White Bluffs in the Pasco Basin (see Figure 5-10).

5.2.4 Regional Hydrology

This section presents a description of surface and groundwater hydrology of the Pasco Basin and the Hanford Site.

5.2.4.1 Surface Water. The Hanford Site occupies approximately one-third of the land area within the Pasco Basin. Primary surface water features associated with the Hanford Site are the Columbia and Yakima Rivers and their major tributaries, the Snake and Walla Walla Rivers. With the exception of the Columbia River, there are no perennial streams within the Hanford Site. Ephemeral streams and major surface ponds are depicted in Figure 5-11. Waste water cribs and ditches also are present on the Site, associated with nuclear fuel processing and waste disposal activities. A network of dams and multipurpose water resource projects are located along the course of the Columbia River (Figure 5-12).

The Columbia River is considered to be free flowing along approximately two-thirds of the Hanford Site. This area of the river, referred to as the Hanford reach, extends from Priest Rapids Dam to the headwaters of Lake

Wallula (the reservoir behind McNary Dam). Flow inventories are discussed in DOE (1988b, pp. 3.1-9-3.1-15). Flow along this reach is controlled by the Priest Rapids Dam. Several drains and intakes also are present along this reach, including irrigation outfalls from the Columbia Basin Irrigation Project and intakes for Hanford Site water use.

Cold Creek and its tributary, Dry Creek, are ephemeral streams within the Yakima River drainage system. Both streams drain areas along the western part of the Hanford Site and cross the southwestern part toward the Yakima River. Surface flow, which may occur during spring run-off or after heavier-than-normal precipitation, infiltrates into the surface sediments. Rattlesnake Springs, located on the western part of the Hanford Site, forms a small surface stream that flows for approximately 1.8 miles before disappearing into the ground. West Lake, an expression of the water table, is a small, shallow lake in a natural topographic low.

Approximately one-third of the Hanford Site is drained by the Yakima River system. The average annual discharge of the Yakima River to the Columbia River (over a recorded 57-year period) is approximately 3,600 cubic feet per second (DOE 1988b, pp. 3.1-14). Extremes include a maximum discharge of 67,000 cubic feet per second on December 23, 1933 and a minimum discharge of 105 cubic feet per second on September 11, 1906 (USGS 1985, pp. 322).

Flow in the Columbia River at the Priest Rapids Dam (i.e., above the Hanford Site) averages 120,000 cubic feet per second. Maximum flow for the 66-year period of record was 690,000 cubic feet per second on June 12, 1948; minimum flow was 4,120 cubic feet per second on February 10, 1932 (DOE 1988b, pp. 3.1-13). Normal river elevations range from 394 feet above mean sea level where the Columbia River enters the Hanford Site to 341 feet where the river leaves the Hanford Site.

Large Columbia River floods have occurred in the past, but the likelihood of large-scale flooding has been reduced by the construction of several dams upstream of the Hanford Site. The probable maximum flood calculated for the Columbia River below Priest Rapids Dam is 1,440,000 cubic feet per second (Gephart et al. 1979, pp. III-49). The probable maximum flood would inundate portions of the 100 Areas, but would not reach the Separations Area or B Pond (Gephart et al. 1979, pp. III-51).

Routine water-quality monitoring of the Columbia River is conducted by the DOE-RL for both radiological and nonradiological parameters. Reports on the monitoring have been published annually since 1983 by PNL (e.g., Jaquish and Mitchell 1988). Ecology has issued a Class A (excellent) quality designation for the Columbia River water along the reach from Grand Coulee Dam, through the Pasco Basin, to McNary Dam. This designation requires that all industrial uses of this water be compatible with other uses, including drinking, wildlife habitat, and recreation. In general, Columbia River water is characterized by a very low suspended load, a low nutrient content, and an absence of microbial contaminants (DOE 1988b, pp. 3.4-13).

5.2.4.2 Groundwater. The Hanford Site is underlain by an unconfined aquifer system, consisting of glaciofluvial, fluvial, and lacustrine sediments, and a

system of deeper confined to semiconfined aquifers in the basalt flow tops, flow bottoms, and sedimentary interbeds. The multiaquifer system has been conceptualized as consisting of four primary geohydrologic units:

- Suprabasalt Hanford and Ringold Formation sediments
- Saddle Mountains Basalt
- Wanapum Basalt
- Grande Ronde Basalt.

The regional limits of the unconfined aquifer system are the boundaries of the Pasco Basin. The aquifer is made up of the glaciofluvial sands and gravels of the Hanford formation and the fluvial-lacustrine sediments of the Ringold Formation. The aquifer is relatively continuous throughout the Pasco Basin. It ranges in thickness from zero, along the flanks of the bordering structures and at basalt highs within the basin, to greater than 230 feet in some central basin areas. The base of the unconfined aquifer is generally the basalt surface, but semiconfining silts and clays are present above the basalt in some areas.

Recharge to the unconfined aquifer system is derived from natural and artificial sources. Sources of natural recharge are precipitation from the higher bordering elevations and water infiltration from ephemeral streams and influent reaches of the Columbia and Yakima Rivers. As indicated in Section 5.2.1, the average annual precipitation in the vicinity of the 200 Areas is approximately 6.3 inches. The amount of precipitation falling at the higher elevation of Rattlesnake Mountain is approximately 15.0 inches per year. Mean annual run-off, however, is less than 0.5 inch (Leonhart 1979, pp. II-55). The actual amount of recharge to the unconfined sediments from precipitation is minimal because of the very high evapotranspiration rates in the basin [five to nine times that of precipitation (Leonhart 1979, pp. II-55)]. Gee (1987, pp. 5.3-5.4) indicates that minimum recharge (greater 0.04 inch per year) occurs where soils are fine and vegetation consists of deep-rooted plants, and a possible maximum recharge (3.9 inches per year) may occur where soils are coarse in texture and there is no vegetation. Surface recharge to the sediments in the 200 Areas is suspected to range from near zero to 2.4 inches per year (Last et al. 1989, pp. 6.2).

Artificial recharge to the unconfined sediments in the Pasco Basin occurs through agricultural irrigation and waste water disposal practices. Most of the agricultural irrigation originates on the eastern and northern sides of the Columbia River (in Franklin County) and in Cold Creek Valley to the west of the Hanford Site (in Benton County). The average estimated water use for these areas before 1979 was 7.4×10^{10} gallons per year for Benton County and 1.9×10^{11} gallons per year for Franklin County (Leonhart 1979, pp. II-59-II-60).

Waste water disposal to ponds, trenches, and other facilities in the 200 Areas has resulted in the formation of large groundwater mounds beneath the major disposal areas at the 216-U-10 Pond (U Pond), the Gable Mountain Pond, and B Pond (see Figure 5-11). Since the start of disposal practices, the water table under U Pond rose over 85 feet. The mound under B Pond rose by approximately 35 feet. The smaller mound beneath B Pond reflects the

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higher transmissivity of the aquifer in that area. Waste water disposal to U Pond was discontinued in 1984, but the associated groundwater mound persists due to the lower transmissivity of the saturated sediments and local effluent discharge to trenches and cribs in the area.

Principal groundwater flow direction within the unconfined aquifer system is west to east across the Pasco Basin to the Columbia River. Local variations in this general direction reflect the presence of groundwater mounds associated with liquid-waste disposal facilities or where bedrock ridges (e.g., Gable Mountain) protrude above the water table (Figure 5-3). The most pronounced mounds are located beneath the 200 Areas. Groundwater in the unconfined aquifer flux flows northward between Gable Mountain and Gable Butte, and the hydraulic gradient beneath the 200 East Area has been reduced to near zero due to the influence of the westward-flowing component of groundwater flow from B Pond mound. Figure 5-13 illustrates the water table beneath the Hanford Site.

Because of the heterogeneous nature of the sediments, the hydraulic properties of the unconfined aquifer system within the Pasco Basin are variable. Hydraulic conductivities for the Hanford formation (2,000 to 10,000 feet per day) are much greater than those of the middle member of the Ringold Formation (9 to 230 feet per day) (Graham et al. 1981, pp. 3-12). The main body of the suprabasalt aquifer occurs within the middle member of the Ringold Formation.

Water from the unconfined aquifer in the Pasco Basin generally has low specific conductance (125 to 1,250 micromhos per centimeter). The water is principally a calcium-bicarbonate type, with local variations (Graham et al. 1981, pp. 2-4). The estimated background concentrations of chemical constituents within the groundwater of the unconfined aquifer at the Hanford Site is given in Table 5-4.

Confined aquifers are present in the sedimentary interbeds and/or interflow zones between dense basalt flows of the Columbia River basalts. The main water-bearing portions of the interflow zones are networks of interconnecting vesicles and fractures of the flow tops and flow bottoms. Hydraulic conductivity of flow tops in the Saddle Mountains Basalt has a geometric mean between 10 feet per day and 100 feet per day (DOE 1988b, pp. 3.9-93). Sedimentary interbeds in the Saddle Mountains Basalt have hydraulic conductivities between 1 foot per day and 10 feet per day (DOE 1988b, pp. 3.9-99). Hydraulic conductivity of basalt flow interiors is approximately five orders of magnitude lower than flow tops.

Recharge to the Saddle Mountains Basalt apparently occurs along the southwestern and western boundaries of the Pasco Basin. Some recharge also may occur in the eastern Saddle Mountains along the northern boundary of the Pasco Basin (DOE 1988b, pp. 3.7-14). Groundwater also flows from the suprabasalt aquifer into the Rattlesnake Ridge interbed in the western half of the Hanford Site (DOE 1988b, pp. 3.9-116).

The configuration of the potentiometric surface and hydrochemistry indicate that the Saddle Mountains Basalt aquifers discharge into the

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Columbia River (DOE 1988b, pp. 3.7-14 and 3.7-15). These discharges occur between the Columbia River's confluence with the Yakima and Snake Rivers and the eastern portion of the Hanford Site. The Saddle Mountains Basalt aquifers also may discharge into the lower Snake and Walla Walla Rivers in the Pasco Basin. In the eastern half of the Hanford Site, the Rattlesnake Ridge aquifer has a higher potential than the suprabasalt sediments (DOE 1988b, pp. 3.9-116), and here groundwater has the potential to flow upward through the confining units into the Ringold Formation.

Erosional 'windows' through the dense basalt flow interiors provide the potential for direct interconnections between the unconfined and uppermost confined aquifers. Graham et al. (1984, pp. 70-87) indicate that some contamination was present in the uppermost confined aquifer (Rattlesnake Ridge), south and east of the Gable Mountain Pond. Graham et al. (1984, pp. 67-68) evaluated the hydrologic relationships between the Rattlesnake Ridge aquifer and the unconfined aquifer in this area and delineated a potential area of intercommunication beneath the northeastern portion of the 200 East Area.

5.2.5 Hydrogeology of the B Pond Area

This section summarizes results of hydrogeologic characterization at the B pond site to date and describes site geology and hydrology.

5.2.5.1 Geology of the B Pond Site. The generalized geology of the area is shown in two cross sections (Figures 5-14 and 5-15). The locations of the boreholes used in creating the fence diagram are shown in Figure 5-2.

The depth to the top of the basalt is approximately 200 feet based on boreholes 699-42-42, 699-43-42, and 699-42-40C. The uppermost confined aquifers in the basalt and interflow aquifer system are the Elephant Mountain interflow zone and the Rattlesnake Ridge interbed. The sediment thickness above the basalt varies by no more than 30 feet between the three boreholes. Above the basalt, the Ringold Formation, the Hanford formation, and eolian sediments are present.

The Ringold Formation directly overlies the basalt and is approximately 100 feet thick in the three boreholes that penetrate the entire suprabasalt section. The water table occurs near the Hanford-Ringold contact, and the Ringold Formation makes up the bulk of the uppermost aquifer (Figures 5-14 and 5-15). The top of the Ringold Formation in the central part of the B Pond area is marked by a calcic paleosol composed of yellow sandy-silty material. This feature occurs as a lenticular body about 100 feet below the land surface, pinching out to the west and south of the B Pond area.

The Ringold Formation throughout the B Pond area is primarily a sand and pebble conglomerate, and a pebble conglomerate (Lindsey et al. 1992). Several beds of clay-muds and silts are intercalated with these conglomerates in the southern part of the B Pond area. These beds pinch out to the north and west and form a series of local, low-permeability beds.

The Hanford formation mainly comprises sand and pebble conglomerates and pebble conglomerates. Boreholes 699-43-42, 699-41-40, and 699-43-43, however, encountered cobbles and boulders immediately above the Ringold Formation.

Throughout the central and northern parts of the area, Holocene eolian sands overlie the Hanford formation.

5.2.5.2 Hydrology of the B Pond Site. This section describes properties of the principal hydrologic units in the subsurface beneath B Pond. These units are the unsaturated zone, the Hanford formation, coarse- and fine-grained facies of the Ringold Formation, and the uppermost aquifers within the basalt and interbeds. Hydrogeologic investigations to date indicate that the 'uppermost aquifer' in the vicinity of B Pond may be defined as the suprabasalt aquifer system.

The unsaturated zone beneath B Pond ranges in thickness from 124 feet at wells 699-42-40A and 699-42-40B to between 150 and 160 feet at wells 699-42-42B, 699-43-42J, 699-43-43, 699-44-42, and 699-45-42. The zone is composed primarily of Hanford formation sediments (Figures 5-14 and 5-15), mostly sands and gravels, with minor amounts of silt and clay. The unsaturated zone includes the top few feet of the fine-grained Ringold Lower Mud unit near wells 699-40-39 and 699-41-40, where the water table is below the Hanford-Ringold contact.

Moisture content analyses were performed on sediment samples taken while drilling the RCRA wells. Samples were not collected at regular intervals in all wells; water was added occasionally during drilling, which precluded sampling for natural moisture content. Most values ranged from 3 to 7 percent. Zones of significantly higher moisture content were observed in wells 699-44-42 (at 80-90 feet of depth), 699-43-43 (35-40 and 85 feet), 699-42-42B (35, 50-60, 70-80, and 90 feet), 699-43-45 (14, 43-55 feet), and 699-41-40 (126-149 feet, which is below the potentiometric surface). These zones of relatively high moisture content appear to be associated with sand lenses, but because sampling was discontinuous, it is not possible to trace the extent of the high moisture zones.

A thin layer of perched water was encountered while drilling well 699-43-45 in muddy sand at approximately 44 feet below land surface. This perched water zone does not appear to be extensive; no perched water was noted in the other wells except in well 699-40-36 which was drilled for the W-049H TEDF Facility. No perched water was observed beneath 3C Pond, although the fine-grained layer at the top of the saturated zone is thickest in this region, and percolation rates from 3C Pond are higher than from the other ponds.

The uppermost aquifer in the vicinity of B Pond comprises sediments of the Hanford and Ringold formations. It ranges in thickness from approximately 50 feet in the northwestern part of the site to approximately 100 feet in the southeast. This aquifer characteristically has been referred to as unconfined. However, hydrogeologic data from recently installed monitoring wells indicate that part of the aquifer within the suprabasalt sediments is confined or semiconfined. The aquifer is unconfined to the west and north of

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216-B-3 Pond and is progressively more confined in the southeast part of the site, beneath 3C Pond. There is no marked difference in hydraulic head measured in the confined and unconfined portions of the aquifer.

The uppermost aquifer system beneath B Pond includes a portion of the Hanford formation and the Ringold Formation. As discussed in Section 5.2.5.1, the Ringold Formation includes a coarse-grained facies (sand and gravel) and a discontinuous fine-grained facies (silt and clay). The fine-grained layer locally acts as a confining unit. Aquifer tests and laboratory tests have been conducted for each of these units to estimate hydraulic properties. Results of some of these tests are discussed in the following paragraphs. Slug injection/withdrawal tests were conducted during the summer of 1989. Analysis and review of the results have not been completed at the time of this writing, but will be included in a site characterization report.

Hanford formation--Constant-discharge tests in two of the wells (699-43-43 and 699-44-42) were conducted over an interval including portions of both the Hanford and Ringold Formations in the upper part of the unconfined aquifer. Hydraulic properties determined from these tests are probably more representative of the Hanford formation than the Ringold Formation because the Hanford formation generally is more permeable than the Ringold Formation, therefore yielding more water per unit thickness (i.e., higher transmissivity). In addition, the portion of the screen length extending over the Hanford formation was greater than that over the Ringold Formation for each of the tests.

Estimates of hydraulic conductivity of the Hanford formation were determined from results of tests conducted in these two wells. Hydraulic conductivity values were determined to be 2,100 feet per day and 4,200 feet per day from wells 699-43-43 and 699-44-42, respectively. Calculation of these values assumes that water was derived only from the screened interval.

Graham et al. (1981, pp. 3-12) estimated storativity of the Hanford formation in the Separations Area as 0.07.

Coarse-grained Ringold Unit--A multiple-well constant-discharge test was conducted at well 699-42-42B, and well 699-43-42J was used as an observation well. The tested interval in the pumping well represented the Ringold Formation in the lower part of the uppermost aquifer. The aquifer at this well is considered to be semiconfined or confined. The results of the test yielded a value of hydraulic conductivity of 6 feet per day. Storativity and the ratio of horizontal to vertical hydraulic conductivity could not be determined from this test because of the lack of response in the observation well.

Another multiple-well constant-discharge aquifer test was conducted at well 699-42-40C in 1982 (Graham et al. 1984, pp. C.10 and C.11). The observation wells used during the test were 699-42-40A and 699-42-40B. This test was conducted in the lowermost sediments of the Ringold Formation.

Transmissivities determined from results of this test yielded values of 310 square feet per day (well 699-42-40A) and 360 square feet per day (well 699-42-40B). Estimates of storativity are 1.7×10^{-2} (observation well 699-42-40A) and 9.3×10^{-3} (observation well 699-42-40B).

Fine-grained Ringold Unit--Falling-head and constant-head permeameter tests were conducted on sediment samples collected from well 699-42-42B to determine vertical hydraulic conductivity. These sediment samples represent fine-grained materials of the Ringold Formation in the upper portion of the aquifer, each representing a different interval from the sediment profile. Results of the falling-head test yielded a vertical saturated hydraulic conductivity of approximately 0.07 foot per day. Results of the constant-head test yielded a vertical saturated hydraulic conductivity of approximately 0.002 foot per day.

Basalt and Interflow Aquifer System--The two uppermost confined aquifers in the basalt beneath B Pond are the interbed-interflow zone between Elephant Mountain flows and the Rattlesnake Ridge aquifer. The Elephant Mountain aquifer consists of interconnected vesicles, basalt rubble, and in some places sands and clays. The Rattlesnake Ridge aquifer consists of the flow bottom of the Elephant Mountain Member, the flow top of the Pomona basalt, and the Rattlesnake Ridge Interbed (Graham et al. 1984, pp. 10). The Rattlesnake Ridge Interbed is composed of (in descending order) tuffite, volcanic ash, overbank flood deposits, and a clay matrix-supported basaltic conglomerate. The interbed is 50 to 65 feet thick in the vicinity of B Pond.

The confining unit between the Rattlesnake Ridge aquifer and the unconfined aquifer is composed of the dense interiors of the Elephant Mountain Member. At well 699-42-40C, the thickness of the Elephant Mountain Member is about 100 feet (Graham et al. 1984, p. 49). The thickness of the Elephant Mountain Member to the southeast of B Pond is unknown because of a lack of wells penetrating the basalts.

Results of aquifer tests in the basalt aquifer system conducted near B Pond are summarized in the following paragraphs.

Elephant Mountain Member--A constant-discharge test at well 699-42-40C in 1982 (Graham et al. 1984, pp. C.12) was conducted over an interval open to the Elephant Mountain Interflow Zone. Results of the test yielded a transmissivity of approximately 8 square feet per day.

Rattlesnake Ridge Aquifer--The two constant-discharge tests, two recovery tests, and two slug tests performed in well 699-42-40C in 1982 (Graham et al. 1984, pp. C.13-C.16 and D.7-D.8) were conducted in the sediments of the Rattlesnake Ridge confined aquifer. Results of the constant-discharge tests yielded transmissivity values of 300 square feet per day and 310 square feet per day, and the recovery tests yielded transmissivity values of 170 square feet per day and 260 square feet per day.

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The slug test included both injection and withdrawal tests or "phases." The slug injection test results yielded a transmissivity value of 910 square feet per day, and the slug withdrawal test results yielded a transmissivity value of 130 square feet per day.

Hydraulic conductivities of the Columbia River basalts flow interiors are extremely low, ranging from 3×10^{-6} to 3×10^{-8} feet per day (DOE 1988b, pp. 3.9-101).

5.2.5.3 Direction and Rate of Groundwater Movement. Water table maps of the Separations Area indicate that groundwater flows radially outward from a groundwater high beneath B Pond. Flow is interrupted by basalt that extends above the water table to the north and northeast (see Figure 5-13). Groundwater flow in the 200 East Area is not well defined. The groundwater gradient in this area is very small; differences in water levels between wells are often within the margin of measurement uncertainty. Groundwater converges in the 200 East Area from the west and east, then diverges with a component flowing northward between Gable Mountain and Gable Butte, and another component flowing southeast toward the Columbia River.

Direction of groundwater flow over time also can be inferred by examining the patterns of groundwater chemistry. A tritium plume associated with the Separations Area is illustrated in Figure 5-4. Concentration gradients around B Pond show a pattern similar to the groundwater gradient.

There is also a downward vertical hydraulic gradient within the uppermost aquifer system beneath B Pond. This is evident from a comparison of potentiometric levels between wells 699-42-42B and 699-43-42J. Well 699-43-42J is completed in the upper portion of the uppermost aquifer (open interval of 156.9 to 177.4 feet below land surface), and well 699-42-42B is completed in the lower portion of the uppermost aquifer (open interval of 192.9 to 203.2 feet below land surface). The potentiometric levels measured in these wells on May 24, 1989, were 419.64 and 417.58 feet above mean sea level respectively. This downward gradient of approximately 0.1 is caused by the mounding and recharge resulting from discharges to B Pond.

The B Pond also has created a downward gradient from the suprabasalt aquifer to the underlying Rattlesnake Ridge interbed in the immediate vicinity of the mound (Figure 5-16; Kasza and Schatz 1989, pp. 4). This is a reversal of the natural gradient between these hydrologic units.

Groundwater chemistry on the Rattlesnake Ridge aquifer has been studied to assess whether there is interconnection with unconfined groundwaters (Graham et al. 1984). Tritium is present in the Rattlesnake Ridge aquifer, with the highest concentrations associated with the 200 East Area. Well 699-42-40C, adjacent to B Pond, showed low levels of tritium in the Rattlesnake Ridge aquifer; these levels may have been induced during construction of the well. Tritium concentrations decreased from 39 to 12.2 picocuries per liter during an aquifer test of this well, indicating that the contamination was very local. Other Rattlesnake Ridge wells contained tritium less than or equal to 1.4 picocuries per liter. Apparently, groundwater flow is minimal from the unconfined to the confined aquifer beneath B Pond. Any

contamination in the Rattlesnake Ridge aquifer eventually will discharge back to the unconfined aquifer (Graham et al. 1984. pp. 89).

The movement of the tritium plume provides a means of tracing groundwater flow through time and for estimating its velocity over a larger area from B Pond to the southeast (Wilbur et al. 1983, Plates 3 through 6). The configuration of the plume in 1964 indicates that groundwater flowed at an average rate of 1.5 kilometers per year (14 feet per day) since the PUREX Plant began operations. Data from 1972 indicate a tritium migration of 18.3 kilometers in 16 years, or an average of 1.1 kilometers per year (10 feet per day). These estimates could represent groundwater flow in the more permeable, upper portion of the unconfined aquifer. Few wells are completed in the less permeable strata, so no estimates of flow rate have been made for these layers.

As discussed previously, the vertical hydraulic gradient is estimated to be two orders of magnitude greater than the horizontal gradient, so the downward flow of groundwater beneath B Pond is significant. This water may enter underlying aquifers in the basalt and interflow aquifer system (Chapter 6.0, Section 6.3.3). There are insufficient data to estimate vertical groundwater velocity in the suprabasalt aquifer.

An estimate of the average linear groundwater velocity can be calculated based on Darcy's Law. The calculations assume horizontal flow and a homogeneous aquifer. Estimates for the Hanford formation range from 50 to 240 feet per day. The approximate velocity in the Ringold Formation ranges from 0.03 to 0.1 foot per day. These estimates apply to the area of the groundwater mound beneath B Pond.

1

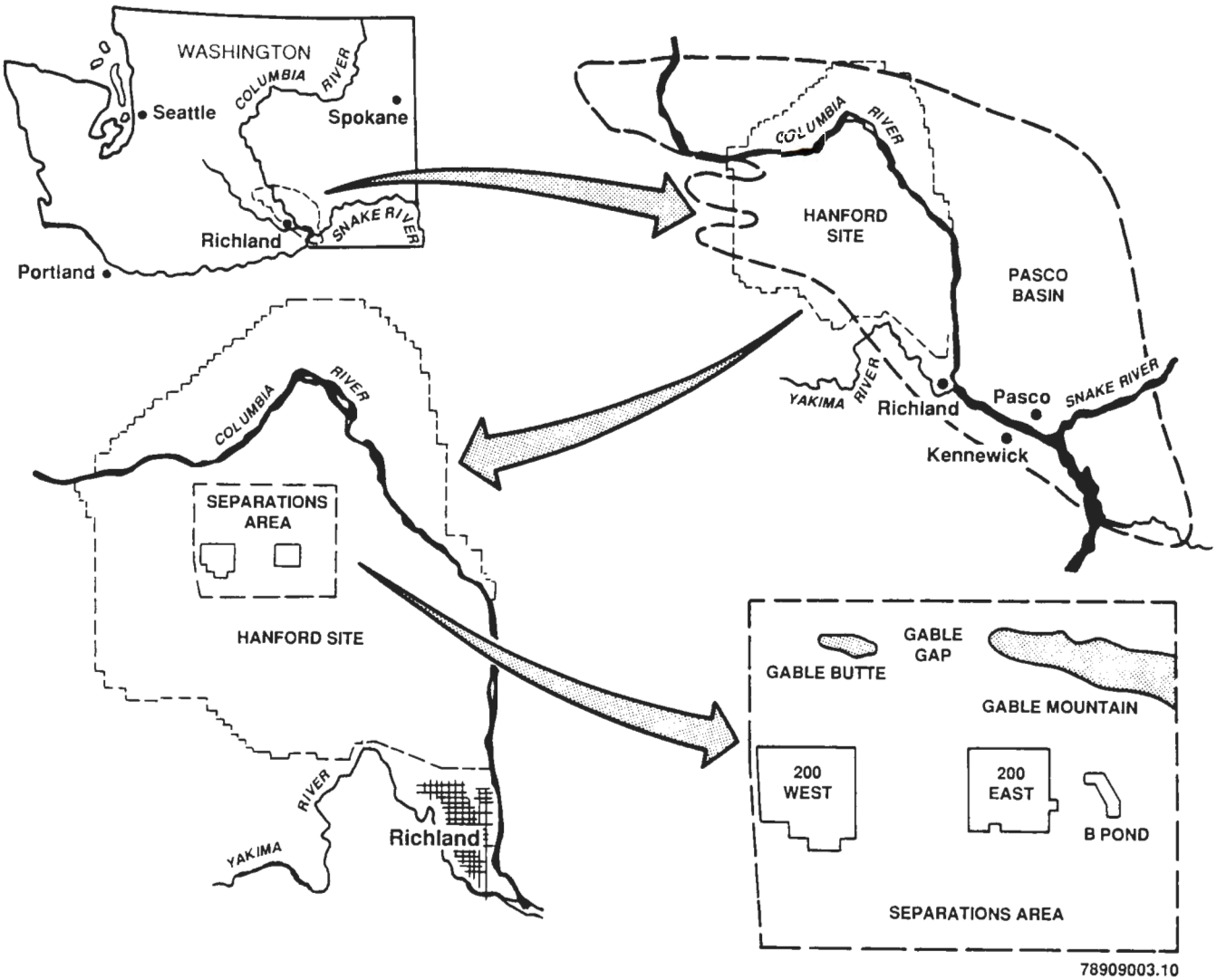


Figure 5-1. Locations of the Hanford Site and the Separations Area.

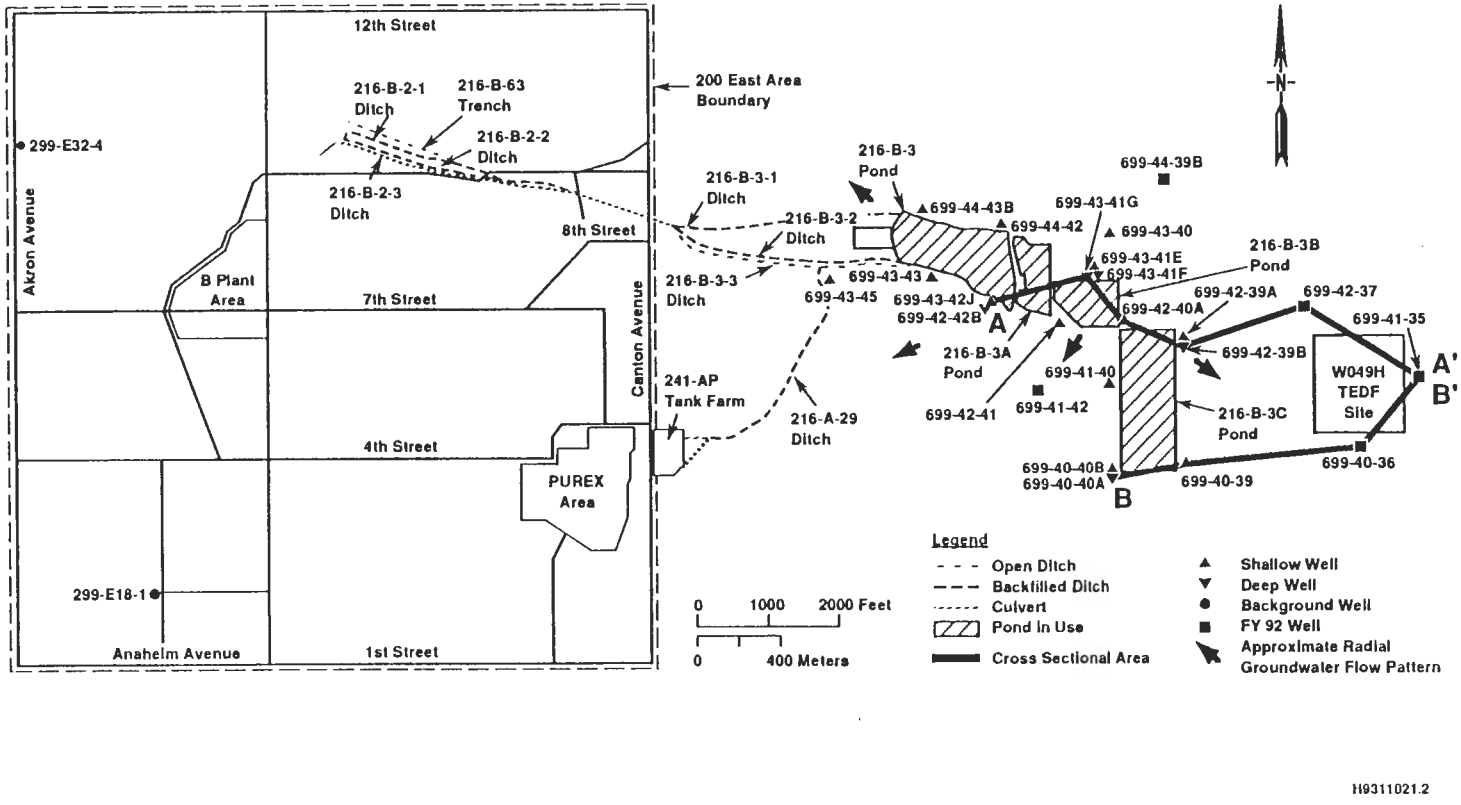
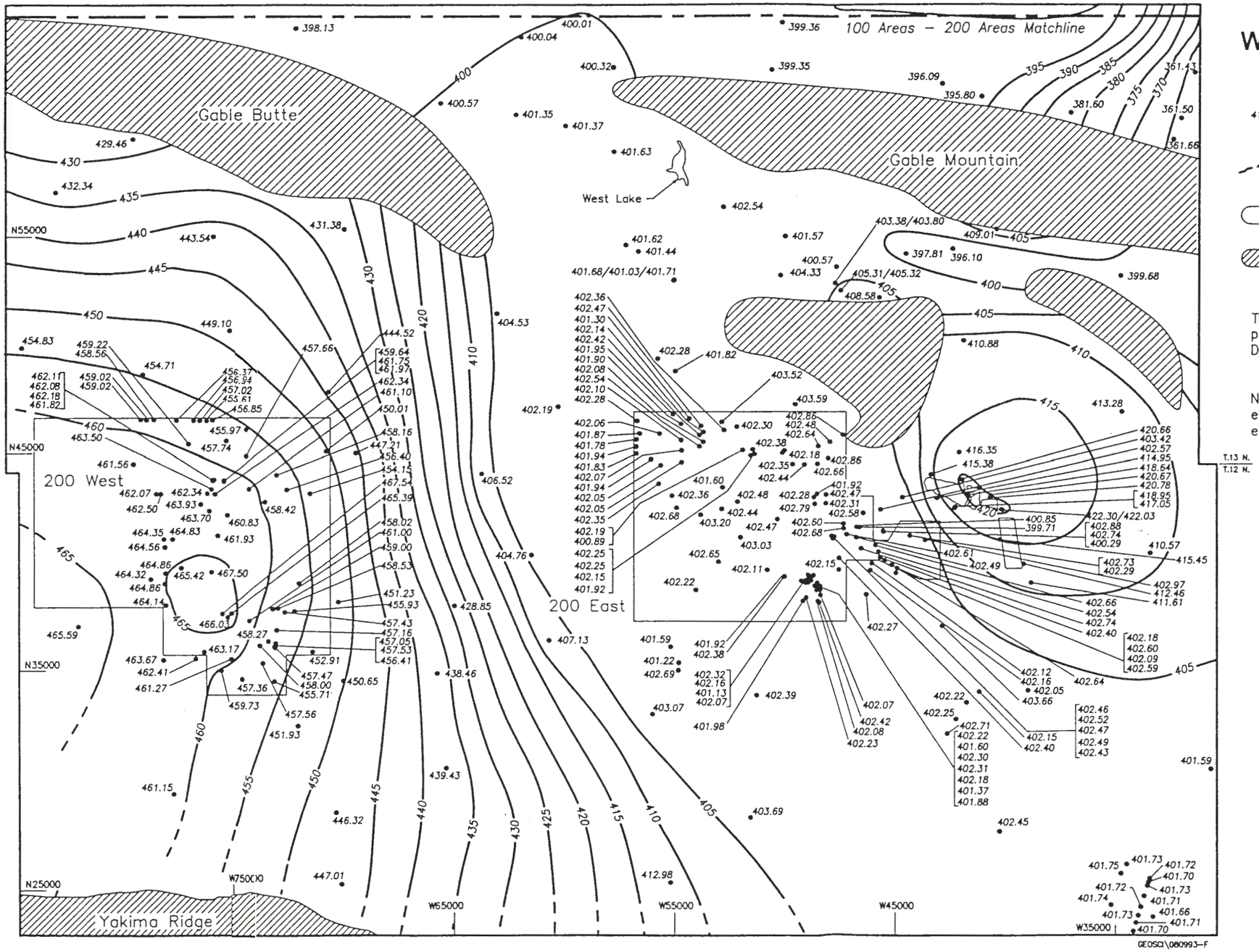


Figure 5-2. Monitoring Well Locations, 216-B-3 Pond.



200 Areas Water Table Elevation December 1992

411.49 — Water table elevation (feet above mean sea level)

400 — Groundwater table elevation contour interval = 5ft

Ponds

Areas where the basalt surface is above the water table (Connelly, et al. 1992A and 1992B)

The 200 Areas water table elevation map has been prepared by the Geosciences Function, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 — 1 Mile

0 — 1 Kilometer

-N-

Figure 5-3. Separations Area Water Table Map.

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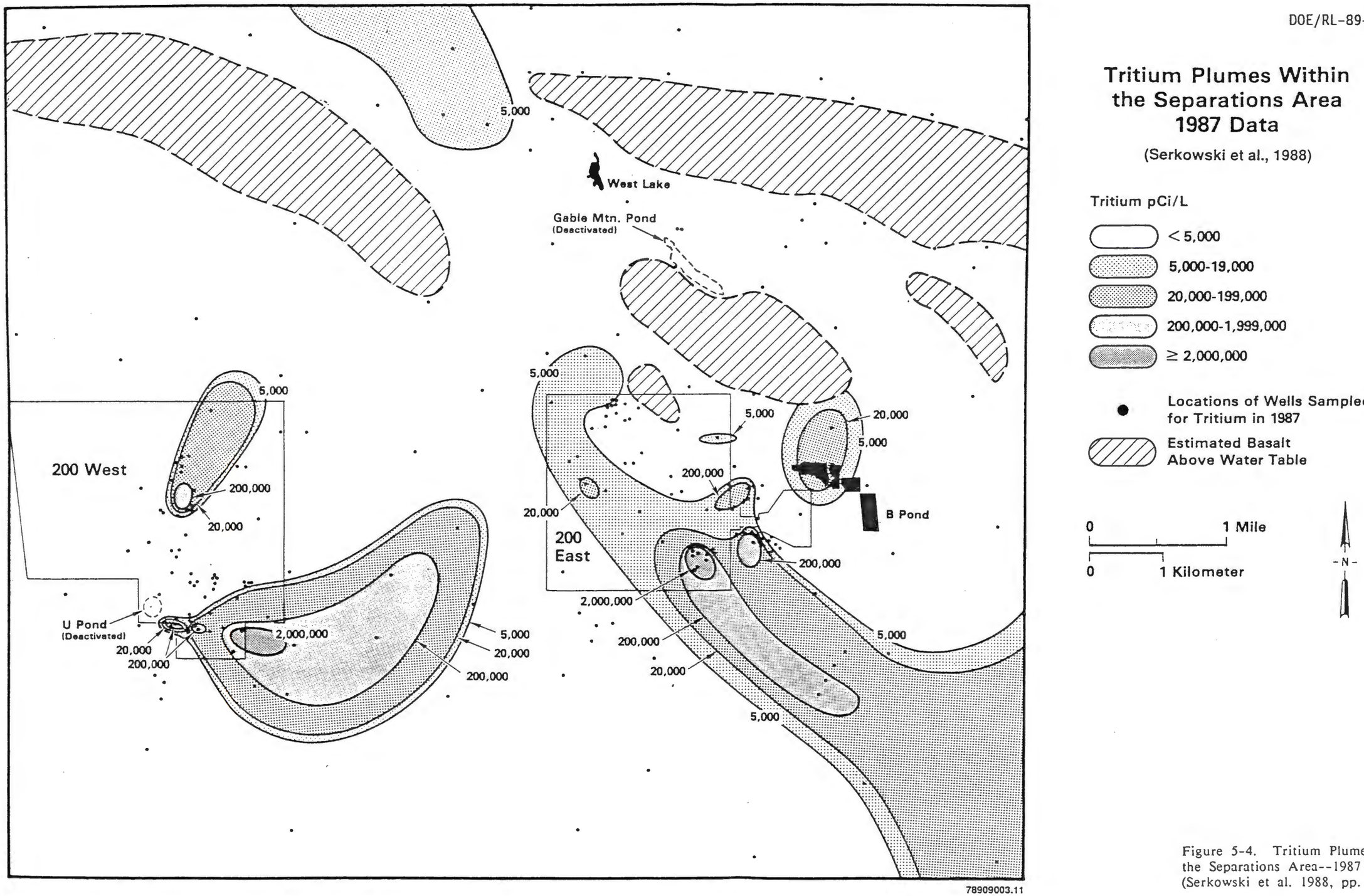

Figure 5-4. Tritium Plumes Within the Separations Area--1987 Data (Serkowski et al. 1988, pp. 6-5/6).

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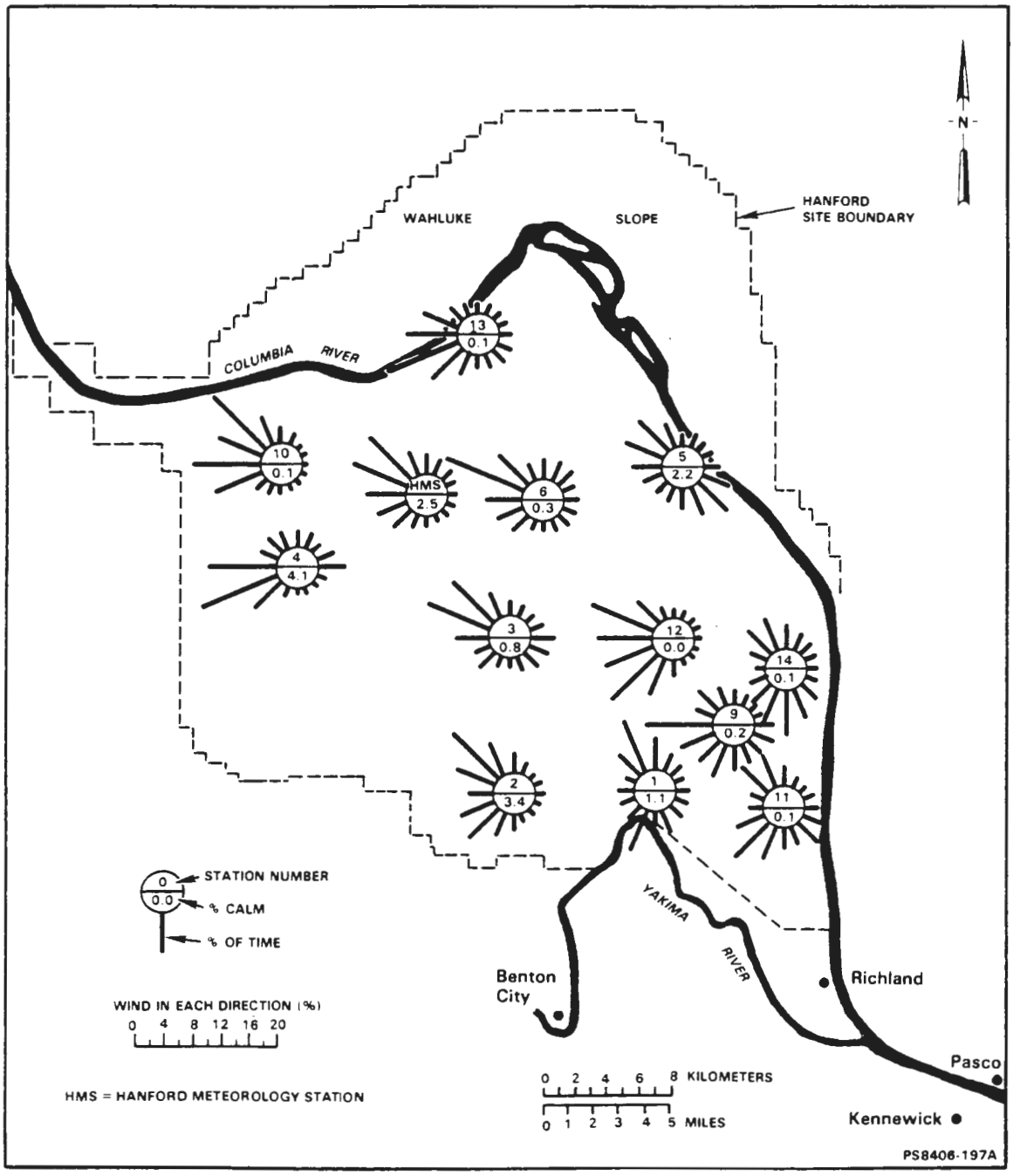

Figure 5-5. Wind Rose Patterns for the Hanford Site (after DOE 1988b).

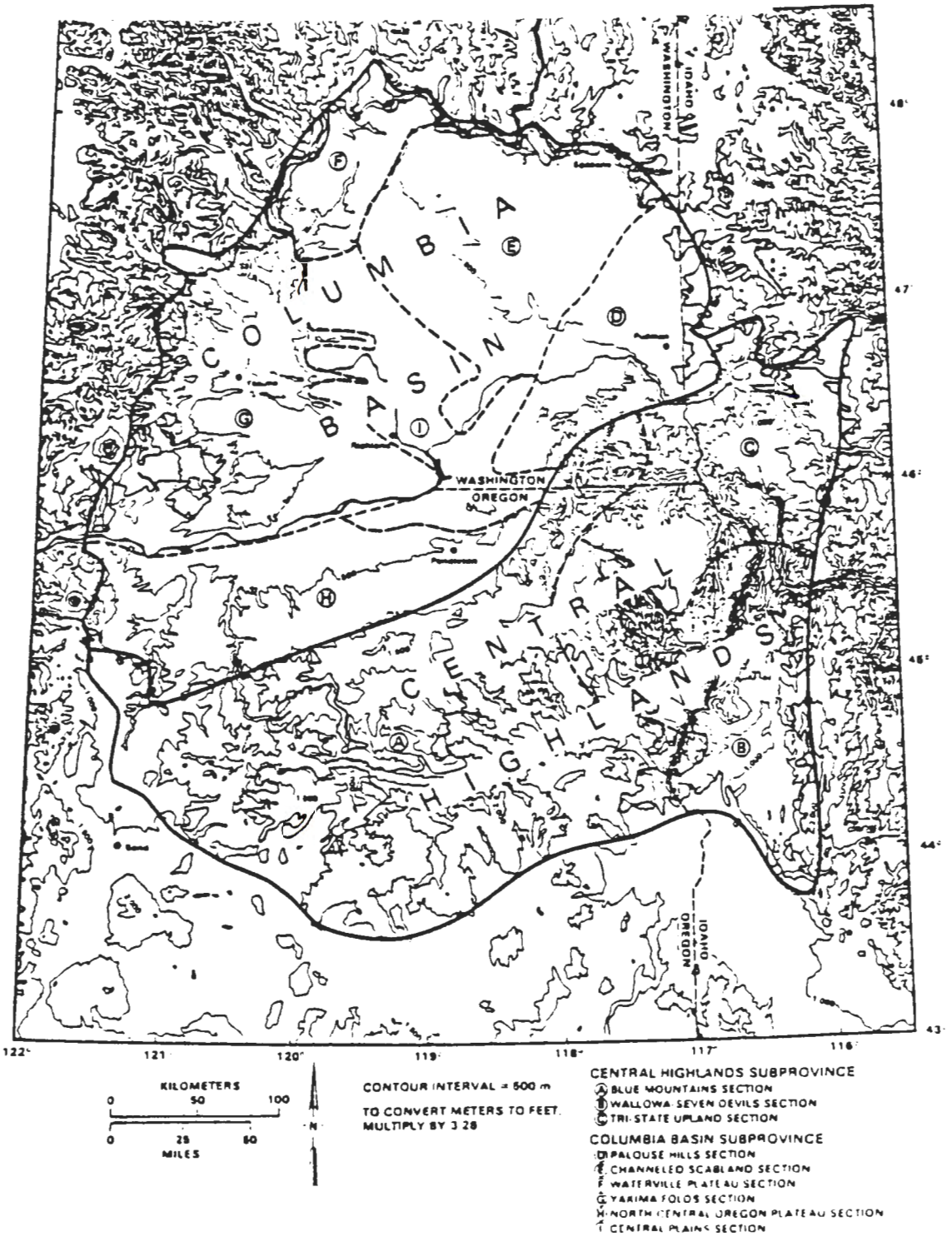

Figure 5-6. Geomorphic Units Within the Central Highlands and Columbia Basin Subprovinces That Contain the Columbia River Basalt Group (after Thornbury 1965, p. 445).

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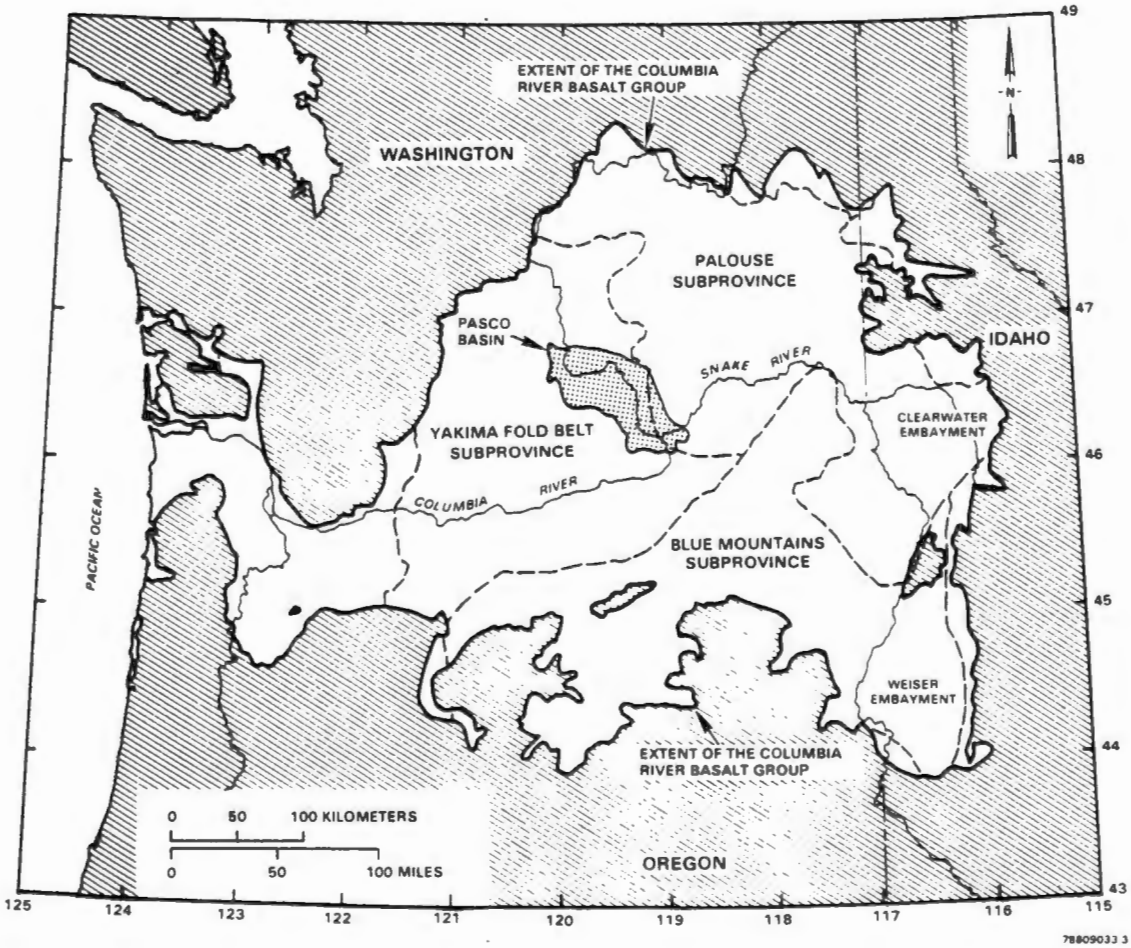
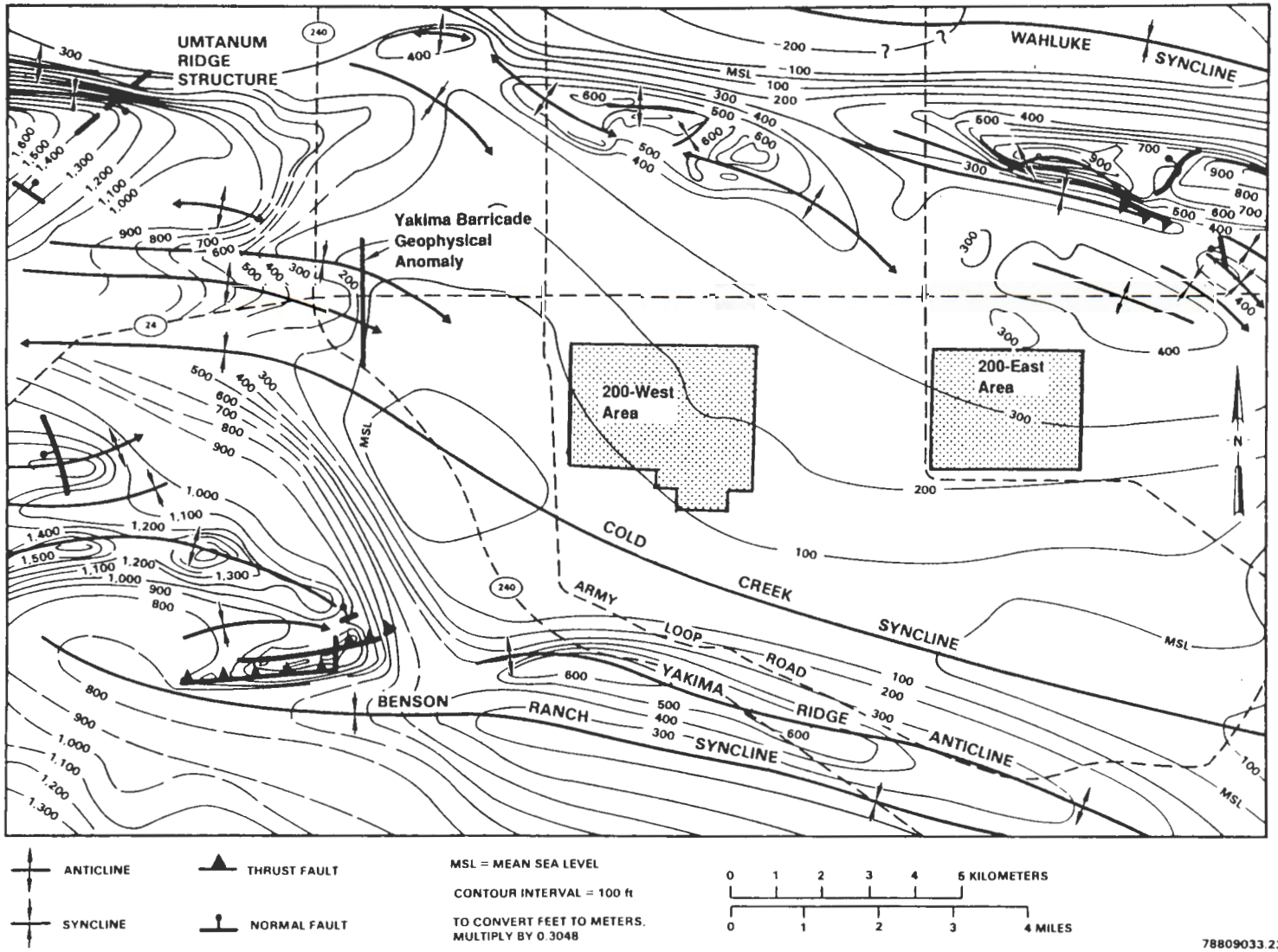


Figure 5-7. Structural Subprovinces of the Columbia Plateau (DOE 1988b, pp. 1.3-15).



ANTICLINE
SYNCLINE
THRUST FAULT
NORMAL FAULT

MSL = MEAN SEA LEVEL

CONTOUR INTERVAL = 100 ft

TO CONVERT FEET TO METERS, MULTIPLY BY 0.3048

0 1 2 3 4 5 KILOMETERS

0 1 2 3 4 MILES

78809033.23

Figure 5-8. Tectonic Structures Adjacent to the 200 Areas, Top of Basalt (after DOE 1988b).

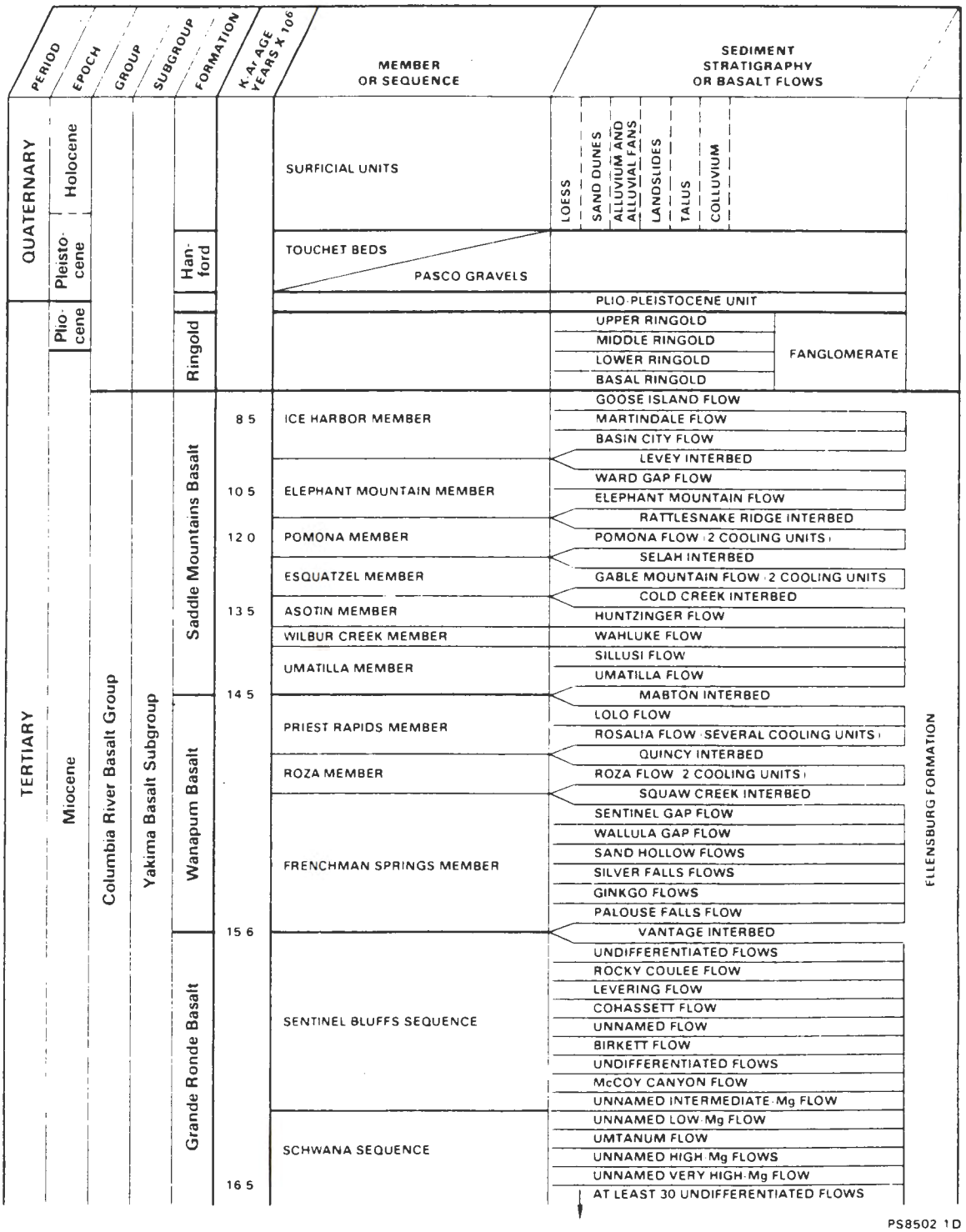


Figure 5-9. Stratigraphic Nomenclature of Units Penetrated Within the Pasco Basin.

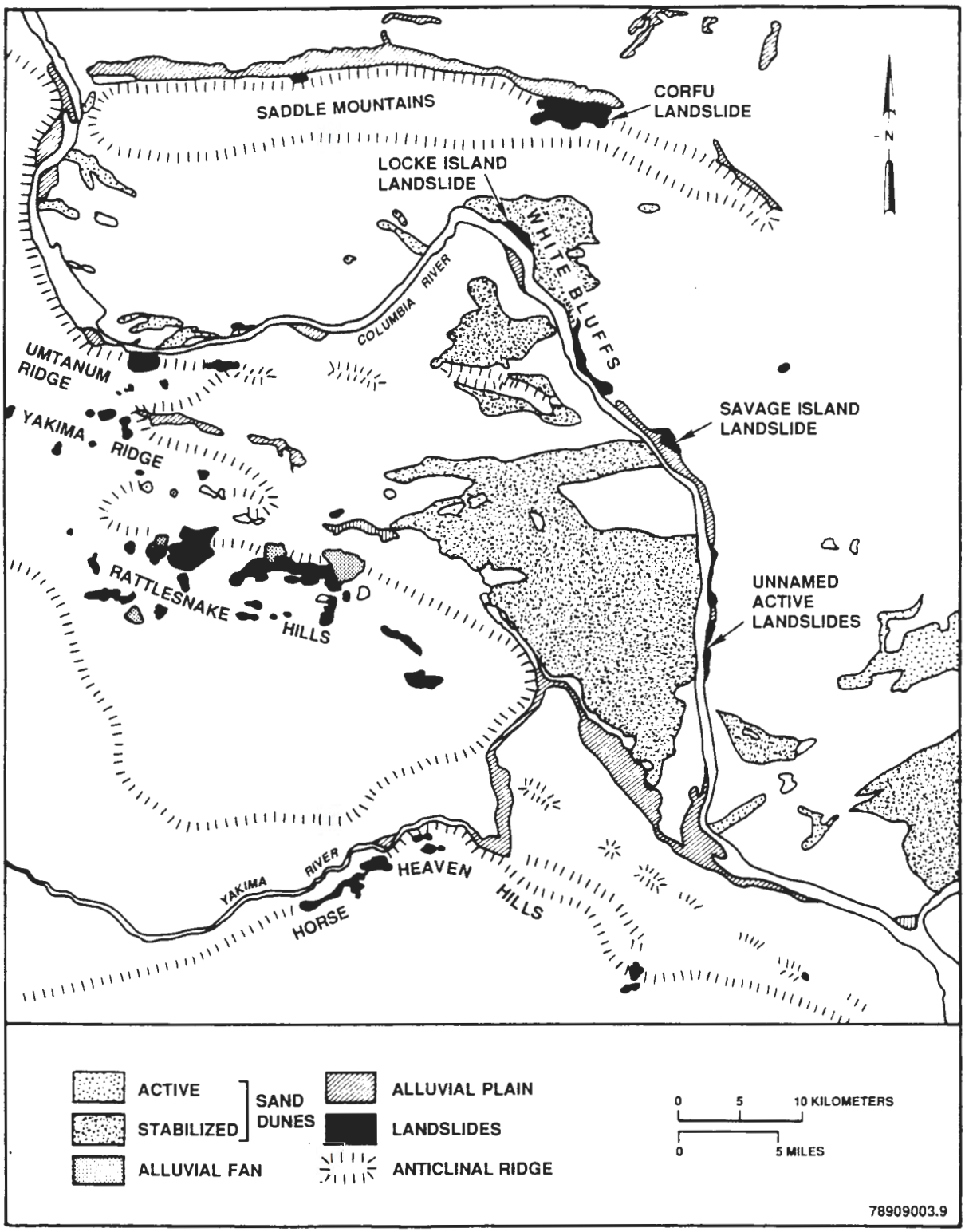


Figure 5-10. Late Quaternary Landforms Within and Adjacent to the Pasco Basin (after DOE 1988b).

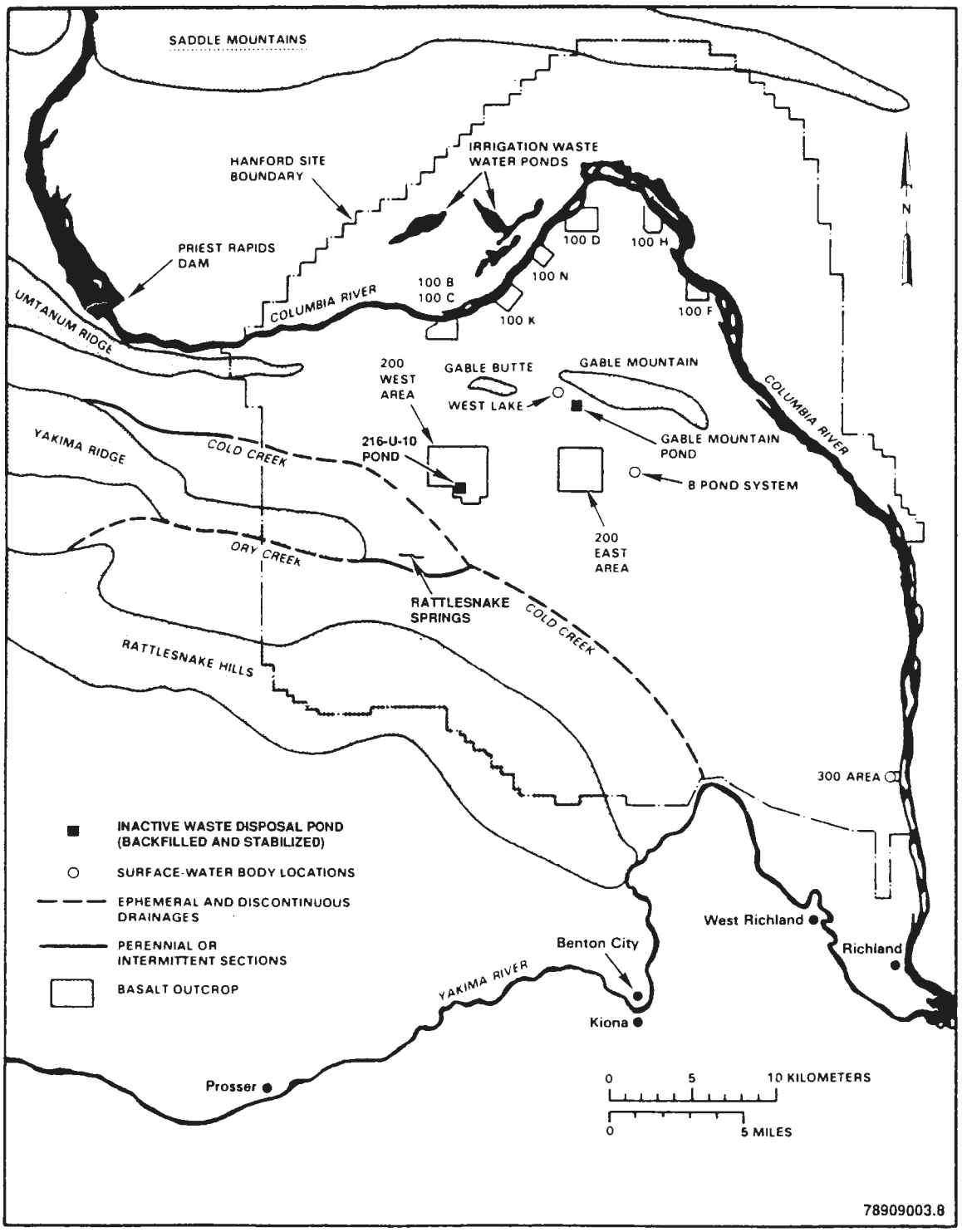


Figure 5-11. Locations of Surface Water Bodies on the Hanford Site (after DOE 1988b).

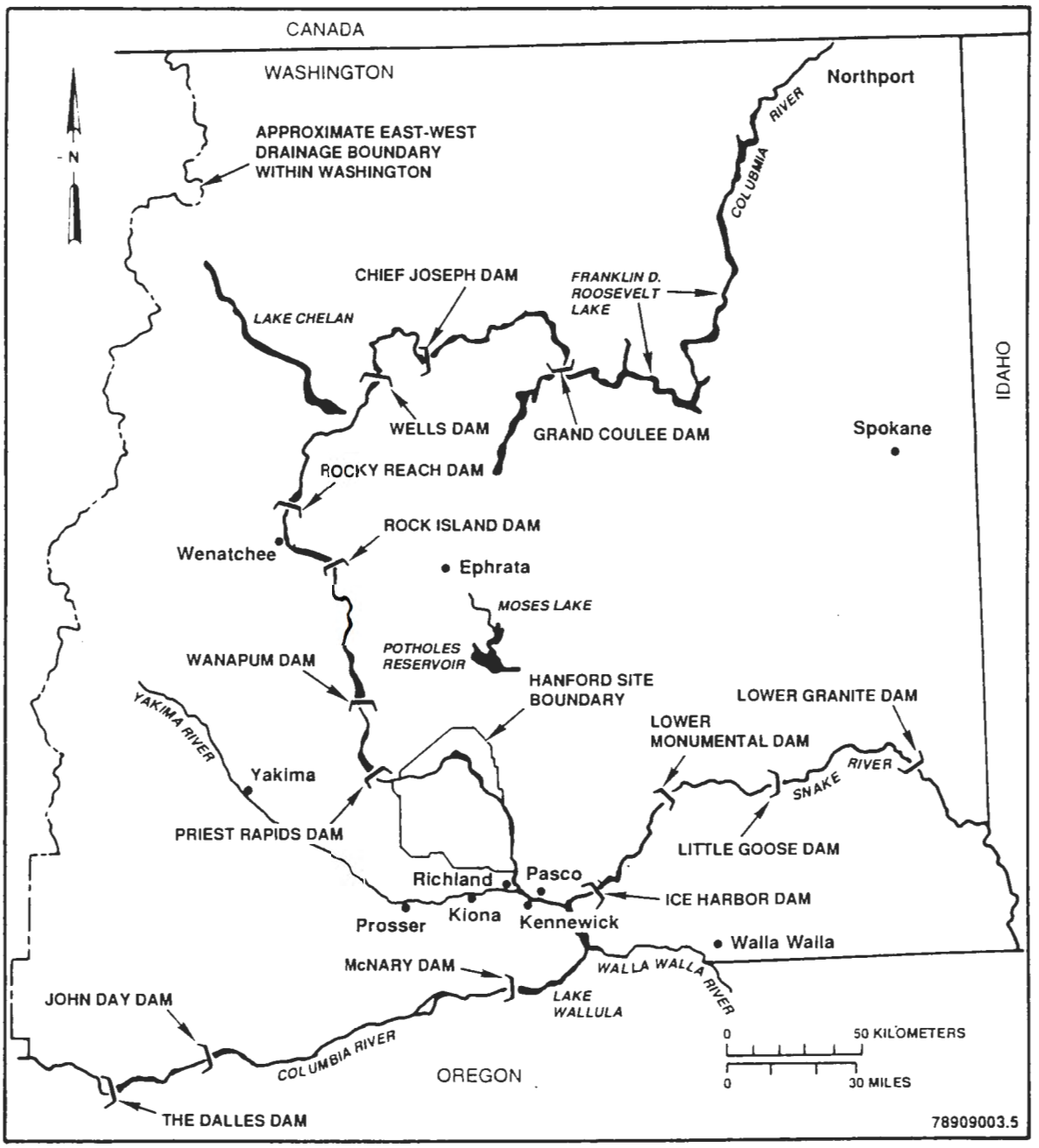
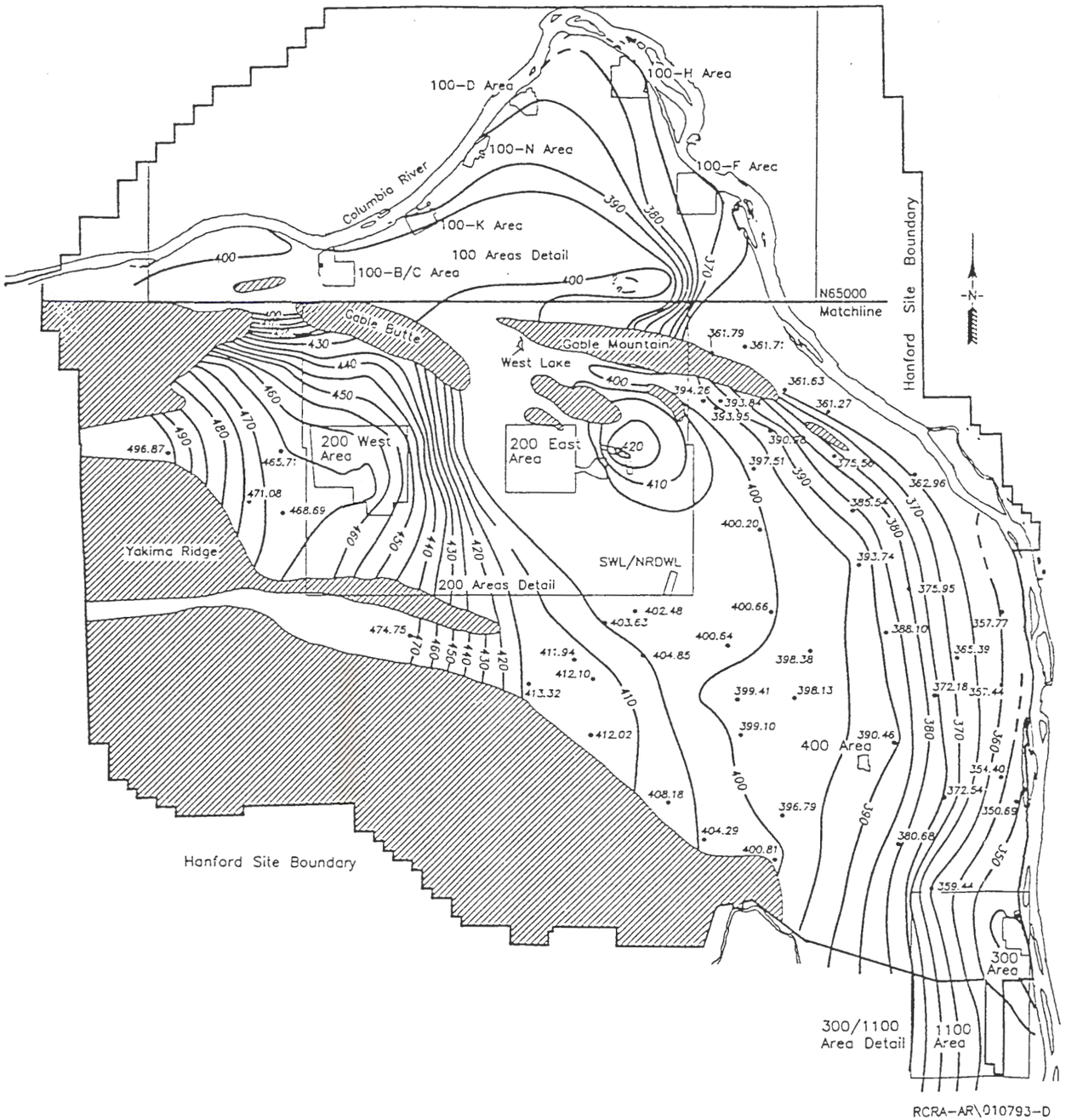


Figure 5-12. Locations of Principle Dams Within the Columbia Plateau (after DOE 1988b).



Hanford Site Water Table Map June 1992

411.49 • Water table elevation (feet above mean sea level)

400 Water table contours in feet above mean sea level Contour Interval = 5 ft

Contour Lines are dashed where approximated.

Ponds

Areas where the basalt surface is generally above the water table

The Hanford Site water table map has been prepared by the Geosciences Group, Environmental Division, of Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

From: Kasza, et al., 1992

0 1 2 3 4 5 Miles
0 1 2 3 4 5 Kilometers

Figure 5-13. Water Table Map of the Hanford Site (June 1992).

9413096.0862

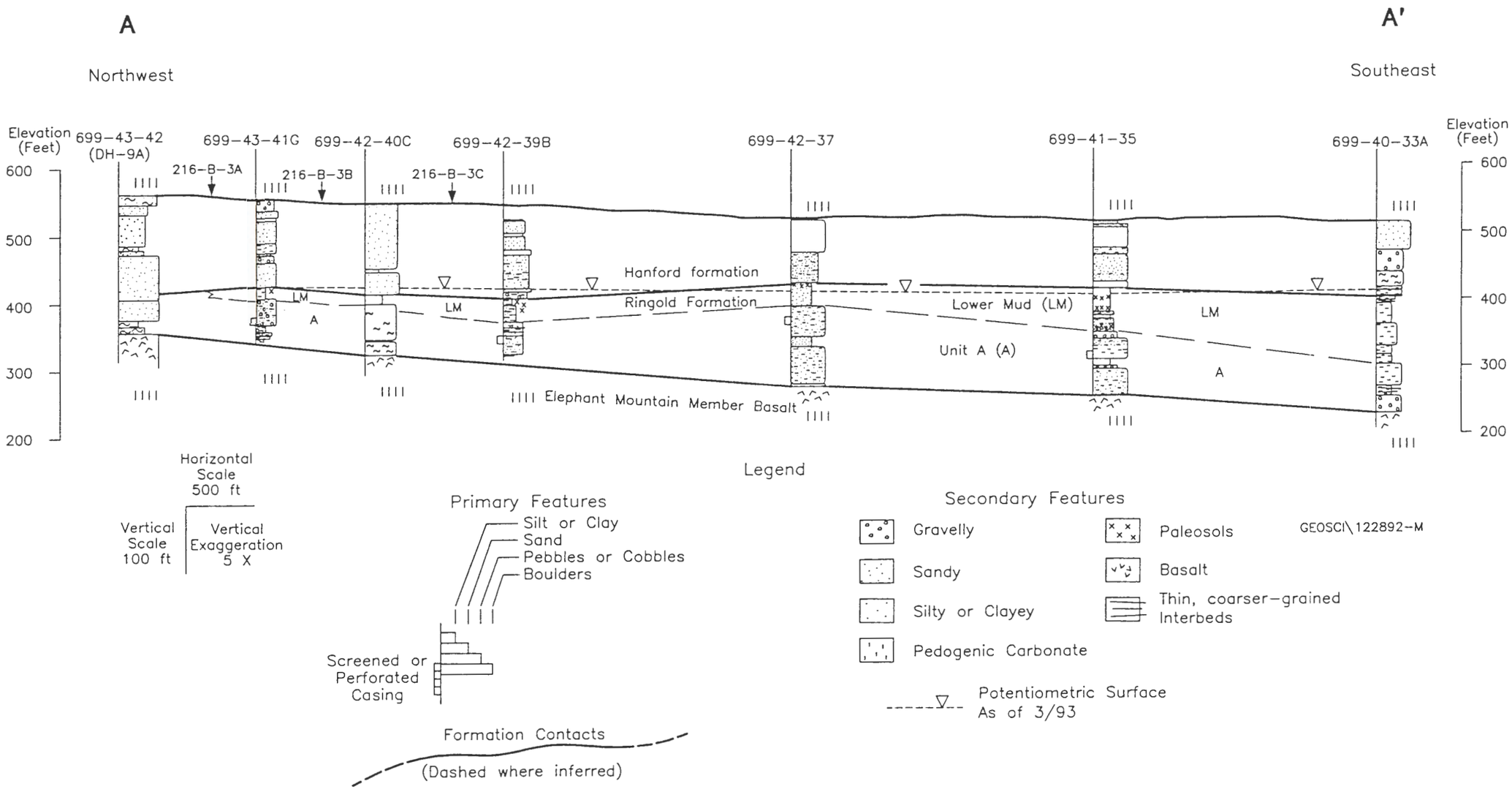


Figure 5-14. Cross-Section A-A'

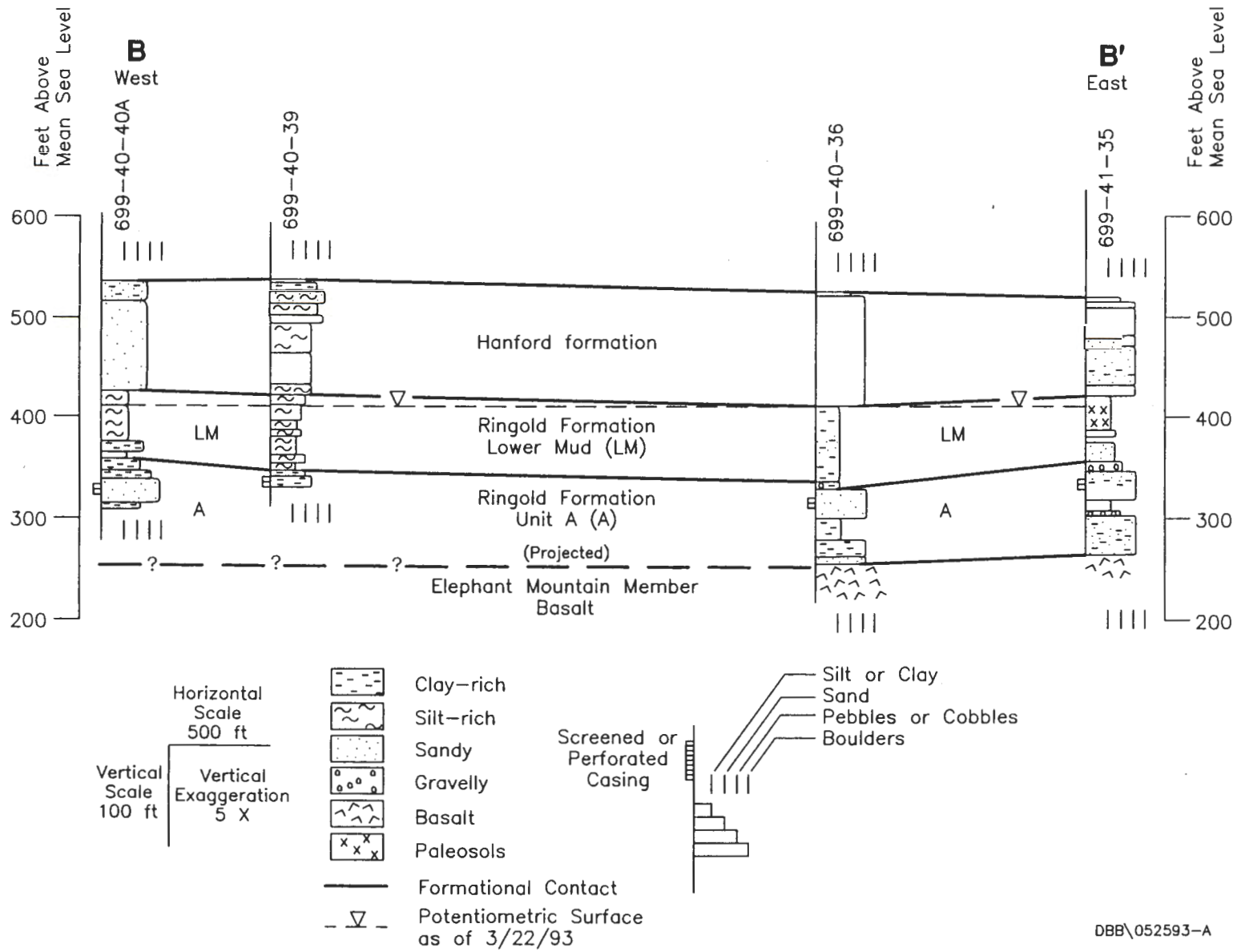


Figure 5-15. Cross-Section B-B'.

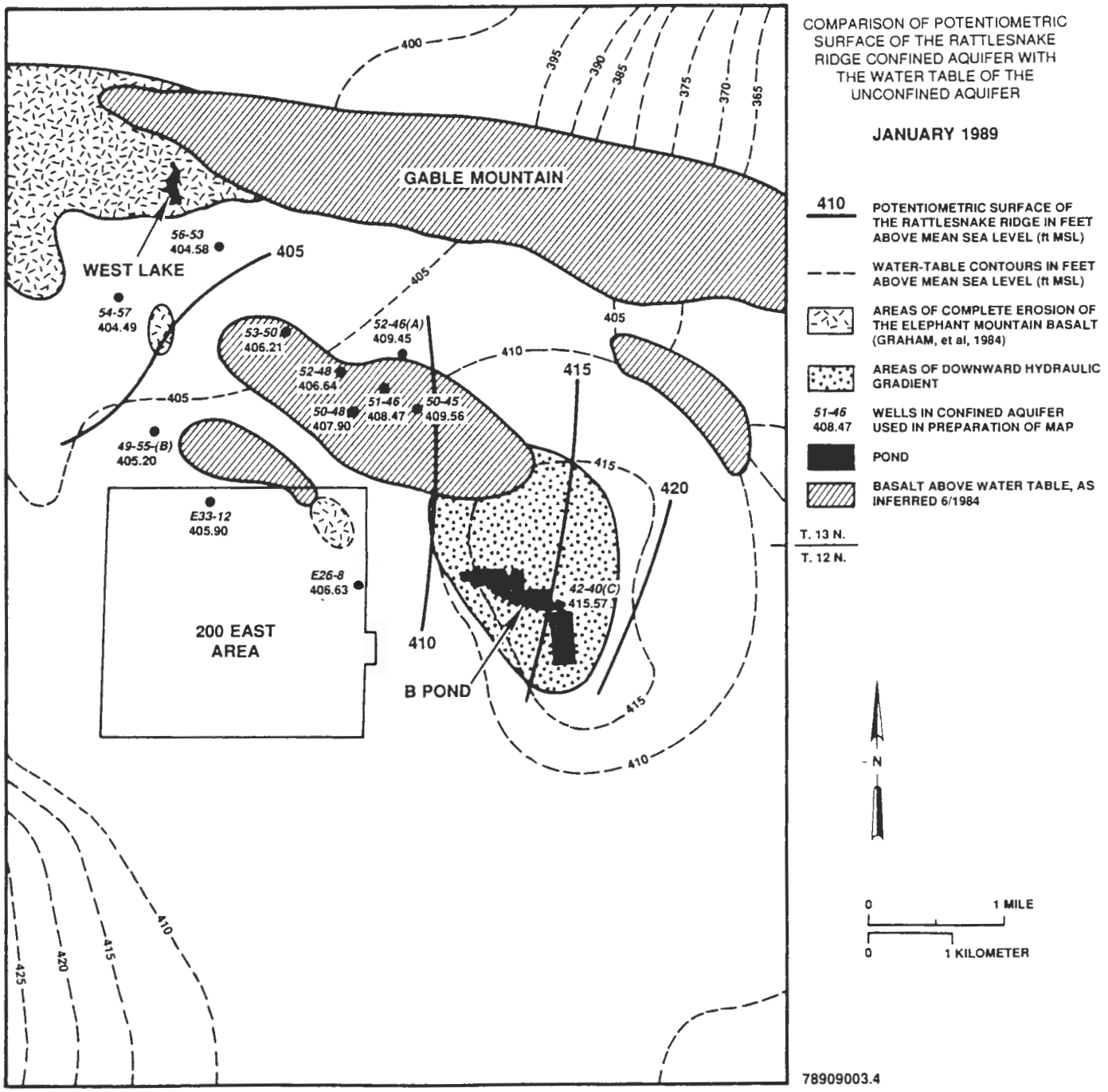


Figure 5-16. Comparison of Potentiometric Surface of the Rattlesnake Ridge Confined Aquifer with the Water Table of the Unconfined Aquifer.

Table 5-1. Construction Summary--B Pond Groundwater Monitoring Network.

Well number	Date completed	Total depth drilled (feet[a])	Screened depth (feet[a])	Aquifer	Depth to water (feet[a]) and date measured	
299-E18-1[c]	8/88	332	309-327	Top of unconfined	318	6/93
299-E32-4[c]	9/87	310	278-298	Top of unconfined	284	6/93
699-40-36	12/92	280	209-219	Top of semiconfined	118	6/93
699-40-39	7/89	212	201-211	Top of semiconfined	129	6/93
699-40-40A	10/91	227	215-225	Lower semiconfined	130	6/93
699-40-40B	10/91	202	188-199	Top of semiconfined	131	6/93
699-41-35	11/92	260	198-200	Top of semiconfined	108	4/93
699-41-40	6/89	176	164-174	Top of semiconfined	131	6/93
699-41-42	8/92	343	270-281	Top of unconfined	233	4/93
699-42-37	11/92	268	144-154	Top of semiconfined	105	6/93
699-42-39A	6/91	181	169-180	Top of semiconfined	139	6/93
699-42-39B	10/91	216	203-214	Lower semiconfined	140	6/93
699-42-40A	7/81	176	139-171	Top of unconfined	124	6/93
699-42-41	8/91	157	134-155	Top of unconfined	147	6/93
699-42-42B	10/88	250	183-203	Top of semiconfined	166	6/93
699-43-40	10/91	137	114-135	Top of unconfined	122	6/93
699-43-41E	5/89	149	135-146	Top of semiconfined	130	6/93
699-43-41F	6/89	176	165-176	Lower semiconfined	130	6/93
699-43-41G	10/91	201	188-199	Top of lower semiconfined	135	6/93
699-43-42J	9/88	180	157-177	Lower unconfined	163	6/93
699-43-43	9/88	180	158-178	Top of unconfined	164	6/93
699-43-45	6/89	204	183-203	Top of unconfined	195	6/93
699-44-39B	9/92	182	99-119	Top of unconfined	94	6/93
699-44-42	9/88	173	152-172	Top of unconfined	159	6/93
699-44-43B	5/89	176	156-176	Top of unconfined	165	6/93

NOTE: All wells are constructed with 4-inch diameter stainless steel casing and screen except for the following wells: 699-42-40A (8-inch carbon steel casing with 8-inch telescoping stainless steel screen),

[a]Depths are approximate.

[b]SS--Stainless steel; CS--carbon steel; casing diameter in parentheses.

[c]Background well.

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Table 5-2. Groundwater Constituents, Parameters[a], and Drinking Water Standards. (sheet 1 of 2)

Constituent	Drinking water standard[b]
Arsenic	0.05 milligrams per liter[c]
Barium	1.0
Cadmium	0.01
Chromium	0.10
Fluoride	1.4 to 2.4
Lead	0.05
Mercury	0.002
Nitrate (as NO_3^-)	45.0
Selenium	0.01
Silver	0.05
Endrin	0.0002
Lindane	0.004
Methoxychlor	0.1
Toxaphene	0.005
2,4-D	0.1
2,4,5-TP silvex	0.01
Radium	5 picocuries per liter
Gross alpha	15 picocuries per liter
Gross beta	4 millirems per year
Turbidity (surface water only)	1 turbidity unit
Coliform bacteria	1/100 milliliter
Groundwater quality parameters	
Chloride	250 (s)
Iron	0.3 (s)
Manganese	0.05 (s)
Phenols	none
Sodium	none
Sulfate	250 (s)

Table 5-2. Groundwater Constituents, Parameters[a], and Drinking Water Standards. (sheet 2 of 2)

Constituent	Drinking water standard[b]
Groundwater contamination indicator parameters	
pH	6.5-8.5
Specific conductance	none
Total organic carbon	none
Total organic halogen	none
Site-specific parameters	
Hydrazine	none
Ammonium	none
Tritium	20,000 picocuries/liter
Assessment monitoring parameters	
Herbicides	
Pesticides	
Polychlorinated biphenyls (PCBs)	
Enhanced volatiles[d]	
Semivolatiles	

[a]Regulatory requirements for sampling parameters are subject to change because of federal regulations.

[b]Unless otherwise noted, standards are based on maximum contaminant levels given in 40 CFR 141. Other standards are denoted as follows: (s)=secondary maximum contaminant levels given in 40 CFR 143.

[c]Unless noted, concentrations are in milligrams per liter.

[d]Enhanced volatiles include enhanced list identified in Appendix IX of 40 CFR Part 261.

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 1 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
299-E18-1	8/16/88	H0007ZT7	812	534	7.80	7.90	532 U	1.3 U
		H0007ZT8	809	521	7.80	7.90	397 U	-4.8 U
		H0007ZT9	811	529	7.90	7.90	382 U	11.4 U
		H0007ZV0	812	531	7.80	7.90	890 U	11.5 U
	11/10/88	H0007ZV2	595	571	8.60	7.90	400 U	4.0 U
		H0007ZV3	594	583	8.50	7.90	300 U	3.0 U
		H0007ZV4	593	588	8.50	8.00	300 U	3.0 U
		H0007ZV5	594	586	8.60	7.90	300 U	.0 U
	11/23/88	H0007ZV6	633		8.50			
	2/15/89	H0007ZV8	537	514	7.00	7.90	200 U	5.0 U
		H0007ZV9	531	517	6.90	7.80	200 U	5.0 U
		H0007ZW0	532	510	6.90	7.70	200 U	.0 U
		H0007ZW1	534	512	7.00	7.80	200 U	5.0 U
	5/26/89	H0007ZW2	550	503	7.89	8.00	500 U	4.0 U
		H0007ZW3	549	498	7.89	8.00	600 U	3.0 U
		H0007ZW4	549	484	7.89	8.00	300 U	3.0 U
		H0007ZW5	549	474	7.89	8.00	500 U	3.0 U
	8/08/89	H0007ZW6	564	533	7.89	8.00	300 U	3.0 U
		H0007ZW7	567	535	7.88	8.00	300 U	2.0 U
		H0007ZW8	568	534	7.88	8.00	300 U	4.0 U
		H0007ZW9	567	532	7.89	8.00	400 U	4.0 U
	10/31/89	H0007ZX0	552		7.95		500 U	1.0 U
	11/29/89	H0007ZX1	563	542	8.09	7.30	200 U	3.0 U
		H0007ZX2	560	552	8.10	7.80	300 U	8.0 U
		H0007ZX3	561	550	8.09	7.80	300 U	4.0 U
		H0007ZX4	562	543	8.08	7.80	300 U	5.0 U
	5/30/90	H0007ZX5	529	545	7.98	7.90	200 U	1.0 U
		H0007ZX6	530	557	7.97	7.90	200 U	
		H0007ZX7	530	556	7.98	7.90	500 U	
		H0007ZX8	529	558	7.99	7.90	200 U	
	7/09/91	H00071X9	521	540	8.07	8.25	U	U
	9/06/91	B00LB6	515		8.02			
		B00LB7	516		8.02			
		B00LB8	515		8.03			
		B00LB9	515		8.04			
	1/24/92	B01Q59	527		8.08		1000 U	10.0 UA
	6/03/92	B06PH8	558		7.99		1000 U	10.0 UA
		B06PH9	556		7.98		1000 U	10.0 A
		B06PJ0	560		7.98		1000 U	10.0 UA
		B06PJ1	560		7.97		1000 U	10.0 A
	11/03/92	B07LH1	553		8.22			10.0 UA
		B07LH2	554		8.22			10.0 UA
		B07LH3	556		8.21			10.0 UA

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 2 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
299-E18-1	11/03/92	B07LH4	555		8.22			10.0 UA
	12/16/92	B07S32	510	520	8.12	8.20	1000 U	10.0 UA
		B07S33	506		8.19		1000 U	10.0 UA
		B07S34	516		8.18		1000 U	10.0 UA
		B07S35	513		8.17		1000 U	10.0 UA
299-E32-4	9/27/88	H0008ZB8	410	410	7.90	7.80	300 U	35.0
		H0008ZB9	410	412	8.10	7.70	200 U	74.0
		H0008ZC0	410	411	8.10	7.80	400 U	32.0
		H0008ZC1	410	415	8.00	7.70	200 U	2.0 U
	12/28/88	H0008ZC2	364	423	7.80	8.00	200 U	2.0 U
		H0008ZC3	366	422	7.90	8.00	200 U	9.0 U
		H0008ZC4	365	422	7.90	8.00	200 U	6.0 U
		H0008ZC5	365	422	7.90	8.00	200 U	6.0 U
	3/01/89	H0008ZC6	395	414	7.90	7.93	500 U	5.0 U
		H0008ZC7	396		8.10		200 U	6.0 U
		H0008ZC8	397		7.90		200 U	7.0 U
		H0008ZC9	395		7.90		500 U	6.0 U
	3/13/89	H0008ZD0	422	418	8.00	8.00	200 U	5.0 U
		H0008ZD1		421		8.00	300 U	4.0 U
		H0008ZD2		418		8.00	200 U	6.0 U
		H0008ZD3		417		8.00	200 U	4.0 U
	6/16/89	H0008ZD4	410	428	7.38	8.00	500 U	4.0 U
		H0008ZD5	409		7.38		300 U	3.0 U
		H0008ZD6	409		7.38		300 U	2.0 U
		H0008ZD7	410		7.37		200 U	3.0 U
	7/19/89	H0008ZD8	348	433	7.90	7.90	400 U	7.0 U
		H0008ZD9	343	435	7.89	7.90	300 U	5.0 U
		H0008ZF0	345	435	7.89	7.90	300 U	2.0 U
		H0008ZF1	347	434	7.90	7.90	300 U	3.0 U
	8/10/89	H0008ZF2	426		7.86			
		H0008ZF3	427		7.85			
		H0008ZF4	426		7.86			
		H0008ZF5	427		7.85			
	9/08/89	H0008ZF6	447	427	7.72	7.90	700 U	2.0 U
		H0008ZF7	447	425	7.68	7.90	500 U	4.0 U
		H0008ZF8	447	429	7.68	7.90	1000 U	3.0 U
		H0008ZF9	445	425	7.69	7.90	1000 U	4.0 U
	1/17/90	H0008ZG0	445	454	7.98	7.80	200 U	5.0 U
		H0008ZG1	446	455	7.97	7.80	200 U	8.0 U
		H0008ZG2	446	456	7.98	7.80	200 U	3.0 U
		H0008ZG3	445	457	7.97	7.80	200 U	6.0 U
	1/26/90	H0008ZG4	398		7.88			
		H0008ZG5	396		7.84			

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 3 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
299-E32-4	1/26/90	H0008ZG6	391		7.86			
		H0008ZG7	395		7.84			
	4/29/90	H0008ZG8	442		7.62			
	5/09/90	H0008ZG9	454	487	7.81	7.80	300 U	1.0 U
		H0008ZH0	452	489	7.78	7.80	200 U	1.0 U
		H0008ZH1	451	476	7.80	7.80	200 U	.0 U
		H0008ZH2	452	485	7.79	7.70	300 U	1.0 U
	8/05/91	H0007264	459		7.25			
	9/23/91	B00LK5	438		8.25			
	1/15/92	B01QK6	442		7.93		1000 U	10.0 UA
	4/06/92	B06696					1000 U	10.0 UA
	4/09/92	B065B6	445		7.99			
	7/14/92	B07173	445		8.03		1000 U	10.0 UA
	4/30/93	B08FZ2	431		6.93			
		B08FZ3	430		6.94			
		B08FZ4	430		6.95			
		B08FZ5	428		6.96			
699-40-36	12/21/92	B07TB1	310		7.92		1000 U	180.0 A
		B07TB3	310		7.92		1000 U	180.0 A
		B07TB5	309		7.92		1000 U	100.0 A
		B07TB7	308		7.92		1000 U	130.0 A
	2/22/93	B08717	310		7.85		1000 U	220.0 A
		B08718	312		7.85		1000 U	230.0 A
		B08719	310		7.84		1000 U	230.0 A
		B08720	313		7.84		1000 U	230.0 A
699-40-39	12/05/89	H000DBX2	318		7.79		200 U	9.0 U
		H000DBX3	326		8.14			
		H000DBX4	327		8.17			
		H000DBX5	328		8.53			
	1/25/90	H000DBX6	240	308	8.21	7.90	200 U	6.0 U
		H000DBX7	227		7.99		200 U	9.0 U
		H000DBX8	231		8.07		200 U	6.0 U
		H000DBX9	236		8.12		200 U	4.0 U
	4/25/90	H000DBY0	309	326	8.30	7.80	300 U	1.0 U
		H000DBY1	305		8.12		200 U	2.0 U
		H000DBY2	305		8.15		200 U	4.0 U
		H000DBY3	306		8.21		300 U	2.0 U
	4/15/91	H000DBY4	336		7.15			
	7/08/91	H00071Y4	306	310	8.08	7.90	U	U
	9/11/91	B00LG1	303		8.00			
	1/31/92	B01Q65	243		8.36		1000 UD	10.0 UA
	4/17/92	B065P2					1000 UD	10.0 URA
		B065P5					1000 UD	40.0 AF

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 4 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-40-39	4/17/92	B065P8					1000 UD	90.0 AF
		B065Q1					1000 UD	10.0 UAF
	6/24/92	B06ZT7	323		8.43		1000 U	50.0 RA
		B06ZT8	318		8.39		1000 U	10.0 UAF
		B06ZT9	317		8.36		1000 U	10.0 RA
		B06ZV0	318		8.34		1000 U	10.0 UAF
	10/20/92	B07JM3	370		8.61		1000 U	10.0 UA
		B07JM4	350		8.59		1000 U	10.0 UA
		B07JM5	345		8.57		1000 U	10.0 UA
		B07JM6	330		8.54		1000 U	10.0 UA
	1/14/93	B07TX4	310		8.18		1000 U	10.0 UA
		B07TX5	311		8.20		1000 U	10.0 UA
		B07TX6	314		8.19		1000 U	10.0 UA
		B07TX7	314		8.19		1000 U	10.0 UA
	4/26/93	B08GK2	327		7.29			
		B08GK3	316		7.33			
		B08GK4	306		7.35			
		B08GK5	305		7.37			
699-40-40A	1/24/92	B01T62	344		7.44		1000	930.0 RA
	4/22/92	B065Q8					1000 U	230.0 FAD
		B065R1					1000 U	180.0 AFD
		B065R4					1000 U	150.0 AFD
		B065R6					1000 U	170.0 AFD
	6/25/92	B06ZV2	334		7.85		1000 U	80.0 AF
		B06ZV4	331		7.84		1000 U	60.0 AF
		B06ZV6	334		7.83		1000 U	90.0 AF
		B06ZV8	333		7.82		1000 U	100.0 RA
	10/21/92	B07JK3	335		8.32		1000 U	50.0 A
		B07JK4	333		8.31		1000 U	10.0 UA
		B07JK5	333		8.30		1000 U	10.0 UA
		B07JK6	333		8.28		1000 U	70.0 A
	1/26/93	B07V49	341		8.17		1000 U	30.0 AQ
		B07V50	341		8.18		1000 U	30.0 AQ
		B07V51	341		8.18		1000 U	20.0 AQ
		B07V52	341		8.18		1000 U	30.0 AQ
	4/27/93	B08GG0	348		7.99			
		B08GG1	347		7.98			
		B08GG2	348		7.96			
		B08GG3	348		7.95			
699-40-40B	1/24/92	B01T64					800	510.0 RA
	4/22/92	B065S0					1000 U	80.0 AD
		B065S1					1000 U	70.0 AD
		B065S2					1000 U	80.0 AD

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 5 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-40-40B	4/22/92	B065S3					1000 U	70.0 AD
	6/29/92	B06ZW2	325		7.94		1000 U	170.0 AF
		B06ZW3	324		7.92		1000 U	60.0 AF
		B06ZW4	322		7.91		1000 U	70.0 RA
		B06ZW5	323		7.90		1000 U	60.0 RA
	10/21/92	B07JK8	281		7.49		1000 U	30.0 A
		B07JK9	283		7.49		1000 U	30.0 A
		B07JL0	282		7.49		1000 U	30.0 A
		B07JL1	281		7.48		1000 U	30.0 A
	1/26/93	B07V54	284		7.60		1000 U	10.0 AQ
		B07V55	283		7.60		1000 U	10.0 AQ
		B07V56	282		7.61		1000 U	20.0 AQ
		B07V57	290		7.81		1000 U	20.0 AQ
	4/22/93	B08GF5	319		7.56	7.90		
		B08GF6	319		7.55			
		B08GF7	317		7.54			
		B08GF8	317		7.53			
699-41-35	12/21/92	B07TB9	325		7.95		1000 U	150.0 A
		B07TC0	323		7.94		1000 U	110.0 A
		B07TC1	323		7.94		1000 U	110.0 A
		B07TC2	322		7.94		1000 U	100.0 A
	2/22/93	B08707	324		7.44		1000 U	600.0 A
		B08708	323		7.44		1000 U	480.0 A
		B08709	322		7.45		1000 U	350.0 A
		B08710	321		7.46		1000 U	400.0 A
699-41-40	12/05/89	H000DD44	383		8.08		400 U	10.0
		H000DD45	371		7.85			
		H000DD46	367		7.82			
		H000DD47	371		7.75			
	1/25/90	H000DD48	300	377	8.07	8.00	400 U	7.0 U
		H000DD49	322		8.06		400 U	9.0 U
		H000DD50	314		8.06		400 U	3.0 U
		H000DD51	309		8.07		400 U	4.0 U
	4/19/90	H000DD52	376	403	8.21	7.90	600 U	1.0 U
		H000DD53	368		8.22		600 U	3.0 U
		H000DD54	369		8.23		600 U	1.0 U
		H000DD55	275		8.24		1400	2.0 U
	4/15/91	H000DD56	378		8.38			
	7/10/91	H00071Y1	383	380	8.33	8.20	U	U
	9/11/91	B00LG2	375		8.31			
	1/31/92	B01QC8	384		8.25		1000 UD	20.0 AF
	4/28/92	B065S5					1000 UD	20.0 QAD
		B065S6					1000 UD	10.0 UAQD

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 6 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-41-40	4/28/92	B065S7					1000 UD	10.0 AD
		B065S8					1000 UD	20.0 AD
	6/24/92	B06ZX2	381		8.34		1000 U	10.0 UA
		B06ZX3	381		8.31		1000 U	10.0 UA
		B06ZX4	382		8.30		1000 U	10.0 UA
		B06ZX5	379		8.29		1000 U	10.0 UA
	10/20/92	B07JM7	392		8.74		1000 U	10.0 UA
		B07JM8	390		8.75		1000 U	10.0 UA
		B07JM9	388		8.75		1000 U	10.0 UA
		B07JN0	388		8.75		1000 U	10.0 UA
	1/14/93	B07TX9	358		8.36		1000 U	10.0 UA
		B07TY0	359		8.36		1000 U	10.0 UA
		B07TY1	360		8.37		1000 U	10.0 UA
		B07TY2	360		8.38		1000 U	10.0 UA
699-41-42	1/08/93	B07V59	257		8.31		1000 U	10.0 UA
		B07V60	259		8.29		1000 U	10.0 UA
		B07V61	259		8.29		1000 U	10.0 UA
		B07V62	262		8.29		1000 U	20.0 BA
	4/22/93	B08GG5	268		8.35	8.50		
		B08GG6	267		8.34			
		B08GG7	267		8.34			
		B08GG8	268		8.34			
699-42-37	12/22/92	B07TC4	361		8.11		1000 U	10.0 UA
		B07TC5	360		8.10		1000 U	40.0 A
		B07TC6	359		8.08		1000 U	20.0 A
		B07TC7	356		8.09		1000 U	20.0 BA
	2/23/93	B08712	381		8.10		1000 U	10.0 UA
		B08713	382		8.10		1000 U	10.0 A
		B08714	382		8.10		1000 U	20.0 A
		B08715	382		8.10		1000 U	10.0 UA
699-42-39A	1/23/92	B01T66	328 P		7.37 P		1000 UP	10.0 UAP
	4/17/92	B065T1					1000 UP	10.0 UFP
		B065T2					1000 UP	60.0 PF
		B065T3					1000 UP	10.0 UPF
		B065T4					1000 UP	10.0 UFPA
	6/25/92	B06ZX7	353 P		7.27 P		1000 UP	10.0 UAP
		B06ZX8	354 P		7.33 P		1000 UP	10.0 UPA
		B06ZX9	356 P		7.34 P		1000 UP	10.0 UAP
		B06ZY0	354 P		7.34 P		1000 UP	10.0 UPA
	10/21/92	B07JL3	312		7.77		1000 UP	10.0 UA
		B07JL4	312		7.76		1000 UP	10.0 UA
		B07JL5	312		7.70		1000 UP	10.0 UA
		B07JL6	312		7.71		1000 UP	10.0 UA

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 7 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-42-39A	1/27/93	B07V64	288		8.01		1000 UP	10.0 A
		B07V65	292		8.00		1000 UP	10.0 UA
		B07V66	291		7.99		1000 UP	10.0 UA
		B07V67	290		7.99		1000 UP	10.0 UA
699-42-39B	1/23/92	B01T68	357		7.47		600	10.0 UA
	4/17/92	B065T6					1000 U	10.0 UA
		B065T7					2000	10.0 UA
		B065T8					1000 U	10.0 UA
		B065T9					1000 U	10.0 UA
	6/25/92	B06ZY2	357		7.79		1000 U	
		B06ZY3	354		7.77		1000 U	40.0 AF
		B06ZY4	355		7.77		1000 U	10.0 UAF
		B06ZY5	359		7.76		1000 U	10.0 UA
	10/28/92	B07JJ2	366		7.99		1000 U	10.0 UA
		B07JJ3	364		7.99		1000 U	10.0 UA
		B07JJ4	364		7.98		1000 U	10.0 UA
		B07JJ5	364		7.99		1000 U	10.0 UA
	1/25/93	B07V69	377		7.91		1000 U	10.0 UA
		B07V70	377		7.91		1000 U	10.0 UA
		B07V71	376		7.93		1000 U	10.0 UA
		B07V72	375		7.94		1000 U	10.0 UA
699-42-40A	8/22/85	H000DF11	153	170	7.70	8.23	750 U	.4 U
		H000DF12					900 U	2.2 U
		H000DF13					730 U	2.0 U
		H000DF14					1080	6.1 U
	2/07/86	H000DF22	176		8.30			
	5/12/86	H000DF27	159		8.40		1000	2.9 U
		H000DF28					1610	3.7 U
		H000DF29					1200	2.7 U
		H000DF30					1130	4.6 U
	8/05/86	H000DF33	137		8.00		529 U	3.0 U
		H000DF34					434 U	.6 U
		H000DF35					375 U	.1 U
		H000DF36					777 U	100.0 U
	1/08/88	H000DF55	117		7.90	7.68	844 U	54.1
	11/22/88	H000DF60	170		8.30		800 U	9.0 U
		H000DF61	169		8.30		800 U	-2.0 U
		H000DF62	169		8.30		800 U	1.0 U
		H000DF63	169		8.30		800 U	6.0 U
	2/15/89	H000DF65	161	164	8.40	8.10	800 U	7.0 U
		H000DF66	162		8.40		800 U	6.0 U
		H000DF67	162		8.40		800 U	6.0 U
		H000DF68	161		8.40		800 U	6.0 U

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 8 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-42-40A	5/31/89	H000DF70	165	172	8.12	8.10	1200 U	15.0
		H000DF71	165		8.20		1200 U	7.0 U
		H000DF72	165		8.21		1100 U	11.0
		H000DF73	165		8.19		1200 U	14.0
	8/10/89	H000DF74	140	145	8.16	8.00	1100 U	4.0 U
		H000DF75	139		8.17		1100 U	5.0 U
		H000DF76	139		8.17		1100 U	8.0 U
		H000DF77	137		8.17		1100 U	4.0 U
	1/26/90	H000DF78	204	193	8.03	7.90	700 U	3.0 U
		H000DF79	199		8.03		700 U	4.0 U
		H000DF80	198		8.03		700 U	3.0 U
		H000DF81	199		8.03		800 U	6.0 U
	7/08/91	H00071Y2	171	170	8.01	8.00	1400	U
	1/08/92	B07TY8	170		8.21		1000 U	10.0 UA
		B07TZ0	163		8.20		1000 U	10.0 UA
		B07TZ1	169		8.21		1000 U	10.0 UA
		B07TZ2	169		8.21		1000 U	10.0 UA
	1/23/92	B01Q61	145		8.99		1100	10.0 UA
	6/25/92	B06ZY7	173		8.10		1000 U	20.0 RA
		B06ZY8	174		8.11		1000 U	20.0 RA
		B06ZY9	173		8.11		1000 U	50.0 AF
		B06ZZ0	173		8.11		1000 U	70.0 AF
	10/22/92	B07JN1	141		8.10		1000 U	A
		B07JN3	141		8.09		1000 U	10.0 UA
		B07JN5	141		8.08		1000 U	10.0 UA
		B07JN7	141		8.07		1000 U	10.0 UA
	12/28/92	B07TG4	177		8.14			10.0 UA
		B07TG6	175		8.13			10.0 UA
		B07TG8	176		8.12			10.0 UA
		B07TG9	176		8.12			10.0 UA
699-42-41	1/24/92	B01T70	179 P		8.71 P		1100 P	10.0 UAP
	4/17/92	B065V1					1000 UP	10.0 UAFP
		B065V2					1000 P	10.0 UFP
		B065V3					2000 P	30.0 PF
		B065V4					2000 P	10.0 UAF
	6/29/92	B06ZZ2	180 P		8.13 P		1000 UP	10.0 UFP
		B06ZZ3	178 P		8.13 P		1000 UP	10.0 UPF
		B06ZZ4	178 P		8.13 P		1000 UP	10.0 FP
		B06ZZ5	178 P		8.13 P		1000 UP	40.0 AF
	10/22/92	B07JN9	176		7.85		1000 UP	10.0 UA
		B07JP0	175		7.87		1000 UP	10.0 UA
		B07JP1	174		7.88		1000 UP	10.0 UA
		B07JP2	175		7.89		1000 UP	10.0 UA

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 9 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-42-41	1/25/93	B07TZ4	170		8.21		1000 UP	10.0 UA
		B07TZ5	170		8.21		1000 UP	10.0 UA
		B07TZ6	170		8.21		1000 UP	10.0 UA
		B07TZ7	171		8.22		1000 UP	10.0 UA
	4/21/93	B08GL4	192 P		7.94 P	8.30 P		
		B08GL5	191 P		7.95 P			
		B08GL6	191 P		7.95 P			
		B08GL7	191 P		7.95 P			
699-42-42B	11/22/88	H000DFT3	251		8.40		400 U	4.0 U
		H000DFT4	250		8.40		400 U	2.0 U
		H000DFT5	251		8.40		400 U	-2.0 U
		H000DFT6	252		8.30		400 U	1.0 U
	2/24/89	H000DFT7	230	242	7.60	8.00	500 U	5.0 U
		H000DFT8	230		7.70		500 U	7.0 U
		H000DFT9	230		7.70		500 U	5.0 U
		H000DFV0	230		7.60		400 U	3.0 U
	6/16/89	H000DFV1	237	247	7.50	8.20	300 U	4.0 U
		H000DFV2	236		7.51		300 U	2.0 U
		H000DFV3	236		7.50		300 U	5.0 U
		H000DFV4	236		7.51		400 U	4.0 U
	8/09/89	H000DFV5	173	248	8.14	8.10	500 U	64.0
		H000DFV6	172		8.14		400 U	68.0
		H000DFV7	173		8.14		400 U	72.0
		H000DFV8	172		8.14		500 U	62.0
	1/02/90	H000DFV9	254		8.08			
	1/26/90	H000DFW0	280	256	8.01	7.90	300 U	4.0 U
		H000DFW1	279		8.00		300 U	4.0 U
		H000DFW2	279		8.00		300 U	4.0 U
		H000DFW3	280		8.00		300 U	8.0 U
	7/08/91	H00071Y3	250	270	8.13	7.90	U	U
	1/24/92	B01Q63	248		8.41		1000 U	10.0 UA
	6/24/92	B06ZZ7	258		8.10		1000 U	10.0 UA
		B06ZZ8	259		8.08		1000 U	10.0 A
		B06ZZ9	258		8.07		1000 U	10.0 UA
		B07000	256		8.07		1000 U	10.0 UA
	10/20/92	B07JP3	259		7.96		1000 U	10.0 UA
		B07JP4	257		7.95		1000 U	10.0 UA
		B07JP5	256		7.96		1000 U	10.0 UA
		B07JP6	253		7.96		1000 U	10.0 UA
	1/21/93	B07TZ9	257		8.18		1000 UQ	10.0 UA
		B07V00	258		8.17		1000 U	10.0 UA
		B07V01	258		8.18		1000 U	10.0 UA
		B07V02	257		8.17		1000 U	10.0 UA

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 10 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-43-40	1/31/92	B01T72	350 P		7.98 P		1000 UPD	10.0 PAQ
	4/28/92	B065V6					1000 UPD	20.0 PAD
		B065V7					1000 UPD	10.0 UAPD
		B065V8					1000 UP	30.0 AP
		B065V9					1000 UP	30.0 PA
	6/26/92	B07002	285 P		7.96 P		1000 UP	20.0 PA
		B07003	282 P		7.99 P		1000 UP	10.0 UAP
		B07004	283 P		7.97 P		1000 UP	10.0 UPA
		B07005	283 P		7.95 P		1000 UP	10.0 UPA
	10/22/92	B07JP7	324		7.14		1000 UP	10.0 UA
		B07JP8	332		7.27		1000 UP	10.0 UA
		B07JP9	320 P		7.29		1000 UP	10.0 UA
		B07JQ0	317		7.39		1000 UP	10.0 UA
	1/25/93	B07V04	312		8.23		1000 UP	10.0 UA
		B07V05	314		8.23		1000 UP	10.0 UA
		B07V06	313		8.23		1000 UP	10.0 UA
		B07V07	313		8.23		1000 UP	10.0 UA
	4/22/93	B08GN0	306 P		8.27 P	8.30 P		
		B08GN1	305 P		8.24 P			
		B08GN2	304 P		8.20 P			
		B08GN3	304 P		8.18 P			
699-43-41E	12/05/89	H000DGD6	319		8.06		700 U	26.0
		H000DGD7	322		8.08			
		H000DGD8	322		8.08			
		H000DGD9	320		8.07			
	1/25/90	H000DGF0	318	330	8.42	7.90	500 U	21.0
		H000DGF1	316		8.42		700 U	21.0
		H000DGF2	316		8.42		700 U	28.0
		H000DGF3	317		8.42		700 U	22.0
	3/19/90	H000DGF4	329		8.20			162.0
		H000DGF5	327		8.21			217.0
		H000DGF6	329		8.20			184.0
		H000DGF7	324		8.22			173.0
	5/01/90	H000DGF8	326		8.08			
	5/15/90	H000DGF9	330	337	8.17	7.80	1100	1160.0
		H000DGG0	329		8.18		1100	1160.0
		H000DGG1	330		8.18		1100	1240.0
		H000DGG2	329		8.18		1200	1260.0
	2/07/91	H000DGG3	321		8.53			
	4/18/91	H000DGG4	333		8.51			
		H000DGG5	333		8.48			
		H000DGG6	333		8.49			
		H000DGG7	333		8.50			

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 11 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-43-41E	6/28/91	H0007203	333	330	8.16	8.20	U	130.0
		H0007204		330		8.30	U	130.0
	9/11/91	B00LG3	331		8.15			
	1/23/92	B01QC3	321		8.67		1000 U	50.0 RA
	4/17/92	B065P4					1000 U	60.0 A
		B065P7					1000 U	50.0 A
		B065Q0					1000 U	50.0 A
		B065Q3					1000 U	50.0 A
	6/24/92	B06ZV3	323		8.31		1000 U	50.0 RA
		B06ZV5	322		8.32		1000 U	40.0 RA
		B06ZV7	323		8.32		1000 U	80.0 AF
		B06ZV9	322		8.32		1000 U	40.0 AF
	10/20/92	B07JQ1	318		8.74		1000 U	10.0 A
		B07JQ2	317		8.74		1000 U	20.0 A
		B07JQ3	318		8.74		1000 U	20.0 A
		B07JQ4	316		8.75		1000 U	30.0 A
	1/25/93	B07V09	323		8.81		1000 U	20.0 A
		B07V10	326		8.78		1000 U	20.0 A
		B07V11	319		8.76		1000 U	20.0 A
		B07V12	324		8.76		1000 U	10.0 A
	4/22/93	B08GN4	320		8.52	8.70		
		B08GN5	321		8.50			
		B08GN6	321		8.50			
		B08GN7	320		8.48			
699-43-41F	12/05/89	H000DGG8	318		8.09		400 U	19.0
		H000DGG9	324		8.10			
		H000DGH0	332		8.10			
		H000DGH1	321		8.09			
	1/25/90	H000DGH2	292	298	8.27	7.70	300 U	1.0 U
		H000DGH3	292		8.30		300 U	8.0 U
		H000DGH4	291		8.28		400 U	11.0
		H000DGH5	292		8.30		300 U	7.0 U
	4/18/90	H000DGH6	282	324	8.05	7.50	1100	1270.0
		H000DGH7	282		8.01		1200	1170.0
		H000DGH8	285		8.02		1200	1310.0
		H000DGH9	279		8.06		1000	998.0
	5/01/90	H000DGJ0	305		7.91			
	2/07/91	H000DGJ1	320		8.22			
	4/18/91	H000DGJ2	316		7.99			
		H000DGJ3	318		7.98			
		H000DGJ4	317		7.99			
		H000DGJ5	317		8.00			
	7/02/91	H00071Y5	314	320	8.21	8.00	U	23.0

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 12 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-43-41F	9/11/91	B00LG4	312		7.79			
	5/05/92	B065R0	307		8.10		1000 U	10.0 UA
		B065R3	306		8.08		1000 U	20.0 A
		B065R5	305		8.08		1000 U	20.0 A
		B065R7	307		8.07		1000 U	10.0 A
	6/25/92	B06ZW7	334		8.25		1000 U	50.0 RA
		B06ZW8	334		8.22		1000 U	10.0 URA
		B06ZW9	335		8.19		1000 U	10.0 URA
		B06ZX0	335		8.17		1000 U	10.0 URA
	10/21/92	B07JQ5	304		8.05		1000 U	10.0 A
		B07JQ6	301		8.03		1000 U	10.0 UA
		B07JQ7	302		8.04		1000 U	10.0 A
		B07JQ8	302		8.03		1000 U	10.0 UA
	1/22/93	B07V14	305		8.38		1000 U	10.0 UA
		B07V15	305		8.36		1000 U	10.0 UA
		B07V16	304		8.36		1000 U	10.0 UA
		B07V17	303		8.34		1000 U	10.0 UA
699-43-41G	1/23/92	B01T74	304		8.49		600	360.0 RA
	4/17/92	B065W1					1000 U	10.0 A
		B065W2					1000 U	10.0 A
		B065W3					1000 U	10.0 A
		B065W4					1000 U	10.0 A
	6/26/92	B07007	297		8.59		1000 U	10.0 UA
		B07008	300		8.58		1000 U	20.0 A
		B07009	298		8.59		1000 U	20.0 A
		B07010	298		8.58		1000 U	10.0 A
	10/28/92	B07JL8	295		8.71		1000 U	20.0 A
		B07JL9	292		8.71		1000 U	AD
		B07JM0	292		8.69		1000 U	AD
		B07JM1	291		8.70		1000 U	20.0 A
	1/25/93	B07V74	304		8.79		1000 U	10.0 UA
		B07V75	303		8.76		1000 U	10.0 UA
		B07V76	303		8.75		1000 U	10.0 UA
		B07V77	302		8.74		1000 U	10.0 UA
	4/27/93	B08GJ0	299		7.97			
		B08GJ1	299		7.98			
		B08GJ2	298		7.99			
		B08GJ3	299		7.99			
699-43-42J	11/22/88	H000DGP2	187		8.00		600 U	2.0 U
		H000DGP3	187		8.30		700 U	5.0 U
		H000DGP4	187		8.00		800 U	4.0 U
		H000DGP5	187		8.20		600 U	6.0 U
	2/24/89	H000DGP6	239	222	8.10	8.00	500 U	5.0 U

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 13 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-43-42J	2/24/89	H000DGP7	240		8.10		500 U	5.0 U
		H000DGP8	240		8.10		600 U	4.0 U
		H000DGP9	239		8.10		700 U	8.0 U
	6/15/89	H000DGQ0	228	233	7.97	8.20	500 U	2.0 U
		H000DGQ1	228		7.94		600 U	1.0 U
		H000DGQ2	228		7.94		600 U	.0 U
		H000DGQ3	228		7.95		500 U	2.0 U
	8/09/89	H000DGQ4	154	220	8.26	8.20	600 U	5.0 U
		H000DGQ5	153		8.23		600 U	6.0 U
		H000DGQ6	154		8.23		700 U	7.0 U
		H000DGQ7	154		8.24		600 U	3.0 U
	1/02/90	H000DGQ8	283		8.27			
	1/31/90	H000DGQ9	274	284	8.38	8.00	400 U	11.0
		H000DGR0	275		8.37		300 U	2.0 U
		H000DGR1	274		8.37		400 U	3.0 U
		H000DGR2	274		8.37		300 U	13.0
	7/02/91	H00071Y6	268	270	8.25	8.15	1100	U
	1/31/92	B01S49	292		7.99		1000 UD	10.0 UA
	2/25/92	B05Y96	295		8.00			
	6/25/92	B07012	314		8.26		1000 U	60.0 RA
		B07013	315		8.25		1000 U	30.0 RA
		B07014	314		8.24		1000 U	10.0 URA
		B07015	315		8.23		1000 U	20.0 RA
	10/22/92	B07JQ9	256		8.22		1000 U	10.0 UA
		B07JR0	259		8.22		1000 U	A
		B07JR1	259		8.22		1000 U	A
		B07JR2	259		8.21		1000 U	10.0 UA
	12/28/92	B07TH0	292		8.23			10.0 UA
		B07TH1	295		8.23			10.0 UA
		B07TH2	293		8.22			10.0 UA
		B07TH3	293		8.21			10.0 UA
		B07TH4						10.0 UA
		B07TH5						10.0 UA
		B07TH6						10.0 UA
		B07TH7						10.0 UA
	1/21/93	B07V19	302		8.08		1000 U	10.0 UA
		B07V20	296		8.11		1000 U	10.0 UA
		B07V21	300		8.13		1000 U	10.0 UA
		B07V22	298		8.15		1000 U	10.0 UA
699-43-43	11/21/88	H000DGR3	172		8.00		600 U	1.0 U
		H000DGR4	172		8.00		600 U	5.0 U
		H000DGR5	172		8.00		600 U	6.0 U
		H000DGR6	172		8.00		600 U	2.0 U

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 14 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-43-43	2/24/89	H000DGR7	217	195	7.80	8.10	600 U	1.0 U
		H000DGR8	214		7.80		500 U	6.0 U
		H000DGR9	214		7.70		500 U	8.0 U
		H000DGS0	214		7.80		600 U	1.0 U
	6/15/89	H000DGS1	193	213	7.70	8.20	600 U	2.0 U
		H000DGS2	193		7.74		500 U	1.0 U
		H000DGS3	193		7.74		600 U	.0 U
		H000DGS4	193		7.71		500 U	2.0 U
	8/09/89	H000DGS5	236	214	6.95	8.20	700 U	10.0
		H000DGS6	235		6.95		700 U	8.0 U
		H000DGS7	235		7.00		700 U	13.0
		H000DGS8	236		6.95		800 U	5.0 U
	1/26/90	H000DGS9	226	222	8.35	7.90	500 U	6.0 U
		H000DGT0	226		8.41		500 U	5.0 U
		H000DGT1	226		8.40		500 U	14.0
		H000DGT2	225		8.38		500 U	3.0 U
	4/26/90	H000DGT3	240		8.08			
	7/08/91	H00071Y7	217	220	8.14	7.35	U	U
	1/24/92	B01Q67	233		8.23		1000 U	10.0 UA
	4/22/92	B065N6					1000 U	10.0 UAD
		B065P0					1000 U	10.0 UAD
		B065P1					1000 U	10.0 UAD
		B065P3					1000 U	10.0 UAD
		B065P6					1000 U	10.0 UAD
	6/26/92	B06ZS7	240		8.11		1000 U	10.0 A
		B06ZS8	240		8.16		1000 U	10.0 UA
		B06ZS9					1000 U	10.0 UA
		B06ZT0					1000 U	10.0 UA
		B070W0	240		8.11		1000 U	30.0 A
		B070W1	240		8.11			
	10/26/92	B07JG5	254		8.14		1000 U	10.0 UA
		B07JR3	253		8.13		1000 U	10.0 UA
		B07JR4	251		8.13		1000 U	10.0 UA
		B07JR5	252		8.12		1000 U	10.0 UA
	1/13/93	B07V24	237		8.11		1000 U	10.0 UA
		B07V25	241		8.14		1000 U	10.0 UA
		B07V26	241		8.14		1000 U	10.0 UA
		B07V27	238		8.15		1000 U	10.0 UA
699-43-45	12/06/89	H000DGT4	210		7.92		500 U	1.0 U
		H000DGT5	210		7.93			
		H000DGT6	210		7.93			
		H000DGT7	210		7.93			
	1/26/90	H000DGT8	234	241	8.15	7.80	500 U	3.0 U

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 15 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-43-45	1/26/90	H000DGT9	233		8.14		400 U	10.0
		H000DGV0	234		8.15		400 U	6.0 U
		H000DGV1	232		8.14		500 U	2.0 U
	4/18/90	H000DGV2	242	257	8.04	8.10	400 U	2.0 U
		H000DGV3	244		8.07		400 U	2.0 U
		H000DGV4	240		8.06		500 U	4.0 U
		H000DGV5	241		8.05		400 U	3.0 U
	4/29/90	H000DGV6	286		8.09			
	7/08/91	H00071Y8	238	240	8.15	8.05	U	U
	9/11/91	B00LG5	235		8.15			
	1/24/92	B01QD0	226		9.15		700	10.0 UA
	4/22/92	B065N8					1000 U	10.0 UAD
		B065Q2					1000 U	20.0 AD
		B065Q5					1000 U	10.0 UAD
		B065Q7					1000 U	10.0 AD
		B065Q9					1000 U	10.0 UAD
	6/26/92	B06ZT2	236		8.12		1000 U	10.0 UA
		B06ZT3	236		8.13		1000 U	10.0 UA
		B06ZT4	235		8.11		1000 U	10.0 UA
		B06ZT5	234		8.11		1000 U	10.0 UA
		B070W2					1000 U	20.0 A
	10/26/92	B07JG7	243		7.99		1000 U	10.0 UA
		B07JR6	244		7.99		1000 U	10.0 UA
		B07JR7	242		7.98		1000 U	10.0 UA
		B07JR8	243		7.98		1000 U	10.0 UA
	1/13/93	B07V29	228		8.04		1000 U	10.0 UA
		B07V30	229		8.03		1000 U	10.0 UA
		B07V31	230		8.04		1000 U	10.0 UA
		B07V32	232		8.04		1000 U	10.0 UA
	4/26/93	B08DC0	199		8.08			
		B08GQ7	204		8.08			
		B08GQ8	205		8.08			
		B08GQ9	205		8.08			
699-44-39B	1/08/93	B07WK1	199		8.24		1000 U	10.0 UA
		B07WK2	200		8.24		1000 U	10.0 UA
		B07WK3	201		8.25		1000 U	10.0 UA
		B07WK4	200		8.25		1000 U	10.0 UA
	4/26/93	B08GJ5	192		7.81			
		B08GJ6	192		7.81			
		B08GJ7	192		7.81			
		B08GJ8	190		7.83			
699-44-42	11/21/88	H000DHK2	182		8.00		600 U	3.0 U
		H000DHK3	181		8.20		700 U	4.0 U

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 16 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-44-42	11/21/88	H000DHK4	182		8.20		600 U	2.0 U
		H000DHK5	182		8.20		600 U	2.0 U
	2/17/89	H000DHK6	240	222	7.60	8.10	1800 U	5.0 U
		H000DHK7	239		7.60		1700 U	2.0 U
		H000DHK8	240		7.60		1800 U	5.0 U
		H000DHK9	239		7.60		1900 U	6.0 U
	6/15/89	H000DHL0	188	217	7.82	8.20	600 U	2.0 U
		H000DHL1	188		7.64		600 U	23.0
		H000DHL2	188		7.69		600 U	2.0 U
		H000DHL3	189		7.73		600 U	4.0 U
	8/08/89	H000DHL4	226	231	8.12	7.40	800 U	2.0 U
		H000DHL5	222		8.11		700 U	3.0 U
		H000DHL6	223		8.11		800 U	2.0 U
		H000DHL7	224		8.11		800 U	4.0 U
	1/31/90	H000DHL8	227	238	8.35	7.90	500 U	2.0 U
		H000DHL9	228		8.39		500 U	2.0 U
		H000DHM0	228		8.40		500 U	7.0 U
		H000DHM1	228		8.38		500 U	4.0 U
	4/26/90	H000DHM2	244		8.12			
	7/10/91	H00071Y9	233	240	8.20	8.10	U	U
	1/31/92	B01S52	323		8.13		1000 UD	20.0 RA
	2/25/92	B05Y97	240		7.87			
	6/25/92	B07017	244		8.08		1000 U	20.0 A
		B07018	243		8.08		1000 U	20.0 A
		B07019	243		8.08		1000 U	30.0 A
		B07020	241		8.07		1000 U	20.0 A
	10/22/92	B07JR9	227		8.25		1000 U	10.0 UA
		B07JS0	228		8.25		1000 U	20.0 A
		B07JS1	227		8.29		1000 U	10.0 UA
		B07JS2	228		8.28		1000 U	10.0 A
	1/13/93	B07V34	256		8.32		1000 U	10.0 UA
		B07V35	253		8.30		1000 U	10.0 UA
		B07V36	250		8.28		1000 U	10.0 A
		B07V37	250		8.27		1000 U	10.0 A
		B07V38					1000 U	10.0 UA
		B07V39					1000 U	10.0 UA
		B07V40					1000 U	10.0 UA
		B07V41					1000 U	10.0 UA
	4/26/93	B08GP6	239		7.96			
		B08GP7	240		7.97			
		B08GP8	240		7.97			
		B08GP9	240		7.97			
699-44-43B	12/20/89	H000DHM3	298		8.19		400 U	3.0 U

Table 5-3. Results of Indicator Parameter Analyses.
(sheet 17 of 17)

Well Name	Collection Date	Sample Number	COND FIELD uMho 1/.	COND LAB uMho 1/.	pH FIELD .01/6.5-8.5s	pH LAB .01/6.5-8.5s	TOC ppb 1000/.	TOX ppb 10/.
699-44-43B	12/20/89	H000DHM4	301		8.20			
		H000DHM5	299		8.20			
		H000DHM6	298		8.20			
	1/26/90	H000DHM7	321	309	8.44	7.90	300 U	2.0 U
		H000DHM8	320		8.47		300 U	15.0
		H000DHM9	320		8.46		300 U	3.0 U
		H000DHN0	322		8.44		300 U	1.0 U
	4/18/90	H000DHN1	261	309	8.28	7.90	500 U	2.0 U
		H000DHN2	245		7.91		300 U	4.0 U
		H000DHN3	243		7.89		300 U	1.0 U
		H000DHN4	246		7.90		400 U	3.0 U
	4/26/90	H000DHN5	305		8.09			
	7/08/91	H00071Z0	281	290	8.13	8.00	U	U
	9/11/91	B00LG6	285		8.28			
	1/23/92	B01Q69	288		8.48		1000 U	10.0 UA
	4/20/92	B065W9					1000 UD	10.0 A
		B065X1					1000 UD	10.0 UA
		B065X3					1000 UD	10.0 UA
		B065X4					1000 UD	10.0 UA
	6/26/92	B07022	287		8.28		1000 U	10.0 UA
		B07023	287		8.25		1000 U	10.0 UA
		B07024	287		8.25		1000 U	10.0 UA
		B07025	287		8.25		1000 U	10.0 UA
	10/22/92	B07JS3	259		8.18		1000 U	10.0 UA
		B07JS4	358		8.19		1000 U	10.0 UA
		B07JS5	258		8.19		1000 U	10.0 UA
		B07JS6	257		8.19		1000 U	10.0 UA
	1/27/93	B07V44	295		7.80		1000 U	10.0 UA
		B07V45	293		7.79		1000 U	10.0 UA
		B07V46	293		7.77		1000 U	10.0 UA
		B07V47	293		7.77		1000 U	10.0 UA
	4/26/93	B08GQ0	281		7.82			
		B08GQ1	282		7.84			
		B08GQ2	282		7.86			
		B08GQ3	283		7.86			

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Table 5-4. Estimated Background Levels for Selected Constituents in Hanford Ground Water (Evans et al. 1989). (sheet 1 of 2)

Constituent	Detection limit[a]	Background concentration[a]
Aluminum	2[b]	<2[b]
Ammonia	50	<50
Arsenic	0.2[b]	3.9 ± 2.4[b]
Barium	6	42 ± 20
Beryllium	0.3[b]	0.3[b]
Bismuth	0.02[b]	0.02[b]
Boron	50[b]	<50[b]
Cadmium	0.2[b]	0.02[b]
Calcium	50	40,400 ± 10,300
Chloride	500	10,300 ± 6,500
Chromium	2[b]	4.0 ± 2.0[b]
Copper	1[b]	<1[b]
Cyanide	10	<10
Fluoride	500	370 ± 100
Lead	0.5[b]	<0.5[b]
Magnesium	10	11,800 ± 3,400
Manganese	5	7 ± 5
Mercury	0.1	<0.1
Nickel	4[b]	<4[b]
Phosphate	1,000	<1,000
Potassium	100	4,950 ± 1,240
Selenium	2[b]	<2[b]
Silver	10	<10
Sodium	10	18,260 ± 10,150
Strontium	20	236 ± 102
Sulfate	500	34,300 ± 16,900
Uranium	0.5[c]	1.7 ± 0.8[c]
Vanadium	5	17 ± 9
Zinc	5	6 ± 2

Table 5-4. Estimated Background Levels for Selected Constituents in Hanford Ground Water (Evans et al. 1989). (sheet 2 of 2)

Constituent	Detection limit[a]	Background concentration[a]
Alkalinity	--	123,000 ± 21,000
pH	--	7.64 ± 0.16
Total organic carbon	200	586 ± 347
Conductivity	1[d]	380 ± 82[d]
Gross alpha	0.5[c]	2.5 ± 1.4[c]
Gross beta	4[c]	19 ± 12[c]
Radium	0.2[c]	0.2[c]

[a]Units in ppb unless otherwise noted. Uncertainties are ± one standard deviation.
[b]Based on ICP/MS data.
[c]Units in pCi/L.
[d]Units in μmho/cm.

6.0 CLOSURE PERFORMANCE STANDARDS 6-1

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FIGURE

6-1. RCRA Closure Logic Flow Diagram F6-1

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6.0 CLOSURE PERFORMANCE STANDARDS

This chapter describes how closure of the 216-B-3A, 216-B-3B, and the 216-B-3C Ponds will meet the closure requirements of WAC 173-303-610.

6.1 CLOSURE STRATEGY

The strategy is to clean close the three expansion ponds. After 'Clean closure', as used in this context, no dangerous waste or dangerous waste contaminated soil, structures, or equipment that pose a threat to human health or the environment will remain onsite.

6.1.1 Closure Strategy for the Expansion Ponds

The proposed strategy for closure of the expansion ponds is clean closure. Clean closure of the 3A, 3B, and 3C Ponds is contingent upon verification that constituents remaining in the vadose zone and originating from disposal of dangerous waste in the ponds are not present in concentrations that represent a threat to human health or the environment. The possibility of detecting dangerous waste contamination in the ponds was low because (1) the ponds have been in use for a relatively short period of time and (2) administrative and physical controls have been implemented to eliminate the potential for inadvertent disposal of dangerous waste.

Figure 6-1 presents the logic used to assess the closure options for the three expansion ponds. This diagram is based on information obtained from vadose zone soil and sediment sampling. Soil sampling and analysis were conducted as described in Chapter 7.0. Analytical results were evaluated to identify any potential constituents of concern. Constituents of concern are those constituents derived from dangerous waste disposal activities that statistically exceed background levels.

Action levels were based on background and health-based limits. The term 'action levels', as used here, refers to concentration thresholds that should not be exceeded in soil for clean closure. A discussion on the determination of action levels is presented in Chapter 7.0, Section 7.1.1. Concentrations of constituents of concern were compared with background levels and health-based levels. As no constituents detected above background levels were present in levels greater than the health-based action levels, no remedial actions are proposed.

Because the analytical results from the sampling efforts at the expansion ponds and the B-Pond System showed that dangerous waste constituents of concern were below action levels, no additional analyses at the structures are planned. The structures will be removed and disposed of in a manner based on the results of radiation surveys.

A groundwater monitoring network has been installed around B Pond to assess the impact of waste-disposal practices on the uppermost aquifer

underlying B Pond. Based on the results of groundwater monitoring, it appears that there are no dangerous waste constituents present at levels of concern.

6.2 MINIMIZE NEED FOR FURTHER MAINTENANCE

The closure performance standard in WAC 173-303-610(2)(a)(i) requires the owner or operator of a TSD facility to close the facility in a manner that minimizes the need for further maintenance.

As discussed in Section 6.1, the primary strategy for closure of the 216-B-3A, -3B, and -3C Ponds is clean closure. Because the three expansion ponds are being clean closed, RCRA requirements to monitor sediments and subsoils for dangerous waste contaminants within these portions of the TSD unit will be eliminated. Waste water streams routed to the B Pond expansion ponds will continue to be sampled upstream of the percolation ponds. A separate plan for characterizing liquid effluents at the Hanford Site and evaluating the potential for migration of contaminants within disposal-site soils (including B Pond) has been prepared for the DOE by Westinghouse Hanford (Sommer et al. 1989).

Because B Pond is located within the 200-BP-11 operable unit, facility maintenance, radiation monitoring, and groundwater monitoring activities all must be continued at least until the operable unit remediation/closure has been completed.

If there are concerns over any radioactive contamination at the expansion ponds, interim stabilization will be performed. This is expected to be a possibility for the 216-B-3A Pond only. Interim stabilization actions are designed to (1) isolate and immobilize radiological contaminants within subject portions of the facility pending final closure and, (2) minimize maintenance requirements while strategies are developed for final closure/remediation of the 200-BP-11 operable unit. Personnel at the Hanford Site have had extensive experience with the technique of stabilizing sites by installing an interim cover of clean, coarse soil over contaminated surface soils. Some level of maintenance is associated with any stabilization method. With the proposed technique, (Chapter 7.0, Section 7.?) maintenance requirements are envisioned to consist of surveillance with possible minor repairs. Surveillance would ensure that the objectives of isolation and immobilization of waste are not compromised by processes such as erosion, animal intrusion, uptake of contaminants by vegetation, and upward migration of contaminants by capillary movement of soil moisture. Minimal maintenance requirements (other than surveillance) are expected.

Groundwater monitoring wells within the 200-BP-11 operable unit must be maintained, at least through the CERCLA operable unit activities, to ensure the continuity of groundwater monitoring. The types of activities that may be required to maintain the wells include inspection and repair of the sample pumps and flushing of screens to ensure an adequate flow of water into the wells.

6.3 PROTECT HUMAN HEALTH AND THE ENVIRONMENT

The performance standard in WAC 173-303-610(2)(a)(ii) requires the owner or operator of a TSD facility to close the facility in a manner that controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, postclosure escape of dangerous waste, dangerous constituents, leachate, contaminated run-off, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere. In addition, WAC 173-303-650(6)(a) requires the owner or operator to:

- Remove or decontaminate all dangerous waste and dangerous waste residues, contaminated containment system components (e.g., liners), contaminated subsoils, and structures and equipment contaminated with dangerous waste and leachate and managed as dangerous waste

- Close as a landfill by eliminating free liquids, stabilizing remaining waste, and covering the surface impoundment with a final cover; and comply with postclosure requirements.

The following describes how the requirements of WAC 173-303-650(6)(a) and WAC 173-303-610(2)(a)(ii) will be accomplished.

The 3A, 3B, and 3C Ponds are to be clean closed. Consistent with this intent and strategy, it was determined that the following actions would be performed before certification of clean closure.

- Sample bottom sediments, subsoils, and associated structures to determine the specific nature and extent of residual dangerous waste contaminants.

- Remove soil from the expansion ponds, as necessary, to reduce contaminant concentrations to within proposed action levels for all dangerous waste contaminants that are present.

- Remove and dispose of associated structures.

Based on the results of the three sampling efforts associated with characterization of the 3A, 3B, and 3C Ponds, these ponds are to be clean closed. These sampling efforts are described in Chapter 7.0, Section 7.1. The results of these sampling efforts indicate that no contaminants of concern are present in concentrations above action levels.

Closure of the 216-B-3 Pond and the 216-B-3-3 Ditch is being addressed within the scope of the 200-BP-11 operable unit integrated WP/CP.

6.4 RETURN LAND TO THE APPEARANCE AND USE OF SURROUNDING LAND AREAS

In accordance with WAC 173-303-610(2)(a)(iii), the owner or operator of a TSD facility is required to close the facility in a manner that returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

Clean closure is the proposed closure strategy for the three expansion ponds (3A, 3B, and 3C). After Ecology accepts certification of clean closure, the DOE-RL intends to continue to use the expansion ponds to dispose of nondangerous waste water from facilities in the 200 East Area. Therefore, no site reclamation actions are planned.

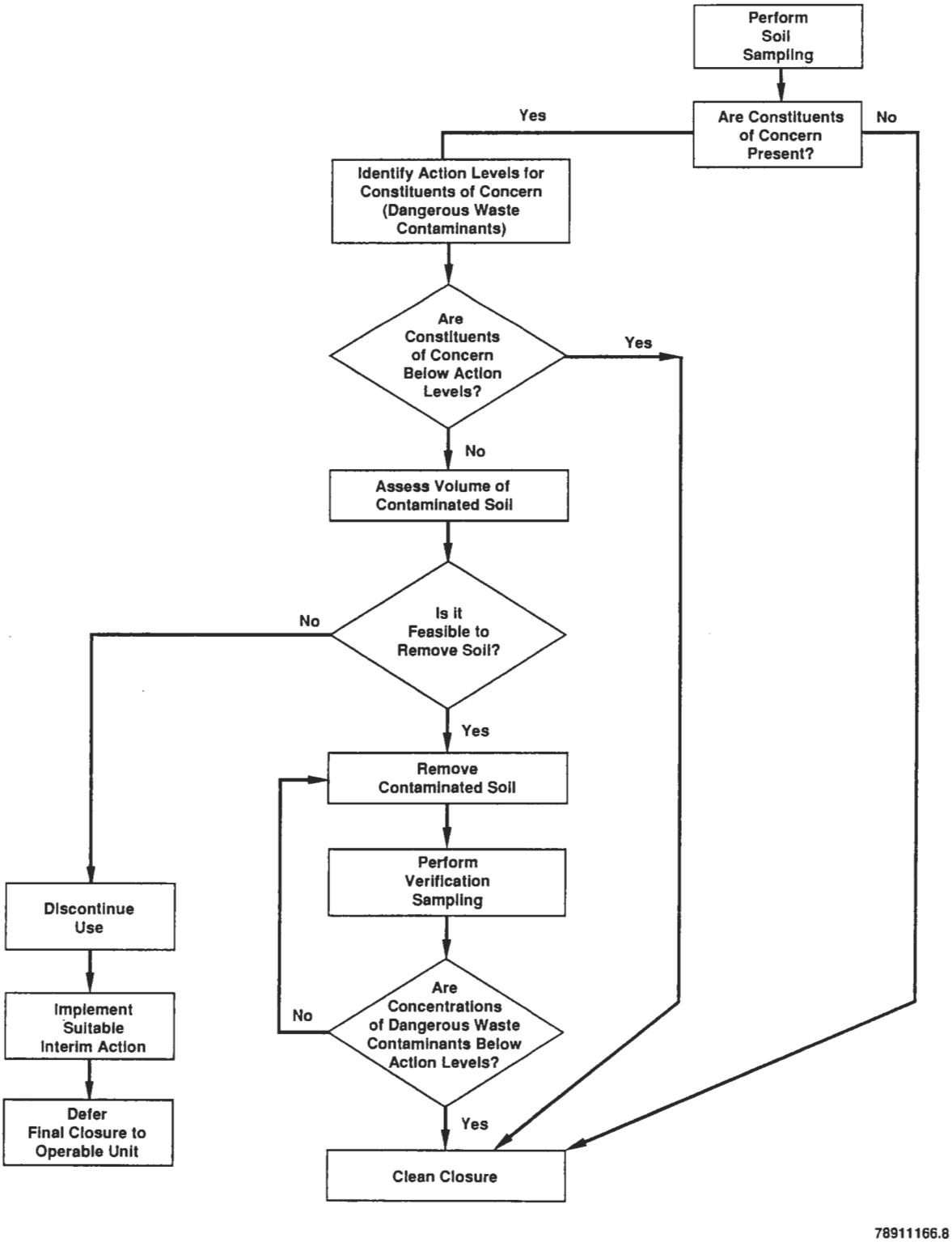

Figure 6-1. RCRA Closure Logic Flow Diagram.

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7.0 CLOSURE ACTIVITIES

This chapter discusses the activities that have been or will be conducted during closure of the 216-B-3 Pond System. The following summarizes the closure activities for the 3A, 3B, and 3C expansion ponds.

- Sample and analyze the pond soil and sediment to assess the presence and possible extent of contamination. If the pond soil is not contaminated with dangerous waste constituents, no further action will be required to achieve clean closure. Soil sampling and analysis are discussed in Section 7.1.1.

- The engineered structures associated with the ponds will be removed. If the structures are left in place the gate valves will be welded in the closed position. Disposition of structures is discussed in Section 7.2.

- Interim stabilize the 3A Pond, if necessary, to isolate and immobilize radioactive contaminants. Interim stabilization is discussed in Section 7.3.

- Certify closure upon completion of closure activities. Certification of closure is discussed in Section 7.7.

Based on the results of the sampling and analysis activities described in Section 7.1, clean closure was selected for the 216-B-3A, 216-B-3B, and 216-B-3C Ponds.

Groundwater monitoring activities will be conducted to assess the impact of disposal practices on the uppermost aquifer. Groundwater monitoring activities are discussed in Chapter 5.0.

7.1 SOIL AND SEDIMENT SAMPLING

A phased approach was used in the analyses of the soil and sediment of the expansion ponds. This approach allows information from earlier phases to be considered in the design of subsequent samples efforts. Sampling consisted of three phases. Phase 1 sampling, completed in 1989, consisted of initial surface soil and sediment sampling in the expansion ponds, the 216-B-3 Pond and in the 216-B-3-3 Ditch. Phase 2 sampling, completed in 1992, was an additional surface soil and sediment sampling effort. Phase 2 sampling was limited to the expansion ponds and was used to confirm the results of the Phase 1 sampling effort and verification for clean closure. Phase 3 sampling, completed in 1991 prior to Phase 2 sampling, consisted of subsurface (vadose zone) soil and sediment sampling beneath the three expansion ponds. The data generated were used to provide a technical assessment of whether dangerous waste discharges at the expansion ponds have contaminated the surrounding soil and sediment. Based on the results of this phased sampling effort clean closure was chosen for the 216-B-3A, 216-B-3B, and 216-B-3C Ponds.

7.1.1 Soil Sampling and Analysis Plan

7.1.2 Phase 1 Sampling

Phase 1 sampling was conducted between August and September of 1989. Sampling objectives, analytical parameters, the sampling methodology, and numbers, types, and locations of samples collected during Phase 1 are described in the following sections.

7.1.2.1 Phase 1 Sampling Objectives. The purpose of Phase 1 (Appendix C) characterization was to gather initial information on the constituents of concern in the surface soils and sediments of the entire 216-B-3 Pond System (216-B-3 Pond, 216-B-3A Pond, 216-B-3B Pond, 216-B-3C Pond, and the 216-B-3-3 Ditch). It was envisioned that information from Phase 1 sampling would be used to plan and carry out subsequent phases of sampling. As this was an initial scoping investigation, it was envisioned that additional requirements for surface sampling and analysis for the constituents of concern might be identified based on the results obtained from this initial phase.

The following were specific objectives of Phase 1.

- Assess surface soil and sediment contamination within the 216-B-3 Pond, the 216-B-3-3 Ditch, and the expansion ponds.
- Identify constituents of concern.
- Establish local background values.
- Calculate rough estimates of variability for these constituents.

7.1.2.2 Analytical Parameters. The available information concerning past waste disposal practices relative to the 216-B-3 Pond System indicates that inorganic constituents, including metals, certain ions, and radioisotopes, are the most potentially significant contaminants of concern. Therefore, individual soil samples were analyzed mainly for inorganic constituents, including metals and radionuclides (Table 7-1), but screening also was carried out for organic constituents, including pesticides and PCBs.

Composite samples were analyzed for the parameters listed in Table 7-2. Tables 7-1 and 7-2 together include the constituents on the 40 CFR 264 Appendix IX list of dangerous constituents. This list has been formulated by the EPA to represent the dangerous waste constituent list of compounds for which standardized testing procedures are available. The Appendix IX list accounts for the alteration and/or degradation of dangerous waste constituents following their release to the environment, and primarily includes organics. Many of these analytes were not expected to be present, as organics were not the primary chemical constituents used by the operating facilities that discharged to the 216-B-3 Pond System. However, many of the 200 East Area facilities have discharged waste water to the B Pond System since the 1940's and 1950's, and detailed records concerning the types and quantities of chemicals discharged were not maintained. Therefore, the analytical parameter

list included Appendix IX constituents to verify that they are not present in the pond soils in concentrations that would represent threats to human health or the environment.

All samples collected during Phase 1 were field screened onsite with hand-held instruments for radiological constituents and organic vapors. Background samples were analyzed for the inorganic parameters listed in Tables 7-1 and 7-2. Quality assurance split and duplicate samples were subjected to the same analyses as the original samples. Equipment blanks were analyzed for all parameters listed in Tables 7-1 and 7-2.

7.1.2.3 Sampling Methodology. Random sample locations were assigned by projecting a sampling grid over each area to be sampled. The grid spacing for the 216-B-3A and -3B Ponds was 50 feet; a 100-foot linear spacing was used for the 216-B-3C Pond. Sample locations were selected using a random number process. Random sample locations for the three expansion ponds are shown in Figures 7-1 and 7-2. The random locations were supplemented with biased sample locations to ensure that adequate numbers of samples would be taken in areas of greatest suspected contamination.

7.1.2.3.1 Numbers, Types, and Locations of Samples from 216-B-3A Pond. The 3A Pond, currently filled with overflow water from the 216-B-3 Pond, was sampled as two blocks: (1) the trench within the pond and (2) the pond outside the trench. The trench was sampled in three locations and the pond outside the trench was sampled in four locations (Figure 7-1). Random sample location pairs are (7,15), (10,17), (4,18), and (9,16) for the pond and (4,7), (6,13), and (6,17) for the trench. One composite sample was collected from each of the sampling blocks. Twelve samples were collected as follows:

- Seven random samples selected within the blocks
- Two composite samples--one from the trench and one from the sediments outside the trench. (A composite sample is a combination of splits from individual samples.)
- One split sample
- One duplicate sample
- One equipment blank.

7.1.2.3.2 Numbers, Types, and Locations of Samples from 216-B-3B Pond. The 3B Pond had a series of percolation trenches excavated in the bottom and it was filled with water as recently as 1985. Since that time, the bottom has been excavated and several feet of soil have been removed. The pond has not been used since the excavation; however, small quantities of water have been discharged to the 3B Pond as a result of seepage through the overflow control structure between the 3A and 3B Ponds. Other small discharges to 3B Pond have occurred as a result of wave action over-topping the central structure between 3A and 3B Ponds during high-wind conditions. Because disturbance of the pond bottom has obscured original depositional patterns, a simple random sampling

approach was used. Five random samples were taken in the 3B Pond (Figure 7-1). Random sample location pairs are (9,12), (3,12), (9,11), (9,1), and (11,1). Nine samples were collected as follows:

- Five random samples
- One composite sample made up of splits from individual samples
- One split sample
- One duplicate sample
- One equipment blank.

7.1.2.3.3 Numbers, Types, and Locations of Samples from 216-B-3C Pond. The 216-B-3C Pond covers approximately 41 acres. Percolation trenches were excavated in the bottom. Only the percolation trenches have received water and only a portion of the trenches routinely are wetted. As shown in Figure 7-2, each of the eight approximately 2,200-foot trenches was randomly sampled once--at 1,300, 900, 300, 1,200, 1,800, 2,100, 400, and 500 feet, respectively--counting from the northwest corner. Two composite samples were taken: one from splits of samples taken in the wetted portions of the trenches and one from splits of samples taken in the dry portions of the trenches. Thirteen samples were collected as follows:

- One sample from a random location in each of the trenches (8 samples total)
- Two composite samples made up of splits from individual samples
- One split sample
- One duplicate sample
- One equipment blank.

7.1.2.3.4 Local Background Samples. Background soil samples were collected as a part of Phase 1 sampling to establish local background threshold values for comparison with the 216-B-3 Pond System soil constituent concentrations. No additional background sampling was performed in conjunction with Phases 2 or 3.

Background soil samples were taken from the surface sediments in the 216-E-28 Contingency Pond because it has not received influent and is located near the 216-B-3 Pond System in the same geologic formation at a similar depth. Additional background samples were collected from other undisturbed locations, as shown in Figure 7-3. Background samples collected from multiple locations provide an estimate of the variability of background levels in the area. Sample locations and numbers of samples were selected on best professional judgment. Twelve samples were collected as follows:

- Five random samples from the contingency pond
- Five samples selected to form a rough perimeter of B Pond
- One split sample

- One duplicate sample

- Zero equipment blanks--Equipment blanks usually are taken one per sampling day and were included in previous totals.

7.1.2.4 Analytical Methods and Analytical Quality Assurance and Quality Control. Phase 1 samples were analyzed in accordance with SW-846 methods (EPA 1986b) when available. Contract analytical services for dangerous waste constituents in environmental media were performed as stipulated in the contractor's laboratory procedures and quality assurance and quality control manuals. The contractor was directed to conform to EPA-approved methods when available. Quality assurance and quality control procedures were reviewed and precision and accuracy (bias) values were provided to be met by the contractor laboratory.

7.1.2.5 Summary of Phase 1 Analytical Results. The following information is excerpted from *Phase I Characterization of the 216-B-3 Pond System* (Kramer 1991), which is incorporated into this closure plan as Appendix C. Local Background samples were taken from the 216-E-28 Contingency Pond and from another group of sites in native sagebrush habitat peripheral to 216-B-3 Pond. The two background sample populations were found to be statistically dissimilar. For example, calcium values for the Contingency Pond samples ranged from 6,830 to 9,923 ug/g (mean 8,700 coefficient of variation 17.2%), whereas calcium in samples from the B Pond vicinity ranged from 3,172 to 3,872 ug/g (mean 3,555 coefficient of variation 8.02%). Values from the sagebrush sites were used as the primary comparative basis for defining local background threshold. Values from Contingency Pond samples are reported as alternative background limits.

Determinations of most background analytes were accepted as normally distributed. Ammonium values were best characterized as having a log-normal distribution. The distributions of zinc and zirconium values were neither normal or log-normal.

Phase 1 samples from the 3A, 3B, and 3C Ponds did not contain any organic constituents of interest (including volatiles, semivolatiles, herbicides, pesticides, and/or PCBs) in meaningful quantities, although a number of common laboratory contaminants were reported. None of the samples from the three expansion ponds exhibited elevated levels of metals or ions relative to local (primary or alternative) background values.

7.1.3 Phase 2 Sampling

Phase 2 was designed to provide supplemental sampling, as necessary, to develop a more complete assessment of surface soil and sediment contamination within the 3A, 3B, and 3C expansion ponds. Phase 2 sampling and analysis was performed following Phase 1 and Phase 3. Phase 2 sampling was conducted between August and September of 1992. Sampling objectives, analytical parameters, the sampling methodology, and numbers, types, and locations of samples collected during Phase 2 are described in the following sections. The

discussion of Phase 2 sampling and analysis is excerpted from *Phase 2 Characterization of the 216-B-3A, -3B, and -3C Expansion Ponds* (Blumenkranz 1993), which is included as Appendix D of this closure plan.

7.1.3.1 Phase 2 Sampling Objectives. Phase 2 sampling was carried out, in part, to substantiate the conclusions of Phase 1. Ecology had expressed concerns over the quality control and data validation associated with the Phase 1 analytical data. Documentation from the contractor laboratory was insufficient to perform the level of data validation requested by Ecology.

7.1.3.2 Analytical Parameters. As in Phase 1, individual soil samples were analyzed primarily for inorganic constituents, including metals and radionuclides (Table 7-3), but samples also were screened for organic constituents, including pesticides and PCBs. Trip blanks were analyzed for volatile organics only. The samples were analyzed by Roy F. Weston Laboratory in Lionville, Pennsylvania. TMA/NORCAL in Richmond, California, analyzed split samples.

7.1.3.3 Sampling Methodology. Because of the different nature of the 3A, 3B, and 3C Ponds, each pond was sampled as a separate entity. However, a common sampling strategy was applied to all of the ponds. Three sample locations were identified for each pond, as follows:

- One sample was collected at the influent point of each pond. This location would be expected to be contaminated with any heavy solids that might be present.

- A second sample was collected from the deepest point in the pond. Should any contamination be present, light materials and fines would be expected to accumulate at this point.

- A third sample was collected at a point expected to contain high levels of the analytes of concern (relative to other locations), as determined by an evaluation of Phase 1 sample results (WHC 1991) and by field observation.

In the 3A and 3C Ponds, which are currently receiving waste water, the location of the second (deepest) sample point was determined by measuring the water depth visually and then confirming the relative depth with a probe. The probe consisted of conduit pipe with marks at 1-foot increments.

Additionally, while this sampling event focused on soil and sediments at the 216-B-3 Pond System, at the request of Ecology, water samples were taken from the two active (wet) ponds.

Samples were collected in the same manner as in Phase 1. The sampling equipment utilized included a long pole and a 3.25-inch by 12-inch soil recovery auger. Multiple borings were necessary to obtain sufficient quantities of material for all of the indicated analyses. These were commingled in a stainless steel bowl prior to allocation to individual sample containers. Stainless steel shovels were used to collect samples in the northern portion of 3C Pond, near the infuent point. Stainless steel

scoopulas, spoons, bowls, shovels, and augers were prepared for use in accordance with Environmental Investigation Instruction 5.5, "Decontamination of Equipment for RCRA/CERCLA Sampling" (WHC-CM-4-10). Sample media were monitored for radiation. Flat-bottomed aluminum boats were used as a floating sample platform to collect samples from the 3A Pond.

7.1.3.3.1 Numbers, Types, and Locations of Samples from 216-B-3A Pond. Sample locations are shown in Figure 3 of Appendix D. In the 3A Pond, the first soil sample taken at the influent point where water from 216-3-B Pond enters the 3A Pond. Water samples also were taken at this location. A second soil/ sediment sample was taken from the deepest portion of the pond. This point is located at the north end of the trench excavated into the bottom of the pond. A water sample was also taken in this vicinity. A third soil/sediment sample was taken at the east side of the pond, near the transfer structure to 3B Pond. The thickest accumulation of sediment was identified at this location.

7.1.3.3.2 Numbers, Types, and Locations of Samples from 216-B-3B Pond. Because this pond is currently not in service, the bottom soils/sediments are exposed and directly accessible for sampling. Due to previous excavation activities, the "deepest point" of the 3B Pond could not be determined. One sample of soil/sediment was taken near the inlet structure to the pond, approximately 10 feet to the east of the designated surface contamination area. A second sample point was located approximately 100 feet east and 15 feet south of the inlet. The slope of the pond bottom suggested that settleable contaminates likely would have been deposited in this vicinity when the pond was in use. Discrete samples of the surface soil and the underlying soils were taken at this point.

7.1.3.3.3 Numbers, Types, and Locations of Samples from 216-B-3C Pond. Three samples were collected from 3C Pond. The high inflow rate to 3C Pond made sampling in the immediate vicinity of the inlet structure impractical. The first point sampled was located 70 feet downstream and 15 feet north of the inlet structure. This area was characterized by heavy sedimentation. A water sample also was taken at this location. A second set of soil/sediment samples was taken at the intersection of the third north/south trench and the main east/west feed trench. Based on visual inspection, this location was determined to be the deepest point in the pond. A third sample, consisting of dry sediments, was collected from the fourth trench at a point approximately 100 feet south of the feed trench.

7.1.3.4 Analytical Methods and Analytical Quality Assurance and Quality Control. A water sample duplicate and split were taken at the 3A Pond. A soil/sediment sample duplicate and split were taken at the 3B Pond for chemical and radiological analyses. Two equipment blanks were prepared, one for water matrix and one for soil matrix. Water matrix trip blanks were included in all sample shipping containers. Trip blanks of clean silica sand were included in all shipments of soil/sediment samples. Trip blanks were analyzed for volatile organics only.

As indicated in Table 7-3, Phase 2 samples were analyzed by SW-846 methods (EPA 1986b) when available. Metals were analyzed either by the

inductively coupled plasma (ICP) method or the graphite furnace atomic absorption method. Determinations for gross radioactivity and for strontium-90 followed laboratory-specific procedures; there are no SW-846 methods for radiological analyses.

The analytical results were subjected to data validation in accordance with the RCRA procedure (level B) in the *Sample Management and Administration Manual* (WHC 1990). Data validation included a review of the following quality control elements reported by the contractor laboratories in data deliverables:

- Holding times
- Blank analyses
- Surrogates
- Matrix spikes
- Duplicates.

All data received from the Weston laboratory were determined to be acceptable with the exception of the initial semi-volatile organic analysis of one sample, which was qualified as unusable due to low surrogate recovery. This sample was re-extracted and reanalyzed.

All holding time criteria were met for both water and soil samples analyzed by Weston with the exception of semi-volatile and pesticide/PCB extraction criteria (exceeded by one day) for one sample.

Weston prepared and analyzed laboratory blanks for both soil and water sample matrices. Analyses of the blanks identified the following potential laboratory contaminants:

- Volatile organics
  - Acetone (soil blanks only)
  - Methylene chloride

- Semivolatile organics
  - Di-n-butylphthalate
  - Bis-(2-ethylhexyl)-phthalate

- Metals
  - Copper, lead, and zinc.

Compounds detected in the organics blanks were below the contract-required quantitation limit and are estimated values. Analytes detected in the metals blanks were at levels less than the contract-required detection limit. When evidence of blank contamination was present, blank validation criteria were applied to determine appropriate qualification for associated sample results.

Weston prepared and analyzed matrix spike samples and reported the results as percent recovery as an indication of accuracy. Spiked sample results were generally within control limits for percent recovery. Matrix spike recovery for thallium, lead, and silver were low in one or more of the Weston delivery groups. Weston also analyzed surrogate compounds for organics analyses and reported results in terms of percent recovery as another

indication of accuracy. Reported surrogate recoveries were outside control limits for several volatile, semivolatile, and pesticide/PCB samples in one or more of the Weston delivery groups. Results that fell outside of the applicable control limits were qualified according to the validation procedure. No indication of significant matrix effects were observed in the sample results.

Duplicate samples were prepared and analyzed, and data were reported as relative percent difference (RPD) by Weston as an indication of laboratory precision. For analyses of organics, RPD calculations were made between matrix spike/matrix spike duplicate samples. For inorganic analyses, RPD calculations were made between initial and duplicate sample results. Reported RPDs for duplicate samples were high for aluminum, magnesium, and zinc in one or more of the Weston delivery groups. Results that fell outside of the applicable control limits were qualified according to the validation procedure.

Weston utilized contract laboratory program (CLP 3/90) protocols to perform sample analyses instead of the requested SW-846 methods. The use of CLP protocols is expected to have minimal impact on the data. The detection levels achieved using CLP were adequate to support decisions regarding closure of the 216-B-3 Pond System expansion pond. It is concluded that the data are acceptable with the qualifiers listed. These qualifiers were taken into account in further evaluations of the data set by project personnel.

TMA analyzed samples using SW-846 protocols. All data received from the TMA laboratory were determined to be acceptable with exception of the antimony result for one sample. The antimony result for that sample was qualified as unusable due to a very low matrix spike recovery. Holding time criteria were met for the analyses of soil and water samples with the exception of cyanide results for two samples. The TMA results have been qualified accordingly.

TMA prepared and analyzed laboratory blanks for both soil and water sample matrices. Analyses of the blanks identified the following compounds as potential laboratory contaminants:

- Volatile organics
  - Acetone
  - Benzene
- Semivolatile organics
  - Butylbenzylphthalate
- Metals
  - Aluminum, calcium, copper, iron, magnesium, mercury, silver, sodium, vanadium, and zinc.

Target compounds and tentatively identified compounds detected in the organics blanks were below the contract-required quantitation limit and are estimated values. Analytes detected in metals blanks were at levels less than the

contract-required detection limit. When evidence of blank contamination was present, blank validation criteria were applied to determine appropriate qualification for associated sample results.

TMA prepared and analyzed matrix spike samples and reported the results as percent recovery as an indication of accuracy. Spiked sample results were generally within control limits for percent recovery. Aluminum, cadmium, iron, thallium, antimony, and zinc matrix spike recoveries were outside control limits in one or more quality control samples. TMA also analyzed surrogate compounds for organics analyses and reported results in terms of percent recovery as another indication of accuracy. Results that fell outside the applicable control limits were qualified according to the validation procedure. No indication of significant matrix effects was observed in the sample results.

Duplicate samples were prepared and analyzed, and data were reported as relative percent difference (RPD) by TMA as an indication of laboratory precision. For organics analyses, RPD calculations were made between matrix spike/matrix spike duplicate samples. For inorganics analyses, RPD calculations were made between initial and duplicate sample results. Reported RPDs for duplicate samples were high for aluminum, barium, iron, arsenic lead, and sodium in one or more of the TMA quality control samples. Results that fell outside the applicable control limits were qualified according to the validation procedure.

7.1.3.5 Summary of Phase 2 Analytical Results. Phase 2 analytical results were compared to background levels and to health-based limits. Analytical results were compared to Hanford Site background threshold values (DOE 1993) and to the local background values determined during Phase 1 sampling. Health-based limits were calculated as stipulated in WAC 173-340, *Model Toxics Control Act* (MTCA) Cleanup Regulation. The calculations are described in Appendix D.

Hanford Site Background is a sitewide approach to determining background levels that was developed as an alternative to local unit-based background determinations at the Hanford Site. The Hanford Site Background approach is based on the premise that most or all Hanford waste management units are associated with vadose zone sediments of similar geologic origin, therefore, the chemical composition of these sediments should be similar. The range of natural soil compositions is then used to establish a single set of soil background data. Hanford Site Background data set accurately represents the range of natural variability in soil composition across the Site, and provides a consistent, credible, and efficient basis for evaluating soil contamination.

No volatile organic compounds were detected in any of the water samples. Of the compounds found in the soil samples, all the compounds found in the trip blank were disregarded with respect to determining contamination. The remaining analytes detected, toluene, methylene chloride, and acetone, are considered to be common laboratory contaminants, and with the exception of two toluene hits, were found only in very low concentrations. The two toluene values of possible concern, greater than 100 μg/kg, were found in very dry

surface soil samples from 3B Pond. These values can be compared to the MTCA cleanup levels in WAC 173-340-740(3); all reported values are significantly below the cleanup levels.

No semi-volatile organic compounds were detected in any of the soil samples. All semi-volatile organic compounds found in the water samples were at very low levels. The methoxyethoxyethanol was found in two routine samples at concentrations less than or equal to that found in the trip blanks. Therefore, this compound was attributed to contamination after sampling. Methylcyclopentanol was found in one duplicate sample, but was not reported in the original analysis. No pesticides or PCBs were detected in any samples.

Metal analyte values exceeding laboratory instrument detection limits were compared to Hanford Site Background values (DOE-RL 1993). In calculating background threshold values from the reference data, certain soil classes such as topsoil and volcanic ash were excluded. The Phase 2 results include individual values for copper, lead, zinc, antimony, and cadmium that exceed Hanford Site background threshold values. These analytes were then compared to the local area background values determined during Phase 1 sampling, to common concentrations found in soils, and to MTCA Method B cleanup levels, with the exception of lead, which was compared to the more stringent MTCA Method A cleanup level. Method A levels for lead were used for comparison because data for the Method B cleanup level calculation were not available. From these comparisons, it is concluded that no metal analytes are present at concentrations that would be indicative of contamination. The data suggest that the soils and sediments at the sampled locations would not be classified as dangerous waste under the WAC 173-303 *Dangerous Waste Regulations*.

7.1.4 Phase 3 Sampling

The scope of Phase 3 sampling and analysis was to collect data for use in evaluating potential dangerous waste contamination of the vadose zone beneath the three expansion ponds of the 216-B-3 Pond System. One borehole was drilled through the vadose zone in each of the expansion ponds. Soil samples were collected and submitted for chemical analyses similar to those performed in Phase 1. Some nonchemical data also were collected in conjunction with the drilling. After drilling and sampling were completed, gross gamma logging was done in each borehole. The discussion of Phase 3 sampling and analysis is excerpted from *Vadose Zone Investigation of 216-B-3A, 216-B-3B, and 216-B-3C Ponds* (Kramer 1992), which is included as Appendix E of this closure plan.

7.1.4.1 Phase 3 Sampling Objectives. Objectives of Phase 3 sampling and analysis were as follows:

- Determine whether dangerous waste constituents are present in the vadose zone beneath the lobes

- Determine which constituents (if any) are present in concentrations of concern

- Assess the distribution of contaminants (if any) with depth in the vadose zone.

7.1.4.2 Analytical Parameters. Samples were analyzed for the inorganic constituents identified in Table 3-1 of Appendix E. The indicated methods are a combination of EPA SW-846 methods for metals and wet-chemistry methods for ions. Split samples were analyzed for the analytes listed in Table 3-1, with the following exceptions: ammonia, boron, chloride, fluoride, molybdenum, nitrate, silicon, sulfate, and sulfide.

Organic analyses included pesticides/PCBs, herbicides, organophosphorus pesticides, dioxins/furans, volatile organics, and base/neutral/acid (BNA) compounds. Split samples generally were analyzed for the following:

- Target Compound List Volatiles (CLP SOW 2/88--Rev. 5/89)
- Target Compound List Semivolatiles (CLP SOW 2/88--Rev. 5/89)
- Pesticide and PCB Target Compounds (CLP SOW).

One split sample was analyzed for semivolatiles by EPA 8270.

7.1.4.3 Sampling Methodology.

7.1.4.3.1 Drilling and Sampling at 216-B-3A Pond. Phase 3 sampling was initiated at 3A Pond. Several months prior to drilling, a pad was constructed by placing and extending clean fill outward from the shoreline into the pond. This pad was located near the north shore of the pond, approximately 25 yards from the east corner.

Borehole BH-3A-1 (699-43-411) was drilled through the fill into the original pond bottom sediments. Samples were planned at 2-feet intervals for the first 10 feet below the former pond bottom and at a decreasing frequency thereafter until ground water was intercepted. All depths were referenced to ground surface elevation (i.e., grade surface on the drill pad). The pond bottom was encountered at approximately 6.5 feet.

Drilling was done with a cable tool rig. Samples were collected using a 5-inch outside diameter stainless steel split tube with stainless steel liners. A 10-inch outside diameter, Schedule 40 casing was first used, followed by 8- and then 6-inch casings. The 10-inch casing string was set at 20.4-feet. The 8-inch casing was set at 77.7 feet. Samples were collected per procedures of the *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7. Samples for chemical analysis were placed in supplier-cleaned glass bottles.

Samples were screened for radioactivity with hand held instruments. A field photoionization detector was used to monitor for organic vapors. No evidence of contamination was detected by either of the two screening instruments. Aliquots submitted to an onsite laboratory revealed no evidence of radiological contamination. All aliquots were found to be below the applicable administrative limits for release from Hanford Site radiological controls.

Difficult drilling was experienced at approximately 100 feet due to large cobbles and boulders. After two samples were collected from the interval 101.0 to 102.2 feet, hardtooling was employed. This required adding some raw water (untreated Columbia River water) to the hole. Drilling improved below 105 feet, and hardtooling was discontinued. A small amount (approximately ½ gallon) of additional raw water was used at a depth of 112 feet to facilitate sample capture (recovery) in the core barrel. The next sample interval was 120.7 to 123.2 feet.

The final sample from the 3A Pond borehole was collected from a depth of 142.75 to 143.85 feet. Recovery in the split spoon was estimated at only 50 percent. Observations in the field log note the sample as "very wet." The water level was measured at 142.75 feet.

A gross gamma log was run in the cased hole during February and March of 1991. Later, the casing was removed, and the borehole was backfilled, abandoned and marked in accordance with EII 6.5 (WHC-CM-7-7).

The following samples were collected from 3A Pond and submitted for analysis:

- Twenty-two regular samples
- Two field duplicates
- Two split samples
- Two blanks, consisting of pure silica sand.

7.1.4.3.2 Drilling and Sampling at 216-B-3B Pond. Borehole BH 3B-1 (699-42-41B) was located in the center of the dry 3B Pond. Samples were collected with a split tube sampler. All sampling equipment (split tube samplers, bowls, spoons, etc.) was cleaned and decontaminated prior to use per EII 5.5, *1706 KE Laboratory Decontamination of RCRA/CERCLA Sampling Equipment*, (WHC-CM-7-7). Recoveries from the first several sample intervals were estimated at 50 percent due to the coarse soil texture (i.e., sand and gravel). Finer-textured soils were encountered below a depth of 7 feet.

The drilling method and sampling frequency were similar to the other Phase 3 boreholes. Samples were planned at 2-foot intervals for the first 10 feet and at a decreasing frequency thereafter until ground water was intercepted. Samples were collected as previously described for the 3A Pond, except that no drilling pad or fill material was placed over the area to be investigated. All depths were referenced to ground surface elevation. The 10-inch casing string was set at 21.1 feet. The 8-inch casing was set at 78.2 feet. Samples were screened with field instruments for radioactivity and hazardous organic vapors. No evidence of radioactivity or organic vapors was detected.

The borehole was advanced by drive barrel to approximately 74 feet before there was any need to add water to the hole. One gallon of raw water was added to facilitate drilling at this depth, which was about 6 feet above the next sample interval, 79.8 to 81.5 feet.

Hard tool drilling was required at 95 to 103 feet and at 109 to 113 feet. A total of 30 gallons of raw water was added to the hole in these intervals. Three soil samples collected from these intervals potentially were affected by the addition of raw water. In each case, the samples were collected several feet below the depth where the last of the water had been added. The final sample, consisting of wet silt, was collected at a depth of 123.5 feet. Final depth of the borehole was 124.7 feet.

A gross gamma log was run in the cased hole during March 1991. Later, the casing was removed, and the borehole was backfilled, abandoned, and marked in accordance with EII procedures.

The following samples were collected from 3B Pond and submitted for analysis:

- Twenty-two regular samples
- Two field duplicates
- Two split samples
- Two blanks, consisting of pure silica sand.

7.1.4.3.3 Drilling and Sampling at 216-B-3C Pond. The 3C Pond (which functionally is a series of percolation trenches) was in active use at the time of this investigation. Borehole BH 3C-1 (699-41-4) was located on dry ground between trenches in the northwest quadrant of the pond area. The water surface in the adjacent trench was several feet below the borehole collar elevation.

Drilling and sampling methods were identical to those previously described. As with the other two boreholes, samples were collected more frequently from the upper portion of the borehole. Five samples were collected from the first 10 feet. The 10-inch casing string was set at 32.1 feet. An 8-inch casing was used for the remainder of the borehole. In-field monitoring of samples showed no radioactivity or hazardous organic vapors.

Moisture was a factor in sample recovery. Samples collected from the upper part of the borehole were damp, but moisture appeared to increase at about 18 feet. There was no standing water in the hole at 19 feet, however, some difficulty was experienced retaining soil in the sample barrel. Poor recovery also limited planned sampling in the 20 to 25 feet range. There was standing water in the borehole at a depth of 27.8 feet. Drilling and sampling conditions improved below that depth, but for the remainder of the borehole moisture was present in all samples. Intermittent saturated zones were encountered between 74 and 80 feet. Drilling was terminated at a depth of 80.9 feet.

A gross gamma log was run in the cased hole during March 1991. Afterward, the casing was removed, and the borehole was backfilled and abandoned in accordance with EII procedures. The borehole location is marked with a brass survey monument.

The following samples were collected from 3C Pond and submitted for analysis:

- Eighteen regular samples
- Two field duplicates
- Two split samples
- Two blanks, consisting of pure silica sand.

7.1.4.4 Analytical Methods and Analytical Quality Assurance and Quality Control. During Phase 3, 22 regular soil samples were collected from BH-3A-1; 22 regular soil samples were collected from BH-3B-1; and 18 regular soil samples were collected from BH-3C-1 (62 regular samples). Two splits, two field duplicates, and two soil blanks were submitted for analysis from each borehole (80 Phase 3 samples total).

Phase 3 analyses were performed by four different offsite contractor laboratories. The primary laboratory was Martin Marietta's K-25 laboratory in Oak Ridge, Tennessee. Phosphorous pesticide and dioxin analyses were subcontracted to IT Analytical Services in Knoxville, Tennessee. Split samples were analyzed by Roy F. Weston laboratories in Lionville, Pennsylvania. Radiochemical analysis of split samples was subcontracted by Weston to Teledyne in Westwood, New Jersey.

Samples were analyzed for inorganic constituents by the methods listed in Table 3-1 of Appendix E. Split samples were analyzed and reported according to CLP protocol (CLP SOW, March 1990) for the analytes listed in Table 7-6 minus ammonia, boron, chloride, fluoride, molybdenum, nitrate, silicon, sulfate, and sulfide.

Summary statistics for inorganic analyses are provided in Table 4-8 of Appendix E. Statistical evaluation of results reported for split samples, which were analyzed by the primary laboratory and the split laboratory independently, indicated that the split laboratory tended to report lower analyte concentrations than the primary contractor.

Organic analyses included pesticides/PCBs, herbicides, organophosphorus pesticides, dioxins/furans, volatile organics, and BNA compounds. All organic analyses were performed by EPA SW-846 methods or contractor laboratory-specific methods based on CLP protocols. Most split samples were analyzed for the following:

- Target Compound List Volatiles (CLP SOW 2/88--Rev. 5/89)
- Target Compound List Semivolatiles (CLP SOW 2/88--Rev. 5/89)
- Pesticide and PCB Target Compounds (CLP SOW).

One split sample was analyzed for semivolatiles by EPA 8270. Organic analyses were performed on fifty percent of the regular samples (specifically, 11 samples from 3A, 11 from 3B, and 9 from 3C), together with 1 split, 1 field duplicate, and 1 blank from each borehole. All 40 samples were analyzed for pesticides/PCBs, herbicides, organophosphorus pesticides, volatile organic compounds, and BNA compounds. Thirty samples (including all 9 QC samples)

were analyzed for total tetra through octa dioxin and furan homologs. The samples analyzed for dioxin/furan compounds were all from shallow vadose zone depths.

Most Phase 3 sample results were qualified as estimated. The most prevalent reason for qualification was the application of the pre-extraction holding time limit for water samples as a data validation criterion, even though the matrix for all Phase 3 samples was soil. All samples, including silica sand and field duplicates, were extracted outside the 7-day criterion. All extracts were analyzed within the allotted 40 days after extraction. Additionally, any tentatively identified compounds (TICs) reported were routinely qualified by the laboratory as estimated.

7.1.4.5 Summary of Phase 3 Analytical Results. As indicated above, the split laboratory tended to report lower inorganic analyte concentrations than the primary contractor, suggesting a potential bias in concentration data reported by the primary laboratory. In particular, chromium concentrations in Phase 3 samples frequently exceeded Phase 1 threshold values. However, chromium values were still one to two orders of magnitude below EPA's protective trigger level for further investigation or Ecology's MTCA "Method A" cleanup level for industrial soil.

Beryllium was detected in all regular Phase 3 soil samples. Beryllium was not found in any Phase 1 samples (regular or background soil). However, the difference appears to be attributable to a lower contract required quantitation limit (CRQL) specification for Phase 3 analyses. Beryllium was reported to be present in Phase 3 samples at levels below the Phase 1 contract detection limit. The reported levels are within the range of natural background for the Hanford Site (DOE 1993). Antimony was detected in four samples, at levels comparable with natural background. Mercury, selenium, thallium, and cyanide were reported, but at levels less than CRQLs.

All pesticides/PCBs, herbicides, organophosphorus pesticides, and dioxin/furan homologs were reported as nondetected, or were qualified as nondetected upon validation. Analyses of QC samples were all within acceptable limits for these groups of compounds.

No volatile organic compounds of significance were found. Traces of three common solvents, methylene chloride, acetone, and 4-methyl-2-pentanone (a.k.a. methyl isobutyl ketone or hexone), were reported in several samples. Methylene chloride was detected in two samples at concentrations less than the CRQL. Acetone was identified in six samples, all at levels less than the SW-846 practical quantitation limit. Four-methyl-2-pentanone was detected in three samples at concentrations less than the CRQL. The three compounds are common laboratory contaminants.

No semivolatile target compounds were identified above their respective CRQLs. Two target compounds, benzoic acid and diethylphthalate, were reported at levels below CRQLs. However, both of these compounds also were identified in at least one blank. The primary laboratory reported an average of

approximately 13 TICs per Phase 3 sample, whereas the split laboratory reported slightly more than 3 per sample. Identical compounds occurred at similar concentrations in associated laboratory blanks.

In summary, the results of Phase 3 sampling and analysis indicate that there is no apparent basis for regulating vadose zone soils beneath the three 216-B-3 Pond System expansion ponds based on ignitability, corrosivity, reactivity, or toxicity characteristics as identified in WAC 173-303-090, or carcinogenic, persistent, or toxic criteria as identified in WAC 173-303-100. There is no indication that any listed dangerous waste constituents (organic or inorganic) are present in vadose zone soils at the site at levels of regulatory concern.

7.1.5 Summary of Sampling and Analyses Results for 216-B-3A, 216-B-3B, and 216-B-3C Ponds

Based on the results of the sampling and analysis efforts described in this section, clean closure was selected for the 216-B-3A, 216-B-3B, and 216-B-3C ponds.

7.2 INTERIM STABILIZATION OF THE 216-B-3A POND

The 3A Pond will not be used in the future due to its proximity to the 216-B-3 Pond. Sampling has demonstrated that the 3A Pond is not contaminated with hazardous constituents above proposed action levels. If it is determined that the 3A Pond is radiologically contaminated it may be necessary to interim stabilize this pond. If radiological contamination is present, the contaminated soil will be removed and consolidated, if possible, into the 216-B-3 Pond. After surveying and/or soil removal, the surface contamination posting signs will be removed. In either case, the pond may then have a clean soil layer or other suitable rooting medium placed over it and be revegetated.

If the 3A Pond must be interim stabilized, then stabilization will occur in three phases as depicted in Figure 7-8. Isolation and dismantling of structures associated with this pond will be an integral part of the interim stabilization. Interim stabilization of the 3A Pond will occur after until interim stabilization of the 216-B-3 Pond and 216-B-3-3 Ditch has been completed.

7.2.1 Phase 1: Drawdown and Interim Stabilization of Pond Sediments

The shoreline area and surrounding surface contamination zone will be interim stabilized with a minimum of two feet of clean backfill. Clean soil will be worked out over the contaminated areas, progressing towards the water's edge. When the entire shoreline and adjacent surface contamination zone have been interim stabilized, the quantity of waste water discharged to the 3A Pond will be reduced, with the excess being diverted from the 3A Pond to the 3B and/or 3C Ponds. Waste water transfers via the 216-B-354 flow control structure will be terminated.

As the pond level is lowered, the clean soil layer will be extended out over the exposed sediments following the pond bottom topography. Flow into the pond will be controlled such that the water level continues to drop, allowing interim stabilization of the exposed sediments. Work will progress from the highest elevation points to the low point, which is a north-south oriented trench dug to increase the percolation capacity of the pond. The water level will be reduced to the top of the trench. Sediments will be allowed to dry sufficiently to allow successful interim stabilization but not to the point as to allow airborne contamination. Water will be applied if pond sediments are in danger of drying enough to allow airborne contamination. A flow channel leading from the diversion pipeline to the reduced pool in the 3A Pond will be maintained. Clean soil will be placed up to the edge of this channel so that no unwetted sediments will be exposed.

7.2.2 Phase 2: Backfilling of the Percolation Trench

This phase entails the placement of clean soil into the percolation trench. The trench will be brought up to the surrounding grade with clean soil. The water level in the trench will be maintained at a constant elevation that is roughly equal to the projected final grade, i.e., the level with the surrounding pond bottom. The trench will be filled with clean soil to cover all potentially contaminated sediments. Waste water will then be diverted to the 3B and/or 3C Ponds or other suitable location, and the trench allowed to empty. Sediments will be allowed to dry sufficiently to allow interim stabilization, but not to the point as to allow air borne contamination. Clean fill will then be pushed into the trench. At the end of Phase 2, the trench will have been backfilled to the surrounding grade. As the water level is reduced and eventually eliminated, exposed sediments in the flow channel between the diversion pipeline and the 3A Pond will be interim stabilized.

7.2.3 Phase 3: Topsoil Placement, Revegetation, and Marker Post Placement

Topsoil will be placed over the coarse soil fill. The topsoil will provide a suitable rooting medium. The topsoil layer will be approximately 12 inches thick, and will be excavated from a nearby borrow area. Perennial grasses will be planted to minimize soil erosion. A high nitrogen fertilizer will be spread over the site and a mixture of Siberian and Thickspike perennial wheatgrass or other suitable grasses will be planted to minimize soil erosion. Straw mulch will then be broadcast over the area and crimped into the soil. The perennial mix requires autumn planting to establish a viable stand. If interim stabilization is completed too late in the fall for a planting, an annual grass such as rye can be planted in the early spring, followed in autumn by the perennial.

Once the stabilization has been completed, the areas that were decontaminated will be surveyed to confirm that there are no radioactive

materials present on the surface. After interim stabilization, radioactively contaminated areas will be posted as "underground radioactive material" in accordance with WHC-CM-4-10.

7.2.4 Post-Stabilization Surveillance

In the period between interim stabilization and final remediation, routine surveillance and maintenance of the 216-B-3 Pond System will be performed. The Westinghouse Hanford Environmental Assurance organization will establish a schedule for periodic surveillance of the site. Initially, the frequency is expected to be semi-annually or every six months. The surveillance will include monitoring the site for the following: surface radioactive material, potential uptake of radioactivity by vegetation, intrusion into subsurface radioactive materials by animals or insects, proper posting, and general appearance and condition.

Any items found to be out of compliance will be identified for corrective action. Items which cannot be fixed immediately will be documented and tracked until they are corrected. The landlord organization will periodically inspect the site to ensure the posting and barriers are in good condition. Annually, the site will be cleaned of unwanted vegetation and sprayed with a selective herbicide or sterilant. Besides surveillance, the 216-B-3 Pond system will be placed on the schedule for herbicide application. The selective herbicide is used to control deep-rooted vegetation without harming the desirable grasses. The sterilant is used where no vegetation is wanted. The herbicide will be applied under the direction of the Westinghouse Hanford Site Commercial Pesticide Applicator.

7.2.5 Project Documentation

A final report will be prepared and issued documenting the 3A Pond interim stabilization project. The report will include a description of the activities performed at the site and note any significant variation from the original plan. Topographic surveys from before and after stabilization will be included in the report along with key photographs. If any noteworthy problems are encountered during the stabilization, their resolution will be documented in a "Lessons Learned" section. The interim stabilization final report will be entered into the administrative record for the site.

7.3 DECONTAMINATION/REMOVAL OF STRUCTURES AND ASSOCIATED FIXED EQUIPMENT

This section describes the decontamination and removal activities of the structures associated with the 216-B-3 Pond expansion ponds.

7.3.1 The 216-B-3A Pond Dikes

The proposed disposition for the earthen dikes and the associated piezometers and boreholes are discussed in the following sections.

7.3.1.1 Proposed Disposition for the 216-B-3A Pond Dike and Associated Piezometers. Clean closure is proposed for the 3A Pond and the 3B Pond. If clean closure of the 3A Pond and the 3B Pond will be feasible and practical without the need to remove contaminated soil from either pond, then the diking around the ponds will be retained in the current configuration. This earthen dike also contains a network of piezometers (see Chapter 2.0, Figure 2-20). If the 3A and the 3B Ponds are clean closed as proposed, then no action is proposed with regard to these piezometers; they will be maintained for continued use to monitor seepage through the dike.

7.3.1.2 Abandonment of Piezometers. The piezometers associated with the 216-B-3 Pond will be plugged and abandoned after the 216-B-3 Pond has been removed from service. Piezometers are defined as 'resource protection wells' in WAC 173-160 and requirements for abandonment are stipulated in WAC 173-160-560. Plugging and abandonment of piezometers on the Hanford Site will follow WHC-CM-7-7, EII 6.5, "Plugging and Abandoning of Characterization Boreholes," which conforms to WAC. In addition, a groundwater monitoring borehole (699-43-42) will be abandoned in the same manner as the piezometers. This well has cracked casing and will be taken out of service to prevent communication between B Pond and the underlying aquifer.

The proposed method of abandonment is to plug the piezometer tubes (1 to 3 per borehole) with a high-solids bentonite. Ecology will be notified at least 72 hours before initiating abandonment activities. Documentation of abandonment activities will be performed as specified in WHC-CM-7-7, EII 6.5, "Plugging and Abandoning of Characterization Boreholes."

7.3.2 The 216-B-353 Flow Control and Spillway Structure

The proposed disposition and contingency plans for sampling, decontamination, and removal are discussed in the following sections.

7.3.2.1 Proposed Disposition. The 216-B-353 flow control and spillway structure monitors and controls waste water transfer from the 3A Pond to the 3B Pond (see Chapter 2.0, Figures 2-8, 2-9, 2-10, and 2-14). The structure has not been used since May 1985. Clean closure is proposed for the 3A and 3B Ponds. No future use is planned for the 3A Pond, therefore, the structure will be demolished and removed.

7.3.2.2 Removal Plan. Removal of the 216-B-353 flow control and spillway structure is to follow the same general approach indicated for the 216-B-351 (see Section 7.2.2.2) and 216-B-352 control structures (see Section 7.2.3.2). The 216-B-353 flow control and spillway structure has a formed, reinforced concrete overflow structure at the inlet, with two control weirs and steel slide gates, a metal trash guard constructed of galvanized-wire fabric supported by a 2-inch-diameter pipe, and an expanded metal grating. Waste

water is transferred via two 30-inch-diameter, corrugated-steel pipes to a stilling basin lined with riprap. The pipe consists of 20-foot sections, with O-ring seals and band couplers at the joints. Pipe runs in the 216-B-353 structure each have two 8° elbows at changes in profile. Each pipe is about 60 feet long. The pipes are buried under 5 to 10 feet of cover.

The concrete inlet structure will be demolished. The concrete will be broken with a pneumatic or hydraulic concrete breaker, which may be either a hand-operated type (e.g., a jackhammer) or a larger, machine-mounted unit. As it is exposed, embedded reinforcing bar and/or wire will be severed with an acetylene torch, enabling the debris to be physically separated and loaded out. Concrete demolition waste may be consolidated into the 216-B-3 Pond during interim stabilization of the pond. No sampling of concrete associated with the 216-B-353 structure is proposed.

Before removal, exposed surfaces of metal components (slide gate assembly, trash guard and supports, and expanded metal grating) will be surveyed for radiological contamination with hand-held detectors to determine appropriate dispositions for all materials. Metal scrap that can be unconditionally released from radiological controls (in accordance with WHC-CM-4-10, Section 9) will be disposed of as uncontaminated scrap. If radiological contaminants are present, the scrap metal will be handled and disposed of as indicated in Section 7.2.8.

Limited surveying of the corrugated pipes will be performed before removal. A backhoe or hydraulic excavator will be used to remove the overlying cover soil. The pipe will be disassembled at the joints, hoisted out in sections, and then cut into manageable lengths for disposal. If the pipe is unconditionally released from radiological controls (in accordance with WHC-CM-4-10, Section 9) it will be disposed of as uncontaminated scrap metal. If radiological contaminants are present, the scrap will be handled and disposed of as indicated in Section 7.2.10. The sections will be crushed flat (if practical) or cut apart lengthwise to facilitate disposal.

7.3.3 The 216-B-354 Flow Control and Spillway Structure

The proposed disposition and contingency plans for sampling, decontamination and removal are discussed in the following sections.

7.3.3.1 Proposed Disposition. The 216-B-354 flow control and spillway structure monitors and controls the transfer of waste water from the 3A Pond to the 3C Pond (see Chapter 2.0, Figures 2-14, 2-16, 2-17, and 2-18). Clean closure is proposed in this closure plan for both the 3A Pond and the 3C Pond. However, there is no future use planned for the 3A Pond, therefore, there is no need to preserve the 216-B-354 flow control structure for future use and the structure will be demolished and removed.

7.3.3.2 Removal Plan. Removal of the 216-B-354 flow control and spillway structure is to follow the same general approach indicated for the 216-B-351, 216-B-352, and 216-B-353 control structures (see Sections 7.2.3.2, 7.2.4.2, and 7.2.5.3). The 216-B-354 control structure has a formed

reinforced-concrete overflow structure at the inlet, with two control weirs and steel slide gates, a metal trash guard constructed of galvanized-wire fabric supported by a 2-inch-diameter pipe, and an expanded metal grating. Waste water is transferred via two 30-inch-diameter, corrugated-steel pipes to a stilling basin lined with riprap. The pipe consists of 20-foot sections, with O-ring seals and band couplers at the joints. Each pipe has one 45 degree elbow along the length of the pipe. Each pipe is about 1,000 feet long. The pipes are buried under 5 to 10 feet of cover.

The concrete inlet structure will be demolished. The concrete will be broken with a pneumatic or hydraulic concrete breaker, which may be either a hand-operated type (e.g., a jackhammer) or a larger, machine-mounted unit. As it is exposed, embedded reinforcing bar and/or wire will be severed with an acetylene torch, enabling the debris to be physically separated and loaded out. Concrete demolition waste will be disposed of in an appropriate disposal site if radiologically contaminated or other disposal site if not radiologically contaminated. No sampling for hazardous constituents of concrete associated with the 216-B-354 structure is proposed.

Before removal, exposed surfaces of metal components (slide gate assembly, trash guard and supports, and expanded metal grating) will be surveyed for radiological contamination with hand-held detectors to determine appropriate dispositions for all materials. Metal components will be cut away with an acetylene torch. After removal, the components will be cut into smaller pieces to the extent necessary to facilitate loading them into waste containers. Metal scrap that is substantially free that can be unconditionally released from radiological controls (in accordance with WHC-CM-4-10, Section 9) will be disposed of as uncontaminated scrap. If the metal slide gate assembly is unconditionally released from radiological controls, it may be salvaged for reuse. If radiological contaminants are present, the scrap metal will be handled and disposed of as indicated in Section 7.2.8.

7.3.4 Procedures for Handling and Disposal of Waste

Requirements and procedures for packaging, container labeling, manifesting, inspection, loading, placarding, transportation (onsite and offsite), and disposal of dangerous, radioactive, and mixed waste for points of origin and/or destination on the Hanford Site are discussed in detail in the following documents:

- WHC-CM-2-14, *Hazardous Materials Packaging and Shipping*
- WHC-CM-5-16, *Nonradioactive Dangerous Waste Packaging and Disposal Requirements*
- WHC-EP-0063-1, *Hanford Site Radioactive Solid Waste Acceptance Criteria* (Stickney 1989).

Information from these documents is summarized in the following sections. Each of these functions will be managed and performed in conjunction with removal of any contaminated structural materials/debris from the 216-B-3 Pond System to onsite or offsite disposal units.

7.3.4.1 Packaging. Containers that are suitable for the specific types of contaminants present and that comply with applicable U.S. Department of Transportation, DOE, Nuclear Regulatory Commission, EPA, and Washington State Department of Transportation regulatory requirements, will be provided for packaging of waste at the site. Containers are available for shipping various types and classes of hazardous waste at the Hanford Site. A safety analysis report for packaging is required for any container that will be used to transport materials containing radioactive waste. Considerations in the selecting of an appropriate container include the following:

- Quantity, type, form, and classification of radionuclides (if any) to be packaged
- Need for shielding and/or heat transfer (e.g., cooling)
- Size, shape, and weight of material to be shipped
- Destination, mode of transport, and consignee's ability to handle receipt of the shipment
- Dose rate and contamination considerations
- Availability of shipping containers.

7.3.4.2 Container Labeling. Any waste package containing dangerous waste regulated as dangerous waste or extremely hazardous waste will have a properly completed EPA hazardous waste sticker with the following information:

- Uniform Hazardous Waste Manifest unique identification number, page number, and waste item line identification letter
- Proper shipping name and identification number
- Generator's name and address:

  U.S. Department of Energy
  P. O. Box 550, 2401 Stevens Drive
  Richland, WA 99352

- EPA/Ecology ID No. for the Hanford Site: WA7890008967
- EPA/Ecology Waste No. (dangerous waste codes)
- Accumulation start date.

Waste packages with PCB contaminants (if any) will bear a properly completed EPA 'Waste for Disposal' sticker and a "Caution: Contains PCB's"

sticker in accordance with 40 CFR 761. Additional labeling will be provided in accordance with 49 CFR 172. Waste packages originating on the Hanford Site will have various additional markings on the top and sides (e.g., 'This End Up,' inventory number, unit number, package weight, and hazard class information).

The following marks and labels are to be attached to waste packages containing radioactive materials:

- Responsible generator
- Date sealed and shipped
- Radiation survey data
- Estimated activity and identity of radioactive materials present
- Gross weight if greater than 55 pounds
- Radioactive labels (20-year equivalent labels for mixed waste)
- Other hazard class labels (U.S. Department of Transportation-approved labels) as appropriate.

7.3.4.3 Manifesting. A Uniform Hazardous Waste Manifest will be completed for each offsite shipment of dangerous or mixed waste. For monitoring and control of radioactive solid waste shipments from the Hanford Site, the 'Storage/Disposal Approval Record' and the 'Solid Waste Disposal Analysis Record' are used. No offsite shipments are planned for these closure activities.

7.3.4.4 Inspection. If any waste that requires a Uniform Hazardous Waste Manifest is shipped from a point of origin on the Hanford Site, the DOE requires the shipment be inspected and approved for transport. The inspection is performed after the waste has been packaged and manifested to ensure compliance with the loading, placarding, transportation, and disposal requirements discussed in the following sections.

7.3.4.5 Loading. All shipments will be inspected before loading to ensure compliance with packaging and manifesting instructions. Loaded shipments will be inspected to ensure compliance with applicable U.S. Department of Transportation requirements. For radioactive solid waste shipments, there are specific tiedown requirements for each approved shipping container. The tiedown requirements are documented in the safety analysis report for packaging prepared for each container.

7.3.4.6 Placarding. Placarding of shipments of contaminated materials/debris will conform to all applicable regulations imposed by 49 CFR 172.504 and the state of Washington. Appropriate placards will be provided to the carrier

after the load and the vehicle have been inspected. If the vehicle is equipped with permanent placards, the inspector will ensure that placards for the appropriate hazards are displayed.

7.3.4.7 Transportation. All waste shipments, whether to onsite or offsite destinations, are scheduled in advance. Schedules will comply with the 90-day shipping deadline imposed on dangerous waste, if applicable (and the 30-day deadline that applies to PCBs, if PCBs should be present in the waste). Radiation release surveys also must be scheduled. Unconditional radiological release stickers/documentation are valid only for a 24-hour period following their issuance. A separate release sticker is required for each container. The Hanford Site procedures require that all onsite shipments of radioactive waste be escorted by radiation protection technologists and Hanford Patrol personnel.

7.3.4.8 Disposal. Radioactive waste generated as a result of decontamination and removal activities on the Hanford Site is disposed of at the Hanford Site low-level burial grounds (currently under RCRA interim status; permit number WA7890008967). Radioactive mixed waste is sent to the Central Waste Complex (currently under RCRA; interim status; permit number WA7890008967) for interim storage and future treatment or disposal. The Hanford Site requirements for radioactive solid waste packaging, storage, and disposal (WHC-CM-2-14) will be followed when preparing waste for storage and/or disposal.

Solid waste that is nonradioactive and nondangerous will be handled and disposed of as nonregulated solid waste.

7.4 SCHEDULE FOR CLOSURE

This section addresses schedule information regarding performance of various closure activities.

Sampling activities have been completed and are described in Section 7.1, Soil and Sediment Sampling.

Monitoring of site groundwater is an active program that will continue following closure in support of the 200-BP-11 operable unit investigation (unless directed otherwise by Ecology).

Official copies of the closure plan will be located at the following office:

U.S. Department of Energy,
Richland Operations Office
Federal Building
825 Jadwin Avenue
P.O. Box 550
Richland, Washington 99352.

The DOE-RL office will be responsible for amending this closure plan, as deemed necessary, according to the amendment procedures in WAC 173-303-610. The closure plan will be kept at the DOE-RL office until closure is complete and certified.

7.5 AMENDMENT OF PLAN

In addition, as required by WAC 173-303-610(3)(b), the closure plan will be amended if, when conducting final closure activities, unexpected events require a modification of the approved closure plan. If an amendment to the approved closure plan is required, the DOE-RL will submit a written request to Ecology to authorize a change to the approved plan. The written request will include a copy of the closure plan amendment for approval.

7.6 CERTIFICATION OF CLOSURE

Within 60 days of closure of the TSD Unit, the DOE-RL will submit to the Benton County Auditor and the lead regulatory agency a certification of closure and a duly certified survey plat. The certification of closure will be signed by both the DOE-RL and a registered independent professional engineer, stating that the unit has been closed in accordance with the approved closure plan. The certification will be submitted by registered mail or an equivalent delivery service. Documentation supporting the independent registered professional engineer's certification will be supplied

The DOE-RL and the independent professional engineer will certify with a document similar to Figure 7-4.

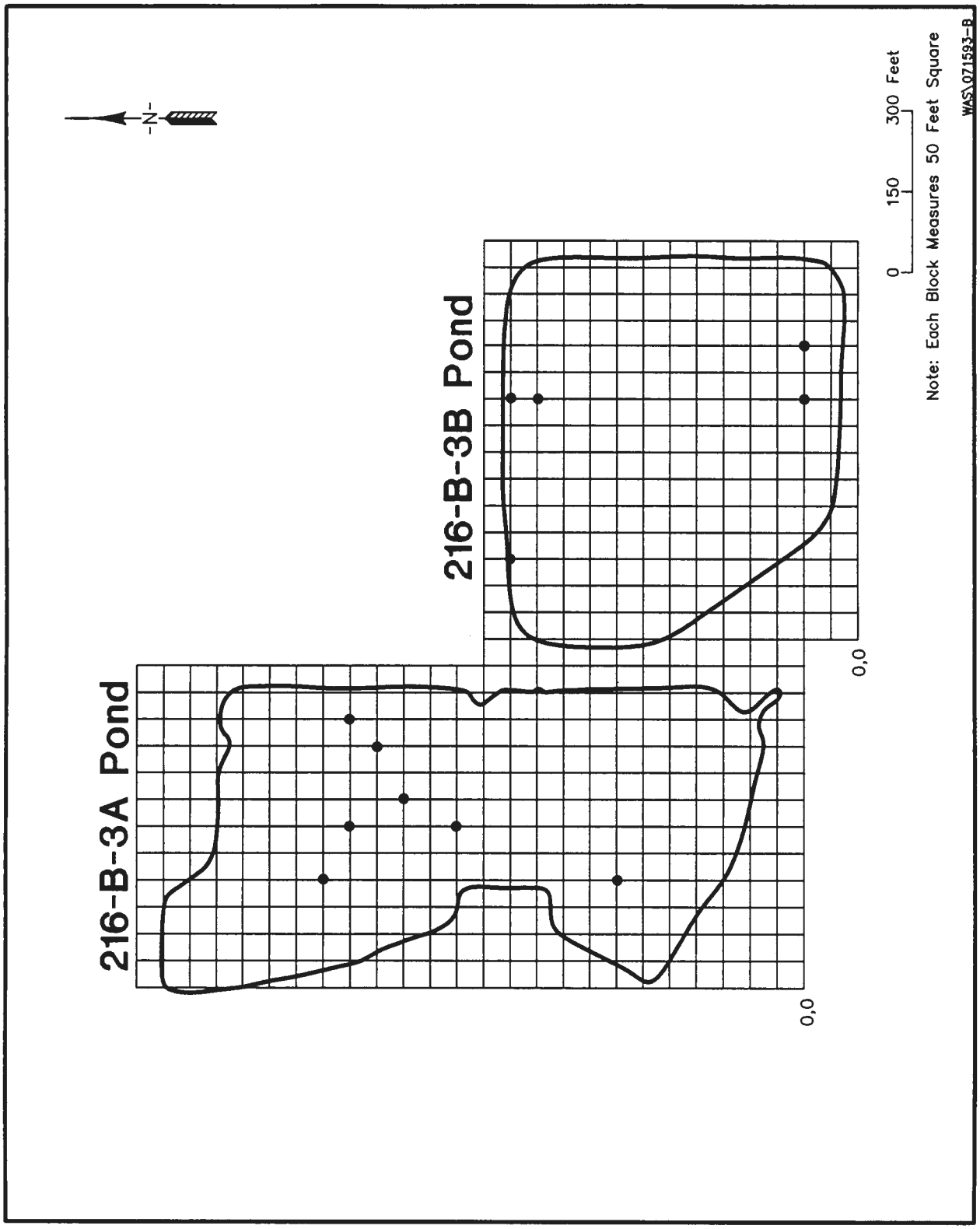

Figure 7-1. Random Sample Locations for 216-B-3A and -3B Ponds (Phase 1).

1

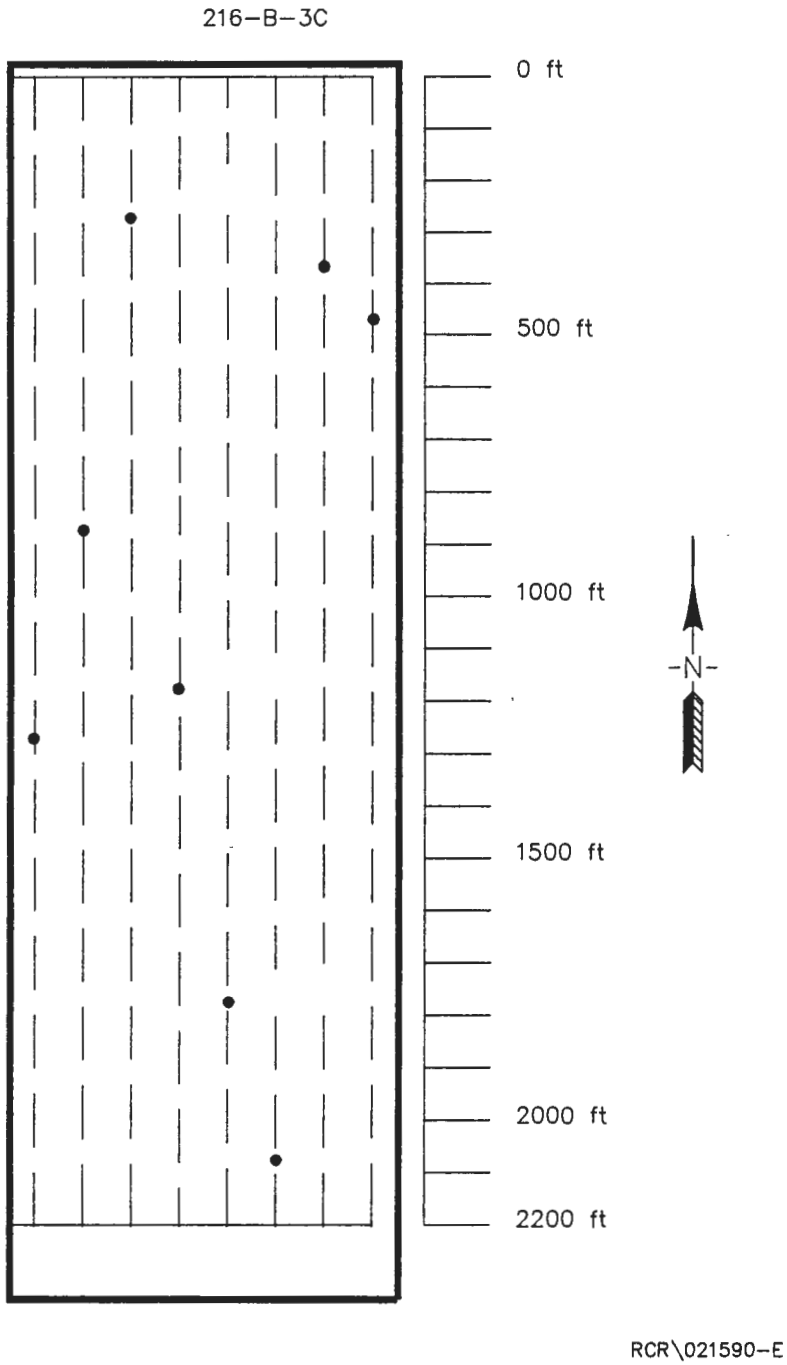

Figure 7-2. Random Sample Locations for 216-B-3C Pond (Phase 1).

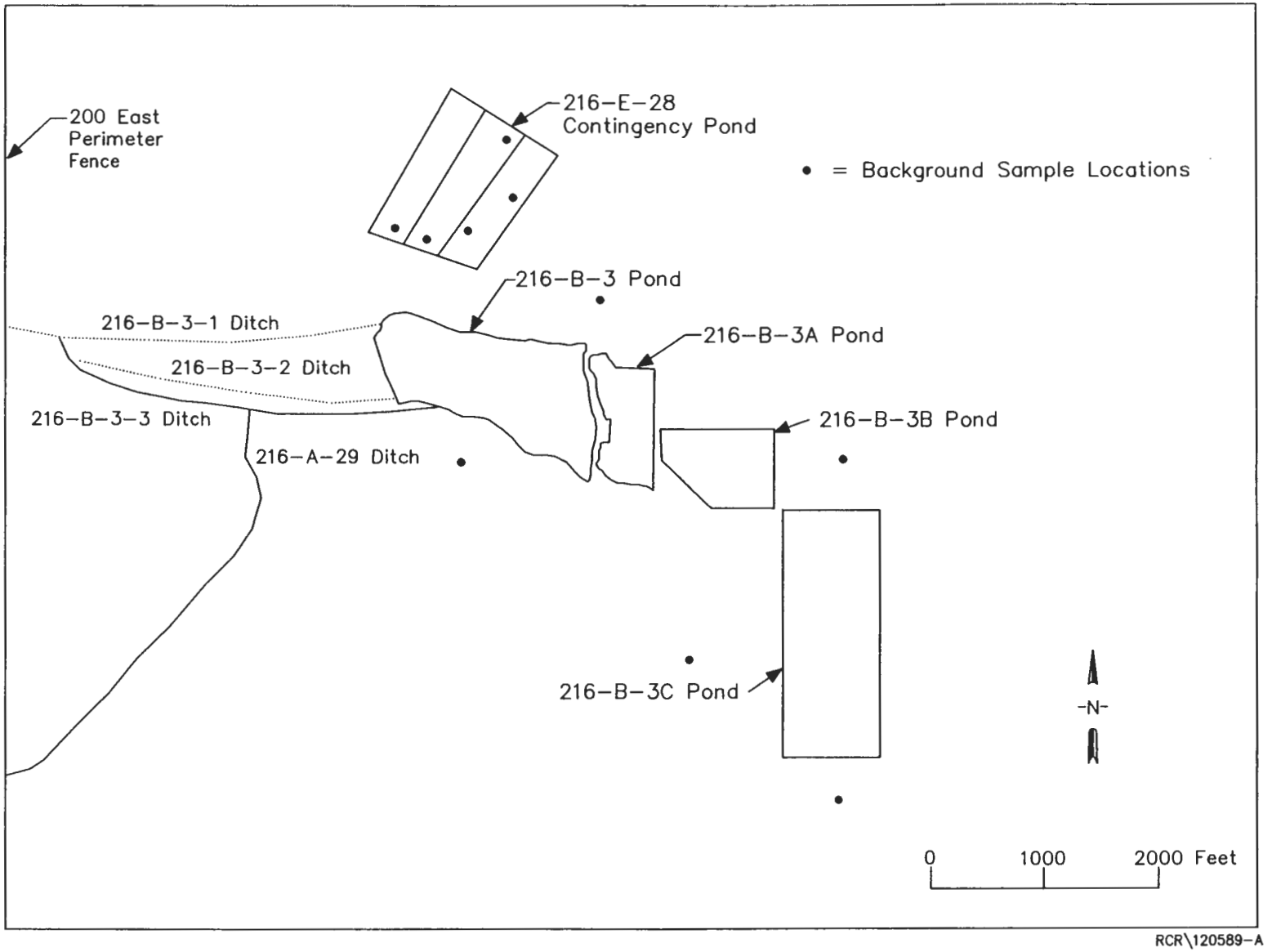

Figure 7-3. Background Sample Locations (Phase 1).

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CLOSURE CERTIFICATION
FOR

_____

Hanford Site
U.S. Department of Energy, Richland Operations Office

We, the undersigned, hereby certify that all _____ _____ closure activities were performed in accordance with the specifications in the approved closure plan.

_____ _____
Owner/Operator Signature DOE-RL Representative Date
(Typed Name)

_____ P.E.# _____ State ___ _____
Signature Independent Registered Professional Engineer Date
(Typed Name, Professional Engineer license number, state of issuance, and date of signature)

Figure 7-4. Typical Closure Certification Document.

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Table 7-1. Analytical Parameters for Individual Samples.

Parameter or group	Analysis method	Sample size (grams)
	Metals	
Extraction procedure toxic metals, enhanced[a]	EPA 6010[b]	100
Arsenic	EPA 7060/7061[b]	5
Lead	EPA 7425[b]	5
Mercury	EPA 7470[b]	5
Selenium	EPA 7740/7741[b]	5
Thallium	EPA 7841[b]	5
	Ions	
Anions[c]	EPA 300[b]	90
Sulfide	EPA 9030[b]	45
Cyanide	EPA 9010[b]	90
Ammonium	ASTM D 1426-C/D[d]	70
	Radiologic	
Gross alpha	EPA 9310[b]	5
Gross beta	EPA 9310[b]	5
	Organic	
Volatile organic compounds	EPA 8240[b]	40 milliliters duplicate samples

[a]Extraction procedure toxic metals, enhanced, include: aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silicon, silver, sodium, strontium, tin, titanium, vanadium, zinc, zirconium.

[b]EPA 1986c.

[c]Includes: bromide, chloride, fluoride, nitrate, nitrite, phosphate, sulfate.

[d]ASTM 1988.

Table 7-2. Analytical Parameters for Composite Samples.

Parameter or group	Analysis method	Sample size (grams)
Radionuclides		
Strontium-90	U.S. Testing Co.[a] method	5
Cesium-137	U.S. Testing Co.[a] method	100
Organics		
Semivolatile organic compounds	EPA 8270[b]	45
Pesticides and polychlorinated biphenyls[c]	EPA 8080[b]	50
Chlorinated herbicides	EPA 8150[b]	135
Phosphorous pesticides[e]	EPA 8140[b]	50

[a]U.S. Testing Company, Incorporated, Richland, Washington.
[b]EPA 1986c.
[c]Includes: Aldrin, chlordane, chlorobenzilate, 4,4'-dichlorodiphenyldichloroethane, 4,4'-dichlorodiphenyldichloroethylene, 4,4'-dichlorodiphenyltrichloroethane, dieldrin, endosulfan I and II, endosulfan sulfate, endrin, heptachlor, heptachlor epoxide, kepone, lindane, (and isomers), methoxychlor, polychorinated biphenyls, toxaphene.
[d]Includes: 2,4-D, 2,4,5-TP silvex, 2,4,5-T.
[e]Includes: dimehoate, disulfoton, methyl parathion, phorate, tetraethylpyrophosphate.

Table 7-3. Soil Sample Parameters.

Ammonium	Arsenic
Cyanide	Fluoride
Gross alpha	Gross beta
Inductively coupled plasma metals	Ion chromatography
Lead	Mercury
Selenium	Total radium
Sulfide	Thallium
Total carbon	Total organic carbon
Total organic halogens	Reactivity
Ignitability	Extraction procedure toxic metals
Fluorometric titration for uranium	
Volatile organic compounds [8240 (EPA 1986c)]	
Semivolatile organic compounds [8270 (EPA 1986c)]	

Table 7-4. Analytical Parameters for All Subsurface Samples.

Parameter or group	Analysis method	Sample size (grams)
	Metals	
EP toxic metals, enhanced[a]	EPA 6010[b]	100
	Ions	
Anions[c]	EPA 300[b]	90
Ammonium	ASTM D 1426-C/D[d]	70
	Radiological	
Gross alpha	EPA 9310[b]	5
Gross beta	EPA 9310[b]	5

[a]EP toxic metals, enhanced, include: aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silicon, silver, sodium, strontium, tin, titanium, vanadium, zinc, zirconium.

[b]EPA 1986c.

[c]Includes: bromide, chloride, fluoride, nitrate, nitrite, phosphate, sulfate.

[d]ASTM (1988).

Table 7-5. Additional Analytical Parameters for Selected Subsurface Samples.

Parameter or group	Analysis method	Sample size (grams)
	Ions	
Sulfide	EPA 9030[a]	45
Cyanide	EPA 9010[a]	90
	Radionuclides	
^{90}Sr	U.S. Testing Method	5
^{137}Cs	U.S. Testing Method	100
	Organics	
Volatile organic compounds	EPA 8240[a]	40 milliliters duplicate sample
Semivolatile organic compounds	EPA 8270[a]	45
Pesticides and polychlorinated biphenyls	EPA 8080[a]	50
Chlorinated herbicides	EPA 8150[a]	135
Phosphorous pesticides	EPA 8140[a]	45

[a]EPA (1986c).
[b]Includes: Aldrin, chlordane, chlorobenzilate, 4,4'-dichlorodiphenyldichloroethylene, 4,4'-dichlorodipheny-dichloroethane, 4,4'-dichlorodiphenyldichlorotrichloroethane, dieldrin, endosulfan sulfate, endosulfan I and II, endrin, heptachlor, heptachlor epoxide, kepone, lindane (and isomers), methoxychlor, polychorinated biphenyls, toxaphene.
[d]Includes: 2,4-D, 2,4,5-TP silvex, 2,4,5-T.
[e]Includes: dimehoate, disulfoton, methyl parathion, phorate, tetraethylpyrophosphate.

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8.0 POSTCLOSURE PLAN

This closure/postclosure plan proposes clean closure of the three expansion ponds. Postclosure care will not be required if clean closure is achieved. Final closure/postclosure of other portions of the 216-B-3 Pond system (including the overflow area) and the 216-B-3-3 Ditch will be coordinated with the 200-BP-11 operable unit activities. A final cover design, specific postclosure care requirements, and the postclosure permit application, for those portions of the TSD unit that cannot be clean closed, will be developed following the operable unit RCRA Facility Investigation/Corrective Measures Study.

8.1 INSPECTION AND MAINTENANCE PLAN

The facility will be visually inspected throughout the postclosure care period. Inspections will be conducted in accordance with an established schedule, and observations will be recorded in a logbook that will be maintained throughout the postclosure care period. The information obtained during the inspections will be used to assess when maintenance activities are necessary. Inspection and maintenance activities will be assigned to personnel that are properly trained to conduct these activities.

The following will be checked during the scheduled inspections as appropriate:

- Condition of the security control devices
- Condition of vegetative cover
- Animal activity such as burrows
- Condition of groundwater monitoring wells including locks, guardposts, and pumps.

Following inspections, maintenance activities will be initiated to correct any problems noted during the inspection.

8.2 MONITORING PLAN

The current groundwater monitoring program for B Pond is described in Chapter 5.0. Monitoring will continue in accordance with this program through closure of the TSD unit. If it is determined that postclosure care is required for the TSD unit, the program will be modified, as necessary, to meet all the requirements of WAC 173-303-645.

8.3 AMENDMENT OF PLAN

The postclosure plan may be amended any time during the active life of the facility or during the postclosure care period. The DOE-RL must submit a written request to authorize a change in the approved postclosure plan whenever (1) changes in operating plans or facility design affect the approved postclosure plan or (2) events that occur during the active life of the facility, including partial and final closure, affect the approved postclosure plan.

The approved postclosure plan will be amended by submitting a written request to Ecology and the EPA to authorize a change to the approved postclosure plan. The written request will include a copy of the amended postclosure plan for approval. The request will be submitted at least 60 days before the proposed change in facility design or operation or no later than 60 days after an unexpected event has occurred that has affected the postclosure plan.

8.4 NOTICE TO LOCAL LAND AUTHORITY

No later than the submission of the certification of closure, the DOE-RL will submit to the Benton County Land Planning Department, Ecology, and the EPA a survey plat indicating the location and dimensions of the 216-B-3 Pond System with respect to permanently surveyed benchmarks. The survey plat submitted will (1) be prepared and certified by a professional land surveyor and (2) contain a note, prominently displayed, that states the DOE-RLs obligation to restrict disturbance of the dangerous waste disposal unit in accordance with the requirements of WAC 173-303-610(a).

In addition, no later than 60 days after certification of closure, the DOE-RL will submit to the Benton County Land Planning Department a record of the type, location, and quantity of dangerous waste disposed within the facility.

8.5 NOTICE IN DEED

Within 60 days of the certification of closure, the DOE-RL will, in accordance with state regulations, sign, notarize, and file for recording, the following notice. The notice will be sent to the Auditor of Benton County, P.O. Box 470, Prosser, Washington, with instructions to record this notice in the General Index. This document normally is reviewed in property title searches.

TO WHOM IT MAY CONCERN

The United States Department of Energy-Richland Operations Office, an operations office of the United States Department of Energy, which is a department of the United States government, the undersigned, whose local address is the Federal Building, 825 Jadwin Avenue, Richland, Washington,

hereby gives the following notice as required by 40 CFR 264.119(b) and WAC 173-303-610(10) (whichever is applicable):

(a) The United States of America is, and since April 1943, has been in possession in fee simple of the following described lands: (legal description of the 216-B-3 Pond System).

(b) The United States Department of Energy-Richland Operations Office, by operation of the 216-B-3 Pond System, has disposed of hazardous and/or dangerous waste under the terms of regulations promulgated by the United States Environmental Protection Agency and the Washington State Department of Ecology (whichever is applicable) at the above described land.

(c) The future use of the above described land is restricted under terms of 40 CFR 264.117(c) and WAC 173-303-610(7)(d) (whichever is applicable).

(d) Any and all future purchasers of this land should inform themselves of the requirements of the regulations and ascertain the amount and nature of waste disposed on the above described property.

(e) The United States Department of Energy-Richland Operations Office has filed a survey plat with the Benton County Planning Department and with the United States Environmental Protection Agency, Region X and the Washington State Department of Ecology (whichever are applicable) showing the location and dimensions of site, and a record of the type, location, and quantity of waste disposed of within the unit.

8.6 CERTIFICATION OF POSTCLOSURE CARE

No later than 60 days after completion of the established postclosure care period, the DOE-RL will submit to Ecology a certification of postclosure care. This certification will be signed by both the DOE-RL and an independent professional engineer registered in the state of Washington, stating that postclosure care for the facility was performed in accordance with the approved postclosure plan. The certification will be submitted by registered mail. Documentation supporting the postclosure certification will be retained and furnished to Ecology upon request.

Owner/Operator Postclosure Certification--The DOE-RL will self-certify with the following document or a document similar to it:

> The undersigned, the owner and the operator of the 216-B-3 Pond System, hereby certify that I have reviewed the approved 216-B-3 Pond System Postclosure Plan and made visual inspection of the facility, and to the best of my information and belief, all postclosure activities were performed in accordance with the specifications identified in the approved postclosure plan. (Signature and date)

Professional Engineer Postclosure Certification--The DOE-RL will engage an independent professional engineer, registered in the state of Washington, to certify that postclosure care for the facility has been conducted in accordance with the approved postclosure plan. The DOE-RL will require the professional engineer to sign the following document or a document similar to it:

> The undersigned, an independent registered professional engineer, hereby certify that I have reviewed the approved 216-B-3 Pond System Postclosure Plan and made visual inspection of the facility and to the best of my information and belief, all postclosure activities were performed in accordance with the specifications identified in the approved postclosure plan. (Signature, date, registered professional engineer license number, business address, and phone number)

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9.2 CODE OF FEDERAL REGULATIONS AND FEDERAL REGISTER

10 CFR 61.55, *Waste Classification, Licensing Requirements for Land Disposal of Radioactive Waste*

40 CFR 141, *National Primary Drinking Water Regulations*

40 CFR 143, *National Secondary Drinking Water Regulations*

40 CFR 264, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*

40 CFR 265, *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*

40 CFR 761, *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*

49 CFR 172, *Hazardous Materials Tables and Hazardous Materials Communications Requirements and Emergency Response Information Requirements*

51 FR 7722, *Hazardous Waste Management System; Supplement to Preamble to Final Codification Rule*

52 FR 8704, *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Final Rule*

9.3 FEDERAL AND STATE ACTS

Atomic Energy Act of 1954, 42 USC 2011 et seq.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601 et seq.

Hazardous and Solid Waste Amendments of 1984, 42 USC 6912(a), 6921, 6922, 6924, 6925, 6926, 6930, 6935, 6937, 6939, 6991, and 6993.

Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq.

Solid Waste Disposal Act, 42 USC 3251 et seq.

State of Washington Hazardous Waste Management Act of 1976, Revised Code of Washington, Chapter 70.105 et seq., Olympia, Washington.

Toxic Substances Control Act, 1976, 15 USC 2601 et seq.

9.4 REVISED CODE OF WASHINGTON AND WASHINGTON ADMINISTRATIVE CODE

WAC 173-160, *Minimum Standards for Construction and Maintenance of Wells*

WAC 173-303, *Dangerous Waste Regulations*

WAC 248-54, *Public Water Supplies*

9.5 U.S. DEPARTMENT OF ENERGY ORDER

5820.2A *Radioactive Waste Management*

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APPENDICES

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APPENDIX A

GEOLOGIC AND WELL CONSTRUCTION DIAGRAMS

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APPENDIX A

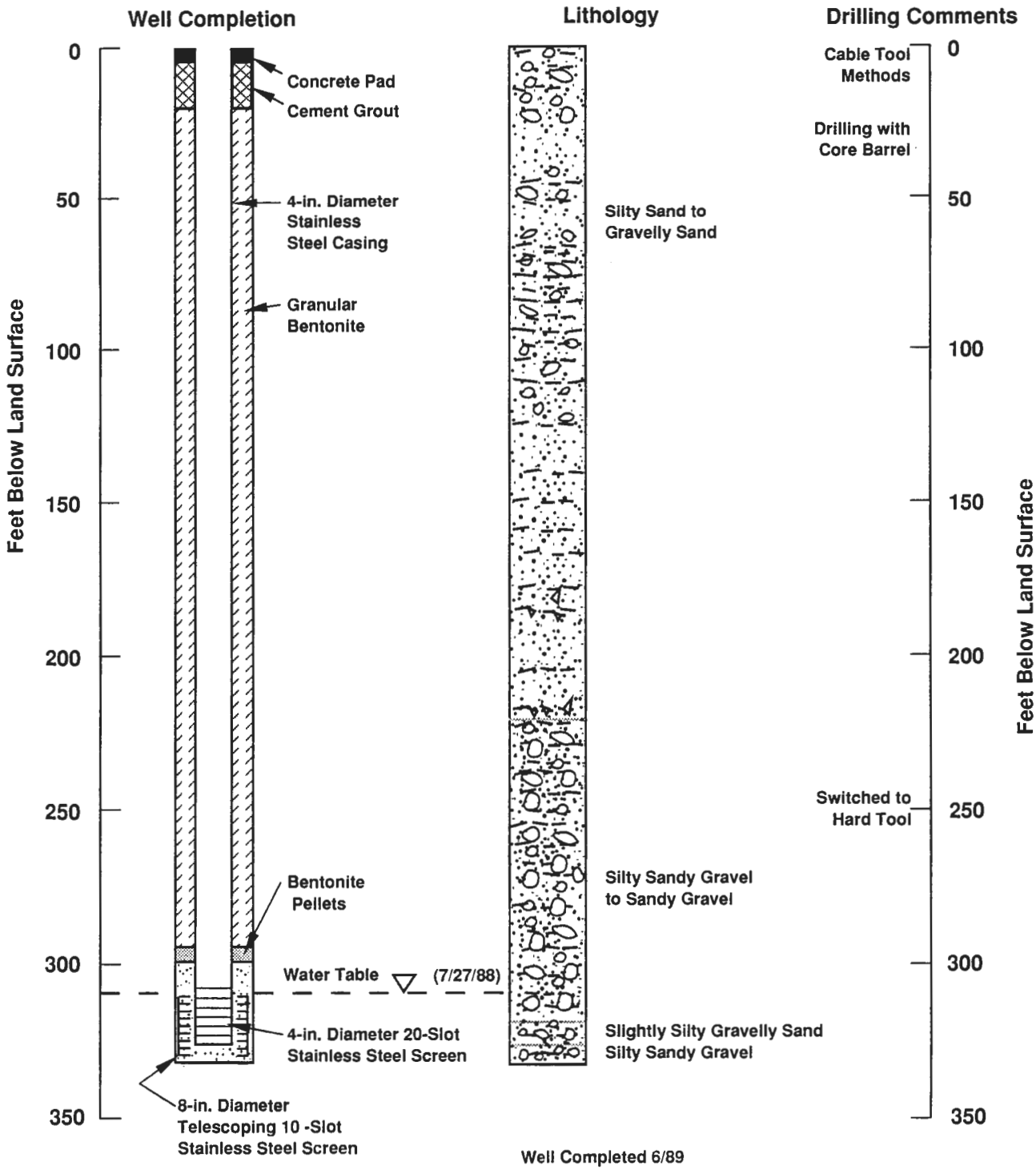
GEOLOGIC AND WELL CONSTRUCTION DIAGRAMS

This appendix comprises geologic and well construction diagrams for wells in the 216-B-3 Pond monitoring network. The lithologic and well construction information was obtained from driller logs and geologist logs. Listed below are well coordinates and elevations.

Well number	Completion date	Hanford coordinates	Casing elevation (ft msl)
299-E18-1	8/88	N38458 W54458	720.24
299-E32-4	9/87	N44985 W55713	685.88
699-40-36	12/92	N39830 W36432	528.92
699-40-39	7/89	N39878 W39224	541.84
699-40-40A	10/91	N39710 W40072	541.21
699-40-40B	10/91	N39761 W40080	542.18
699-41-35	11/92	N40856 W35476	520.38
699-41-40	6/89	W41030 W40285	545.94
699-42-37	11/92	N41846 W37451	519.40
699-42-39A	9/91	N41867 W39485	558.14
699-42-39B	10/91	N41816 W39478	558.32
699-42-40A	7/81	N42420 W40205	545.53

Well number	Completion date	Hanford coordinates	Casing elevation (ft msl)
699-42-41	8/91	N42246 W41196	567.30
699-42-42B	10/88	N42473 W42301	583.23
699-43-40	10/91	N43357 W40379	542.20
699-43-41E	5/89	N42995 W40723	547.89
699-43-41F	6/89	N42945 W40721	551.01
699-43-41G	10/91	N42969 W40763	551.34
699-43-42J	9/88	N42532 W42274	581.68
699-43-43	9/88	N42942 W43184	579.37
699-43-45	6/89	N42977 W44644	597.68
699-44-39B	9/92	N43426 W39140	513.40
699-44-42	9/88	N43783 W41965	579.22
699-44-43B	5/89	N43997 W43363	580.12

299-E18-1

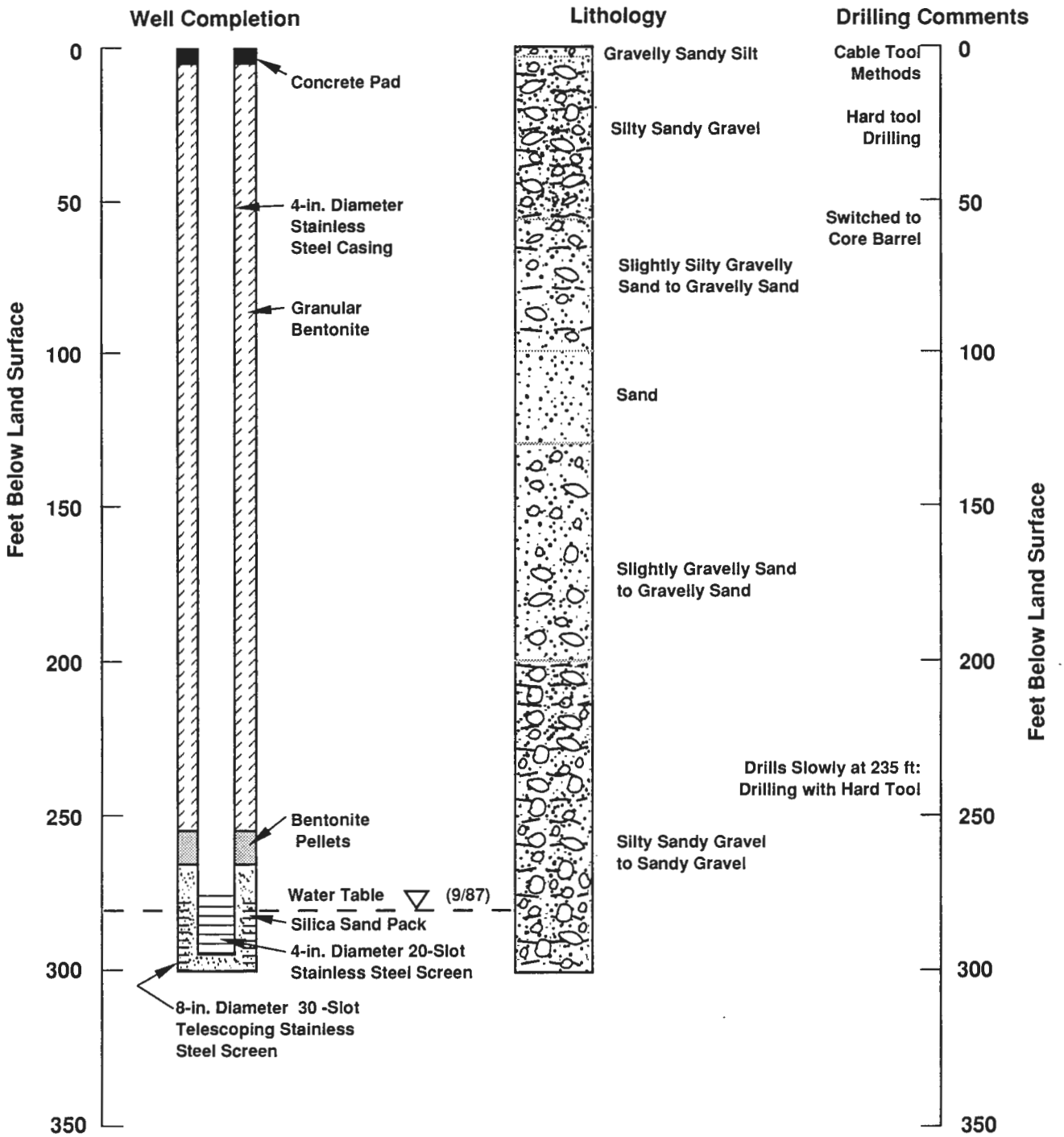


Well Completed 6/89
Casing Elevations: 597.68 ft
Depth to Water: 187.10 ft (5/89)

Not to Scale

79001203.3

299-E32-4

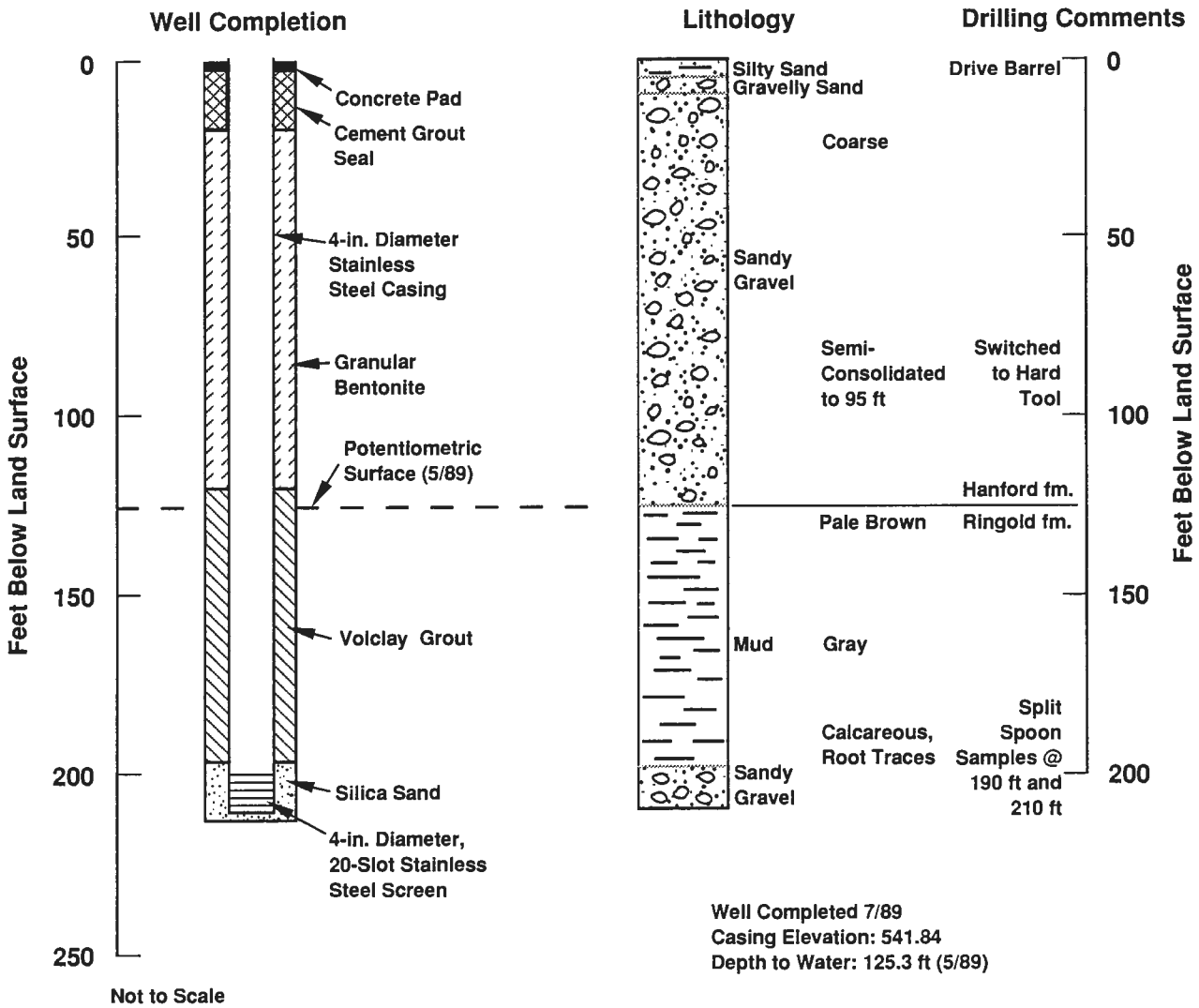


Well Completed 9/87
Casing Elevations: 685.88 ft
Depth to Water: 280.34 ft (9/87)

Not to Scale

79001203.4

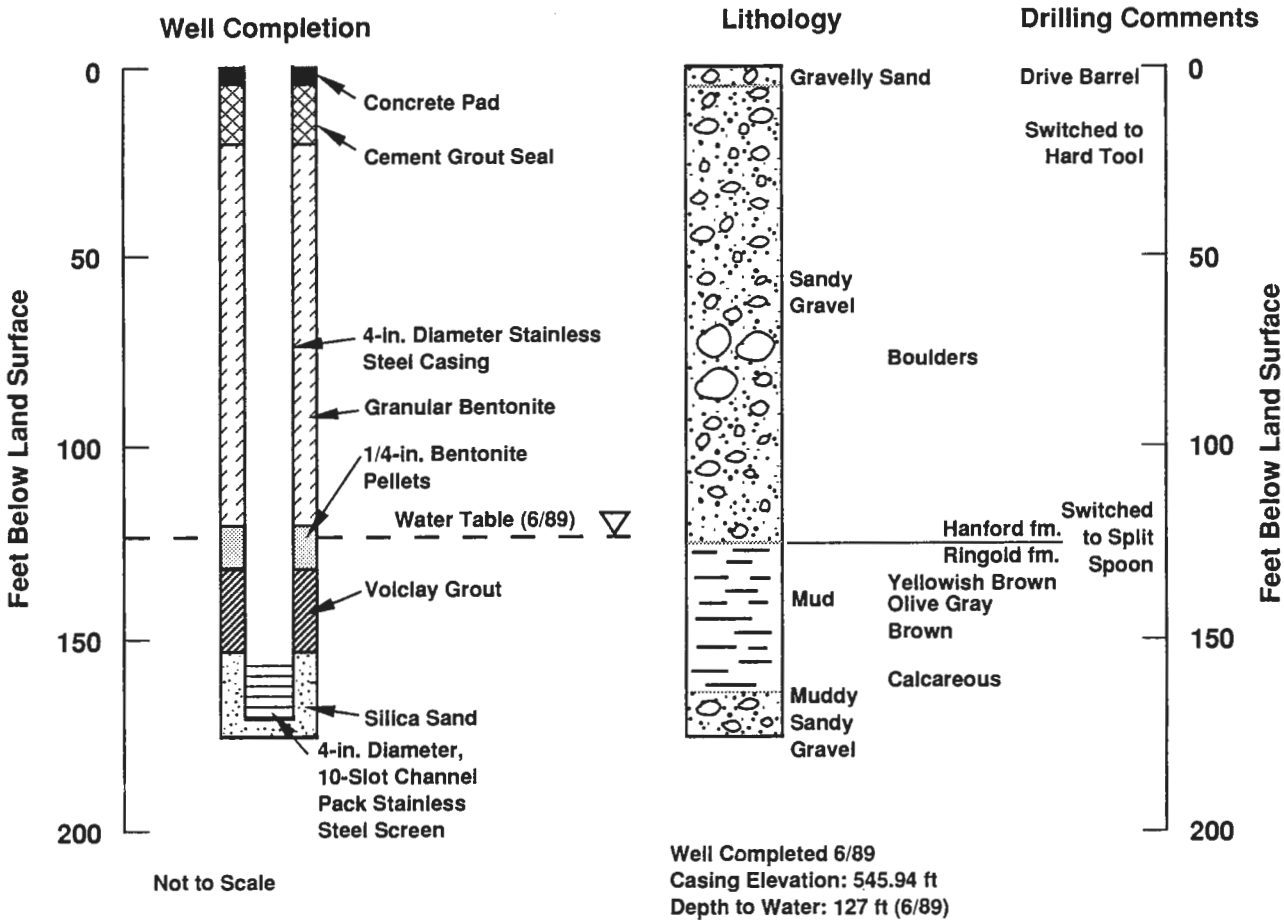
699-40-39 (BP-5)



Well Completed 7/89
Casing Elevation: 541.84
Depth to Water: 125.3 ft (5/89)

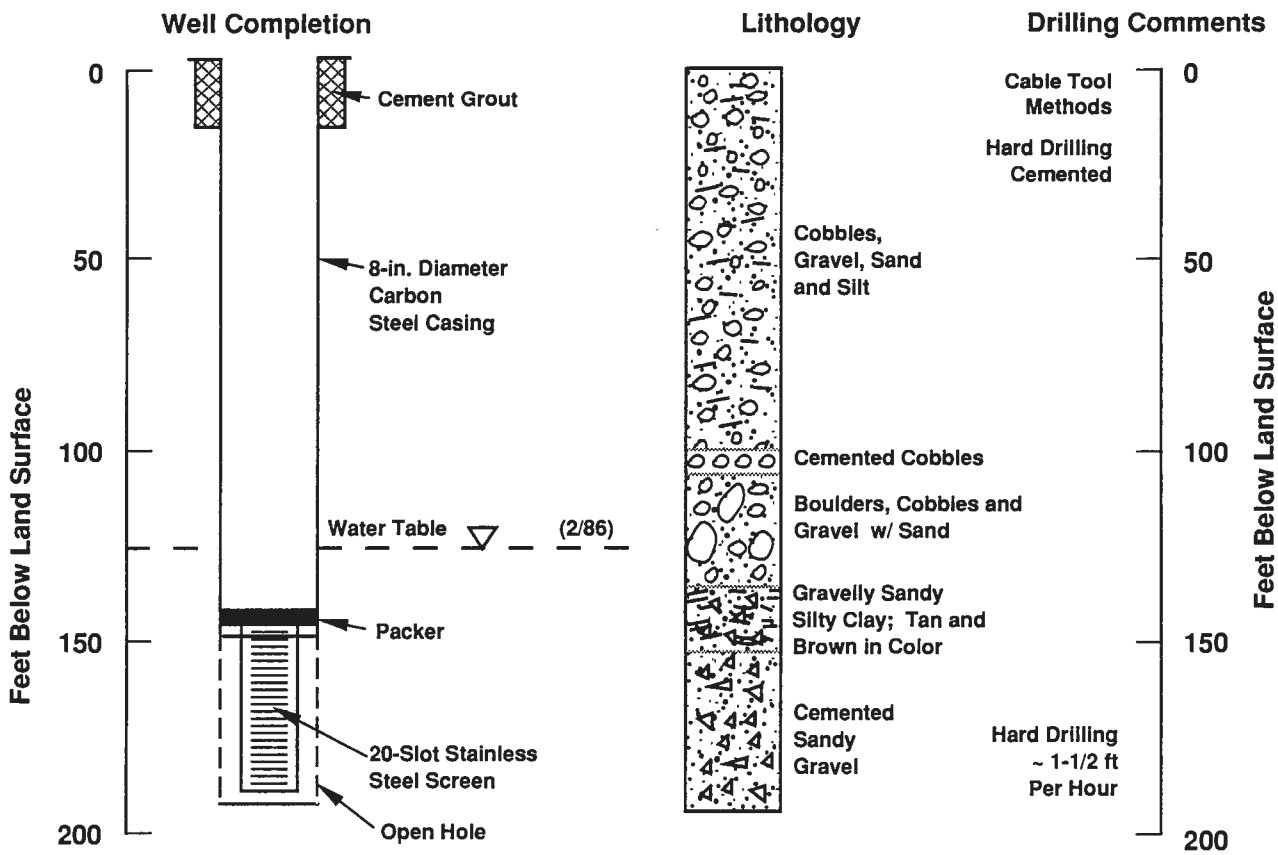
S8908052.7

699-41-40 (BP-6)



S8908052.9

699-42-40A

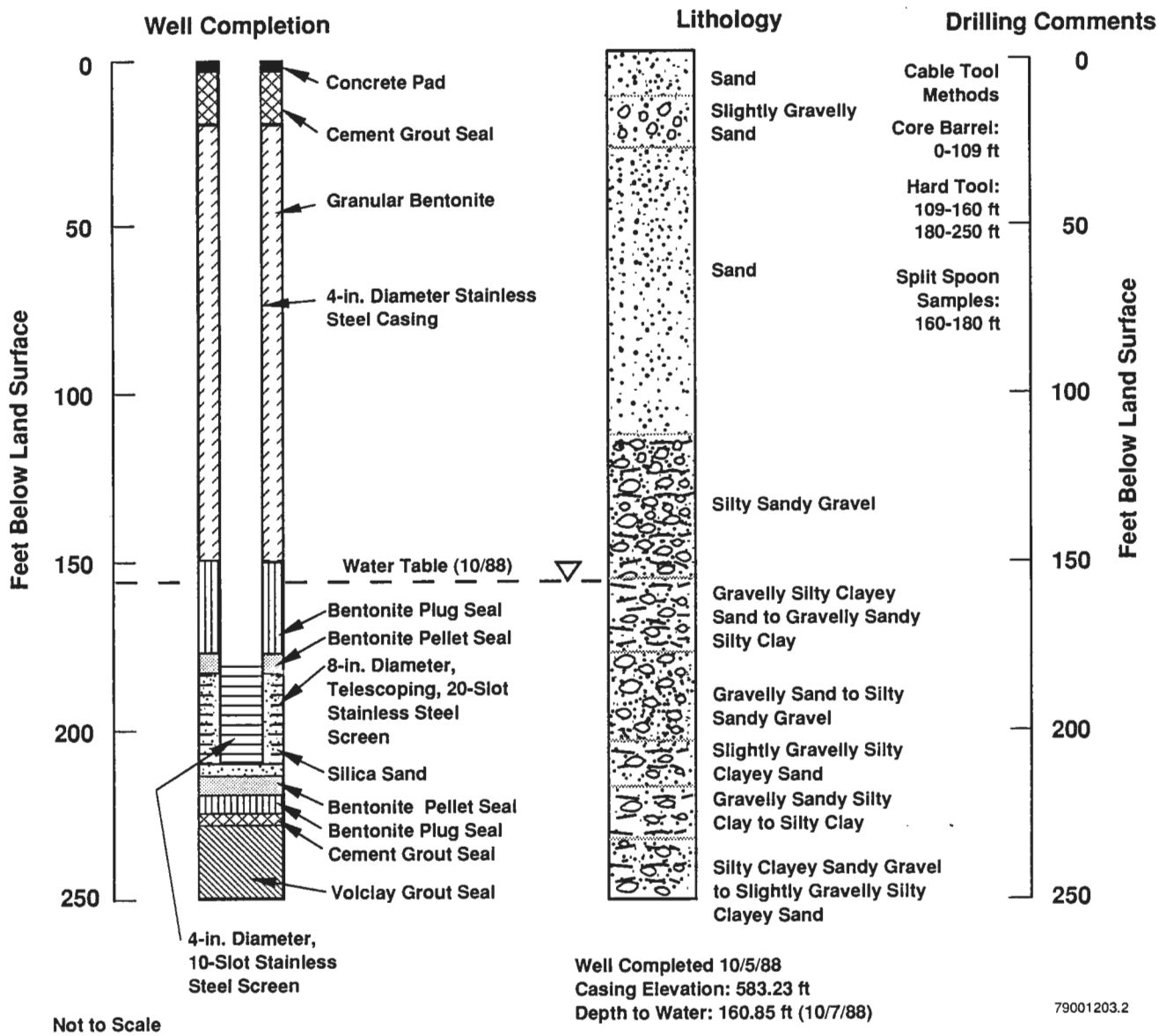


Not to Scale

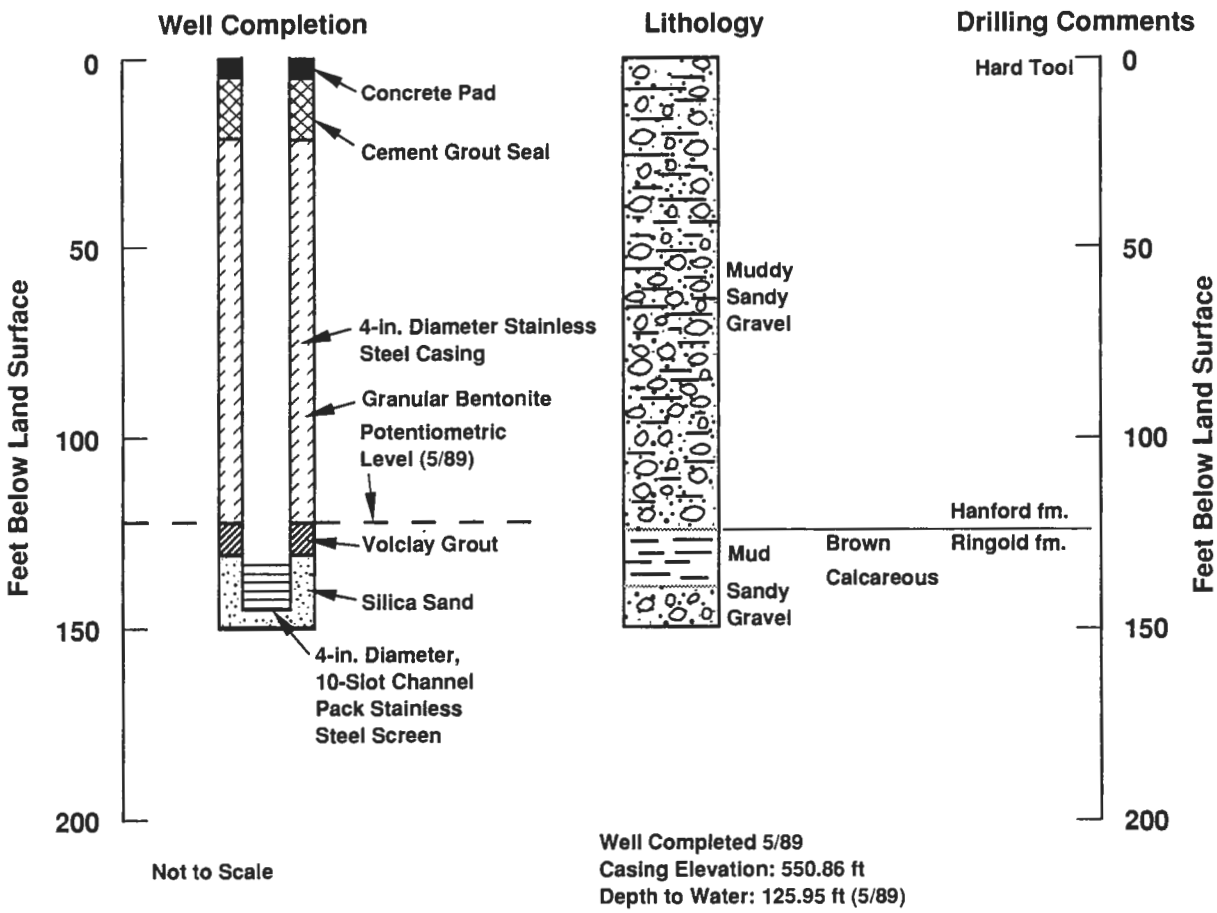
Well Completed 7/81
Casing Elevation: 545.53 ft
Depth to Water: 124.50 ft (12/86)

79001203.8

699-42-42B (BP-10)

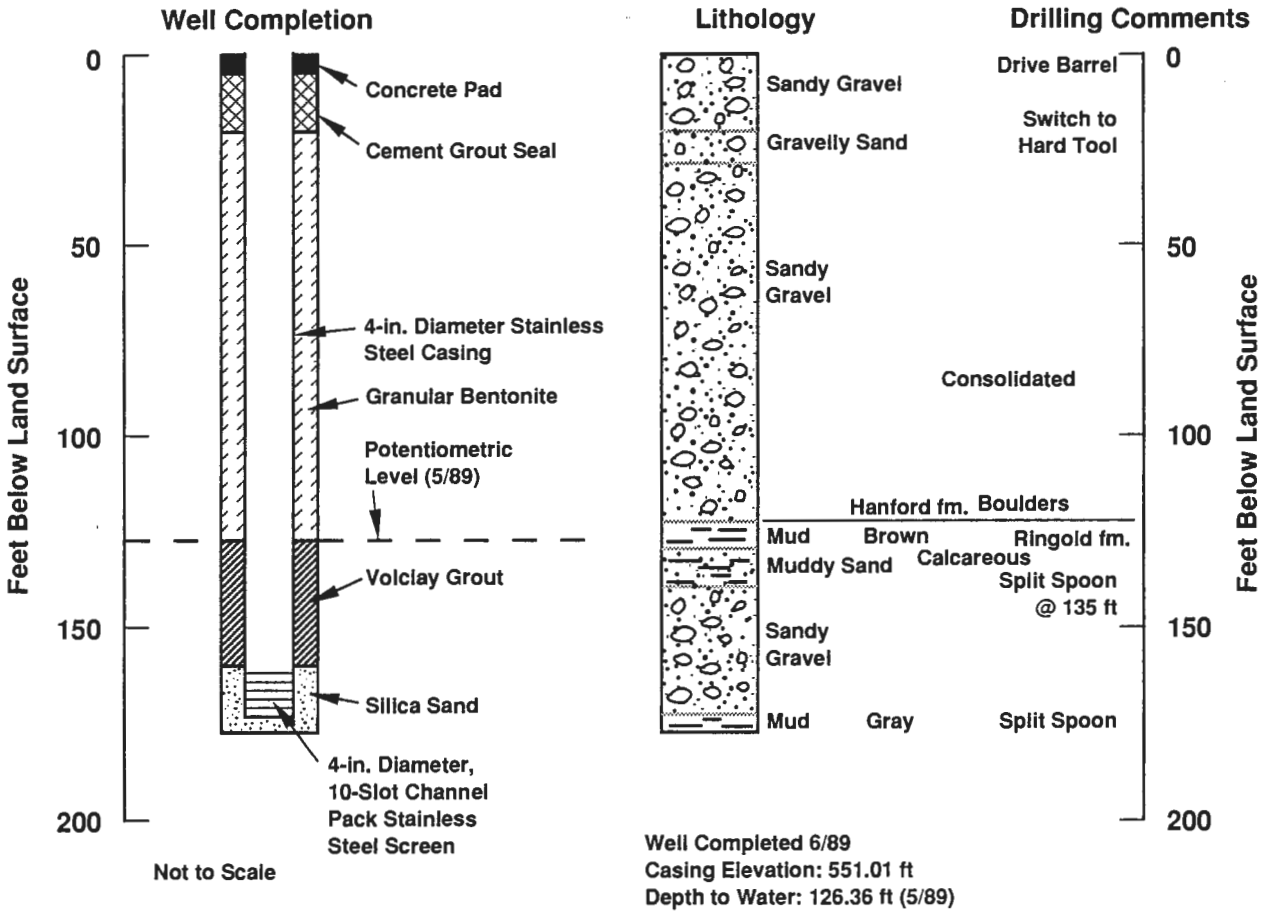


699-43-41E (BP-4)



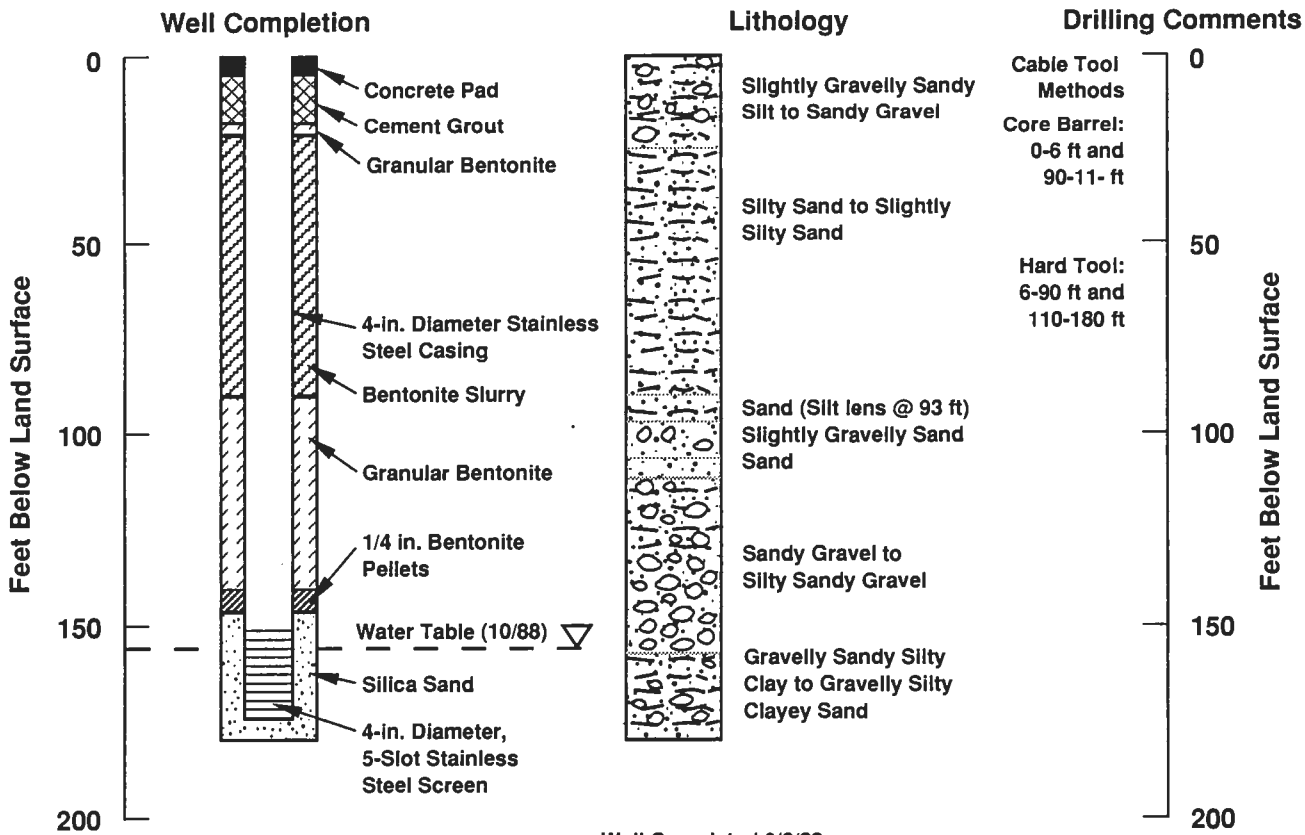
S8908052.5

699-43-41F (BP-9)



S8908052.2

699-43-42J (BP-7)

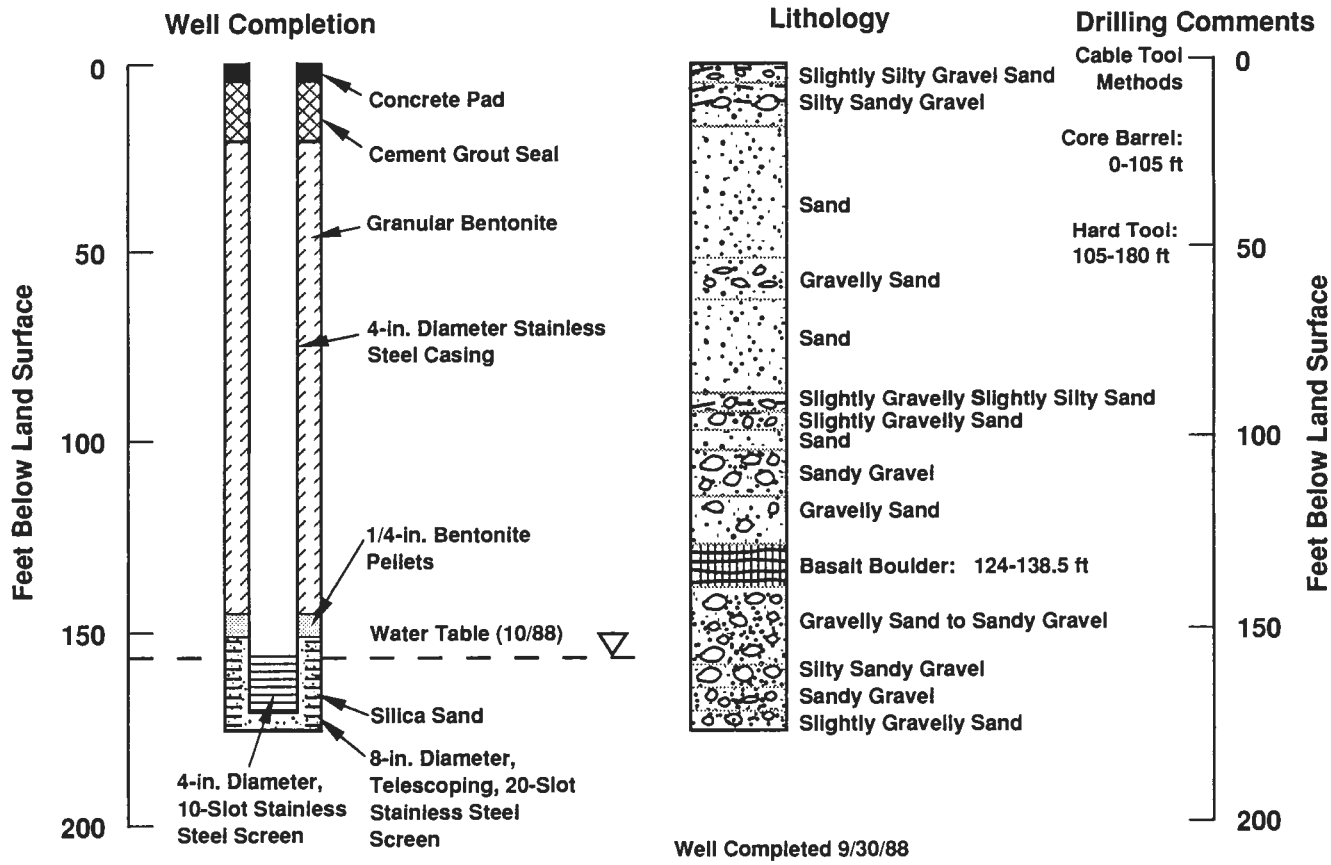


Not to Scale

Well Completed 9/2/88
Casing Elevation: 581.68 ft
Depth to Water: 157.1 ft (10/7/88)

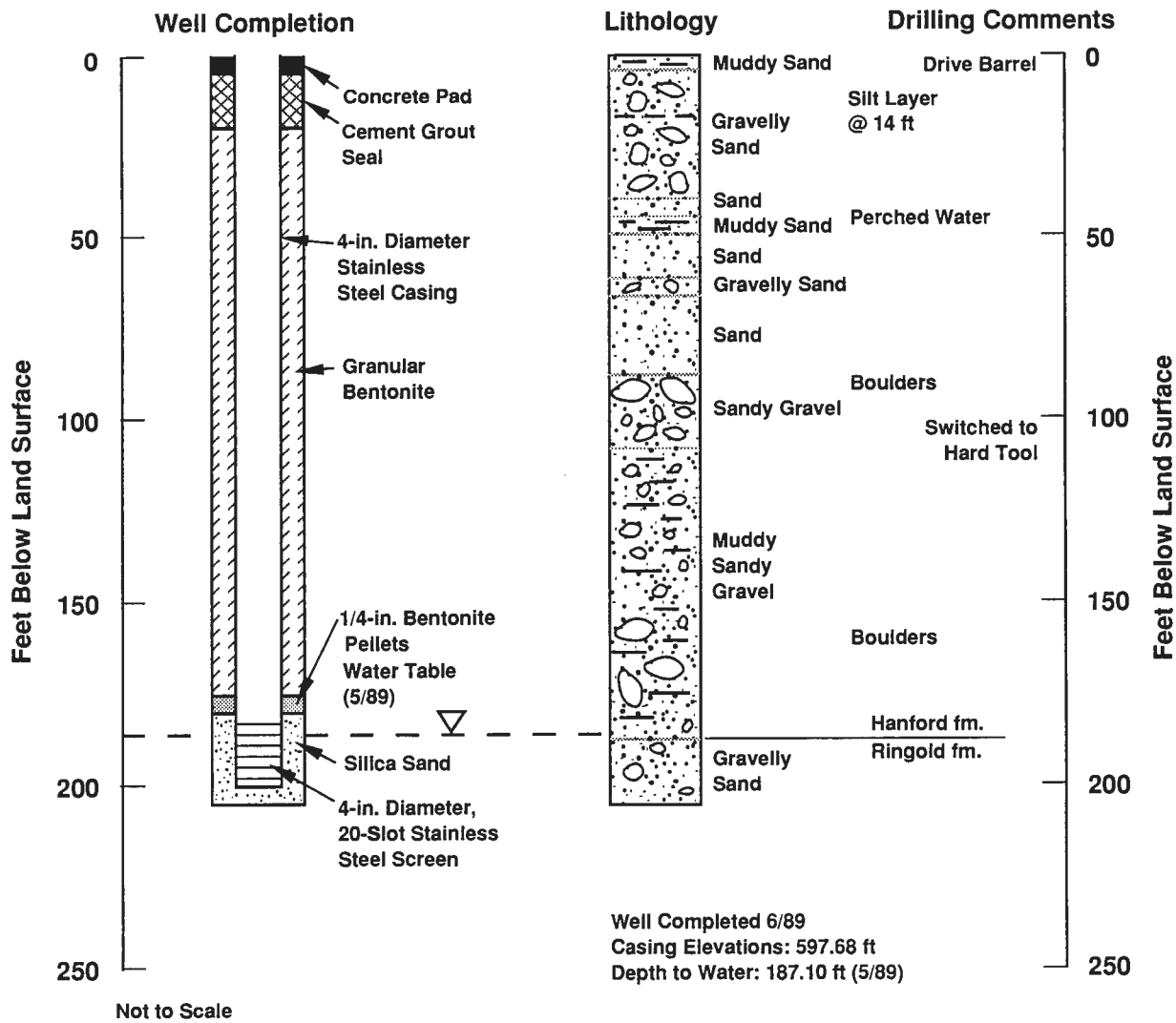
79001203.1

699-43-43 (BP-8)



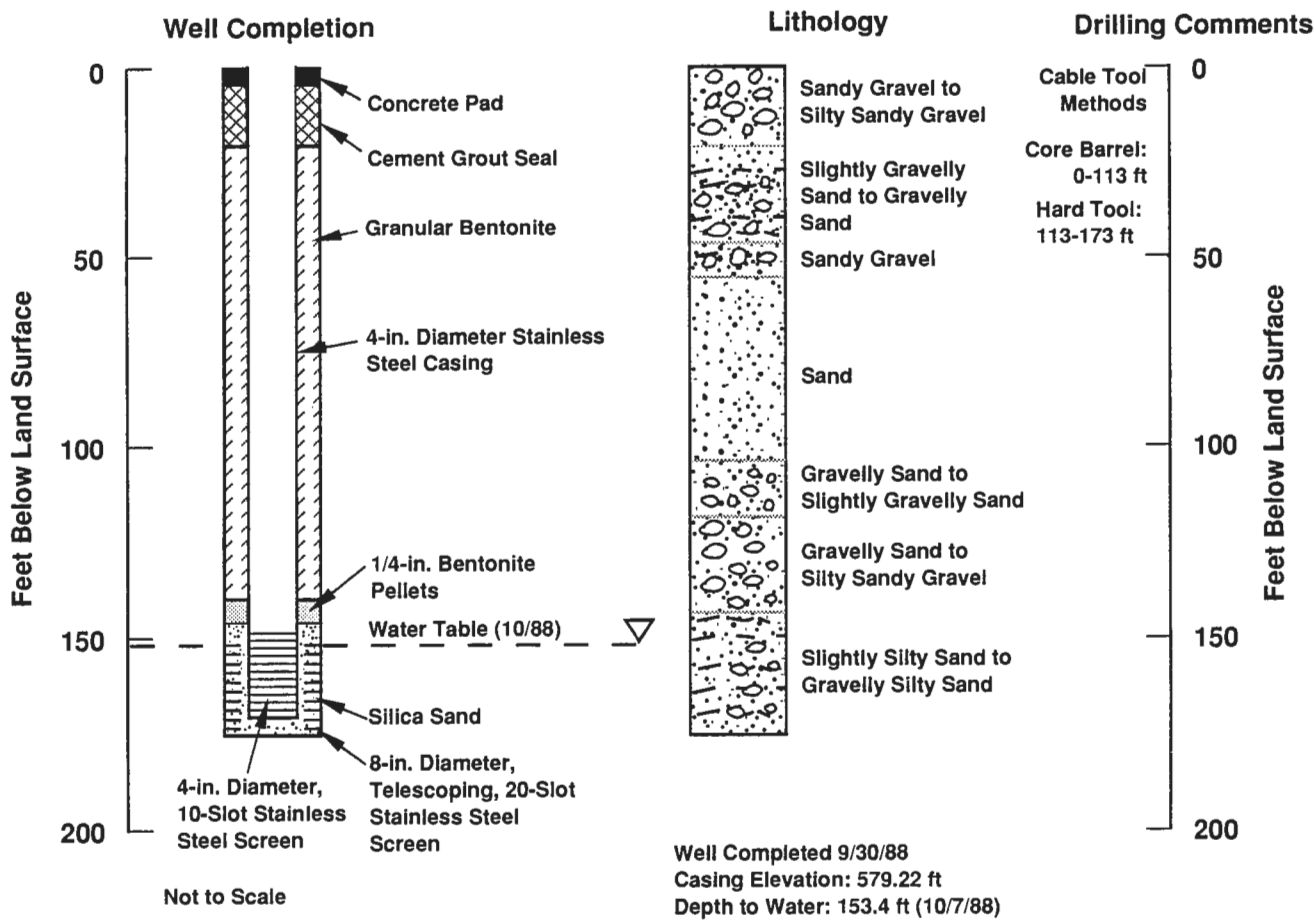
79001203.6

699-43-45 (BP-1)



S8908052.14

699-44-42 (BP-3)



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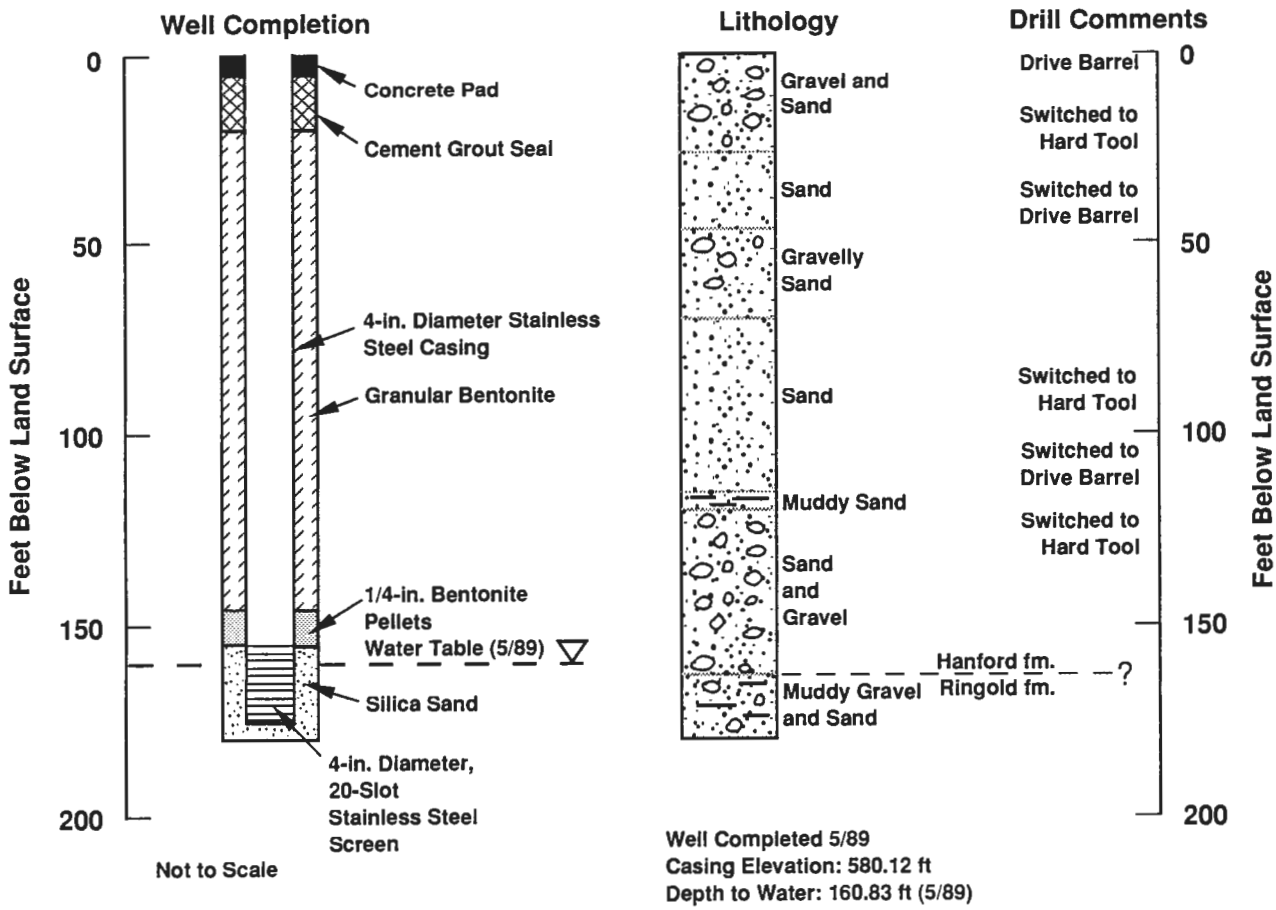
699-44-43B (BP-2)



S8908052.4

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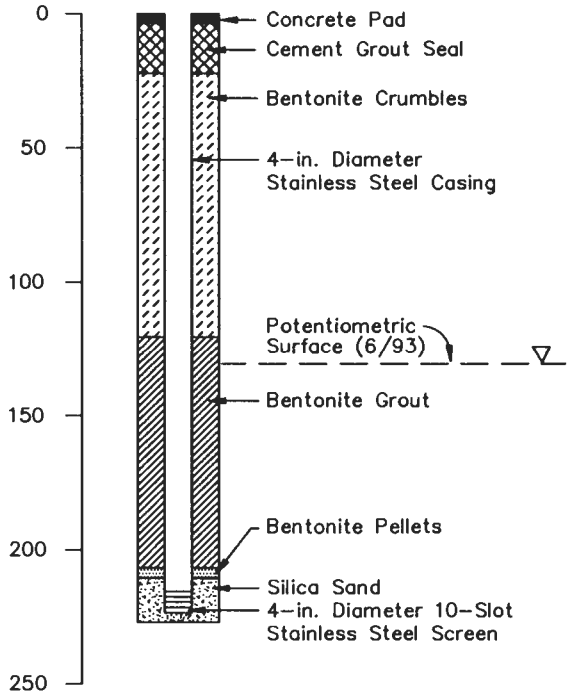
699-40-40A

Well Completion



Lithology/Stratigraphy

0 – 15 ft Silty Sandy Gravel

15 – 75 ft Sandy Gravel

75 – 105 ft Slightly Sandy Gravel

105 – 116 ft Silty Sandy Gravel

Hanford fm.

Ringold Fm.

116 – 130 ft Silty Clay

130 – 160 ft Slightly Silty Clay

160 – 171 ft Slightly Silty Sand

171 – 175 ft Sandy Silt

175 – 185 ft Silty Sand

185 – 190 ft Gravelly Sand

190 – 225 ft Sandy Gravel

225 – 227 ft Silty Sand

Drilling Comments

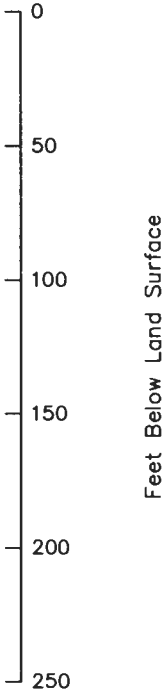
Drive Barrel
0 – 120 ft

Hard Tool
120 – 164 ft

Split Tube
164 – 180 ft

Hard Tool
180 – 225 ft

Split Tube
225 – 227 ft

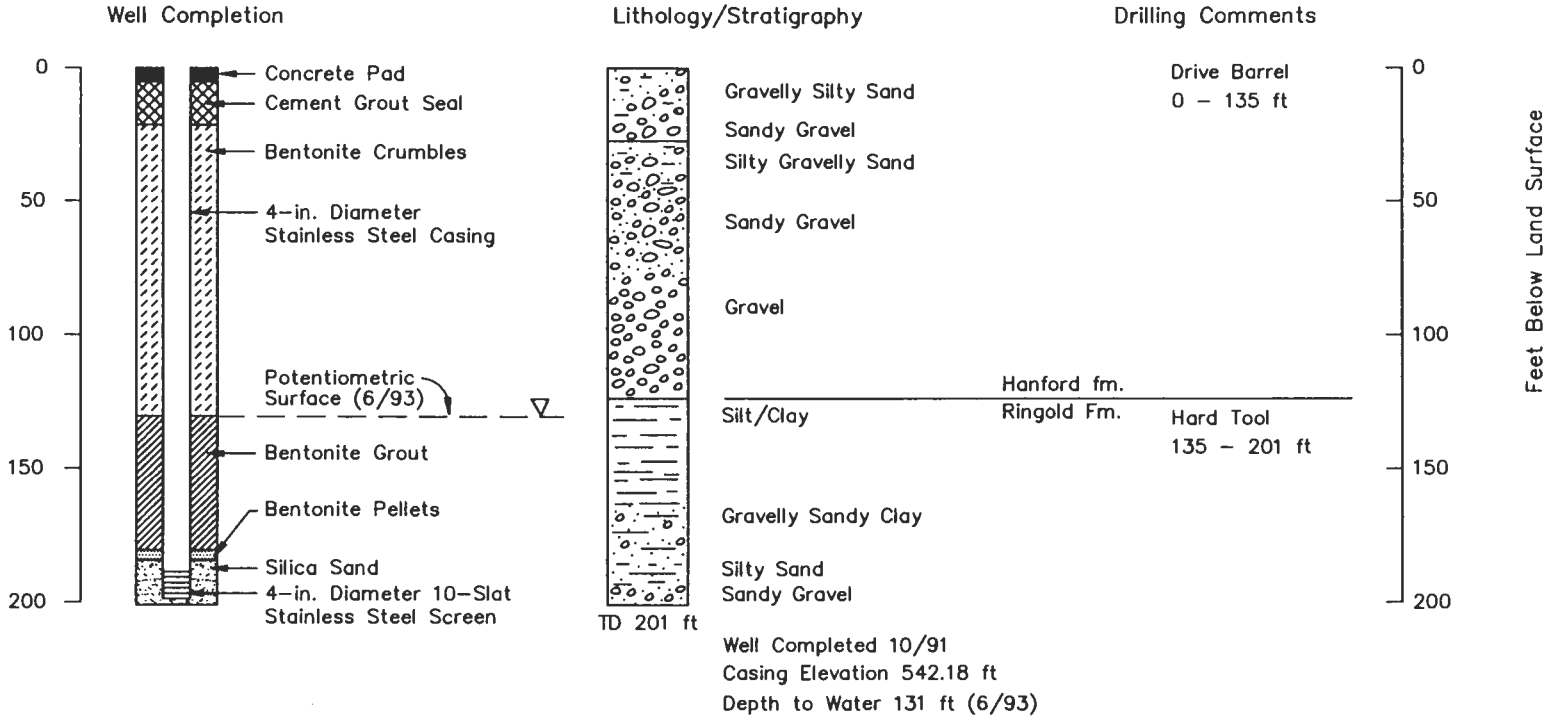


Well Completed 10/91
Casing Elevation 541.21 ft
Depth to Water 130 ft (6/93)

GEN\40-40A

9413099.0921

699-40-40B

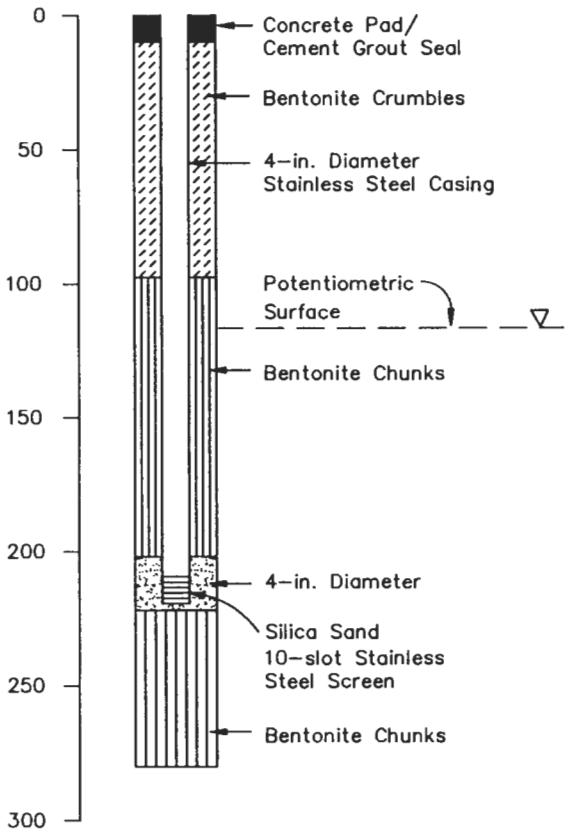


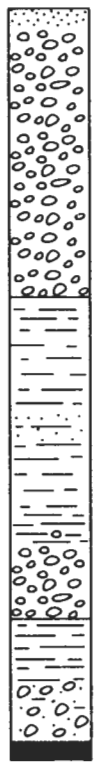
Well Completed 10/91
Casing Elevation 542.18 ft
Depth to Water 131 ft (6/93)

GEN\4040B

9413095.0971

699-40-36





Lithology/Stratigraphy

0 – 4 ft Eolian Sand
4 – 7 ft Sandy Silty Gravel

7 – 113 ft Gravel
49 – 73.5 ft Sandy gravel
73.5 – 80 ft Silty sandy gravel

Hanford fm.
Ringold Fm.

113 – 193 ft Clay/Silt

Occasional Sand
Interbeds (152 – 155 ft)
Slightly Sandy 155–160 ft

193 – 198 ft Slightly Gravelly
Silty Clay

198 – 227 ft Sandy Gravel
227 – 250 ft Clay/Silt

250 – 265 ft Silty Sandy Gravel
265 – 272 ft Sandy Gravel

272 – 280 ft Basalt – Elephant
Mtn. Member

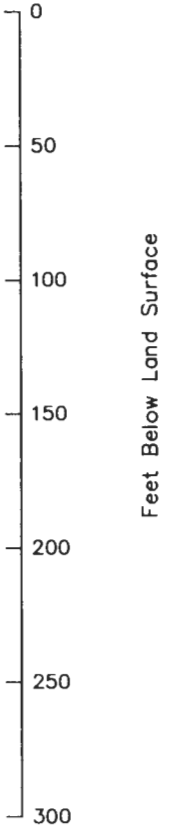
Drilling Comments

Drive Barrel
0 – 160 ft

Hard Tool
160 – 210 ft

Drive Barrel
210 – 217 ft

Hard Tool
217 – 280 ft



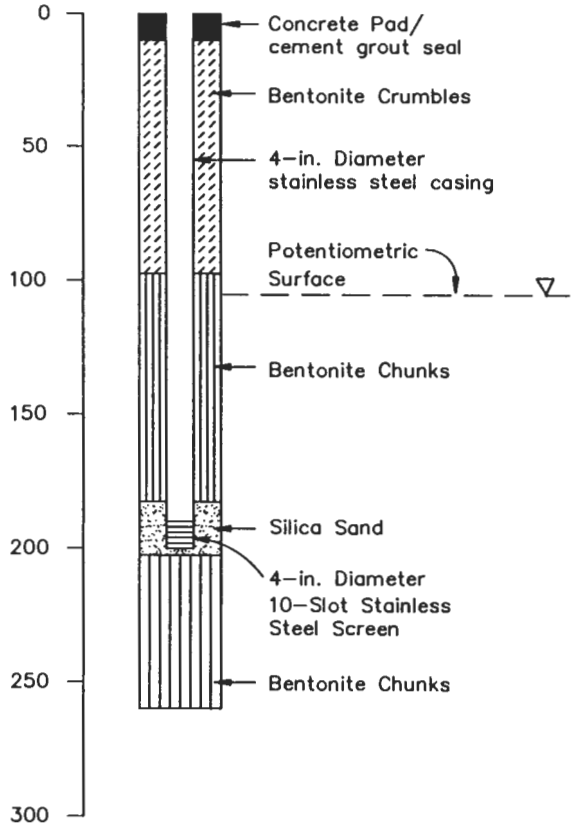
Well Completed 12/92
Casing Elevation 528.92 ft
Depth to Water 118 ft (6/93)

GEN\40-36

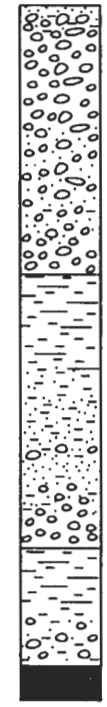
9413095.0972

699-41-35

Well Completion



Lithology/Stratigraphy



0 – 3 ft Sand
3 – 7 ft Silty Sandy Gravel
7 – 38.5 ft Gravel
38.5 – 49 ft Silty Sandy Gravel
49 – 73.5 ft Sandy Gravel
73.5 – 80 ft Silty Sandy Gravel
80 – 89 ft Sandy Gravel
89 – 101 ft Gravel

101 – 138 ft Silt
138 – 143 ft Clayey/Silty Sand
143 – 145.6 ft Clay/Silt
145.6 146.1 ft Sandy Clay
146.1 147.6 ft Clayey Sand
147.6 – 155 ft Sandy Clay
155 – 157 ft Slightly Clayey Sand
165 – 170 ft Slightly Clayey Sand
170 – 174 ft Sand
174 – 180 ft Gravelly Silty Sand
180 – 188 ft Silty Sandy Gravel

188–203 ft Gravel
203 – 223 ft Clay
223 –230 ft Gravel
230 247 ft Silty Sandy Gravel

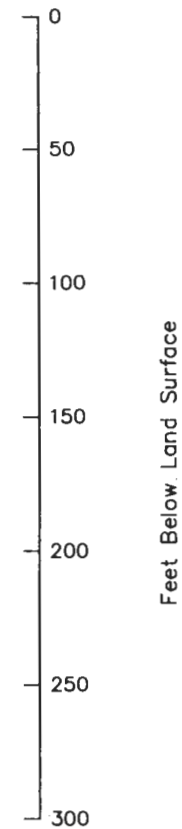
Well Completed 11/92
Casing Elevation 520.38
Depth to Water 108 ft (4/93)

Drilling Comments

Hanford fm.
Ringold Fm.

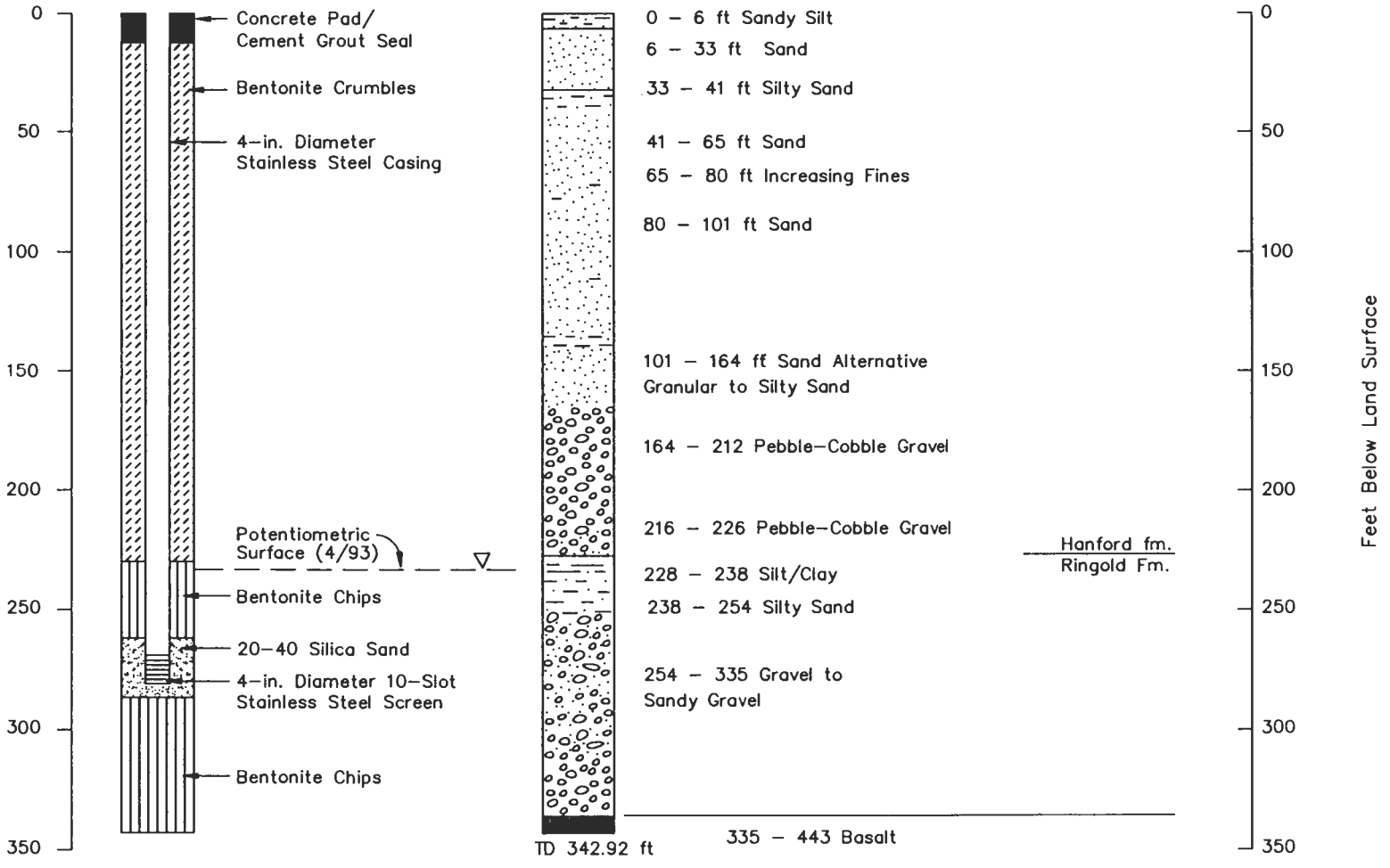
Hard Tool
105 – 260 ft

247 – 260 ft Basalt



GEN\41-35

699-41-42



Well Completed 8/92
Casing Elevation 643.91 ft
Depth to Water 233 ft (4/93)

GEN\41-42

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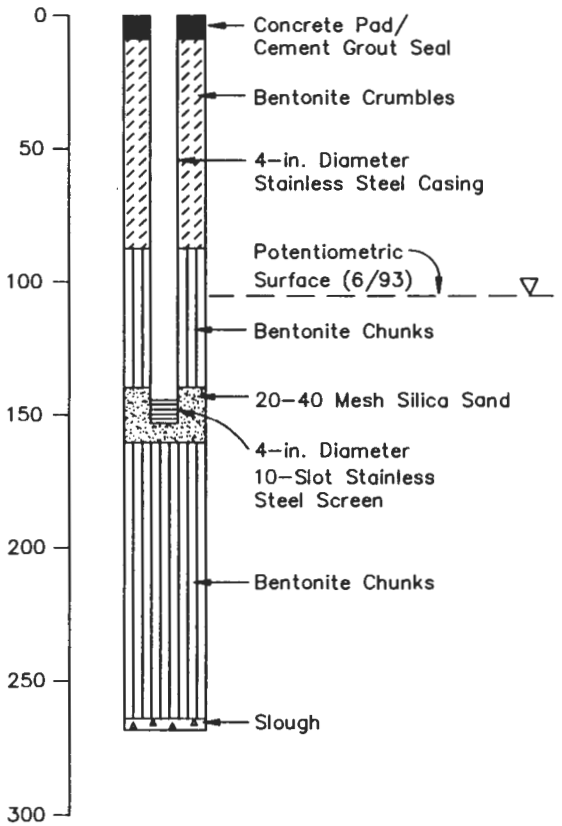
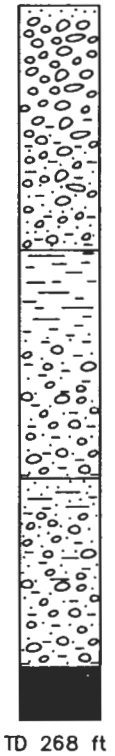
699-42-37





Lithology/Stratigraphy

0 – 2 ft Sand

2 – 48.5 ft Gravel

48.5 – 92 ft Silty Sandy Gravel

92 – 121 ft Clay/Silt

121 – 129 ft Sandy Silty Clay

129 – 176 ft Silty Sandy Gravel

176 – 191 ft Silty Clay; Sand at 180 ft

191 – 245 ft Silty Sandy Gravel

< 1 ft Silty Sandy Clay at 214 ft

6 in. Silty Sandy Clay at 219 ft

248.5 – 268 ft

Drilling Comments

Hanford fm.

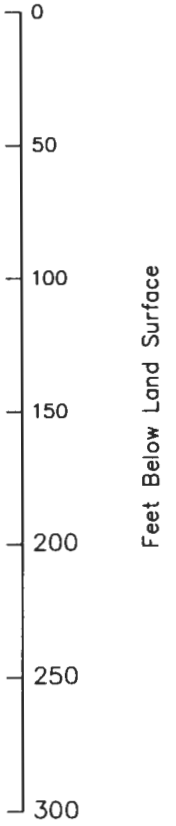
Ringold Fm.

Hard Tool
100 – 128 ft

Drive Barrel
128 – 137 ft

Hard Tool
137 – 268 ft

Basalt



Well Completed 11/92
Casing Elevation 519.40
Depth to Water 105 ft (6/93)

GEN\42-37

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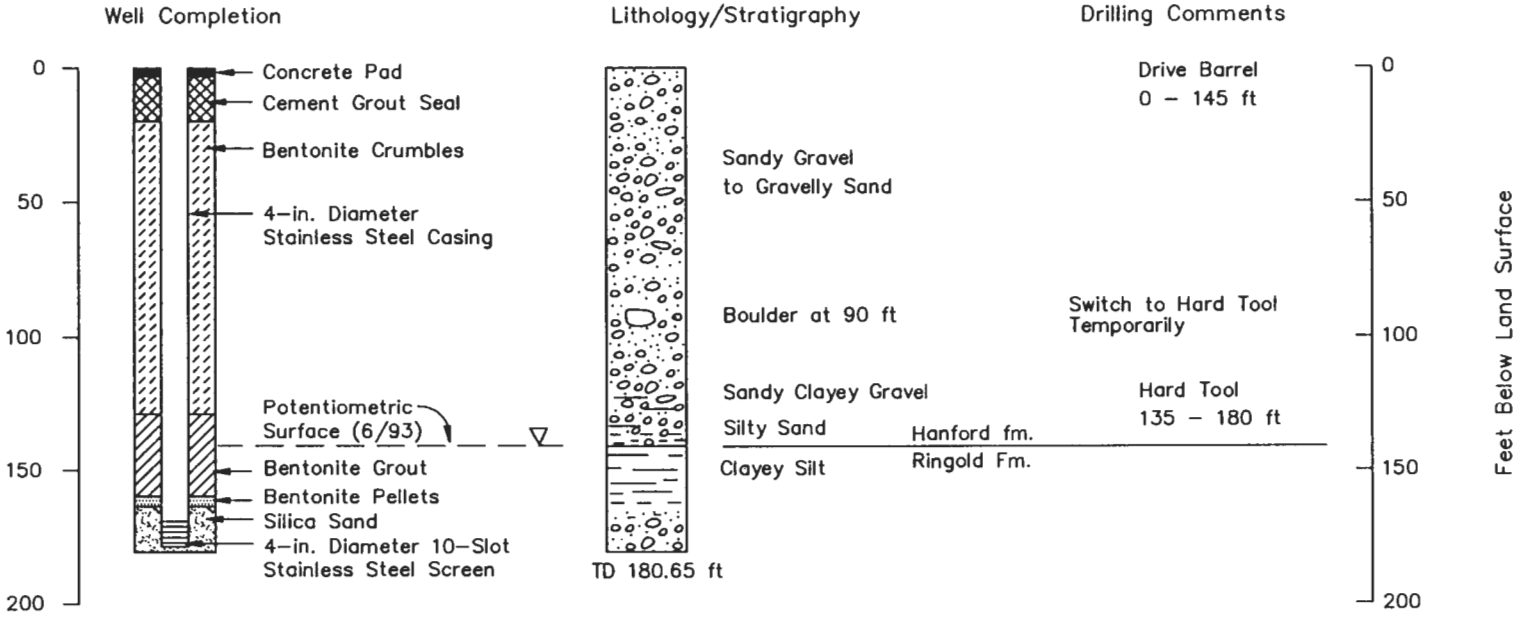
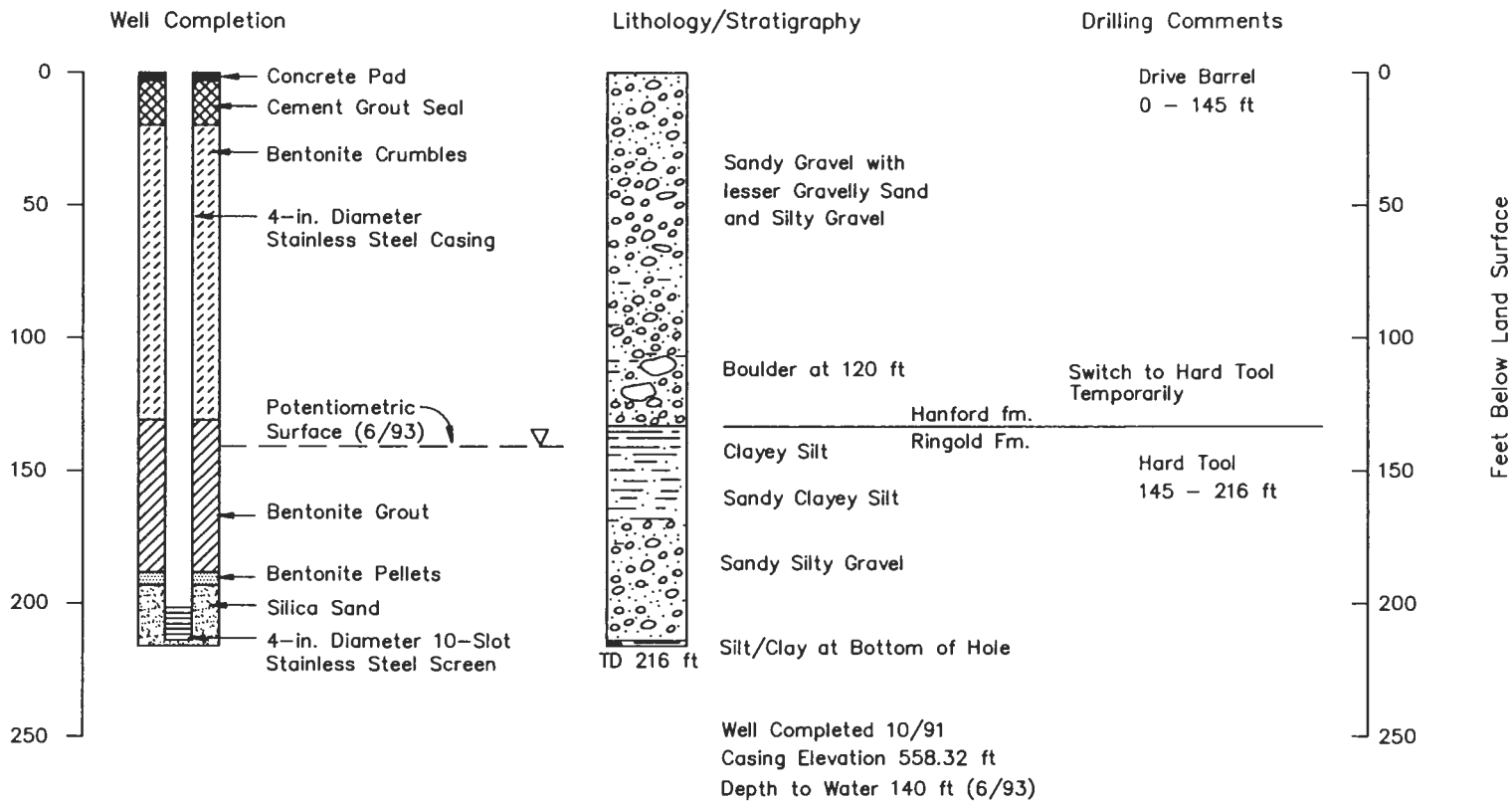
699-42-39A



Well Completed 9/91
Casing Elevation 558.14 ft
Depth to Water 139 ft (6/93)

GEN\42-39A

699-42-39B

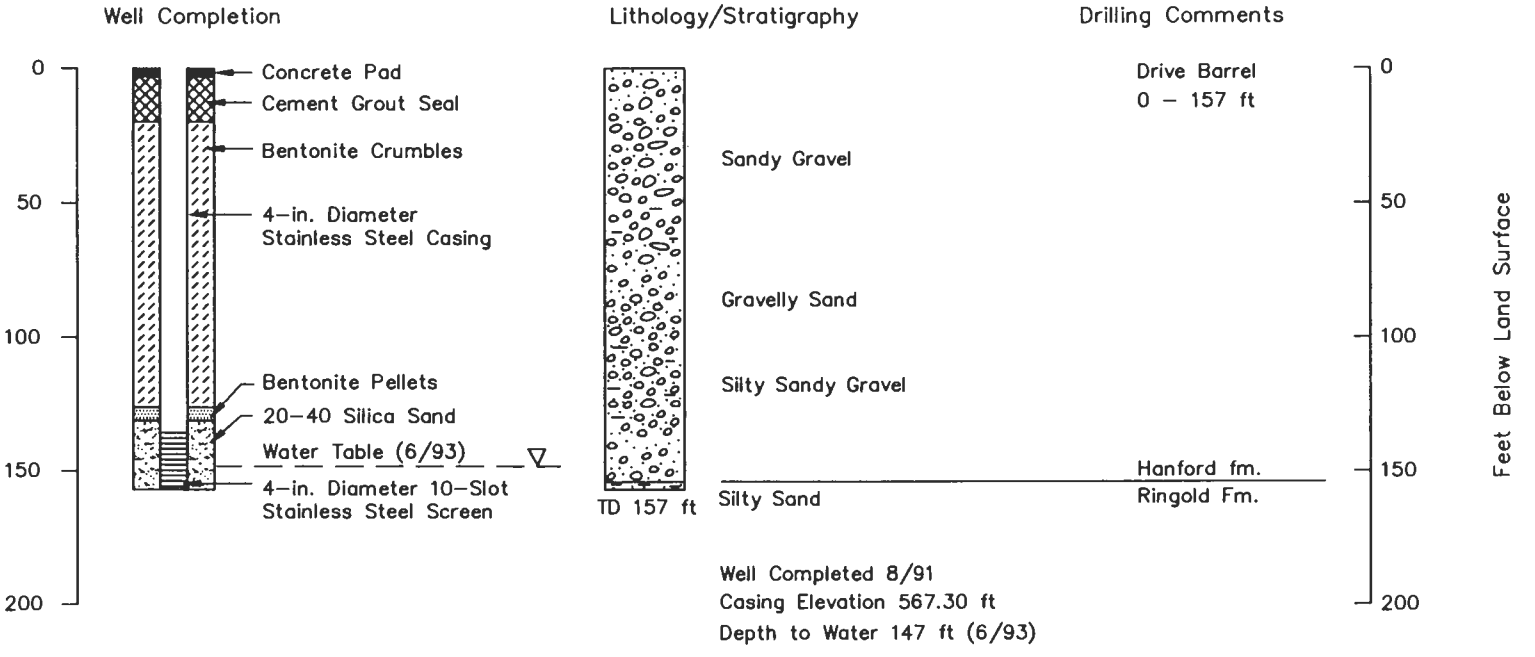


Well Completed 10/91
Casing Elevation 558.32 ft
Depth to Water 140 ft (6/93)

GEN\42-39B

9413095.0472

699-42-41



GEN\42-41

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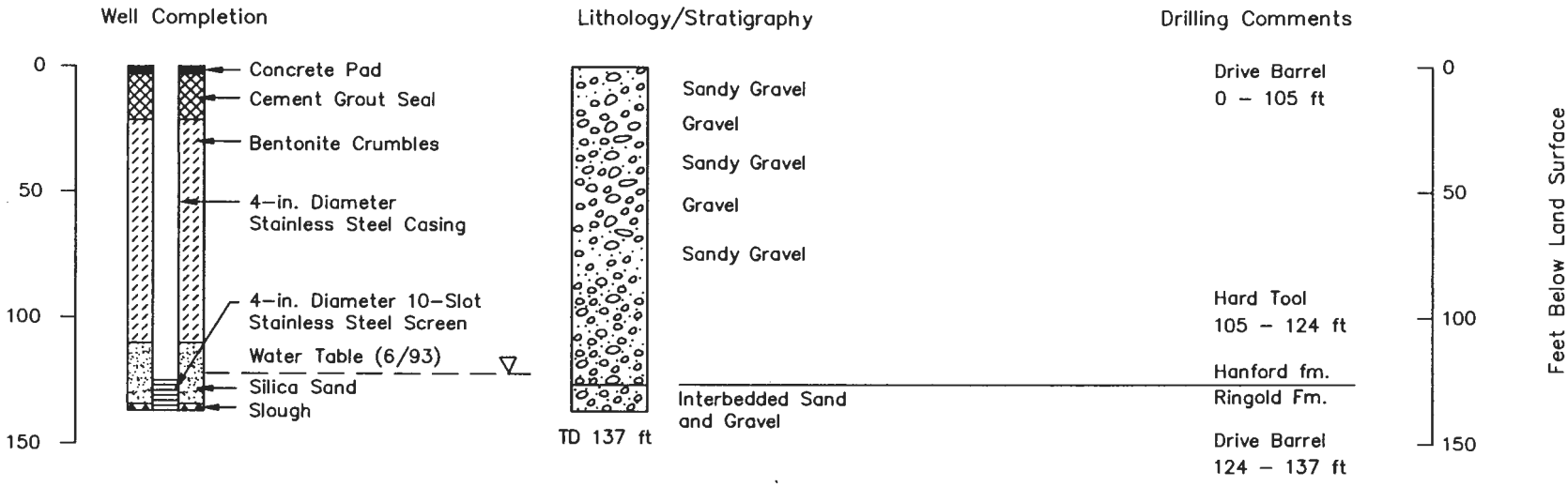
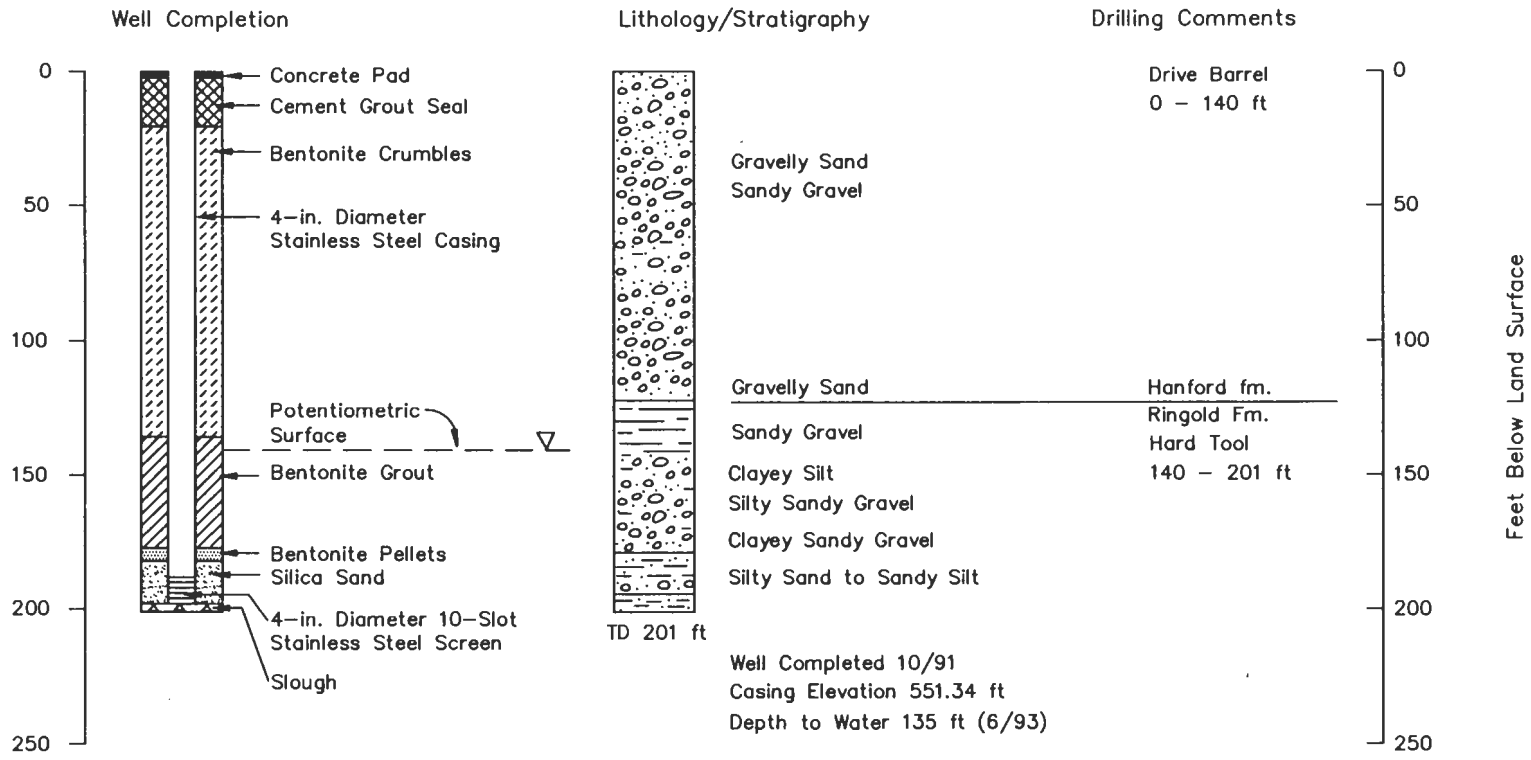
699-43-40



Well Completed 10/91
Casing Elevation 542.20 ft
Depth to Water 122 ft (6/93)

GEN\4340

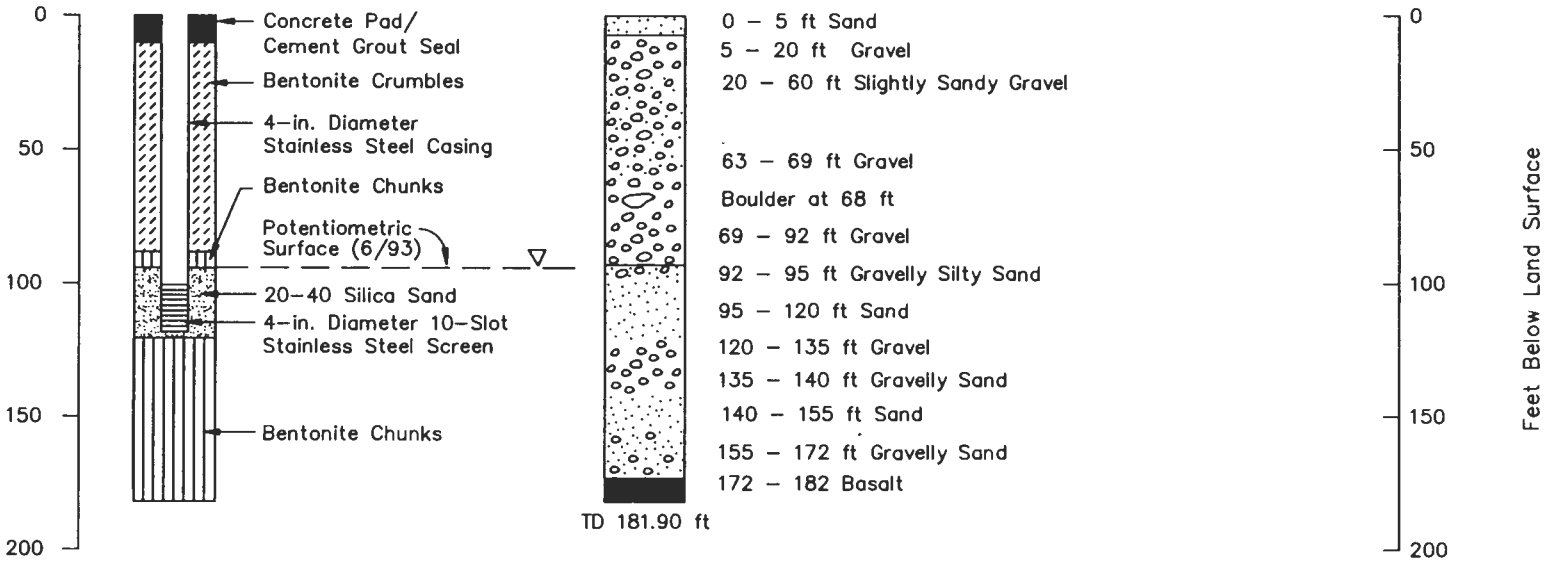
699-43-41G



Well Completed 10/91
Casing Elevation 551.34 ft
Depth to Water 135 ft (6/93)

GEN\4341G

699-44-39B



Well Completed 9/92
Casing Elevation 513.40 ft
Depth to Water 94 ft (6/93)

GEN\44-39B

APPENDIX B

THE B POND GROUNDWATER CHEMISTRY

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APPENDIX B

THE B POND GROUNDWATER CHEMISTRY

This appendix contains results of analyses of groundwater samples from the wells in the B Pond monitoring network from November 1988 through August 1989. The column headers consist of the following:

Well Name: Abbreviated number of monitoring well (e.g., 2-E18-1 = 299-E18-1; 6-42-42B = 699-42-42B, etc.).

Constituent Name: Chemical constituent.

Units: Analytical units of detection limit, drinking water standard, and analysis value. Unit abbreviations are:

MPN = most probable number
NTU = national turbidity unit
PCI/L = picocuries per liter (for radioactive constituents)
PPB = parts per billion
UMHO = micromhos.

Detection Limit: The laboratory contractual detection limit.

Drinking Water Standard: Drinking water standards from a variety of regulations. These are provided here only for reference. The uppermost aquifer at the B Pond site is not used as a source of drinking water.

Sample Date: Month, day, and year that sample was collected.

Analysis Value: Reported results of laboratory analysis. The symbol '<' indicates that result is less than detection limit.

931119.1338

Column Headings: Columns contain analytical results and qualifiers for the constituent. The structure of the column header is as follows:

Constituent short name
Method code/units
CRQL/DWS (suffix)

A "." in the DWS column indicates no established DWS exists. DWS suffixes are as follows:

Agency	Suffix	Regulatory basis
EPA	none	Maximum contaminant levels in 40 CFR Part 141, *National Primary Drinking Water Regulations* (40 CFR 141)
EPAP	p	Proposed maximum contaminant level goals in 50 FR 46936
EPAR	r	National interim primary drinking water regulations, Appendix IV, EPA-570/9-76/003
EPAS	s	Secondary maximum contaminant levels in 40 CFR Part 143, national secondary drinking water regulations
WDOE	w	Additional secondary maximum contaminant levels in WAC 248-54, public water supplies

Data Qualifiers and Flags--Data qualifiers and flags used in the detected and CIP tables are assigned by the laboratory and by the Westinghouse Hanford QC team, respectively. Qualifiers reflect conditions occurring in the laboratory relating to the analytical procedure. Flags serve a wider function of alerting the data user to the limitations of the reported value. Qualifiers and flags can be appended to each other to form a string of letters when several factors apply to a result. The qualifiers and flags used are as follows:

Qualifiers:

- B - Blank associated with analyte is contaminated
- D - Analyzed sample is diluted
- E - Concentration is out of instrument calibration range
- H - Laboratory holding time exceeded
- J - Concentration is estimated
- U - Analyte concentration is below CRQL; for radionuclides without CRQL's, this flag is assigned by Westinghouse Hanford when the reported value is less than or equal to the total error value reported by the laboratory.

Flags:

- A - Result associated with audit finding described in Section 1.2
- P - Potential problem; see text associated with table
- Q - Result associated with suspect QC data
- R - Suspect data currently under review
- + - Suspect water-level data currently under review
- * - CRQL is greater than DWS, so exceedance of DWS is undetermined.

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CONTAMINATION INDICATOR PARAMETERS

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
CONDUCT	94	Conductivity, field	umhos	1			370	370	
CONDUCT	73	Conductivity, lab					105	105	
CONDUCT	76	Specific conductance	umhos				273	273	
TOC	122	Total Organic Carbon	ppb	1000			343	13	
TOC	66	Total Organic Carbon					232	14	
TOXLDL	67	Total Organic Halogen					575	173	
TOXLDL	76	Total Organic Halogen	ppb				12	0	
PH	19	pH			6.5-8.5	EPAS	3	3	0
PH	75	pH			6.5-8.5	EPAS	92	92	0
PH	76	pH			6.5-8.5	EPAS	273	273	5
PH	93	pH, field		.1	6.5-8.5	EPAS	370	370	33
PH	125	pH, lab			6.5-8.5	EPAS	19	19	1

DRINKING WATER PARAMETERS

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
2,4,5TP		2,4,5-TP	ppb	2	10	EPA	150	0	1
2,4-D		2,4-D	ppb	10	100	EPA	150	0	0
a-BHC		Alpha-BHC	ppb	.05	4	EPA	154	0	0
ARSENIC	43	Arsenic	ppb	5	50	EPA	163	70	0
FARSENIC	43	Arsenic, filtered	ppb	5	50	EPA	89	33	0
FARSENIC	76	Arsenic, filtered	ppb				65	31	
BARIUM	34	Barium	ppb	20	1000	EPA	112	94	0
BARIUM	35	Barium			1000	EPA	65	59	0
FBARIUM	34	Barium, filtered	ppb	20	1000	EPA	175	150	0
b-BHC		Beta-BHC	ppb	.05	4	EPA	154	0	0
CADMIUM	34	Cadmium	ppb	10	10	EPA	112	0	0
CADMIUM	35	Cadmium			10	EPA	65	4	0
FCADMIU	34	Cadmium, filtered	ppb	10	10	EPA	175	1	0
CHROMUM	34	Chromium	ppb	20	50	EPA	112	96	71
CHROMUM	35	Chromium			50	EPA	65	52	16
FCHROMI	34	Chromium, filtered	ppb	20	50	EPA	175	12	2
d-BHC		Delta-BHC	ppb	.1	4	EPA	154	0	0
ENDRIN		Endrin	ppb	.1	.2	EPA	154	0	4
FLUORID		Fluoride	ppb	100	4000	EPA	105	103	0
FLUORIN		Fluorine	ppb		4000	EPA	69	24	0
ALPHA	135	Gross alpha	pCi/L	4	15	EPA	107	94	0
ALPHA	77	Gross alpha	pCi/L		15	EPA	110	84	0

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
BETA	136	Gross beta	pCi/L	8	50	EPA	107	103	0
BETA	77	Gross beta	pCi/L		50	EPA	134	130	2
LEAD	34	Lead					1	0	
LEAD	40	Lead	ppb	5	50	EPA	90	8	0
LEAD	76	Lead	ppb				67	5	
FLEAD	40	Lead, filtered	ppb	5	50	EPA	154	1	0
MERCURY	41	Mercury	ppb	.2	2	EPA	82	0	0
MERCURY	76	Mercury	ppb				64	0	
FMERCUR	41	Mercury, filtered	ppb	.2	2	EPA	143	0	0
METHLOR		Methoxychlor	ppb	2	100	EPA	154	0	0
RADIUM	137	Radium	pCi/L	1	5	EPA	101	34	0
RADIUM	77	Radium	pCi/L		5	EPA	66	33	0
SELENUM	48	Selenium	ppb	10	10	EPA	89	0	0
SELENUM	76	Selenium	ppb				68	9	
FSELENI	48	Selenium, filtered	ppb	10	10	EPA	154	9	1
SILVER	34	Silver	ppb	20	50	EPA	112	0	0
SILVER	35	Silver			50	EPA	65	0	0
FSILVER	34	Silver, filtered	ppb	20	50	EPA	175	0	0
TOXAENE	17	Toxaphene	ppb	2	5	EPA	90	0	0
TOXAENE	37	Toxaphene			5	EPA	64	0	0
TURBID	126	Turbidity	NTU	.1	1	EPA	92	92	50
TURBID	76	Turbidity	NTU				54	54	
g-BHC		gamma-BHC (Lindane)	ppb	.05	4	EPA	154	0	0

GROUNDWATER QUALITY PARAMETERS

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
CHLORID	124	Chloride	ppb	200	250000	EPAS	105	105	0
CHLORID	46	Chloride			250000	EPAS	69	69	0
IRON	34	Iron	ppb	20	300	EPAS	112	111	79
IRON	35	Iron			300	EPAS	65	65	32
FIRON	34	Iron, filtered	ppb	20	300	EPAS	175	104	8
MANGESE	34	Manganese	ppb	10	50	EPAS	112	77	44
MANGESE	35	Manganese			50	EPAS	65	51	9
FMANGAN	34	Manganese, filtered	ppb	10	50	EPAS	175	73	47
LPHENOL	19	Phenol	ppb	10			24	0	
LPHENOL	30	Phenol	ppb	1			134	3	
LPHENOL	32	Phenol					18	0	
SODIUM	34	Sodium	ppb	300			112	112	
SODIUM	35	Sodium					65	65	
FSODIUM	34	Sodium, filtered	ppb	300			175	175	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
SULFATE	124	Sulfate	ppb	500	250000	EPAS	105	105	0
SULFATE	46	Sulfate			250000	EPAS	69	69	0

SITE SPECIFIC AND OTHER CONSTITUENTS

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
							3	1	
1112-tc		1,1,1,2-Tetrachloroethane	ppb	5			38	0	
1,1,1-T	16	1,1,1-Trichloroethane	ppb	5	200	EPA	90	0	0
1,1,1-T	25	1,1,1-Trichloroethane	ppb	.5	200	EPA	3	0	0
1122-tc		1,1,2,2-Tetrachloroethane	ppb	5			38	0	
1,1,2-T	16	1,1,2-Trichloroethane	ppb	5			90	0	
1,1,2-T	25	1,1,2-Trichloroethane	ppb	.5			3	0	
1,1-DIC	16	1,1-Dichloroethane	ppb	5			22	0	
1,1-DIC	25	1,1-Dichloroethane	ppb	1			3	0	
1,1-DIC	45	1,1-Dichloroethane					60	0	
DICETHY		1,1-Dichloroethene	ppb	5	7	EPA	39	0	25
1,1-DIM		1,1-Dimethylhydrazine					18	0	
1234TE		1,2,3,4-tetrachlorobenzene	ppb				18	0	
1235TE		1,2,3,5-tetrachlorobenzene					18	0	
123-trp	16	1,2,3-Trichloropropane	ppb	5			38	0	
123-trp	76	1,2,3-Trichloropropane	ppb				8	0	
123TRI		1,2,3-trichlorobenzene	ppb				18	0	
TETRCHB	19	1,2,4,5-Tetrachlorobenzene	ppb	10			18	0	
TETRCHB	21	1,2,4,5-Tetrachlorobenzene	ppb				18	0	
TRICHLB	19	1,2,4-Trichlorobenzene	ppb	10			18	0	
TRICHLB	21	1,2,4-Trichlorobenzene	ppb				18	0	
DIBRCHL		1,2-Dibromo-3-chloropropane	ppb	5			38	0	
DIBRETH		1,2-Dibromoethane	ppb	5			38	0	
12-dben	19	1,2-Dichlorobenzene	ppb	10			18	0	
12-dben	21	1,2-Dichlorobenzene	ppb				18	0	
1,2-DIC	16	1,2-Dichloroethane	ppb	5	5	EPA	82	0	8
1,2-DIC	25	1,2-Dichloroethane	ppb	.5	5	EPA	3	0	0
12-DCE		1,2-Dichloroethene	ppb	5				0	
DICPANE		1,2-Dichloropropane	ppb	5			38	0	
1,2-DIM		1,2-Dimethylhydrazine					18	0	
DIPHHYD		1,2-Diphenylhydrazine	ppb				15	0	
135TRI		1,3,5-trichlorobenzene	ppb				18	0	
13-dben	19	1,3-Dichlorobenzene	ppb	10			18	0	
13-dben	20	1,3-Dichlorobenzene					18	0	
DICPENE		1,3-Dichloropropene					25	0	

Constituent Name				Lab	DWS		Number of Samples		
Short	(Method)	Full	Units	CRQL	Limit	Agency	Total	>CRQL	>DWS
DIBUTEN		1,4-Dichloro-2-butene	ppb	5			13	0	
14-dben	16	1,4-Dichlorobenzene	ppb	5	750	EPA	22	0	0
14-dben	19	1,4-Dichlorobenzene	ppb	5	750	EPA	18	0	0
14-dben	21	1,4-Dichlorobenzene	ppb		750	EPA	18	0	0
14-dben	24	1,4-Dichlorobenzene			750	EPA	52	0	0
14-dben	25	1,4-Dichlorobenzene	ppb	2	750	EPA	3	0	0
DIOXANE		1,4-Dioxane	ppb	200			39	0	
NAPHQUI	19	1,4-Naphtoquinone	ppb	10			18	0	
NAPHQUI	21	1,4-Naphtoquinone	ppb				15	0	
CHLOREA		1-(o-Chlorophenyl)thiourea					13	0	
ACETREA		1-Acetyl-2-thiourea					13	0	
1BUTYN	16	1-Butanol	ppm	1			9	0	
1BUTYN	28	1-Butanol					12	0	
CHLEPOX		1-Chloro-2,3-epoxypropane	ppb				15	0	
NAPHREA		1-Naphthyl-2-thiourea					13	0	
1-napha	19	1-Naphthylamine	ppb	10			18	0	
1-napha	21	1-Naphthylamine	ppb				15	0	
1PROPAN		1-Propanol					11	0	
TETRCHP	19	2,3,4,6-Tetrachlorophenol	ppb	10			18	0	
TETRCHP	21	2,3,4,6-Tetrachlorophenol	ppb				15	0	
2378TCD	51	2,3,7,8-TCDD	ppb	.005			12	0	
2378TCD	76	2,3,7,8-TCDD	ppb				2	0	
2,4,5-T		2,4,5-T	ppb	2			140	0	
245-trp	19	2,4,5-Trichlorophenol	ppb	10			18	0	
245-trp	21	2,4,5-Trichlorophenol	ppb				15	0	
246-trp	19	2,4,6-Trichlorophenol	ppb	10			18	0	
246-trp	21	2,4,6-Trichlorophenol	ppb				15	0	
246-trp	30	2,4,6-Trichlorophenol	ppb	5			86	0	
24-dchp	19	2,4-Dichlorophenol	ppb	10			18	0	
24-dchp	21	2,4-Dichlorophenol	ppb				15	0	
24-dchp	30	2,4-Dichlorophenol	ppb	5			86	0	
DIMPHEN	19	2,4-Dimethylphenol	ppb	10			22	0	
DIMPHEN	30	2,4-Dimethylphenol	ppb	5			86	1	
DINPHEN	19	2,4-Dinitrophenol	ppb	50			18	0	
DINPHEN	30	2,4-Dinitrophenol	ppb	150			86	2	
DINPHEN	72	2,4-Dinitrophenol					15	0	
24-dint	19	2,4-Dinitrotoluene	ppb	10			18	0	
24-dint	21	2,4-Dinitrotoluene	ppb				15	0	
26-dchp	19	2,6-Dichlorophenol	ppb	10			18	0	
26-dchp	21	2,6-Dichlorophenol	ppb				15	0	
26-dchp	30	2,6-Dichlorophenol	ppb	5			86	0	
26-dint	19	2,6-Dinitrotoluene	ppb	10			18	0	
26-dint	21	2,6-Dinitrotoluene	ppb				15	0	
ACEFENE	19	2-Acetylaminofluorene	ppb	10			18	0	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
ACEFENE	21	2-Acetylaminofluorene	ppb				15	0	
CHLTHER		2-Chloroethyl vinyl ether					25	0	
CHLNAPH	19	2-Chloronaphthalene	ppb	10			18	0	
CHLNAPH	21	2-Chloronaphthalene	ppb				15	0	
CHLPHEN	19	2-Chlorophenol	ppb	10			18	0	
CHLPHEN	21	2-Chlorophenol	ppb				15	0	
CHLPHEN	30	2-Chlorophenol	ppb	5			86	0	
CYCHDIN		2-Cyclohexyl-4,6-dinitrophenol	ppb				15	0	
2HEXANO		2-Hexanone	ppb	50			30	0	
METAZIR		2-Methylaziridine	ppb				15	0	
METACTO		2-Methyllactonitrile	ppb				15	0	
2MENAPH	19	2-Methylnaphthalene	ppb	10			18	0	
2MENAPH	21	2-Methylnaphthalene	ppb				11	0	
2METHPH		2-Methylphenol	ppb	10			28	0	
2-napha	19	2-Naphthylamine	ppb	10			18	0	
2-napha	21	2-Naphthylamine	ppb				15	0	
ONITANI		2-Nitroaniline	ppb				18	0	
2NITPH	19	2-Nitrophenol	ppb				18	0	
2NITPH	30	2-Nitrophenol	ppb	5			86	2	
PICOLIN	16	2-Picoline	ppb	5			13	0	
PICOLIN	21	2-Picoline	ppb				15	0	
2PROPAN		2-Propanol	ppb				1	0	
PROPYNO		2-Propyn-1-ol					14	0	
METPROP		2-methyl-2-(methylthio) propiona	ppb				15	0	
BUTDINP	21	2-sec-Butyl-4,6-dinitrophenol(DN	ppb				15	0	
BUTDINP	30	2-sec-Butyl-4,6-dinitrophenol(DN	ppb	5			86	0	
BUTDINP	49	2-sec-Butyl-4,6-dinitrophenol(DN	ppb	1			84	0	
DICHBEN	19	3,3'-Dichlorobenzidine	ppb	20			18	0	
DICHBEN	21	3,3'-Dichlorobenzidine	ppb				15	0	
DIMETHB		3,3'-Dimethoxybenzidine	ppb				15	0	
DIMEYLB		3,3'-Dimethylbenzidine	ppb	10			33	0	
CHLPROP		3-Chloropropionitrile					14	0	
METCHAN	19	3-Methylcholanthrene	ppb	10			18	0	
METCHAN	21	3-Methylcholanthrene	ppb				15	0	
MNITANI	19	3-Nitroaniline	ppb	50			18	0	
MNITANI	21	3-Nitroaniline	ppb				11	0	
DDD		4,4'-DDD	ppb	.1			104	0	
DDE		4,4'-DDE	ppb	.05			104	0	
DDT		4,4'-DDT	ppb	.1			104	0	
METBISC		4,4'-Methylenebis(2-chloroanilin	ppb				15	0	
46DN2MP	19	4,6-Dinitro-2-methylphenol	ppb	50			18	0	
46DN2MP	30	4,6-Dinitro-2-methylphenol	ppb	200			86	0	
46DN2MP	72	4,6-Dinitro-2-methylphenol					15	0	
AMINOYL	19	4-Aminobiphenyl	ppb	10			18	0	

Constituent Name				Lab	DWS		Number of Samples		
Short	(Method)	Full	Units	CRQL	Limit	Agency	Total	>CRQL	>DWS
AMINOYL	21	4-Aminobiphenyl	ppb				15	0	
BROPHEN	19	4-Bromophenylphenyl ether	ppb	10			20	0	
BROPHEN	21	4-Bromophenylphenyl ether	ppb				15	0	
CHLCRES	19	4-Chloro-3-methylphenol	ppb	20			18	0	
CHLCRES	21	4-Chloro-3-methylphenol	ppb				15	0	
CHLCRES	30	4-Chloro-3-methylphenol	ppb	5			86	0	
CHLANIL	19	4-Chloroaniline	ppb	20			18	0	
CHLANIL	21	4-Chloroaniline	ppb				15	0	
4CPPETH		4-Chlorophenylphenyl ether	ppb	10			18	0	
MIBK		4-Methyl-2-pentanone					87	0	
4METHPH		4-Methylphenol	ppb	10			28	0	
NITRANI	19	4-Nitroaniline	ppb	50			18	0	
NITRANI	21	4-Nitroaniline	ppb				15	0	
NITPHEN	19	4-Nitrophenol	ppb	50			18	0	
NITPHEN	21	4-Nitrophenol	ppb				15	0	
NITPHEN	30	4-Nitrophenol	ppb	30			86	0	
4NITQUI	19	4-Nitroquinoline-1-oxide	ppb	10			18	0	
4NITQUI	21	4-Nitroquinoline-1-oxide	ppb				11	0	
AMIISOX		5-(Aminomethyl)-3-isoxazolol	ppb				15	0	
NITRTOL	19	5-Nitro-o-toluidine	ppb	10			18	0	
NITRTOL	21	5-Nitro-o-toluidine	ppb				15	0	
DIMBENZ	19	7,12-Dimethylbenz[a]anthracene	ppb	10			18	0	
DIMBENZ	21	7,12-Dimethylbenz[a]anthracene	ppb				15	0	
DIBCGCA		7H-Dibenzo[c,g]carbazole	ppb				15	0	
ACENAPH	19	Acenaphthene	ppb	10			18	0	
ACENAPH	21	Acenaphthene	ppb				11	0	
ACENATL	19	Acenaphthylene	ppb	10			18	0	
ACENATL	21	Acenaphthylene	ppb				11	0	
ACETONE	16	Acetone	ppb	100			80	2	
ACETONE	21	Acetone	ppb				11	0	
ACETILE		Acetonitrile	ppb	200			25	0	
ACETOPH	19	Acetophenone	ppb	10			18	0	
ACETOPH	21	Acetophenone	ppb				15	0	
ACROLIN		Acrolein	ppb	5			38	0	
ACRYIDE		Acrylamide					14	0	
ACRYILE		Acrylonitrile	ppb	5			38	0	
ALDRIN		Aldrin	ppb	.05			104	0	
ALKALIN	52	Alkalinity	ppm	50			2	2	
ALKALIN	53	Alkalinity					4	4	
ALLYLAL		Allyl alcohol					14	0	
DIMPHAM	19	Alpha,alpha-Dimethylphenethylami	ppb	10			18	0	
DIMPHAM	21	Alpha,alpha-Dimethylphenethylami	ppb				15	0	
FALUMIN	34	Aluminum					62	1	
ALUMNUM	35	Aluminum					65	14	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
AM-241	147	Americium-241	pCi/L	.1			5	1	
AM-241	77	Americium-241	pCi/L				8	1	
AMITROL		Amitrole	ppb				15	0	
AMMONIU		Ammonium ion					137	15	
ANILINE	19	Aniline	ppb	10			18	0	
ANILINE	21	Aniline	ppb				15	0	
ANTHRA	19	Anthracene	ppb	10			18	0	
ANTHRA	21	Anthracene	ppb				11	0	
ANTIONY	34	Antimony	ppb	200			112	0	
ANTIONY	35	Antimony					63	0	
FANTIMO	34	Antimony, filtered	ppb	200			174	0	
SB-125		Antimony-125	pCi/L				8	0	
ARAMITE	19	Aramite	ppb	10			18	0	
ARAMITE	21	Aramite	ppb				15	0	
AR1016	17	Aroclor-1016	ppb	1			22	0	
AR1016	33	Aroclor-1016					21	0	
AR1221	17	Aroclor-1221	ppb	1			22	0	
AR1221	33	Aroclor-1221					21	0	
AR1232	17	Aroclor-1232	ppb	1			22	0	
AR1232	33	Aroclor-1232					21	0	
AR1242	17	Aroclor-1242	ppb	1			22	0	
AR1242	33	Aroclor-1242					21	0	
AR1248	17	Aroclor-1248	ppb	1			22	0	
AR1248	33	Aroclor-1248					21	0	
AR1254	17	Aroclor-1254	ppb	1			22	0	
AR1254	33	Aroclor-1254					21	0	
AR1260	17	Aroclor-1260	ppb	1			22	0	
AR1260	33	Aroclor-1260					21	0	
AURAMIN		Auramine	ppb				15	0	
BENZCAC		Benz[c]acridine	ppb				15	0	
BENZENE	16	Benzene	ppb	5	5	EPA	83	0	2
BENZENE	25	Benzene	ppb	2	5	EPA	3	0	0
BENDICM		Benzene, dichloromethyl-	ppb				15	0	
BENTHOL		Benzenethiol	ppb				15	0	
BENDINE		Benzidine	ppb				15	0	
BENZAAN	19	Benzo(a)anthracene	ppb	10			18	0	
BENZAAN	21	Benzo(a)anthracene	ppb				15	0	
BENZOPY	19	Benzo(a)pyrene	ppb	10			18	0	
BENZOPY	21	Benzo(a)pyrene	ppb				15	0	
BENZBFL	19	Benzo(b)fluoranthene	ppb	10			18	0	
BENZBFL	21	Benzo(b)fluoranthene	ppb				15	0	
BGHIPER	19	Benzo(ghi)perylene	ppb	10			18	0	
BGHIPER	21	Benzo(ghi)perylene	ppb				11	0	
BENZJFL		Benzo(j)fluoranthene	ppb				15	0	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
BNZKFLU	19	Benzo(k)fluoranthene	ppb	10			18	0	
BNZKFLU	21	Benzo(k)fluoranthene	ppb				11	0	
BENZALC	19	Benzyl alcohol	ppb	20			18	0	
BENZALC	21	Benzyl alcohol	ppb				11	0	
BENZCHL		Benzyl chloride	ppb				15	0	
BERYLUM	34	Beryllium	ppb	3			112	1	
BERYLUM	35	Beryllium					63	1	
FBERYLL	34	Beryllium, filtered	ppb	3			174	0	
BE-7		Beryllium-7	pCi/L				3	0	
BIS2CHM	19	Bis(2-Choroethoxy)methane	ppb	10			18	0	
BIS2CHM	21	Bis(2-Choroethoxy)methane	ppb				15	0	
B2CLMEE		Bis(2-chloro-1-methylethyl)ether	ppb				11	0	
BIS2CHE	19	Bis(2-chloroethyl) ether	ppb	10			18	0	
BIS2CHE	21	Bis(2-chloroethyl) ether	ppb				15	0	
BIS2ETH	19	Bis(2-chloroisopropyl) ether	ppb	10			18	0	
BIS2ETH	21	Bis(2-chloroisopropyl) ether	ppb				15	0	
BIS2EPH	19	Bis(2-ethylhexyl) phthalate	ppb	10			18	0	
BIS2EPH	21	Bis(2-ethylhexyl) phthalate	ppb				15	0	
BISTHER		Bis(chloromethyl) ether					25	0	
BORON	35	Boron					50	46	
FBORON	34	Boron, filtered					50	48	
BROMIDE	124	Bromide	ppb	500			92	0	
BROMIDE	46	Bromide					62	0	
BROMONE		Bromoacetone					25	0	
BDCM		Bromodichloromethane	ppb	5	100	EPA	30	0	0
BROMORM		Bromoform	ppb	5	100	EPA	38	0	0
BUTBENP	19	Butylbenzylphthalate	ppb	10			20	0	
BUTBENP	21	Butylbenzylphthalate	ppb				15	0	
CALCIUM	34	Calcium	ppb	100			112	112	
CALCIUM	35	Calcium					65	65	
FCALCIU	34	Calcium, filtered	ppb	100			175	175	
CARBIDE		Carbon disulfide	ppb	5			38	0	
TETRANE	16	Carbon tetrachloride	ppb	5	5	EPA	90	0	3
TETRANE	25	Carbon tetrachloride	ppb	1	5	EPA	3	0	0
CARPHNT		Carbonphenothion					14	0	
CEPR-144		Cerium/Praseodymium-144	pCi/L				3	0	
CS-134		Cesium-134	pCi/L				3	0	
CS-137	140	Cesium-137	pCi/L	20			8	0	
CS-137	77	Cesium-137	pCi/L				79	38	
CHLORAL		Chloral	ppb				1	0	
CHLOANE		Chlordane	ppb	.1			104	0	
CHLNAPZ		Chlornaphazine	ppb				15	0	
CHLACET		Chloroacetaldehyde	ppb				3	0	
CHALETH		Chloroalkyl ethers	ppb				15	0	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
CHLROB	16	Chlorobenzene	ppb	5			39	0	
CHLROB	21	Chlorobenzene	ppb				11	0	
CHLLATE	17	Chlorobenzilate					15	0	
CHLLATE	19	Chlorobenzilate	ppb	10			18	0	
CLETHAN		Chloroethane	ppb	10			30	0	
CHLFORM	16	Chloroform	ppb	5	100	EPA	89	0	0
CHLFORM	25	Chloroform	ppb	.5	100	EPA	3	0	0
CHMTHER		Chloromethyl methyl ether					25	0	
CHLPRENE		Chloroprene	ppb	5			13	0	
CHRYSEN	19	Chrysene	ppb	10			18	0	
CHRYSEN	21	Chrysene	ppb				15	0	
CITRUSR		Citrus red No. 2					13	0	
COBALT	34	Cobalt	ppb	20			112	0	
COBALT	35	Cobalt					50	0	
FCOBALT	34	Cobalt, filtered	ppb	20			163	0	
CO-60	140	Cobalt-60	pCi/L				8	1	
CO-60	77	Cobalt-60	pCi/L				80	40	
COLIFORM	144	Coliforms	COL		1	EPA	84	8	5
COLIFORM	69	Coliforms	COL				49	0	
COLIFORM		Coliforms	COL				11	0	
COPPER	34	Copper	ppb	20	1000	EPAS	112	7	0
COPPER	35	Copper			1000	EPAS	65	3	0
FCOPPER	34	Copper, filtered	ppb	20	1000	EPAS	175	5	0
CRESOLS	21	Cresols (methylphenols)	ppb				15	0	
CRESOLS	30	Cresols (methylphenols)	ppb	10			86	0	
CROTONA		Crotonaldehyde					25	0	
CYANIDE		Cyanide	ppb	20			37	0	
CYANOGN		Cyanogen	ppb				1	0	
CYANBRO		Cyanogen bromide	ppb				1	0	
CYANCHL		Cyanogen chloride	ppb				1	0	
DECANE		Decane	ppb	10			10	0	
DIBPHTH	19	Di-n-butylphthalate	ppb	10			18	0	
DIBPHTH	21	Di-n-butylphthalate	ppb				15	0	
DIOPHTH	19	Di-n-octylphthalate	ppb	10			18	0	
DIOPHTH	21	Di-n-octylphthalate	ppb				15	0	
DIALLATE		Diallate	ppb	10			29	0	
DIBAJAC		Dibenz(a,j)acridine	ppb				15	0	
DIBAHAC		Dibenz[a,h]acridine	ppb				15	0	
DIBAHAN	19	Dibenz[a,h]anthracene	ppb	10			18	0	
DIBAHAN	21	Dibenz[a,h]anthracene	ppb				15	0	
DIBAEPY		Dibenzo(a,e)pyrene	ppb				15	0	
DIBAHPY		Dibenzo[a,h]pyrene	ppb				15	0	
DIBAIPY		Dibenzo[a,i]pyrene	ppb				15	0	
DIBENFR	19	Dibenzofuran	ppb	10			18	0	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
DIBENFR	21	Dibenzofuran	ppb				11	0	
BRCHLMET		Dibromochloromethane	ppb	5	100	EPA	30	0	0
DIBRMET		Dibromomethane	ppb	5			38	0	
DBP		Dibutyl Phosphate					12	0	
DICDIFM		Dichlorodifluoromethane	ppb	5			38	0	
DICPROP		Dichloropropanol	ppb				1	0	
DIELRIN		Dieldrin	ppb	.05			104	0	
DIEPHTH	19	Diethyl phthalate	ppb	10			18	0	
DIEPHTH	21	Diethyl phthalate	ppb				15	0	
DIETHY		Diethylarsine	ppb				8	0	
DIETROL		Diethylstilbesterol					13	0	
DIHYSAF		Dihydrosafrole	ppb				15	0	
DIMETHO	19	Dimethoate	ppb	10			18	0	
DIMETHO	29	Dimethoate					14	0	
DIMPHTH	19	Dimethyl phthalate	ppb	10			18	0	
DIMPHTH	21	Dimethyl phthalate	ppb				15	0	
DINOSEB		Dinoseb	ppb				11	0	
DIPHAMI	19	Diphenylamine	ppb	10			18	0	
DIPHAMI	21	Diphenylamine	ppb				15	0	
DISULFO		Disulfoton	ppb	2			16	0	
DODECAN		Dodecane	ppb	10			10	0	
ENDO1		Endosulfan I	ppb	.1			104	0	
ENDO2		Endosulfan II	ppb	.05			103	0	
ENDSFAN		Endosulfan sulfate	ppb	.5			101	0	
ENDRALD		Endrin Aldehyde	ppb	.2			90	0	
ETHANOL		Ethanol					12	0	
ETHCARB		Ethyl carbamate (Urethane)					14	0	
ETHCYAN	16	Ethyl cyanide	ppb	5			13	0	
ETHCYAN	28	Ethyl cyanide					14	0	
ETHMETH	16	Ethyl methacrylate	ppb	5			13	0	
ETHMETH	50	Ethyl methacrylate					25	0	
ETHMETS	19	Ethyl methanesulfonate	ppb	10			18	0	
ETHMETS	21	Ethyl methanesulfonate	ppb				15	0	
ETHBENZ	16	Ethylbenzene	ppb	5			30	0	
ETHBENZ	25	Ethylbenzene	ppb	2			3	0	
ETHGLYC		Ethylene Glycol					11	0	
ETHGLY		Ethylene glycol	ppb				1	0	
ETHOXID		Ethylene oxide					25	0	
ETHMINE		Ethyleneimine	ppb				15	0	
ETHYREA		Ethylenethiourea					13	0	
EU-154		Europium-154	pCi/L				3	1	
EU-155		Europium-155	pCi/L				3	1	
FAMPHUR		Famphur	ppb	10			18	0	
FLUORAN	19	Fluoranthene	ppb	10			18	0	

Constituent Name				Lab	DWS		Number of Samples		
Short	(Method)	Full	Units	CRQL	Limit	Agency	Total	>CRQL	>DWS
FLUORAN	21	Fluoranthene	ppb				15	0	
FLRENE	19	Fluorene	ppb	10			18	0	
FLRENE	21	Fluorene	ppb				11	0	
FLUOROA		Fluoroacetic acid	ppb				1	0	
FORMALN		Formaldehyde					26	0	
GLYCIDY		Glycidylaldehyde	ppb				1	0	
HEPTLOR		Heptachlor	ppb	.05			104	0	
HEPTIDE		Heptachlor epoxide	ppb	1			104	0	
HEXCBEN	19	Hexachlorobenzene	ppb	10			18	0	
HEXCBEN	21	Hexachlorobenzene	ppb				18	0	
HEXCBUT	19	Hexachlorobutadiene	ppb	10			18	0	
HEXCBUT	21	Hexachlorobutadiene	ppb				15	0	
HEXCCYC	19	Hexachlorocyclopentadiene	ppb	10			18	0	
HEXCCYC	21	Hexachlorocyclopentadiene	ppb				15	0	
HEXCETH	19	Hexachloroethane	ppb	10			18	0	
HEXCETH	21	Hexachloroethane	ppb				15	0	
HEXACHL	19	Hexachlorophene	ppb	10			18	0	
HEXACHL	21	Hexachlorophene	ppb				18	0	
HEXAENE	19	Hexachloropropene	ppb	10			18	0	
HEXAENE	21	Hexachloropropene	ppb				16	0	
LHYDRAZ	36	Hydrazine	ppb	30			120	0	
LHYDRAZ	76	Hydrazine	ppb				3	0	
HYDRSUL		Hydrogen sulfide	ppb				8	0	
INDENOP	19	Indeno(1,2,3-cd)pyrene	ppb	10			18	0	
INDENOP	21	Indeno(1,2,3-cd)pyrene	ppb				15	0	
I-129		Iodine-129	pCi/L	1			5	1	
ISOBUTY	16	Isobutyl alcohol	ppb	200			13	0	
ISOBUTY	28	Isobutyl alcohol					14	0	
ISODRIN		Isodrin	ppb	10			29	0	
ISOPHER	19	Isophorone	ppb	10			18	0	
ISOPHER	21	Isophorone	ppb				11	0	
ISOSOLE	19	Isosafrole	ppb	10			18	0	
ISOSOLE	21	Isosafrole	ppb				15	0	
KEPONE	17	Kepone					11	0	
KEPONE	19	Kepone	ppb	10			18	0	
KEROSEN	19	Kerosene	ppb	10000			18	0	
KEROSEN	21	Kerosene	ppb				18	0	
PB212		Lead-212	pCi/L				1	1	
FLITHIU	34	Lithium					50	5	
LITHIUM	35	Lithium					50	6	
MAGNES	34	Magnesium	ppb	100			112	112	
MAGNES	35	Magnesium					63	63	
FMAGNES	34	Magnesium, filtered	ppb	100			175	175	
MALHYDR		Maleic hydrazide	ppb				16	0	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
MALOILE		Malononitrile	ppb				15	0	
MELPHAL		Melphalan	ppb				15	0	
METHACR		Methacrylonitrile	ppb	5			38	0	
METHTHI		Methanethiol					25	0	
METHAPY		Methapyrilene	ppb	10			33	0	
METHNYL		Metholonyl	ppb				15	0	
IODOMET		Methyl Iodide	ppb	5			38	0	
METHBRO		Methyl bromide	ppb	10			38	0	
METHCHL		Methyl chloride	ppb	10			38	0	
METHONE		Methyl ethyl ketone	ppb	100			90	0	
METACRY	16	Methyl methacrylate	ppb	5			13	0	
METACRY	21	Methyl methacrylate	ppb				19	0	
METMSUL	19	Methyl methanesulfonate	ppb	10			18	0	
METMSUL	21	Methyl methanesulfonate	ppb				15	0	
METHPAR		Methyl parathion	ppb	.5			16	0	
METHYCH	16	Methylene chloride	ppb	5			89	1	
METHYCH	25	Methylene chloride	ppb	5			3	0	
METHHYD		Methylhydrazine	ppb				1	0	
METHIOU		Methylthiouracil	ppb				15	0	
FMOLYBD	34	Molybdenum					50	0	
??	35	Molybdenum					50	0	
MBP		Monobutyl Phosphate					12	0	
NNDIEHY		N,N-Diethylhydrazine					25	0	
NNIURET		N-Nitroso-N-methylurethane	ppb				15	0	
DIPRNIT	19	N-Nitroso-di-n-dipropylamine	ppb	10			18	0	
DIPRNIT	21	N-Nitroso-di-n-dipropylamine	ppb				15	0	
NNIBUTY	19	N-Nitrosodi-n-butylamine	ppb	10			18	0	
NNIBUTY	21	N-Nitrosodi-n-butylamine	ppb				15	0	
NNIDIEA		N-Nitrosodiethanolamine					15	0	
NNIDIEY	19	N-Nitrosodiethylamine	ppb	10			18	0	
NNIDIEY	21	N-Nitrosodiethylamine	ppb				15	0	
NNIDIME	19	N-Nitrosodimethylamine	ppb	10			18	0	
NNIDIME	21	N-Nitrosodimethylamine	ppb				15	0	
NNDIPHA	19	N-Nitrosodiphenylamine	ppb	10			18	0	
NNDIPHA	21	N-Nitrosodiphenylamine	ppb				11	0	
NNIMETH	19	N-Nitrosomethylethylamine	ppb	10			18	0	
NNIMETH	21	N-Nitrosomethylethylamine	ppb				15	0	
NNIVINY		N-Nitrosomethylvinylamine	ppb				15	0	
NNIMORP	19	N-Nitrosomorpholine	ppb	10			18	0	
NNIMORP	21	N-Nitrosomorpholine	ppb				15	0	
NNINICO		N-Nitrosonornicotine	ppb				15	0	
NNIPIPE	19	N-Nitrosopiperidine	ppb	10			18	0	
NNIPIPE	21	N-Nitrosopiperidine	ppb				15	0	
PHENREA		N-Phenylthiourea					13	0	

Constituent Name				Lab	DWS		Number of Samples		
Short	(Method)	Full	Units	CRQL	Limit	Agency	Total	>CRQL	>DWS
PROPYLA		N-Propylamine					14	0	
NAPHTHA	19	Naphthalene	ppb	10			28	0	
NAPHTHA	21	Naphthalene	ppb				18	0	
NICKEL	34	Nickel	ppb	30			112	63	
NICKEL	35	Nickel					65	44	
FNICKEL	34	Nickel, filtered	ppb	30			175	8	
NICOTIN		Nicotinic acid	ppb				16	0	
NITRATE	124	Nitrate	ppb	200	45000	EPA	92	88	1
NITRATE	130	Nitrate	ppb	200	45000	EPA	21	21	0
NITRATE	46	Nitrate			45000	EPA	80	68	0
NITRATE	76	Nitrate	ppm				15	15	
NITRITE	124	Nitrite	ppb	200			92	0	
NITRITE	55	Nitrite					62	0	
NITBENZ	19	Nitrobenzene	ppb	10			18	0	
NITBENZ	21	Nitrobenzene	ppb				15	0	
NITRPYR	19	Nitrosopyrrolidine	ppb	10			18	0	
NITRPYR	21	Nitrosopyrrolidine	ppb				15	0	
TRIPHOS	19	O,O,O-Triethyl phosphorothioate	ppb	10			18	0	
TRIPHOS	21	O,O,O-Triethyl phosphorothioate	ppb				15	0	
DIPHOS		O,O-diethylO-2-pyrazinylphosphor	ppb	10			29	0	
OSMIUM		Osmium	ppb				3	0	
PCDDS		PCDDs					10	0	
PCDFS		PCDFs					10	0	
PARALDE		Paraldehyde					14	0	
PARATHI	19	Parathion	ppb	10			18	0	
PARATHI	29	Parathion					14	0	
PENTCHB	19	Pentachlorobenzene	ppb	10			18	0	
PENTCHB	21	Pentachlorobenzene	ppb				18	0	
PENTACH		Pentachloroethane	ppb	5			38	0	
PENTCHN	19	Pentachloronitrobenzene (PCNB)	ppb	10			18	0	
PENTCHN	21	Pentachloronitrobenzene (PCNB)	ppb				15	0	
PENTCHP	19	Pentachlorophenol	ppb	50			28	0	
PENTCHP	21	Pentachlorophenol	ppb				15	0	
PENTCHP	30	Pentachlorophenol	ppb	100			86	0	
PERCHLO		Perchlorate					9	0	
PHENTIN	19	Phenacetin	ppb	10			18	0	
PHENTIN	21	Phenacetin	ppb				15	0	
PHENANT	19	Phenanthrene	ppb	10			18	0	
PHENANT	21	Phenanthrene	ppb				11	0	
PHENINE		Phenylenediamine	ppb				15	0	
PHORATE		Phorate	ppb	2			13	2	
PHOSPHA	124	Phosphate	ppb	400			95	9	
PHOSPHA	46	Phosphate					69	4	
PHTHEST		Phthalic acid esters	ppb				15	0	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
PU-238	146	Plutonium-238	pCi/L	.1			8	0	
PU-238	77	Plutonium-238	pCi/L				20	0	
PU39-40	146	Plutonium-239/40	pCi/L	.1			8	0	
PU39-40	77	Plutonium-239/40	pCi/L				20	1	
POTASUM	34	Potassium	ppb	300			112	112	
POTASUM	35	Potassium					65	65	
FPOTASS	34	Potassium, filtered	ppb	300			175	175	
PRONIDE	19	Pronamide	ppb	10			18	0	
PRONIDE	21	Pronamide	ppb				15	0	
PROPCN		Propionitrile					17	0	
PYRENE	19	Pyrene	ppb	10			18	0	
PYRENE	21	Pyrene	ppb				11	0	
PYRIDIN		Pyridine	ppb	5			39	0	
RESERPI		Reserpine	ppb				15	0	
RESORCI		Resorcinol	ppb				15	0	
RU-106	140	Ruthenium-106	pCi/L				8	0	
RU-106	77	Ruthenium-106	pCi/L				79	35	
SAFROL	19	Safrol	ppb	10			18	0	
SAFROL	21	Safrol	ppb				15	0	
FSILICO	34	Silicon					50	50	
SILICON	35	Silicon					50	50	
STRONUM	35	Strontium					63	60	
FSTRONUM	34	Strontium, filtered					61	61	
SR-90	141	Strontium-90	pCi/L	5	8	EPA	5	0	0
SR-90	77	Strontium-90	pCi/L		8	EPA	71	32	2
STRYCHN		Strychnine	ppb				16	0	
STYRENE		Styrene	ppb	5			30	0	
SULFIDE		Sulfide	ppb	10000			16	0	
TC-99	143	Technetium-99					8	6	
TC-99	77	Technetium-99	pCi/L				8	1	
TMP_C		Temperature, field	DegC				264	264	
PERCENE	16	Tetrachloroethene	ppb	5			90	0	
PERCENE	25	Tetrachloroethene	ppb	.5			3	0	
TETPHNL		Tetrachlorophenols	ppb	10			86	1	
TETRADE		Tetradecane	ppb	10			10	0	
PYROPHOS		Tetraethyldithiopyrophosphate	ppb	10			18	0	
TETEPYR		Tetraethylpyrophosphate					14	0	
TAF		Tetrahydrofuran					79	0	
THALLIUM	42	Thallium	ppb	5			2	0	
THALLIUM	76	Thallium	ppb				12	0	
FTHALIUM	42	Thallium, filtered	ppb	5			13	0	
THIONOX		Thiofanox	ppb				15	0	
THIOURA		Thiourea					13	0	
THIURAM		Thiuram	ppb				15	0	

Constituent Name Short	(Method)	Full	Units	Lab CRQL	DWS Limit	Agency	Number of Samples Total	>CRQL	>DWS
TIN	34	Tin, filtered					112	0	
FTIN	34	Tin, filtered					163	0	
TIN	35	Tin, filtered					50	0	
FTITAN	34	Titanium					50	0	
TITAN	35	Titanium					50	2	
TOLUENE	16	Toluene	ppb	5			83	0	
TOLUENE	25	Toluene	ppb	2			3	0	
TOLUDIA		Toluenediamine	ppb				15	0	
TC		Total Carbon	ppb	2000			59	59	
TDS		Total Dissolved Solids					9	9	
TRIBUTPH		Tributyl Phosphate	ppb				28	0	
TRIBUPH		Tributylphosphoric Acid	ppb				14	0	
TRICENE	16	Trichloroethene	ppb	5	5	EPA	90	0	3
TRICENE	25	Trichloroethene	ppb	1	5	EPA	3	0	0
TRCMEOL		Trichloromethanethiol					25	0	
TRCMFLM		Trichloromonofluoromethane	ppb	5			38	0	
TRIPHNL		Trichlorophenols	ppb	5			86	0	
TRISPHO		Tris(2,3-dibromopropyl) phosphat	ppb				15	0	
TRITIUM	142	Tritium	pCi/L	500	20000	EPA	116	92	54
TRITIUM	77	Tritium	pCi/L		20000	EPA	125	85	30
UNKNOWN		Unknown	ppb				1	1	
UNKALI		Unknown aliphatic hydrocarbon	ppb				1	1	
URANIUM	145	Uranium	ppb	.5			9	9	
URANIUM	77	Uranium	pCi/L				47	46	
U-234		Uranium-234	pCi/L				6	6	
U-235		Uranium-235	pCi/L				6	2	
U-238		Uranium-238	pCi/L				6	6	
VANADUM	34	Vanadium	ppb	30			112	35	
VANADUM	35	Vanadium					65	54	
FVANADI	34	Vanadium, filtered	ppb	30			175	83	
VINYLAC		Vinyl acetate	ppb	5			30	0	
VINYIDE	16	Vinyl chloride	ppb	10	2	EPA	82	0	82*
VINYIDE	25	Vinyl chloride	ppb	2	2	EPA	3	0	0
WARFRIN		Warfarin	ppb				15	0	
M-XYLE		Xylene(m)	ppb	5			13	0	
XYLENEO		Xylene(o)	ppb	5			13	0	
XYLENEP		Xylene(p)	ppb	5			13	0	
OPXYLE		Xylenes					68	0	
XYLENE	16	Xylenes (total)	ppb	5			77	0	
XYLENE	25	Xylenes (total)	ppb	5			3	0	
ZINC	34	Zinc	ppb	10			112	60	
ZINC	35	Zinc					65	46	
FZINC	34	Zinc, filtered	ppb	10			175	59	
ZN-65		Zinc-65	pCi/L				3	0	

Constituent Name				Lab	DWS		Number of Samples		
Short	(Method)	Full	Units	CRQL	Limit	Agency	Total	>CRQL	>DWS
FZIRCON	34	Zirconium					50	0	
??	35	Zirconium					50	0	
ZRNB-95		Zirconium/Niobium-95	pCi/L				3	0	
ALLYLCL		allylchloride	ppb	100			30	0	
CIS12DE		cis-1,2-Dichloroethylene	ppb	1			3	0	
TDICPENE		cis-1,3-Dichloropropene	ppb	5			13	0	
MCRESOL		m-Cresol	ppb	10			28	0	
DINBENZ		m-dinitrobenzene	ppb	10			33	0	
2NITPH		o-Nitroaniline	ppb				11	0	
ONITANI		o-Nitroaniline	ppb				11	0	
OTOLHYD		o-Toluidine	ppb	10			18	0	
TOLDHYD		o-Toluidine hydrochloride	ppb				15	0	
PBENZQU		p-Benzoquinone	ppb				15	0	
DIMEAMB	19	p-Dimethylaminoazobenzene	ppb	10			18	0	
DIMEAMB	21	p-Dimethylaminoazobenzene	ppb				15	0	
PHENDIA		p-Phenylenediamine	ppb	10			18	0	
SYMTRIN	19	sym-Trinitrobenzene	ppb	10			18	0	
SYMTRIN	21	sym-Trinitrobenzene	ppb				15	0	
TRANDCE	16	trans-1,2-Dichloroethylene	ppb	5			82	0	
TRANDCE	25	trans-1,2-Dichloroethylene					3	0	
DICPENE		trans-1,3-Dichloropropene	ppb	5			13	0	
TDIBUTEN		trans-1,4-dichloro-2-butene	ppb	5			25	0	

For explanation of this table, see Section 1.4 of report.

Well Name	Collection Date	Sample Number	DIMPHEN 30/ppb 5/.	DINPHEN 30/ppb 150/.	2NITPH 30/ppb 5/.	ACETONE 16/ppb 100/.
299-E18-1	11/10/88	H0007ZV2				2.00 U
299-E18-1	11/10/88	H0007ZV3				1.00 U
299-E18-1	11/10/88	H0007ZV4				3.00 U
299-E18-1	11/10/88	H0007ZV5				2.00 U
299-E18-1	11/23/88	H0007ZV6				10.00 U
299-E18-1	11/23/88	H0007ZV7				5.00 U
299-E18-1	2/15/89	H0007ZV8				10.00 U
299-E18-1	5/26/89	H0007ZW2				10.00 U
299-E18-1	8/08/89	H0007ZW6				10.00 U
299-E18-1	10/31/89	H0007ZX0				10.00 U
299-E18-1	1/24/92	B01Q59	5.00 U	150.00 U	5.00 UQ	
299-E18-1	6/03/92	B06PH8	5.00 U	150.00 U	5.00 U	100.00 U
299-E18-1	12/16/92	B07SW0	5.00 U	150.00 U	5.00 U	
299-E32-4	3/01/89	H0008ZC6				10.00 U
299-E32-4	3/13/89	H0008ZD0				10.00 U
299-E32-4	7/19/89	H0008ZD8				10.00 U
299-E32-4	9/08/89	H0008ZF6				10.00 U
299-E32-4	1/17/90	H0008ZG0				10.00 U
299-E32-4	5/09/90	H0008ZG9				10.00 U
299-E32-4	1/15/92	B01QK6	5.00 U	150.00 U	5.00 U	100.00 U
299-E32-4	4/06/92	B06696	5.00 U	150.00 U	5.00 U	100.00 U
299-E32-4	7/14/92	B07173	5.00 U	150.00 U	5.00 U	100.00 U
699-40-39	12/05/89	H000DBX2				6.00 U
699-40-39	1/25/90	H000DBX6				10.00 U
699-40-39	4/25/90	H000DBY0				10.00 U
699-40-39	1/31/92	B01Q65	5.00 U	150.00 U	5.00 U	
699-40-39	4/17/92	B065P2	5.00 UD	150.00 UD	5.00 UD	
699-40-39	6/24/92	B06ZT7	5.00 U	150.00 U	5.00 U	
699-40-39	1/14/93	B07TX4	5.00 U	150.00 U	5.00 U	
699-40-40A	1/24/92	B01T62	5.00 U	150.00 U	5.00 UQ	
699-40-40A	4/22/92	B065Q8	5.00 U	150.00 U	5.00 U	
699-40-40A	6/25/92	B06ZV2	5.00 U	150.00 U	5.00 U	
699-40-40A	10/21/92	B07JK3	5.00 U	150.00 U	5.00 U	100.00 UQ
699-40-40A	1/26/93	B07V49	5.00 U	150.00 U	5.00 U	100.00 U
699-40-40B	1/24/92	B01T64	5.00 U	59.00	10.00 Q	
699-40-40B	4/22/92	B065S0	5.00 U	150.00 U	5.00 U	
699-40-40B	6/29/92	B06ZW2	5.00 UD	150.00 UD	5.00 UD	
699-40-40B	10/21/92	B07JK8	5.00 U	150.00 U	5.00 U	100.00 UQ
699-40-40B	1/26/93	B07V54	5.00 U	150.00 U	5.00 U	100.00 U
699-41-40	12/05/89	H000DD44				10.00 U
699-41-40	1/25/90	H000DD48				10.00 U
699-41-40	4/19/90	H000DD52				10.00 U
699-41-40	1/31/92	B01QC8	5.00 U	150.00 U	5.00 U	

Well Name	Collection Date	Sample Number	DIMPHEN 30/ppb 5/.	DINPHEN 30/ppb 150/.	2NITPH 30/ppb 5/.	ACETONE 16/ppb 100/.
699-41-40	4/28/92	B065S5	5.00 UD	150.00 UD	5.00 UD	
699-41-40	4/28/92	B065S6	5.00 UD	150.00 UD	5.00 UD	
699-41-40	6/24/92	B06ZX2	5.00 U	150.00 U	5.00 U	
699-41-40	1/14/93	B07TX9	5.00 U	150.00 U	5.00 U	
699-41-42	1/08/93	B07V59	5.00 U	150.00 U	5.00 U	100.00 UQ
699-42-37	12/22/92	B07TC4				100.00 U
699-42-39A	1/23/92	B01T66	5.00 UP	150.00 UP	5.00 UP	
699-42-39A	4/17/92	B065T1	5.00 UPD	150.00 UPD	5.00 UPD	
699-42-39A	6/25/92	B06ZX7	5.00 UP	150.00 UP	5.00 UP	
699-42-39A	10/21/92	B07JL3	5.00 UP	150.00 UP	5.00 UP	100.00 UPQ
699-42-39A	1/27/93	B07V64	5.00 UP	150.00 UP	5.00 UP	100.00 UP
699-42-39B	1/23/92	B01T68	D	D	QD	
699-42-39B	4/17/92	B065T6	5.00 UD	150.00 UD	5.00 UD	
699-42-39B	6/25/92	B06ZY2	5.00 U	150.00 U	5.00 U	
699-42-39B	10/28/92	B07JJ2	5.00 U	150.00 U	5.00 U	100.00 UQ
699-42-39B	10/28/92	B07JJ3	5.00 U	150.00 U	5.00 U	100.00 UQ
699-42-39B	1/25/93	B07V69	5.00 U	150.00 U	5.00 U	100.00 U
699-42-40A	2/15/89	H000DF65				10.00 U
699-42-40A	5/31/89	H000DF70				10.00 U
699-42-40A	8/10/89	H000DF74				13.30
699-42-40A	1/26/90	H000DF78				10.00 U
699-42-40A	1/23/92	B01Q61	5.00 U	150.00 U	5.00 U	
699-42-40A	6/25/92	B06ZY7	5.00 U	150.00 U	5.00 U	
699-42-41	1/24/92	B01T70	5.00 UP	120.00 P	28.00 P	
699-42-41	4/17/92	B065V1	5.00 UPD	150.00 UPD	5.00 UPD	
699-42-41	6/29/92	B06ZZ2	5.00 UPD	150.00 UPD	5.00 UPD	
699-42-41	1/25/93	B07TZ4	5.00 UP	150.00 UP	5.00 UP	
699-42-42B	2/24/89	H000DFT7				10.00 U
699-42-42B	6/16/89	H000DFV1				10.00 U
699-42-42B	6/16/89	H000DFV4				10.00 U
699-42-42B	8/09/89	H000DFV5				10.00 U
699-42-42B	1/26/90	H000DFW0				10.00 U
699-42-42B	1/24/92	B01Q63	5.00 U	150.00 U	5.00 UQ	
699-42-42B	6/24/92	B06ZZ7	5.00 U	150.00 U	5.00 U	
699-42-42B	1/21/93	B07TZ9	5.00 U	150.00 U	5.00 U	
699-43-40	1/31/92	B01T72	5.00 UP	150.00 UP	5.00 UP	
699-43-40	4/28/92	B065V6	5.00 UPD	150.00 UPD	5.00 UPD	
699-43-40	6/26/92	B07002	5.00 UPD	150.00 UPD	5.00 UPD	
699-43-40	1/25/93	B07V04	5.00 UP	150.00 UP	5.00 UP	
699-43-41E	12/05/89	H000DGD6				9.00 U
699-43-41E	1/25/90	H000DGF0				10.00 U
699-43-41E	5/15/90	H000DGF9				10.00 U
699-43-41E	6/28/91	H0007203				U

Well Name	Collection Date	Sample Number	DIMPHEN 30/ppb 5/.	DINPHEN 30/ppb 150/.	2NITPH 30/ppb 5/.	ACETONE 16/ppb 100/.
699-43-41E	6/28/91	H0007204				U
699-43-41E	1/23/92	B01QC3	5.00 U	150.00 U	5.00 UQ	
699-43-41E	4/17/92	B065P4	5.00 UD	150.00 UD	5.00 UD	100.00 U
699-43-41E	6/24/92	B06ZV3	5.00 U	150.00 U	5.00 U	100.00 U
699-43-41E	1/25/93	B07V09	5.00 U	150.00 U	5.00 U	
699-43-41F	12/05/89	H000DGG8				8.00 U
699-43-41F	1/25/90	H000DGH2				10.00 U
699-43-41F	4/18/90	H000DGH6				10.00 U
699-43-41F	7/02/91	H00071Y5				U
699-43-41F	5/05/92	B065R0	5.00 UD	150.00 UD	5.00 UD	100.00 U
699-43-41F	6/25/92	B06ZW7	5.00 U	150.00 U	5.00 U	100.00 U
699-43-41F	1/22/93	B07V14	5.00 U	150.00 U	5.00 U	
699-43-41G	1/23/92	B01T74	5.00 U	150.00 U	5.00 UQ	
699-43-41G	4/17/92	B065W1	5.00 UD	150.00 UD	5.00 UD	
699-43-41G	6/26/92	B07007	5.00 UD	150.00 UD	5.00 UD	
699-43-41G	10/28/92	B07JL8	5.00 U	150.00 U	5.00 U	100.00 UQ
699-43-41G	1/25/93	B07V74	5.00 U	150.00 U	5.00 U	100.00 U
699-43-42J	2/24/89	H000DGP6				10.00 U
699-43-42J	6/15/89	H000DGQ0				10.00 U
699-43-42J	8/09/89	H000DGQ4				6.00 U
699-43-42J	8/09/89	H000DGQ7				12.00
699-43-42J	1/31/90	H000DGQ9				10.00 U
699-43-42J	1/31/92	B01S49	5.00 U	150.00 U	5.00 U	
699-43-42J	1/31/92	B01S50	8.00	150.00 U	5.00 U	
699-43-42J	6/25/92	B07012	5.00 U	150.00 U	5.00 U	
699-43-42J	1/21/93	B07V19	5.00 U	150.00 U	5.00 U	
699-43-43	2/24/89	H000DGR7				10.00 U
699-43-43	2/24/89	H000DGS0				10.00 U
699-43-43	6/15/89	H000DGS1				10.00 U
699-43-43	8/09/89	H000DGS5				10.00 U
699-43-43	1/26/90	H000DGS9				10.00 U
699-43-43	1/24/92	B01Q67	5.00 U	150.00 U	5.00 UQ	
699-43-43	4/22/92	B065N6	5.00 U	150.00 U	5.00 U	
699-43-43	6/26/92	B070W0	5.00 UD	150.00 UD	5.00 UD	
699-43-43	10/26/92	B07JG5	5.00 U	150.00 U	5.00 U	
699-43-43	1/13/93	B07V24	5.00 U	150.00 U	5.00 U	
699-43-45	12/06/89	H000DGT4				10.00 U
699-43-45	1/26/90	H000DGT8				10.00 U
699-43-45	4/18/90	H000DGV2				10.00 U
699-43-45	1/24/92	B01QD0	5.00 U	150.00 U	5.00 UQ	
699-43-45	4/22/92	B065N8	5.00 U	150.00 U	5.00 U	
699-43-45	6/26/92	B070W2	5.00 UD	150.00 UD	5.00 UD	
699-43-45	10/26/92	B07JG7	5.00 U	150.00 U	5.00 U	

Well Name	Collection Date	Sample Number	DIMPHEN 30/ppb 5/.	DINPHEN 30/ppb 150/.	2NITPH 30/ppb 5/.	ACETONE 16/ppb 100/.
699-43-45	1/13/93	B07V29	5.00 U	150.00 U	5.00 U	
699-44-39B	1/08/93	B07WK1	5.00 U	150.00 U	5.00 U	100.00 UQ
699-44-42	2/17/89	H000DHK6				10.00 U
699-44-42	6/15/89	H000DHL0				10.00 U
699-44-42	8/08/89	H000DHL4				10.00 U
699-44-42	1/31/90	H000DHL8				10.00 U
699-44-42	1/31/92	B01S52	5.00 U	150.00 U	5.00 U	
699-44-42	1/31/92	B01S53	5.00 U	150.00 U	5.00 U	
699-44-42	6/25/92	B07017	5.00 U	150.00 U	5.00 U	
699-44-42	1/13/93	B07V34	5.00 U	150.00 U	5.00 U	
699-44-42	1/13/93	B07V35	5.00 U	150.00 U	5.00 U	
699-44-43B	12/20/89	H000DHM3				10.00 U
699-44-43B	12/20/89	H000DHM6				10.00 U
699-44-43B	1/26/90	H000DHM7				10.00 U
699-44-43B	4/18/90	H000DHN1				10.00 U
699-44-43B	1/23/92	B01Q69	5.00 U	150.00 U	5.00 UQ	
699-44-43B	4/20/92	B065W9	5.00 U	150.00 U	5.00 U	
699-44-43B	6/26/92	B07022	5.00 UD	150.00 UD	5.00 UD	
699-44-43B	6/26/92	B07023	5.00 UD	150.00 UD	5.00 UD	
699-44-43B	1/27/93	B07V44	5.00 U	150.00 U	5.00 U	

Well Name	Collection Date	Sample Number	ALKALIN 52/ppm 50/.	ALKALIN 53/ppb ./.	FALUMIN 34/ppb ./.	ALUMNUM 35/ppb ./.
299-E18-1	8/16/88	H0007ZT7				351.00
299-E18-1	8/16/88	H0007ZT7			150.00 U	
299-E18-1	9/22/88	H0007ZV1				609.00
299-E18-1	9/22/88	H0007ZV1			150.00 U	
299-E18-1	11/10/88	H0007ZV2				150.00 U
299-E18-1	11/10/88	H0007ZV2			150.00 U	
299-E18-1	11/10/88	H0007ZV5				150.00 U
299-E18-1	11/10/88	H0007ZV5			150.00 U	
299-E18-1	2/15/89	H0007ZV8				150.00 U
299-E18-1	2/15/89	H0007ZV8			150.00 U	
299-E18-1	5/26/89	H0007ZW2		102000.00		150.00 U
299-E18-1	5/26/89	H0007ZW2			150.00 U	
299-E18-1	8/08/89	H0007ZW6		108000.00		150.00 U
299-E18-1	8/08/89	H0007ZW6			150.00 U	
299-E18-1	10/31/89	H0007ZX0				244.00
299-E18-1	10/31/89	H0007ZX0			150.00 U	

Well Name	Collection Date	Sample Number	ALKALIN 52/ppm 50/.	ALKALIN 53/ppb ./.	FALUMIN 34/ppb ./.	ALUMNUM 35/ppb ./.
299-E18-1	11/29/89	H0007ZX1		102000.00		
299-E32-4	9/27/88	H0008ZB8				150.00 U
299-E32-4	9/27/88	H0008ZB8			150.00 U	
299-E32-4	12/28/88	H0008ZC2				150.00 U
299-E32-4	12/28/88	H0008ZC2			150.00 U	
299-E32-4	3/01/89	H0008ZC6				150.00 U
299-E32-4	3/01/89	H0008ZC6			150.00 U	
299-E32-4	3/13/89	H0008ZD0				150.00 U
299-E32-4	3/13/89	H0008ZD0			150.00 U	
299-E32-4	6/16/89	H0008ZD4				276.00
299-E32-4	6/16/89	H0008ZD4			150.00 U	
299-E32-4	7/19/89	H0008ZD8				150.00 U
299-E32-4	7/19/89	H0008ZD8			150.00 U	
299-E32-4	9/08/89	H0008ZF6				150.00 U
299-E32-4	9/08/89	H0008ZF6			150.00 U	
299-E32-4	1/17/90	H0008ZG0				215.00
299-E32-4	1/17/90	H0008ZG0			150.00 U	
699-40-39	12/05/89	H000DBX2				345.00
699-40-39	12/05/89	H000DBX2			150.00 U	
699-40-39	1/25/90	H000DBX6				193.00
699-40-39	1/25/90	H000DBX6			150.00 U	
699-40-39	4/25/90	H000DBY0				150.00 U
699-40-39	4/25/90	H000DBY0			150.00 U	
699-41-40	12/05/89	H000DD44				150.00 U
699-41-40	12/05/89	H000DD44			150.00 U	
699-41-40	1/25/90	H000DD48				291.00
699-41-40	1/25/90	H000DD48			150.00 U	
699-41-40	4/19/90	H000DD52				250.00
699-41-40	4/19/90	H000DD52			150.00 U	
699-42-40A	8/22/85	H000DF11				150.00 U
699-42-40A	5/12/86	H000DF27				150.00 U
699-42-40A	8/05/86	H000DF33				150.00 U
699-42-40A	1/08/88	H000DF55		75200.00		150.00 U
699-42-40A	1/08/88	H000DF55			150.00 U	
699-42-40A	11/22/88	H000DF60				150.00 U
699-42-40A	11/22/88	H000DF60			150.00 U	
699-42-40A	2/15/89	H000DF65				150.00 U
699-42-40A	2/15/89	H000DF65			150.00 U	
699-42-40A	5/31/89	H000DF70				150.00 U
699-42-40A	5/31/89	H000DF70			150.00 U	
699-42-40A	8/10/89	H000DF74				150.00 U
699-42-40A	8/10/89	H000DF74			150.00 U	
699-42-40A	1/26/90	H000DF78				150.00 U

Well Name	Collection Date	Sample Number	ALKALIN 52/ppm 50/.	ALKALIN 53/ppb ./.	FALUMIN 34/ppb ./.	ALUMNUM 35/ppb ./.
699-42-40A	1/26/90	H000DF78			150.00 U	
699-42-42B	11/22/88	H000DFT3				150.00 U
699-42-42B	11/22/88	H000DFT3			150.00 U	
699-42-42B	2/24/89	H000DFT7				150.00 U
699-42-42B	2/24/89	H000DFT7			150.00 U	
699-42-42B	6/16/89	H000DFV1				150.00 U
699-42-42B	6/16/89	H000DFV1			150.00 U	
699-42-42B	6/16/89	H000DFV4				150.00 U
699-42-42B	6/16/89	H000DFV4			150.00 U	
699-42-42B	8/09/89	H000DFV5				150.00 U
699-42-42B	8/09/89	H000DFV5			150.00 U	
699-43-41E	12/05/89	H000DGD6				150.00 U
699-43-41E	12/05/89	H000DGD6			150.00 U	
699-43-41E	1/25/90	H000DGF0				150.00 U
699-43-41E	1/25/90	H000DGF0			150.00 U	
699-43-41F	12/05/89	H000DGG8				450.00
699-43-41F	12/05/89	H000DGG8			150.00 U	
699-43-41F	1/25/90	H000DGH2				323.00
699-43-41F	1/25/90	H000DGH2			150.00 U	
699-43-41F	4/18/90	H000DGH6				1140.00
699-43-41F	4/18/90	H000DGH6			300.00	
699-43-42J	11/22/88	H000DGP2				150.00 U
699-43-42J	11/22/88	H000DGP2			150.00 U	
699-43-42J	2/24/89	H000DGP6				150.00 U
699-43-42J	2/24/89	H000DGP6			150.00 U	
699-43-42J	6/15/89	H000DGQ0				150.00 U
699-43-42J	6/15/89	H000DGQ0			150.00 U	
699-43-42J	8/09/89	H000DGQ4				150.00 U
699-43-42J	8/09/89	H000DGQ4			150.00 U	
699-43-42J	8/09/89	H000DGQ7				150.00 U
699-43-42J	8/09/89	H000DGQ7			150.00 U	
699-43-42J	1/31/92	B01S49	120.00 D			
699-43-43	11/21/88	H000DGR3				150.00 U
699-43-43	11/21/88	H000DGR3			150.00 U	
699-43-43	2/24/89	H000DGR7				150.00 U
699-43-43	2/24/89	H000DGR7			150.00 U	
699-43-43	2/24/89	H000DGS0				150.00 U
699-43-43	2/24/89	H000DGS0			150.00 U	
699-43-43	6/15/89	H000DGS1				150.00 U
699-43-43	6/15/89	H000DGS1			150.00 U	
699-43-43	8/09/89	H000DGS5				150.00 U
699-43-43	8/09/89	H000DGS5			150.00 U	
699-43-43	1/26/90	H000DGS9				150.00 U

Well Name	Collection Date	Sample Number	ALKALIN 52/ppm 50/.	ALKALIN 53/ppb ./.	FALUMIN 34/ppb ./.	ALUMNUM 35/ppb ./.
699-43-43	1/26/90	H000DGS9			150.00 U	
699-43-45	12/06/89	H000DGT4				150.00 U
699-43-45	12/06/89	H000DGT4			150.00 U	
699-43-45	1/26/90	H000DGT8				150.00 U
699-43-45	1/26/90	H000DGT8			150.00 U	
699-43-45	4/18/90	H000DGV2				150.00 U
699-43-45	4/18/90	H000DGV2			150.00 U	
699-44-42	11/21/88	H000DHK2				150.00 U
699-44-42	11/21/88	H000DHK2			150.00 U	
699-44-42	2/17/89	H000DHK6				150.00 U
699-44-42	2/17/89	H000DHK6			150.00 U	
699-44-42	6/15/89	H000DHL0				150.00 U
699-44-42	6/15/89	H000DHL0			150.00 U	
699-44-42	8/08/89	H000DHL4				150.00 U
699-44-42	8/08/89	H000DHL4			150.00 U	
699-44-42	1/31/90	H000DHL8				150.00 U
699-44-42	1/31/90	H000DHL8			150.00 U	
699-44-42	1/31/92	B01S52	100.00 D			
699-44-43B	12/20/89	H000DHM3				150.00 U
699-44-43B	12/20/89	H000DHM3			150.00 U	
699-44-43B	12/20/89	H000DHM6				168.00
699-44-43B	12/20/89	H000DHM6			150.00 U	
699-44-43B	1/26/90	H000DHM7				150.00 U
699-44-43B	1/26/90	H000DHM7			150.00 U	
699-44-43B	1/26/90	H000DHN0				150.00 U
699-44-43B	1/26/90	H000DHN0			150.00 U	
699-44-43B	4/18/90	H000DHN1				405.00
699-44-43B	4/18/90	H000DHN1			150.00 U	

Well Name	Collection Date	Sample Number	AM-241 147/pCi/L ./.	AM-241 77/pCi/L ./.	AMMONIU 54/ppb 100/.	ARSENIC 43/ppb 5/50
299-E18-1	8/16/88	H0007ZT7				5.00 U
299-E18-1	9/22/88	H0007ZV1				5.00 U
299-E18-1	11/10/88	H0007ZV2			50.00 U	5.00 U
299-E18-1	11/10/88	H0007ZV5			50.00 U	5.00 U
299-E18-1	2/15/89	H0007ZV8			50.00 U	5.00 U
299-E18-1	5/26/89	H0007ZW2				5.00 U
299-E18-1	8/08/89	H0007ZW6			50.00 U	5.00 U
299-E18-1	10/31/89	H0007ZX0		.03	50.00 U	5.00 U

Well Name	Collection Date	Sample Number	AM-241 147/pCi/L ./.	AM-241 77/pCi/L ./.	AMMONIU 54/ppb 100/.	ARSENIC 43/ppb 5/50
299-E18-1	1/24/92	B01Q59			100.00 U	
299-E18-1	6/03/92	B06PH8			100.00 U	5.00 U
299-E18-1	12/16/92	B07S32				5.00 U
299-E18-1	12/16/92	B07SN0			100.00 U	
299-E32-4	9/27/88	H0008ZB8			50.00 U	5.00 U
299-E32-4	12/28/88	H0008ZC2			50.00 U	5.00 U
299-E32-4	3/01/89	H0008ZC6			50.00 U	5.00 U
299-E32-4	3/13/89	H0008ZD0			50.00 U	5.00 U
299-E32-4	6/16/89	H0008ZD4			50.00 U	5.00 U
299-E32-4	7/19/89	H0008ZD8			50.00 U	5.00 U
299-E32-4	9/08/89	H0008ZF6			50.00 U	5.00 U
299-E32-4	1/17/90	H0008ZG0			50.00 U	5.00 U
299-E32-4	5/09/90	H0008ZG9			50.00 U	5.00 U
299-E32-4	9/23/91	B00LK5	.05			
299-E32-4	1/15/92	B01QK6	.00 U		20.00	5.00 U
299-E32-4	4/06/92	B06696	-.00 U		100.00 U	5.00 U
299-E32-4	4/09/92	B065B6	-.00 U			
299-E32-4	7/14/92	B07173	-.00 U		200.00	5.00 U
699-40-36	12/21/92	B07TB1			100.00 U	5.00 U
699-40-36	2/22/93	B08717			100.00 U	5.00 U
699-40-39	12/05/89	H000DBX2		.01 U	50.00 U	5.00 U
699-40-39	1/25/90	H000DBX6			50.00 U	5.00 U
699-40-39	4/25/90	H000DBY0			50.00 U	5.00 U
699-40-39	7/08/91	H00071Y4				U
699-40-39	1/31/92	B01Q65			20.00	5.00 U
699-40-39	4/17/92	B065P2			100.00 UD	5.00 U
699-40-39	6/24/92	B06ZT7				5.00 U
699-40-39	1/14/93	B07TX4			100.00 U	5.00 U
699-40-40A	1/24/92	B01T62			60.00	5.00 U
699-40-40A	4/22/92	B065Q8			100.00 U	5.00 U
699-40-40A	6/25/92	B06ZV2				5.00 U
699-40-40A	10/21/92	B07JK3			100.00 UQ	5.00 U
699-40-40A	1/26/93	B07V49			100.00 U	5.00 U
699-40-40B	1/24/92	B01T64			100.00 U	5.00 U
699-40-40B	4/22/92	B065S0			100.00 U	5.00 U
699-40-40B	6/29/92	B06ZW2				5.00 U
699-40-40B	10/21/92	B07JK8			100.00 UQ	5.00 U
699-40-40B	1/26/93	B07V54			100.00 U	5.00 U
699-41-35	12/21/92	B07TB9			100.00 U	5.00 U
699-41-35	2/22/93	B08707			100.00 U	5.00 U
699-41-40	12/05/89	H000DD44		.01 U	140.00	5.00 U
699-41-40	1/25/90	H000DD48			50.00 U	5.00 U
699-41-40	4/19/90	H000DD52			50.00 U	5.00 U

Well Name	Collection Date	Sample Number	AM-241 147/pCi/L ./.	AM-241 77/pCi/L ./.	AMMONIU 54/ppb 100/.	ARSENIC 43/ppb 5/50
699-41-40	7/10/91	H00071Y1				U
699-41-40	1/31/92	B01QC8			100.00 U	5.00 U
699-41-40	4/28/92	B065S5			100.00 UD	5.00 U
699-41-40	4/28/92	B065S6			100.00 UD	5.00 U
699-41-40	6/24/92	B06ZX2				5.00
699-41-40	1/14/93	B07TX9			100.00 U	5.00 U
699-41-42	1/08/93	B07V59			100.00 U	7.60
699-42-37	12/22/92	B07TC4			100.00 U	5.00 U
699-42-37	2/23/93	B08712			100.00 U	5.00 U
699-42-39A	1/23/92	B01T66			100.00 UP	5.00 UP
699-42-39A	4/17/92	B065T1			100.00 UP	5.00 UP
699-42-39A	6/25/92	B06ZX7				5.60 P
699-42-39A	10/21/92	B07JL3			100.00 UPQ	5.00 UP
699-42-39A	1/27/93	B07V64			100.00 UP	5.00 UP
699-42-39B	1/23/92	B01T68			100.00	5.00 U
699-42-39B	4/17/92	B065T6			100.00 U	5.00 U
699-42-39B	6/25/92	B06ZY2				5.00 U
699-42-39B	10/28/92	B07JJ2			100.00	5.00 U
699-42-39B	10/28/92	B07JJ3			100.00	5.00 U
699-42-39B	1/25/93	B07V69			100.00 U	5.00 U
699-42-40A	8/22/85	H000DF11			185.00	9.26
699-42-40A	5/12/86	H000DF27			50.00 U	5.00 U
699-42-40A	8/05/86	H000DF33			50.00 U	5.00 U
699-42-40A	1/08/88	H000DF55			50.00 U	5.00 U
699-42-40A	11/22/88	H000DF60				5.00 U
699-42-40A	2/15/89	H000DF65			50.00 U	5.00 U
699-42-40A	5/31/89	H000DF70			50.00 U	5.00 U
699-42-40A	8/10/89	H000DF74			50.00 U	5.00 U
699-42-40A	1/26/90	H000DF78			50.00 U	5.00 U
699-42-40A	7/08/91	H00071Y2				U
699-42-40A	1/08/92	B07TY8			100.00 U	5.20
699-42-40A	1/23/92	B01Q61			100.00 U	
699-42-40A	6/25/92	B06ZY7				6.00
699-42-41	1/24/92	B01T70			100.00 UP	5.00 UP
699-42-41	4/17/92	B065V1			100.00 UP	5.00 UP
699-42-41	6/29/92	B06ZZ2				5.00 UP
699-42-41	1/25/93	B07TZ4			100.00 UP	5.00 UP
699-42-42B	11/22/88	H000DFT3				7.00
699-42-42B	2/24/89	H000DFT7			50.00 U	6.00
699-42-42B	6/16/89	H000DFV1			50.00 U	6.00
699-42-42B	6/16/89	H000DFV4			50.00 U	7.00
699-42-42B	8/09/89	H000DFV5			50.00 U	6.00
699-42-42B	1/26/90	H000DFW0			50.00 U	6.00

Well Name	Collection Date	Sample Number	AM-241 147/pCi/L ./.	AM-241 77/pCi/L ./.	AMMONIU 54/ppb 100/.	ARSENIC 43/ppb 5/50
699-42-42B	7/08/91	H00071Y3				U
699-42-42B	1/24/92	B01Q63			100.00 U	
699-42-42B	6/24/92	B06ZZ7				11.00
699-42-42B	1/21/93	B07TZ9			100.00 U	5.80
699-43-40	1/31/92	B01T72			30.00 P	5.00 UP
699-43-40	4/28/92	B065V6			100.00 UPD	5.00 UP
699-43-40	6/26/92	B07002				5.00 UP
699-43-40	1/25/93	B07V04			100.00 UP	5.00 UP
699-43-41E	12/05/89	H000DGD6		.01 U	149.00	5.00 U
699-43-41E	1/25/90	H000DGF0			50.00 U	5.00 U
699-43-41E	5/15/90	H000DGF9			50.00 U	
699-43-41E	5/15/90	H000DGG2			50.00 U	
699-43-41E	6/28/91	H0007203				U
699-43-41E	6/28/91	H0007204				U
699-43-41E	1/23/92	B01QC3			100.00 U	5.00 U
699-43-41E	4/17/92	B065P4			100.00 U	5.00 U
699-43-41E	6/24/92	B06ZV3				7.60
699-43-41E	1/25/93	B07V09			100.00 U	5.00 U
699-43-41F	12/05/89	H000DGG8		.00 U	88.00	5.00 U
699-43-41F	1/25/90	H000DGH2			50.00 U	5.00 U
699-43-41F	4/18/90	H000DGH6			50.00 U	5.00 U
699-43-41F	7/02/91	H00071Y5				7.00
699-43-41F	5/05/92	B065R0			100.00 U	6.10
699-43-41F	6/25/92	B06ZW7				8.10
699-43-41F	1/22/93	B07V14			100.00 U	5.00 U
699-43-41G	1/23/92	B01T74			50.00	5.00 U
699-43-41G	4/17/92	B065W1			100.00 U	5.00 U
699-43-41G	6/26/92	B07007				5.00 U
699-43-41G	10/28/92	B07JL8			100.00 U	5.00 U
699-43-41G	1/25/93	B07V74			100.00 U	5.60
699-43-42J	11/22/88	H000DGP2				9.00
699-43-42J	2/24/89	H000DGP6			50.00 U	8.00
699-43-42J	6/15/89	H000DGQ0			50.00 U	10.00
699-43-42J	8/09/89	H000DGQ4			50.00 U	8.00
699-43-42J	8/09/89	H000DGQ7			50.00 U	8.00
699-43-42J	1/31/90	H000DGQ9			50.00 U	16.00
699-43-42J	7/02/91	H00071Y6				15.00
699-43-42J	1/31/92	B01S49			100.00 U	17.00
699-43-42J	6/25/92	B07012				29.00
699-43-42J	1/21/93	B07V19			100.00 U	17.00
699-43-43	11/21/88	H000DGR3				7.00
699-43-43	2/24/89	H000DGR7			50.00 U	7.00
699-43-43	2/24/89	H000DGS0			50.00 U	7.00

Well Name	Collection Date	Sample Number	AM-241 147/pCi/L ./.	AM-241 77/pCi/L ./.	AMMONIU 54/ppb 100/.	ARSENIC 43/ppb 5/50
699-43-43	6/15/89	H000DGS1			50.00 U	8.00
699-43-43	8/09/89	H000DGS5			50.00 U	7.00
699-43-43	1/26/90	H000DGS9			50.00 U	8.00
699-43-43	7/08/91	H00071Y7				8.00
699-43-43	1/24/92	B01Q67			100.00 U	
699-43-43	1/24/92	B01T83				7.10
699-43-43	4/22/92	B065N6			100.00 U	7.90
699-43-43	6/26/92	B070W0			100.00 U	7.10
699-43-43	10/26/92	B07JG5			100.00 U	9.20
699-43-43	1/13/93	B07V24			100.00	6.80
699-43-45	12/06/89	H000DGT4		.01 U	50.00 U	10.00
699-43-45	1/26/90	H000DGT8			50.00 U	12.00
699-43-45	4/18/90	H000DGV2			50.00 U	11.00
699-43-45	7/08/91	H00071Y8				10.00
699-43-45	1/24/92	B01QD0			100.00 U	8.60
699-43-45	4/22/92	B065N8			100.00 U	8.30
699-43-45	6/26/92	B070W2			100.00	8.30
699-43-45	10/26/92	B07JG7			100.00 U	11.00
699-43-45	1/13/93	B07V29			100.00 U	10.00
699-44-39B	1/08/93	B07WK1			100.00 U	5.00 U
699-44-42	11/21/88	H000DHK2				11.00
699-44-42	2/17/89	H000DHK6			50.00 U	13.00
699-44-42	6/15/89	H000DHL0			50.00 U	14.00
699-44-42	8/08/89	H000DHL4			50.00 U	11.00
699-44-42	1/31/90	H000DHL8			50.00 U	16.00
699-44-42	7/10/91	H00071Y9				14.00
699-44-42	1/31/92	B01S52			100.00 U	12.00
699-44-42	6/25/92	B07017				18.00
699-44-42	1/13/93	B07V34			100.00 U	10.00
699-44-42	1/13/93	B07V35			100.00 U	10.00
699-44-43B	12/20/89	H000DHM3		.00 U	50.00 U	7.00
699-44-43B	12/20/89	H000DHM6		.01 U	50.00 U	7.00
699-44-43B	1/26/90	H000DHM7			50.00 U	9.00
699-44-43B	1/26/90	H000DHN0			50.00 U	7.00
699-44-43B	4/18/90	H000DHN1			50.00 U	7.00
699-44-43B	7/08/91	H00071Z0				7.00
699-44-43B	1/23/92	B01Q69			100.00 U	6.10
699-44-43B	4/20/92	B065W9			100.00 U	7.10
699-44-43B	6/26/92	B07022				6.30
699-44-43B	6/26/92	B07023				5.00 U
699-44-43B	1/27/93	B07V44			100.00 U	6.80

Well Name	Collection Date	Sample Number	AM-241 147/pCi/L ./.	AM-241 77/pCi/L ./.	AMMONIU 54/ppb 100/.	ARSENIC 43/ppb 5/50

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
299-E18-1	8/16/88	H0007ZT7				41.00
299-E18-1	8/16/88	H0007ZT7		5.00 U		
299-E18-1	9/22/88	H0007ZV1				54.00
299-E18-1	9/22/88	H0007ZV1		5.00 U		
299-E18-1	11/10/88	H0007ZV2				42.00
299-E18-1	11/10/88	H0007ZV2		5.00 U		
299-E18-1	11/10/88	H0007ZV5				38.00
299-E18-1	11/10/88	H0007ZV5		5.00 U		
299-E18-1	2/15/89	H0007ZV8				29.00
299-E18-1	2/15/89	H0007ZV8		5.00 U		
299-E18-1	5/26/89	H0007ZW2				28.00
299-E18-1	5/26/89	H0007ZW2		5.00 U		
299-E18-1	8/08/89	H0007ZW6				25.00
299-E18-1	8/08/89	H0007ZW6		5.00 U		
299-E18-1	10/31/89	H0007ZX0				29.00
299-E18-1	10/31/89	H0007ZX0		5.00 U		
299-E18-1	7/09/91	H00071X9			30.00	
299-E18-1	9/06/91	B00LB6			26.00	
299-E18-1	1/24/92	B01Q59			24.00 D	
299-E18-1	6/03/92	B06PH8			27.00	
299-E18-1	6/03/92	B06PJ2	5.00 U			
299-E18-1	12/16/92	B07S32			30.00	
299-E18-1	12/16/92	B07S36	5.00 U			
299-E32-4	9/27/88	H0008ZB8				82.00
299-E32-4	9/27/88	H0008ZB8		5.00 U		
299-E32-4	12/28/88	H0008ZC2				67.00
299-E32-4	12/28/88	H0008ZC2		5.00 U		
299-E32-4	3/01/89	H0008ZC6				74.00
299-E32-4	3/01/89	H0008ZC6		5.00 U		
299-E32-4	3/13/89	H0008ZD0				73.00
299-E32-4	3/13/89	H0008ZD0		5.00 U		
299-E32-4	6/16/89	H0008ZD4				74.00
299-E32-4	6/16/89	H0008ZD4		5.00 U		
299-E32-4	7/19/89	H0008ZD8				73.00
299-E32-4	7/19/89	H0008ZD8		5.00 U		
299-E32-4	9/08/89	H0008ZF6				81.00

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
299-E32-4	9/08/89	H0008ZF6		5.00 U		
299-E32-4	1/17/90	H0008ZG0				77.00
299-E32-4	1/17/90	H0008ZG0		5.00 U		
299-E32-4	5/09/90	H0008ZG9		5.00 U		
299-E32-4	8/05/91	H00071Y0			80.00 D	
299-E32-4	8/05/91	H0007264			77.00 D	
299-E32-4	9/23/91	B00LK5			68.00	
299-E32-4	1/15/92	B01QK6			74.00	
299-E32-4	1/15/92	B01QK8	5.00 U			
299-E32-4	4/06/92	B06696			71.00	
299-E32-4	4/06/92	B06697	5.00 U			
299-E32-4	7/14/92	B07173			73.00	
299-E32-4	7/14/92	B07174	5.00 U			
699-40-36	12/21/92	B07TB1			80.00	
699-40-36	12/21/92	B07TB8	5.00 U			
699-40-36	2/22/93	B08717			80.00	
699-40-36	2/22/93	B08721	5.00 U			
699-40-39	12/05/89	H000DBX2				110.00
699-40-39	12/05/89	H000DBX2		5.00 U		
699-40-39	1/25/90	H000DBX6				117.00
699-40-39	1/25/90	H000DBX6		5.00 U		
699-40-39	4/25/90	H000DBY0				119.00
699-40-39	4/25/90	H000DBY0		5.00 U		
699-40-39	9/11/91	B00LG1			120.00	
699-40-39	1/31/92	B01Q65			120.00 D	
699-40-39	1/31/92	B01Q66	5.00 U			
699-40-39	4/17/92	B065P2			110.00	
699-40-39	4/17/92	B065Q4	5.00 U			
699-40-39	6/24/92	B06ZT7			110.00	
699-40-39	6/24/92	B06ZV1	5.00 U			
699-40-39	1/14/93	B07TX4			110.00	
699-40-39	1/14/93	B07TX8	5.00 U			
699-40-40A	1/24/92	B01T62			140.00 D	
699-40-40A	1/24/92	B01T63	5.00 U			
699-40-40A	4/22/92	B065Q8			120.00	
699-40-40A	4/22/92	B065R8	5.00 U			
699-40-40A	6/25/92	B06ZV2			100.00	
699-40-40A	6/25/92	B06ZW0	5.00 U			
699-40-40A	10/21/92	B07JK3			100.00	
699-40-40A	10/21/92	B07JK7	5.00 U			
699-40-40A	1/26/93	B07V49			100.00	
699-40-40A	1/26/93	B07V53	5.00 U			
699-40-40B	1/01/92	B01T65	5.00 U			

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
699-40-40B	1/24/92	B01T64			170.00 D	
699-40-40B	4/22/92	B065S0			82.00	
699-40-40B	4/22/92	B065S4	5.00 U			
699-40-40B	6/29/92	B06ZW2			82.00	
699-40-40B	6/29/92	B06ZW6	5.80			
699-40-40B	10/21/92	B07JK8			90.00	
699-40-40B	10/21/92	B07JL2	5.00 U			
699-40-40B	1/26/93	B07V54			90.00	
699-40-40B	1/26/93	B07V58	5.00 U			
699-41-35	12/21/92	B07TB9			130.00	
699-41-35	12/21/92	B07TC3	5.00 U			
699-41-35	2/22/93	B08707			140.00	
699-41-35	2/22/93	B08711	5.00 U			
699-41-40	12/05/89	H000DD44				84.00
699-41-40	12/05/89	H000DD44		5.00 U		
699-41-40	1/25/90	H000DD48				77.00
699-41-40	1/25/90	H000DD48		5.00 U		
699-41-40	4/19/90	H000DD52				76.00
699-41-40	4/19/90	H000DD52		5.00 U		
699-41-40	7/10/91	H00071Y1			76.00	
699-41-40	9/11/91	B00LG2			75.00	
699-41-40	1/31/92	B01QC8			68.00 D	
699-41-40	1/31/92	B01QC9	5.00 U			
699-41-40	4/28/92	B065S5			73.00	
699-41-40	4/28/92	B065S6			69.00	
699-41-40	4/28/92	B065S9	5.00 U			
699-41-40	4/28/92	B065T0	5.00 U			
699-41-40	6/24/92	B06ZX2			70.00	
699-41-40	6/24/92	B06ZX6	5.30			
699-41-40	1/14/93	B07TX9			70.00	
699-41-40	1/14/93	B07TY3	5.00 U			
699-41-42	1/08/93	B07V59			40.00	
699-41-42	1/08/93	B07V63	7.00			
699-42-37	12/22/92	B07TC4			70.00	
699-42-37	12/22/92	B07TC8	5.00 U			
699-42-37	2/23/93	B08712			70.00	
699-42-37	2/23/93	B08716	5.00 U			
699-42-39A	1/23/92	B01T66			66.00 P	
699-42-39A	1/23/92	B01T67	5.00 UP			
699-42-39A	4/17/92	B065T1			90.00 P	
699-42-39A	4/17/92	B065T5	5.00 UP			
699-42-39A	6/25/92	B06ZX7			79.00 P	
699-42-39A	6/25/92	B06ZY1	5.00 UP			

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
699-42-39A	10/21/92	B07JL3			80.00 P	
699-42-39A	10/21/92	B07JL7	5.00 UP			
699-42-39A	1/27/93	B07V64			60.00 P	
699-42-39A	1/27/93	B07V68	5.00 UP			
699-42-39B	1/23/92	B01T68			87.00	
699-42-39B	1/23/92	B01T69	5.00 U			
699-42-39B	4/17/92	B065T6			89.00	
699-42-39B	4/17/92	B065V0	5.00 U			
699-42-39B	6/25/92	B06ZY2			89.00	
699-42-39B	6/25/92	B06ZY6	5.00 U			
699-42-39B	10/28/92	B07JJ2			80.00	
699-42-39B	10/28/92	B07JJ3			80.00	
699-42-39B	10/28/92	B07JJ6	5.00 U			
699-42-39B	10/28/92	B07JJ7	5.00 U			
699-42-39B	1/25/93	B07V69			80.00	
699-42-39B	1/25/93	B07V73	5.00 U			
699-42-40A	8/22/85	H000DF11				6.00 U
699-42-40A	5/12/86	H000DF27				6.00
699-42-40A	8/05/86	H000DF33				6.00 U
699-42-40A	1/08/88	H000DF55				6.00 U
699-42-40A	1/08/88	H000DF55		5.00 U		
699-42-40A	11/22/88	H000DF60				6.00
699-42-40A	11/22/88	H000DF60		5.00 U		
699-42-40A	2/15/89	H000DF65				6.00 U
699-42-40A	2/15/89	H000DF65		5.00 U		
699-42-40A	5/31/89	H000DF70				6.00 U
699-42-40A	5/31/89	H000DF70		5.00 U		
699-42-40A	8/10/89	H000DF74				6.00 U
699-42-40A	8/10/89	H000DF74		5.00 U		
699-42-40A	1/26/90	H000DF78				7.00
699-42-40A	1/26/90	H000DF78		5.00 U		
699-42-40A	7/08/91	H00071Y2			20.00 U	
699-42-40A	1/08/92	B07TY8			20.00 U	
699-42-40A	1/08/92	B07TZ3	5.00 U			
699-42-40A	1/23/92	B01Q61			73.00	
699-42-40A	6/25/92	B06ZY7			30.00	
699-42-40A	6/25/92	B06ZZ1	5.00 U			
699-42-41	1/24/92	B01T70			20.00 UPD	
699-42-41	1/24/92	B01T71	5.00 UP			
699-42-41	4/17/92	B065V1			20.00 UP	
699-42-41	4/17/92	B065V5	5.00 UP			
699-42-41	6/29/92	B06ZZ2			20.00 UP	
699-42-41	6/29/92	B06ZZ6	5.80 P			

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
699-42-41	1/25/93	B07TZ4			20.00 UP	
699-42-41	1/25/93	B07TZ8	5.00 UP			
699-42-42B	11/22/88	H000DFT3				30.00
699-42-42B	11/22/88	H000DFT3		6.00		
699-42-42B	2/24/89	H000DFT7				28.00
699-42-42B	2/24/89	H000DFT7		6.00		
699-42-42B	6/16/89	H000DFV1				27.00
699-42-42B	6/16/89	H000DFV1		7.00		
699-42-42B	6/16/89	H000DFV4				26.00
699-42-42B	6/16/89	H000DFV4		7.00		
699-42-42B	8/09/89	H000DFV5				21.00
699-42-42B	8/09/89	H000DFV5		6.00		
699-42-42B	1/26/90	H000DFW0		7.00		
699-42-42B	7/08/91	H00071Y3			24.00	
699-42-42B	1/24/92	B01Q63			22.00 D	
699-42-42B	6/24/92	B06ZZ7			23.00	
699-42-42B	6/24/92	B07001	11.00			
699-42-42B	1/21/93	B07TZ9			20.00	
699-42-42B	1/21/93	B07V03	7.20			
699-43-40	1/31/92	B01T72			75.00 PD	
699-43-40	1/31/92	B01T73	5.00 UP			
699-43-40	4/28/92	B065V6			54.00 P	
699-43-40	4/28/92	B065W0	5.00 UP			
699-43-40	6/26/92	B07002			67.00 P	
699-43-40	6/26/92	B07006	5.00 UP			
699-43-40	1/25/93	B07V04			60.00 P	
699-43-40	1/25/93	B07V08	5.00 UP			
699-43-41E	12/05/89	H000DGD6				61.00
699-43-41E	12/05/89	H000DGD6		5.00 U		
699-43-41E	1/25/90	H000DGF0				56.00
699-43-41E	1/25/90	H000DGF0		5.00 U		
699-43-41E	6/28/91	H0007203			41.00 D	
699-43-41E	6/28/91	H0007204			42.00 D	
699-43-41E	1/23/92	B01QC3			44.00	
699-43-41E	1/23/92	B01QC4	5.00 U			
699-43-41E	4/17/92	B065P4			36.00	
699-43-41E	4/17/92	B065Q6	5.00 U			
699-43-41E	6/24/92	B06ZV3			39.00	
699-43-41E	6/24/92	B06ZW1	6.60			
699-43-41E	1/25/93	B07V09			40.00	
699-43-41E	1/25/93	B07V13	5.00 U			
699-43-41F	12/05/89	H000DGG8				52.00
699-43-41F	12/05/89	H000DGG8		5.00 U		

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
699-43-41F	1/25/90	H000DGH2				47.00
699-43-41F	1/25/90	H000DGH2		5.00 U		
699-43-41F	4/18/90	H000DGH6				52.00
699-43-41F	4/18/90	H000DGH6		5.00 U		
699-43-41F	7/02/91	H00071Y5			38.00 D	
699-43-41F	5/05/92	B065R0			35.00	
699-43-41F	5/05/92	B065R9	5.80			
699-43-41F	6/25/92	B06ZW7			38.00	
699-43-41F	6/25/92	B06ZX1	7.90			
699-43-41F	1/22/93	B07V14			40.00	
699-43-41F	1/22/93	B07V18	5.00 U			
699-43-41G	1/23/92	B01T74			66.00	
699-43-41G	1/23/92	B01T75	6.40			
699-43-41G	4/17/92	B065W1			59.00	
699-43-41G	4/17/92	B065W6	5.00 U			
699-43-41G	6/26/92	B07007			53.00	
699-43-41G	6/26/92	B07011	5.00 U			
699-43-41G	10/28/92	B07JL8			50.00	
699-43-41G	10/28/92	B07JM2	5.70			
699-43-41G	1/25/93	B07V74			50.00	
699-43-41G	1/25/93	B07V78	5.20			
699-43-42J	11/22/88	H000DGP2				12.00
699-43-42J	11/22/88	H000DGP2		9.00		
699-43-42J	2/24/89	H000DGP6				13.00
699-43-42J	2/24/89	H000DGP6		8.00		
699-43-42J	6/15/89	H000DGQ0				11.00
699-43-42J	6/15/89	H000DGQ0		10.00		
699-43-42J	8/09/89	H000DGQ4				11.00
699-43-42J	8/09/89	H000DGQ4		7.00		
699-43-42J	8/09/89	H000DGQ7				11.00
699-43-42J	8/09/89	H000DGQ7		8.00		
699-43-42J	1/31/90	H000DGQ9		14.00		
699-43-42J	7/02/91	H00071Y6			20.00 UD	
699-43-42J	1/31/92	B01S49			20.00 UD	
699-43-42J	1/31/92	B01S51	16.00			
699-43-42J	6/25/92	B07012			20.00 U	
699-43-42J	6/25/92	B07016	28.00			
699-43-42J	1/21/93	B07V19			20.00 U	
699-43-42J	1/21/93	B07V23	19.00			
699-43-43	11/21/88	H000DGR3				13.00
699-43-43	11/21/88	H000DGR3		7.00		
699-43-43	2/24/89	H000DGR7				14.00
699-43-43	2/24/89	H000DGR7		7.00		

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
699-43-43	2/24/89	H000DGS0				12.00
699-43-43	2/24/89	H000DGS0		7.00		
699-43-43	6/15/89	H000DGS1				9.00
699-43-43	6/15/89	H000DGS1		8.00		
699-43-43	8/09/89	H000DGS5				12.00
699-43-43	8/09/89	H000DGS5		9.00		
699-43-43	1/26/90	H000DGS9				14.00
699-43-43	1/26/90	H000DGS9		8.00		
699-43-43	7/08/91	H00071Y7			20.00 U	
699-43-43	1/24/92	B01Q67			20.00 UD	
699-43-43	1/24/92	B01T84	9.50			
699-43-43	4/22/92	B065N6			20.00 U	
699-43-43	4/22/92	B065N7	7.60			
699-43-43	6/26/92	B070W0			20.00 UD	
699-43-43	6/26/92	B070W1	7.00			
699-43-43	10/26/92	B07JG5			20.00 U	
699-43-43	10/26/92	B07JG6	9.40			
699-43-43	1/13/93	B07V24			20.00 U	
699-43-43	1/13/93	B07V28	7.70			
699-43-45	12/06/89	H000DGT4				40.00
699-43-45	12/06/89	H000DGT4		9.00		
699-43-45	1/26/90	H000DGT8				41.00
699-43-45	1/26/90	H000DGT8		12.00		
699-43-45	4/18/90	H000DGV2				39.00
699-43-45	4/18/90	H000DGV2		11.00		
699-43-45	7/08/91	H00071Y8			41.00	
699-43-45	9/11/91	B00LG5			37.00	
699-43-45	1/24/92	B01QD0			32.00 D	
699-43-45	1/24/92	B01QD1	11.00			
699-43-45	4/22/92	B065N8			36.00	
699-43-45	4/22/92	B065N9	9.30			
699-43-45	6/26/92	B070W2			35.00 D	
699-43-45	6/26/92	B070W3	8.50			
699-43-45	10/26/92	B07JG7			40.00	
699-43-45	10/26/92	B07JG8	11.00			
699-43-45	1/13/93	B07V29			30.00	
699-43-45	1/13/93	B07V33	9.60			
699-44-39B	1/08/93	B07WK1			20.00 U	
699-44-39B	1/08/93	B07WK5	5.00 U			
699-44-42	11/21/88	H000DHK2				12.00
699-44-42	11/21/88	H000DHK2		12.00		
699-44-42	2/17/89	H000DHK6				14.00
699-44-42	2/17/89	H000DHK6		12.00		

Well Name	Collection Date	Sample Number	FARSENIC 43/ppb 5/50	FARSENIC 76/ppb ./.	BARIUM 34/ppb 20/1000	BARIUM 35/ppb ./1000
699-44-42	6/15/89	H000DHL0				13.00
699-44-42	6/15/89	H000DHL0		13.00		
699-44-42	8/08/89	H000DHL4				12.00
699-44-42	8/08/89	H000DHL4		8.00		
699-44-42	1/31/90	H000DHL8				14.00
699-44-42	1/31/90	H000DHL8		15.00		
699-44-42	7/10/91	H00071Y9			20.00 U	
699-44-42	1/31/92	B01S52			27.00 D	
699-44-42	1/31/92	B01S54	12.00			
699-44-42	6/25/92	B07017			39.00	
699-44-42	6/25/92	B07021	18.00			
699-44-42	1/13/93	B07V34			30.00	
699-44-42	1/13/93	B07V35			30.00	
699-44-42	1/13/93	B07V42	12.00			
699-44-42	1/13/93	B07V43	10.00			
699-44-43B	12/20/89	H000DHM3				47.00
699-44-43B	12/20/89	H000DHM3		6.00		
699-44-43B	12/20/89	H000DHM6				47.00
699-44-43B	12/20/89	H000DHM6		6.00		
699-44-43B	1/26/90	H000DHM7				52.00
699-44-43B	1/26/90	H000DHM7		8.00		
699-44-43B	1/26/90	H000DHN0				52.00
699-44-43B	1/26/90	H000DHN0		7.00		
699-44-43B	4/18/90	H000DHN1				51.00
699-44-43B	4/18/90	H000DHN1		7.00		
699-44-43B	7/08/91	H00071Z0			49.00	
699-44-43B	9/11/91	B00LG6			46.00	
699-44-43B	1/23/92	B01Q69			42.00	
699-44-43B	1/23/92	B01Q70	5.00 U			
699-44-43B	4/20/92	B065W9			48.00	
699-44-43B	4/20/92	B065X5	7.30			
699-44-43B	6/26/92	B01MT4	6.10			
699-44-43B	6/26/92	B07022			48.00	
699-44-43B	6/26/92	B07023			47.00	
699-44-43B	6/26/92	B07026	6.00			
699-44-43B	1/27/93	B07V44			50.00	
699-44-43B	1/27/93	B07V48	6.10			

9413085.1021

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
299-E18-1	8/16/88	H0007ZT7			5.00 U	
299-E18-1	8/16/88	H0007ZT7	41.00			5.00 U
299-E18-1	9/22/88	H0007ZV1	48.00			
299-E18-1	11/10/88	H0007ZV2			5.00 U	
299-E18-1	11/10/88	H0007ZV2	43.00			5.00 U
299-E18-1	11/10/88	H0007ZV5			5.00 U	
299-E18-1	11/10/88	H0007ZV5	38.00			5.00 U
299-E18-1	2/15/89	H0007ZV8			5.00 U	
299-E18-1	2/15/89	H0007ZV8	31.00			5.00 U
299-E18-1	5/26/89	H0007ZW2			5.00 U	
299-E18-1	5/26/89	H0007ZW2	25.00			5.00 U
299-E18-1	8/08/89	H0007ZW6			5.00 U	
299-E18-1	8/08/89	H0007ZW6	34.00			5.00 U
299-E18-1	10/31/89	H0007ZX0			5.00 U	
299-E18-1	10/31/89	H0007ZX0	28.00			5.00 U
299-E18-1	7/09/91	H00071X9		3.80		
299-E18-1	7/09/91	H00071X9F	25.00			3.00 U
299-E18-1	9/06/91	B00LB6		3.00 U		
299-E18-1	9/06/91	B00LB6F	24.00			3.00 U
299-E18-1	1/24/92	B01Q59		3.00 UD		
299-E18-1	1/24/92	B01Q60	23.00 D			3.00 UD
299-E18-1	6/03/92	B06PH8		3.00 U		
299-E18-1	6/03/92	B06PJ2	27.00			3.00 U
299-E18-1	12/16/92	B07S32		3.00 U		
299-E18-1	12/16/92	B07S36	30.00			3.00 U
299-E32-4	9/27/88	H0008ZB8			5.00 U	
299-E32-4	9/27/88	H0008ZB8	73.00			5.00 U
299-E32-4	12/28/88	H0008ZC2			5.00 U	
299-E32-4	12/28/88	H0008ZC2	70.00			5.00 U
299-E32-4	3/01/89	H0008ZC6			5.00 U	
299-E32-4	3/01/89	H0008ZC6	73.00			5.00 U
299-E32-4	3/13/89	H0008ZD0			5.00 U	
299-E32-4	3/13/89	H0008ZD0	72.00			5.00 U
299-E32-4	6/16/89	H0008ZD4			5.00 U	
299-E32-4	6/16/89	H0008ZD4	70.00			5.00 U
299-E32-4	7/19/89	H0008ZD8			5.00 U	
299-E32-4	7/19/89	H0008ZD8	69.00			5.00 U
299-E32-4	9/08/89	H0008ZF6			10.00	
299-E32-4	9/08/89	H0008ZF6	71.00			5.00 U
299-E32-4	1/17/90	H0008ZG0			5.00 U	
299-E32-4	1/17/90	H0008ZG0	76.00			5.00 U
299-E32-4	8/05/91	H00071Y0		3.00 UD		
299-E32-4	8/05/91	H00071Y0F	74.00			3.00 U

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
299-E32-4	8/05/91	H0007264		3.00 UD		
299-E32-4	8/05/91	H0007264F	74.00			3.00 U
299-E32-4	9/23/91	B00LK5		3.00 U		
299-E32-4	9/23/91	B00LK5F	68.00			3.00 U
299-E32-4	1/15/92	B01QK6		3.00 U		
299-E32-4	1/15/92	B01QK8	74.00			3.00 U
299-E32-4	4/06/92	B06696		3.00 U		
299-E32-4	4/06/92	B06697	73.00			3.00 U
299-E32-4	7/14/92	B07173		3.00 U		
299-E32-4	7/14/92	B07174	72.00			3.00 U
699-40-36	12/21/92	B07TB1		3.00 U		
699-40-36	12/21/92	B07TB8	80.00			3.00 U
699-40-36	2/22/93	B08717		3.00 U		
699-40-36	2/22/93	B08721	80.00			3.00 U
699-40-39	12/05/89	H000DBX2			5.00 U	
699-40-39	12/05/89	H000DBX2	108.00			5.00 U
699-40-39	1/25/90	H000DBX6			5.00 U	
699-40-39	1/25/90	H000DBX6	110.00			5.00 U
699-40-39	4/25/90	H000DBY0			5.00 U	
699-40-39	4/25/90	H000DBY0	118.00			5.00 U
699-40-39	7/08/91	H00071Y4F	120.00			3.00 U
699-40-39	9/11/91	B00LG1		3.00 U		
699-40-39	9/11/91	B00LG1F	110.00			3.00 U
699-40-39	1/31/92	B01Q65		3.00 UD		
699-40-39	1/31/92	B01Q66	110.00 D			3.00 UD
699-40-39	4/17/92	B065P2		3.00 U		
699-40-39	4/17/92	B065Q4	100.00			3.00 U
699-40-39	6/24/92	B06ZT7		3.00 U		
699-40-39	6/24/92	B06ZV1	110.00			3.00 U
699-40-39	1/14/93	B07TX4		3.00 U		
699-40-39	1/14/93	B07TX8	110.00			3.00 U
699-40-40A	1/24/92	B01T62		3.00 UD		
699-40-40A	1/24/92	B01T63	110.00 D			3.00 UD
699-40-40A	4/22/92	B065Q8		3.00 U		
699-40-40A	4/22/92	B065R8	120.00			3.00 U
699-40-40A	6/25/92	B06ZV2		3.00 U		
699-40-40A	6/25/92	B06ZW0	110.00			3.00 U
699-40-40A	10/21/92	B07JK3		3.00 U		
699-40-40A	10/21/92	B07JK7	100.00			3.00 U
699-40-40A	1/26/93	B07V49		3.00 U		
699-40-40A	1/26/93	B07V53	100.00			3.00 U
699-40-40B	1/01/92	B01T65	83.00 D			3.00 UD
699-40-40B	1/24/92	B01T64		3.00 UD		

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
699-40-40B	4/22/92	B065S0		3.00 U		
699-40-40B	4/22/92	B065S4	76.00			3.00 U
699-40-40B	6/29/92	B06ZW2		3.00 U		
699-40-40B	6/29/92	B06ZW6	74.00			3.00 U
699-40-40B	10/21/92	B07JK8		3.00 U		
699-40-40B	10/21/92	B07JL2	90.00			3.00 U
699-40-40B	1/26/93	B07V54		3.00 U		
699-40-40B	1/26/93	B07V58	80.00			3.00 U
699-41-35	12/21/92	B07TB9		3.00 U		
699-41-35	12/21/92	B07TC3	120.00			3.00 U
699-41-35	2/22/93	B08707		3.00 U		
699-41-35	2/22/93	B08711	170.00			3.00 U
699-41-40	12/05/89	H000DD44			5.00 U	
699-41-40	12/05/89	H000DD44	82.00			5.00 U
699-41-40	1/25/90	H000DD48			5.00 U	
699-41-40	1/25/90	H000DD48	75.00			5.00 U
699-41-40	4/19/90	H000DD52			5.00 U	
699-41-40	4/19/90	H000DD52	69.00			5.00 U
699-41-40	7/10/91	H00071Y1		3.00 U		
699-41-40	7/10/91	H00071Y1F	75.00			3.00 U
699-41-40	9/11/91	B00LG2		3.00 U		
699-41-40	9/11/91	B00LG2F	72.00			3.00 U
699-41-40	1/31/92	B01QC8		3.00 UD		
699-41-40	1/31/92	B01QC9	66.00 D			3.00 UD
699-41-40	4/28/92	B065S5		3.00 U		
699-41-40	4/28/92	B065S6		3.00 U		
699-41-40	4/28/92	B065S9	70.00			3.00 U
699-41-40	4/28/92	B065T0	69.00			3.00 U
699-41-40	6/24/92	B06ZX2		3.00 U		
699-41-40	6/24/92	B06ZX6	71.00			3.00 U
699-41-40	1/14/93	B07TX9		3.00 U		
699-41-40	1/14/93	B07TY3	70.00			3.00 U
699-41-42	1/08/93	B07V59		3.00 U		
699-41-42	1/08/93	B07V63	40.00			3.00 U
699-42-37	12/22/92	B07TC4		3.00 U		
699-42-37	12/22/92	B07TC8	60.00			3.00 U
699-42-37	2/23/93	B08712		3.00 U		
699-42-37	2/23/93	B08716	70.00			3.00 U
699-42-39A	1/23/92	B01T66		3.00 UP		
699-42-39A	1/23/92	B01T67	61.00 P			3.00 UP
699-42-39A	4/17/92	B065T1		3.00 UP		
699-42-39A	4/17/92	B065T5	70.00 P			3.00 UP
699-42-39A	6/25/92	B06ZX7		3.00 UP		

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
699-42-39A	6/25/92	B06ZY1	62.00 P			3.00 UP
699-42-39A	10/21/92	B07JL3		3.00 UP		
699-42-39A	10/21/92	B07JL7	60.00 P			3.00 UP
699-42-39A	1/27/93	B07V64		3.00 UP		
699-42-39A	1/27/93	B07V68	60.00 P			3.00 UP
699-42-39B	1/23/92	B01T68		3.00 U		
699-42-39B	1/23/92	B01T69	83.00			3.00 U
699-42-39B	4/17/92	B065T6		3.00 U		
699-42-39B	4/17/92	B065V0	82.00			3.00 U
699-42-39B	6/25/92	B06ZY2		3.00 U		
699-42-39B	6/25/92	B06ZY6	78.00			3.00 U
699-42-39B	10/28/92	B07JJ2		3.00 U		
699-42-39B	10/28/92	B07JJ3		3.00 U		
699-42-39B	10/28/92	B07JJ6	80.00			3.00 U
699-42-39B	10/28/92	B07JJ7	80.00			3.00 U
699-42-39B	1/25/93	B07V69		3.00 U		
699-42-39B	1/25/93	B07V73	80.00			3.00 U
699-42-40A	8/22/85	H000DF11			5.00 U	
699-42-40A	5/12/86	H000DF27			5.00 U	
699-42-40A	8/05/86	H000DF33			5.00 U	
699-42-40A	1/08/88	H000DF55	6.00 U			5.00 U
699-42-40A	11/22/88	H000DF60			5.00 U	
699-42-40A	11/22/88	H000DF60	6.00 U			5.00 U
699-42-40A	2/15/89	H000DF65			5.00 U	
699-42-40A	2/15/89	H000DF65	6.00 U			5.00 U
699-42-40A	5/31/89	H000DF70			5.00 U	
699-42-40A	5/31/89	H000DF70	6.00 U			5.00 U
699-42-40A	8/10/89	H000DF74			5.00 U	
699-42-40A	8/10/89	H000DF74	12.00			5.00 U
699-42-40A	1/26/90	H000DF78			5.00 U	
699-42-40A	1/26/90	H000DF78	6.00 U			5.00 U
699-42-40A	7/08/91	H00071Y2		3.00 U		
699-42-40A	7/08/91	H00071Y2F	20.00 U			3.00 U
699-42-40A	1/08/92	B07TY8		3.00 U		
699-42-40A	1/08/92	B07TZ3	20.00 U			3.00 U
699-42-40A	1/23/92	B01Q61		3.00 U		
699-42-40A	1/23/92	B01Q62	20.00 U			3.00 U
699-42-40A	6/25/92	B06ZY7		3.00 U		
699-42-40A	6/25/92	B06ZZ1	20.00 U			3.00 U
699-42-41	1/24/92	B01T70		3.00 UPD		
699-42-41	1/24/92	B01T71	20.00 UPD			3.00 UPD
699-42-41	4/17/92	B065V1		3.00 UP		
699-42-41	4/17/92	B065V5	20.00 UP			3.00 UP

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
699-42-41	6/29/92	B06ZZ2		3.00 UP		
699-42-41	6/29/92	B06ZZ6	20.00 UP			3.00 UP
699-42-41	1/25/93	B07TZ4		3.00 UP		
699-42-41	1/25/93	B07TZ8	20.00 UP			3.00 UP
699-42-42B	11/22/88	H000DFT3			5.00 U	
699-42-42B	11/22/88	H000DFT3	32.00			5.00 U
699-42-42B	2/24/89	H000DFT7			5.00 U	
699-42-42B	2/24/89	H000DFT7	26.00			5.00 U
699-42-42B	6/16/89	H000DFV1			5.00 U	
699-42-42B	6/16/89	H000DFV1	28.00			5.00 U
699-42-42B	6/16/89	H000DFV4			5.00 U	
699-42-42B	6/16/89	H000DFV4	23.00			5.00 U
699-42-42B	8/09/89	H000DFV5			5.00 U	
699-42-42B	8/09/89	H000DFV5	33.00			5.00 U
699-42-42B	7/08/91	H00071Y3		3.00 U		
699-42-42B	7/08/91	H00071Y3F	26.00			3.00 U
699-42-42B	1/24/92	B01Q63		3.00 UD		
699-42-42B	1/24/92	B01Q64	22.00 D			3.00 UD
699-42-42B	6/24/92	B06ZZ7		3.00 U		
699-42-42B	6/24/92	B07001	22.00			3.00 U
699-42-42B	1/21/93	B07TZ9		3.00 U		
699-42-42B	1/21/93	B07V03	20.00			3.00 U
699-43-40	1/31/92	B01T72		3.00 UPD		
699-43-40	1/31/92	B01T73	56.00 PD			3.00 UPD
699-43-40	4/28/92	B065V6		3.00 UP		
699-43-40	4/28/92	B065W0	60.00 P			3.00 UP
699-43-40	6/26/92	B07002		3.00 UP		
699-43-40	6/26/92	B07006	63.00 P			3.00 UP
699-43-40	1/25/93	B07V04		3.00 UP		
699-43-40	1/25/93	B07V08	60.00 P			3.00 UP
699-43-41E	12/05/89	H000DGD6			5.00 U	
699-43-41E	12/05/89	H000DGD6	57.00			5.00 U
699-43-41E	1/25/90	H000DGF0			5.00 U	
699-43-41E	1/25/90	H000DGF0	54.00			5.00 U
699-43-41E	6/28/91	H0007203		3.00 UD		
699-43-41E	6/28/91	H0007203F	38.00			3.00 U
699-43-41E	6/28/91	H0007204		3.00 UD		
699-43-41E	6/28/91	H0007204F	40.00			3.00 U
699-43-41E	1/23/92	B01QC3		3.00 U		
699-43-41E	1/23/92	B01QC4	36.00			3.00 U
699-43-41E	4/17/92	B065P4		3.00 U		
699-43-41E	4/17/92	B065Q6	36.00			3.00 U
699-43-41E	6/24/92	B06ZV3		3.00 U		

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
699-43-41E	6/24/92	B06ZW1	38.00			3.00 U
699-43-41E	1/25/93	B07V09		3.00 U		
699-43-41E	1/25/93	B07V13	40.00			3.00 U
699-43-41F	12/05/89	H000DGG8			5.00 U	
699-43-41F	12/05/89	H000DGG8	50.00			5.00 U
699-43-41F	1/25/90	H000DGH2			5.00 U	
699-43-41F	1/25/90	H000DGH2	42.00			5.00 U
699-43-41F	4/18/90	H000DGH6			5.00 U	
699-43-41F	4/18/90	H000DGH6	44.00			5.00 U
699-43-41F	7/02/91	H00071Y5		3.00 UD		
699-43-41F	7/02/91	H00071Y5F	37.00			3.00 U
699-43-41F	5/05/92	B065R0		3.00 U		
699-43-41F	5/05/92	B065R9	36.00			3.00 U
699-43-41F	6/25/92	B06ZW7		3.00 U		
699-43-41F	6/25/92	B06ZX1	34.00			3.00 U
699-43-41F	1/22/93	B07V14		3.00 U		
699-43-41F	1/22/93	B07V18	40.00			3.00 U
699-43-41G	1/23/92	B01T74		3.00 U		
699-43-41G	1/23/92	B01T75	53.00			3.00 U
699-43-41G	4/17/92	B065W1		3.00 U		
699-43-41G	4/17/92	B065W6	56.00			3.00 U
699-43-41G	6/26/92	B07007		3.00 U		
699-43-41G	6/26/92	B07011	53.00			3.00 U
699-43-41G	10/28/92	B07JL8		3.00 U		
699-43-41G	10/28/92	B07JM2	50.00			3.00 U
699-43-41G	1/25/93	B07V74		3.00 U		
699-43-41G	1/25/93	B07V78	50.00			3.00 U
699-43-42J	11/22/88	H000DGP2			5.00 U	
699-43-42J	11/22/88	H000DGP2	13.00			5.00 U
699-43-42J	2/24/89	H000DGP6			5.00 U	
699-43-42J	2/24/89	H000DGP6	12.00			5.00 U
699-43-42J	6/15/89	H000DGQ0			5.00 U	
699-43-42J	6/15/89	H000DGQ0	13.00			5.00 U
699-43-42J	8/09/89	H000DGQ4			5.00 U	
699-43-42J	8/09/89	H000DGQ4	17.00			5.00 U
699-43-42J	8/09/89	H000DGQ7			5.00 U	
699-43-42J	8/09/89	H000DGQ7	14.00			5.00 U
699-43-42J	7/02/91	H00071Y6		3.00 UD		
699-43-42J	7/02/91	H00071Y6F	20.00 U			3.00 U
699-43-42J	1/31/92	B01S49		3.00 UD		
699-43-42J	1/31/92	B01S51	20.00 UD			3.00 UD
699-43-42J	6/25/92	B07012		3.00 U		
699-43-42J	6/25/92	B07016	20.00 U			3.00 U

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
699-43-42J	1/21/93	B07V19		3.00 U		
699-43-42J	1/21/93	B07V23	20.00 U			3.00 U
699-43-43	11/21/88	H000DGR3			5.00 U	
699-43-43	11/21/88	H000DGR3	12.00			5.00 U
699-43-43	2/24/89	H000DGR7			5.00 U	
699-43-43	2/24/89	H000DGR7	13.00			5.00 U
699-43-43	2/24/89	H000DGS0			5.00 U	
699-43-43	2/24/89	H000DGS0	13.00			5.00 U
699-43-43	6/15/89	H000DGS1			5.00 U	
699-43-43	6/15/89	H000DGS1	13.00			5.00 U
699-43-43	8/09/89	H000DGS5			5.00 U	
699-43-43	8/09/89	H000DGS5	18.00			5.00 U
699-43-43	1/26/90	H000DGS9			5.00 U	
699-43-43	1/26/90	H000DGS9	15.00			5.00 U
699-43-43	7/08/91	H00071Y7		3.00 U		
699-43-43	7/08/91	H00071Y7F	20.00 U			3.00 U
699-43-43	1/24/92	B01Q67		3.00 UD		
699-43-43	1/24/92	B01Q68	20.00 UD			3.00 UD
699-43-43	4/22/92	B065N6		3.00 U		
699-43-43	4/22/92	B065N7	20.00 U			3.00 U
699-43-43	6/26/92	B070W0		3.00 UD		
699-43-43	6/26/92	B070W1	20.00 U			3.00 U
699-43-43	10/26/92	B07JG5		3.00 U		
699-43-43	10/26/92	B07JG6	20.00 U			3.00 U
699-43-43	1/13/93	B07V24		3.00 U		
699-43-43	1/13/93	B07V28	20.00 U			3.00 U
699-43-45	12/06/89	H000DGT4			5.00 U	
699-43-45	12/06/89	H000DGT4	38.00			5.00 U
699-43-45	1/26/90	H000DGT8			5.00 U	
699-43-45	1/26/90	H000DGT8	38.00			5.00 U
699-43-45	4/18/90	H000DGV2			5.00 U	
699-43-45	4/18/90	H000DGV2	39.00			5.00 U
699-43-45	7/08/91	H00071Y8		3.00 U		
699-43-45	7/08/91	H00071Y8F	37.00			3.00 U
699-43-45	9/11/91	B00LG5		3.00 U		
699-43-45	9/11/91	B00LG5F	36.00			3.00 U
699-43-45	1/24/92	B01QD0		3.00 UD		
699-43-45	1/24/92	B01QD1	33.00 D			3.00 UD
699-43-45	4/22/92	B065N8		3.00 U		
699-43-45	4/22/92	B065N9	36.00			3.00 U
699-43-45	6/26/92	B070W2		3.00 UD		
699-43-45	6/26/92	B070W3	36.00			3.00 U
699-43-45	10/26/92	B07JG7		3.00 U		

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
699-43-45	10/26/92	B07JG8	30.00			3.00 U
699-43-45	1/13/93	B07V29		3.00 U		
699-43-45	1/13/93	B07V33	30.00			3.00 U
699-44-39B	1/08/93	B07WK1		3.00 U		
699-44-39B	1/08/93	B07WK5	20.00 U			3.00 U
699-44-42	11/21/88	H000DHK2			5.00 U	
699-44-42	11/21/88	H000DHK2	12.00			5.00 U
699-44-42	2/17/89	H000DHK6			5.00 U	
699-44-42	2/17/89	H000DHK6	15.00			5.00 U
699-44-42	6/15/89	H000DHL0			5.00 U	
699-44-42	6/15/89	H000DHL0	12.00			5.00 U
699-44-42	8/08/89	H000DHL4			5.00 U	
699-44-42	8/08/89	H000DHL4	17.00			5.00 U
699-44-42	1/31/90	H000DHL8			5.00 U	
699-44-42	1/31/90	H000DHL8	13.00			5.00 U
699-44-42	7/10/91	H00071Y9		3.00 U		
699-44-42	7/10/91	H00071Y9F	20.00 U			3.00 U
699-44-42	1/31/92	B01S52		3.00 UD		
699-44-42	1/31/92	B01S54	27.00 D			3.00 UD
699-44-42	6/25/92	B07017		3.00 U		
699-44-42	6/25/92	B07021	39.00			3.00 U
699-44-42	1/13/93	B07V34		3.00 U		
699-44-42	1/13/93	B07V35		3.00 U		
699-44-42	1/13/93	B07V42	30.00			3.00 U
699-44-42	1/13/93	B07V43	30.00			3.00 U
699-44-43B	12/20/89	H000DHM3			5.00 U	
699-44-43B	12/20/89	H000DHM3	50.00			5.00 U
699-44-43B	12/20/89	H000DHM6			5.00 U	
699-44-43B	12/20/89	H000DHM6	52.00			5.00 U
699-44-43B	1/26/90	H000DHM7			5.00 U	
699-44-43B	1/26/90	H000DHM7	49.00			5.00 U
699-44-43B	1/26/90	H000DHN0			5.00 U	
699-44-43B	1/26/90	H000DHN0	49.00			5.00 U
699-44-43B	4/18/90	H000DHN1			5.00 U	
699-44-43B	4/18/90	H000DHN1	47.00			5.00 U
699-44-43B	7/08/91	H00071Z0		3.00 U		
699-44-43B	7/08/91	H00071Z0F	50.00			3.00 U
699-44-43B	9/11/91	B00LG6		3.00 U		
699-44-43B	9/11/91	B00LG6F	43.00			3.00 U
699-44-43B	1/23/92	B01Q69		3.00 U		
699-44-43B	1/23/92	B01Q70	46.00			3.00 U
699-44-43B	4/20/92	B065W9		3.00 U		
699-44-43B	4/20/92	B065X5	46.00			3.00 U

Well Name	Collection Date	Sample Number	FBARIUM 34/ppb 20/1000	BERYLUM 34/ppb 3/.	BERYLUM 35/ppb ./.	FBERYLL 34/ppb 3/.
699-44-43B	6/26/92	B01MT4	46.00			3.00 U
699-44-43B	6/26/92	B07022		3.00 U		
699-44-43B	6/26/92	B07023		3.00 U		
699-44-43B	6/26/92	B07026	45.00			3.00 U
699-44-43B	1/27/93	B07V44		3.00 U		
699-44-43B	1/27/93	B07V48	50.00			3.00 U

Well Name	Collection Date	Sample Number	BORON 35/ppb ./.	FBORON 34/ppb ./.	CADMIUM 34/ppb 10/10	CADMIUM 35/ppb ./10
299-E18-1	8/16/88	H0007ZT7				2.00 U
299-E18-1	9/22/88	H0007ZV1				2.00 U
299-E18-1	11/10/88	H0007ZV2				2.00 U
299-E18-1	11/10/88	H0007ZV5				2.00 U
299-E18-1	2/15/89	H0007ZV8	33.00			2.00 U
299-E18-1	2/15/89	H0007ZV8		38.00		
299-E18-1	5/26/89	H0007ZW2	37.00			2.00 U
299-E18-1	5/26/89	H0007ZW2		34.00		
299-E18-1	8/08/89	H0007ZW6	38.00			2.00 U
299-E18-1	8/08/89	H0007ZW6		42.00		
299-E18-1	10/31/89	H0007ZX0	31.00			2.00 U
299-E18-1	10/31/89	H0007ZX0		30.00		
299-E18-1	7/09/91	H00071X9			10.00 U	
299-E18-1	9/06/91	B00LB6			10.00 U	
299-E18-1	1/24/92	B01Q59			10.00 UD	
299-E18-1	6/03/92	B06PH8			10.00 U	
299-E18-1	12/16/92	B07S32			10.00 U	
299-E32-4	9/27/88	H0008ZB8				2.00 U
299-E32-4	12/28/88	H0008ZC2				2.00 U
299-E32-4	3/01/89	H0008ZC6	31.00			2.00 U
299-E32-4	3/01/89	H0008ZC6		33.00		
299-E32-4	3/13/89	H0008ZD0	38.00			2.00 U
299-E32-4	3/13/89	H0008ZD0		41.00		
299-E32-4	6/16/89	H0008ZD4	59.00			2.00 U
299-E32-4	6/16/89	H0008ZD4		45.00		
299-E32-4	7/19/89	H0008ZD8	61.00			2.00 U
299-E32-4	7/19/89	H0008ZD8		62.00		
299-E32-4	9/08/89	H0008ZF6	23.00			2.00 U
299-E32-4	9/08/89	H0008ZF6		24.00		
299-E32-4	1/17/90	H0008ZG0	42.00			2.00 U

Well Name	Collection Date	Sample Number	BORON 35/ppb ./.	FBORON 34/ppb ./.	CADMIUM 34/ppb 10/10	CADMIUM 35/ppb ./10
299-E32-4	1/17/90	H0008ZG0		45.00		
299-E32-4	8/05/91	H00071Y0			10.00 UD	
299-E32-4	8/05/91	H0007264			10.00 UD	
299-E32-4	9/23/91	B00LK5			10.00 U	
299-E32-4	1/15/92	B01QK6			10.00 U	
299-E32-4	4/06/92	B06696			10.00 U	
299-E32-4	7/14/92	B07173			10.00 U	
699-40-36	12/21/92	B07TB1			10.00 U	
699-40-36	2/22/93	B08717			10.00 U	
699-40-39	12/05/89	H000DBX2	25.00			2.00 U
699-40-39	12/05/89	H000DBX2		33.00		
699-40-39	1/25/90	H000DBX6	40.00			2.00 U
699-40-39	1/25/90	H000DBX6		23.00		
699-40-39	4/25/90	H000DBY0	28.00			2.00 U
699-40-39	4/25/90	H000DBY0		26.00		
699-40-39	9/11/91	B00LG1			10.00 U	
699-40-39	1/31/92	B01Q65			10.00 UD	
699-40-39	4/17/92	B065P2			10.00 U	
699-40-39	6/24/92	B06ZT7			10.00 U	
699-40-39	1/14/93	B07TX4			10.00 U	
699-40-40A	1/24/92	B01T62			10.00 UD	
699-40-40A	4/22/92	B065Q8			10.00 U	
699-40-40A	6/25/92	B06ZV2			10.00 U	
699-40-40A	10/21/92	B07JK3			10.00 U	
699-40-40A	1/26/93	B07V49			10.00 U	
699-40-40B	1/24/92	B01T64			10.00 UD	
699-40-40B	4/22/92	B065S0			10.00 U	
699-40-40B	6/29/92	B06ZW2			10.00 U	
699-40-40B	10/21/92	B07JK8			10.00 U	
699-40-40B	1/26/93	B07V54			10.00 U	
699-41-35	12/21/92	B07TB9			10.00 U	
699-41-35	2/22/93	B08707			10.00 U	
699-41-40	12/05/89	H000DD44	19.00			2.00 U
699-41-40	12/05/89	H000DD44		23.00		
699-41-40	1/25/90	H000DD48	30.00			2.00 U
699-41-40	1/25/90	H000DD48		24.00		
699-41-40	4/19/90	H000DD52	22.00			2.00 U
699-41-40	4/19/90	H000DD52		23.00		
699-41-40	7/10/91	H00071Y1			10.00 U	
699-41-40	9/11/91	B00LG2			10.00 U	
699-41-40	1/31/92	B01QC8			10.00 UD	
699-41-40	4/28/92	B065S5			10.00 U	
699-41-40	4/28/92	B065S6			10.00 U	

Well Name	Collection Date	Sample Number	BORON 35/ppb ./.	FBORON 34/ppb ./.	CADMIUM 34/ppb 10/10	CADMIUM 35/ppb ./10
699-41-40	6/24/92	B06ZX2			10.00 U	
699-41-40	1/14/93	B07TX9			10.00 U	
699-41-42	1/08/93	B07V59			10.00 U	
699-42-37	12/22/92	B07TC4			10.00 U	
699-42-37	2/23/93	B08712			10.00 U	
699-42-39A	1/23/92	B01T66			10.00 UP	
699-42-39A	4/17/92	B065T1			10.00 UP	
699-42-39A	6/25/92	B06ZX7			10.00 UP	
699-42-39A	10/21/92	B07JL3			10.00 UP	
699-42-39A	1/27/93	B07V64			10.00 UP	
699-42-39B	1/23/92	B01T68			10.00 U	
699-42-39B	4/17/92	B065T6			10.00 U	
699-42-39B	6/25/92	B06ZY2			10.00 U	
699-42-39B	10/28/92	B07JJ2			10.00 U	
699-42-39B	10/28/92	B07JJ3			10.00 U	
699-42-39B	1/25/93	B07V69			10.00 U	
699-42-40A	8/22/85	H000DF11				2.00 U
699-42-40A	5/12/86	H000DF27				2.00 U
699-42-40A	8/05/86	H000DF33				2.00 U
699-42-40A	1/08/88	H000DF55				2.00 U
699-42-40A	11/22/88	H000DF60				2.00 U
699-42-40A	2/15/89	H000DF65	10.00 U			2.00 U
699-42-40A	2/15/89	H000DF65		10.00 U		
699-42-40A	5/31/89	H000DF70	26.00			2.00 U
699-42-40A	5/31/89	H000DF70		10.00		
699-42-40A	8/10/89	H000DF74	10.00			3.00
699-42-40A	8/10/89	H000DF74		19.00		
699-42-40A	1/26/90	H000DF78	12.00			2.00 U
699-42-40A	1/26/90	H000DF78		12.00		
699-42-40A	7/08/91	H00071Y2			10.00 U	
699-42-40A	1/08/92	B07TY8			10.00 U	
699-42-40A	1/23/92	B01Q61			10.00 U	
699-42-40A	6/25/92	B06ZY7			10.00 U	
699-42-41	1/24/92	B01T70			10.00 UPD	
699-42-41	4/17/92	B065V1			10.00 UP	
699-42-41	6/29/92	B06ZZ2			10.00 UP	
699-42-41	1/25/93	B07TZ4			10.00 UP	
699-42-42B	11/22/88	H000DFT3				2.00 U
699-42-42B	2/24/89	H000DFT7	14.00			2.00
699-42-42B	2/24/89	H000DFT7		17.00		
699-42-42B	6/16/89	H000DFV1	17.00			2.00 U
699-42-42B	6/16/89	H000DFV1		18.00		
699-42-42B	6/16/89	H000DFV4	28.00			2.00 U

Well Name	Collection Date	Sample Number	BORON 35/ppb ./.	FBORON 34/ppb ./.	CADMIUM 34/ppb 10/10	CADMIUM 35/ppb ./10
699-42-42B	6/16/89	H000DFV4		13.00		
699-42-42B	8/09/89	H000DFV5	13.00			2.00
699-42-42B	8/09/89	H000DFV5		26.00		
699-42-42B	7/08/91	H00071Y3			10.00 U	
699-42-42B	1/24/92	B01Q63			10.00 UD	
699-42-42B	6/24/92	B06ZZ7			10.00 U	
699-42-42B	1/21/93	B07TZ9			10.00 U	
699-43-40	1/31/92	B01T72			10.00 UPD	
699-43-40	4/28/92	B065V6			10.00 UP	
699-43-40	6/26/92	B07002			10.00 UP	
699-43-40	1/25/93	B07V04			10.00 UP	
699-43-41E	12/05/89	H000DGD6	17.00			2.00 U
699-43-41E	12/05/89	H000DGD6		13.00		
699-43-41E	1/25/90	H000DGF0	16.00			2.00 U
699-43-41E	1/25/90	H000DGF0		18.00		
699-43-41E	6/28/91	H0007203			10.00 UD	
699-43-41E	6/28/91	H0007204			10.00 UD	
699-43-41E	1/23/92	B01QC3			10.00 U	
699-43-41E	4/17/92	B065P4			10.00 U	
699-43-41E	6/24/92	B06ZV3			10.00 U	
699-43-41E	1/25/93	B07V09			10.00 U	
699-43-41F	12/05/89	H000DGG8	14.00			2.00 U
699-43-41F	12/05/89	H000DGG8		25.00		
699-43-41F	1/25/90	H000DGH2	17.00			2.00 U
699-43-41F	1/25/90	H000DGH2		13.00		
699-43-41F	4/18/90	H000DGH6	21.00			2.00 U
699-43-41F	4/18/90	H000DGH6		15.00		
699-43-41F	7/02/91	H00071Y5			10.00 UD	
699-43-41F	5/05/92	B065R0			10.00 U	
699-43-41F	6/25/92	B06ZW7			10.00 U	
699-43-41F	1/22/93	B07V14			10.00 U	
699-43-41G	1/23/92	B01T74			10.00 U	
699-43-41G	4/17/92	B065W1			10.00 U	
699-43-41G	6/26/92	B07007			10.00 U	
699-43-41G	10/28/92	B07JL8			10.00 U	
699-43-41G	1/25/93	B07V74			10.00 U	
699-43-42J	11/22/88	H000DGP2				2.00 U
699-43-42J	2/24/89	H000DGP6	14.00			2.00
699-43-42J	2/24/89	H000DGP6		16.00		
699-43-42J	6/15/89	H000DGQ0	17.00			2.00 U
699-43-42J	6/15/89	H000DGQ0		16.00		
699-43-42J	8/09/89	H000DGQ4	13.00			2.00 U
699-43-42J	8/09/89	H000DGQ4		16.00		

Well Name	Collection Date	Sample Number	BORON 35/ppb ./.	FBORON 34/ppb ./.	CADMIUM 34/ppb 10/10	CADMIUM 35/ppb ./10
699-43-42J	8/09/89	H000DGQ7	14.00			2.00 U
699-43-42J	8/09/89	H000DGQ7		14.00		
699-43-42J	7/02/91	H00071Y6			10.00 UD	
699-43-42J	1/31/92	B01S49			10.00 UD	
699-43-42J	6/25/92	B07012			10.00 U	
699-43-42J	1/21/93	B07V19			10.00 U	
699-43-43	11/21/88	H000DGR3				2.00 U
699-43-43	2/24/89	H000DGR7	14.00			2.00 U
699-43-43	2/24/89	H000DGR7		20.00		
699-43-43	2/24/89	H000DGS0	12.00			2.00 U
699-43-43	2/24/89	H000DGS0		13.00		
699-43-43	6/15/89	H000DGS1	10.00 U			2.00 U
699-43-43	6/15/89	H000DGS1		10.00 U		
699-43-43	8/09/89	H000DGS5	10.00 U			2.00 U
699-43-43	8/09/89	H000DGS5		16.00		
699-43-43	1/26/90	H000DGS9	13.00			2.00 U
699-43-43	1/26/90	H000DGS9		19.00		
699-43-43	7/08/91	H00071Y7			10.00 U	
699-43-43	1/24/92	B01Q67			10.00 UD	
699-43-43	4/22/92	B065N6			10.00 U	
699-43-43	6/26/92	B070W0			10.00 UD	
699-43-43	10/26/92	B07JG5			10.00 U	
699-43-43	1/13/93	B07V24			10.00 U	
699-43-45	12/06/89	H000DGT4	11.00			2.00 U
699-43-45	12/06/89	H000DGT4		19.00		
699-43-45	1/26/90	H000DGT8	12.00			2.00 U
699-43-45	1/26/90	H000DGT8		30.00		
699-43-45	4/18/90	H000DGV2	12.00			2.00 U
699-43-45	4/18/90	H000DGV2		22.00		
699-43-45	7/08/91	H00071Y8			10.00 U	
699-43-45	9/11/91	B00LG5			10.00 U	
699-43-45	1/24/92	B01QD0			10.00 UD	
699-43-45	4/22/92	B065N8			10.00 U	
699-43-45	6/26/92	B070W2			10.00 UD	
699-43-45	10/26/92	B07JG7			10.00 U	
699-43-45	1/13/93	B07V29			10.00 U	
699-44-39B	1/08/93	B07WK1			10.00 U	
699-44-42	11/21/88	H000DHK2				2.00 U
699-44-42	2/17/89	H000DHK6	10.00 U			2.00 U
699-44-42	2/17/89	H000DHK6		12.00		
699-44-42	6/15/89	H000DHL0	11.00			2.00 U
699-44-42	6/15/89	H000DHL0		17.00		
699-44-42	8/08/89	H000DHL4	11.00			2.00 U

Well Name	Collection Date	Sample Number	BORON 35/ppb ./.	FBORON 34/ppb ./.	CADMIUM 34/ppb 10/10	CADMIUM 35/ppb ./10
699-44-42	8/08/89	H000DHL4		16.00		
699-44-42	1/31/90	H000DHL8	54.00			2.00 U
699-44-42	1/31/90	H000DHL8		20.00		
699-44-42	7/10/91	H00071Y9			10.00 U	
699-44-42	1/31/92	B01S52			10.00 UD	
699-44-42	6/25/92	B07017			10.00 U	
699-44-42	1/13/93	B07V34			10.00 U	
699-44-42	1/13/93	B07V35			10.00 U	
699-44-43B	12/20/89	H000DHM3	13.00			2.00 U
699-44-43B	12/20/89	H000DHM3		16.00		
699-44-43B	12/20/89	H000DHM6	14.00			2.00 U
699-44-43B	12/20/89	H000DHM6		15.00		
699-44-43B	1/26/90	H000DHM7	37.00			2.00 U
699-44-43B	1/26/90	H000DHM7		23.00		
699-44-43B	1/26/90	H000DHN0	29.00			2.00 U
699-44-43B	1/26/90	H000DHN0		23.00		
699-44-43B	4/18/90	H000DHN1	16.00			2.00 U
699-44-43B	4/18/90	H000DHN1		17.00		
699-44-43B	7/08/91	H00071Z0			10.00 U	
699-44-43B	9/11/91	B00LG6			10.00 U	
699-44-43B	1/23/92	B01Q69			10.00 U	
699-44-43B	4/20/92	B065W9			10.00 U	
699-44-43B	6/26/92	B07022			10.00 U	
699-44-43B	6/26/92	B07023			10.00 U	
699-44-43B	1/27/93	B07V44			10.00 U	

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
299-E18-1	8/16/88	H0007ZT7			57300.00	
299-E18-1	8/16/88	H0007ZT7	2.00 U			70800.00
299-E18-1	9/22/88	H0007ZV1			72800.00	
299-E18-1	9/22/88	H0007ZV1	2.00 U			73700.00
299-E18-1	11/10/88	H0007ZV2			67400.00	
299-E18-1	11/10/88	H0007ZV2	2.00 U			63200.00
299-E18-1	11/10/88	H0007ZV5			57700.00	
299-E18-1	11/10/88	H0007ZV5	2.00 U			58400.00
299-E18-1	2/15/89	H0007ZV8			55700.00	
299-E18-1	2/15/89	H0007ZV8	2.00 U			57600.00
299-E18-1	5/26/89	H0007ZW2			58000.00	

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
299-E18-1	5/26/89	H0007ZW2	2.00 U			60400.00
299-E18-1	8/08/89	H0007ZW6			57000.00	
299-E18-1	8/08/89	H0007ZW6	2.00 U			69500.00
299-E18-1	10/31/89	H0007ZX0			56900.00	
299-E18-1	10/31/89	H0007ZX0	2.00 U			64400.00
299-E18-1	7/09/91	H00071X9		60000.00		
299-E18-1	7/09/91	H00071X9F	10.00 U			60000.00
299-E18-1	9/06/91	B00LB6		58000.00		
299-E18-1	9/06/91	B00LB6F	10.00 U			58000.00
299-E18-1	1/24/92	B01Q59		56000.00 D		
299-E18-1	1/24/92	B01Q60	10.00 UD			57000.00 D
299-E18-1	6/03/92	B06PH8		61000.00		
299-E18-1	6/03/92	B06PJ2	10.00 U			60000.00
299-E18-1	12/16/92	B07S32		59000.00		
299-E18-1	12/16/92	B07S36	10.00 U			58000.00
299-E32-4	9/27/88	H0008ZB8			44900.00	
299-E32-4	9/27/88	H0008ZB8	2.00 U			40000.00
299-E32-4	12/28/88	H0008ZC2			43200.00	
299-E32-4	12/28/88	H0008ZC2	2.00 U			40300.00
299-E32-4	3/01/89	H0008ZC6			39200.00	
299-E32-4	3/01/89	H0008ZC6	2.00 U			38900.00
299-E32-4	3/13/89	H0008ZD0			39900.00	
299-E32-4	3/13/89	H0008ZD0	2.00 U			39800.00
299-E32-4	6/16/89	H0008ZD4			40700.00	
299-E32-4	6/16/89	H0008ZD4	2.00 U			40000.00
299-E32-4	7/19/89	H0008ZD8			44200.00	
299-E32-4	7/19/89	H0008ZD8	2.00 U			43000.00
299-E32-4	9/08/89	H0008ZF6			42800.00	
299-E32-4	9/08/89	H0008ZF6	2.00 U			38200.00
299-E32-4	1/17/90	H0008ZG0			43500.00	
299-E32-4	1/17/90	H0008ZG0	2.00 U			44000.00
299-E32-4	8/05/91	H00071Y0		46000.00 D		
299-E32-4	8/05/91	H00071Y0F	10.00 U			45000.00
299-E32-4	8/05/91	H0007264		45000.00 D		
299-E32-4	8/05/91	H0007264F	10.00 U			46000.00
299-E32-4	9/23/91	B00LK5		43000.00		
299-E32-4	9/23/91	B00LK5F	10.00 U			43000.00
299-E32-4	1/15/92	B01QK6		43000.00		
299-E32-4	1/15/92	B01QK8	10.00 U			43000.00
299-E32-4	4/06/92	B06696		42000.00		
299-E32-4	4/06/92	B06697	10.00 U			44000.00
299-E32-4	7/14/92	B07173		43000.00		
299-E32-4	7/14/92	B07174	10.00 U			43000.00

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
699-40-36	12/21/92	B07TB1		15000.00		
699-40-36	12/21/92	B07TB8	10.00 U			15000.00
699-40-36	2/22/93	B08717		15000.00		
699-40-36	2/22/93	B08721	10.00 U			17000.00
699-40-39	12/05/89	H000DBX2			19500.00	
699-40-39	12/05/89	H000DBX2	2.00 U			19500.00
699-40-39	1/25/90	H000DBX6			20100.00	
699-40-39	1/25/90	H000DBX6	2.00 U			19100.00
699-40-39	4/25/90	H000DBY0			19500.00	
699-40-39	4/25/90	H000DBY0	2.00 U			20500.00
699-40-39	7/08/91	H00071Y4F	10.00 U			22000.00
699-40-39	9/11/91	B00LG1		21000.00		
699-40-39	9/11/91	B00LG1F	10.00 U			20000.00
699-40-39	1/31/92	B01Q65		21000.00 D		
699-40-39	1/31/92	B01Q66	10.00 UD			20000.00 D
699-40-39	4/17/92	B065P2		20000.00 Q		
699-40-39	4/17/92	B065Q4	10.00 U			19000.00 Q
699-40-39	6/24/92	B06ZT7		22000.00		
699-40-39	6/24/92	B06ZV1	10.00 U			22000.00
699-40-39	1/14/93	B07TX4		21000.00		
699-40-39	1/14/93	B07TX8	10.00 U			21000.00
699-40-40A	1/24/92	B01T62		23000.00 D		
699-40-40A	1/24/92	B01T63	10.00 UD			21000.00 D
699-40-40A	4/22/92	B065Q8		20000.00		
699-40-40A	4/22/92	B065R8	10.00 U			21000.00
699-40-40A	6/25/92	B06ZV2		20000.00		
699-40-40A	6/25/92	B06ZW0	10.00 U			19000.00
699-40-40A	10/21/92	B07JK3		20000.00		
699-40-40A	10/21/92	B07JK7	10.00 U			20000.00
699-40-40A	1/26/93	B07V49		20000.00		
699-40-40A	1/26/93	B07V53	10.00 U			20000.00
699-40-40B	1/01/92	B01T65	10.00 UD			23000.00 D
699-40-40B	1/24/92	B01T64		29000.00 D		
699-40-40B	4/22/92	B065S0		24000.00		
699-40-40B	4/22/92	B065S4	10.00 U			22000.00
699-40-40B	6/29/92	B06ZW2		23000.00		
699-40-40B	6/29/92	B06ZW6	10.00 U			21000.00
699-40-40B	10/21/92	B07JK8		24000.00		
699-40-40B	10/21/92	B07JL2	10.00 U			24000.00
699-40-40B	1/26/93	B07V54		24000.00		
699-40-40B	1/26/93	B07V58	10.00 U			24000.00
699-41-35	12/21/92	B07TB9		18000.00		
699-41-35	12/21/92	B07TC3	10.00 U			18000.00

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
699-41-35	2/22/93	B08707		18000.00		
699-41-35	2/22/93	B08711	10.00 U			23000.00
699-41-40	12/05/89	H000DD44			28900.00	
699-41-40	12/05/89	H000DD44	2.00 U			28900.00
699-41-40	1/25/90	H000DD48			28300.00	
699-41-40	1/25/90	H000DD48	2.00 U			29600.00
699-41-40	4/19/90	H000DD52			29000.00	
699-41-40	4/19/90	H000DD52	2.00 U			27300.00
699-41-40	7/10/91	H00071Y1		30000.00		
699-41-40	7/10/91	H00071Y1F	10.00 U			30000.00
699-41-40	9/11/91	B00LG2		29000.00		
699-41-40	9/11/91	B00LG2F	10.00 U			30000.00
699-41-40	1/31/92	B01QC8		28000.00 D		
699-41-40	1/31/92	B01QC9	10.00 UD			28000.00 D
699-41-40	4/28/92	B065S5		29000.00 Q		
699-41-40	4/28/92	B065S6		28000.00 Q		
699-41-40	4/28/92	B065S9	10.00 U			29000.00 Q
699-41-40	4/28/92	B065T0	10.00 U			28000.00 Q
699-41-40	6/24/92	B06ZX2		31000.00		
699-41-40	6/24/92	B06ZX6	10.00 U			31000.00
699-41-40	1/14/93	B07TX9		29000.00		
699-41-40	1/14/93	B07TY3	10.00 U			29000.00
699-41-42	1/08/93	B07V59		19000.00		
699-41-42	1/08/93	B07V63	10.00 U			19000.00
699-42-37	12/22/92	B07TC4		23000.00		
699-42-37	12/22/92	B07TC8	10.00 U			23000.00
699-42-37	2/23/93	B08712		24000.00		
699-42-37	2/23/93	B08716	10.00 U			25000.00
699-42-39A	1/23/92	B01T66		30000.00 P		
699-42-39A	1/23/92	B01T67	10.00 UP			29000.00 P
699-42-39A	4/17/92	B065T1		31000.00 P		
699-42-39A	4/17/92	B065T5	10.00 UP			28000.00 P
699-42-39A	6/25/92	B06ZX7		30000.00 P		
699-42-39A	6/25/92	B06ZY1	10.00 UP			28000.00 P
699-42-39A	10/21/92	B07JL3		31000.00 P		
699-42-39A	10/21/92	B07JL7	10.00 UP			30000.00 P
699-42-39A	1/27/93	B07V64		30000.00 P		
699-42-39A	1/27/93	B07V68	10.00 UP			29000.00 P
699-42-39B	1/23/92	B01T68		27000.00		
699-42-39B	1/23/92	B01T69	10.00 U			27000.00
699-42-39B	4/17/92	B065T6		27000.00		
699-42-39B	4/17/92	B065V0	10.00 U			27000.00
699-42-39B	6/25/92	B06ZY2		27000.00		

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
699-42-39B	6/25/92	B06ZY6	10.00 U			26000.00
699-42-39B	10/28/92	B07JJ2		28000.00		
699-42-39B	10/28/92	B07JJ3		29000.00		
699-42-39B	10/28/92	B07JJ6	10.00 U			28000.00
699-42-39B	10/28/92	B07JJ7	10.00 U			28000.00
699-42-39B	1/25/93	B07V69		28000.00		
699-42-39B	1/25/93	B07V73	10.00 U			28000.00
699-42-40A	8/22/85	H000DF11			12500.00	
699-42-40A	5/12/86	H000DF27			18100.00	
699-42-40A	8/05/86	H000DF33			15500.00	
699-42-40A	1/08/88	H000DF55			20200.00	
699-42-40A	1/08/88	H000DF55	2.00 U			21300.00
699-42-40A	11/22/88	H000DF60			18100.00	
699-42-40A	11/22/88	H000DF60	2.00 U			17000.00
699-42-40A	2/15/89	H000DF65			20700.00	
699-42-40A	2/15/89	H000DF65	2.00 U			21700.00
699-42-40A	5/31/89	H000DF70			20800.00	
699-42-40A	5/31/89	H000DF70	2.00 U			20700.00
699-42-40A	8/10/89	H000DF74			16900.00	
699-42-40A	8/10/89	H000DF74	2.00 U			20500.00
699-42-40A	1/26/90	H000DF78			24300.00	
699-42-40A	1/26/90	H000DF78	2.00 U			23900.00
699-42-40A	7/08/91	H00071Y2		22000.00		
699-42-40A	7/08/91	H00071Y2F	10.00 U			23000.00
699-42-40A	1/08/92	B07TY8		22000.00		
699-42-40A	1/08/92	B07TZ3	10.00 U			21000.00
699-42-40A	1/23/92	B01Q61		21000.00		
699-42-40A	1/23/92	B01Q62	10.00 U			18000.00
699-42-40A	6/25/92	B06ZY7		22000.00		
699-42-40A	6/25/92	B06ZZ1	10.00 U			21000.00
699-42-41	1/24/92	B01T70		23000.00 PD		
699-42-41	1/24/92	B01T71	10.00 UPD			23000.00 PD
699-42-41	4/17/92	B065V1		23000.00 P		
699-42-41	4/17/92	B065V5	10.00 UP			23000.00 P
699-42-41	6/29/92	B06ZZ2		23000.00 P		
699-42-41	6/29/92	B06ZZ6	10.00 UP			23000.00 P
699-42-41	1/25/93	B07TZ4		22000.00 P		
699-42-41	1/25/93	B07TZ8	10.00 UP			22000.00 P
699-42-42B	11/22/88	H000DFT3			22200.00	
699-42-42B	11/22/88	H000DFT3	2.00 U			22000.00
699-42-42B	2/24/89	H000DFT7			22400.00	
699-42-42B	2/24/89	H000DFT7	2.00 U			20700.00
699-42-42B	6/16/89	H000DFV1			21200.00	

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
699-42-42B	6/16/89	H000DFV1	2.00 U			21800.00
699-42-42B	6/16/89	H000DFV4			20200.00	
699-42-42B	6/16/89	H000DFV4	2.00 U			19600.00
699-42-42B	8/09/89	H000DFV5			19500.00	
699-42-42B	8/09/89	H000DFV5	2.00 U			22800.00
699-42-42B	7/08/91	H00071Y3		22000.00		
699-42-42B	7/08/91	H00071Y3F	10.00 U			25000.00
699-42-42B	1/24/92	B01Q63		23000.00 D		
699-42-42B	1/24/92	B01Q64	10.00 UD			22000.00 D
699-42-42B	6/24/92	B06ZZ7		23000.00		
699-42-42B	6/24/92	B07001	10.00 U			22000.00
699-42-42B	1/21/93	B07TZ9		24000.00		
699-42-42B	1/21/93	B07V03	10.00 U			22000.00
699-43-40	1/31/92	B01T72		21000.00 PD		
699-43-40	1/31/92	B01T73	10.00 UPD			23000.00 PD
699-43-40	4/28/92	B065V6		23000.00 P		
699-43-40	4/28/92	B065W0	10.00 UP			23000.00 P
699-43-40	6/26/92	B07002		24000.00 P		
699-43-40	6/26/92	B07006	10.00 UP			24000.00 P
699-43-40	1/25/93	B07V04		26000.00 P		
699-43-40	1/25/93	B07V08	10.00 UP			26000.00 P
699-43-41E	12/05/89	H000DGD6			24300.00	
699-43-41E	12/05/89	H000DGD6	2.00 U			23400.00
699-43-41E	1/25/90	H000DGF0			25000.00	
699-43-41E	1/25/90	H000DGF0	2.00 U			24500.00
699-43-41E	6/28/91	H0007203		26000.00 D		
699-43-41E	6/28/91	H0007203F	10.00 U			26000.00
699-43-41E	6/28/91	H0007204		27000.00 D		
699-43-41E	6/28/91	H0007204F	10.00 U			26000.00
699-43-41E	1/23/92	B01QC3		25000.00		
699-43-41E	1/23/92	B01QC4	10.00 U			26000.00
699-43-41E	4/17/92	B065P4		25000.00		
699-43-41E	4/17/92	B065Q6	10.00 U			25000.00
699-43-41E	6/24/92	B06ZV3		27000.00		
699-43-41E	6/24/92	B06ZW1	10.00 U			27000.00
699-43-41E	1/25/93	B07V09		27000.00		
699-43-41E	1/25/93	B07V13	10.00 U			26000.00
699-43-41F	12/05/89	H000DGG8			26000.00	
699-43-41F	12/05/89	H000DGG8	2.00 U			26500.00
699-43-41F	1/25/90	H000DGH2			26600.00	
699-43-41F	1/25/90	H000DGH2	2.00 U			25100.00
699-43-41F	4/18/90	H000DGH6			25100.00	
699-43-41F	4/18/90	H000DGH6	2.00 U			24800.00

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
699-43-41F	7/02/91	H00071Y5		27000.00 D		
699-43-41F	7/02/91	H00071Y5F	10.00 U			27000.00
699-43-41F	5/05/92	B065R0		26000.00		
699-43-41F	5/05/92	B065R9	10.00 U			27000.00
699-43-41F	6/25/92	B06ZW7		25000.00		
699-43-41F	6/25/92	B06ZX1	10.00 U			25000.00
699-43-41F	1/22/93	B07V14		27000.00		
699-43-41F	1/22/93	B07V18	10.00 U			27000.00
699-43-41G	1/23/92	B01T74		23000.00		
699-43-41G	1/23/92	B01T75	10.00 U			23000.00
699-43-41G	4/17/92	B065W1		23000.00		
699-43-41G	4/17/92	B065W6	10.00 U			23000.00
699-43-41G	6/26/92	B07007		23000.00		
699-43-41G	6/26/92	B07011	10.00 U			23000.00
699-43-41G	10/28/92	B07JL8		24000.00		
699-43-41G	10/28/92	B07JM2	10.00 U			24000.00
699-43-41G	1/25/93	B07V74		22000.00		
699-43-41G	1/25/93	B07V78	10.00 U			24000.00
699-43-42J	11/22/88	H000DGP2			22400.00	
699-43-42J	11/22/88	H000DGP2	2.00 U			23400.00
699-43-42J	2/24/89	H000DGP6			25000.00	
699-43-42J	2/24/89	H000DGP6	3.00			24800.00
699-43-42J	6/15/89	H000DGQ0			25300.00	
699-43-42J	6/15/89	H000DGQ0	2.00 U			26100.00
699-43-42J	8/09/89	H000DGQ4			23000.00	
699-43-42J	8/09/89	H000DGQ4	2.00 U			25000.00
699-43-42J	8/09/89	H000DGQ7			22000.00	
699-43-42J	8/09/89	H000DGQ7	2.00 U			25600.00
699-43-42J	7/02/91	H00071Y6		21000.00 D		
699-43-42J	7/02/91	H00071Y6F	10.00 U			21000.00
699-43-42J	1/31/92	B01S49		20000.00 D		
699-43-42J	1/31/92	B01S51	10.00 UD			20000.00 D
699-43-42J	6/25/92	B07012		19000.00		
699-43-42J	6/25/92	B07016	10.00 U			15000.00
699-43-42J	1/21/93	B07V19		20000.00		
699-43-42J	1/21/93	B07V23	10.00 U			19000.00
699-43-43	11/21/88	H000DGR3			25200.00	
699-43-43	11/21/88	H000DGR3	2.00 U			23500.00
699-43-43	2/24/89	H000DGR7			24600.00	
699-43-43	2/24/89	H000DGR7	2.00 U			22600.00
699-43-43	2/24/89	H000DGS0			25400.00	
699-43-43	2/24/89	H000DGS0	2.00 U			22600.00
699-43-43	6/15/89	H000DGS1			25600.00	

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
699-43-43	6/15/89	H000DGS1	2.00 U			24900.00
699-43-43	8/09/89	H000DGS5			24600.00	
699-43-43	8/09/89	H000DGS5	2.00 U			26400.00
699-43-43	1/26/90	H000DGS9			25600.00	
699-43-43	1/26/90	H000DGS9	2.00 U			25900.00
699-43-43	7/08/91	H00071Y7		28000.00		
699-43-43	7/08/91	H00071Y7F	10.00 U			27000.00
699-43-43	1/24/92	B01Q67		28000.00 D		
699-43-43	1/24/92	B01Q68	10.00 UD			28000.00 D
699-43-43	4/22/92	B065N6		30000.00		
699-43-43	4/22/92	B065N7	10.00 U			29000.00
699-43-43	6/26/92	B070W0		29000.00 D		
699-43-43	6/26/92	B070W1	10.00 U			28000.00
699-43-43	10/26/92	B07JG5		29000.00		
699-43-43	10/26/92	B07JG6	10.00 U			29000.00
699-43-43	1/13/93	B07V24		29000.00		
699-43-43	1/13/93	B07V28	10.00 U			28000.00
699-43-45	12/06/89	H000DGT4			26300.00	
699-43-45	12/06/89	H000DGT4	2.00 U			26200.00
699-43-45	1/26/90	H000DGT8			26500.00	
699-43-45	1/26/90	H000DGT8	2.00 U			25900.00
699-43-45	4/18/90	H000DGV2			25400.00	
699-43-45	4/18/90	H000DGV2	2.00 U			26300.00
699-43-45	7/08/91	H00071Y8		29000.00		
699-43-45	7/08/91	H00071Y8F	10.00 U			29000.00
699-43-45	9/11/91	B00LG5		27000.00		
699-43-45	9/11/91	B00LG5F	10.00 U			28000.00
699-43-45	1/24/92	B01QD0		27000.00 D		
699-43-45	1/24/92	B01QD1	10.00 UD			27000.00 D
699-43-45	4/22/92	B065N8		30000.00		
699-43-45	4/22/92	B065N9	10.00 U			30000.00
699-43-45	6/26/92	B070W2		28000.00 D		
699-43-45	6/26/92	B070W3	10.00 U			28000.00
699-43-45	10/26/92	B07JG7		28000.00		
699-43-45	10/26/92	B07JG8	10.00 U			28000.00
699-43-45	1/13/93	B07V29		27000.00		
699-43-45	1/13/93	B07V33	10.00 U			26000.00
699-44-39B	1/08/93	B07WK1		20000.00		
699-44-39B	1/08/93	B07WK5	10.00 U			21000.00
699-44-42	11/21/88	H000DHK2			24100.00	
699-44-42	11/21/88	H000DHK2	2.00 U			24100.00
699-44-42	2/17/89	H000DHK6			21700.00	
699-44-42	2/17/89	H000DHK6	2.00 U			22300.00

Well Name	Collection Date	Sample Number	FCADMIU 34/ppb 10/10	CALCIUM 34/ppb 100/.	CALCIUM 35/ppb ./.	FCALCIU 34/ppb 100/.
699-44-42	6/15/89	H000DHL0			21000.00	
699-44-42	6/15/89	H000DHL0	2.00 U			20500.00
699-44-42	8/08/89	H000DHL4			19900.00	
699-44-42	8/08/89	H000DHL4	2.00 U			22000.00
699-44-42	1/31/90	H000DHL8			22300.00	
699-44-42	1/31/90	H000DHL8	2.00 U			22100.00
699-44-42	7/10/91	H00071Y9		23000.00		
699-44-42	7/10/91	H00071Y9F	10.00 U			24000.00
699-44-42	1/31/92	B01S52		23000.00 D		
699-44-42	1/31/92	B01S54	10.00 UD			24000.00 D
699-44-42	6/25/92	B07017		23000.00		
699-44-42	6/25/92	B07021	10.00 U			23000.00
699-44-42	1/13/93	B07V34		24000.00		
699-44-42	1/13/93	B07V35		24000.00		
699-44-42	1/13/93	B07V42	10.00 U			25000.00
699-44-42	1/13/93	B07V43	10.00 U			24000.00
699-44-43B	12/20/89	H000DHM3			22300.00	
699-44-43B	12/20/89	H000DHM3	2.00 U			24600.00
699-44-43B	12/20/89	H000DHM6			22700.00	
699-44-43B	12/20/89	H000DHM6	2.00 U			24800.00
699-44-43B	1/26/90	H000DHM7			24700.00	
699-44-43B	1/26/90	H000DHM7	2.00 U			23700.00
699-44-43B	1/26/90	H000DHN0			24500.00	
699-44-43B	1/26/90	H000DHN0	2.00 U			23900.00
699-44-43B	4/18/90	H000DHN1			21900.00	
699-44-43B	4/18/90	H000DHN1	2.00 U			22600.00
699-44-43B	7/08/91	H00071Z0		25000.00		
699-44-43B	7/08/91	H00071Z0F	10.00 U			26000.00
699-44-43B	9/11/91	B00LG6		24000.00		
699-44-43B	9/11/91	B00LG6F	10.00 U			23000.00
699-44-43B	1/23/92	B01Q69		51000.00		
699-44-43B	1/23/92	B01Q70	10.00 U			25000.00
699-44-43B	4/20/92	B065W9		26000.00		
699-44-43B	4/20/92	B065X5	10.00 U			25000.00
699-44-43B	6/26/92	B01MT4	10.00 U			24000.00
699-44-43B	6/26/92	B07022		25000.00		
699-44-43B	6/26/92	B07023		25000.00		
699-44-43B	6/26/92	B07026	10.00 U			24000.00
699-44-43B	1/27/93	B07V44		24000.00		
699-44-43B	1/27/93	B07V48	10.00 U			24000.00

Well Name	Collection Date	Sample Number	CS-137 77/pCi/L ./.	CHLORID 124/ppb 200/250000s	CHLORID 46/ppb ./250000s	CHROMUM 34/ppb 20/50
299-E18-1	8/16/88	H0007ZT7			6550.00	
299-E18-1	11/10/88	H0007ZV2			6800.00	
299-E18-1	11/10/88	H0007ZV5			6200.00	
299-E18-1	2/15/89	H0007ZV8			6900.00	
299-E18-1	5/26/89	H0007ZW2			7100.00	
299-E18-1	8/08/89	H0007ZW6			6000.00	
299-E18-1	10/31/89	H0007ZX0	1.18 U		8000.00	
299-E18-1	5/30/90	H0007ZX5			6900.00	
299-E18-1	7/09/91	H00071X9		7600.00		150.00
299-E18-1	9/06/91	B00LB6				96.00
299-E18-1	1/24/92	B01Q59		7600.00		71.00 D
299-E18-1	6/03/92	B06PH8		7800.00		60.00
299-E18-1	12/16/92	B07S32		7800.00		140.00
299-E32-4	9/27/88	H0008ZB8	6.59		8470.00	
299-E32-4	12/28/88	H0008ZC2			8700.00	
299-E32-4	3/01/89	H0008ZC6			8400.00	
299-E32-4	3/13/89	H0008ZD0	1.44 U		9300.00	
299-E32-4	6/16/89	H0008ZD4			9100.00	
299-E32-4	7/19/89	H0008ZD8	1.77 U		9220.00	
299-E32-4	9/08/89	H0008ZF6	1.89 U		9000.00	
299-E32-4	1/17/90	H0008ZG0	4.52 U		9800.00	
299-E32-4	5/09/90	H0008ZG9	-.30 U		9200.00	
299-E32-4	8/05/91	H00071Y0				180.00 D
299-E32-4	8/05/91	H0007264				160.00 D
299-E32-4	9/23/91	B00LK5				35.00
299-E32-4	1/15/92	B01QK6		10000.00		110.00
299-E32-4	4/06/92	B06696		9000.00		30.00
299-E32-4	4/09/92	B065B6		9100.00		
299-E32-4	7/14/92	B07173		9700.00		62.00
699-40-36	12/21/92	B07TB1		3100.00		30.00
699-40-36	2/22/93	B08717		3400.00		30.00
699-40-39	12/05/89	H000DBX2	.71 U		3100.00	
699-40-39	1/25/90	H000DBX6			3400.00	
699-40-39	4/25/90	H000DBY0			3200.00	
699-40-39	7/08/91	H00071Y4		3200.00		
699-40-39	9/11/91	B00LG1				65.00
699-40-39	1/31/92	B01Q65		3100.00		570.00 D
699-40-39	4/17/92	B065P2		3700.00 D		20.00 U
699-40-39	6/24/92	B06ZT7		3100.00		20.00
699-40-39	1/14/93	B07TX4		2800.00		630.00
699-40-40A	1/24/92	B01T62		5600.00		120.00 D
699-40-40A	4/22/92	B065Q8		6600.00		72.00
699-40-40A	6/25/92	B06ZV2		5700.00		130.00

Well Name	Collection Date	Sample Number	CS-137 77/pCi/L ./.	CHLORID 124/ppb 200/250000s	CHLORID 46/ppb ./250000s	CHROMUM 34/ppb 20/50
699-40-40A	10/21/92	B07JK3		6400.00		60.00
699-40-40A	1/26/93	B07V49		5600.00		70.00
699-40-40B	1/24/92	B01T64		4400.00		770.00 D
699-40-40B	4/22/92	B065S0		6100.00		300.00
699-40-40B	6/29/92	B06ZW2		4600.00 D		340.00
699-40-40B	10/21/92	B07JK8		4800.00		550.00
699-40-40B	1/26/93	B07V54		5000.00		270.00
699-41-35	12/21/92	B07TB9		3400.00		20.00 U
699-41-35	2/22/93	B08707		3600.00		20.00 U
699-41-40	12/05/89	H000DD44	.63 U		6400.00	
699-41-40	1/25/90	H000DD48			7400.00	
699-41-40	4/19/90	H000DD52			6500.00	
699-41-40	7/10/91	H00071Y1		7700.00		73.00
699-41-40	9/11/91	B00LG2				52.00
699-41-40	1/31/92	B01QC8		7600.00		630.00 D
699-41-40	4/28/92	B065S5		7300.00 D		52.00
699-41-40	4/28/92	B065S6		7200.00 D		51.00
699-41-40	6/24/92	B06ZX2		7200.00		53.00
699-41-40	1/14/93	B07TX9		7200.00		260.00
699-41-42	1/08/93	B07V59		4200.00		20.00
699-42-37	12/22/92	B07TC4		7800.00		30.00
699-42-37	2/23/93	B08712		7900.00		50.00
699-42-39A	1/23/92	B01T66		8700.00 P		88.00 P
699-42-39A	4/17/92	B065T1		9500.00 P		120.00 P
699-42-39A	6/25/92	B06ZX7		8400.00 P		310.00 P
699-42-39A	10/21/92	B07JL3		8300.00 P		240.00 P
699-42-39A	1/27/93	B07V64		8300.00 P		360.00 P
699-42-39B	1/23/92	B01T68		8400.00		190.00
699-42-39B	4/17/92	B065T6		8700.00		230.00
699-42-39B	6/25/92	B06ZY2		8700.00		160.00
699-42-39B	10/28/92	B07JJ2		9000.00		100.00
699-42-39B	10/28/92	B07JJ3		9700.00		90.00
699-42-39B	1/25/93	B07V69		8300.00		230.00
699-42-40A	2/03/83	H000DDX8	-2.85			
699-42-40A	2/28/83	H000DDX9	-1.45			
699-42-40A	3/28/83	H000DDY0	-1.94			
699-42-40A	4/14/83	H000DDY2	.40			
699-42-40A	5/12/83	H000DDY3	-3.04			
699-42-40A	6/16/83	H000DDY4	-5.39			
699-42-40A	7/14/83	H000DDY5	-2.16			
699-42-40A	8/19/83	H000DDY6	2.54			
699-42-40A	9/27/83	H000DDY7	-5.35			
699-42-40A	10/12/83	H000DDY8	-14.40			

Well Name	Collection Date	Sample Number	CS-137 77/pCi/L ./.	CHLORID 124/ppb 200/250000s	CHLORID 46/ppb ./250000s	CHROMUM 34/ppb 20/50
699-42-40A	11/07/83	H000DDY9	1.16			
699-42-40A	12/09/83	H000DDZ0	5.67			
699-42-40A	1/24/84	H000DDZ1	6.11			
699-42-40A	2/28/84	H000DDZ2	-7.33			
699-42-40A	4/10/84	H000DDZ3	.39			
699-42-40A	4/26/84	H000DDZ4	1.60			
699-42-40A	5/15/84	H000DDZ5	-.71			
699-42-40A	6/05/84	H000DDZ6	8.68			
699-42-40A	7/19/84	H000DDZ7	-.72			
699-42-40A	8/10/84	H000DDZ8	-6.07			
699-42-40A	9/11/84	H000DDZ9	2.85			
699-42-40A	10/09/84	H000DF00	5.42			
699-42-40A	11/13/84	H000DF01	1.72			
699-42-40A	12/12/84	H000DF02	.70			
699-42-40A	1/16/85	H000DF03	-17.80			
699-42-40A	2/11/85	H000DF04	1.28			
699-42-40A	3/14/85	H000DF05	3.44			
699-42-40A	4/04/85	H000DF06	2.41			
699-42-40A	5/03/85	H000DF07	5.11			
699-42-40A	6/11/85	H000DF09	-4.27			
699-42-40A	7/11/85	H000DF10	-1.78 U			
699-42-40A	8/22/85	H000DF11			4690.00	
699-42-40A	8/22/85	H000DF15	3.10 U			
699-42-40A	10/07/85	H000DF16	-3.92 U			
699-42-40A	11/06/85	H000DF18	4.13			
699-42-40A	12/14/85	H000DF20	-2.75 U			
699-42-40A	1/09/86	H000DF21	-.32 U			
699-42-40A	2/07/86	H000DF23	3.79 U			
699-42-40A	3/07/86	H000DF24	1.03 U			
699-42-40A	4/11/86	H000DF25	1.24 U			
699-42-40A	5/06/86	H000DF26	-1.28 U			
699-42-40A	5/12/86	H000DF27			4000.00	
699-42-40A	6/06/86	H000DF31	8.33			
699-42-40A	7/02/86	H000DF32	-4.67 U			
699-42-40A	8/05/86	H000DF33			5100.00	
699-42-40A	8/05/86	H000DF37	5.00 U			
699-42-40A	9/05/86	H000DF38	1.33 U			
699-42-40A	10/24/86	H000DF39	3.79 U			
699-42-40A	11/04/86	H000DF40	-18.90 U			
699-42-40A	12/10/86	H000DF41	-6.00 U			
699-42-40A	1/15/87	H000DF42	4.00 U			
699-42-40A	2/13/87	H000DF43	-4.53 U			
699-42-40A	3/07/87	H000DF44	1.51 U			

Well Name	Collection Date	Sample Number	CS-137 77/pCi/L ./.	CHLORID 124/ppb 200/250000s	CHLORID 46/ppb ./250000s	CHROMUM 34/ppb 20/50
699-42-40A	4/06/87	H000DF46	4.13			
699-42-40A	5/08/87	H000DF47	-1.38 U			
699-42-40A	6/04/87	H000DF48	6.33			
699-42-40A	7/09/87	H000DF49	2.41 U			
699-42-40A	8/11/87	H000DF50	4.48			
699-42-40A	9/09/87	H000DF51	3.79 U			
699-42-40A	10/06/87	H000DF52	.96 U			
699-42-40A	11/04/87	H000DF53	1.37 U			
699-42-40A	12/01/87	H000DF54	7.14			
699-42-40A	1/08/88	H000DF55			2340.00	
699-42-40A	1/08/88	H000DF56	4.30 U			
699-42-40A	5/23/88	H000DF57	-2.26 U			
699-42-40A	7/19/88	H000DF58	-4.51 U			
699-42-40A	11/15/88	H000DF59	-.63 U			
699-42-40A	11/22/88	H000DF60			2500.00	
699-42-40A	2/06/89	H000DF64	0.00 U			
699-42-40A	2/15/89	H000DF65			3100.00	
699-42-40A	4/07/89	H000DF69	3.78			
699-42-40A	5/31/89	H000DF70			3100.00	
699-42-40A	8/10/89	H000DF74			4000.00	
699-42-40A	1/26/90	H000DF78			4100.00	
699-42-40A	7/08/91	H00071Y2		2300.00		20.00 U
699-42-40A	1/08/92	B07TY8				20.00 U
699-42-40A	1/23/92	B01Q61		3600.00		20.00 U
699-42-40A	6/25/92	B06ZY7		3100.00		20.00 U
699-42-41	1/24/92	B01T70		3700.00 P		75.00 PD
699-42-41	4/17/92	B065V1		3600.00 P		79.00 P
699-42-41	6/29/92	B06ZZ2		2500.00 PD		69.00 P
699-42-41	1/25/93	B07TZ4		1500.00 P		30.00 P
699-42-42B	11/22/88	H000DFT3			3700.00	
699-42-42B	2/24/89	H000DFT7			3600.00	
699-42-42B	6/16/89	H000DFV1			3900.00	
699-42-42B	6/16/89	H000DFV4			3900.00	
699-42-42B	8/09/89	H000DFV5			3800.00	
699-42-42B	7/08/91	H00071Y3		4500.00		79.00
699-42-42B	1/24/92	B01Q63		4100.00		38.00 D
699-42-42B	6/24/92	B06ZZ7		3900.00		20.00 U
699-42-42B	1/21/93	B07TZ9		3800.00		60.00
699-43-40	1/31/92	B01T72		5200.00 P		260.00 PD
699-43-40	4/28/92	B065V6		5400.00 PD		46.00 P
699-43-40	6/26/92	B07002		5000.00 P		20.00 UP
699-43-40	1/25/93	B07V04		6100.00 P		90.00 P
699-43-41E	12/05/89	H000DGD6	-.71 U		6600.00	

Well Name	Collection Date	Sample Number	CS-137 77/pCi/L ./.	CHLORID 124/ppb 200/250000s	CHLORID 46/ppb ./250000s	CHROMUM 34/ppb 20/50
699-43-41E	1/25/90	H000DGF0			7100.00	
699-43-41E	5/15/90	H000DGF9			6600.00	
699-43-41E	5/15/90	H000DGG2			6700.00	
699-43-41E	6/28/91	H0007203		7200.00		61.00 QD
699-43-41E	6/28/91	H0007204		7300.00		39.00 QD
699-43-41E	1/23/92	B01QC3		6700.00		20.00 U
699-43-41E	4/17/92	B065P4		7000.00		440.00
699-43-41E	6/24/92	B06ZV3		6900.00		86.00
699-43-41E	1/25/93	B07V09		7200.00		140.00
699-43-41F	12/05/89	H000DGG8	-.77 U		6000.00	
699-43-41F	1/25/90	H000DGH2			7900.00	
699-43-41F	4/18/90	H000DGH6			6200.00	
699-43-41F	7/02/91	H00071Y5		6300.00		46.00 D
699-43-41F	5/05/92	B065R0		6300.00		120.00
699-43-41F	6/25/92	B06ZW7		6000.00		270.00
699-43-41F	1/22/93	B07V14		6100.00		20.00 U
699-43-41G	1/23/92	B01T74		5800.00		28.00
699-43-41G	4/17/92	B065W1		6100.00		210.00
699-43-41G	6/26/92	B07007		5900.00		23.00
699-43-41G	10/28/92	B07JL8		6100.00		50.00
699-43-41G	1/25/93	B07V74		6000.00		60.00
699-43-42J	11/22/88	H000DGP2			2800.00	
699-43-42J	2/24/89	H000DGP6			3000.00	
699-43-42J	6/15/89	H000DGQ0			3500.00	
699-43-42J	8/09/89	H000DGQ4			3400.00	
699-43-42J	8/09/89	H000DGQ7			3400.00	
699-43-42J	1/31/90	H000DGQ9			3100.00	
699-43-42J	7/02/91	H00071Y6		3500.00		32.00 D
699-43-42J	1/31/92	B01S49		3200.00		180.00 D
699-43-42J	6/25/92	B07012		3000.00		230.00
699-43-42J	1/21/93	B07V19		3300.00		100.00
699-43-43	11/21/88	H000DGR3			2900.00	
699-43-43	2/24/89	H000DGR7			2900.00	
699-43-43	2/24/89	H000DGS0			2900.00	
699-43-43	6/15/89	H000DGS1			3200.00	
699-43-43	8/09/89	H000DGS5			3200.00	
699-43-43	1/26/90	H000DGS9			3300.00	
699-43-43	7/08/91	H00071Y7		3700.00		82.00
699-43-43	1/24/92	B01Q67		2800.00		29.00 D
699-43-43	4/22/92	B065N6		3400.00		89.00
699-43-43	6/26/92	B070W0		3000.00		31.00 D
699-43-43	10/26/92	B07JG5		2900.00		90.00
699-43-43	1/13/93	B07V24		2000.00		50.00

Well Name	Collection Date	Sample Number	CS-137 77/pCi/L ./.	CHLORID 124/ppb 200/250000s	CHLORID 46/ppb ./250000s	CHROMUM 34/ppb 20/50
699-43-45	12/06/89	H000DGT4	-.22 U		2500.00	
699-43-45	1/26/90	H000DGT8			2900.00	
699-43-45	4/18/90	H000DGV2			2700.00	
699-43-45	7/08/91	H00071Y8		3000.00		100.00
699-43-45	9/11/91	B00LG5				38.00
699-43-45	1/24/92	B01QD0		2900.00		150.00 D
699-43-45	4/22/92	B065N8		3500.00		94.00
699-43-45	6/26/92	B070W2		2800.00		20.00 UD
699-43-45	10/26/92	B07JG7		2900.00		110.00
699-43-45	1/13/93	B07V29		2300.00		90.00
699-44-39B	1/08/93	B07WK1		2900.00		20.00 U
699-44-42	11/21/88	H000DHK2			3100.00	
699-44-42	2/17/89	H000DHK6			3300.00	
699-44-42	6/15/89	H000DHL0			3300.00	
699-44-42	8/08/89	H000DHL4			3100.00	
699-44-42	1/31/90	H000DHL8			3200.00	
699-44-42	7/10/91	H00071Y9		3500.00		29.00
699-44-42	1/31/92	B01S52		2900.00		66.00 D
699-44-42	6/25/92	B07017		3000.00		130.00
699-44-42	1/13/93	B07V34		2100.00		30.00 Q
699-44-42	1/13/93	B07V35		2100.00		20.00 UQ
699-44-43B	12/20/89	H000DHM3	-4.42 U		4300.00	
699-44-43B	12/20/89	H000DHM6	-9.51 U		4300.00	
699-44-43B	1/26/90	H000DHM7			4600.00	
699-44-43B	1/26/90	H000DHN0			4600.00	
699-44-43B	4/18/90	H000DHN1			4400.00	
699-44-43B	7/08/91	H00071Z0		4100.00		76.00
699-44-43B	9/11/91	B00LG6				32.00
699-44-43B	1/23/92	B01Q69		3700.00		20.00 U
699-44-43B	4/20/92	B065W9		3900.00		86.00
699-44-43B	6/26/92	B07022		3600.00		20.00 U
699-44-43B	6/26/92	B07023		3600.00		23.00
699-44-43B	1/27/93	B07V44		3700.00		80.00

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
299-E18-1	8/16/88	H0007ZT7	30.00			
299-E18-1	8/16/88	H0007ZT7		10.00 U		
299-E18-1	9/22/88	H0007ZV1	104.00			

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
299-E18-1	9/22/88	H0007ZV1		10.00 U		
299-E18-1	11/10/88	H0007ZV2	30.00			
299-E18-1	11/10/88	H0007ZV2		10.00 U		
299-E18-1	11/10/88	H0007ZV5	20.00			
299-E18-1	11/10/88	H0007ZV5		10.00 U		
299-E18-1	2/15/89	H0007ZV8	22.00			
299-E18-1	2/15/89	H0007ZV8		10.00 U		
299-E18-1	5/26/89	H0007ZW2	20.00			
299-E18-1	5/26/89	H0007ZW2		10.00 U		
299-E18-1	8/08/89	H0007ZW6	100.00			
299-E18-1	8/08/89	H0007ZW6		10.00 U		
299-E18-1	10/31/89	H0007ZX0	39.00			.76 U
299-E18-1	10/31/89	H0007ZX0		10.00 U		
299-E18-1	7/09/91	H00071X9F		20.00 U		
299-E18-1	9/06/91	B00LB6			-3.59 U	
299-E18-1	9/06/91	B00LB6F		20.00 U		
299-E18-1	1/24/92	B01Q60		20.00 UD		
299-E18-1	6/03/92	B06PH8			-3.79 U	
299-E18-1	6/03/92	B06PJ2		20.00 U		
299-E18-1	12/16/92	B07S36		20.00 U		
299-E32-4	9/27/88	H0008ZB8	25.00			-7.93 U
299-E32-4	9/27/88	H0008ZB8		10.00 U		
299-E32-4	12/28/88	H0008ZC2	38.00			
299-E32-4	12/28/88	H0008ZC2		10.00 U		
299-E32-4	3/01/89	H0008ZC6	30.00			
299-E32-4	3/01/89	H0008ZC6		10.00 U		
299-E32-4	3/13/89	H0008ZD0	43.00			-.20 U
299-E32-4	3/13/89	H0008ZD0		10.00 U		
299-E32-4	6/16/89	H0008ZD4	58.00			
299-E32-4	6/16/89	H0008ZD4		10.00 U		
299-E32-4	7/19/89	H0008ZD8	46.00			.38 U
299-E32-4	7/19/89	H0008ZD8		10.00 U		
299-E32-4	9/08/89	H0008ZF6	43.00			4.36 U
299-E32-4	9/08/89	H0008ZF6		10.00 U		
299-E32-4	1/17/90	H0008ZG0	82.00			1.07 U
299-E32-4	1/17/90	H0008ZG0		10.00 U		
299-E32-4	5/09/90	H0008ZG9				2.63 U
299-E32-4	8/05/91	H00071Y0F		20.00 U		
299-E32-4	8/05/91	H0007264			3.94 U	
299-E32-4	8/05/91	H0007264F		20.00 U		
299-E32-4	9/23/91	B00LK5			-.71 U	
299-E32-4	9/23/91	B00LK5F		20.00 U		
299-E32-4	1/15/92	B01QK6			4.36	

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
299-E32-4	1/15/92	B01QK8		20.00 U		
299-E32-4	4/06/92	B06696			-7.33 U	
299-E32-4	4/06/92	B06697		20.00 U		
299-E32-4	4/09/92	B065B6			-1.17 U	
299-E32-4	7/14/92	B07173			3.50 U	
299-E32-4	7/14/92	B07174		20.00 U		
699-40-36	12/21/92	B07TB8		20.00 U		
699-40-36	2/22/93	B08721		20.00 U		
699-40-39	12/05/89	H000DBX2	19.00			7.95
699-40-39	12/05/89	H000DBX2		10.00 U		
699-40-39	1/25/90	H000DBX6	25.00			
699-40-39	1/25/90	H000DBX6		10.00 U		
699-40-39	4/25/90	H000DBY0	22.00			
699-40-39	4/25/90	H000DBY0		10.00 U		
699-40-39	7/08/91	H00071Y4F		32.00		
699-40-39	9/11/91	B00LG1F		20.00 U		
699-40-39	1/31/92	B01Q66		20.00 UD		
699-40-39	4/17/92	B065Q4		20.00 U		
699-40-39	6/24/92	B06ZV1		20.00 U		
699-40-39	1/14/93	B07TX8		20.00 U		
699-40-40A	1/24/92	B01T63		20.00 UD		
699-40-40A	4/22/92	B065R8		20.00		
699-40-40A	6/25/92	B06ZW0		20.00 U		
699-40-40A	10/21/92	B07JK7		20.00 U		
699-40-40A	1/26/93	B07V53		20.00 U		
699-40-40B	1/01/92	B01T65		20.00 UD		
699-40-40B	4/22/92	B065S4		22.00		
699-40-40B	6/29/92	B06ZW6		20.00 U		
699-40-40B	10/21/92	B07JL2		20.00 U		
699-40-40B	1/26/93	B07V58		20.00 U		
699-41-35	12/21/92	B07TC3		20.00 U		
699-41-35	2/22/93	B08711		20.00 U		
699-41-40	12/05/89	H000DD44	10.00 U			.61 U
699-41-40	12/05/89	H000DD44		10.00 U		
699-41-40	1/25/90	H000DD48	86.00			
699-41-40	1/25/90	H000DD48		10.00 U		
699-41-40	4/19/90	H000DD52	28.00			
699-41-40	4/19/90	H000DD52		21.00		
699-41-40	7/10/91	H00071Y1F		20.00 U		
699-41-40	9/11/91	B00LG2F		20.00 U		
699-41-40	1/31/92	B01QC9		20.00 UD		
699-41-40	4/28/92	B065S9		20.00 U		
699-41-40	4/28/92	B065T0		20.00 U		

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
699-41-40	6/24/92	B06ZX6		20.00 U		
699-41-40	1/14/93	B07TY3		20.00 U		
699-41-42	1/08/93	B07V63		20.00 U		
699-42-37	12/22/92	B07TC8		20.00 U		
699-42-37	2/23/93	B08716		20.00 U		
699-42-39A	1/23/92	B01T67		20.00 UP		
699-42-39A	4/17/92	B065T5		20.00 UP		
699-42-39A	6/25/92	B06ZY1		20.00 UP		
699-42-39A	10/21/92	B07JL7		20.00 UP		
699-42-39A	1/27/93	B07V68		20.00 UP		
699-42-39B	1/23/92	B01T69		29.00		
699-42-39B	4/17/92	B065V0		20.00 U		
699-42-39B	6/25/92	B06ZY6		20.00 U		
699-42-39B	10/28/92	B07JJ6		20.00 UQ		
699-42-39B	10/28/92	B07JJ7		50.00 Q		
699-42-39B	1/25/93	B07V73		20.00 U		
699-42-40A	2/03/83	H000DDX8				-.37
699-42-40A	2/28/83	H000DDX9				-7.77
699-42-40A	3/28/83	H000DDY0				3.84
699-42-40A	4/14/83	H000DDY2				-2.99
699-42-40A	5/12/83	H000DDY3				.21
699-42-40A	6/16/83	H000DDY4				-1.69
699-42-40A	7/14/83	H000DDY5				2.57
699-42-40A	8/19/83	H000DDY6				-2.99
699-42-40A	9/27/83	H000DDY7				-3.26
699-42-40A	10/12/83	H000DDY8				-.62
699-42-40A	11/07/83	H000DDY9				-16.70
699-42-40A	12/09/83	H000DDZ0				2.45
699-42-40A	1/24/84	H000DDZ1				-14.10
699-42-40A	2/28/84	H000DDZ2				1.11
699-42-40A	4/10/84	H000DDZ3				2.23
699-42-40A	4/26/84	H000DDZ4				-4.07
699-42-40A	5/15/84	H000DDZ5				-3.70
699-42-40A	6/05/84	H000DDZ6				-4.74
699-42-40A	7/19/84	H000DDZ7				.52
699-42-40A	8/10/84	H000DDZ8				1.01
699-42-40A	9/11/84	H000DDZ9				5.90
699-42-40A	10/09/84	H000DF00				7.33
699-42-40A	11/13/84	H000DF01				-2.82
699-42-40A	12/12/84	H000DF02				1.21
699-42-40A	1/16/85	H000DF03				-7.85
699-42-40A	2/11/85	H000DF04				5.07
699-42-40A	3/14/85	H000DF05				4.53

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
699-42-40A	4/04/85	H000DF06				7.91
699-42-40A	5/03/85	H000DF07				2.02
699-42-40A	6/11/85	H000DF09				5.91
699-42-40A	7/11/85	H000DF10				4.74 U
699-42-40A	8/22/85	H000DF11	10.00 U			
699-42-40A	8/22/85	H000DF15				2.27 U
699-42-40A	10/07/85	H000DF16				-.59 U
699-42-40A	11/02/85	H000DF17				-1.40
699-42-40A	11/06/85	H000DF18				2.26 U
699-42-40A	12/14/85	H000DF20				0.00
699-42-40A	1/09/86	H000DF21				3.03 U
699-42-40A	2/07/86	H000DF23				-3.95 U
699-42-40A	3/07/86	H000DF24				-10.20 U
699-42-40A	4/11/86	H000DF25				2.68 U
699-42-40A	5/06/86	H000DF26				1.01 U
699-42-40A	5/12/86	H000DF27	10.00 U			
699-42-40A	6/06/86	H000DF31				5.34
699-42-40A	7/02/86	H000DF32				-2.69 U
699-42-40A	8/05/86	H000DF33	10.00 U			
699-42-40A	8/05/86	H000DF37				2.69 U
699-42-40A	9/05/86	H000DF38				.54 U
699-42-40A	10/24/86	H000DF39				-3.94 U
699-42-40A	11/04/86	H000DF40				-4.25 U
699-42-40A	12/10/86	H000DF41				-5.93 U
699-42-40A	1/15/87	H000DF42				7.48
699-42-40A	2/13/87	H000DF43				1.82 U
699-42-40A	3/07/87	H000DF44				6.08
699-42-40A	4/06/87	H000DF46				-5.09 U
699-42-40A	5/08/87	H000DF47				3.38 U
699-42-40A	6/04/87	H000DF48				7.49
699-42-40A	7/09/87	H000DF49				4.53 U
699-42-40A	8/11/87	H000DF50				-2.03 U
699-42-40A	9/09/87	H000DF51				4.53 U
699-42-40A	10/06/87	H000DF52				2.03 U
699-42-40A	11/04/87	H000DF53				-7.91 U
699-42-40A	12/01/87	H000DF54				6.07
699-42-40A	1/08/88	H000DF55	10.00 U			
699-42-40A	1/08/88	H000DF55		10.00 U		
699-42-40A	1/08/88	H000DF56				1.42 U
699-42-40A	5/23/88	H000DF57				0.00
699-42-40A	7/19/88	H000DF58				-3.85 U
699-42-40A	11/15/88	H000DF59				-4.08 U
699-42-40A	11/22/88	H000DF60	10.00 U			

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
699-42-40A	11/22/88	H000DF60		10.00 U		
699-42-40A	2/06/89	H000DF64				-1.03 U
699-42-40A	2/15/89	H000DF65	10.00 U			
699-42-40A	2/15/89	H000DF65		10.00 U		
699-42-40A	4/07/89	H000DF69				-6.75 U
699-42-40A	5/31/89	H000DF70	10.00 U			
699-42-40A	5/31/89	H000DF70		10.00 U		
699-42-40A	8/10/89	H000DF74	10.00 U			
699-42-40A	8/10/89	H000DF74		10.00 U		
699-42-40A	1/26/90	H000DF78	10.00 U			
699-42-40A	1/26/90	H000DF78		10.00 U		
699-42-40A	7/08/91	H00071Y2F		20.00 U		
699-42-40A	1/08/92	B07TZ3		20.00 U		
699-42-40A	1/23/92	B01Q62		20.00 U		
699-42-40A	6/25/92	B06ZZ1		22.00		
699-42-41	1/24/92	B01T71		20.00 UPD		
699-42-41	4/17/92	B065V5		20.00 UP		
699-42-41	6/29/92	B06ZZ6		20.00 UP		
699-42-41	1/25/93	B07TZ8		20.00 UP		
699-42-42B	11/22/88	H000DFT3	16.00			
699-42-42B	11/22/88	H000DFT3		10.00 U		
699-42-42B	2/24/89	H000DFT7	37.00			
699-42-42B	2/24/89	H000DFT7		10.00 U		
699-42-42B	6/16/89	H000DFV1	13.00			
699-42-42B	6/16/89	H000DFV1		10.00 U		
699-42-42B	6/16/89	H000DFV4	18.00			
699-42-42B	6/16/89	H000DFV4		10.00 U		
699-42-42B	8/09/89	H000DFV5	61.00			
699-42-42B	8/09/89	H000DFV5		10.00 U		
699-42-42B	7/08/91	H00071Y3F		20.00 U		
699-42-42B	1/24/92	B01Q64		20.00 UD		
699-42-42B	6/24/92	B07001		20.00 U		
699-42-42B	1/21/93	B07V03		20.00 U		
699-43-40	1/31/92	B01T73		20.00 UPD		
699-43-40	4/28/92	B065W0		20.00 UP		
699-43-40	6/26/92	B07006		20.00 UP		
699-43-40	1/25/93	B07V08		20.00 UP		
699-43-41E	12/05/89	H000DGD6	86.00			-.58 U
699-43-41E	12/05/89	H000DGD6		10.00 U		
699-43-41E	1/25/90	H000DGF0	186.00			
699-43-41E	1/25/90	H000DGF0		10.00 U		
699-43-41E	6/28/91	H0007203F		20.00 U		
699-43-41E	6/28/91	H0007204F		20.00 U		

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
699-43-41E	1/23/92	B01QC4		560.00 F		
699-43-41E	4/17/92	B065Q6		20.00 U		
699-43-41E	6/24/92	B06ZW1		20.00 U		
699-43-41E	1/25/93	B07V13		20.00 U		
699-43-41F	12/05/89	H000DGG8	69.00			-2.49 U
699-43-41F	12/05/89	H000DGG8		10.00 U		
699-43-41F	1/25/90	H000DGH2	25.00			
699-43-41F	1/25/90	H000DGH2		10.00 U		
699-43-41F	4/18/90	H000DGH6	23.00			
699-43-41F	4/18/90	H000DGH6		10.00 U		
699-43-41F	7/02/91	H00071Y5F		20.00 U		
699-43-41F	5/05/92	B065R9		20.00 U		
699-43-41F	6/25/92	B06ZX1		20.00 U		
699-43-41F	1/22/93	B07V18		20.00 U		
699-43-41G	1/23/92	B01T75		20.00 U		
699-43-41G	4/17/92	B065W6		20.00 U		
699-43-41G	6/26/92	B07011		20.00 U		
699-43-41G	10/28/92	B07JM2		20.00 U		
699-43-41G	1/25/93	B07V78		20.00 U		
699-43-42J	11/22/88	H000DGP2	33.00			
699-43-42J	11/22/88	H000DGP2		10.00 U		
699-43-42J	2/24/89	H000DGP6	41.00			
699-43-42J	2/24/89	H000DGP6		10.00 U		
699-43-42J	6/15/89	H000DGQ0	51.00			
699-43-42J	6/15/89	H000DGQ0		10.00 U		
699-43-42J	8/09/89	H000DGQ4	206.00			
699-43-42J	8/09/89	H000DGQ4		10.00 U		
699-43-42J	8/09/89	H000DGQ7	118.00			
699-43-42J	8/09/89	H000DGQ7		10.00 U		
699-43-42J	7/02/91	H00071Y6F		20.00 U		
699-43-42J	1/31/92	B01S51		20.00 UD		
699-43-42J	6/25/92	B07016		20.00 U		
699-43-42J	1/21/93	B07V23		20.00 U		
699-43-43	11/21/88	H000DGR3	57.00			
699-43-43	11/21/88	H000DGR3		10.00 U		
699-43-43	2/24/89	H000DGR7	34.00			
699-43-43	2/24/89	H000DGR7		10.00 U		
699-43-43	2/24/89	H000DGS0	23.00			
699-43-43	2/24/89	H000DGS0		10.00		
699-43-43	6/15/89	H000DGS1	10.00 U			
699-43-43	6/15/89	H000DGS1		10.00 U		
699-43-43	8/09/89	H000DGS5	22.00			
699-43-43	8/09/89	H000DGS5		10.00 U		

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
699-43-43	1/26/90	H000DGS9	33.00			
699-43-43	1/26/90	H000DGS9		10.00 U		
699-43-43	7/08/91	H00071Y7F		20.00 U		
699-43-43	1/24/92	B01Q68		20.00 UD		
699-43-43	4/22/92	B065N7		20.00 U		
699-43-43	6/26/92	B070W1		20.00 U		
699-43-43	10/26/92	B07JG6		20.00 U		
699-43-43	1/13/93	B07V28		20.00 U		
699-43-45	12/06/89	H000DGT4	37.00			7.11 U
699-43-45	12/06/89	H000DGT4		10.00 U		
699-43-45	1/26/90	H000DGT8	55.00			
699-43-45	1/26/90	H000DGT8		10.00 U		
699-43-45	4/18/90	H000DGV2	54.00			
699-43-45	4/18/90	H000DGV2		10.00 U		
699-43-45	7/08/91	H00071Y8F		20.00 U		
699-43-45	9/11/91	B00LG5F		20.00 U		
699-43-45	1/24/92	B01QD1		20.00 UD		
699-43-45	4/22/92	B065N9		20.00 U		
699-43-45	6/26/92	B070W3		20.00 U		
699-43-45	10/26/92	B07JG8		20.00 U		
699-43-45	1/13/93	B07V33		20.00 U		
699-44-39B	1/08/93	B07WK5		20.00 U		
699-44-42	11/21/88	H000DHK2	18.00			
699-44-42	11/21/88	H000DHK2		10.00 U		
699-44-42	2/17/89	H000DHK6	10.00 U			
699-44-42	2/17/89	H000DHK6		10.00 U		
699-44-42	6/15/89	H000DHL0	10.00 U			
699-44-42	6/15/89	H000DHL0		10.00 U		
699-44-42	8/08/89	H000DHL4	27.00			
699-44-42	8/08/89	H000DHL4		10.00 U		
699-44-42	1/31/90	H000DHL8	53.00			
699-44-42	1/31/90	H000DHL8		10.00 U		
699-44-42	7/10/91	H00071Y9F		20.00 U		
699-44-42	1/31/92	B01S54		20.00 UD		
699-44-42	6/25/92	B07021		20.00 U		
699-44-42	1/13/93	B07V42		20.00 U		
699-44-42	1/13/93	B07V43		20.00 U		
699-44-43B	12/20/89	H000DHM3	41.00			9.09
699-44-43B	12/20/89	H000DHM3		10.00 U		
699-44-43B	12/20/89	H000DHM6	30.00			3.46 U
699-44-43B	12/20/89	H000DHM6		15.00		
699-44-43B	1/26/90	H000DHM7	23.00			
699-44-43B	1/26/90	H000DHM7		10.00 U		

Well Name	Collection Date	Sample Number	CHROMUM 35/ppb ./50	FCHROMI 34/ppb 20/50	CO-60 140/pCi/L ./.	CO-60 77/pCi/L ./.
699-44-43B	1/26/90	H000DHN0	29.00			
699-44-43B	1/26/90	H000DHN0		10.00 U		
699-44-43B	4/18/90	H000DHN1	23.00			
699-44-43B	4/18/90	H000DHN1		10.00 U		
699-44-43B	7/08/91	H00071Z0F		40.00		
699-44-43B	9/11/91	B00LG6F		20.00 U		
699-44-43B	1/23/92	B01Q70		130.00 F		
699-44-43B	4/20/92	B065X5		20.00 U		
699-44-43B	6/26/92	B01MT4		20.00 U		
699-44-43B	6/26/92	B07026		20.00 U		
699-44-43B	1/27/93	B07V48		20.00 U		

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
299-E18-1	8/16/88	H0007ZT7			10.00 U	
299-E18-1	8/16/88	H0007ZT7				10.00 U
299-E18-1	9/22/88	H0007ZV1			10.00 U	
299-E18-1	9/22/88	H0007ZV1				10.00 U
299-E18-1	11/10/88	H0007ZV2			10.00 U	
299-E18-1	11/10/88	H0007ZV2				10.00 U
299-E18-1	11/10/88	H0007ZV5			12.00	
299-E18-1	11/10/88	H0007ZV5				10.00 U
299-E18-1	2/15/89	H0007ZV8			10.00 U	
299-E18-1	2/15/89	H0007ZV8				10.00 U
299-E18-1	5/26/89	H0007ZW2			10.00 U	
299-E18-1	5/26/89	H0007ZW2				10.00 U
299-E18-1	8/08/89	H0007ZW6			10.00 U	
299-E18-1	8/08/89	H0007ZW6				10.00 U
299-E18-1	10/31/89	H0007ZX0			10.00 U	
299-E18-1	10/31/89	H0007ZX0				10.00 U
299-E18-1	7/09/91	H00071X9		20.00 U		
299-E18-1	7/09/91	H00071X9F				20.00 U
299-E18-1	9/06/91	B00LB6		20.00 U		
299-E18-1	9/06/91	B00LB6F				20.00 U
299-E18-1	1/24/92	B01Q59		20.00 UD		
299-E18-1	1/24/92	B01Q60				20.00 UD
299-E18-1	6/03/92	B06PH8	1.00 U	20.00 U		
299-E18-1	6/03/92	B06PJ2				20.00 U
299-E18-1	12/16/92	B07S32	1.00 U	20.00 U		

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
299-E18-1	12/16/92	B07S36				20.00 U
299-E32-4	9/27/88	H0008ZB8			10.00 U	
299-E32-4	9/27/88	H0008ZB8				10.00 U
299-E32-4	12/28/88	H0008ZC2			10.00 U	
299-E32-4	12/28/88	H0008ZC2				10.00 U
299-E32-4	3/01/89	H0008ZC6			13.00	
299-E32-4	3/01/89	H0008ZC6				10.00 U
299-E32-4	3/13/89	H0008ZD0			10.00 U	
299-E32-4	3/13/89	H0008ZD0				10.00 U
299-E32-4	6/16/89	H0008ZD4			10.00 U	
299-E32-4	6/16/89	H0008ZD4				10.00 U
299-E32-4	7/19/89	H0008ZD8			10.00 U	
299-E32-4	7/19/89	H0008ZD8				10.00 U
299-E32-4	9/08/89	H0008ZF6			10.00 U	
299-E32-4	9/08/89	H0008ZF6				10.00 U
299-E32-4	1/17/90	H0008ZG0			10.00 U	
299-E32-4	1/17/90	H0008ZG0				10.00 U
299-E32-4	8/05/91	H00071Y0		20.00 UD		
299-E32-4	8/05/91	H00071Y0F				20.00 U
299-E32-4	8/05/91	H0007264		20.00 UQD		
299-E32-4	8/05/91	H0007264F				33.00 Q
299-E32-4	9/23/91	B00LK5		25.00		
299-E32-4	9/23/91	B00LK5F				20.00 U
299-E32-4	1/15/92	B01QK6	32.00 F	20.00 U		
299-E32-4	1/15/92	B01QK8				20.00 U
299-E32-4	4/06/92	B06696	1.00 U	20.00 U		
299-E32-4	4/06/92	B06697				20.00 U
299-E32-4	7/14/92	B07173	1.00 U	20.00 U		
299-E32-4	7/14/92	B07174				20.00 U
699-40-36	12/21/92	B07TB1		20.00 U		
699-40-36	12/21/92	B07TB8				20.00 U
699-40-36	2/22/93	B08717	1.00 U	20.00 U		
699-40-36	2/22/93	B08721				20.00 U
699-40-39	12/05/89	H000DBX2			10.00 U	
699-40-39	12/05/89	H000DBX2				10.00 U
699-40-39	1/25/90	H000DBX6			10.00 U	
699-40-39	1/25/90	H000DBX6				10.00 U
699-40-39	4/25/90	H000DBY0			10.00 U	
699-40-39	4/25/90	H000DBY0				10.00 U
699-40-39	7/08/91	H00071Y4F				20.00 U
699-40-39	9/11/91	B00LG1		20.00 U		
699-40-39	9/11/91	B00LG1F				29.00
699-40-39	1/31/92	B01Q65	1.00 U	20.00 UD		

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
699-40-39	1/31/92	B01Q66				20.00 UD
699-40-39	4/17/92	B065P2	1.00 UQ	20.00 U		
699-40-39	4/17/92	B065Q4				20.00 U
699-40-39	6/24/92	B06ZT7	1.00 U	20.00 U		
699-40-39	6/24/92	B06ZV1				20.00 U
699-40-39	1/14/93	B07TX4	1.00 U	20.00 U		
699-40-39	1/14/93	B07TX8				20.00 U
699-40-40A	1/24/92	B01T62	1.00 U	20.00 UD		
699-40-40A	1/24/92	B01T63				20.00 UD
699-40-40A	4/22/92	B065Q8	1.00 U	20.00 U		
699-40-40A	4/22/92	B065R8				20.00 U
699-40-40A	6/25/92	B06ZV2	1.00 U	20.00 U		
699-40-40A	6/25/92	B06ZW0				20.00 U
699-40-40A	10/21/92	B07JK3	1.00 U	20.00 U		
699-40-40A	10/21/92	B07JK7				20.00 U
699-40-40A	1/26/93	B07V49	27.00 F	20.00 U		
699-40-40A	1/26/93	B07V53				20.00 U
699-40-40B	1/01/92	B01T65				20.00 UD
699-40-40B	1/24/92	B01T64	1.00 U	37.00 D		
699-40-40B	4/22/92	B065S0	1.00 U	20.00 U		
699-40-40B	4/22/92	B065S4				20.00 U
699-40-40B	6/29/92	B06ZW2	1.00 U	20.00 U		
699-40-40B	6/29/92	B06ZW6				20.00 U
699-40-40B	10/21/92	B07JK8	200.00 F	20.00		
699-40-40B	10/21/92	B07JL2				20.00 U
699-40-40B	1/26/93	B07V54	200.00 F	20.00 U		
699-40-40B	1/26/93	B07V58				20.00 U
699-41-35	12/21/92	B07TB9		20.00 U		
699-41-35	12/21/92	B07TC3				20.00 U
699-41-35	2/22/93	B08707	1.00 U	20.00 U		
699-41-35	2/22/93	B08711				20.00 U
699-41-40	12/05/89	H000DD44			10.00 U	
699-41-40	12/05/89	H000DD44				10.00 U
699-41-40	1/25/90	H000DD48			10.00 U	
699-41-40	1/25/90	H000DD48				16.00
699-41-40	4/19/90	H000DD52			10.00 U	
699-41-40	4/19/90	H000DD52				10.00 U
699-41-40	7/10/91	H00071Y1		20.00 U		
699-41-40	7/10/91	H00071Y1F				20.00 U
699-41-40	9/11/91	B00LG2		20.00 U		
699-41-40	9/11/91	B00LG2F				26.00
699-41-40	1/31/92	B01QC8	1.00 U	22.00 D		
699-41-40	1/31/92	B01QC9				20.00 UD

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
699-41-40	4/28/92	B065S5	1.00 U	20.00 U		
699-41-40	4/28/92	B065S6	1.00 U	20.00 U		
699-41-40	4/28/92	B065S9				20.00 U
699-41-40	4/28/92	B065T0				20.00 U
699-41-40	6/24/92	B06ZX2	1.00 U	20.00 U		
699-41-40	6/24/92	B06ZX6				20.00 U
699-41-40	1/14/93	B07TX9	1.00 U	20.00 U		
699-41-40	1/14/93	B07TY3				20.00 U
699-41-42	1/08/93	B07V59	1.00 U	20.00 U		
699-41-42	1/08/93	B07V63				20.00 U
699-42-37	12/22/92	B07TC4		20.00 U		
699-42-37	12/22/92	B07TC8				20.00 U
699-42-37	2/23/93	B08712	1.00 U	20.00 U		
699-42-37	2/23/93	B08716				20.00 U
699-42-39A	1/23/92	B01T66	1.00 UP	20.00 UP		
699-42-39A	1/23/92	B01T67				20.00 UP
699-42-39A	4/17/92	B065T1	1.00 UPQ	20.00 UP		
699-42-39A	4/17/92	B065T5				20.00 UP
699-42-39A	6/25/92	B06ZX7	1.00 UP	20.00 UP		
699-42-39A	6/25/92	B06ZY1				20.00 UP
699-42-39A	10/21/92	B07JL3	1.00 UP	20.00 UP		
699-42-39A	10/21/92	B07JL7				20.00 UP
699-42-39A	1/27/93	B07V64	1.00 UP	20.00 UP		
699-42-39A	1/27/93	B07V68				20.00 UP
699-42-39B	1/23/92	B01T68	1.00 U	20.00 U		
699-42-39B	1/23/92	B01T69				20.00 U
699-42-39B	4/17/92	B065T6	1.00 UQ	20.00 U		
699-42-39B	4/17/92	B065V0				20.00 U
699-42-39B	6/25/92	B06ZY2	1.00 U	20.00 U		
699-42-39B	6/25/92	B06ZY6				20.00 U
699-42-39B	10/28/92	B07JJ2	1.00 U	20.00 U		
699-42-39B	10/28/92	B07JJ3	1.00 U	20.00 U		
699-42-39B	10/28/92	B07JJ6				20.00 U
699-42-39B	10/28/92	B07JJ7				20.00 U
699-42-39B	1/25/93	B07V69	1.00 U	20.00 U		
699-42-39B	1/25/93	B07V73				20.00 U
699-42-40A	8/22/85	H000DF11			10.00 U	
699-42-40A	5/12/86	H000DF27			10.00 U	
699-42-40A	8/05/86	H000DF33			10.00 U	
699-42-40A	1/08/88	H000DF55			10.00 U	
699-42-40A	1/08/88	H000DF55				10.00 U
699-42-40A	11/22/88	H000DF60			10.00 U	
699-42-40A	11/22/88	H000DF60				10.00 U

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
699-42-40A	2/15/89	H000DF65			10.00 U	
699-42-40A	2/15/89	H000DF65				10.00 U
699-42-40A	5/31/89	H000DF70			10.00 U	
699-42-40A	5/31/89	H000DF70				10.00 U
699-42-40A	8/10/89	H000DF74			10.00 U	
699-42-40A	8/10/89	H000DF74				10.00 U
699-42-40A	1/26/90	H000DF78			10.00 U	
699-42-40A	1/26/90	H000DF78				10.00 U
699-42-40A	7/08/91	H00071Y2		20.00 U		
699-42-40A	7/08/91	H00071Y2F				20.00 U
699-42-40A	1/08/92	B07TY8		20.00 U		
699-42-40A	1/08/92	B07TZ3				20.00 U
699-42-40A	1/23/92	B01Q61		20.00 U		
699-42-40A	1/23/92	B01Q62				20.00 U
699-42-40A	6/25/92	B06ZY7	1.00 U	20.00 U		
699-42-40A	6/25/92	B06ZZ1				20.00 U
699-42-41	1/24/92	B01T70	1.00 UP	20.00 UPD		
699-42-41	1/24/92	B01T71				20.00 UPD
699-42-41	4/17/92	B065V1	1.00 UP	20.00 UP		
699-42-41	4/17/92	B065V5				20.00 UP
699-42-41	6/29/92	B06ZZ2	1.00 UP	20.00 UP		
699-42-41	6/29/92	B06ZZ6				20.00 UP
699-42-41	1/25/93	B07TZ4	1.00 UP	20.00 UP		
699-42-41	1/25/93	B07TZ8				20.00 UP
699-42-42B	11/22/88	H000DFT3			10.00 U	
699-42-42B	11/22/88	H000DFT3				10.00 U
699-42-42B	2/24/89	H000DFT7			10.00 U	
699-42-42B	2/24/89	H000DFT7				10.00 U
699-42-42B	6/16/89	H000DFV1			10.00 U	
699-42-42B	6/16/89	H000DFV1				10.00 U
699-42-42B	6/16/89	H000DFV4			10.00 U	
699-42-42B	6/16/89	H000DFV4				10.00 U
699-42-42B	8/09/89	H000DFV5			10.00 U	
699-42-42B	8/09/89	H000DFV5				10.00 U
699-42-42B	7/08/91	H00071Y3		20.00 U		
699-42-42B	7/08/91	H00071Y3F				20.00 U
699-42-42B	1/24/92	B01Q63		20.00 UD		
699-42-42B	1/24/92	B01Q64				20.00 UD
699-42-42B	6/24/92	B06ZZ7	1.00 U	20.00 U		
699-42-42B	6/24/92	B07001				20.00 U
699-42-42B	1/21/93	B07TZ9		20.00 U		
699-42-42B	1/21/93	B07V03				20.00 U
699-43-40	1/31/92	B01T72	15.00 P	20.00 UPD		

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
699-43-40	1/31/92	B01T73				20.00 UPD
699-43-40	4/28/92	B065V6	1.00 UP	20.00 UP		
699-43-40	4/28/92	B065W0				20.00 UP
699-43-40	6/26/92	B07002	1.00 UP	20.00 UP		
699-43-40	6/26/92	B07006				20.00 UP
699-43-40	1/25/93	B07V04	1.00 UP	20.00 UP		
699-43-40	1/25/93	B07V08				20.00 UP
699-43-41E	12/05/89	H000DGD6			10.00 U	
699-43-41E	12/05/89	H000DGD6				10.00 U
699-43-41E	1/25/90	H000DGF0			15.00	
699-43-41E	1/25/90	H000DGF0				10.00 U
699-43-41E	6/28/91	H0007203		20.00 UD		
699-43-41E	6/28/91	H0007203F				20.00 U
699-43-41E	6/28/91	H0007204		20.00 UD		
699-43-41E	6/28/91	H0007204F				20.00 U
699-43-41E	1/23/92	B01QC3	1.00 U	20.00 U		
699-43-41E	1/23/92	B01QC4				26.00
699-43-41E	4/17/92	B065P4	1.00 UQ	20.00 U		
699-43-41E	4/17/92	B065Q6				20.00 U
699-43-41E	6/24/92	B06ZV3	1.00 U	20.00 U		
699-43-41E	6/24/92	B06ZW1				20.00 U
699-43-41E	1/25/93	B07V09	1.00 U	20.00 U		
699-43-41E	1/25/93	B07V13				20.00 U
699-43-41F	12/05/89	H000DGG8			10.00 U	
699-43-41F	12/05/89	H000DGG8				10.00 U
699-43-41F	1/25/90	H000DGH2			10.00 U	
699-43-41F	1/25/90	H000DGH2				10.00 U
699-43-41F	4/18/90	H000DGH6			10.00 U	
699-43-41F	4/18/90	H000DGH6				10.00 U
699-43-41F	7/02/91	H00071Y5		20.00 UD		
699-43-41F	7/02/91	H00071Y5F				20.00 U
699-43-41F	5/05/92	B065R0	1.00 U	20.00 U		
699-43-41F	5/05/92	B065R9				20.00 U
699-43-41F	6/25/92	B06ZW7	1.00 U	20.00 U		
699-43-41F	6/25/92	B06ZX1				20.00 U
699-43-41F	1/22/93	B07V14	1.00 U	20.00 U		
699-43-41F	1/22/93	B07V18				20.00 U
699-43-41G	1/23/92	B01T74	1.00 U	20.00 U		
699-43-41G	1/23/92	B01T75				20.00 U
699-43-41G	4/17/92	B065W1	1.00 UQ	20.00 U		
699-43-41G	4/17/92	B065W6				20.00 U
699-43-41G	6/26/92	B07007	1.00 U	20.00 U		
699-43-41G	6/26/92	B07011				20.00 U

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
699-43-41G	10/28/92	B07JL8	1.00 U	20.00 U		
699-43-41G	10/28/92	B07JM2				20.00 U
699-43-41G	1/25/93	B07V74	1.00 U	20.00 U		
699-43-41G	1/25/93	B07V78				20.00 U
699-43-42J	11/22/88	H000DGP2			10.00 U	
699-43-42J	11/22/88	H000DGP2				10.00 U
699-43-42J	2/24/89	H000DGP6			10.00 U	
699-43-42J	2/24/89	H000DGP6				10.00 U
699-43-42J	6/15/89	H000DGQ0			10.00 U	
699-43-42J	6/15/89	H000DGQ0				10.00 U
699-43-42J	8/09/89	H000DGQ4			10.00 U	
699-43-42J	8/09/89	H000DGQ4				10.00 U
699-43-42J	8/09/89	H000DGQ7			10.00 U	
699-43-42J	8/09/89	H000DGQ7				10.00 U
699-43-42J	7/02/91	H00071Y6		20.00 UD		
699-43-42J	7/02/91	H00071Y6F				20.00 U
699-43-42J	1/31/92	B01S49	1.00 U	20.00 UD		
699-43-42J	1/31/92	B01S51				20.00 UD
699-43-42J	6/25/92	B07012	1.00 U	20.00 U		
699-43-42J	6/25/92	B07016				20.00 U
699-43-42J	1/21/93	B07V19	1.00 U	20.00 U		
699-43-42J	1/21/93	B07V23				20.00 U
699-43-43	11/21/88	H000DGR3			10.00 U	
699-43-43	11/21/88	H000DGR3				10.00 U
699-43-43	2/24/89	H000DGR7			10.00 U	
699-43-43	2/24/89	H000DGR7				10.00 U
699-43-43	2/24/89	H000DGS0			10.00 U	
699-43-43	2/24/89	H000DGS0				10.00 U
699-43-43	6/15/89	H000DGS1			10.00 U	
699-43-43	6/15/89	H000DGS1				10.00 U
699-43-43	8/09/89	H000DGS5			10.00 U	
699-43-43	8/09/89	H000DGS5				10.00 U
699-43-43	1/26/90	H000DGS9			10.00 U	
699-43-43	1/26/90	H000DGS9				10.00 U
699-43-43	7/08/91	H00071Y7		22.00		
699-43-43	7/08/91	H00071Y7F				20.00 U
699-43-43	1/24/92	B01Q67		20.00 UD		
699-43-43	1/24/92	B01Q68				20.00 UD
699-43-43	1/24/92	B01T83	1.00 U			
699-43-43	4/22/92	B065N6	1.00 U	20.00 U		
699-43-43	4/22/92	B065N7				20.00 U
699-43-43	6/26/92	B070W0	1.00	20.00 UD		
699-43-43	6/26/92	B070W1				20.00 U

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
699-43-43	10/26/92	B07JG5	1.00 U	20.00 U		
699-43-43	10/26/92	B07JG6				20.00 U
699-43-43	1/13/93	B07V24	1.00 U	20.00 U		
699-43-43	1/13/93	B07V28				20.00 U
699-43-45	12/06/89	H000DGT4			10.00 U	
699-43-45	12/06/89	H000DGT4				10.00 U
699-43-45	1/26/90	H000DGT8			10.00 U	
699-43-45	1/26/90	H000DGT8				10.00 U
699-43-45	4/18/90	H000DGV2			10.00 U	
699-43-45	4/18/90	H000DGV2				10.00 U
699-43-45	7/08/91	H00071Y8		20.00 U		
699-43-45	7/08/91	H00071Y8F				20.00 U
699-43-45	9/11/91	B00LG5		26.00		
699-43-45	9/11/91	B00LG5F				20.00 U
699-43-45	1/24/92	B01QD0	1.00 U	20.00 UD		
699-43-45	1/24/92	B01QD1				20.00 UD
699-43-45	4/22/92	B065N8	1.00 U	20.00 U		
699-43-45	4/22/92	B065N9				20.00 U
699-43-45	6/26/92	B070W2	1.00	20.00 UD		
699-43-45	6/26/92	B070W3				20.00 U
699-43-45	10/26/92	B07JG7	1.00 U	20.00 U		
699-43-45	10/26/92	B07JG8				20.00 U
699-43-45	1/13/93	B07V29	1.00 U	20.00 U		
699-43-45	1/13/93	B07V33				20.00 U
699-44-39B	1/08/93	B07WK1	1.00 U	20.00 U		
699-44-39B	1/08/93	B07WK5				20.00 U
699-44-42	11/21/88	H000DHK2			10.00 U	
699-44-42	11/21/88	H000DHK2				10.00 U
699-44-42	2/17/89	H000DHK6			10.00 U	
699-44-42	2/17/89	H000DHK6				10.00 U
699-44-42	6/15/89	H000DHL0			10.00 U	
699-44-42	6/15/89	H000DHL0				10.00 U
699-44-42	8/08/89	H000DHL4			10.00 U	
699-44-42	8/08/89	H000DHL4				10.00 U
699-44-42	1/31/90	H000DHL8			10.00 U	
699-44-42	1/31/90	H000DHL8				10.00 U
699-44-42	7/10/91	H00071Y9		20.00 U		
699-44-42	7/10/91	H00071Y9F				20.00 U
699-44-42	1/31/92	B01S52	1.00 U	20.00 UD		
699-44-42	1/31/92	B01S54				20.00 UD
699-44-42	6/25/92	B07017	1.00 U	20.00 U		
699-44-42	6/25/92	B07021				20.00 U
699-44-42	1/13/93	B07V34	1.00 U	20.00 U		

Well Name	Collection Date	Sample Number	COLIFORM 144/COL 1/1	COPPER 34/ppb 20/1000s	COPPER 35/ppb ./1000s	FCOPPER 34/ppb 20/1000s
699-44-42	1/13/93	B07V35	1.00 U	20.00 U		
699-44-42	1/13/93	B07V42				20.00 U
699-44-42	1/13/93	B07V43				20.00 U
699-44-43B	12/20/89	H000DHM3			10.00 U	
699-44-43B	12/20/89	H000DHM3				10.00 U
699-44-43B	12/20/89	H000DHM6			10.00 U	
699-44-43B	12/20/89	H000DHM6				10.00 U
699-44-43B	1/26/90	H000DHM7			10.00 U	
699-44-43B	1/26/90	H000DHM7				10.00 U
699-44-43B	1/26/90	H000DHN0			10.00 U	
699-44-43B	1/26/90	H000DHN0				10.00 U
699-44-43B	4/18/90	H000DHN1			10.00 U	
699-44-43B	4/18/90	H000DHN1				10.00 U
699-44-43B	7/08/91	H00071Z0		20.00 U		
699-44-43B	7/08/91	H00071Z0F				20.00 U
699-44-43B	9/11/91	B00LG6		20.00 U		
699-44-43B	9/11/91	B00LG6F				20.00 U
699-44-43B	1/23/92	B01Q69	1.00 U	20.00 U		
699-44-43B	1/23/92	B01Q70				20.00 U
699-44-43B	4/20/92	B065W9	1.00 U	22.00		
699-44-43B	4/20/92	B065X5				20.00 U
699-44-43B	6/26/92	B01MT4				20.00 U
699-44-43B	6/26/92	B07022	1.00 U	20.00 U		
699-44-43B	6/26/92	B07023	1.00	20.00 U		
699-44-43B	6/26/92	B07026				20.00 U
699-44-43B	1/27/93	B07V44	1.00 U	20.00 U		
699-44-43B	1/27/93	B07V48				20.00 U

Well Name	Collection Date	Sample Number	EU-154 140/pCi/L ./.	EU-155 140/pCi/L ./.	FLUORID 124/ppb 100/4000	FLUORIN 46/ppb ./4000
299-E18-1	8/16/88	H0007ZT7				500.00 U
299-E18-1	11/10/88	H0007ZV2				500.00 U
299-E18-1	11/10/88	H0007ZV5				500.00 U
299-E18-1	2/15/89	H0007ZV8				500.00 U
299-E18-1	5/26/89	H0007ZW2				500.00
299-E18-1	8/08/89	H0007ZW6				600.00
299-E18-1	10/31/89	H0007ZX0				500.00
299-E18-1	5/30/90	H0007ZX5				500.00
299-E18-1	7/09/91	H00071X9			590.00	

Well Name	Collection Date	Sample Number	EU-154 140/pCi/L ./.	EU-155 140/pCi/L ./.	FLUORID 124/ppb 100/4000	FLUORIN 46/ppb ./4000
299-E18-1	9/06/91	B00LB6	-1.58 U	6.01		
299-E18-1	1/24/92	B01Q59			500.00	
299-E18-1	6/03/92	B06PH8			500.00	
299-E18-1	12/16/92	B07S32			500.00	
299-E32-4	9/27/88	H0008ZB8				500.00 U
299-E32-4	12/28/88	H0008ZC2				600.00
299-E32-4	3/01/89	H0008ZC6				500.00
299-E32-4	3/13/89	H0008ZD0				600.00
299-E32-4	6/16/89	H0008ZD4				600.00
299-E32-4	7/19/89	H0008ZD8				580.00
299-E32-4	9/08/89	H0008ZF6				600.00
299-E32-4	1/17/90	H0008ZG0				500.00
299-E32-4	5/09/90	H0008ZG9				600.00
299-E32-4	8/05/91	H0007264	7.92 U	-3.29 U		
299-E32-4	9/23/91	B00LK5	6.32	-.73 U		
299-E32-4	1/15/92	B01QK6			600.00	
299-E32-4	4/06/92	B06696			600.00	
299-E32-4	4/09/92	B065B6			600.00	
299-E32-4	7/14/92	B07173			700.00	
699-40-36	12/21/92	B07TB1			900.00	
699-40-36	2/22/93	B08717			900.00	
699-40-39	12/05/89	H000DBX2				700.00
699-40-39	1/25/90	H000DBX6				700.00
699-40-39	4/25/90	H000DBY0				700.00
699-40-39	7/08/91	H00071Y4			900.00	
699-40-39	1/31/92	B01Q65			800.00	
699-40-39	4/17/92	B065P2			800.00 D	
699-40-39	6/24/92	B06ZT7			700.00	
699-40-39	1/14/93	B07TX4			700.00	
699-40-40A	1/24/92	B01T62			800.00	
699-40-40A	4/22/92	B065Q8			900.00	
699-40-40A	6/25/92	B06ZV2			800.00	
699-40-40A	10/21/92	B07JK3			900.00	
699-40-40A	1/26/93	B07V49			800.00	
699-40-40B	1/24/92	B01T64			600.00	
699-40-40B	4/22/92	B065S0			800.00	
699-40-40B	6/29/92	B06ZW2			600.00 D	
699-40-40B	10/21/92	B07JK8			500.00	
699-40-40B	1/26/93	B07V54			500.00	
699-41-35	12/21/92	B07TB9			800.00	
699-41-35	2/22/93	B08707			1000.00	
699-41-40	12/05/89	H000DD44				600.00
699-41-40	1/25/90	H000DD48				600.00

Well Name	Collection Date	Sample Number	EU-154 140/pCi/L ./.	EU-155 140/pCi/L ./.	FLUORID 124/ppb 100/4000	FLUORIN 46/ppb ./4000
699-41-40	4/19/90	H000DD52				500.00
699-41-40	7/10/91	H00071Y1			790.00	
699-41-40	1/31/92	B01QC8			700.00	
699-41-40	4/28/92	B065S5			700.00 D	
699-41-40	4/28/92	B065S6			700.00 D	
699-41-40	6/24/92	B06ZX2			700.00	
699-41-40	1/14/93	B07TX9			600.00	
699-41-42	1/08/93	B07V59			600.00	
699-42-37	12/22/92	B07TC4			700.00	
699-42-37	2/23/93	B08712			900.00	
699-42-39A	1/23/92	B01T66			600.00 P	
699-42-39A	4/17/92	B065T1			900.00 P	
699-42-39A	6/25/92	B06ZX7			700.00 P	
699-42-39A	10/21/92	B07JL3			700.00 P	
699-42-39A	1/27/93	B07V64			800.00 P	
699-42-39B	1/23/92	B01T68			500.00	
699-42-39B	4/17/92	B065T6			900.00	
699-42-39B	6/25/92	B06ZY2			700.00	
699-42-39B	10/28/92	B07JJ2			800.00	
699-42-39B	10/28/92	B07JJ3			800.00	
699-42-39B	1/25/93	B07V69			700.00	
699-42-40A	8/22/85	H000DF11				620.00
699-42-40A	5/12/86	H000DF27				500.00 U
699-42-40A	8/05/86	H000DF33				500.00 U
699-42-40A	1/08/88	H000DF55				500.00 U
699-42-40A	11/22/88	H000DF60				500.00 U
699-42-40A	2/15/89	H000DF65				500.00 U
699-42-40A	5/31/89	H000DF70				500.00 U
699-42-40A	8/10/89	H000DF74				500.00
699-42-40A	1/26/90	H000DF78				500.00 U
699-42-40A	7/08/91	H00071Y2			180.00	
699-42-40A	1/23/92	B01Q61			100.00 U	
699-42-40A	6/25/92	B06ZY7			100.00	
699-42-41	1/24/92	B01T70			100.00 P	
699-42-41	4/17/92	B065V1			200.00 P	
699-42-41	6/29/92	B06ZZ2			100.00 PD	
699-42-41	1/25/93	B07TZ4			100.00 UP	
699-42-42B	11/22/88	H000DFT3				500.00 U
699-42-42B	2/24/89	H000DFT7				500.00 U
699-42-42B	6/16/89	H000DFV1				600.00
699-42-42B	6/16/89	H000DFV4				600.00
699-42-42B	8/09/89	H000DFV5				500.00 U
699-42-42B	7/08/91	H00071Y3			560.00	

Well Name	Collection Date	Sample Number	EU-154 140/pCi/L ./.	EU-155 140/pCi/L ./.	FLUORID 124/ppb 100/4000	FLUORIN 46/ppb ./4000
699-42-42B	1/24/92	B01Q63			500.00	
699-42-42B	6/24/92	B06ZZ7			500.00	
699-42-42B	1/21/93	B07TZ9			500.00	
699-43-40	1/31/92	B01T72			600.00 P	
699-43-40	4/28/92	B065V6			500.00 PD	
699-43-40	6/26/92	B07002			500.00 P	
699-43-40	1/25/93	B07V04			400.00 P	
699-43-41E	12/05/89	H000DGD6				500.00
699-43-41E	1/25/90	H000DGF0				500.00 U
699-43-41E	5/15/90	H000DGF9				500.00
699-43-41E	5/15/90	H000DGG2				500.00 U
699-43-41E	6/28/91	H0007203			720.00	
699-43-41E	6/28/91	H0007204			690.00	
699-43-41E	1/23/92	B01QC3			400.00	
699-43-41E	4/17/92	B065P4			700.00	
699-43-41E	6/24/92	B06ZV3			500.00	
699-43-41E	1/25/93	B07V09			500.00	
699-43-41F	12/05/89	H000DGG8				500.00 U
699-43-41F	1/25/90	H000DGH2				500.00 U
699-43-41F	4/18/90	H000DGH6				500.00 U
699-43-41F	7/02/91	H00071Y5			620.00	
699-43-41F	5/05/92	B065R0			500.00	
699-43-41F	6/25/92	B06ZW7			500.00	
699-43-41F	1/22/93	B07V14			500.00	
699-43-41G	1/23/92	B01T74			400.00	
699-43-41G	4/17/92	B065W1			700.00	
699-43-41G	6/26/92	B07007			600.00	
699-43-41G	10/28/92	B07JL8			700.00	
699-43-41G	1/25/93	B07V74			500.00	
699-43-42J	11/22/88	H000DGP2				500.00 U
699-43-42J	2/24/89	H000DGP6				500.00 U
699-43-42J	6/15/89	H000DGQ0				500.00 U
699-43-42J	8/09/89	H000DGQ4				500.00 U
699-43-42J	8/09/89	H000DGQ7				500.00 U
699-43-42J	1/31/90	H000DGQ9				500.00 U
699-43-42J	7/02/91	H00071Y6			560.00	
699-43-42J	1/31/92	B01S49			500.00	
699-43-42J	6/25/92	B07012			500.00	
699-43-42J	1/21/93	B07V19			600.00	
699-43-43	11/21/88	H000DGR3				500.00 U
699-43-43	2/24/89	H000DGR7				500.00 U
699-43-43	2/24/89	H000DGS0				500.00 U
699-43-43	6/15/89	H000DGS1				500.00 U

Well Name	Collection Date	Sample Number	EU-154 140/pCi/L ./.	EU-155 140/pCi/L ./.	FLUORID 124/ppb 100/4000	FLUORIN 46/ppb ./4000
699-43-43	8/09/89	H000DGS5				500.00 U
699-43-43	1/26/90	H000DGS9				500.00 U
699-43-43	7/08/91	H00071Y7			280.00	
699-43-43	1/24/92	B01Q67			200.00	
699-43-43	4/22/92	B065N6			300.00	
699-43-43	6/26/92	B070W0			200.00	
699-43-43	10/26/92	B07JG5			200.00	
699-43-43	1/13/93	B07V24			200.00	
699-43-45	12/06/89	H000DGT4				500.00 U
699-43-45	1/26/90	H000DGT8				500.00 U
699-43-45	4/18/90	H000DGV2				500.00 U
699-43-45	7/08/91	H00071Y8			420.00	
699-43-45	1/24/92	B01QD0			400.00	
699-43-45	4/22/92	B065N8			300.00	
699-43-45	6/26/92	B070W2			300.00	
699-43-45	10/26/92	B07JG7			300.00	
699-43-45	1/13/93	B07V29			300.00	
699-44-39B	1/08/93	B07WK1			200.00	
699-44-42	11/21/88	H000DHK2				500.00 U
699-44-42	2/17/89	H000DHK6				500.00 U
699-44-42	6/15/89	H000DHL0				500.00 U
699-44-42	8/08/89	H000DHL4				500.00 U
699-44-42	1/31/90	H000DHL8				500.00 U
699-44-42	7/10/91	H00071Y9			350.00	
699-44-42	1/31/92	B01S52			300.00	
699-44-42	6/25/92	B07017			300.00	
699-44-42	1/13/93	B07V34			300.00	
699-44-42	1/13/93	B07V35			300.00	
699-44-43B	12/20/89	H000DHM3				500.00 U
699-44-43B	12/20/89	H000DHM6				500.00 U
699-44-43B	1/26/90	H000DHM7				500.00 U
699-44-43B	1/26/90	H000DHN0				500.00 U
699-44-43B	4/18/90	H000DHN1				500.00 U
699-44-43B	7/08/91	H00071Z0			580.00	
699-44-43B	1/23/92	B01Q69			300.00	
699-44-43B	4/20/92	B065W9			700.00	
699-44-43B	6/26/92	B07022			500.00	
699-44-43B	6/26/92	B07023			500.00	
699-44-43B	1/27/93	B07V44			600.00	

Well Name	Collection Date	Sample Number	ALPHA 135/pCi/L ./15	ALPHA 77/pCi/L ./15	BETA 136/pCi/L ./50	BETA 77/pCi/L ./50
299-E18-1	8/16/88	H0007ZT7		2.21		3.89
299-E18-1	11/10/88	H0007ZV2		3.83		8.45
299-E18-1	11/10/88	H0007ZV5		3.90		10.70
299-E18-1	2/15/89	H0007ZV8		4.87		6.85
299-E18-1	5/26/89	H0007ZW2		5.53		6.58
299-E18-1	8/08/89	H0007ZW6		5.53		7.46
299-E18-1	10/31/89	H0007ZX0		4.52		8.50
299-E18-1	9/06/91	B00LB6	1.62		6.29	
299-E18-1	6/03/92	B06PH8	1.68		7.49	
299-E18-1	12/16/92	B07S32	4.71		8.46	
299-E32-4	9/27/88	H0008ZB8		4.59		9.22
299-E32-4	12/28/88	H0008ZC2		2.09		6.50
299-E32-4	3/01/89	H0008ZC6		4.25		5.99
299-E32-4	3/13/89	H0008ZD0		5.89		3.72
299-E32-4	6/16/89	H0008ZD4		4.82		9.12
299-E32-4	7/19/89	H0008ZD8		7.93		10.00
299-E32-4	9/08/89	H0008ZF6		3.00		6.57
299-E32-4	1/17/90	H0008ZG0		6.76		5.31
299-E32-4	5/09/90	H0008ZG9		6.93		8.81
299-E32-4	8/05/91	H0007264	4.66		10.10	
299-E32-4	9/23/91	B00LK5	5.85		7.49	
299-E32-4	1/15/92	B01QK6	2.79		7.19	
299-E32-4	4/06/92	B06696	3.28		4.46	
299-E32-4	7/14/92	B07173	2.76		6.82	
699-40-36	12/21/92	B07TB1	4.44		8.24	
699-40-36	2/22/93	B08717	1.47		8.77	
699-40-39	12/05/89	H000DBX2		3.74		5.98
699-40-39	1/25/90	H000DBX6		2.62		5.43
699-40-39	4/25/90	H000DBY0		3.13		5.52
699-40-39	7/08/91	H00071Y4	1.88		6.22	
699-40-39	9/11/91	B00LG1	2.09		5.87	
699-40-39	1/31/92	B01Q65	2.84		4.47	
699-40-39	4/17/92	B065P2	2.36		4.32	
699-40-39	6/24/92	B06ZT7	1.79		3.33	
699-40-39	1/14/93	B07TX4	3.27		5.08	
699-40-40A	1/24/92	B01T62	2.89		7.44	
699-40-40A	4/22/92	B065Q8	.49 U		5.27	
699-40-40A	6/25/92	B06ZV2	1.80		6.73	
699-40-40A	10/21/92	B07JK3	1.07 U		5.61	
699-40-40A	1/26/93	B07V49	.11 U		7.14	
699-40-40B	1/24/92	B01T64	5.87		13.10	
699-40-40B	4/22/92	B065S0	1.69		4.72	
699-40-40B	6/29/92	B06ZW2	.89 U		4.37	

Well Name	Collection Date	Sample Number	ALPHA 135/pCi/L ./15	ALPHA 77/pCi/L ./15	BETA 136/pCi/L ./50	BETA 77/pCi/L ./50
699-40-40B	10/21/92	B07JK8	1.02 U		2.30	
699-40-40B	1/26/93	B07V54	.97 U		4.71	
699-41-35	12/21/92	B07TB9	7.40		8.37	
699-41-35	2/22/93	B08707	1.88		4.47	
699-41-40	12/05/89	H000DD44		4.63		6.78
699-41-40	1/25/90	H000DD48		2.42		4.67
699-41-40	4/19/90	H000DD52		2.72		7.11
699-41-40	7/10/91	H00071Y1	2.39		4.93	
699-41-40	9/11/91	B00LG2	2.96		2.59	
699-41-40	1/31/92	B01QC8	2.24		4.74	
699-41-40	4/28/92	B065S5	3.52		3.34	
699-41-40	4/28/92	B065S6	2.49		3.40	
699-41-40	6/24/92	B06ZX2	4.03		6.20	
699-41-40	1/14/93	B07TX9	3.76		2.74	
699-41-42	1/08/93	B07V59	5.00		9.08	
699-42-37	12/22/92	B07TC4	6.09		4.32	
699-42-37	2/23/93	B08712	4.03		5.23	
699-42-39A	1/23/92	B01T66	2.70 P		6.39 P	
699-42-39A	4/17/92	B065T1	5.82 P		6.82 P	
699-42-39A	6/25/92	B06ZX7	4.10 P		6.48 P	
699-42-39A	10/21/92	B07JL3	3.35 P		6.35 P	
699-42-39A	1/27/93	B07V64	3.41 P		3.95 P	
699-42-39B	1/23/92	B01T68	3.66		7.11	
699-42-39B	4/17/92	B065T6	1.59		5.55	
699-42-39B	6/25/92	B06ZY2	1.44		5.90	
699-42-39B	10/28/92	B07JJ2	2.77		6.80 Q	
699-42-39B	10/28/92	B07JJ3	2.87		4.35 Q	
699-42-39B	1/25/93	B07V69	1.67		8.00	
699-42-40A	2/03/83	H000DDX8				159.00
699-42-40A	2/28/83	H000DDX9				14.30
699-42-40A	3/28/83	H000DDY0				-.26
699-42-40A	4/14/83	H000DDY2				3.05
699-42-40A	5/12/83	H000DDY3				-1.79
699-42-40A	6/16/83	H000DDY4				9.04
699-42-40A	7/14/83	H000DDY5				-1.84
699-42-40A	8/19/83	H000DDY6				11.80
699-42-40A	9/27/83	H000DDY7				9.09
699-42-40A	10/12/83	H000DDY8				32.90
699-42-40A	11/07/83	H000DDY9				0.00
699-42-40A	12/09/83	H000DDZ0				73.50
699-42-40A	1/24/84	H000DDZ1				18.90
699-42-40A	2/28/84	H000DDZ2				3.07
699-42-40A	4/10/84	H000DDZ3				37.30

Well Name	Collection Date	Sample Number	ALPHA 135/pCi/L ./15	ALPHA 77/pCi/L ./15	BETA 136/pCi/L ./50	BETA 77/pCi/L ./50
699-42-40A	4/26/84	H000DDZ4				-20.90
699-42-40A	5/15/84	H000DDZ5				-7.81
699-42-40A	6/05/84	H000DDZ6				-2.42
699-42-40A	7/19/84	H000DDZ7				25.10
699-42-40A	8/10/84	H000DDZ8				-5.87
699-42-40A	9/11/84	H000DDZ9				18.70
699-42-40A	10/09/84	H000DF00				-31.30
699-42-40A	11/13/84	H000DF01				6.87
699-42-40A	12/12/84	H000DF02				4.51
699-42-40A	1/16/85	H000DF03		1.21		3.51
699-42-40A	2/11/85	H000DF04		.70		4.31
699-42-40A	3/14/85	H000DF05		2.12		5.34
699-42-40A	4/04/85	H000DF06		1.11		3.69
699-42-40A	5/03/85	H000DF07		1.75		5.00
699-42-40A	6/11/85	H000DF09		1.07		5.92
699-42-40A	7/11/85	H000DF10		.05 U		3.36
699-42-40A	8/22/85	H000DF11		.39 U		7.56
699-42-40A	8/22/85	H000DF15		.47		1.18 U
699-42-40A	10/07/85	H000DF16		.82		3.05
699-42-40A	11/02/85	H000DF17		2.40		-2.50
699-42-40A	11/06/85	H000DF18		.40		5.56
699-42-40A	12/14/85	H000DF20		.27 U		5.26
699-42-40A	1/09/86	H000DF21		.97		6.33
699-42-40A	2/07/86	H000DF23		.86		5.97
699-42-40A	3/07/86	H000DF24		.86		3.60
699-42-40A	4/11/86	H000DF25		.61		3.62
699-42-40A	5/06/86	H000DF26		.47		3.98
699-42-40A	5/12/86	H000DF27		.76 U		8.03
699-42-40A	6/06/86	H000DF31		.27 U		6.15
699-42-40A	7/02/86	H000DF32		.74		6.52
699-42-40A	8/05/86	H000DF33		.39 U		26.00
699-42-40A	8/05/86	H000DF37		.35		5.46
699-42-40A	9/05/86	H000DF38		.33		5.52
699-42-40A	10/24/86	H000DF39		.50		4.13
699-42-40A	11/04/86	H000DF40		1.03		4.50
699-42-40A	12/10/86	H000DF41		1.86		4.84
699-42-40A	1/15/87	H000DF42		1.23		3.66
699-42-40A	2/13/87	H000DF43		1.67		5.10
699-42-40A	3/07/87	H000DF44		.80		3.85
699-42-40A	4/06/87	H000DF46		.93		3.32
699-42-40A	5/08/87	H000DF47		.47		3.79
699-42-40A	6/04/87	H000DF48		.79		4.21
699-42-40A	7/09/87	H000DF49		.03 U		4.52

Well Name	Collection Date	Sample Number	ALPHA 135/pCi/L ./15	ALPHA 77/pCi/L ./15	BETA 136/pCi/L ./50	BETA 77/pCi/L ./50
699-42-40A	8/11/87	H000DF50		.27 U		4.97
699-42-40A	9/09/87	H000DF51		.18 U		4.86
699-42-40A	10/06/87	H000DF52		.72		3.52
699-42-40A	11/04/87	H000DF53		.78		3.86
699-42-40A	12/01/87	H000DF54		.81		3.46
699-42-40A	1/08/88	H000DF56		.39		2.12
699-42-40A	5/23/88	H000DF57		.74		4.09
699-42-40A	7/19/88	H000DF58		.29 U		3.61
699-42-40A	11/15/88	H000DF59		.32 U		4.78
699-42-40A	11/22/88	H000DF60		.16 U		4.08
699-42-40A	2/06/89	H000DF64		1.07 U		3.97
699-42-40A	2/15/89	H000DF65		2.32		1.32 U
699-42-40A	4/07/89	H000DF69		-.38 U		5.12
699-42-40A	5/31/89	H000DF70		-.12 U		2.72
699-42-40A	8/10/89	H000DF74		2.98		12.70
699-42-40A	1/26/90	H000DF78		1.40		3.82
699-42-40A	7/08/91	H00071Y2	.57 U		3.13	
699-42-40A	6/25/92	B06ZY7	2.07		5.78	
699-42-41	1/24/92	B01T70	.89 P		4.56 P	
699-42-41	4/17/92	B065V1	1.33 P		1.38 UP	
699-42-41	6/29/92	B06ZZ2	1.02 P		2.81 P	
699-42-41	1/25/93	B07TZ4	.89 P		14.30 P	
699-42-42B	11/22/88	H000DFT3		1.37		5.48
699-42-42B	2/24/89	H000DFT7		.77 U		1.64 U
699-42-42B	6/16/89	H000DFV1		2.18		7.32
699-42-42B	6/16/89	H000DFV4		1.19 U		7.29
699-42-42B	8/09/89	H000DFV5		2.37		10.80
699-42-42B	1/26/90	H000DFW0		2.67		3.19
699-42-42B	7/08/91	H00071Y3	1.31		1.10 U	
699-42-42B	6/24/92	B06ZZ7	1.52		3.15	
699-42-42B	1/21/93	B07TZ9	2.56		3.00	
699-43-40	1/31/92	B01T72	3.91 P		7.64 P	
699-43-40	4/28/92	B065V6	1.93 P		4.21 P	
699-43-40	6/26/92	B07002	2.14 P		9.38 P	
699-43-40	1/25/93	B07V04	4.17 P		5.03 P	
699-43-41E	12/05/89	H000DGD6		4.21		6.69
699-43-41E	1/25/90	H000DGF0		2.35		3.24
699-43-41E	5/15/90	H000DGF9		1.68		6.82
699-43-41E	5/15/90	H000DGG2		2.35		2.74
699-43-41E	6/28/91	H0007203	4.88		11.60	
699-43-41E	6/28/91	H0007204	2.24		6.63	
699-43-41E	1/23/92	B01QC3	2.04		5.70	
699-43-41E	4/17/92	B065P4	1.79		3.31	

Well Name	Collection Date	Sample Number	ALPHA 135/pCi/L ./15	ALPHA 77/pCi/L ./15	BETA 136/pCi/L ./50	BETA 77/pCi/L ./50
699-43-41E	6/24/92	B06ZV3	1.94		7.13	
699-43-41E	1/25/93	B07V09	2.33		6.01	
699-43-41F	12/05/89	H000DGG8		3.11		10.20
699-43-41F	1/25/90	H000DGH2		2.09		2.19 U
699-43-41F	4/18/90	H000DGH6		4.44		5.94
699-43-41F	7/02/91	H00071Y5	2.86		5.48	
699-43-41F	5/05/92	B065R0	2.23		2.13 U	
699-43-41F	6/25/92	B06ZW7	2.78		3.45	
699-43-41F	1/22/93	B07V14	1.79		3.21	
699-43-41G	1/23/92	B01T74	2.15		10.80	
699-43-41G	4/17/92	B065W1	2.41		3.73	
699-43-41G	6/26/92	B07007	2.14		4.93	
699-43-41G	10/28/92	B07JL8	.96 U		4.60	
699-43-41G	1/25/93	B07V74	2.69		7.00	
699-43-42J	11/22/88	H000DGP2		.71 U		8.01
699-43-42J	2/24/89	H000DGP6		2.34		4.52
699-43-42J	6/15/89	H000DGQ0		1.62		7.18
699-43-42J	8/09/89	H000DGQ4		1.03		5.85
699-43-42J	8/09/89	H000DGQ7		1.91		5.57
699-43-42J	1/31/90	H000DGQ9		.20 U		4.02
699-43-42J	7/02/91	H00071Y6	1.74		4.29	
699-43-42J	1/31/92	B01S49	.64 U		2.30	
699-43-42J	6/25/92	B07012	2.25		4.35	
699-43-42J	1/21/93	B07V19	2.87		4.56	
699-43-43	11/21/88	H000DGR3		.96		7.05
699-43-43	2/24/89	H000DGR7		.30 U		3.99
699-43-43	2/24/89	H000DGS0		.41 U		4.23
699-43-43	6/15/89	H000DGS1		-.04 U		4.08
699-43-43	8/09/89	H000DGS5		.53 U		11.90
699-43-43	1/26/90	H000DGS9		.64 U		6.29
699-43-43	7/08/91	H00071Y7	.97		4.82	
699-43-43	1/24/92	B01T83	1.51		6.02	
699-43-43	4/22/92	B065N6	2.17		3.22	
699-43-43	6/26/92	B070W0	1.16		5.50	
699-43-43	10/26/92	B07JG5	1.66		8.02	
699-43-43	1/13/93	B07V24	.74 U		6.64	
699-43-45	12/06/89	H000DGT4		2.59		6.86
699-43-45	1/26/90	H000DGT8		1.47		5.84
699-43-45	4/18/90	H000DGV2		1.97		6.60
699-43-45	7/08/91	H00071Y8	1.03		4.67	
699-43-45	9/11/91	B00LG5	.69 U		6.36	
699-43-45	1/24/92	B01QD0	.81 U		1.69 U	
699-43-45	4/22/92	B065N8	1.96		4.18	

Well Name	Collection Date	Sample Number	ALPHA 135/pCi/L ./15	ALPHA 77/pCi/L ./15	BETA 136/pCi/L ./50	BETA 77/pCi/L ./50
699-43-45	6/26/92	B070W2	1.89		3.78	
699-43-45	10/26/92	B07JG7	1.70		4.48	
699-43-45	1/13/93	B07V29	1.60		5.16	
699-44-39B	1/08/93	B07WK1	2.25		4.93	
699-44-42	11/21/88	H000DHK2		.08 U		7.57
699-44-42	2/17/89	H000DHK6		1.56		3.89
699-44-42	6/15/89	H000DHL0		.79 U		6.07
699-44-42	8/08/89	H000DHL4		1.36		5.94
699-44-42	1/31/90	H000DHL8		1.65		4.16
699-44-42	7/10/91	H00071Y9	.21 U		4.13	
699-44-42	1/31/92	B01S52	1.84		5.65	
699-44-42	6/25/92	B07017	1.40		3.45	
699-44-42	1/13/93	B07V34	1.44		5.60 Q	
699-44-42	1/13/93	B07V35	2.39		10.50 Q	
699-44-43B	12/20/89	H000DHM3		2.26		7.79
699-44-43B	12/20/89	H000DHM6		1.61		5.18
699-44-43B	1/26/90	H000DHM7		2.97		7.04
699-44-43B	1/26/90	H000DHN0		2.01		4.47
699-44-43B	4/18/90	H000DHN1		3.09		5.50
699-44-43B	7/08/91	H00071Z0	2.28		5.54	
699-44-43B	9/11/91	B00LG6	2.24		3.44	
699-44-43B	1/23/92	B01Q69	3.49		4.06	
699-44-43B	4/20/92	B065W9	2.26		3.88	
699-44-43B	6/26/92	B07022	2.75		4.97	
699-44-43B	6/26/92	B07023	1.59		5.94	
699-44-43B	1/27/93	B07V44	4.32		5.64	

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
299-E18-1	8/16/88	H0007ZT7			1250.00	
299-E18-1	8/16/88	H0007ZT7				33.00
299-E18-1	9/22/88	H0007ZV1			1810.00	
299-E18-1	9/22/88	H0007ZV1				30.00 U
299-E18-1	11/10/88	H0007ZV2			355.00	
299-E18-1	11/10/88	H0007ZV2				30.00 U
299-E18-1	11/10/88	H0007ZV5			265.00	
299-E18-1	11/10/88	H0007ZV5				30.00 U
299-E18-1	2/15/89	H0007ZV8			162.00	
299-E18-1	2/15/89	H0007ZV8				30.00 U

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
299-E18-1	5/26/89	H0007ZW2			546.00	
299-E18-1	5/26/89	H0007ZW2				30.00 U
299-E18-1	8/08/89	H0007ZW6			531.00	
299-E18-1	8/08/89	H0007ZW6				30.00 U
299-E18-1	10/31/89	H0007ZX0			802.00	
299-E18-1	10/31/89	H0007ZX0				35.00
299-E18-1	7/09/91	H00071X9		1100.00		
299-E18-1	7/09/91	H00071X9F				49.00
299-E18-1	9/06/91	B00LB6		600.00		
299-E18-1	9/06/91	B00LB6F				31.00
299-E18-1	1/24/92	B01Q59		430.00 D		
299-E18-1	1/24/92	B01Q60				40.00 D
299-E18-1	6/03/92	B06PC7	-.10 U			
299-E18-1	6/03/92	B06PH8		290.00		
299-E18-1	6/03/92	B06PJ2				56.00
299-E18-1	12/16/92	B07S32		910.00		
299-E18-1	12/16/92	B07S36				30.00
299-E32-4	9/27/88	H0008ZB8			123.00	
299-E32-4	9/27/88	H0008ZB8				34.00
299-E32-4	12/28/88	H0008ZC2			197.00	
299-E32-4	12/28/88	H0008ZC2				30.00 U
299-E32-4	3/01/89	H0008ZC6			299.00	
299-E32-4	3/01/89	H0008ZC6				30.00 U
299-E32-4	3/13/89	H0008ZD0			267.00	
299-E32-4	3/13/89	H0008ZD0				41.00
299-E32-4	6/16/89	H0008ZD4			899.00	
299-E32-4	6/16/89	H0008ZD4				30.00 U
299-E32-4	7/19/89	H0008ZD8			368.00	
299-E32-4	7/19/89	H0008ZD8				32.00
299-E32-4	9/08/89	H0008ZF6			399.00	
299-E32-4	9/08/89	H0008ZF6				30.00 U
299-E32-4	1/17/90	H0008ZG0			844.00	
299-E32-4	1/17/90	H0008ZG0				38.00
299-E32-4	8/05/91	H00071Y0		1700.00 D		
299-E32-4	8/05/91	H00071Y0F				78.00
299-E32-4	8/05/91	H0007264		1400.00 QD		
299-E32-4	8/05/91	H0007264F				200.00 Q
299-E32-4	9/23/91	B00LK5		300.00		
299-E32-4	9/23/91	B00LK5F				24.00
299-E32-4	1/15/92	B01QK6		550.00 Q		
299-E32-4	1/15/92	B01QK8				33.00 Q
299-E32-4	4/06/92	B06696		190.00		
299-E32-4	4/06/92	B06697				20.00 U

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
299-E32-4	4/09/92	B065B6	.06 U			
299-E32-4	7/14/92	B07173		360.00		
299-E32-4	7/14/92	B07174				25.00
699-40-36	12/21/92	B07TB1	.01 U	550.00		
699-40-36	12/21/92	B07TB8				80.00
699-40-36	2/22/93	B08717		580.00		
699-40-36	2/22/93	B08721				40.00
699-40-39	12/05/89	H000DBX2			715.00	
699-40-39	12/05/89	H000DBX2				30.00 U
699-40-39	1/25/90	H000DBX6			448.00	
699-40-39	1/25/90	H000DBX6				51.00
699-40-39	4/25/90	H000DBY0			280.00	
699-40-39	4/25/90	H000DBY0				39.00
699-40-39	7/08/91	H00071Y4F				230.00
699-40-39	9/11/91	B00LG1		500.00		
699-40-39	9/11/91	B00LG1F				92.00
699-40-39	1/31/92	B01Q65		2700.00 D		
699-40-39	1/31/92	B01Q66				71.00 D
699-40-39	4/17/92	B065P2		130.00 Q		
699-40-39	4/17/92	B065Q4				20.00 UQ
699-40-39	6/24/92	B06ZT7		250.00		
699-40-39	6/24/92	B06ZV1				56.00
699-40-39	1/14/93	B07TX4		2600.00		
699-40-39	1/14/93	B07TX8				40.00
699-40-40A	1/24/92	B01T62		5500.00 D		
699-40-40A	1/24/92	B01T63				320.00 D
699-40-40A	4/22/92	B065Q8		1100.00		
699-40-40A	4/22/92	B065R8				470.00
699-40-40A	6/25/92	B06ZV2		940.00		
699-40-40A	6/25/92	B06ZW0				220.00
699-40-40A	10/21/92	B07JK3		500.00		
699-40-40A	10/21/92	B07JK7				120.00
699-40-40A	1/26/93	B07V49		430.00		
699-40-40A	1/26/93	B07V53				160.00
699-40-40B	1/01/92	B01T65				77.00 D
699-40-40B	1/24/92	B01T64		22000.00 D		
699-40-40B	4/22/92	B065S0		1400.00		
699-40-40B	4/22/92	B065S4				140.00
699-40-40B	6/29/92	B06ZW2		2000.00		
699-40-40B	6/29/92	B06ZW6				29.00
699-40-40B	10/21/92	B07JK8		2600.00		
699-40-40B	10/21/92	B07JL2				20.00 U
699-40-40B	1/26/93	B07V54		1400.00		

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
699-40-40B	1/26/93	B07V58				100.00
699-41-35	12/21/92	B07TB9	-.03 U	300.00		
699-41-35	12/21/92	B07TC3				20.00 U
699-41-35	2/22/93	B08707		270.00		
699-41-35	2/22/93	B08711				30.00
699-41-40	12/05/89	H000DD44			98.00	
699-41-40	12/05/89	H000DD44				30.00 U
699-41-40	1/25/90	H000DD48			795.00	
699-41-40	1/25/90	H000DD48				47.00
699-41-40	4/19/90	H000DD52			499.00	
699-41-40	4/19/90	H000DD52				164.00
699-41-40	7/10/91	H00071Y1		650.00		
699-41-40	7/10/91	H00071Y1F				140.00
699-41-40	9/11/91	B00LG2		570.00		
699-41-40	9/11/91	B00LG2F				66.00
699-41-40	1/31/92	B01QC8		2700.00 D		
699-41-40	1/31/92	B01QC9				63.00 D
699-41-40	4/28/92	B065S5		250.00		
699-41-40	4/28/92	B065S6		270.00		
699-41-40	4/28/92	B065S9				20.00 U
699-41-40	4/28/92	B065T0				20.00 U
699-41-40	6/24/92	B06ZX2		370.00		
699-41-40	6/24/92	B06ZX6				21.00
699-41-40	1/14/93	B07TX9		1200.00		
699-41-40	1/14/93	B07TY3				20.00 U
699-41-42	1/08/93	B07V59		360.00		
699-41-42	1/08/93	B07V63				30.00
699-42-37	12/22/92	B07TC4	.43	1200.00		
699-42-37	12/22/92	B07TC8				60.00
699-42-37	2/23/93	B08712		870.00		
699-42-37	2/23/93	B08716				40.00
699-42-39A	1/23/92	B01T66		910.00 P		
699-42-39A	1/23/92	B01T67				25.00 P
699-42-39A	4/17/92	B065T1		5300.00 PQ		
699-42-39A	4/17/92	B065T5				20.00 UP
699-42-39A	6/25/92	B06ZX7		4000.00 P		
699-42-39A	6/25/92	B06ZY1				47.00 P
699-42-39A	10/21/92	B07JL3		4300.00 P		
699-42-39A	10/21/92	B07JL7				80.00 P
699-42-39A	1/27/93	B07V64		1800.00 P		
699-42-39A	1/27/93	B07V68				20.00 UP
699-42-39B	1/23/92	B01T68		1900.00		
699-42-39B	1/23/92	B01T69				150.00

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
699-42-39B	4/17/92	B065T6		2600.00 Q		
699-42-39B	4/17/92	B065V0				20.00 UQ
699-42-39B	6/25/92	B06ZY2		1600.00		
699-42-39B	6/25/92	B06ZY6				64.00
699-42-39B	10/28/92	B07JJ2		560.00		
699-42-39B	10/28/92	B07JJ3		580.00		
699-42-39B	10/28/92	B07JJ6				30.00 QF
699-42-39B	10/28/92	B07JJ7				310.00 QF
699-42-39B	1/25/93	B07V69		1100.00		
699-42-39B	1/25/93	B07V73				20.00 U
699-42-40A	8/22/85	H000DF11			610.00	
699-42-40A	5/12/86	H000DF27			184.00	
699-42-40A	8/05/86	H000DF33			433.00	
699-42-40A	1/08/88	H000DF55			155.00	
699-42-40A	1/08/88	H000DF55				171.00
699-42-40A	11/22/88	H000DF60			309.00	
699-42-40A	11/22/88	H000DF60				57.00
699-42-40A	2/15/89	H000DF65			130.00	
699-42-40A	2/15/89	H000DF65				53.00
699-42-40A	5/31/89	H000DF70			124.00	
699-42-40A	5/31/89	H000DF70				46.00
699-42-40A	8/10/89	H000DF74			521.00	
699-42-40A	8/10/89	H000DF74				44.00
699-42-40A	1/26/90	H000DF78			175.00	
699-42-40A	1/26/90	H000DF78				49.00
699-42-40A	7/08/91	H00071Y2		1100.00		
699-42-40A	7/08/91	H00071Y2F				70.00
699-42-40A	1/08/92	B07TY8		4600.00		
699-42-40A	1/08/92	B07TZ3				180.00
699-42-40A	1/23/92	B01Q61		22000.00		
699-42-40A	1/23/92	B01Q62				63.00
699-42-40A	6/25/92	B06ZY7		6900.00		
699-42-40A	6/25/92	B06ZZ1				190.00
699-42-41	1/24/92	B01T70		910.00 PD		
699-42-41	1/24/92	B01T71				23.00 PD
699-42-41	4/17/92	B065V1		500.00 PQ		
699-42-41	4/17/92	B065V5				20.00 UPQ
699-42-41	6/29/92	B06ZZ2		1000.00 P		
699-42-41	6/29/92	B06ZZ6				20.00 UP
699-42-41	1/25/93	B07TZ4		100.00 P		
699-42-41	1/25/93	B07TZ8				20.00 UP
699-42-42B	11/22/88	H000DFT3			137.00	
699-42-42B	11/22/88	H000DFT3				30.00 U

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
699-42-42B	2/24/89	H000DFT7			221.00	
699-42-42B	2/24/89	H000DFT7				30.00 U
699-42-42B	6/16/89	H000DFV1			229.00	
699-42-42B	6/16/89	H000DFV1				30.00 U
699-42-42B	6/16/89	H000DFV4			237.00	
699-42-42B	6/16/89	H000DFV4				30.00 U
699-42-42B	8/09/89	H000DFV5			291.00	
699-42-42B	8/09/89	H000DFV5				30.00 U
699-42-42B	7/08/91	H00071Y3		420.00		
699-42-42B	7/08/91	H00071Y3F				37.00
699-42-42B	1/24/92	B01Q63		180.00 D		
699-42-42B	1/24/92	B01Q64				61.00 D
699-42-42B	6/24/92	B06ZZ7		89.00		
699-42-42B	6/24/92	B07001				49.00
699-42-42B	1/21/93	B07TZ9		290.00		
699-42-42B	1/21/93	B07V03				20.00 U
699-43-40	1/31/92	B01T72		1200.00 PD		
699-43-40	1/31/92	B01T73				30.00 PD
699-43-40	4/28/92	B065V6		500.00 P		
699-43-40	4/28/92	B065W0				20.00 UP
699-43-40	6/26/92	B07002		130.00 P		
699-43-40	6/26/92	B07006				41.00 P
699-43-40	1/25/93	B07V04		350.00 P		
699-43-40	1/25/93	B07V08				20.00 UP
699-43-41E	12/05/89	H000DGD6			417.00	
699-43-41E	12/05/89	H000DGD6				30.00
699-43-41E	1/25/90	H000DGF0			903.00	
699-43-41E	1/25/90	H000DGF0				37.00
699-43-41E	6/28/91	H0007203		550.00 D		
699-43-41E	6/28/91	H0007203F				110.00 Q
699-43-41E	6/28/91	H0007204		450.00 D		
699-43-41E	6/28/91	H0007204F				77.00 Q
699-43-41E	1/23/92	B01QC3		24.00		
699-43-41E	1/23/92	B01QC4				2300.00 F
699-43-41E	4/17/92	B065P4		1700.00 Q		
699-43-41E	4/17/92	B065Q6				20.00 UQ
699-43-41E	6/24/92	B06ZV3		380.00		
699-43-41E	6/24/92	B06ZW1				39.00
699-43-41E	1/25/93	B07V09		550.00		
699-43-41E	1/25/93	B07V13				20.00 U
699-43-41F	12/05/89	H000DGG8			1540.00	
699-43-41F	12/05/89	H000DGG8				157.00
699-43-41F	1/25/90	H000DGH2			925.00	

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
699-43-41F	1/25/90	H000DGH2				63.00
699-43-41F	4/18/90	H000DGH6			2820.00	
699-43-41F	4/18/90	H000DGH6				747.00
699-43-41F	7/02/91	H00071Y5		470.00 D		
699-43-41F	7/02/91	H00071Y5F				120.00
699-43-41F	5/05/92	B065R0		540.00		
699-43-41F	5/05/92	B065R9				26.00
699-43-41F	6/25/92	B06ZW7		2100.00		
699-43-41F	6/25/92	B06ZX1				58.00
699-43-41F	1/22/93	B07V14		30.00		
699-43-41F	1/22/93	B07V18				20.00 U
699-43-41G	1/23/92	B01T74		1900.00		
699-43-41G	1/23/92	B01T75				20.00 U
699-43-41G	4/17/92	B065W1		2500.00 Q		
699-43-41G	4/17/92	B065W6				20.00 UQ
699-43-41G	6/26/92	B07007		190.00		
699-43-41G	6/26/92	B07011				49.00
699-43-41G	10/28/92	B07JL8		250.00		
699-43-41G	10/28/92	B07JM2				30.00
699-43-41G	1/25/93	B07V74		270.00		
699-43-41G	1/25/93	B07V78				20.00 U
699-43-42J	11/22/88	H000DGP2			153.00	
699-43-42J	11/22/88	H000DGP2				30.00 U
699-43-42J	2/24/89	H000DGP6			216.00	
699-43-42J	2/24/89	H000DGP6				33.00
699-43-42J	6/15/89	H000DGQ0			199.00	
699-43-42J	6/15/89	H000DGQ0				30.00 U
699-43-42J	8/09/89	H000DGQ4			795.00	
699-43-42J	8/09/89	H000DGQ4				30.00 U
699-43-42J	8/09/89	H000DGQ7			436.00	
699-43-42J	8/09/89	H000DGQ7				30.00 U
699-43-42J	7/02/91	H00071Y6		170.00 D		
699-43-42J	7/02/91	H00071Y6F				54.00
699-43-42J	1/31/92	B01S49		730.00 D		
699-43-42J	1/31/92	B01S51				25.00 D
699-43-42J	6/25/92	B07012		910.00		
699-43-42J	6/25/92	B07016				83.00
699-43-42J	1/21/93	B07V19		370.00		
699-43-42J	1/21/93	B07V23				20.00 U
699-43-43	11/21/88	H000DGR3			231.00	
699-43-43	11/21/88	H000DGR3				30.00 U
699-43-43	2/24/89	H000DGR7			132.00	
699-43-43	2/24/89	H000DGR7				30.00 U

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
699-43-43	2/24/89	H000DGS0			98.00	
699-43-43	2/24/89	H000DGS0				31.00
699-43-43	6/15/89	H000DGS1			58.00	
699-43-43	6/15/89	H000DGS1				30.00 U
699-43-43	8/09/89	H000DGS5			73.00	
699-43-43	8/09/89	H000DGS5				30.00 U
699-43-43	1/26/90	H000DGS9			144.00	
699-43-43	1/26/90	H000DGS9				30.00 U
699-43-43	7/08/91	H00071Y7		340.00		
699-43-43	7/08/91	H00071Y7F				61.00
699-43-43	1/24/92	B01Q67		150.00 D		
699-43-43	1/24/92	B01Q68				97.00 D
699-43-43	4/22/92	B065N6		350.00		
699-43-43	4/22/92	B065N7				27.00
699-43-43	6/26/92	B070W0		150.00 D		
699-43-43	6/26/92	B070W1				44.00
699-43-43	10/26/92	B07JG5		390.00		
699-43-43	10/26/92	B07JG6				20.00 U
699-43-43	1/13/93	B07V24		180.00		
699-43-43	1/13/93	B07V28				20.00 U
699-43-45	12/06/89	H000DGT4			265.00	
699-43-45	12/06/89	H000DGT4				30.00 U
699-43-45	1/26/90	H000DGT8			479.00	
699-43-45	1/26/90	H000DGT8				30.00 U
699-43-45	4/18/90	H000DGV2			343.00	
699-43-45	4/18/90	H000DGV2				30.00 U
699-43-45	7/08/91	H00071Y8		650.00		
699-43-45	7/08/91	H00071Y8F				22.00
699-43-45	9/11/91	B00LG5		330.00		
699-43-45	9/11/91	B00LG5F				59.00
699-43-45	1/24/92	B01QD0		640.00 D		
699-43-45	1/24/92	B01QD1				23.00 D
699-43-45	4/22/92	B065N8		430.00		
699-43-45	4/22/92	B065N9				20.00 U
699-43-45	6/26/92	B070W2		66.00 D		
699-43-45	6/26/92	B070W3				38.00
699-43-45	10/26/92	B07JG7		500.00		
699-43-45	10/26/92	B07JG8				20.00 U
699-43-45	1/13/93	B07V29		400.00		
699-43-45	1/13/93	B07V33				20.00 U
699-44-39B	1/08/93	B07WK1		120.00		
699-44-39B	1/08/93	B07WK5				20.00 U
699-44-42	11/21/88	H000DHK2			104.00	

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s
699-44-42	11/21/88	H000DHK2				30.00 U
699-44-42	2/17/89	H000DHK6			44.00	
699-44-42	2/17/89	H000DHK6				30.00 U
699-44-42	6/15/89	H000DHL0			71.00	
699-44-42	6/15/89	H000DHL0				30.00 U
699-44-42	8/08/89	H000DHL4			127.00	
699-44-42	8/08/89	H000DHL4				30.00 U
699-44-42	1/31/90	H000DHL8			231.00	
699-44-42	1/31/90	H000DHL8				30.00 U
699-44-42	7/10/91	H00071Y9		190.00		
699-44-42	7/10/91	H00071Y9F				34.00
699-44-42	1/31/92	B01S52		290.00 D		
699-44-42	1/31/92	B01S54				21.00 D
699-44-42	6/25/92	B07017		590.00		
699-44-42	6/25/92	B07021				67.00
699-44-42	1/13/93	B07V34		130.00 Q		
699-44-42	1/13/93	B07V35		80.00 Q		
699-44-42	1/13/93	B07V42				20.00 U
699-44-42	1/13/93	B07V43				20.00 U
699-44-43B	12/20/89	H000DHM3			368.00	
699-44-43B	12/20/89	H000DHM3				157.00
699-44-43B	12/20/89	H000DHM6			562.00	
699-44-43B	12/20/89	H000DHM6				318.00
699-44-43B	1/26/90	H000DHM7			417.00	
699-44-43B	1/26/90	H000DHM7				30.00 U
699-44-43B	1/26/90	H000DHN0			463.00	
699-44-43B	1/26/90	H000DHN0				64.00
699-44-43B	4/18/90	H000DHN1			1060.00	
699-44-43B	4/18/90	H000DHN1				30.00 U
699-44-43B	7/08/91	H00071Z0		580.00		
699-44-43B	7/08/91	H00071Z0F				640.00
699-44-43B	9/11/91	B00LG6		290.00		
699-44-43B	9/11/91	B00LG6F				52.00
699-44-43B	1/23/92	B01Q69		20.00 U		
699-44-43B	1/23/92	B01Q70				680.00 F
699-44-43B	4/20/92	B065W9		380.00		
699-44-43B	4/20/92	B065X5				49.00
699-44-43B	6/26/92	B01MT4				20.00 U
699-44-43B	6/26/92	B07022		150.00		
699-44-43B	6/26/92	B07023		160.00		
699-44-43B	6/26/92	B07026				20.00 U
699-44-43B	1/27/93	B07V44		320.00		
699-44-43B	1/27/93	B07V48				20.00 U

Well Name	Collection Date	Sample Number	I-129 139/pCi/L ./.	IRON 34/ppb 20/300s	IRON 35/ppb ./300s	FIRON 34/ppb 20/300s

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
299-E18-1	8/16/88	H0007ZT7		5.00 U		
299-E18-1	8/16/88	H0007ZT7			5.00 U	
299-E18-1	11/10/88	H0007ZV2		5.00 U		
299-E18-1	11/10/88	H0007ZV2			5.00 U	
299-E18-1	11/10/88	H0007ZV5		5.00 U		
299-E18-1	11/10/88	H0007ZV5			5.00 U	
299-E18-1	2/15/89	H0007ZV8		5.00 U		
299-E18-1	2/15/89	H0007ZV8			5.00 U	
299-E18-1	5/26/89	H0007ZW2		5.00 U		
299-E18-1	5/26/89	H0007ZW2			5.00 U	
299-E18-1	8/08/89	H0007ZW6		5.00 U		
299-E18-1	8/08/89	H0007ZW6			5.00 U	
299-E18-1	10/31/89	H0007ZX0		5.00 U		
299-E18-1	10/31/89	H0007ZX0			5.00 U	
299-E18-1	9/06/91	B00LB6				10.30
299-E18-1	6/03/92	B06PH8	5.00 U			
299-E18-1	6/03/92	B06PJ2			5.00 U	
299-E18-1	12/16/92	B07SN0	5.00 U			
299-E18-1	12/16/92	B07SN1			5.00 U	
299-E32-4	9/27/88	H0008ZB8		5.00 U		
299-E32-4	9/27/88	H0008ZB8			5.00 U	
299-E32-4	12/28/88	H0008ZC2		5.00 U		
299-E32-4	12/28/88	H0008ZC2			5.00 U	
299-E32-4	3/01/89	H0008ZC6		5.00		
299-E32-4	3/01/89	H0008ZC6			5.00 U	
299-E32-4	3/13/89	H0008ZD0		5.00 U		
299-E32-4	3/13/89	H0008ZD0			5.00 U	
299-E32-4	6/16/89	H0008ZD4		5.00 U		
299-E32-4	6/16/89	H0008ZD4			5.00 U	
299-E32-4	7/19/89	H0008ZD8		8.00		
299-E32-4	7/19/89	H0008ZD8		·	5.00 U	
299-E32-4	9/08/89	H0008ZF6		6.00		
299-E32-4	9/08/89	H0008ZF6			5.00 U	
299-E32-4	1/17/90	H0008ZG0		10.00		
299-E32-4	1/17/90	H0008ZG0			5.00 U	
299-E32-4	1/15/92	B01QK6	5.00 U			

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
299-E32-4	1/15/92	B01QK8			5.00 U	
299-E32-4	4/06/92	B06696	5.00 U			
299-E32-4	4/06/92	B06697			5.00 U	
299-E32-4	7/14/92	B07173	5.00 U			
299-E32-4	7/14/92	B07174			5.00 U	
699-40-36	12/21/92	B07TB1	5.00 U			
699-40-36	12/21/92	B07TB8			5.00 U	
699-40-36	2/22/93	B08717	5.00 U			
699-40-36	2/22/93	B08721			5.00 U	
699-40-39	12/05/89	H000DBX2		5.00 U		
699-40-39	12/05/89	H000DBX2			5.00 U	
699-40-39	1/25/90	H000DBX6		5.00 U		
699-40-39	1/25/90	H000DBX6			5.00 U	
699-40-39	4/25/90	H000DBY0		5.00 U		
699-40-39	4/25/90	H000DBY0			5.00 U	
699-40-39	7/08/91	H00071Y4	U			
699-40-39	1/31/92	B01Q65	5.00 U			
699-40-39	1/31/92	B01Q66			5.00 U	
699-40-39	4/17/92	B065P2	5.00 U			
699-40-39	4/17/92	B065Q4			5.00 U	
699-40-39	6/24/92	B06ZT7	5.00 U			
699-40-39	6/24/92	B06ZV1			5.00 U	
699-40-39	1/14/93	B07TX4	5.00 U			
699-40-39	1/14/93	B07TX8			5.00 U	
699-40-40A	1/24/92	B01T62	5.00 U			
699-40-40A	1/24/92	B01T63			5.00 U	
699-40-40A	4/22/92	B065Q8	5.00 U			
699-40-40A	4/22/92	B065R8			5.00 U	
699-40-40A	6/25/92	B06ZV2	5.00 U			
699-40-40A	6/25/92	B06ZW0			5.00 U	
699-40-40A	10/21/92	B07JK3	5.00 U			
699-40-40A	10/21/92	B07JK7			5.00 U	
699-40-40A	1/26/93	B07V49	5.00 U			
699-40-40A	1/26/93	B07V53			5.00 U	
699-40-40B	1/01/92	B01T65			5.00 U	
699-40-40B	1/24/92	B01T64	8.30			
699-40-40B	4/22/92	B065S0	5.00 U			
699-40-40B	4/22/92	B065S4			5.00 U	
699-40-40B	6/29/92	B06ZW2	5.00 U			
699-40-40B	6/29/92	B06ZW6			5.00 U	
699-40-40B	10/21/92	B07JK8	5.00 U			
699-40-40B	10/21/92	B07JL2			5.00 U	
699-40-40B	1/26/93	B07V54	5.00 U			

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
699-40-40B	1/26/93	B07V58			5.00 U	
699-41-35	12/21/92	B07TB9	5.00 U			
699-41-35	12/21/92	B07TC3			5.00 U	
699-41-35	2/22/93	B08707	5.00 U			
699-41-35	2/22/93	B08711			5.00 U	
699-41-40	12/05/89	H000DD44		5.00 U		
699-41-40	12/05/89	H000DD44			5.00 U	
699-41-40	1/25/90	H000DD48		5.00 U		
699-41-40	1/25/90	H000DD48			5.00 U	
699-41-40	4/19/90	H000DD52		10.00		
699-41-40	4/19/90	H000DD52			5.00 U	
699-41-40	7/10/91	H00071Y1	U			
699-41-40	1/31/92	B01QC8	5.00 U			
699-41-40	1/31/92	B01QC9			5.00 U	
699-41-40	4/28/92	B065S5	5.00 U			
699-41-40	4/28/92	B065S6	5.00 U			
699-41-40	4/28/92	B065S9			5.00 U	
699-41-40	4/28/92	B065T0			5.00 U	
699-41-40	6/24/92	B06ZX2	5.00 U			
699-41-40	6/24/92	B06ZX6			5.00 U	
699-41-40	1/14/93	B07TX9	5.00 U			
699-41-40	1/14/93	B07TY3			5.00 U	
699-41-42	1/08/93	B07V59	5.00 U			
699-41-42	1/08/93	B07V63			5.00 U	
699-42-37	12/22/92	B07TC4	5.00 U			
699-42-37	12/22/92	B07TC8			5.00 U	
699-42-37	2/23/93	B08712	5.00 U			
699-42-37	2/23/93	B08716			5.00 U	
699-42-39A	1/23/92	B01T66	5.10 P			
699-42-39A	1/23/92	B01T67			5.00 UP	
699-42-39A	4/17/92	B065T1	5.00 UP			
699-42-39A	4/17/92	B065T5			5.00 UP	
699-42-39A	6/25/92	B06ZX7	5.00 UP			
699-42-39A	6/25/92	B06ZY1			5.00 UP	
699-42-39A	10/21/92	B07JL3	5.00 UP			
699-42-39A	10/21/92	B07JL7			5.00 UP	
699-42-39A	1/27/93	B07V64	5.00 UP			
699-42-39A	1/27/93	B07V68			5.00 UP	
699-42-39B	1/23/92	B01T68	7.80			
699-42-39B	1/23/92	B01T69			5.00 U	
699-42-39B	4/17/92	B065T6	5.00 U			
699-42-39B	4/17/92	B065V0			5.00 U	
699-42-39B	6/25/92	B06ZY2	5.00 U			

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
699-42-39B	6/25/92	B06ZY6			5.00 U	
699-42-39B	10/28/92	B07JJ2	5.00 U			
699-42-39B	10/28/92	B07JJ3	5.00 U			
699-42-39B	10/28/92	B07JJ6			5.00 U	
699-42-39B	10/28/92	B07JJ7			5.00 U	
699-42-39B	1/25/93	B07V69	5.00 U			
699-42-39B	1/25/93	B07V73			5.00 U	
699-42-40A	5/12/86	H000DF27		5.00 U		
699-42-40A	8/05/86	H000DF33		5.00 U		
699-42-40A	1/08/88	H000DF55		5.00 U		
699-42-40A	1/08/88	H000DF55			5.00 U	
699-42-40A	11/22/88	H000DF60		5.00 U		
699-42-40A	11/22/88	H000DF60			5.00 U	
699-42-40A	2/15/89	H000DF65		5.00 U		
699-42-40A	2/15/89	H000DF65			5.00 U	
699-42-40A	5/31/89	H000DF70		5.00 U		
699-42-40A	5/31/89	H000DF70			5.00 U	
699-42-40A	8/10/89	H000DF74		5.00 U		
699-42-40A	8/10/89	H000DF74			5.00 U	
699-42-40A	1/26/90	H000DF78		5.00 U		
699-42-40A	1/26/90	H000DF78			5.00 U	
699-42-40A	7/08/91	H00071Y2	U			
699-42-40A	1/08/92	B07TY8	5.00 U			
699-42-40A	1/08/92	B07TZ3			5.00 U	
699-42-40A	6/25/92	B06ZY7	5.00 U			
699-42-40A	6/25/92	B06ZZ1			5.00 U	
699-42-41	1/24/92	B01T70	5.00 UP			
699-42-41	1/24/92	B01T71			5.00 UP	
699-42-41	4/17/92	B065V1	5.00 UP			
699-42-41	4/17/92	B065V5			5.00 UP	
699-42-41	6/29/92	B06ZZ2	5.00 UP			
699-42-41	6/29/92	B06ZZ6			5.00 UP	
699-42-41	1/25/93	B07TZ4	5.00 UP			
699-42-41	1/25/93	B07TZ8			5.00 UP	
699-42-42B	11/22/88	H000DFT3		5.00 U		
699-42-42B	11/22/88	H000DFT3			5.00 U	
699-42-42B	2/24/89	H000DFT7		5.00 U		
699-42-42B	2/24/89	H000DFT7			5.00 U	
699-42-42B	6/16/89	H000DFV1		5.00 U		
699-42-42B	6/16/89	H000DFV1			5.00 U	
699-42-42B	6/16/89	H000DFV4		5.00 U		
699-42-42B	6/16/89	H000DFV4			5.00 U	
699-42-42B	8/09/89	H000DFV5		5.00 U		

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
699-42-42B	8/09/89	H000DFV5			5.00 U	
699-42-42B	1/26/90	H000DFW0		5.00 U		
699-42-42B	1/26/90	H000DFW0			5.00 U	
699-42-42B	7/08/91	H00071Y3	U			
699-42-42B	6/24/92	B06ZZ7	5.00 U			
699-42-42B	6/24/92	B07001			5.00 U	
699-42-42B	1/21/93	B07TZ9	5.00 U			
699-42-42B	1/21/93	B07V03			5.00 U	
699-43-40	1/31/92	B01T72	5.00 UP			
699-43-40	1/31/92	B01T73			5.00 UP	
699-43-40	4/28/92	B065V6	5.00 UP			
699-43-40	4/28/92	B065W0			5.00 UP	
699-43-40	6/26/92	B07002	5.00 UP			
699-43-40	6/26/92	B07006			5.00 UP	
699-43-40	1/25/93	B07V04	5.00 UP			
699-43-40	1/25/93	B07V08			5.00 UP	
699-43-41E	12/05/89	H000DGD6		5.00 U		
699-43-41E	12/05/89	H000DGD6			5.00 U	
699-43-41E	1/25/90	H000DGF0		5.00 U		
699-43-41E	1/25/90	H000DGF0			5.00 U	
699-43-41E	5/15/90	H000DGF9		5.00 U		
699-43-41E	5/15/90	H000DGF9			5.00 U	
699-43-41E	5/15/90	H000DGG2		5.00 U		
699-43-41E	5/15/90	H000DGG2			5.00 U	
699-43-41E	6/28/91	H0007203	14.00			
699-43-41E	6/28/91	H0007204	U			
699-43-41E	1/23/92	B01QC3	5.00 U			
699-43-41E	1/23/92	B01QC4			5.00 U	
699-43-41E	4/17/92	B065P4	5.00 U			
699-43-41E	4/17/92	B065Q6			5.00 U	
699-43-41E	6/24/92	B06ZV3	5.00 U			
699-43-41E	6/24/92	B06ZW1			5.00 U	
699-43-41E	1/25/93	B07V09	7.00			
699-43-41E	1/25/93	B07V13			5.00 U	
699-43-41F	12/05/89	H000DGG8		5.00 U		
699-43-41F	12/05/89	H000DGG8			5.00 U	
699-43-41F	1/25/90	H000DGH2		5.00 U		
699-43-41F	1/25/90	H000DGH2			5.00 U	
699-43-41F	4/18/90	H000DGH6		5.00 U		
699-43-41F	4/18/90	H000DGH6			5.00 U	
699-43-41F	7/02/91	H00071Y5	U			
699-43-41F	5/05/92	B065R0	5.00 U			
699-43-41F	5/05/92	B065R9			6.20	

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
699-43-41F	6/25/92	B06ZW7	5.00 U			
699-43-41F	6/25/92	B06ZX1			5.00 U	
699-43-41F	1/22/93	B07V14	5.00 U			
699-43-41F	1/22/93	B07V18			5.00 U	
699-43-41G	1/23/92	B01T74	5.00 U			
699-43-41G	1/23/92	B01T75			5.00 U	
699-43-41G	4/17/92	B065W1	5.00 U			
699-43-41G	4/17/92	B065W6			5.00 U	
699-43-41G	6/26/92	B07007	5.00 U			
699-43-41G	6/26/92	B07011			5.00 U	
699-43-41G	10/28/92	B07JL8	5.00 U			
699-43-41G	10/28/92	B07JM2			5.00 U	
699-43-41G	1/25/93	B07V74	5.00 U			
699-43-41G	1/25/93	B07V78			5.00 U	
699-43-42J	11/22/88	H000DGP2		5.00 U		
699-43-42J	11/22/88	H000DGP2			5.00 U	
699-43-42J	2/24/89	H000DGP6		5.00 U		
699-43-42J	2/24/89	H000DGP6			5.00 U	
699-43-42J	6/15/89	H000DGQ0		5.00 U		
699-43-42J	6/15/89	H000DGQ0			5.00 U	
699-43-42J	8/09/89	H000DGQ4		5.00 U		
699-43-42J	8/09/89	H000DGQ4			5.00 U	
699-43-42J	8/09/89	H000DGQ7		5.00 U		
699-43-42J	8/09/89	H000DGQ7			5.00 U	
699-43-42J	1/31/90	H000DGQ9		5.00 U		
699-43-42J	1/31/90	H000DGQ9			5.00 U	
699-43-42J	7/02/91	H00071Y6	U			
699-43-42J	1/31/92	B01S49	5.00 U			
699-43-42J	1/31/92	B01S51			5.00 U	
699-43-42J	6/25/92	B07012	5.00 U			
699-43-42J	6/25/92	B07016			5.00 U	
699-43-42J	1/21/93	B07V19	5.00 U			
699-43-42J	1/21/93	B07V23			5.00 U	
699-43-43	11/21/88	H000DGR3		5.00 U		
699-43-43	11/21/88	H000DGR3			5.00 U	
699-43-43	2/24/89	H000DGR7		5.00 U		
699-43-43	2/24/89	H000DGR7			5.00 U	
699-43-43	2/24/89	H000DGS0		5.00 U		
699-43-43	2/24/89	H000DGS0			5.00 U	
699-43-43	6/15/89	H000DGS1		5.00 U		
699-43-43	6/15/89	H000DGS1			5.00 U	
699-43-43	8/09/89	H000DGS5		5.00 U		
699-43-43	8/09/89	H000DGS5			5.00 U	

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
699-43-43	1/26/90	H000DGS9		5.00 U		
699-43-43	1/26/90	H000DGS9			5.00 U	
699-43-43	7/08/91	H00071Y7	U			
699-43-43	1/24/92	B01T83	5.00 U			
699-43-43	1/24/92	B01T84			5.00 U	
699-43-43	4/22/92	B065N6	5.00 U			
699-43-43	4/22/92	B065N7			5.00 U	
699-43-43	6/26/92	B070W0	5.00 U			
699-43-43	6/26/92	B070W1			5.00 U	
699-43-43	10/26/92	B07JG5	5.00 U			
699-43-43	10/26/92	B07JG6			5.00 U	
699-43-43	1/13/93	B07V24	5.00 U			
699-43-43	1/13/93	B07V28			5.00 U	
699-43-45	12/06/89	H000DGT4		5.00 U		
699-43-45	12/06/89	H000DGT4			5.00 U	
699-43-45	1/26/90	H000DGT8		5.00 U		
699-43-45	1/26/90	H000DGT8			5.00 U	
699-43-45	4/18/90	H000DGV2		5.00 U		
699-43-45	4/18/90	H000DGV2			5.00 U	
699-43-45	7/08/91	H00071Y8	U			
699-43-45	1/24/92	B01QD0	7.00			
699-43-45	1/24/92	B01QD1			5.00 U	
699-43-45	4/22/92	B065N8	5.00 U			
699-43-45	4/22/92	B065N9			5.00 U	
699-43-45	6/26/92	B070W2	5.00 U			
699-43-45	6/26/92	B070W3			5.00 U	
699-43-45	10/26/92	B07JG7	5.00 U			
699-43-45	10/26/92	B07JG8			5.00 U	
699-43-45	1/13/93	B07V29	5.00 U			
699-43-45	1/13/93	B07V33			5.00 U	
699-44-39B	1/08/93	B07WK1	5.00 U			
699-44-39B	1/08/93	B07WK5			5.00 U	
699-44-42	11/21/88	H000DHK2		5.00 U		
699-44-42	11/21/88	H000DHK2			5.00 U	
699-44-42	2/17/89	H000DHK6		5.00 U		
699-44-42	2/17/89	H000DHK6			5.00 U	
699-44-42	6/15/89	H000DHL0		5.00 U		
699-44-42	6/15/89	H000DHL0			5.00 U	
699-44-42	8/08/89	H000DHL4		5.00 U		
699-44-42	8/08/89	H000DHL4			5.00 U	
699-44-42	1/31/90	H000DHL8		5.00 U		
699-44-42	1/31/90	H000DHL8			5.00 U	
699-44-42	7/10/91	H00071Y9	U			

Well Name	Collection Date	Sample Number	LEAD 40/ppb 5/50	LEAD 76/ppb ./.	FLEAD 40/ppb 5/50	PB212 140/pCi/L ./.
699-44-42	1/31/92	B01S52	5.00 U			
699-44-42	1/31/92	B01S54			5.00 U	
699-44-42	6/25/92	B07017	5.00 U			
699-44-42	6/25/92	B07021			5.00 U	
699-44-42	1/13/93	B07V34	5.00 U			
699-44-42	1/13/93	B07V35	5.00 U			
699-44-42	1/13/93	B07V42			5.00 U	
699-44-42	1/13/93	B07V43			5.00 U	
699-44-43B	12/20/89	H000DHM3		5.00 U		
699-44-43B	12/20/89	H000DHM3			5.00 U	
699-44-43B	12/20/89	H000DHM6		5.00 U		
699-44-43B	12/20/89	H000DHM6			5.00 U	
699-44-43B	1/26/90	H000DHM7		5.00 U		
699-44-43B	1/26/90	H000DHM7			5.00 U	
699-44-43B	1/26/90	H000DHN0		5.00 U		
699-44-43B	1/26/90	H000DHN0			5.00 U	
699-44-43B	4/18/90	H000DHN1		5.00 U		
699-44-43B	4/18/90	H000DHN1			5.00 U	
699-44-43B	7/08/91	H00071Z0	U			
699-44-43B	1/23/92	B01Q69	5.20			
699-44-43B	1/23/92	B01Q70			5.00 U	
699-44-43B	4/20/92	B065W9	5.00 U			
699-44-43B	4/20/92	B065X5			5.00 U	
699-44-43B	6/26/92	B01MT4			5.00 U	
699-44-43B	6/26/92	B07022	5.00 U			
699-44-43B	6/26/92	B07023	5.70			
699-44-43B	6/26/92	B07026			5.00 U	
699-44-43B	1/27/93	B07V44	5.00 U			
699-44-43B	1/27/93	B07V48			5.00 U	

Well Name	Collection Date	Sample Number	FLITHIU 34/ppb ./.	LITHIUM 35/ppb ./.	MAGNES 34/ppb 100/.	MAGNES 35/ppb ./.
299-E18-1	8/16/88	H0007ZT7				15300.00
299-E18-1	9/22/88	H0007ZV1				17000.00
299-E18-1	11/10/88	H0007ZV2				15200.00
299-E18-1	11/10/88	H0007ZV5				14700.00
299-E18-1	2/15/89	H0007ZV8		10.00 U		13900.00
299-E18-1	2/15/89	H0007ZV8	10.00 U			
299-E18-1	5/26/89	H0007ZW2		10.00 U		14600.00

Well Name	Collection Date	Sample Number	FLITHIU 34/ppb ./.	LITHIUM 35/ppb ./.	MAGNES 34/ppb 100/.	MAGNES 35/ppb ./.
299-E18-1	5/26/89	H0007ZW2	10.00 U			
299-E18-1	8/08/89	H0007ZW6		10.00 U		13700.00
299-E18-1	8/08/89	H0007ZW6	10.00 U			
299-E18-1	10/31/89	H0007ZX0		10.00 U		14700.00
299-E18-1	10/31/89	H0007ZX0	10.00 U			
299-E18-1	7/09/91	H00071X9			14000.00	
299-E18-1	9/06/91	B00LB6			14000.00	
299-E18-1	1/24/92	B01Q59			13000.00 D	
299-E18-1	6/03/92	B06PH8			14000.00	
299-E18-1	12/16/92	B07S32			14000.00	
299-E32-4	9/27/88	H0008ZB8				14300.00
299-E32-4	12/28/88	H0008ZC2				13300.00
299-E32-4	3/01/89	H0008ZC6		10.00 U		13300.00
299-E32-4	3/01/89	H0008ZC6	10.00 U			
299-E32-4	3/13/89	H0008ZD0		10.00 U		13600.00
299-E32-4	3/13/89	H0008ZD0	10.00 U			
299-E32-4	6/16/89	H0008ZD4		10.00 U		12800.00
299-E32-4	6/16/89	H0008ZD4	10.00 U			
299-E32-4	7/19/89	H0008ZD8		10.00 U		13000.00
299-E32-4	7/19/89	H0008ZD8	10.00 U			
299-E32-4	9/08/89	H0008ZF6		10.00 U		13600.00
299-E32-4	9/08/89	H0008ZF6	10.00 U			
299-E32-4	1/17/90	H0008ZG0		10.00 U		13200.00
299-E32-4	1/17/90	H0008ZG0	10.00 U			
299-E32-4	8/05/91	H00071Y0			14000.00 D	
299-E32-4	8/05/91	H0007264			14000.00 D	
299-E32-4	9/23/91	B00LK5			14000.00	
299-E32-4	1/15/92	B01QK6			14000.00	
299-E32-4	4/06/92	B06696			14000.00	
299-E32-4	7/14/92	B07173			13000.00	
699-40-36	12/21/92	B07TB1			5300.00	
699-40-36	2/22/93	B08717			5200.00	
699-40-39	12/05/89	H000DBX2		15.00		7670.00
699-40-39	12/05/89	H000DBX2	15.00			
699-40-39	1/25/90	H000DBX6		14.00		7640.00
699-40-39	1/25/90	H000DBX6	13.00			
699-40-39	4/25/90	H000DBY0		13.00		7480.00
699-40-39	4/25/90	H000DBY0	13.00			
699-40-39	9/11/91	B00LG1			7800.00	
699-40-39	1/31/92	B01Q65			7800.00 D	
699-40-39	4/17/92	B065P2			7500.00	
699-40-39	6/24/92	B06ZT7			7900.00	
699-40-39	1/14/93	B07TX4			7800.00	

Well Name	Collection Date	Sample Number	FLITHIU 34/ppb ./.	LITHIUM 35/ppb ./.	MAGNES 34/ppb 100/.	MAGNES 35/ppb ./.
699-40-40A	1/24/92	B01T62			8300.00 D	
699-40-40A	4/22/92	B065Q8			7500.00	
699-40-40A	6/25/92	B06ZV2			7300.00	
699-40-40A	10/21/92	B07JK3			7100.00	
699-40-40A	1/26/93	B07V49			7200.00	
699-40-40B	1/24/92	B01T64			10000.00 D	
699-40-40B	4/22/92	B065S0			6300.00	
699-40-40B	6/29/92	B06ZW2			5800.00	
699-40-40B	10/21/92	B07JK8			6200.00	
699-40-40B	1/26/93	B07V54			6300.00	
699-41-35	12/21/92	B07TB9			6900.00	
699-41-35	2/22/93	B08707			6600.00	
699-41-40	12/05/89	H000DD44		10.00		10400.00
699-41-40	12/05/89	H000DD44	10.00			
699-41-40	1/25/90	H000DD48		11.00		10000.00
699-41-40	1/25/90	H000DD48	11.00			
699-41-40	4/19/90	H000DD52		10.00		10600.00
699-41-40	4/19/90	H000DD52	10.00 U			
699-41-40	7/10/91	H00071Y1			12000.00	
699-41-40	9/11/91	B00LG2			11000.00	
699-41-40	1/31/92	B01QC8			11000.00 D	
699-41-40	4/28/92	B065S5			11000.00	
699-41-40	4/28/92	B065S6			11000.00	
699-41-40	6/24/92	B06ZX2			11000.00	
699-41-40	1/14/93	B07TX9			11000.00	
699-41-42	1/08/93	B07V59			6900.00	
699-42-37	12/22/92	B07TC4			9800.00	
699-42-37	2/23/93	B08712			10000.00	
699-42-39A	1/23/92	B01T66			11000.00 P	
699-42-39A	4/17/92	B065T1			12000.00 P	
699-42-39A	6/25/92	B06ZX7			11000.00 P	
699-42-39A	10/21/92	B07JL3			12000.00 P	
699-42-39A	1/27/93	B07V64			11000.00 P	
699-42-39B	1/23/92	B01T68			10000.00	
699-42-39B	4/17/92	B065T6			10000.00	
699-42-39B	6/25/92	B06ZY2			10000.00	
699-42-39B	10/28/92	B07JJ2			11000.00	
699-42-39B	10/28/92	B07JJ3			11000.00	
699-42-39B	1/25/93	B07V69			10000.00	
699-42-40A	8/05/86	H000DF33				4200.00
699-42-40A	1/08/88	H000DF55				5590.00
699-42-40A	11/22/88	H000DF60				4700.00
699-42-40A	2/15/89	H000DF65		10.00 U		5230.00

Well Name	Collection Date	Sample Number	FLITHIU 34/ppb ./.	LITHIUM 35/ppb ./.	MAGNES 34/ppb 100/.	MAGNES 35/ppb ./.
699-42-40A	2/15/89	H000DF65	10.00 U			
699-42-40A	5/31/89	H000DF70		10.00 U		5370.00
699-42-40A	5/31/89	H000DF70	10.00 U			
699-42-40A	8/10/89	H000DF74		10.00 U		4010.00
699-42-40A	8/10/89	H000DF74	10.00 U			
699-42-40A	1/26/90	H000DF78		10.00 U		5770.00
699-42-40A	1/26/90	H000DF78	10.00 U			
699-42-40A	7/08/91	H00071Y2			5300.00	
699-42-40A	1/08/92	B07TY8			6100.00	
699-42-40A	1/23/92	B01Q61			6900.00	
699-42-40A	6/25/92	B06ZY7			6200.00	
699-42-41	1/24/92	B01T70			5400.00 PD	
699-42-41	4/17/92	B065V1			5700.00 P	
699-42-41	6/29/92	B06ZZ2			5500.00 P	
699-42-41	1/25/93	B07TZ4			5400.00 P	
699-42-42B	11/22/88	H000DFT3				7790.00
699-42-42B	2/24/89	H000DFT7		10.00 U		7720.00
699-42-42B	2/24/89	H000DFT7	10.00 U			
699-42-42B	6/16/89	H000DFV1		10.00 U		7190.00
699-42-42B	6/16/89	H000DFV1	10.00 U			
699-42-42B	6/16/89	H000DFV4		10.00 U		6910.00
699-42-42B	6/16/89	H000DFV4	10.00 U			
699-42-42B	8/09/89	H000DFV5		10.00 U		6570.00
699-42-42B	8/09/89	H000DFV5	10.00 U			
699-42-42B	7/08/91	H00071Y3			7600.00	
699-42-42B	1/24/92	B01Q63			7600.00 D	
699-42-42B	6/24/92	B06ZZ7			7500.00	
699-42-42B	1/21/93	B07TZ9			8000.00	
699-43-40	1/31/92	B01T72			8100.00 PD	
699-43-40	4/28/92	B065V6			8900.00 P	
699-43-40	6/26/92	B07002			9600.00 P	
699-43-40	1/25/93	B07V04			10000.00 P	
699-43-41E	12/05/89	H000DGD6		10.00 U		9210.00
699-43-41E	12/05/89	H000DGD6	10.00 U			
699-43-41E	1/25/90	H000DGF0		10.00 U		9180.00
699-43-41E	1/25/90	H000DGF0	10.00 U			
699-43-41E	6/28/91	H0007203			9200.00 D	
699-43-41E	6/28/91	H0007204			9400.00 D	
699-43-41E	1/23/92	B01QC3			9700.00	
699-43-41E	4/17/92	B065P4			9100.00	
699-43-41E	6/24/92	B06ZV3			9800.00	
699-43-41E	1/25/93	B07V09			9800.00	
699-43-41F	12/05/89	H000DGG8		10.00 U		10500.00

Well Name	Collection Date	Sample Number	FLITHIU 34/ppb ./.	LITHIUM 35/ppb ./.	MAGNES 34/ppb 100/.	MAGNES 35/ppb ./.
699-43-41F	12/05/89	H000DGG8	10.00 U			
699-43-41F	1/25/90	H000DGH2		10.00 U		10500.00
699-43-41F	1/25/90	H000DGH2	10.00 U			
699-43-41F	4/18/90	H000DGH6		10.00 U		10700.00
699-43-41F	4/18/90	H000DGH6	10.00 U			
699-43-41F	7/02/91	H00071Y5			10000.00 D	
699-43-41F	5/05/92	B065R0			11000.00	
699-43-41F	6/25/92	B06ZW7			10000.00	
699-43-41F	1/22/93	B07V14			11000.00	
699-43-41G	1/23/92	B01T74			9500.00	
699-43-41G	4/17/92	B065W1			9100.00	
699-43-41G	6/26/92	B07007			9200.00	
699-43-41G	10/28/92	B07JL8			9500.00	
699-43-41G	1/25/93	B07V74			8800.00	
699-43-42J	11/22/88	H000DGP2				5640.00
699-43-42J	2/24/89	H000DGP6		10.00 U		6350.00
699-43-42J	2/24/89	H000DGP6	10.00 U			
699-43-42J	6/15/89	H000DGQ0		10.00 U		6300.00
699-43-42J	6/15/89	H000DGQ0	10.00 U			
699-43-42J	8/09/89	H000DGQ4		10.00 U		5630.00
699-43-42J	8/09/89	H000DGQ4	10.00 U			
699-43-42J	8/09/89	H000DGQ7		10.00 U		5330.00
699-43-42J	8/09/89	H000DGQ7	10.00 U			
699-43-42J	7/02/91	H00071Y6			5100.00 D	
699-43-42J	1/31/92	B01S49			5300.00 D	
699-43-42J	6/25/92	B07012			4800.00	
699-43-42J	1/21/93	B07V19			5100.00	
699-43-43	11/21/88	H000DGR3				5770.00
699-43-43	2/24/89	H000DGR7		10.00 U		5810.00
699-43-43	2/24/89	H000DGR7	10.00 U			
699-43-43	2/24/89	H000DGS0		10.00 U		5950.00
699-43-43	2/24/89	H000DGS0	10.00 U			
699-43-43	6/15/89	H000DGS1		10.00 U		6030.00
699-43-43	6/15/89	H000DGS1	10.00 U			
699-43-43	8/09/89	H000DGS5		10.00 U		5620.00
699-43-43	8/09/89	H000DGS5	10.00 U			
699-43-43	1/26/90	H000DGS9		10.00 U		5850.00
699-43-43	1/26/90	H000DGS9	10.00 U			
699-43-43	7/08/91	H00071Y7			6300.00	
699-43-43	1/24/92	B01Q67			6300.00 D	
699-43-43	4/22/92	B065N6			7000.00	
699-43-43	6/26/92	B070W0			6900.00 D	
699-43-43	10/26/92	B07JG5			6800.00	

Well Name	Collection Date	Sample Number	FLITHIU 34/ppb ./.	LITHIUM 35/ppb ./.	MAGNES 34/ppb 100/.	MAGNES 35/ppb ./.
699-43-43	1/13/93	B07V24			6700.00	
699-43-45	12/06/89	H000DGT4		10.00 U		6610.00
699-43-45	12/06/89	H000DGT4	10.00 U			
699-43-45	1/26/90	H000DGT8		10.00 U		6380.00
699-43-45	1/26/90	H000DGT8	10.00 U			
699-43-45	4/18/90	H000DGV2		10.00 U		6430.00
699-43-45	4/18/90	H000DGV2	10.00 U			
699-43-45	7/08/91	H00071Y8			6800.00	
699-43-45	9/11/91	B00LG5			6600.00	
699-43-45	1/24/92	B01QD0			6400.00 D	
699-43-45	4/22/92	B065N8			7200.00	
699-43-45	6/26/92	B070W2			6800.00 D	
699-43-45	10/26/92	B07JG7			6800.00	
699-43-45	1/13/93	B07V29			6600.00	
699-44-39B	1/08/93	B07WK1			7500.00	
699-44-42	11/21/88	H000DHK2				6510.00
699-44-42	2/17/89	H000DHK6		10.00 U		6020.00
699-44-42	2/17/89	H000DHK6	10.00 U			
699-44-42	6/15/89	H000DHL0		10.00 U		5690.00
699-44-42	6/15/89	H000DHL0	10.00 U			
699-44-42	8/08/89	H000DHL4		10.00 U		5260.00
699-44-42	8/08/89	H000DHL4	10.00 U			
699-44-42	1/31/90	H000DHL8		10.00 U		5980.00
699-44-42	1/31/90	H000DHL8	10.00 U			
699-44-42	7/10/91	H00071Y9			6300.00	
699-44-42	1/31/92	B01S52			6700.00 D	
699-44-42	6/25/92	B07017			7100.00	
699-44-42	1/13/93	B07V34			6900.00	
699-44-42	1/13/93	B07V35			6900.00	
699-44-43B	12/20/89	H000DHM3		10.00 U		8290.00
699-44-43B	12/20/89	H000DHM3	10.00 U			
699-44-43B	12/20/89	H000DHM6		10.00 U		8420.00
699-44-43B	12/20/89	H000DHM6	10.00 U			
699-44-43B	1/26/90	H000DHM7		10.00 U		9000.00
699-44-43B	1/26/90	H000DHM7	10.00 U			
699-44-43B	1/26/90	H000DHN0		10.00 U		8940.00
699-44-43B	1/26/90	H000DHN0	10.00 U			
699-44-43B	4/18/90	H000DHN1		10.00 U		8830.00
699-44-43B	4/18/90	H000DHN1	10.00 U			
699-44-43B	7/08/91	H00071Z0			9100.00	
699-44-43B	9/11/91	B00LG6			8900.00	
699-44-43B	1/23/92	B01Q69			13000.00	
699-44-43B	4/20/92	B065W9			9700.00	

Well Name	Collection Date	Sample Number	FLITHIU 34/ppb ./.	LITHIUM 35/ppb ./.	MAGNES 34/ppb 100/.	MAGNES 35/ppb ./.
699-44-43B	6/26/92	B07022			9400.00	
699-44-43B	6/26/92	B07023			9300.00	
699-44-43B	1/27/93	B07V44			9200.00	

Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
299-E18-1	8/16/88	H0007ZT7			70.00	
299-E18-1	8/16/88	H0007ZT7	17100.00			51.00
299-E18-1	9/22/88	H0007ZV1			46.00	
299-E18-1	9/22/88	H0007ZV1	16500.00			19.00
299-E18-1	11/10/88	H0007ZV2			12.00	
299-E18-1	11/10/88	H0007ZV2	15300.00			5.00 U
299-E18-1	11/10/88	H0007ZV5			12.00	
299-E18-1	11/10/88	H0007ZV5	14700.00			5.00 U
299-E18-1	2/15/89	H0007ZV8			5.00 U	
299-E18-1	2/15/89	H0007ZV8	14400.00			5.00 U
299-E18-1	5/26/89	H0007ZW2			12.00	
299-E18-1	5/26/89	H0007ZW2	15100.00			5.00 U
299-E18-1	8/08/89	H0007ZW6			12.00	
299-E18-1	8/08/89	H0007ZW6	16200.00			5.00 U
299-E18-1	10/31/89	H0007ZX0			18.00	
299-E18-1	10/31/89	H0007ZX0	15500.00			5.00 U
299-E18-1	7/09/91	H00071X9		26.00		
299-E18-1	7/09/91	H00071X9F	14000.00			10.00 U
299-E18-1	9/06/91	B00LB6		16.00		
299-E18-1	9/06/91	B00LB6F	14000.00			10.00 U
299-E18-1	1/24/92	B01Q59		10.00 UD		
299-E18-1	1/24/92	B01Q60	13000.00 D			10.00 UD
299-E18-1	6/03/92	B06PH8		10.00 U		
299-E18-1	6/03/92	B06PJ2	14000.00			10.00 U
299-E18-1	12/16/92	B07S32		20.00		
299-E18-1	12/16/92	B07S36	14000.00			10.00 U
299-E32-4	9/27/88	H0008ZB8			5.00 U	
299-E32-4	9/27/88	H0008ZB8	12900.00			5.00 U
299-E32-4	12/28/88	H0008ZC2			5.00	
299-E32-4	12/28/88	H0008ZC2	14000.00			5.00 U
299-E32-4	3/01/89	H0008ZC6			8.00	
299-E32-4	3/01/89	H0008ZC6	13400.00			5.00 U
299-E32-4	3/13/89	H0008ZD0			5.00	

Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
299-E32-4	3/13/89	H0008ZD0	13500.00			5.00 U
299-E32-4	6/16/89	H0008ZD4			13.00	
299-E32-4	6/16/89	H0008ZD4	12800.00			5.00 U
299-E32-4	7/19/89	H0008ZD8			7.00	
299-E32-4	7/19/89	H0008ZD8	12600.00			5.00 U
299-E32-4	9/08/89	H0008ZF6			13.00	
299-E32-4	9/08/89	H0008ZF6	12200.00			5.00 U
299-E32-4	1/17/90	H0008ZG0			17.00	
299-E32-4	1/17/90	H0008ZG0	13300.00			5.00 U
299-E32-4	8/05/91	H00071Y0		26.00 D		
299-E32-4	8/05/91	H00071Y0F	14000.00			10.00 U
299-E32-4	8/05/91	H0007264		23.00 D		
299-E32-4	8/05/91	H0007264F	14000.00			10.00 U
299-E32-4	9/23/91	B00LK5		10.00 U		
299-E32-4	9/23/91	B00LK5F	14000.00			10.00 U
299-E32-4	1/15/92	B01QK6		11.00		
299-E32-4	1/15/92	B01QK8	14000.00			10.00 U
299-E32-4	4/06/92	B06696		10.00 U		
299-E32-4	4/06/92	B06697	14000.00			10.00 U
299-E32-4	7/14/92	B07173		10.00 U		
299-E32-4	7/14/92	B07174	13000.00			10.00 U
699-40-36	12/21/92	B07TB1		120.00		
699-40-36	12/21/92	B07TB8	5300.00			110.00
699-40-36	2/22/93	B08717		170.00		
699-40-36	2/22/93	B08721	5800.00			150.00
699-40-39	12/05/89	H000DBX2			222.00	
699-40-39	12/05/89	H000DBX2	7740.00			208.00
699-40-39	1/25/90	H000DBX6			252.00	
699-40-39	1/25/90	H000DBX6	7230.00			231.00
699-40-39	4/25/90	H000DBY0			182.00	
699-40-39	4/25/90	H000DBY0	7440.00			175.00
699-40-39	7/08/91	H00071Y4F	8000.00			120.00
699-40-39	9/11/91	B00LG1		90.00		
699-40-39	9/11/91	B00LG1F	7600.00			88.00
699-40-39	1/31/92	B01Q65		140.00 D		
699-40-39	1/31/92	B01Q66	7500.00 D			57.00 D
699-40-39	4/17/92	B065P2		110.00		
699-40-39	4/17/92	B065Q4	7200.00			83.00
699-40-39	6/24/92	B06ZT7		83.00		
699-40-39	6/24/92	B06ZV1	7900.00			34.00
699-40-39	1/14/93	B07TX4		110.00		
699-40-39	1/14/93	B07TX8	7900.00			50.00
699-40-40A	1/24/92	B01T62		370.00 D		

Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
699-40-40A	1/24/92	B01T63	7400.00 D			260.00 D
699-40-40A	4/22/92	B065Q8		220.00		
699-40-40A	4/22/92	B065R8	7600.00			210.00
699-40-40A	6/25/92	B06ZV2		240.00		
699-40-40A	6/25/92	B06ZW0	7100.00			190.00
699-40-40A	10/21/92	B07JK3		200.00		
699-40-40A	10/21/92	B07JK7	7100.00			160.00
699-40-40A	1/26/93	B07V49		180.00		
699-40-40A	1/26/93	B07V53	7100.00			160.00
699-40-40B	1/01/92	B01T65	5800.00 D			300.00 D
699-40-40B	1/24/92	B01T64		640.00 D		
699-40-40B	4/22/92	B065S0		320.00		
699-40-40B	4/22/92	B065S4	5800.00			270.00
699-40-40B	6/29/92	B06ZW2		300.00		
699-40-40B	6/29/92	B06ZW6	5400.00			250.00
699-40-40B	10/21/92	B07JK8		340.00		
699-40-40B	10/21/92	B07JL2	6300.00			290.00
699-40-40B	1/26/93	B07V54		280.00		
699-40-40B	1/26/93	B07V58	6300.00			260.00
699-41-35	12/21/92	B07TB9		180.00		
699-41-35	12/21/92	B07TC3	6400.00			170.00
699-41-35	2/22/93	B08707		150.00		
699-41-35	2/22/93	B08711	8300.00			170.00
699-41-40	12/05/89	H000DD44			107.00	
699-41-40	12/05/89	H000DD44	10300.00			93.00
699-41-40	1/25/90	H000DD48			89.00	
699-41-40	1/25/90	H000DD48	10400.00			75.00
699-41-40	4/19/90	H000DD52			44.00	
699-41-40	4/19/90	H000DD52	9960.00			35.00
699-41-40	7/10/91	H00071Y1		19.00		
699-41-40	7/10/91	H00071Y1F	12000.00			11.00
699-41-40	9/11/91	B00LG2		21.00		
699-41-40	9/11/91	B00LG2F	11000.00			10.00 U
699-41-40	1/31/92	B01QC8		60.00 D		
699-41-40	1/31/92	B01QC9	11000.00 D			10.00 UD
699-41-40	4/28/92	B065S5		10.00 U		
699-41-40	4/28/92	B065S6		10.00 U		
699-41-40	4/28/92	B065S9	11000.00			10.00 U
699-41-40	4/28/92	B065T0	11000.00			10.00 U
699-41-40	6/24/92	B06ZX2		16.00		
699-41-40	6/24/92	B06ZX6	11000.00			10.00 U
699-41-40	1/14/93	B07TX9		30.00		
699-41-40	1/14/93	B07TY3	11000.00			10.00

Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
699-41-42	1/08/93	B07V59		10.00 U		
699-41-42	1/08/93	B07V63	6700.00			10.00 U
699-42-37	12/22/92	B07TC4		140.00		
699-42-37	12/22/92	B07TC8	9400.00			120.00
699-42-37	2/23/93	B08712		130.00		
699-42-37	2/23/93	B08716	10000.00			120.00
699-42-39A	1/23/92	B01T66		56.00 P		
699-42-39A	1/23/92	B01T67	11000.00 P			47.00 P
699-42-39A	4/17/92	B065T1		170.00 P		
699-42-39A	4/17/92	B065T5	11000.00 P			79.00 P
699-42-39A	6/25/92	B06ZX7		110.00 P		
699-42-39A	6/25/92	B06ZY1	11000.00 P			24.00 P
699-42-39A	10/21/92	B07JL3		140.00 P		
699-42-39A	10/21/92	B07JL7	11000.00 P			10.00 P
699-42-39A	1/27/93	B07V64		40.00 P		
699-42-39A	1/27/93	B07V68	11000.00 P			10.00 UP
699-42-39B	1/23/92	B01T68		660.00		
699-42-39B	1/23/92	B01T69	11000.00			630.00
699-42-39B	4/17/92	B065T6		570.00		
699-42-39B	4/17/92	B065V0	10000.00			520.00
699-42-39B	6/25/92	B06ZY2		460.00		
699-42-39B	6/25/92	B06ZY6	9500.00			360.00
699-42-39B	10/28/92	B07JJ2		320.00		
699-42-39B	10/28/92	B07JJ3		320.00		
699-42-39B	10/28/92	B07JJ6	10000.00			280.00
699-42-39B	10/28/92	B07JJ7	11000.00			310.00
699-42-39B	1/25/93	B07V69		290.00		
699-42-39B	1/25/93	B07V73	10000.00			270.00
699-42-40A	8/22/85	H000DF11			33.00	
699-42-40A	5/12/86	H000DF27			6.00	
699-42-40A	8/05/86	H000DF33			19.00	
699-42-40A	1/08/88	H000DF55			5.00 U	
699-42-40A	1/08/88	H000DF55	5630.00			11.00
699-42-40A	11/22/88	H000DF60			12.00	
699-42-40A	11/22/88	H000DF60	4430.00			5.00 U
699-42-40A	2/15/89	H000DF65			8.00	
699-42-40A	2/15/89	H000DF65	5680.00			5.00
699-42-40A	5/31/89	H000DF70			8.00	
699-42-40A	5/31/89	H000DF70	5190.00			5.00
699-42-40A	8/10/89	H000DF74			9.00	
699-42-40A	8/10/89	H000DF74	4950.00			8.00
699-42-40A	1/26/90	H000DF78			15.00	
699-42-40A	1/26/90	H000DF78	5740.00			7.00

Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
699-42-40A	7/08/91	H00071Y2		12.00		
699-42-40A	7/08/91	H00071Y2F	5400.00			10.00 U
699-42-40A	1/08/92	B07TY8		390.00		
699-42-40A	1/08/92	B07TZ3	5700.00			30.00
699-42-40A	1/23/92	B01Q61		2300.00		
699-42-40A	1/23/92	B01Q62	5600.00			45.00
699-42-40A	6/25/92	B06ZY7		580.00		
699-42-40A	6/25/92	B06ZZ1	6100.00			52.00
699-42-41	1/24/92	B01T70		18.00 PD		
699-42-41	1/24/92	B01T71	5400.00 PD			10.00 UPD
699-42-41	4/17/92	B065V1		13.00 P		
699-42-41	4/17/92	B065V5	5500.00 P			10.00 UP
699-42-41	6/29/92	B06ZZ2		18.00 P		
699-42-41	6/29/92	B06ZZ6	5400.00 P			10.00 UP
699-42-41	1/25/93	B07TZ4		10.00 UP		
699-42-41	1/25/93	B07TZ8	5400.00 P			10.00 UP
699-42-42B	11/22/88	H000DFT3			5.00	
699-42-42B	11/22/88	H000DFT3	7740.00			5.00 U
699-42-42B	2/24/89	H000DFT7			7.00	
699-42-42B	2/24/89	H000DFT7	7130.00			5.00 U
699-42-42B	6/16/89	H000DFV1			5.00	
699-42-42B	6/16/89	H000DFV1	7750.00			5.00 U
699-42-42B	6/16/89	H000DFV4			6.00	
699-42-42B	6/16/89	H000DFV4	6940.00			5.00 U
699-42-42B	8/09/89	H000DFV5			5.00 U	
699-42-42B	8/09/89	H000DFV5	7690.00			5.00 U
699-42-42B	7/08/91	H00071Y3		10.00 U		
699-42-42B	7/08/91	H00071Y3F	8300.00			10.00 U
699-42-42B	1/24/92	B01Q63		10.00 UD		
699-42-42B	1/24/92	B01Q64	7500.00 D			10.00 UD
699-42-42B	6/24/92	B06ZZ7		10.00 U		
699-42-42B	6/24/92	B07001	7400.00			10.00 U
699-42-42B	1/21/93	B07TZ9		10.00 U		
699-42-42B	1/21/93	B07V03	7500.00			10.00 U
699-43-40	1/31/92	B01T72		520.00 PD		
699-43-40	1/31/92	B01T73	9500.00 PD			250.00 PD
699-43-40	4/28/92	B065V6		100.00 P		
699-43-40	4/28/92	B065W0	9000.00 P			69.00 P
699-43-40	6/26/92	B07002		170.00 P		
699-43-40	6/26/92	B07006	9500.00 P			150.00 P
699-43-40	1/25/93	B07V04		60.00 P		
699-43-40	1/25/93	B07V08	10000.00 P			60.00 P
699-43-41E	12/05/89	H000DGD6			45.00	

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Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
699-43-41E	12/05/89	H000DGD6	8900.00			33.00
699-43-41E	1/25/90	H000DGF0			34.00	
699-43-41E	1/25/90	H000DGF0	8890.00			16.00
699-43-41E	6/28/91	H0007203		12.00 D		
699-43-41E	6/28/91	H0007203F	9100.00			10.00 U
699-43-41E	6/28/91	H0007204		12.00 D		
699-43-41E	6/28/91	H0007204F	9200.00			10.00 U
699-43-41E	1/23/92	B01QC3		10.00 U		
699-43-41E	1/23/92	B01QC4	9900.00			51.00
699-43-41E	4/17/92	B065P4		38.00		
699-43-41E	4/17/92	B065Q6	9300.00			10.00 U
699-43-41E	6/24/92	B06ZV3		12.00		
699-43-41E	6/24/92	B06ZW1	9600.00			10.00 U
699-43-41E	1/25/93	B07V09		10.00		
699-43-41E	1/25/93	B07V13	9800.00			10.00 U
699-43-41F	12/05/89	H000DGG8			154.00	
699-43-41F	12/05/89	H000DGG8	10600.00			216.00
699-43-41F	1/25/90	H000DGH2			90.00	
699-43-41F	1/25/90	H000DGH2	10000.00			79.00
699-43-41F	4/18/90	H000DGH6			116.00	
699-43-41F	4/18/90	H000DGH6	10300.00			89.00
699-43-41F	7/02/91	H00071Y5		23.00 D		
699-43-41F	7/02/91	H00071Y5F	10000.00			21.00
699-43-41F	5/05/92	B065R0		20.00		
699-43-41F	5/05/92	B065R9	11000.00			10.00 U
699-43-41F	6/25/92	B06ZW7		40.00		
699-43-41F	6/25/92	B06ZX1	10000.00			10.00 U
699-43-41F	1/22/93	B07V14		10.00 U		
699-43-41F	1/22/93	B07V18	11000.00			10.00 U
699-43-41G	1/23/92	B01T74		360.00		
699-43-41G	1/23/92	B01T75	9500.00			310.00
699-43-41G	4/17/92	B065W1		320.00		
699-43-41G	4/17/92	B065W6	9100.00			320.00
699-43-41G	6/26/92	B07007		220.00		
699-43-41G	6/26/92	B07011	9200.00			210.00
699-43-41G	10/28/92	B07JL8		130.00		
699-43-41G	10/28/92	B07JM2	9600.00			130.00
699-43-41G	1/25/93	B07V74		110.00		
699-43-41G	1/25/93	B07V78	9500.00			140.00
699-43-42J	11/22/88	H000DGP2			5.00 U	
699-43-42J	11/22/88	H000DGP2	5850.00			5.00 U
699-43-42J	2/24/89	H000DGP6			8.00	
699-43-42J	2/24/89	H000DGP6	6380.00			5.00

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Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
699-43-42J	6/15/89	H000DGQ0			7.00	
699-43-42J	6/15/89	H000DGQ0	6600.00			5.00
699-43-42J	8/09/89	H000DGQ4			18.00	
699-43-42J	8/09/89	H000DGQ4	6070.00			5.00 U
699-43-42J	8/09/89	H000DGQ7			12.00	
699-43-42J	8/09/89	H000DGQ7	6290.00			5.00
699-43-42J	7/02/91	H00071Y6		10.00 UD		
699-43-42J	7/02/91	H00071Y6F	5000.00			10.00 U
699-43-42J	1/31/92	B01S49		16.00 D		
699-43-42J	1/31/92	B01S51	5100.00 D			10.00 UD
699-43-42J	6/25/92	B07012		21.00		
699-43-42J	6/25/92	B07016	4000.00			10.00 U
699-43-42J	1/21/93	B07V19		10.00		
699-43-42J	1/21/93	B07V23	5000.00			10.00 U
699-43-43	11/21/88	H000DGR3			5.00 U	
699-43-43	11/21/88	H000DGR3	5270.00			5.00 U
699-43-43	2/24/89	H000DGR7			5.00 U	
699-43-43	2/24/89	H000DGR7	5430.00			5.00 U
699-43-43	2/24/89	H000DGS0			5.00 U	
699-43-43	2/24/89	H000DGS0	5370.00			5.00 U
699-43-43	6/15/89	H000DGS1			8.00	
699-43-43	6/15/89	H000DGS1	5960.00			5.00
699-43-43	8/09/89	H000DGS5			5.00 U	
699-43-43	8/09/89	H000DGS5	6070.00			5.00 U
699-43-43	1/26/90	H000DGS9			5.00 U	
699-43-43	1/26/90	H000DGS9	5960.00			5.00 U
699-43-43	7/08/91	H00071Y7		10.00 U		
699-43-43	7/08/91	H00071Y7F	6100.00			10.00 U
699-43-43	1/24/92	B01Q67		10.00 UD		
699-43-43	1/24/92	B01Q68	6400.00 D			10.00 UD
699-43-43	4/22/92	B065N6		10.00 U		
699-43-43	4/22/92	B065N7	6600.00			10.00 U
699-43-43	6/26/92	B070W0		10.00 UD		
699-43-43	6/26/92	B070W1	6700.00			10.00 U
699-43-43	10/26/92	B07JG5		10.00 U		
699-43-43	10/26/92	B07JG6	6800.00			10.00 U
699-43-43	1/13/93	B07V24		10.00 U		
699-43-43	1/13/93	B07V28	6400.00			10.00 U
699-43-45	12/06/89	H000DGT4			6.00	
699-43-45	12/06/89	H000DGT4	6580.00			5.00 U
699-43-45	1/26/90	H000DGT8			11.00	
699-43-45	1/26/90	H000DGT8	6270.00			5.00 U
699-43-45	4/18/90	H000DGV2			7.00	

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Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
699-43-45	4/18/90	H000DGV2	6510.00			5.00 U
699-43-45	7/08/91	H00071Y8		15.00		
699-43-45	7/08/91	H00071Y8F	6800.00			10.00 U
699-43-45	9/11/91	B00LG5		10.00 U		
699-43-45	9/11/91	B00LG5F	6800.00			10.00 U
699-43-45	1/24/92	B01QD0		15.00 D		
699-43-45	1/24/92	B01QD1	6400.00 D			10.00 UD
699-43-45	4/22/92	B065N8		12.00		
699-43-45	4/22/92	B065N9	7100.00			10.00 U
699-43-45	6/26/92	B070W2		10.00 UD		
699-43-45	6/26/92	B070W3	6900.00			10.00 U
699-43-45	10/26/92	B07JG7		10.00		
699-43-45	10/26/92	B07JG8	6800.00			10.00 U
699-43-45	1/13/93	B07V29		10.00		
699-43-45	1/13/93	B07V33	6400.00			10.00 U
699-44-39B	1/08/93	B07WK1		10.00 U		
699-44-39B	1/08/93	B07WK5	7700.00			10.00 U
699-44-42	11/21/88	H000DHK2			5.00 U	
699-44-42	11/21/88	H000DHK2	6450.00			5.00 U
699-44-42	2/17/89	H000DHK6			5.00 U	
699-44-42	2/17/89	H000DHK6	6230.00			5.00 U
699-44-42	6/15/89	H000DHL0			5.00 U	
699-44-42	6/15/89	H000DHL0	5610.00			5.00 U
699-44-42	8/08/89	H000DHL4			5.00 U	
699-44-42	8/08/89	H000DHL4	5750.00			5.00 U
699-44-42	1/31/90	H000DHL8			6.00	
699-44-42	1/31/90	H000DHL8	5950.00			5.00 U
699-44-42	7/10/91	H00071Y9		10.00 U		
699-44-42	7/10/91	H00071Y9F	3400.00			10.00 U
699-44-42	1/31/92	B01S52		10.00 UD		
699-44-42	1/31/92	B01S54	6900.00 D			10.00 UD
699-44-42	6/25/92	B07017		12.00		
699-44-42	6/25/92	B07021	7000.00			10.00 U
699-44-42	1/13/93	B07V34		10.00 U		
699-44-42	1/13/93	B07V35		10.00 U		
699-44-42	1/13/93	B07V42	7100.00			10.00 U
699-44-42	1/13/93	B07V43	6900.00			10.00 U
699-44-43B	12/20/89	H000DHM3			9.00	
699-44-43B	12/20/89	H000DHM3	8830.00			5.00 U
699-44-43B	12/20/89	H000DHM6			11.00	
699-44-43B	12/20/89	H000DHM6	8890.00			7.00
699-44-43B	1/26/90	H000DHM7			8.00	
699-44-43B	1/26/90	H000DHM7	8770.00			5.00 U

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Well Name	Collection Date	Sample Number	FMAGNES 34/ppb 100/.	MANGESE 34/ppb 10/50s	MANGESE 35/ppb ./50s	FMANGAN 34/ppb 10/50s
699-44-43B	1/26/90	H000DHN0			9.00	
699-44-43B	1/26/90	H000DHN0	8760.00			5.00 U
699-44-43B	4/18/90	H000DHN1			19.00	
699-44-43B	4/18/90	H000DHN1	8820.00			5.00 U
699-44-43B	7/08/91	H00071Z0		13.00		
699-44-43B	7/08/91	H00071Z0F	9300.00			10.00
699-44-43B	9/11/91	B00LG6		10.00 U		
699-44-43B	9/11/91	B00LG6F	8800.00			10.00 U
699-44-43B	1/23/92	B01Q69		10.00 U		
699-44-43B	1/23/92	B01Q70	9600.00			13.00
699-44-43B	4/20/92	B065W9		10.00 U		
699-44-43B	4/20/92	B065X5	9500.00			10.00 U
699-44-43B	6/26/92	B01MT4	9100.00			10.00 U
699-44-43B	6/26/92	B07022		10.00 U		
699-44-43B	6/26/92	B07023		10.00 U		
699-44-43B	6/26/92	B07026	9100.00			10.00 U
699-44-43B	1/27/93	B07V44		10.00 U		
699-44-43B	1/27/93	B07V48	9200.00			10.00 U

Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
299-E18-1	8/16/88	H0007ZT7			15.00	
299-E18-1	8/16/88	H0007ZT7				10.00 U
299-E18-1	9/22/88	H0007ZV1			48.00	
299-E18-1	9/22/88	H0007ZV1				10.00 U
299-E18-1	11/10/88	H0007ZV2	10.00 U		25.00	
299-E18-1	11/10/88	H0007ZV2				16.00
299-E18-1	11/10/88	H0007ZV3	10.00 U			
299-E18-1	11/10/88	H0007ZV4	10.00 U			
299-E18-1	11/10/88	H0007ZV5	10.00 U		19.00	
299-E18-1	11/10/88	H0007ZV5				15.00
299-E18-1	11/23/88	H0007ZV6	10.00 U			
299-E18-1	2/15/89	H0007ZV8	5.00 U		10.00 U	
299-E18-1	2/15/89	H0007ZV8				10.00 U
299-E18-1	5/26/89	H0007ZW2	5.00 U		13.00	
299-E18-1	5/26/89	H0007ZW2				10.00 U
299-E18-1	8/08/89	H0007ZW6	5.00 U		44.00	
299-E18-1	8/08/89	H0007ZW6				10.00 U
299-E18-1	10/31/89	H0007ZX0	5.00 U		22.00	

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Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
299-E18-1	10/31/89	H0007ZX0				10.00 U
299-E18-1	7/09/91	H00071X9		67.00		
299-E18-1	7/09/91	H00071X9F				30.00 U
299-E18-1	9/06/91	B00LB6		42.00		
299-E18-1	9/06/91	B00LB6F				30.00 U
299-E18-1	1/24/92	B01Q59		30.00 UD		
299-E18-1	1/24/92	B01Q60				30.00 UD
299-E18-1	6/03/92	B06PH8	5.00 U	30.00 U		
299-E18-1	6/03/92	B06PJ2				30.00 U
299-E18-1	12/16/92	B07S32		50.00		
299-E18-1	12/16/92	B07S36				30.00 U
299-E32-4	9/27/88	H0008ZB8	10.00 U		10.00 U	
299-E32-4	9/27/88	H0008ZB8				10.00 U
299-E32-4	12/28/88	H0008ZC2	2.00 U		21.00	
299-E32-4	12/28/88	H0008ZC2				10.00 U
299-E32-4	3/01/89	H0008ZC6	5.00 U		15.00	
299-E32-4	3/01/89	H0008ZC6				10.00 U
299-E32-4	3/13/89	H0008ZD0	5.00 U		22.00	
299-E32-4	3/13/89	H0008ZD0				10.00 U
299-E32-4	6/16/89	H0008ZD4			34.00	
299-E32-4	6/16/89	H0008ZD4				10.00 U
299-E32-4	7/19/89	H0008ZD8	5.00 U		25.00	
299-E32-4	7/19/89	H0008ZD8				10.00 U
299-E32-4	9/08/89	H0008ZF6	5.00 U		19.00	
299-E32-4	9/08/89	H0008ZF6				12.00
299-E32-4	1/17/90	H0008ZG0	5.00 U		43.00	
299-E32-4	1/17/90	H0008ZG0				10.00 U
299-E32-4	5/09/90	H0008ZG9	5.00 U			
299-E32-4	8/05/91	H00071Y0		98.00 D		
299-E32-4	8/05/91	H00071Y0F				30.00 U
299-E32-4	8/05/91	H0007264		85.00 D		
299-E32-4	8/05/91	H0007264F				30.00 U
299-E32-4	9/23/91	B00LK5		30.00 U		
299-E32-4	9/23/91	B00LK5F				30.00 U
299-E32-4	1/15/92	B01QK6	5.00 U	44.00		
299-E32-4	1/15/92	B01QK8				30.00 U
299-E32-4	4/06/92	B06696	5.00 U	30.00 U		
299-E32-4	4/06/92	B06697				30.00 U
299-E32-4	7/14/92	B07173	5.00 U	36.00		
299-E32-4	7/14/92	B07174				30.00 U
699-40-36	12/21/92	B07TB1		30.00 U		
699-40-36	12/21/92	B07TB8				30.00 U
699-40-36	2/22/93	B08717		30.00 U		

Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
699-40-36	2/22/93	B08721				30.00 U
699-40-39	12/05/89	H000DBX2	5.00 U		10.00 U	
699-40-39	12/05/89	H000DBX2				10.00 U
699-40-39	1/25/90	H000DBX6	5.00 U		13.00	
699-40-39	1/25/90	H000DBX6				10.00 U
699-40-39	4/25/90	H000DBY0	5.00 U		13.00	
699-40-39	4/25/90	H000DBY0				10.00 U
699-40-39	7/08/91	H00071Y4F				30.00 U
699-40-39	9/11/91	B00LG1		30.00		
699-40-39	9/11/91	B00LG1F				30.00 U
699-40-39	1/31/92	B01Q65		260.00 D		
699-40-39	1/31/92	B01Q66				30.00 UD
699-40-39	4/17/92	B065P2		30.00 U		
699-40-39	4/17/92	B065Q4				30.00 U
699-40-39	6/24/92	B06ZT7		30.00 U		
699-40-39	6/24/92	B06ZV1				30.00 U
699-40-39	1/14/93	B07TX4		300.00		
699-40-39	1/14/93	B07TX8				30.00 U
699-40-40A	1/24/92	B01T62		52.00 D		
699-40-40A	1/24/92	B01T63				30.00 UD
699-40-40A	4/22/92	B065Q8		30.00 U		
699-40-40A	4/22/92	B065R8				30.00 U
699-40-40A	6/25/92	B06ZV2		65.00		
699-40-40A	6/25/92	B06ZW0				30.00 U
699-40-40A	10/21/92	B07JK3	5.00 U	30.00 U		
699-40-40A	10/21/92	B07JK7				30.00 U
699-40-40A	1/26/93	B07V49	5.00 U	40.00		
699-40-40A	1/26/93	B07V53				30.00 U
699-40-40B	1/01/92	B01T65				30.00 UD
699-40-40B	1/24/92	B01T64		360.00 D		
699-40-40B	4/22/92	B065S0		140.00		
699-40-40B	4/22/92	B065S4				30.00 U
699-40-40B	6/29/92	B06ZW2		160.00		
699-40-40B	6/29/92	B06ZW6				30.00 U
699-40-40B	10/21/92	B07JK8	5.00 U	260.00		
699-40-40B	10/21/92	B07JL2				30.00 U
699-40-40B	1/26/93	B07V54	5.00 U	150.00		
699-40-40B	1/26/93	B07V58				30.00 U
699-41-35	12/21/92	B07TB9		30.00 U		
699-41-35	12/21/92	B07TC3				30.00 U
699-41-35	2/22/93	B08707		30.00 U		
699-41-35	2/22/93	B08711				30.00 U
699-41-40	12/05/89	H000DD44	5.00 U		10.00 U	

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Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
699-41-40	12/05/89	H000DD44				10.00 U
699-41-40	1/25/90	H000DD48	5.00 U		53.00	
699-41-40	1/25/90	H000DD48				24.00
699-41-40	4/19/90	H000DD52	5.00 U		25.00	
699-41-40	4/19/90	H000DD52				19.00
699-41-40	7/10/91	H00071Y1		30.00 U		
699-41-40	7/10/91	H00071Y1F				30.00 U
699-41-40	9/11/91	B00LG2		30.00 U		
699-41-40	9/11/91	B00LG2F				30.00 U
699-41-40	1/31/92	B01QC8		300.00 D		
699-41-40	1/31/92	B01QC9				30.00 UD
699-41-40	4/28/92	B065S5		30.00		
699-41-40	4/28/92	B065S6		30.00 U		
699-41-40	4/28/92	B065S9				30.00 U
699-41-40	4/28/92	B065T0				30.00 U
699-41-40	6/24/92	B06ZX2		31.00		
699-41-40	6/24/92	B06ZX6				30.00 U
699-41-40	1/14/93	B07TX9		140.00		
699-41-40	1/14/93	B07TY3				30.00 U
699-41-42	1/08/93	B07V59	5.00 U	30.00 U		
699-41-42	1/08/93	B07V63				30.00 U
699-42-37	12/22/92	B07TC4	5.00 U	30.00		
699-42-37	12/22/92	B07TC8				30.00 U
699-42-37	2/23/93	B08712		50.00		
699-42-37	2/23/93	B08716				30.00 U
699-42-39A	1/23/92	B01T66		49.00 P		
699-42-39A	1/23/92	B01T67				30.00 UP
699-42-39A	4/17/92	B065T1		60.00 P		
699-42-39A	4/17/92	B065T5				30.00 UP
699-42-39A	6/25/92	B06ZX7		150.00 P		
699-42-39A	6/25/92	B06ZY1				30.00 UP
699-42-39A	10/21/92	B07JL3	5.00 UP	110.00 P		
699-42-39A	10/21/92	B07JL7				30.00 UP
699-42-39A	1/27/93	B07V64	5.00 UP	190.00 P		
699-42-39A	1/27/93	B07V68				30.00 UP
699-42-39B	1/23/92	B01T68		91.00		
699-42-39B	1/23/92	B01T69				30.00 U
699-42-39B	4/17/92	B065T6		81.00		
699-42-39B	4/17/92	B065V0				30.00 U
699-42-39B	6/25/92	B06ZY2		72.00		
699-42-39B	6/25/92	B06ZY6				30.00 U
699-42-39B	10/28/92	B07JJ2	5.00 U	40.00 Q		
699-42-39B	10/28/92	B07JJ3	5.00 U	30.00 UQ		

Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
699-42-39B	10/28/92	B07JJ6				30.00 U
699-42-39B	10/28/92	B07JJ7				30.00 U
699-42-39B	1/25/93	B07V69	5.00 U	120.00		
699-42-39B	1/25/93	B07V73				30.00 U
699-42-40A	8/22/85	H000DF11			10.00 U	
699-42-40A	2/07/86	H000DF22	10.00 U			
699-42-40A	5/12/86	H000DF27			10.00 U	
699-42-40A	8/05/86	H000DF33	10.00 U		10.00 U	
699-42-40A	1/08/88	H000DF55	10.00 U		10.00 U	
699-42-40A	1/08/88	H000DF55				10.00 U
699-42-40A	11/22/88	H000DF60	10.00 U		10.00 U	
699-42-40A	11/22/88	H000DF60				10.00 U
699-42-40A	2/15/89	H000DF65	5.00 U		10.00 U	
699-42-40A	2/15/89	H000DF65				10.00 U
699-42-40A	5/31/89	H000DF70	5.00 U		10.00 U	
699-42-40A	5/31/89	H000DF70				10.00 U
699-42-40A	8/10/89	H000DF74	5.00 U		10.00 U	
699-42-40A	8/10/89	H000DF74				10.00 U
699-42-40A	1/26/90	H000DF78	5.00 U		10.00 U	
699-42-40A	1/26/90	H000DF78				10.00 U
699-42-40A	7/08/91	H00071Y2		30.00 U		
699-42-40A	7/08/91	H00071Y2F				30.00 U
699-42-40A	1/08/92	B07TY8		30.00 U		
699-42-40A	1/08/92	B07TZ3				30.00 U
699-42-40A	1/23/92	B01Q61		30.00 U		
699-42-40A	1/23/92	B01Q62				30.00 U
699-42-40A	6/25/92	B06ZY7		30.00 U		
699-42-40A	6/25/92	B06ZZ1				30.00 U
699-42-41	1/24/92	B01T70		38.00 PD		
699-42-41	1/24/92	B01T71				30.00 UPD
699-42-41	4/17/92	B065V1		37.00 P		
699-42-41	4/17/92	B065V5				30.00 UP
699-42-41	6/29/92	B06ZZ2		30.00 UP		
699-42-41	6/29/92	B06ZZ6				30.00 UP
699-42-41	1/25/93	B07TZ4		30.00 UP		
699-42-41	1/25/93	B07TZ8				30.00 UP
699-42-42B	11/22/88	H000DFT3	10.00 U		10.00 U	
699-42-42B	11/22/88	H000DFT3				10.00 U
699-42-42B	2/24/89	H000DFT7	5.00 U		22.00	
699-42-42B	2/24/89	H000DFT7				10.00 U
699-42-42B	6/16/89	H000DFV1	5.00 U		10.00 U	
699-42-42B	6/16/89	H000DFV1				10.00 U
699-42-42B	6/16/89	H000DFV4	5.00 U		11.00	

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Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
699-42-42B	6/16/89	H000DFV4				10.00 U
699-42-42B	8/09/89	H000DFV5	5.00 U		35.00	
699-42-42B	8/09/89	H000DFV5				10.00 U
699-42-42B	1/26/90	H000DFW0	6.00			
699-42-42B	7/08/91	H00071Y3		30.00 U		
699-42-42B	7/08/91	H00071Y3F				30.00 U
699-42-42B	1/24/92	B01Q63		30.00 UD		
699-42-42B	1/24/92	B01Q64				30.00 UD
699-42-42B	6/24/92	B06ZZ7		30.00 U		
699-42-42B	6/24/92	B07001				30.00 U
699-42-42B	1/21/93	B07TZ9		40.00		
699-42-42B	1/21/93	B07V03				30.00 U
699-43-40	1/31/92	B01T72		110.00 PD		
699-43-40	1/31/92	B01T73				30.00 UPD
699-43-40	4/28/92	B065V6		30.00 UP		
699-43-40	4/28/92	B065W0				30.00 UP
699-43-40	6/26/92	B07002		30.00 UP		
699-43-40	6/26/92	B07006				30.00 UP
699-43-40	1/25/93	B07V04		40.00 P		
699-43-40	1/25/93	B07V08				30.00 UP
699-43-41E	12/05/89	H000DGD6	5.00 U		40.00	
699-43-41E	12/05/89	H000DGD6				10.00 U
699-43-41E	1/25/90	H000DGF0	5.00 U		100.00	
699-43-41E	1/25/90	H000DGF0				10.00 U
699-43-41E	5/15/90	H000DGF9	5.00 U			
699-43-41E	6/28/91	H0007203	U	44.00 D		
699-43-41E	6/28/91	H0007203F				30.00 U
699-43-41E	6/28/91	H0007204	U	38.00 D		
699-43-41E	6/28/91	H0007204F				30.00 U
699-43-41E	1/23/92	B01QC3		30.00 U		
699-43-41E	1/23/92	B01QC4				310.00
699-43-41E	4/17/92	B065P4	5.00 U	220.00		
699-43-41E	4/17/92	B065Q6				30.00 U
699-43-41E	6/24/92	B06ZV3	5.00 U	44.00		
699-43-41E	6/24/92	B06ZW1				30.00 U
699-43-41E	1/25/93	B07V09		80.00		
699-43-41E	1/25/93	B07V13				30.00 U
699-43-41F	12/05/89	H000DGG8	5.00 U		35.00	
699-43-41F	12/05/89	H000DGG8				10.00 U
699-43-41F	1/25/90	H000DGH2	5.00 U		15.00	
699-43-41F	1/25/90	H000DGH2				10.00 U
699-43-41F	4/18/90	H000DGH6	5.00 U		13.00	
699-43-41F	4/18/90	H000DGH6				10.00 U

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Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
699-43-41F	7/02/91	H00071Y5	U	30.00 UD		
699-43-41F	7/02/91	H00071Y5F				30.00 U
699-43-41F	5/05/92	B065R0	5.00 U	55.00		
699-43-41F	5/05/92	B065R9				30.00 U
699-43-41F	6/25/92	B06ZW7	5.00 U	130.00		
699-43-41F	6/25/92	B06ZX1				30.00 U
699-43-41F	1/22/93	B07V14		30.00 U		
699-43-41F	1/22/93	B07V18				30.00 U
699-43-41G	1/23/92	B01T74		30.00 U		
699-43-41G	1/23/92	B01T75				30.00 U
699-43-41G	4/17/92	B065W1		100.00		
699-43-41G	4/17/92	B065W6				30.00 U
699-43-41G	6/26/92	B07007		30.00 U		
699-43-41G	6/26/92	B07011				30.00 U
699-43-41G	10/28/92	B07JL8	5.00 U	30.00 U		
699-43-41G	10/28/92	B07JM2				30.00 U
699-43-41G	1/25/93	B07V74	5.00 U	40.00		
699-43-41G	1/25/93	B07V78				30.00 U
699-43-42J	11/22/88	H000DGP2	10.00 U		19.00	
699-43-42J	11/22/88	H000DGP2				10.00 U
699-43-42J	2/24/89	H000DGP6	5.00 U		29.00	
699-43-42J	2/24/89	H000DGP6				12.00
699-43-42J	6/15/89	H000DGQ0	5.00 U		34.00	
699-43-42J	6/15/89	H000DGQ0				10.00 U
699-43-42J	8/09/89	H000DGQ4	5.00 U		98.00	
699-43-42J	8/09/89	H000DGQ4				10.00 U
699-43-42J	8/09/89	H000DGQ7	5.00 U		57.00	
699-43-42J	8/09/89	H000DGQ7				10.00 U
699-43-42J	1/31/90	H000DGQ9	5.00 U			
699-43-42J	7/02/91	H00071Y6		30.00 UD		
699-43-42J	7/02/91	H00071Y6F				30.00 U
699-43-42J	1/31/92	B01S49		70.00 D		
699-43-42J	1/31/92	B01S51				30.00 UD
699-43-42J	6/25/92	B07012		110.00		
699-43-42J	6/25/92	B07016				30.00 U
699-43-42J	1/21/93	B07V19		50.00		
699-43-42J	1/21/93	B07V23				30.00 U
699-43-43	11/21/88	H000DGR3	10.00 U		25.00	
699-43-43	11/21/88	H000DGR3				10.00 U
699-43-43	2/24/89	H000DGR7	5.00 U		20.00	
699-43-43	2/24/89	H000DGR7				10.00 U
699-43-43	2/24/89	H000DGS0	5.00 U		16.00	
699-43-43	2/24/89	H000DGS0				10.00 U

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Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
699-43-43	6/15/89	H000DGS1	5.00 U		10.00 U	
699-43-43	6/15/89	H000DGS1				10.00 U
699-43-43	8/09/89	H000DGS5	5.00 U		10.00 U	
699-43-43	8/09/89	H000DGS5				10.00 U
699-43-43	1/26/90	H000DGS9	5.00 U		16.00	
699-43-43	1/26/90	H000DGS9				10.00 U
699-43-43	7/08/91	H00071Y7		32.00		
699-43-43	7/08/91	H00071Y7F				30.00 U
699-43-43	1/24/92	B01Q67		30.00 UD		
699-43-43	1/24/92	B01Q68				30.00 UD
699-43-43	4/22/92	B065N6		37.00		
699-43-43	4/22/92	B065N7				30.00 U
699-43-43	6/26/92	B070W0		30.00 UD		
699-43-43	6/26/92	B070W1				30.00 U
699-43-43	10/26/92	B07JG5		40.00		
699-43-43	10/26/92	B07JG6				30.00 U
699-43-43	1/13/93	B07V24		30.00 U		
699-43-43	1/13/93	B07V28				30.00 U
699-43-45	12/06/89	H000DGT4	5.00 U		20.00	
699-43-45	12/06/89	H000DGT4				10.00 U
699-43-45	1/26/90	H000DGT8	5.00 U		27.00	
699-43-45	1/26/90	H000DGT8				10.00 U
699-43-45	4/18/90	H000DGV2	5.00 U		29.00	
699-43-45	4/18/90	H000DGV2				10.00 U
699-43-45	7/08/91	H00071Y8		40.00		
699-43-45	7/08/91	H00071Y8F				30.00 U
699-43-45	9/11/91	B00LG5		30.00 U		
699-43-45	9/11/91	B00LG5F				30.00 U
699-43-45	1/24/92	B01QD0		64.00 D		
699-43-45	1/24/92	B01QD1				30.00 UD
699-43-45	4/22/92	B065N8		45.00		
699-43-45	4/22/92	B065N9				30.00 U
699-43-45	6/26/92	B070W2		30.00 UD		
699-43-45	6/26/92	B070W3				30.00 U
699-43-45	10/26/92	B07JG7		40.00		
699-43-45	10/26/92	B07JG8				30.00 U
699-43-45	1/13/93	B07V29		50.00		
699-43-45	1/13/93	B07V33				30.00 U
699-44-39B	1/08/93	B07WK1	5.00 U	30.00 U		
699-44-39B	1/08/93	B07WK5				30.00 U
699-44-42	11/21/88	H000DHK2	10.00 U		10.00 U	
699-44-42	11/21/88	H000DHK2				10.00 U
699-44-42	2/17/89	H000DHK6	5.00 U		10.00 U	

Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.
699-44-42	2/17/89	H000DHK6				10.00 U
699-44-42	6/15/89	H000DHL0	5.00 U		10.00 U	
699-44-42	6/15/89	H000DHL0				10.00 U
699-44-42	8/08/89	H000DHL4	5.00 U		15.00	
699-44-42	8/08/89	H000DHL4				10.00 U
699-44-42	1/31/90	H000DHL8	5.00 U		25.00	
699-44-42	1/31/90	H000DHL8				10.00 U
699-44-42	7/10/91	H00071Y9		30.00 U		
699-44-42	7/10/91	H00071Y9F				30.00 U
699-44-42	1/31/92	B01S52		30.00 UD		
699-44-42	1/31/92	B01S54				30.00 UD
699-44-42	6/25/92	B07017		59.00		
699-44-42	6/25/92	B07021				30.00 U
699-44-42	1/13/93	B07V34		30.00 U		
699-44-42	1/13/93	B07V35		30.00 U		
699-44-42	1/13/93	B07V42				30.00 U
699-44-42	1/13/93	B07V43				30.00 U
699-44-43B	12/20/89	H000DHM3	5.00 U		21.00	
699-44-43B	12/20/89	H000DHM3				10.00 U
699-44-43B	12/20/89	H000DHM6	5.00 U		16.00	
699-44-43B	12/20/89	H000DHM6				10.00 U
699-44-43B	1/26/90	H000DHM7	5.00 U		10.00 U	
699-44-43B	1/26/90	H000DHM7				10.00 U
699-44-43B	1/26/90	H000DHN0			13.00	
699-44-43B	1/26/90	H000DHN0				10.00 U
699-44-43B	4/18/90	H000DHN1	5.00 U		13.00	
699-44-43B	4/18/90	H000DHN1				10.00 U
699-44-43B	7/08/91	H00071Z0		39.00		
699-44-43B	7/08/91	H00071Z0F				30.00 U
699-44-43B	9/11/91	B00LG6		30.00 U		
699-44-43B	9/11/91	B00LG6F				30.00 U
699-44-43B	1/23/92	B01Q69		30.00 U		
699-44-43B	1/23/92	B01Q70				69.00
699-44-43B	4/20/92	B065W9		46.00		
699-44-43B	4/20/92	B065X5				30.00 U
699-44-43B	6/26/92	B01MT4				30.00 U
699-44-43B	6/26/92	B07022		30.00 U		
699-44-43B	6/26/92	B07023		30.00 U		
699-44-43B	6/26/92	B07026				30.00 U
699-44-43B	1/27/93	B07V44		50.00		
699-44-43B	1/27/93	B07V48				30.00 U

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Well Name	Collection Date	Sample Number	METHYCH 16/ppb 5/.	NICKEL 34/ppb 30/.	NICKEL 35/ppb ./.	FNICKEL 34/ppb 30/.

Well Name	Collection Date	Sample Number	NITRATE 124/ppb 200/45000	NITRATE 130/ppb 200/45000	NITRATE 46/ppb ./45000	NITRATE 76/ppm ./.
299-E18-1	8/16/88	H0007ZT7			10100.00	
299-E18-1	11/10/88	H0007ZV2			8400.00	
299-E18-1	11/10/88	H0007ZV5			8400.00	
299-E18-1	2/15/89	H0007ZV8			11400.00	
299-E18-1	5/26/89	H0007ZW2			12000.00	
299-E18-1	8/08/89	H0007ZW6			12500.00	
299-E18-1	10/31/89	H0007ZX0			12200.00	
299-E18-1	5/30/90	H0007ZX5			12600.00	
299-E18-1	7/09/91	H00071X9		13300.00		
299-E18-1	9/06/91	B00LB6		11400.00		
299-E18-1	1/24/92	B01Q59	13000.00			
299-E18-1	6/03/92	B06PH8	12000.00			
299-E18-1	12/16/92	B07S32	13000.00			
299-E32-4	9/27/88	H0008ZB8			25000.00	
299-E32-4	12/28/88	H0008ZC2			24200.00	
299-E32-4	3/01/89	H0008ZC6			24600.00	
299-E32-4	3/13/89	H0008ZD0			24800.00	
299-E32-4	6/16/89	H0008ZD4			29000.00	
299-E32-4	7/19/89	H0008ZD8			29600.00	
299-E32-4	9/08/89	H0008ZF6			24500.00	
299-E32-4	1/17/90	H0008ZG0			29600.00	
299-E32-4	5/09/90	H0008ZG9			29300.00	
299-E32-4	8/05/91	H00071Y0		27200.00		
299-E32-4	8/05/91	H0007264		27000.00		
299-E32-4	9/23/91	B00LK5		27000.00		
299-E32-4	1/15/92	B01QK6	5300.00			
299-E32-4	4/06/92	B06696	23000.00			
299-E32-4	4/09/92	B065B6	24000.00 P			
299-E32-4	7/14/92	B07173	25000.00			
699-40-36	12/21/92	B07TB1	200.00 U			
699-40-36	2/22/93	B08717	200.00 U			
699-40-39	12/05/89	H000DBX2			500.00 U	
699-40-39	1/25/90	H000DBX6			500.00 U	
699-40-39	4/25/90	H000DBY0			500.00 U	
699-40-39	7/08/91	H00071Y4		280.00		
699-40-39	9/11/91	B00LG1		220.00		

Well Name	Collection Date	Sample Number	NITRATE 124/ppb 200/45000	NITRATE 130/ppb 200/45000	NITRATE 46/ppb ./45000	NITRATE 76/ppm ./.
699-40-39	1/31/92	B01Q65	500.00			
699-40-39	4/17/92	B065P2	1700.00 D			
699-40-39	6/24/92	B06ZT7	300.00			
699-40-39	1/14/93	B07TX4	300.00			
699-40-40A	1/24/92	B01T62	1900.00			
699-40-40A	4/22/92	B065Q8	3200.00			
699-40-40A	6/25/92	B06ZV2	2600.00			
699-40-40A	10/21/92	B07JK3	1900.00			
699-40-40A	1/26/93	B07V49	2100.00			
699-40-40B	1/24/92	B01T64	700.00			
699-40-40B	4/22/92	B065S0	200.00 U			
699-40-40B	6/29/92	B06ZW2	600.00 D			
699-40-40B	10/21/92	B07JK8	600.00			
699-40-40B	1/26/93	B07V54	800.00			
699-41-35	12/21/92	B07TB9	500.00			
699-41-35	2/22/93	B08707	200.00 U			
699-41-40	12/05/89	H000DD44			18800.00	
699-41-40	1/25/90	H000DD48			22500.00	
699-41-40	4/19/90	H000DD52			19600.00	
699-41-40	7/10/91	H00071Y1		20600.00		
699-41-40	9/11/91	B00LG2		20000.00		
699-41-40	1/31/92	B01QC8	20000.00			
699-41-40	4/28/92	B065S5	20000.00 D			
699-41-40	4/28/92	B065S6	20000.00 D			
699-41-40	6/24/92	B06ZX2	20000.00			
699-41-40	1/14/93	B07TX9	22000.00			
699-41-42	1/08/93	B07V59	5000.00			
699-42-37	12/22/92	B07TC4	4300.00			
699-42-37	2/23/93	B08712	3900.00			
699-42-39A	1/23/92	B01T66	2400.00 P			
699-42-39A	4/17/92	B065T1	13000.00 P			
699-42-39A	6/25/92	B06ZX7	13000.00 P			
699-42-39A	10/21/92	B07JL3	12000.00 P			
699-42-39A	1/27/93	B07V64	11000.00 P			
699-42-39B	1/23/92	B01T68	2600.00			
699-42-39B	4/17/92	B065T6	14000.00			
699-42-39B	6/25/92	B06ZY2	11000.00			
699-42-39B	10/28/92	B07JJ2	12000.00			
699-42-39B	10/28/92	B07JJ3	12000.00			
699-42-39B	1/25/93	B07V69	9700.00			
699-42-40A	3/29/83	H000DDY1				10.60
699-42-40A	6/16/83	H000DDY4				6.00
699-42-40A	9/27/83	H000DDY7				3.07

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Well Name	Collection Date	Sample Number	NITRATE 124/ppb 200/45000	NITRATE 130/ppb 200/45000	NITRATE 46/ppb ./45000	NITRATE 76/ppm ./.
699-42-40A	12/09/83	H000DDZ0				7.84
699-42-40A	1/24/84	H000DDZ1				1.88
699-42-40A	4/26/84	H000DDZ4				6.64
699-42-40A	7/19/84	H000DDZ7				2.51
699-42-40A	10/09/84	H000DF00				3.88
699-42-40A	1/16/85	H000DF03				.64
699-42-40A	5/03/85	H000DF07				1.32
699-42-40A	7/11/85	H000DF10				17.00
699-42-40A	8/22/85	H000DF11			1550.00	
699-42-40A	11/12/85	H000DF19				3.59
699-42-40A	1/09/86	H000DF21				1.94
699-42-40A	4/11/86	H000DF25				.71
699-42-40A	5/12/86	H000DF27			925.00	
699-42-40A	7/02/86	H000DF32				.50
699-42-40A	8/05/86	H000DF33			644.00	
699-42-40A	10/24/86	H000DF39			500.00 U	
699-42-40A	1/15/87	H000DF42			23100.00	
699-42-40A	4/06/87	H000DF45			25500.00	
699-42-40A	7/09/87	H000DF49			2500.00 U	
699-42-40A	10/06/87	H000DF52			2500.00 U	
699-42-40A	1/08/88	H000DF55			500.00 U	
699-42-40A	1/08/88	H000DF56			3650.00	
699-42-40A	5/23/88	H000DF57			2500.00 U	
699-42-40A	7/19/88	H000DF58			2500.00 U	
699-42-40A	11/15/88	H000DF59			2500.00 U	
699-42-40A	11/22/88	H000DF60			700.00	
699-42-40A	2/06/89	H000DF64			2500.00 U	
699-42-40A	2/15/89	H000DF65			600.00	
699-42-40A	4/07/89	H000DF69			2500.00 U	
699-42-40A	5/31/89	H000DF70			700.00	
699-42-40A	8/10/89	H000DF74			6500.00	
699-42-40A	1/26/90	H000DF78			800.00	
699-42-40A	7/08/91	H00071Y2		820.00		
699-42-40A	1/23/92	B01Q61	490.00			
699-42-40A	6/25/92	B06ZY7	3500.00			
699-42-41	1/24/92	B01T70	900.00 P			
699-42-41	4/17/92	B065V1	700.00 P			
699-42-41	6/29/92	B06ZZ2	1000.00 PD			
699-42-41	1/25/93	B07TZ4	600.00 P			
699-42-42B	11/22/88	H000DFT3			6200.00	
699-42-42B	2/24/89	H000DFT7			6400.00	
699-42-42B	6/16/89	H000DFV1			6200.00	
699-42-42B	6/16/89	H000DFV4			6400.00	

(sheet ** of **)

Well Name	Collection Date	Sample Number	NITRATE 124/ppb 200/45000	NITRATE 130/ppb 200/45000	NITRATE 46/ppb ./45000	NITRATE 76/ppm ./.
699-42-42B	8/09/89	H000DFV5			6500.00	
699-42-42B	7/08/91	H00071Y3		5880.00		
699-42-42B	1/24/92	B01Q63	6300.00			
699-42-42B	6/24/92	B06ZZ7	5200.00			
699-42-42B	1/21/93	B07TZ9	6100.00			
699-43-40	1/31/92	B01T72	5900.00 P			
699-43-40	4/28/92	B065V6	5800.00 PD			
699-43-40	6/26/92	B07002	6200.00 P			
699-43-40	1/25/93	B07V04	7400.00 P			
699-43-41E	12/05/89	H000DGD6			9300.00	
699-43-41E	1/25/90	H000DGF0			8700.00	
699-43-41E	5/15/90	H000DGF9			10100.00	
699-43-41E	5/15/90	H000DGG2			10400.00	
699-43-41E	6/28/91	H0007203		7400.00		
699-43-41E	6/28/91	H0007204		7300.00		
699-43-41E	1/23/92	B01QC3	1400.00			
699-43-41E	4/17/92	B065P4	8100.00			
699-43-41E	6/24/92	B06ZV3	9300.00			
699-43-41E	1/25/93	B07V09	11000.00			
699-43-41F	12/05/89	H000DGG8			9500.00	
699-43-41F	1/25/90	H000DGH2			10200.00	
699-43-41F	4/18/90	H000DGH6			11700.00	
699-43-41F	7/02/91	H00071Y5		9990.00		
699-43-41F	5/05/92	B065R0	10000.00			
699-43-41F	6/25/92	B06ZW7	9800.00			
699-43-41F	1/22/93	B07V14	9300.00			
699-43-41G	1/23/92	B01T74	1000.00			
699-43-41G	4/17/92	B065W1	6900.00			
699-43-41G	6/26/92	B07007	5500.00			
699-43-41G	10/28/92	B07JL8	5100.00			
699-43-41G	1/25/93	B07V74	5600.00			
699-43-42J	11/22/88	H000DGP2			1000.00	
699-43-42J	2/24/89	H000DGP6			1800.00	
699-43-42J	6/15/89	H000DGQ0			1800.00	
699-43-42J	8/09/89	H000DGQ4			1400.00	
699-43-42J	8/09/89	H000DGQ7			1400.00	
699-43-42J	1/31/90	H000DGQ9			5100.00	
699-43-42J	7/02/91	H00071Y6		3920.00		
699-43-42J	1/31/92	B01S49	5300.00			
699-43-42J	6/25/92	B07012	4900.00			
699-43-42J	1/21/93	B07V19	4800.00			
699-43-43	11/21/88	H000DGR3			800.00	
699-43-43	2/24/89	H000DGR7			700.00	

Well Name	Collection Date	Sample Number	NITRATE 124/ppb 200/45000	NITRATE 130/ppb 200/45000	NITRATE 46/ppb ./45000	NITRATE 76/ppm ./.
699-43-43	2/24/89	H000DGS0			700.00	
699-43-43	6/15/89	H000DGS1			1100.00	
699-43-43	8/09/89	H000DGS5			1100.00	
699-43-43	1/26/90	H000DGS9			1000.00	
699-43-43	7/08/91	H00071Y7		820.00		
699-43-43	1/24/92	B01Q67	1100.00			
699-43-43	4/22/92	B065N6	1100.00			
699-43-43	6/26/92	B070W0	1000.00			
699-43-43	10/26/92	B07JG5	61000.00 F			
699-43-43	1/13/93	B07V24	1100.00			
699-43-45	12/06/89	H000DGT4			1000.00	
699-43-45	1/26/90	H000DGT8			1200.00	
699-43-45	4/18/90	H000DGV2			1500.00	
699-43-45	7/08/91	H00071Y8		1170.00		
699-43-45	9/11/91	B00LG5		1180.00		
699-43-45	1/24/92	B01QD0	1400.00			
699-43-45	4/22/92	B065N8	1200.00			
699-43-45	6/26/92	B070W2	1200.00			
699-43-45	10/26/92	B07JG7	1100.00			
699-43-45	1/13/93	B07V29	900.00			
699-44-39B	1/08/93	B07WK1	1200.00			
699-44-42	11/21/88	H000DHK2			1100.00	
699-44-42	2/17/89	H000DHK6			1400.00	
699-44-42	6/15/89	H000DHL0			1300.00	
699-44-42	8/08/89	H000DHL4			1500.00	
699-44-42	1/31/90	H000DHL8			1400.00	
699-44-42	7/10/91	H00071Y9		1340.00		
699-44-42	1/31/92	B01S52	1600.00			
699-44-42	6/25/92	B07017	1600.00			
699-44-42	1/13/93	B07V34	1300.00			
699-44-42	1/13/93	B07V35	1400.00			
699-44-43B	12/20/89	H000DHM3			7000.00	
699-44-43B	12/20/89	H000DHM6			7200.00	
699-44-43B	1/26/90	H000DHM7			7600.00	
699-44-43B	1/26/90	H000DHN0			8300.00	
699-44-43B	4/18/90	H000DHN1			6600.00	
699-44-43B	7/08/91	H00071Z0		6180.00		
699-44-43B	9/11/91	B00LG6		4400.00		
699-44-43B	1/23/92	B01Q69	940.00			
699-44-43B	4/20/92	B065W9	5000.00			
699-44-43B	6/26/92	B07022	5500.00			
699-44-43B	6/26/92	B07023	4800.00			
699-44-43B	1/27/93	B07V44	4100.00			

Well Name	Collection Date	Sample Number	NITRATE 124/ppb 200/45000	NITRATE 130/ppb 200/45000	NITRATE 46/ppb ./45000	NITRATE 76/ppm ./.

Well Name	Collection Date	Sample Number	LPHENOL 30/ppb 1/.	PHORATE 29/ppb 2/.	PHOSPHA 124/ppb 400/.	PHOSPHA 46/ppb ./.
299-E18-1	8/16/88	H0007ZT7	10.00 U			1000.00 U
299-E18-1	11/10/88	H0007ZV2				1000.00 U
299-E18-1	11/10/88	H0007ZV5				1000.00 U
299-E18-1	2/15/89	H0007ZV8	10.00 U			1000.00 U
299-E18-1	5/26/89	H0007ZW2	10.00 U			1000.00 U
299-E18-1	8/08/89	H0007ZW6	10.00 U			1000.00 U
299-E18-1	10/31/89	H0007ZX0		2.00 U		1000.00 U
299-E18-1	5/30/90	H0007ZX5				1000.00 U
299-E18-1	7/09/91	H00071X9	U		U	
299-E18-1	1/24/92	B01Q59	1.00 UQ		400.00 U	
299-E18-1	6/03/92	B06PH8	1.00 U		400.00 U	
299-E18-1	12/16/92	B07S32			400.00 U	
299-E18-1	12/16/92	B07SN0	1.00 U			
299-E32-4	9/27/88	H0008ZB8				1000.00 U
299-E32-4	12/28/88	H0008ZC2	10.00 U			1000.00 U
299-E32-4	3/01/89	H0008ZC6	10.00 U			1000.00 U
299-E32-4	3/13/89	H0008ZD0	10.00 U			1000.00 U
299-E32-4	6/16/89	H0008ZD4	10.00 U			1000.00 U
299-E32-4	7/19/89	H0008ZD8	10.00 U			1000.00 U
299-E32-4	9/08/89	H0008ZF6	10.00 U			1000.00 U
299-E32-4	1/17/90	H0008ZG0	10.00 U			1000.00 U
299-E32-4	5/09/90	H0008ZG9	10.00 U			1000.00 U
299-E32-4	1/15/92	B01QK6	1.00 U		400.00 U	
299-E32-4	4/06/92	B06696	1.00 U		400.00 U	
299-E32-4	4/09/92	B065B6			400.00 UP	
299-E32-4	7/14/92	B07173	1.00 U		400.00 U	
699-40-36	12/21/92	B07TB1			400.00 U	
699-40-36	2/22/93	B08717			400.00 U	
699-40-39	12/05/89	H000DBX2		2.00 U		1000.00 U
699-40-39	1/25/90	H000DBX6	10.00 U			1000.00 U
699-40-39	4/25/90	H000DBY0	10.00 U			1000.00 U
699-40-39	7/08/91	H00071Y4	U		U	
699-40-39	1/31/92	B01Q65	1.00 U		400.00 U	
699-40-39	4/17/92	B065P2	1.00 UD		400.00 UD	
699-40-39	6/24/92	B06ZT7	1.00 U		400.00 U	
699-40-39	1/14/93	B07TX4	1.00 U		400.00 U	

Well Name	Collection Date	Sample Number	LPHENOL 30/ppb 1/.	PHORATE 29/ppb 2/.	PHOSPHA 124/ppb 400/.	PHOSPHA 46/ppb ./.
699-40-40A	1/24/92	B01T62	1.00 UQ		400.00 U	
699-40-40A	4/22/92	B065Q8	1.00 U		400.00 U	
699-40-40A	6/25/92	B06ZV2	1.00 U		400.00 U	
699-40-40A	10/21/92	B07JK3	1.00 U		400.00 U	
699-40-40A	1/26/93	B07V49	1.00 U		400.00 U	
699-40-40B	1/24/92	B01T64	8.00 Q		200.00	
699-40-40B	4/22/92	B065S0	1.00 U		400.00 U	
699-40-40B	6/29/92	B06ZW2	1.00 UD		400.00 UD	
699-40-40B	10/21/92	B07JK8	1.00 U		400.00 U	
699-40-40B	1/26/93	B07V54	1.00 U		400.00 U	
699-41-35	12/21/92	B07TB9			400.00 U	
699-41-35	2/22/93	B08707			400.00 U	
699-41-40	12/05/89	H000DD44		2.00 U		1000.00 U
699-41-40	1/25/90	H000DD48	10.00 U			1000.00 U
699-41-40	4/19/90	H000DD52	10.00 U			1000.00 U
699-41-40	7/10/91	H00071Y1	U		U	
699-41-40	1/31/92	B01QC8	1.00 U		400.00 U	
699-41-40	4/28/92	B065S5	1.00 UD		400.00 UD	
699-41-40	4/28/92	B065S6	1.00 UD		400.00 UD	
699-41-40	6/24/92	B06ZX2	1.00 U		400.00 U	
699-41-40	1/14/93	B07TX9	1.00 U		400.00 U	
699-41-42	1/08/93	B07V59	1.00 U		400.00 U	
699-42-37	12/22/92	B07TC4			400.00 U	
699-42-37	2/23/93	B08712			400.00 U	
699-42-39A	1/23/92	B01T66	1.00 UP		400.00 UP	
699-42-39A	4/17/92	B065T1	1.00 UPD		400.00 UP	
699-42-39A	6/25/92	B06ZX7	1.00 UP		400.00 UP	
699-42-39A	10/21/92	B07JL3	1.00 UP		400.00 UP	
699-42-39A	1/27/93	B07V64	1.00 UP		400.00 UP	
699-42-39B	1/23/92	B01T68	QD		400.00 U	
699-42-39B	4/17/92	B065T6	1.00 UD		400.00 U	
699-42-39B	6/25/92	B06ZY2	1.00 U		400.00 U	
699-42-39B	10/28/92	B07JJ2	1.00 U		400.00 U	
699-42-39B	10/28/92	B07JJ3	1.00 U		400.00 U	
699-42-39B	1/25/93	B07V69	1.00 U		400.00 U	
699-42-40A	8/22/85	H000DF11				1000.00 U
699-42-40A	5/12/86	H000DF27				1000.00 U
699-42-40A	8/05/86	H000DF33				1000.00 U
699-42-40A	1/08/88	H000DF55				1000.00 U
699-42-40A	11/22/88	H000DF60	10.00 U			1000.00 U
699-42-40A	2/15/89	H000DF65	10.00 U			1000.00 U
699-42-40A	5/31/89	H000DF70	10.00 U			1000.00 U
699-42-40A	8/10/89	H000DF74	10.00 U			1000.00 U

Well Name	Collection Date	Sample Number	LPHENOL 30/ppb 1/.	PHORATE 29/ppb 2/.	PHOSPHA 124/ppb 400/.	PHOSPHA 46/ppb ./.
699-42-40A	1/26/90	H000DF78		2.00 U		1000.00 U
699-42-40A	7/08/91	H00071Y2	U		U	
699-42-40A	1/23/92	B01Q61	1.00 U		400.00 U	
699-42-40A	6/25/92	B06ZY7	1.00 U		400.00 U	
699-42-41	1/24/92	B01T70	10.00 P		400.00 UP	
699-42-41	4/17/92	B065V1	1.00 UPD		400.00 UP	
699-42-41	6/29/92	B06ZZ2	1.00 UPD		400.00 UPD	
699-42-41	1/25/93	B07TZ4	1.00 UP		400.00 UP	
699-42-42B	11/22/88	H000DFT3	10.00 U			1000.00 U
699-42-42B	2/24/89	H000DFT7	10.00 U			1000.00 U
699-42-42B	6/16/89	H000DFV1	10.00 U			1000.00 U
699-42-42B	6/16/89	H000DFV4	10.00 U			1000.00 U
699-42-42B	8/09/89	H000DFV5	10.00 U			1000.00 U
699-42-42B	1/26/90	H000DFW0		2.00 U		
699-42-42B	7/08/91	H00071Y3	U		U	
699-42-42B	1/24/92	B01Q63	1.00 UQ		400.00 U	
699-42-42B	6/24/92	B06ZZ7	1.00 U		400.00 U	
699-42-42B	1/21/93	B07TZ9	1.00 U		400.00 U	
699-43-40	1/31/92	B01T72	1.00 UP		400.00 UP	
699-43-40	4/28/92	B065V6	1.00 UPD		400.00 UPD	
699-43-40	6/26/92	B07002	1.00 UPD		400.00 UP	
699-43-40	1/25/93	B07V04	1.00 UP		400.00 UP	
699-43-41E	12/05/89	H000DGD6		2.00 U		1600.00
699-43-41E	1/25/90	H000DGF0	10.00 U			3200.00
699-43-41E	5/15/90	H000DGF9				1300.00
699-43-41E	5/15/90	H000DGG2				1500.00
699-43-41E	6/28/91	H0007203	U		500.00	
699-43-41E	6/28/91	H0007204	U		550.00	
699-43-41E	1/23/92	B01QC3	1.00 UQ		400.00 U	
699-43-41E	4/17/92	B065P4	1.00 UD		500.00	
699-43-41E	6/24/92	B06ZV3	1.00 U		1100.00	
699-43-41E	1/25/93	B07V09	1.00 U		500.00	
699-43-41F	12/05/89	H000DGG8		2.00 U		1000.00 U
699-43-41F	1/25/90	H000DGH2	10.00 U			1000.00 U
699-43-41F	4/18/90	H000DGH6	10.00 U			1000.00 U
699-43-41F	7/02/91	H00071Y5	U		560.00	
699-43-41F	5/05/92	B065R0	1.00 UD		2000.00	
699-43-41F	6/25/92	B06ZW7	1.00 U		2100.00	
699-43-41F	1/22/93	B07V14	1.00 U		400.00 U	
699-43-41G	1/23/92	B01T74	1.00 UQ		400.00 U	
699-43-41G	4/17/92	B065W1	1.00 UD		400.00 U	
699-43-41G	6/26/92	B07007	1.00 UD		400.00 U	
699-43-41G	10/28/92	B07JL8	1.00 U		400.00 U	

Well Name	Collection Date	Sample Number	LPHENOL 30/ppb 1/.	PHORATE 29/ppb 2/.	PHOSPHA 124/ppb 400/.	PHOSPHA 46/ppb ./.
699-43-41G	1/25/93	B07V74	1.00 U		400.00 U	
699-43-42J	11/22/88	H000DGP2	10.00 U			1000.00 U
699-43-42J	2/24/89	H000DGP6	10.00 U			1000.00 U
699-43-42J	6/15/89	H000DGQ0	10.00 U			1000.00 U
699-43-42J	8/09/89	H000DGQ4	10.00 U			1000.00 U
699-43-42J	8/09/89	H000DGQ7	10.00 U			1000.00 U
699-43-42J	1/31/90	H000DGQ9	10.00 U			1000.00 U
699-43-42J	7/02/91	H00071Y6	U		U	
699-43-42J	1/31/92	B01S49	1.00 U	11.00	400.00 U	
699-43-42J	1/31/92	B01S50	1.00			
699-43-42J	6/25/92	B07012	1.00 U		400.00 U	
699-43-42J	1/21/93	B07V19	1.00 U		400.00 U	
699-43-43	11/21/88	H000DGR3	10.00 U			1000.00 U
699-43-43	2/24/89	H000DGR7	10.00 U			1000.00 U
699-43-43	2/24/89	H000DGS0				1000.00 U
699-43-43	6/15/89	H000DGS1	10.00 U			1000.00 U
699-43-43	8/09/89	H000DGS5	10.00 U			1000.00 U
699-43-43	1/26/90	H000DGS9		2.00 U		1000.00 U
699-43-43	7/08/91	H00071Y7	U		U	
699-43-43	1/24/92	B01Q67	1.00 UQ		400.00 U	
699-43-43	4/22/92	B065N6	1.00 U		400.00 U	
699-43-43	6/26/92	B070W0	1.00 UD		400.00 U	
699-43-43	10/26/92	B07JG5	1.00 U		400.00 U	
699-43-43	1/13/93	B07V24	1.00 U		400.00 U	
699-43-45	12/06/89	H000DGT4		2.00 U		1000.00 U
699-43-45	1/26/90	H000DGT8	10.00 U			1000.00 U
699-43-45	4/18/90	H000DGV2	10.00 U			1000.00 U
699-43-45	7/08/91	H00071Y8	U		U	
699-43-45	1/24/92	B01QD0	1.00 UQ		400.00 U	
699-43-45	4/22/92	B065N8	1.00 U		400.00 U	
699-43-45	6/26/92	B070W2	1.00 UD		400.00 U	
699-43-45	10/26/92	B07JG7	1.00 U		400.00 U	
699-43-45	1/13/93	B07V29	1.00 U		400.00 U	
699-44-39B	1/08/93	B07WK1	1.00 U		400.00 U	
699-44-42	11/21/88	H000DHK2	10.00 U			1000.00 U
699-44-42	2/17/89	H000DHK6	10.00 U			1000.00 U
699-44-42	6/15/89	H000DHL0	10.00 U			1000.00 U
699-44-42	8/08/89	H000DHL4	10.00 U			1000.00 U
699-44-42	1/31/90	H000DHL8	10.00 U			1000.00 U
699-44-42	7/10/91	H00071Y9	U		U	
699-44-42	1/31/92	B01S52	1.00 U	4.20	400.00 U	
699-44-42	1/31/92	B01S53	1.00 U			
699-44-42	6/25/92	B07017	1.00 U		400.00 U	

Well Name	Collection Date	Sample Number	LPHENOL 30/ppb 1/.	PHORATE 29/ppb 2/.	PHOSPHA 124/ppb 400/.	PHOSPHA 46/ppb ./.
699-44-42	1/13/93	B07V34	1.00 U		400.00 U	
699-44-42	1/13/93	B07V35	1.00 U		400.00 U	
699-44-43B	12/20/89	H000DHM3		2.00 U		1000.00 U
699-44-43B	12/20/89	H000DHM6		2.00 U		1000.00 U
699-44-43B	1/26/90	H000DHM7	10.00 U			1000.00 U
699-44-43B	1/26/90	H000DHN0	10.00 U			1000.00 U
699-44-43B	4/18/90	H000DHN1	10.00 U			1000.00 U
699-44-43B	7/08/91	H00071Z0	U		U	
699-44-43B	1/23/92	B01Q69	1.00 UQ		400.00 U	
699-44-43B	4/20/92	B065W9	1.00 U		400.00 U	
699-44-43B	6/26/92	B07022	1.00 UD		400.00 U	
699-44-43B	6/26/92	B07023	1.00 UD		400.00 U	
699-44-43B	1/27/93	B07V44	1.00 U		400.00 U	

Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
299-E18-1	8/16/88	H0007ZT7			6350.00	
299-E18-1	8/16/88	H0007ZT7				6980.00
299-E18-1	9/22/88	H0007ZV1			7200.00	
299-E18-1	9/22/88	H0007ZV1				6870.00
299-E18-1	11/10/88	H0007ZV2			6330.00	
299-E18-1	11/10/88	H0007ZV2				6540.00
299-E18-1	11/10/88	H0007ZV5			6410.00	
299-E18-1	11/10/88	H0007ZV5				6380.00
299-E18-1	2/15/89	H0007ZV8			5570.00	
299-E18-1	2/15/89	H0007ZV8				5800.00
299-E18-1	5/26/89	H0007ZW2			5780.00	
299-E18-1	5/26/89	H0007ZW2				5810.00
299-E18-1	8/08/89	H0007ZW6			5340.00	
299-E18-1	8/08/89	H0007ZW6				6210.00
299-E18-1	10/31/89	H0007ZX0	.00 U		5460.00	
299-E18-1	10/31/89	H0007ZX0				5790.00
299-E18-1	7/09/91	H00071X9		5200.00 Q		
299-E18-1	7/09/91	H00071X9F				4700.00 Q
299-E18-1	9/06/91	B00LB6		5600.00		
299-E18-1	9/06/91	B00LB6F				5600.00
299-E18-1	1/24/92	B01Q59		4900.00 D		
299-E18-1	1/24/92	B01Q60				5600.00 D
299-E18-1	6/03/92	B06PH8		5900.00		

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Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
299-E18-1	6/03/92	B06PJ2				6000.00
299-E18-1	12/16/92	B07S32		5900.00		
299-E18-1	12/16/92	B07S36				5500.00
299-E32-4	9/27/88	H0008ZB8			6790.00	
299-E32-4	9/27/88	H0008ZB8				6060.00
299-E32-4	12/28/88	H0008ZC2			6080.00	
299-E32-4	12/28/88	H0008ZC2				6400.00
299-E32-4	3/01/89	H0008ZC6			5890.00	
299-E32-4	3/01/89	H0008ZC6				5950.00
299-E32-4	3/13/89	H0008ZD0			6330.00	
299-E32-4	3/13/89	H0008ZD0				6050.00
299-E32-4	6/16/89	H0008ZD4			5970.00	
299-E32-4	6/16/89	H0008ZD4				6030.00
299-E32-4	7/19/89	H0008ZD8			6130.00	
299-E32-4	7/19/89	H0008ZD8				5990.00
299-E32-4	9/08/89	H0008ZF6			6950.00	
299-E32-4	9/08/89	H0008ZF6				6250.00
299-E32-4	1/17/90	H0008ZG0			6100.00	
299-E32-4	1/17/90	H0008ZG0				6180.00
299-E32-4	4/29/90	H0008ZG8	-.00 U			
299-E32-4	8/05/91	H00071Y0		7200.00 D		
299-E32-4	8/05/91	H00071Y0F				6100.00
299-E32-4	8/05/91	H0007264		7300.00 D		
299-E32-4	8/05/91	H0007264F				6200.00
299-E32-4	9/23/91	B00LK5		5900.00		
299-E32-4	9/23/91	B00LK5F				6500.00
299-E32-4	1/15/92	B01QK6		6800.00 Q		
299-E32-4	1/15/92	B01QK8				5800.00 Q
299-E32-4	4/06/92	B06696		6300.00		
299-E32-4	4/06/92	B06697				6500.00
299-E32-4	7/14/92	B07173		6300.00		
299-E32-4	7/14/92	B07174				6400.00
699-40-36	12/21/92	B07TB1		7100.00		
699-40-36	12/21/92	B07TB8				7400.00
699-40-36	2/22/93	B08717		7700.00		
699-40-36	2/22/93	B08721				8800.00
699-40-39	12/05/89	H000DBX2	-.00 U		5370.00	
699-40-39	12/05/89	H000DBX2				5430.00
699-40-39	1/25/90	H000DBX6			4920.00	
699-40-39	1/25/90	H000DBX6				4670.00
699-40-39	4/25/90	H000DBY0			4700.00	
699-40-39	4/25/90	H000DBY0				4790.00
699-40-39	7/08/91	H00071Y4F				5100.00

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Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
699-40-39	9/11/91	B00LG1		4400.00		
699-40-39	9/11/91	B00LG1F				4300.00
699-40-39	1/31/92	B01Q65		4400.00 D		
699-40-39	1/31/92	B01Q66				4100.00 D
699-40-39	4/17/92	B065P2		4500.00		
699-40-39	4/17/92	B065Q4				4500.00
699-40-39	6/24/92	B06ZT7		5000.00		
699-40-39	6/24/92	B06ZV1				5000.00
699-40-39	1/14/93	B07TX4		4100.00		
699-40-39	1/14/93	B07TX8				4100.00
699-40-40A	1/24/92	B01T62		8000.00 D		
699-40-40A	1/24/92	B01T63				6500.00 D
699-40-40A	4/22/92	B065Q8		5900.00		
699-40-40A	4/22/92	B065R8				6100.00
699-40-40A	6/25/92	B06ZV2		6800.00		
699-40-40A	6/25/92	B06ZW0				6800.00
699-40-40A	10/21/92	B07JK3		6500.00		
699-40-40A	10/21/92	B07JK7				6900.00
699-40-40A	1/26/93	B07V49		6700.00		
699-40-40A	1/26/93	B07V53				6600.00
699-40-40B	1/01/92	B01T65				4000.00 D
699-40-40B	1/24/92	B01T64		6800.00 D		
699-40-40B	4/22/92	B065S0		4000.00		
699-40-40B	4/22/92	B065S4				3800.00
699-40-40B	6/29/92	B06ZW2		4300.00		
699-40-40B	6/29/92	B06ZW6				3900.00
699-40-40B	10/21/92	B07JK8		4800.00		
699-40-40B	10/21/92	B07JL2				5300.00
699-40-40B	1/26/93	B07V54		5000.00		
699-40-40B	1/26/93	B07V58				5000.00
699-41-35	12/21/92	B07TB9		6500.00		
699-41-35	12/21/92	B07TC3				5100.00
699-41-35	2/22/93	B08707		6500.00		
699-41-35	2/22/93	B08711				8000.00
699-41-40	12/05/89	H000DD44	-.00 U		4700.00	
699-41-40	12/05/89	H000DD44				4650.00
699-41-40	1/25/90	H000DD48			4390.00	
699-41-40	1/25/90	H000DD48				4610.00
699-41-40	4/19/90	H000DD52			4570.00	
699-41-40	4/19/90	H000DD52				4260.00
699-41-40	7/10/91	H00071Y1		3900.00 Q		
699-41-40	7/10/91	H00071Y1F				4300.00 Q
699-41-40	9/11/91	B00LG2		4300.00		

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Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
699-41-40	9/11/91	B00LG2F				4900.00
699-41-40	1/31/92	B01QC8		3800.00 D		
699-41-40	1/31/92	B01QC9				4100.00 D
699-41-40	4/28/92	B065S5		4700.00		
699-41-40	4/28/92	B065S6		4400.00		
699-41-40	4/28/92	B065S9				4700.00
699-41-40	4/28/92	B065T0				4400.00
699-41-40	6/24/92	B06ZX2		4400.00		
699-41-40	6/24/92	B06ZX6				4500.00
699-41-40	1/14/93	B07TX9		3300.00		
699-41-40	1/14/93	B07TY3				3500.00
699-41-42	1/08/93	B07V59		6000.00		
699-41-42	1/08/93	B07V63				6100.00
699-42-37	12/22/92	B07TC4		4600.00		
699-42-37	12/22/92	B07TC8				4800.00
699-42-37	2/23/93	B08712		5100.00		
699-42-37	2/23/93	B08716				4600.00
699-42-39A	1/23/92	B01T66		4900.00 P		
699-42-39A	1/23/92	B01T67				4700.00 P
699-42-39A	4/17/92	B065T1		4300.00 P		
699-42-39A	4/17/92	B065T5				4300.00 P
699-42-39A	6/25/92	B06ZX7		5000.00 P		
699-42-39A	6/25/92	B06ZY1				4900.00 P
699-42-39A	10/21/92	B07JL3		4900.00 P		
699-42-39A	10/21/92	B07JL7				4500.00 P
699-42-39A	1/27/93	B07V64		5000.00 PQ		
699-42-39A	1/27/93	B07V68				4300.00 PQ
699-42-39B	1/23/92	B01T68		4900.00		
699-42-39B	1/23/92	B01T69				5500.00
699-42-39B	4/17/92	B065T6		5100.00		
699-42-39B	4/17/92	B065V0				5100.00
699-42-39B	6/25/92	B06ZY2		5600.00		
699-42-39B	6/25/92	B06ZY6				5600.00
699-42-39B	10/28/92	B07JJ2		5500.00		
699-42-39B	10/28/92	B07JJ3		5900.00		
699-42-39B	10/28/92	B07JJ6				5700.00
699-42-39B	10/28/92	B07JJ7				5700.00
699-42-39B	1/25/93	B07V69		5200.00		
699-42-39B	1/25/93	B07V73				4700.00
699-42-40A	8/22/85	H000DF11			4180.00	
699-42-40A	5/12/86	H000DF27			3680.00	
699-42-40A	8/05/86	H000DF33			4060.00	
699-42-40A	1/08/88	H000DF55			2850.00	

Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
699-42-40A	1/08/88	H000DF55				2800.00
699-42-40A	1/08/88	H000DF56	-.00 U			
699-42-40A	5/23/88	H000DF57	-.00 U			
699-42-40A	7/19/88	H000DF58	-.00 U			
699-42-40A	11/15/88	H000DF59	-.00 U			
699-42-40A	11/22/88	H000DF60			2910.00	
699-42-40A	11/22/88	H000DF60				2770.00
699-42-40A	2/06/89	H000DF64	-.00 U			
699-42-40A	2/15/89	H000DF65			2190.00	
699-42-40A	2/15/89	H000DF65				2490.00
699-42-40A	4/07/89	H000DF69	.00 U			
699-42-40A	5/31/89	H000DF70			2440.00	
699-42-40A	5/31/89	H000DF70				2380.00
699-42-40A	8/10/89	H000DF74			2400.00	
699-42-40A	8/10/89	H000DF74				3070.00
699-42-40A	1/26/90	H000DF78			2780.00	
699-42-40A	1/26/90	H000DF78				2760.00
699-42-40A	7/08/91	H00071Y2		2200.00		
699-42-40A	7/08/91	H00071Y2F				2400.00
699-42-40A	1/08/92	B07TY8		2500.00		
699-42-40A	1/08/92	B07TZ3				3200.00
699-42-40A	1/23/92	B01Q61		4100.00		
699-42-40A	1/23/92	B01Q62				3500.00
699-42-40A	6/25/92	B06ZY7		3100.00		
699-42-40A	6/25/92	B06ZZ1				3000.00
699-42-41	1/24/92	B01T70		2600.00 PD		
699-42-41	1/24/92	B01T71				2200.00 PD
699-42-41	4/17/92	B065V1		2300.00 P		
699-42-41	4/17/92	B065V5				2000.00 P
699-42-41	6/29/92	B06ZZ2		2500.00 P		
699-42-41	6/29/92	B06ZZ6				2400.00 P
699-42-41	1/25/93	B07TZ4		1400.00 P		
699-42-41	1/25/93	B07TZ8				1600.00 P
699-42-42B	11/22/88	H000DFT3			4080.00	
699-42-42B	11/22/88	H000DFT3				4050.00
699-42-42B	2/24/89	H000DFT7			4130.00	
699-42-42B	2/24/89	H000DFT7				3880.00
699-42-42B	6/16/89	H000DFV1			3710.00	
699-42-42B	6/16/89	H000DFV1				4140.00
699-42-42B	6/16/89	H000DFV4			3590.00	
699-42-42B	6/16/89	H000DFV4				3680.00
699-42-42B	8/09/89	H000DFV5			3420.00	
699-42-42B	8/09/89	H000DFV5				4120.00

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Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
699-42-42B	7/08/91	H00071Y3		4100.00		
699-42-42B	7/08/91	H00071Y3F				4400.00
699-42-42B	1/24/92	B01Q63		3800.00 D		
699-42-42B	1/24/92	B01Q64				3200.00 D
699-42-42B	6/24/92	B06ZZ7		4100.00		
699-42-42B	6/24/92	B07001				4000.00
699-42-42B	1/21/93	B07TZ9		3500.00		
699-42-42B	1/21/93	B07V03				3400.00
699-43-40	1/31/92	B01T72		5700.00 PD		
699-43-40	1/31/92	B01T73				4500.00 PD
699-43-40	4/28/92	B065V6		5200.00 P		
699-43-40	4/28/92	B065W0				5300.00 P
699-43-40	6/26/92	B07002		5600.00 P		
699-43-40	6/26/92	B07006				5600.00 P
699-43-40	1/25/93	B07V04		4600.00 P		
699-43-40	1/25/93	B07V08				4400.00 P
699-43-41E	12/05/89	H000DGD6	-.00 U		5080.00	
699-43-41E	12/05/89	H000DGD6				5060.00
699-43-41E	1/25/90	H000DGF0			4960.00	
699-43-41E	1/25/90	H000DGF0				4780.00
699-43-41E	5/01/90	H000DGF8	-.00 U			
699-43-41E	6/28/91	H0007203		5300.00 D		
699-43-41E	6/28/91	H0007203F				5100.00
699-43-41E	6/28/91	H0007204		4200.00 D		
699-43-41E	6/28/91	H0007204F				4000.00
699-43-41E	1/23/92	B01QC3		5000.00		
699-43-41E	1/23/92	B01QC4				4500.00
699-43-41E	4/17/92	B065P4		4000.00		
699-43-41E	4/17/92	B065Q6				4100.00
699-43-41E	6/24/92	B06ZV3		4600.00		
699-43-41E	6/24/92	B06ZW1				4500.00
699-43-41E	1/25/93	B07V09		4000.00		
699-43-41E	1/25/93	B07V13				3700.00
699-43-41F	12/05/89	H000DGG8	-.00 U		4280.00	
699-43-41F	12/05/89	H000DGG8				4450.00
699-43-41F	1/25/90	H000DGH2			4190.00	
699-43-41F	1/25/90	H000DGH2				4010.00
699-43-41F	4/18/90	H000DGH6			4030.00	
699-43-41F	4/18/90	H000DGH6				3920.00
699-43-41F	5/01/90	H000DGJ0	.00 U			
699-43-41F	7/02/91	H00071Y5		3500.00 QD		
699-43-41F	7/02/91	H00071Y5F				4600.00 Q
699-43-41F	5/05/92	B065R0		4000.00		

Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
699-43-41F	5/05/92	B065R9				4300.00
699-43-41F	6/25/92	B06ZW7		4200.00		
699-43-41F	6/25/92	B06ZX1				4000.00
699-43-41F	1/22/93	B07V14		4100.00		
699-43-41F	1/22/93	B07V18				4200.00
699-43-41G	1/23/92	B01T74		5700.00		
699-43-41G	1/23/92	B01T75				5800.00
699-43-41G	4/17/92	B065W1		4800.00		
699-43-41G	4/17/92	B065W6				4700.00
699-43-41G	6/26/92	B07007		5400.00		
699-43-41G	6/26/92	B07011				5500.00
699-43-41G	10/28/92	B07JL8		5600.00		
699-43-41G	10/28/92	B07JM2				5400.00
699-43-41G	1/25/93	B07V74		4100.00		
699-43-41G	1/25/93	B07V78				4300.00
699-43-42J	11/22/88	H000DGP2			4610.00	
699-43-42J	11/22/88	H000DGP2				4750.00
699-43-42J	2/24/89	H000DGP6			5190.00	
699-43-42J	2/24/89	H000DGP6				5370.00
699-43-42J	6/15/89	H000DGQ0			5350.00	
699-43-42J	6/15/89	H000DGQ0				5490.00
699-43-42J	8/09/89	H000DGQ4			4990.00	
699-43-42J	8/09/89	H000DGQ4				5290.00
699-43-42J	8/09/89	H000DGQ7			4560.00	
699-43-42J	8/09/89	H000DGQ7				5610.00
699-43-42J	7/02/91	H00071Y6		5200.00 QD		
699-43-42J	7/02/91	H00071Y6F				4700.00 Q
699-43-42J	1/31/92	B01S49		4900.00 D		
699-43-42J	1/31/92	B01S51				4700.00 D
699-43-42J	6/25/92	B07012		4900.00		
699-43-42J	6/25/92	B07016				4200.00
699-43-42J	1/21/93	B07V19		4300.00		
699-43-42J	1/21/93	B07V23				4200.00
699-43-43	11/21/88	H000DGR3			5900.00	
699-43-43	11/21/88	H000DGR3				5480.00
699-43-43	2/24/89	H000DGR7			5990.00	
699-43-43	2/24/89	H000DGR7				5750.00
699-43-43	2/24/89	H000DGS0			6140.00	
699-43-43	2/24/89	H000DGS0				5600.00
699-43-43	6/15/89	H000DGS1			5860.00	
699-43-43	6/15/89	H000DGS1				5630.00
699-43-43	8/09/89	H000DGS5			5250.00	
699-43-43	8/09/89	H000DGS5				5810.00

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Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
699-43-43	1/26/90	H000DGS9			5550.00	
699-43-43	1/26/90	H000DGS9				5610.00
699-43-43	4/26/90	H000DGT3	-.01 U			
699-43-43	7/08/91	H00071Y7		5600.00		
699-43-43	7/08/91	H00071Y7F				5600.00
699-43-43	1/24/92	B01Q67		4700.00 D		
699-43-43	1/24/92	B01Q68				5300.00 D
699-43-43	4/22/92	B065N6		5700.00		
699-43-43	4/22/92	B065N7				5100.00
699-43-43	6/26/92	B070W0		5900.00 D		
699-43-43	6/26/92	B070W1				5400.00
699-43-43	10/26/92	B07JG5		5500.00		
699-43-43	10/26/92	B07JG6				5600.00
699-43-43	1/13/93	B07V24		4600.00		
699-43-43	1/13/93	B07V28				4900.00
699-43-45	12/06/89	H000DGT4	.00 U		5580.00	
699-43-45	12/06/89	H000DGT4				5340.00
699-43-45	1/26/90	H000DGT8			4920.00	
699-43-45	1/26/90	H000DGT8				4890.00
699-43-45	4/18/90	H000DGV2			4840.00	
699-43-45	4/18/90	H000DGV2				4920.00
699-43-45	7/08/91	H00071Y8		5000.00		
699-43-45	7/08/91	H00071Y8F				5200.00
699-43-45	9/11/91	B00LG5		5200.00		
699-43-45	9/11/91	B00LG5F				4900.00
699-43-45	1/24/92	B01QD0		5000.00 D		
699-43-45	1/24/92	B01QD1				5000.00 D
699-43-45	4/22/92	B065N8		4800.00		
699-43-45	4/22/92	B065N9				4600.00
699-43-45	6/26/92	B070W2		5000.00 D		
699-43-45	6/26/92	B070W3				5200.00
699-43-45	10/26/92	B07JG7		4900.00		
699-43-45	10/26/92	B07JG8				4900.00
699-43-45	1/13/93	B07V29		3700.00		
699-43-45	1/13/93	B07V33				3400.00
699-44-39B	1/08/93	B07WK1		3000.00		
699-44-39B	1/08/93	B07WK5				3600.00
699-44-42	11/21/88	H000DHK2			5190.00	
699-44-42	11/21/88	H000DHK2				5310.00
699-44-42	2/17/89	H000DHK6			4980.00	
699-44-42	2/17/89	H000DHK6				5080.00
699-44-42	6/15/89	H000DHL0			4790.00	
699-44-42	6/15/89	H000DHL0				4760.00

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Well Name	Collection Date	Sample Number	PU39-40 77/pCi/L ./.	POTASUM 34/ppb 300/.	POTASUM 35/ppb ./.	FPOTASS 34/ppb 300/.
699-44-42	8/08/89	H000DHL4			4550.00	
699-44-42	8/08/89	H000DHL4				4810.00
699-44-42	1/31/90	H000DHL8			4950.00	
699-44-42	1/31/90	H000DHL8				4920.00
699-44-42	4/26/90	H000DHM2	-.01 U			
699-44-42	7/10/91	H00071Y9		4500.00 Q		
699-44-42	7/10/91	H00071Y9F				4200.00 Q
699-44-42	1/31/92	B01S52		4400.00 D		
699-44-42	1/31/92	B01S54				4500.00 D
699-44-42	6/25/92	B07017		4900.00		
699-44-42	6/25/92	B07021				4900.00
699-44-42	1/13/93	B07V34		4000.00		
699-44-42	1/13/93	B07V35		3600.00		
699-44-42	1/13/93	B07V42				4100.00
699-44-42	1/13/93	B07V43				3700.00
699-44-43B	12/20/89	H000DHM3	.02		4530.00	
699-44-43B	12/20/89	H000DHM3				4810.00
699-44-43B	12/20/89	H000DHM6	-.00 U		4570.00	
699-44-43B	12/20/89	H000DHM6				4730.00
699-44-43B	1/26/90	H000DHM7			4960.00	
699-44-43B	1/26/90	H000DHM7				4830.00
699-44-43B	1/26/90	H000DHN0			4930.00	
699-44-43B	1/26/90	H000DHN0				4840.00
699-44-43B	4/18/90	H000DHN1			4620.00	
699-44-43B	4/18/90	H000DHN1				4640.00
699-44-43B	4/26/90	H000DHN5	-.00 U			
699-44-43B	7/08/91	H00071Z0		4900.00		
699-44-43B	7/08/91	H00071Z0F				4600.00
699-44-43B	9/11/91	B00LG6		5300.00		
699-44-43B	9/11/91	B00LG6F				5100.00
699-44-43B	1/23/92	B01Q69		5200.00		
699-44-43B	1/23/92	B01Q70				3500.00
699-44-43B	4/20/92	B065W9		4900.00		
699-44-43B	4/20/92	B065X5				4800.00
699-44-43B	6/26/92	B01MT4				5000.00
699-44-43B	6/26/92	B07022		5100.00		
699-44-43B	6/26/92	B07023		5100.00		
699-44-43B	6/26/92	B07026				5000.00
699-44-43B	1/27/93	B07V44		5700.00 Q		
699-44-43B	1/27/93	B07V48				5800.00 Q

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Well Name	Collection Date	Sample Number	K-40 140/pCi/L ./.	RADIUM 137/pCi/L ./.	RADIUM 77/pCi/L ./5	RU-106 77/pCi/L ./.
299-E18-1	8/16/88	H0007ZT7			2.15	
299-E18-1	11/10/88	H0007ZV2			.27	
299-E18-1	11/10/88	H0007ZV5			.21	
299-E18-1	2/15/89	H0007ZV8			.25	
299-E18-1	5/26/89	H0007ZW2			.47	
299-E18-1	8/08/89	H0007ZW6			.31	
299-E18-1	10/31/89	H0007ZX0			.25	-26.20 U
299-E18-1	9/06/91	B00LB6	159.00 F	.09 U		
299-E18-1	6/03/92	B06PH8		-.02 U		
299-E18-1	12/16/92	B07SN0		.12 U		
299-E32-4	9/27/88	H0008ZB8			.02 U	0.00 U
299-E32-4	12/28/88	H0008ZC2			.05 U	
299-E32-4	3/01/89	H0008ZC6			.25	
299-E32-4	3/13/89	H0008ZD0			.01 U	-15.00 U
299-E32-4	6/16/89	H0008ZD4			.07 U	
299-E32-4	7/19/89	H0008ZD8			.41	-32.50 U
299-E32-4	9/08/89	H0008ZF6			.10 U	17.00 U
299-E32-4	1/17/90	H0008ZG0			.09 U	22.60 U
299-E32-4	5/09/90	H0008ZG9			.28	-18.20 U
299-E32-4	8/05/91	H0007264	58.90 UF	.19		
299-E32-4	9/23/91	B00LK5	16.30 UF	.07 U		
299-E32-4	1/15/92	B01QK6		.20		
299-E32-4	4/06/92	B06696		.07 U		
299-E32-4	7/14/92	B07173		.01 U		
699-40-39	12/05/89	H000DBX2			.37	6.95 U
699-40-39	1/25/90	H000DBX6			.11 U	
699-40-39	4/25/90	H000DBY0			.09 U	
699-40-39	7/08/91	H00071Y4		.14 U		
699-40-39	9/11/91	B00LG1		.08 U		
699-40-39	1/31/92	B01Q65		.07 U		
699-40-39	4/17/92	B065P2		.00 U		
699-40-39	6/24/92	B06ZT7		.02 U		
699-40-39	1/14/93	B07TX4		.03 U		
699-40-40A	1/24/92	B01T62		.15		
699-40-40A	4/22/92	B065Q8		.01 U		
699-40-40A	6/25/92	B06ZV2		.01 U		
699-40-40A	10/21/92	B07JK3		.09 U		
699-40-40A	1/26/93	B07V49		.03 U		
699-40-40B	1/24/92	B01T64		.67		
699-40-40B	4/22/92	B065S0		.12 U		
699-40-40B	6/29/92	B06ZW2		.23		
699-40-40B	10/21/92	B07JK8		.16		
699-40-40B	1/26/93	B07V54		.18		

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Well Name	Collection Date	Sample Number	K-40 140/pCi/L ./.	RADIUM 137/pCi/L ./.	RADIUM 77/pCi/L ./5	RU-106 77/pCi/L ./.
699-41-40	12/05/89	H000DD44			.18	12.60 U
699-41-40	1/25/90	H000DD48			.30	
699-41-40	4/19/90	H000DD52			.24	
699-41-40	7/10/91	H00071Y1		.12		
699-41-40	9/11/91	B00LG2		.04 U		
699-41-40	1/31/92	B01QC8		-.00 U		
699-41-40	4/28/92	B065S5		.03 U		
699-41-40	4/28/92	B065S6		.09 U		
699-41-40	6/24/92	B06ZX2		.16		
699-41-40	1/14/93	B07TX9		.06 U		
699-41-42	1/08/93	B07V59		.38		
699-42-39A	1/23/92	B01T66		.05 UP		
699-42-39A	4/17/92	B065T1		.31 P		
699-42-39A	6/25/92	B06ZX7		.22 P		
699-42-39A	10/21/92	B07JL3		.22 P		
699-42-39A	1/27/93	B07V64		.14 UP		
699-42-39B	1/23/92	B01T68		.17		
699-42-39B	4/17/92	B065T6		.10 U		
699-42-39B	6/25/92	B06ZY2		.24		
699-42-39B	10/28/92	B07JJ2		.15		
699-42-39B	10/28/92	B07JJ3		.05 U		
699-42-39B	1/25/93	B07V69		.17		
699-42-40A	2/03/83	H000DDX8				-17.70
699-42-40A	2/28/83	H000DDX9				45.50
699-42-40A	3/28/83	H000DDY0				-49.60
699-42-40A	4/14/83	H000DDY2				37.70
699-42-40A	5/12/83	H000DDY3				12.70
699-42-40A	6/16/83	H000DDY4				-31.00
699-42-40A	7/14/83	H000DDY5				-9.86
699-42-40A	8/19/83	H000DDY6				4.90
699-42-40A	9/27/83	H000DDY7				13.10
699-42-40A	10/12/83	H000DDY8				-102.00
699-42-40A	11/07/83	H000DDY9				12.80
699-42-40A	12/09/83	H000DDZ0				18.00
699-42-40A	1/24/84	H000DDZ1				29.20
699-42-40A	2/28/84	H000DDZ2				63.40
699-42-40A	4/10/84	H000DDZ3				15.90
699-42-40A	4/26/84	H000DDZ4				-35.40
699-42-40A	5/15/84	H000DDZ5				-26.80
699-42-40A	6/05/84	H000DDZ6				18.30
699-42-40A	7/19/84	H000DDZ7				-35.90
699-42-40A	8/10/84	H000DDZ8				34.40
699-42-40A	9/11/84	H000DDZ9				-8.85

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Well Name	Collection Date	Sample Number	K-40 140/pCi/L ./.	RADIUM 137/pCi/L ./.	RADIUM 77/pCi/L ./5	RU-106 77/pCi/L ./.
699-42-40A	10/09/84	H000DF00				3.00
699-42-40A	11/13/84	H000DF01				29.10
699-42-40A	12/12/84	H000DF02				31.70
699-42-40A	1/16/85	H000DF03				23.20
699-42-40A	2/11/85	H000DF04				-64.60
699-42-40A	3/14/85	H000DF05				-11.80
699-42-40A	4/04/85	H000DF06				-8.78
699-42-40A	5/03/85	H000DF07				7.95
699-42-40A	6/11/85	H000DF09				-21.00
699-42-40A	7/11/85	H000DF10				-6.04 U
699-42-40A	8/22/85	H000DF11			.10 U	
699-42-40A	8/22/85	H000DF15				-5.96 U
699-42-40A	10/07/85	H000DF16				12.00 U
699-42-40A	11/06/85	H000DF18				-17.50 U
699-42-40A	12/14/85	H000DF20				14.50 U
699-42-40A	1/09/86	H000DF21				10.50 U
699-42-40A	2/07/86	H000DF23				-17.40 U
699-42-40A	3/07/86	H000DF24				40.80
699-42-40A	4/11/86	H000DF25				-6.93 U
699-42-40A	5/06/86	H000DF26				-39.90 U
699-42-40A	5/12/86	H000DF27			.08 U	
699-42-40A	6/06/86	H000DF31				61.10
699-42-40A	7/02/86	H000DF32				34.70 U
699-42-40A	8/05/86	H000DF33			.04 U	
699-42-40A	8/05/86	H000DF37				-75.40 U
699-42-40A	9/05/86	H000DF38				-65.10 U
699-42-40A	10/24/86	H000DF39				5.74 U
699-42-40A	11/04/86	H000DF40				-40.80 U
699-42-40A	12/10/86	H000DF41				35.10
699-42-40A	1/15/87	H000DF42				5.60 U
699-42-40A	2/13/87	H000DF43				-37.60 U
699-42-40A	3/07/87	H000DF44				63.30
699-42-40A	4/06/87	H000DF46				52.90
699-42-40A	5/08/87	H000DF47				-63.40 U
699-42-40A	6/04/87	H000DF48				14.10 U
699-42-40A	7/09/87	H000DF49				17.70 U
699-42-40A	8/11/87	H000DF50				-56.50 U
699-42-40A	9/09/87	H000DF51				-32.50 U
699-42-40A	10/06/87	H000DF52				13.60 U
699-42-40A	11/04/87	H000DF53				8.80 U
699-42-40A	12/01/87	H000DF54				50.50 U
699-42-40A	1/08/88	H000DF55			-.03 U	
699-42-40A	1/08/88	H000DF56				2.79 U

Well Name	Collection Date	Sample Number	K-40 140/pCi/L ./.	RADIUM 137/pCi/L ./.	RADIUM 77/pCi/L ./5	RU-106 77/pCi/L ./.
699-42-40A	5/23/88	H000DF57				-18.90 U
699-42-40A	7/19/88	H000DF58				-50.80 U
699-42-40A	11/15/88	H000DF59				-7.31 U
699-42-40A	11/22/88	H000DF60			.10 U	
699-42-40A	2/06/89	H000DF64				12.50 U
699-42-40A	2/15/89	H000DF65			.08 U	
699-42-40A	4/07/89	H000DF69				-25.40 U
699-42-40A	5/31/89	H000DF70			.02 U	
699-42-40A	8/10/89	H000DF74			.04 U	
699-42-40A	1/26/90	H000DF78			-.09 U	
699-42-40A	7/08/91	H00071Y2		.09 U		
699-42-40A	6/25/92	B06ZY7		.28		
699-42-41	1/24/92	B01T70		.00 UP		
699-42-41	4/17/92	B065V1		.06 UP		
699-42-41	6/29/92	B06ZZ2		.17 P		
699-42-41	1/25/93	B07TZ4		.00 UP		
699-42-42B	11/22/88	H000DFT3			.19 U	
699-42-42B	2/24/89	H000DFT7			.51	
699-42-42B	6/16/89	H000DFV1			-.01 U	
699-42-42B	6/16/89	H000DFV4			.15	
699-42-42B	8/09/89	H000DFV5			.31	
699-42-42B	1/26/90	H000DFW0			.09 U	
699-42-42B	7/08/91	H00071Y3		.08 U		
699-42-42B	6/24/92	B06ZZ7		-.01 U		
699-42-42B	1/21/93	B07TZ9		.07 U		
699-43-40	1/31/92	B01T72		.24 P		
699-43-40	4/28/92	B065V6		.27 P		
699-43-40	6/26/92	B07002		.35 P		
699-43-40	1/25/93	B07V04		.34 P		
699-43-41E	12/05/89	H000DGD6			.42	-23.00 U
699-43-41E	1/25/90	H000DGF0			.29	
699-43-41E	6/28/91	H0007203		.25		
699-43-41E	6/28/91	H0007204		.16		
699-43-41E	1/23/92	B01QC3		.10 U		
699-43-41E	4/17/92	B065P4		.11 U		
699-43-41E	6/24/92	B06ZV3		.07 U		
699-43-41E	1/25/93	B07V09		.10 U		
699-43-41F	12/05/89	H000DGG8			.09 U	13.00 U
699-43-41F	1/25/90	H000DGH2			.22	
699-43-41F	4/18/90	H000DGH6			.41	
699-43-41F	7/02/91	H00071Y5		.15		
699-43-41F	5/05/92	B065R0		.18		
699-43-41F	6/25/92	B06ZW7		.24		

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Well Name	Collection Date	Sample Number	K-40 140/pCi/L ./.	RADIUM 137/pCi/L ./.	RADIUM 77/pCi/L ./5	RU-106 77/pCi/L ./.
699-43-41F	1/22/93	B07V14		.03 U		
699-43-41G	1/23/92	B01T74		.23		
699-43-41G	4/17/92	B065W1		.12 U		
699-43-41G	6/26/92	B07007		.11 U		
699-43-41G	10/28/92	B07JL8		.12 U		
699-43-41G	1/25/93	B07V74		-.01 U		
699-43-42J	11/22/88	H000DGP2			.13 U	
699-43-42J	2/24/89	H000DGP6			.24	
699-43-42J	6/15/89	H000DGQ0			.20	
699-43-42J	8/09/89	H000DGQ4			.37	
699-43-42J	8/09/89	H000DGQ7			.15 U	
699-43-42J	1/31/90	H000DGQ9			.01 U	
699-43-42J	7/02/91	H00071Y6		.08 U		
699-43-42J	1/31/92	B01S49		.01 U		
699-43-42J	6/25/92	B07012		.17		
699-43-42J	1/21/93	B07V19		-.03 U		
699-43-43	11/21/88	H000DGR3			-.01 U	
699-43-43	2/24/89	H000DGR7			.01 U	
699-43-43	6/15/89	H000DGS1			.04 U	
699-43-43	8/09/89	H000DGS5			-.02 U	
699-43-43	1/26/90	H000DGS9			-.04 U	
699-43-43	7/08/91	H00071Y7		.19		
699-43-43	1/24/92	B01T83		-.01 U		
699-43-43	4/22/92	B065N6		.07 U		
699-43-43	6/26/92	B070W0		.04 U		
699-43-43	10/26/92	B07JG5		.00 U		
699-43-43	1/13/93	B07V24		-.06 U		
699-43-45	12/06/89	H000DGT4			.16	.93 U
699-43-45	1/26/90	H000DGT8			.20	
699-43-45	4/18/90	H000DGV2			.15	
699-43-45	7/08/91	H00071Y8		.09 U		
699-43-45	9/11/91	B00LG5		.07 U		
699-43-45	1/24/92	B01QD0		.08 U		
699-43-45	4/22/92	B065N8		.05 U		
699-43-45	6/26/92	B070W2		.07 U		
699-43-45	10/26/92	B07JG7		.09 U		
699-43-45	1/13/93	B07V29		.19		
699-44-39B	1/08/93	B07WK1		.13 U		
699-44-42	11/21/88	H000DHK2			.19	
699-44-42	2/17/89	H000DHK6			.23	
699-44-42	6/15/89	H000DHL0			.58	
699-44-42	8/08/89	H000DHL4			.06 U	
699-44-42	1/31/90	H000DHL8			.08 U	

Well Name	Collection Date	Sample Number	K-40 140/pCi/L ./.	RADIUM 137/pCi/L ./.	RADIUM 77/pCi/L ./5	RU-106 77/pCi/L ./.
699-44-42	7/10/91	H00071Y9		.05 U		
699-44-42	1/31/92	B01S52		.04 U		
699-44-42	6/25/92	B07017		.18		
699-44-42	1/13/93	B07V34		.12 U		
699-44-42	1/13/93	B07V35		.13 U		
699-44-43B	12/20/89	H000DHM3			.07 U	5.62 U
699-44-43B	12/20/89	H000DHM6			.29	-2.02 U
699-44-43B	1/26/90	H000DHM7			.23	
699-44-43B	1/26/90	H000DHN0			.41	
699-44-43B	4/18/90	H000DHN1			-.01 U	
699-44-43B	7/08/91	H00071Z0		.20		
699-44-43B	9/11/91	B00LG6		.04 U		
699-44-43B	1/23/92	B01Q69		.03 U		
699-44-43B	4/20/92	B065W9		-.06 U		
699-44-43B	6/26/92	B07022		-.01 U		
699-44-43B	6/26/92	B07023		-.01 U		
699-44-43B	1/27/93	B07V44		.09 U		

Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
299-E18-1	8/16/88	H0007ZT7		14.90		
299-E18-1	8/16/88	H0007ZT7			10.70	
299-E18-1	9/22/88	H0007ZV1		10.00		
299-E18-1	9/22/88	H0007ZV1			8.60	
299-E18-1	11/10/88	H0007ZV2		7.00		
299-E18-1	11/10/88	H0007ZV2			7.00	
299-E18-1	11/10/88	H0007ZV5		7.00		
299-E18-1	11/10/88	H0007ZV5			6.00	
299-E18-1	2/15/89	H0007ZV8		7.00		
299-E18-1	2/15/89	H0007ZV8			7.00	14000.00
299-E18-1	5/26/89	H0007ZW2		6.00		
299-E18-1	5/26/89	H0007ZW2			7.00	15400.00
299-E18-1	8/08/89	H0007ZW6		7.00		
299-E18-1	8/08/89	H0007ZW6			7.00	17300.00
299-E18-1	10/31/89	H0007ZX0		6.00		
299-E18-1	10/31/89	H0007ZX0			6.00	16900.00
299-E18-1	6/03/92	B06PH8	10.00 U			
299-E18-1	6/03/92	B06PJ2			10.00 U	
299-E18-1	12/16/92	B07S32	10.00 U			

Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
299-E18-1	12/16/92	B07S36			10.00 U	
299-E32-4	9/27/88	H0008ZB8		7.00		
299-E32-4	9/27/88	H0008ZB8			7.00	
299-E32-4	12/28/88	H0008ZC2		5.00 U		
299-E32-4	12/28/88	H0008ZC2			5.00 U	
299-E32-4	3/01/89	H0008ZC6		5.00 U		
299-E32-4	3/01/89	H0008ZC6			5.00 U	16400.00
299-E32-4	3/13/89	H0008ZD0		5.00 U		
299-E32-4	3/13/89	H0008ZD0			5.00 U	16600.00
299-E32-4	6/16/89	H0008ZD4		5.00 U		
299-E32-4	6/16/89	H0008ZD4			5.00 U	16200.00
299-E32-4	7/19/89	H0008ZD8		5.00 U		
299-E32-4	7/19/89	H0008ZD8			5.00 U	16200.00
299-E32-4	9/08/89	H0008ZF6		5.00 U		
299-E32-4	9/08/89	H0008ZF6			5.00 U	16500.00
299-E32-4	1/17/90	H0008ZG0		5.00 U		
299-E32-4	1/17/90	H0008ZG0			5.00 U	17000.00
299-E32-4	5/09/90	H0008ZG9		5.00 U		
299-E32-4	5/09/90	H0008ZG9			5.00 U	
299-E32-4	1/15/92	B01QK6	10.00 U			
299-E32-4	1/15/92	B01QK8			10.00 U	
299-E32-4	4/06/92	B06696	10.00 U			
299-E32-4	4/06/92	B06697			10.00 U	
299-E32-4	7/14/92	B07173	10.00 U			
299-E32-4	7/14/92	B07174			10.00 U	
699-40-36	12/21/92	B07TB1	10.00 U			
699-40-36	12/21/92	B07TB8			10.00 U	
699-40-36	2/22/93	B08717	10.00 U			
699-40-36	2/22/93	B08721			10.00 U	
699-40-39	12/05/89	H000DBX2		5.00 U		
699-40-39	12/05/89	H000DBX2			5.00 U	19100.00
699-40-39	1/25/90	H000DBX6		5.00 U		
699-40-39	1/25/90	H000DBX6			5.00 U	17500.00
699-40-39	4/25/90	H000DBY0		5.00 U		
699-40-39	4/25/90	H000DBY0			5.00 U	16500.00
699-40-39	7/08/91	H00071Y4	U			
699-40-39	1/31/92	B01Q65	10.00 U			
699-40-39	1/31/92	B01Q66			10.00 U	
699-40-39	4/17/92	B065P2	10.00 U			
699-40-39	4/17/92	B065Q4			10.00 U	
699-40-39	6/24/92	B06ZT7	10.00 U			
699-40-39	6/24/92	B06ZV1			10.00 U	
699-40-39	1/14/93	B07TX4	10.00 U			

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Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
699-40-39	1/14/93	B07TX8			10.00 U	
699-40-40A	1/24/92	B01T62	10.00 U			
699-40-40A	1/24/92	B01T63			10.00 U	
699-40-40A	4/22/92	B065Q8	10.00 U			
699-40-40A	4/22/92	B065R8			10.00 U	
699-40-40A	6/25/92	B06ZV2	10.00 U			
699-40-40A	6/25/92	B06ZW0			10.00 U	
699-40-40A	10/21/92	B07JK3	10.00 U			
699-40-40A	10/21/92	B07JK7			10.00 U	
699-40-40A	1/26/93	B07V49	10.00 U			
699-40-40A	1/26/93	B07V53			10.00 U	
699-40-40B	1/01/92	B01T65			10.00 U	
699-40-40B	1/24/92	B01T64	10.00 U			
699-40-40B	4/22/92	B065S0	10.00 U			
699-40-40B	4/22/92	B065S4			10.00 U	
699-40-40B	6/29/92	B06ZW2	10.00 U			
699-40-40B	6/29/92	B06ZW6			10.00 U	
699-40-40B	10/21/92	B07JK8	10.00 U			
699-40-40B	10/21/92	B07JL2			10.00 U	
699-40-40B	1/26/93	B07V54	10.00 U			
699-40-40B	1/26/93	B07V58			10.00 U	
699-41-35	12/21/92	B07TB9	10.00 U			
699-41-35	12/21/92	B07TC3			10.00 U	
699-41-35	2/22/93	B08707	10.00 U			
699-41-35	2/22/93	B08711			10.00 U	
699-41-40	12/05/89	H000DD44		5.00 U		
699-41-40	12/05/89	H000DD44			5.00 U	14000.00
699-41-40	1/25/90	H000DD48		5.00 U		
699-41-40	1/25/90	H000DD48			5.00 U	15900.00
699-41-40	4/19/90	H000DD52		5.00 U		
699-41-40	4/19/90	H000DD52			5.00 U	13900.00
699-41-40	7/10/91	H00071Y1	U			
699-41-40	1/31/92	B01QC8	10.00 U			
699-41-40	1/31/92	B01QC9			10.00 U	
699-41-40	4/28/92	B065S5	10.00 U			
699-41-40	4/28/92	B065S6	10.00 U			
699-41-40	4/28/92	B065S9			10.00 U	
699-41-40	4/28/92	B065T0			10.00 U	
699-41-40	6/24/92	B06ZX2	10.00 U			
699-41-40	6/24/92	B06ZX6			10.00 U	
699-41-40	1/14/93	B07TX9	10.00 U			
699-41-40	1/14/93	B07TY3			10.00 U	
699-41-42	1/08/93	B07V59	10.00 U			

Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
699-41-42	1/08/93	B07V63			10.00 U	
699-42-37	12/22/92	B07TC4	10.00 U			
699-42-37	12/22/92	B07TC8			10.00 U	
699-42-37	2/23/93	B08712	10.00 U			
699-42-37	2/23/93	B08716			10.00 U	
699-42-39A	1/23/92	B01T66	10.00 UP			
699-42-39A	1/23/92	B01T67			10.00 UP	
699-42-39A	4/17/92	B065T1	10.00 UP			
699-42-39A	4/17/92	B065T5			10.00 UP	
699-42-39A	6/25/92	B06ZX7	10.00 UP			
699-42-39A	6/25/92	B06ZY1			10.00 UP	
699-42-39A	10/21/92	B07JL3	10.00 UP			
699-42-39A	10/21/92	B07JL7			10.00 UP	
699-42-39A	1/27/93	B07V64	10.00 UP			
699-42-39A	1/27/93	B07V68			10.00 UP	
699-42-39B	1/23/92	B01T68	10.00 U			
699-42-39B	1/23/92	B01T69			10.00 U	
699-42-39B	4/17/92	B065T6	10.00 U			
699-42-39B	4/17/92	B065V0			10.00 U	
699-42-39B	6/25/92	B06ZY2	10.00 U			
699-42-39B	6/25/92	B06ZY6			10.00 U	
699-42-39B	10/28/92	B07JJ2	10.00 U			
699-42-39B	10/28/92	B07JJ3	10.00 U			
699-42-39B	10/28/92	B07JJ6			10.00 U	
699-42-39B	10/28/92	B07JJ7			10.00 U	
699-42-39B	1/25/93	B07V69	10.00 U			
699-42-39B	1/25/93	B07V73			10.00 U	
699-42-40A	8/22/85	H000DF11		5.00 U		
699-42-40A	5/12/86	H000DF27		5.00 U		
699-42-40A	8/05/86	H000DF33		5.00 U		
699-42-40A	1/08/88	H000DF55		5.00 U		
699-42-40A	1/08/88	H000DF55			5.00 U	
699-42-40A	11/22/88	H000DF60		5.00 U		
699-42-40A	11/22/88	H000DF60			5.00 U	
699-42-40A	2/15/89	H000DF65		5.00 U		
699-42-40A	2/15/89	H000DF65			5.00 U	3950.00
699-42-40A	5/31/89	H000DF70		5.00 U		
699-42-40A	5/31/89	H000DF70			5.00 U	4420.00
699-42-40A	8/10/89	H000DF74		5.00 U		
699-42-40A	8/10/89	H000DF74			5.00 U	6850.00
699-42-40A	1/26/90	H000DF78		5.00 U		
699-42-40A	1/26/90	H000DF78			5.00 U	5300.00
699-42-40A	7/08/91	H00071Y2	U			

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Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
699-42-40A	1/08/92	B07TY8	10.00 U			
699-42-40A	1/08/92	B07TZ3			10.00 U	
699-42-40A	6/25/92	B06ZY7	10.00 U			
699-42-40A	6/25/92	B06ZZ1			10.00 U	
699-42-41	1/24/92	B01T70	10.00 UP			
699-42-41	1/24/92	B01T71			10.00 UP	
699-42-41	4/17/92	B065V1	10.00 UP			
699-42-41	4/17/92	B065V5			10.00 UP	
699-42-41	6/29/92	B06ZZ2	10.00 UP			
699-42-41	6/29/92	B06ZZ6			10.00 UP	
699-42-41	1/25/93	B07TZ4	10.00 UP			
699-42-41	1/25/93	B07TZ8			10.00 UP	
699-42-42B	11/22/88	H000DFT3		5.00 U		
699-42-42B	11/22/88	H000DFT3			5.00 U	
699-42-42B	2/24/89	H000DFT7		5.00 U		
699-42-42B	2/24/89	H000DFT7			5.00 U	18000.00
699-42-42B	6/16/89	H000DFV1		5.00 U		
699-42-42B	6/16/89	H000DFV1			5.00 U	19100.00
699-42-42B	6/16/89	H000DFV4		5.00 U		
699-42-42B	6/16/89	H000DFV4			5.00 U	17200.00
699-42-42B	8/09/89	H000DFV5		5.00 U		
699-42-42B	8/09/89	H000DFV5			5.00 U	20000.00
699-42-42B	1/26/90	H000DFW0		5.00 U		
699-42-42B	1/26/90	H000DFW0			5.00 U	
699-42-42B	7/08/91	H00071Y3	U			
699-42-42B	6/24/92	B06ZZ7	10.00 U			
699-42-42B	6/24/92	B07001			10.00 U	
699-42-42B	1/21/93	B07TZ9	10.00 U			
699-42-42B	1/21/93	B07V03			10.00 U	
699-43-40	1/31/92	B01T72	10.00 UP			
699-43-40	1/31/92	B01T73			10.00 UP	
699-43-40	4/28/92	B065V6	10.00 UP			
699-43-40	4/28/92	B065W0			10.00 UP	
699-43-40	6/26/92	B07002	10.00 UP			
699-43-40	6/26/92	B07006			10.00 UP	
699-43-40	1/25/93	B07V04	10.00 UP			
699-43-40	1/25/93	B07V08			10.00 UP	
699-43-41E	12/05/89	H000DGD6		5.00 U		
699-43-41E	12/05/89	H000DGD6			5.00 U	10400.00
699-43-41E	1/25/90	H000DGF0		5.00 U		
699-43-41E	1/25/90	H000DGF0			5.00 U	9960.00
699-43-41E	6/28/91	H0007203	U			
699-43-41E	6/28/91	H0007204	U			

Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
699-43-41E	1/23/92	B01QC3	10.00 U			
699-43-41E	1/23/92	B01QC4			10.00 U	
699-43-41E	4/17/92	B065P4	10.00 U			
699-43-41E	4/17/92	B065Q6			10.00 U	
699-43-41E	6/24/92	B06ZV3	10.00 U			
699-43-41E	6/24/92	B06ZW1			10.00 U	
699-43-41E	1/25/93	B07V09	10.00 U			
699-43-41E	1/25/93	B07V13			10.00 U	
699-43-41F	12/05/89	H000DGG8		5.00 U		
699-43-41F	12/05/89	H000DGG8			5.00 U	19100.00
699-43-41F	1/25/90	H000DGH2		5.00 U		
699-43-41F	1/25/90	H000DGH2			5.00 U	18400.00
699-43-41F	4/18/90	H000DGH6		5.00 U		
699-43-41F	4/18/90	H000DGH6			5.00 U	18500.00
699-43-41F	7/02/91	H00071Y5	U			
699-43-41F	5/05/92	B065R0	10.00 U			
699-43-41F	5/05/92	B065R9			10.00 U	
699-43-41F	6/25/92	B06ZW7	10.00 U			
699-43-41F	6/25/92	B06ZX1			10.00 U	
699-43-41F	1/22/93	B07V14	10.00 U			
699-43-41F	1/22/93	B07V18			10.00 U	
699-43-41G	1/23/92	B01T74	10.00 U			
699-43-41G	1/23/92	B01T75			10.00 U	
699-43-41G	4/17/92	B065W1	10.00 U			
699-43-41G	4/17/92	B065W6			10.00 U	
699-43-41G	6/26/92	B07007	10.00 U			
699-43-41G	6/26/92	B07011			10.00 U	
699-43-41G	10/28/92	B07JL8	10.00 U			
699-43-41G	10/28/92	B07JM2			10.00 U	
699-43-41G	1/25/93	B07V74	10.00 U			
699-43-41G	1/25/93	B07V78			10.00 U	
699-43-42J	11/22/88	H000DGP2		5.00 U		
699-43-42J	11/22/88	H000DGP2			5.00 U	
699-43-42J	2/24/89	H000DGP6		5.00 U		
699-43-42J	2/24/89	H000DGP6			5.00 U	15900.00
699-43-42J	6/15/89	H000DGQ0		5.00 U		
699-43-42J	6/15/89	H000DGQ0			5.00 U	16600.00
699-43-42J	8/09/89	H000DGQ4		5.00 U		
699-43-42J	8/09/89	H000DGQ4			5.00 U	17000.00
699-43-42J	8/09/89	H000DGQ7		5.00 U		
699-43-42J	8/09/89	H000DGQ7			5.00 U	17000.00
699-43-42J	1/31/90	H000DGQ9		5.00 U		
699-43-42J	1/31/90	H000DGQ9			5.00 U	

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Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
699-43-42J	7/02/91	H00071Y6	U			
699-43-42J	1/31/92	B01S49	10.00 U			
699-43-42J	1/31/92	B01S51			10.00 U	
699-43-42J	6/25/92	B07012	10.00 U			
699-43-42J	6/25/92	B07016			10.00 U	
699-43-42J	1/21/93	B07V19	10.00 U			
699-43-42J	1/21/93	B07V23			10.00 U	
699-43-43	11/21/88	H000DGR3		5.00 U		
699-43-43	11/21/88	H000DGR3			5.00 U	
699-43-43	2/24/89	H000DGR7		5.00 U		
699-43-43	2/24/89	H000DGR7			5.00 U	13400.00
699-43-43	2/24/89	H000DGS0		5.00 U		
699-43-43	2/24/89	H000DGS0			5.00 U	13300.00
699-43-43	6/15/89	H000DGS1		5.00 U		
699-43-43	6/15/89	H000DGS1			5.00 U	12900.00
699-43-43	8/09/89	H000DGS5		5.00 U		
699-43-43	8/09/89	H000DGS5			5.00 U	14500.00
699-43-43	1/26/90	H000DGS9		5.00 U		
699-43-43	1/26/90	H000DGS9			5.00 U	14200.00
699-43-43	7/08/91	H00071Y7	U			
699-43-43	1/24/92	B01T83	10.00 U			
699-43-43	1/24/92	B01T84			10.00 U	
699-43-43	4/22/92	B065N6	10.00 U			
699-43-43	4/22/92	B065N7			10.00 U	
699-43-43	6/26/92	B070W0	10.00 U			
699-43-43	6/26/92	B070W1			10.00 U	
699-43-43	10/26/92	B07JG5	10.00 U			
699-43-43	10/26/92	B07JG6			10.00 U	
699-43-43	1/13/93	B07V24	10.00 U			
699-43-43	1/13/93	B07V28			10.00 U	
699-43-45	12/06/89	H000DGT4		5.00 U		
699-43-45	12/06/89	H000DGT4			5.00 U	17500.00
699-43-45	1/26/90	H000DGT8		5.00 U		
699-43-45	1/26/90	H000DGT8			5.00 U	17000.00
699-43-45	4/18/90	H000DGV2		5.00 U		
699-43-45	4/18/90	H000DGV2			5.00 U	17000.00
699-43-45	7/08/91	H00071Y8	U			
699-43-45	1/24/92	B01QD0	10.00 U			
699-43-45	1/24/92	B01QD1			10.00 U	
699-43-45	4/22/92	B065N8	10.00 U			
699-43-45	4/22/92	B065N9			10.00 U	
699-43-45	6/26/92	B070W2	10.00 U			
699-43-45	6/26/92	B070W3			10.00 U	

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Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
699-43-45	10/26/92	B07JG7	10.00 U			
699-43-45	10/26/92	B07JG8			10.00 U	
699-43-45	1/13/93	B07V29	10.00 U			
699-43-45	1/13/93	B07V33			10.00 U	
699-44-39B	1/08/93	B07WK1	10.00 U			
699-44-39B	1/08/93	B07WK5			10.00 U	
699-44-42	11/21/88	H000DHK2		5.00 U		
699-44-42	11/21/88	H000DHK2			5.00 U	
699-44-42	2/17/89	H000DHK6		5.00 U		
699-44-42	2/17/89	H000DHK6			5.00 U	16300.00
699-44-42	6/15/89	H000DHL0		5.00 U		
699-44-42	6/15/89	H000DHL0			5.00 U	15800.00
699-44-42	8/08/89	H000DHL4		5.00 U		
699-44-42	8/08/89	H000DHL4			5.00 U	17500.00
699-44-42	1/31/90	H000DHL8		5.00 U		
699-44-42	1/31/90	H000DHL8			5.00 U	16400.00
699-44-42	7/10/91	H00071Y9	U			
699-44-42	1/31/92	B01S52	10.00 U			
699-44-42	1/31/92	B01S54			10.00 U	
699-44-42	6/25/92	B07017	10.00 U			
699-44-42	6/25/92	B07021			10.00 U	
699-44-42	1/13/93	B07V34	10.00 U			
699-44-42	1/13/93	B07V35	10.00 U			
699-44-42	1/13/93	B07V42			10.00 U	
699-44-42	1/13/93	B07V43			10.00 U	
699-44-43B	12/20/89	H000DHM3		5.00 U		
699-44-43B	12/20/89	H000DHM3			5.00 U	19500.00
699-44-43B	12/20/89	H000DHM6		5.00 U		
699-44-43B	12/20/89	H000DHM6			5.00 U	19800.00
699-44-43B	1/26/90	H000DHM7		5.00 U		
699-44-43B	1/26/90	H000DHM7			5.00 U	19100.00
699-44-43B	1/26/90	H000DHN0		5.00 U		
699-44-43B	1/26/90	H000DHN0			5.00 U	19100.00
699-44-43B	4/18/90	H000DHN1		5.00 U		
699-44-43B	4/18/90	H000DHN1			5.00 U	18000.00
699-44-43B	7/08/91	H00071Z0	U			
699-44-43B	1/23/92	B01Q69	10.00 U			
699-44-43B	1/23/92	B01Q70			10.00 U	
699-44-43B	4/20/92	B065W9	10.00 U			
699-44-43B	4/20/92	B065X5			10.00 U	
699-44-43B	6/26/92	B01MT4			10.00 U	
699-44-43B	6/26/92	B07022	10.00 U			
699-44-43B	6/26/92	B07023	10.00 U			

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Well Name	Collection Date	Sample Number	SELENUM 48/ppb 10/10	SELENUM 76/ppb ./.	FSELENI 48/ppb 10/10	FSILICO 34/ppb ./.
699-44-43B	6/26/92	B07026			10.00 U	
699-44-43B	1/27/93	B07V44	10.00 U			
699-44-43B	1/27/93	B07V48			10.00 U	

Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
299-E18-1	8/16/88	H0007ZT7			28700.00	
299-E18-1	8/16/88	H0007ZT7				31500.00
299-E18-1	9/22/88	H0007ZV1			28800.00	
299-E18-1	9/22/88	H0007ZV1				27400.00
299-E18-1	11/10/88	H0007ZV2			25900.00	
299-E18-1	11/10/88	H0007ZV2				28100.00
299-E18-1	11/10/88	H0007ZV5			27000.00	
299-E18-1	11/10/88	H0007ZV5				26700.00
299-E18-1	2/15/89	H0007ZV8	13600.00		25800.00	
299-E18-1	2/15/89	H0007ZV8				27100.00
299-E18-1	5/26/89	H0007ZW2	15000.00		27800.00	
299-E18-1	5/26/89	H0007ZW2				28500.00
299-E18-1	8/08/89	H0007ZW6	14900.00		26100.00	
299-E18-1	8/08/89	H0007ZW6				30500.00
299-E18-1	10/31/89	H0007ZX0	16200.00		25900.00	
299-E18-1	10/31/89	H0007ZX0				27800.00
299-E18-1	7/09/91	H00071X9		26000.00		
299-E18-1	7/09/91	H00071X9F				25000.00
299-E18-1	9/06/91	B00LB6		27000.00		
299-E18-1	9/06/91	B00LB6F				26000.00
299-E18-1	1/24/92	B01Q59		25000.00 D		
299-E18-1	1/24/92	B01Q60				25000.00 D
299-E18-1	6/03/92	B06PH8		26000.00		
299-E18-1	6/03/92	B06PJ2				26000.00
299-E18-1	12/16/92	B07S32		28000.00		
299-E18-1	12/16/92	B07S36				27000.00
299-E32-4	9/27/88	H0008ZB8			30600.00	
299-E32-4	9/27/88	H0008ZB8				27300.00
299-E32-4	12/28/88	H0008ZC2			26500.00	
299-E32-4	12/28/88	H0008ZC2				28500.00
299-E32-4	3/01/89	H0008ZC6	16600.00		27500.00	
299-E32-4	3/01/89	H0008ZC6				27300.00
299-E32-4	3/13/89	H0008ZD0	16700.00		28200.00	

Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
299-E32-4	3/13/89	H0008ZD0				27000.00
299-E32-4	6/16/89	H0008ZD4	16700.00		26300.00	
299-E32-4	6/16/89	H0008ZD4				26000.00
299-E32-4	7/19/89	H0008ZD8	17000.00		25900.00	
299-E32-4	7/19/89	H0008ZD8				24700.00
299-E32-4	9/08/89	H0008ZF6	18800.00		29100.00	
299-E32-4	9/08/89	H0008ZF6				26300.00
299-E32-4	1/17/90	H0008ZG0	17200.00		26300.00	
299-E32-4	1/17/90	H0008ZG0				26400.00
299-E32-4	8/05/91	H00071Y0		28000.00 QD		
299-E32-4	8/05/91	H00071Y0F				27000.00 Q
299-E32-4	8/05/91	H0007264		27000.00 QD		
299-E32-4	8/05/91	H0007264F				27000.00 Q
299-E32-4	9/23/91	B00LK5		26000.00		
299-E32-4	9/23/91	B00LK5F				26000.00
299-E32-4	1/15/92	B01QK6		27000.00		
299-E32-4	1/15/92	B01QK8				27000.00
299-E32-4	4/06/92	B06696		27000.00		
299-E32-4	4/06/92	B06697				28000.00
299-E32-4	7/14/92	B07173		27000.00		
299-E32-4	7/14/92	B07174				27000.00
699-40-36	12/21/92	B07TB1		45000.00		
699-40-36	12/21/92	B07TB8				48000.00
699-40-36	2/22/93	B08717		47000.00		
699-40-36	2/22/93	B08721				54000.00
699-40-39	12/05/89	H000DBX2	19100.00		33900.00	
699-40-39	12/05/89	H000DBX2				34500.00
699-40-39	1/25/90	H000DBX6	18600.00		34100.00	
699-40-39	1/25/90	H000DBX6				32300.00
699-40-39	4/25/90	H000DBY0	16500.00		32700.00	
699-40-39	4/25/90	H000DBY0				33400.00
699-40-39	7/08/91	H00071Y4F				34000.00
699-40-39	9/11/91	B00LG1		33000.00		
699-40-39	9/11/91	B00LG1F				33000.00
699-40-39	1/31/92	B01Q65		32000.00 D		
699-40-39	1/31/92	B01Q66				31000.00 D
699-40-39	4/17/92	B065P2		32000.00		
699-40-39	4/17/92	B065Q4				32000.00
699-40-39	6/24/92	B06ZT7		33000.00		
699-40-39	6/24/92	B06ZV1				33000.00
699-40-39	1/14/93	B07TX4		33000.00		
699-40-39	1/14/93	B07TX8				33000.00
699-40-40A	1/24/92	B01T62		39000.00 D		

Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
699-40-40A	1/24/92	B01T63				38000.00 D
699-40-40A	4/22/92	B065Q8		37000.00		
699-40-40A	4/22/92	B065R8				38000.00
699-40-40A	6/25/92	B06ZV2		39000.00		
699-40-40A	6/25/92	B06ZW0				40000.00
699-40-40A	10/21/92	B07JK3		39000.00		
699-40-40A	10/21/92	B07JK7				40000.00
699-40-40A	1/26/93	B07V49		40000.00		
699-40-40A	1/26/93	B07V53				39000.00
699-40-40B	1/01/92	B01T65				37000.00 D
699-40-40B	1/24/92	B01T64		40000.00 D		
699-40-40B	4/22/92	B065S0		35000.00		
699-40-40B	4/22/92	B065S4				32000.00
699-40-40B	6/29/92	B06ZW2		35000.00		
699-40-40B	6/29/92	B06ZW6				34000.00
699-40-40B	10/21/92	B07JK8		36000.00		
699-40-40B	10/21/92	B07JL2				36000.00
699-40-40B	1/26/93	B07V54		35000.00		
699-40-40B	1/26/93	B07V58				34000.00
699-41-35	12/21/92	B07TB9		47000.00		
699-41-35	12/21/92	B07TC3				39000.00
699-41-35	2/22/93	B08707		45000.00		
699-41-35	2/22/93	B08711				53000.00
699-41-40	12/05/89	H000DD44	14600.00		30600.00	
699-41-40	12/05/89	H000DD44				30000.00
699-41-40	1/25/90	H000DD48	15300.00		29900.00	
699-41-40	1/25/90	H000DD48				31900.00
699-41-40	4/19/90	H000DD52	14600.00		31100.00	
699-41-40	4/19/90	H000DD52				29000.00
699-41-40	7/10/91	H00071Y1		30000.00		
699-41-40	7/10/91	H00071Y1F				31000.00
699-41-40	9/11/91	B00LG2		31000.00		
699-41-40	9/11/91	B00LG2F				31000.00
699-41-40	1/31/92	B01QC8		29000.00 D		
699-41-40	1/31/92	B01QC9				29000.00 D
699-41-40	4/28/92	B065S5		31000.00		
699-41-40	4/28/92	B065S6		30000.00		
699-41-40	4/28/92	B065S9				30000.00
699-41-40	4/28/92	B065T0				30000.00
699-41-40	6/24/92	B06ZX2		31000.00		
699-41-40	6/24/92	B06ZX6				31000.00
699-41-40	1/14/93	B07TX9		31000.00		
699-41-40	1/14/93	B07TY3				30000.00

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Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
699-41-42	1/08/93	B07V59		24000.00		
699-41-42	1/08/93	B07V63				24000.00
699-42-37	12/22/92	B07TC4		35000.00		
699-42-37	12/22/92	B07TC8				35000.00
699-42-37	2/23/93	B08712		38000.00		
699-42-37	2/23/93	B08716				40000.00
699-42-39A	1/23/92	B01T66		28000.00 P		
699-42-39A	1/23/92	B01T67				28000.00 P
699-42-39A	4/17/92	B065T1		27000.00 P		
699-42-39A	4/17/92	B065T5				27000.00 P
699-42-39A	6/25/92	B06ZX7		28000.00 P		
699-42-39A	6/25/92	B06ZY1				27000.00 P
699-42-39A	10/21/92	B07JL3		27000.00 P		
699-42-39A	10/21/92	B07JL7				27000.00 P
699-42-39A	1/27/93	B07V64		28000.00 P		
699-42-39A	1/27/93	B07V68				28000.00 P
699-42-39B	1/23/92	B01T68		29000.00		
699-42-39B	1/23/92	B01T69				30000.00
699-42-39B	4/17/92	B065T6		29000.00		
699-42-39B	4/17/92	B065V0				29000.00
699-42-39B	6/25/92	B06ZY2		31000.00		
699-42-39B	6/25/92	B06ZY6				29000.00
699-42-39B	10/28/92	B07JJ2		30000.00		
699-42-39B	10/28/92	B07JJ3		31000.00		
699-42-39B	10/28/92	B07JJ6				30000.00
699-42-39B	10/28/92	B07JJ7				30000.00
699-42-39B	1/25/93	B07V69		30000.00		
699-42-39B	1/25/93	B07V73				30000.00
699-42-40A	8/22/85	H000DF11			10600.00	
699-42-40A	5/12/86	H000DF27			7430.00	
699-42-40A	8/05/86	H000DF33			6310.00	
699-42-40A	1/08/88	H000DF55			4140.00	
699-42-40A	1/08/88	H000DF55				4460.00
699-42-40A	11/22/88	H000DF60			3920.00	
699-42-40A	11/22/88	H000DF60				3770.00
699-42-40A	2/15/89	H000DF65	3830.00		3540.00	
699-42-40A	2/15/89	H000DF65				4040.00
699-42-40A	5/31/89	H000DF70	4690.00		4390.00	
699-42-40A	5/31/89	H000DF70				4260.00
699-42-40A	8/10/89	H000DF74	5750.00		3960.00	
699-42-40A	8/10/89	H000DF74				5010.00
699-42-40A	1/26/90	H000DF78	5460.00		4440.00	
699-42-40A	1/26/90	H000DF78				4330.00

Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
699-42-40A	7/08/91	H00071Y2		4600.00		
699-42-40A	7/08/91	H00071Y2F				5300.00
699-42-40A	1/08/92	B07TY8		4600.00		
699-42-40A	1/08/92	B07TZ3				4500.00
699-42-40A	1/23/92	B01Q61		5100.00		
699-42-40A	1/23/92	B01Q62				4900.00
699-42-40A	6/25/92	B06ZY7		4800.00		
699-42-40A	6/25/92	B06ZZ1				4800.00
699-42-41	1/24/92	B01T70		3900.00 PD		
699-42-41	1/24/92	B01T71				3800.00 PD
699-42-41	4/17/92	B065V1		4200.00 P		
699-42-41	4/17/92	B065V5				3900.00 P
699-42-41	6/29/92	B06ZZ2		4400.00 P		
699-42-41	6/29/92	B06ZZ6				4300.00 P
699-42-41	1/25/93	B07TZ4		3500.00 P		
699-42-41	1/25/93	B07TZ8				3500.00 P
699-42-42B	11/22/88	H000DFT3			21800.00	
699-42-42B	11/22/88	H000DFT3				22600.00
699-42-42B	2/24/89	H000DFT7	19200.00		20200.00	
699-42-42B	2/24/89	H000DFT7				19600.00
699-42-42B	6/16/89	H000DFV1	17800.00		18800.00	
699-42-42B	6/16/89	H000DFV1				21600.00
699-42-42B	6/16/89	H000DFV4	17200.00		18200.00	
699-42-42B	6/16/89	H000DFV4				19100.00
699-42-42B	8/09/89	H000DFV5	16600.00		17600.00	
699-42-42B	8/09/89	H000DFV5				21500.00
699-42-42B	7/08/91	H00071Y3		19000.00		
699-42-42B	7/08/91	H00071Y3F				18000.00
699-42-42B	1/24/92	B01Q63		18000.00 D		
699-42-42B	1/24/92	B01Q64				18000.00 D
699-42-42B	6/24/92	B06ZZ7		19000.00		
699-42-42B	6/24/92	B07001				19000.00
699-42-42B	1/21/93	B07TZ9		18000.00		
699-42-42B	1/21/93	B07V03				18000.00
699-43-40	1/31/92	B01T72		21000.00 PD		
699-43-40	1/31/92	B01T73				20000.00 PD
699-43-40	4/28/92	B065V6		19000.00 P		
699-43-40	4/28/92	B065W0				20000.00 P
699-43-40	6/26/92	B07002		21000.00 P		
699-43-40	6/26/92	B07006				21000.00 P
699-43-40	1/25/93	B07V04		21000.00 P		
699-43-40	1/25/93	B07V08				21000.00 P
699-43-41E	12/05/89	H000DGD6	10400.00		26900.00	

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Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
699-43-41E	12/05/89	H000DGD6				25900.00
699-43-41E	1/25/90	H000DGF0	9620.00		28600.00	
699-43-41E	1/25/90	H000DGF0				27300.00
699-43-41E	6/28/91	H0007203		27000.00 D		
699-43-41E	6/28/91	H0007203F				26000.00
699-43-41E	6/28/91	H0007204		27000.00 D		
699-43-41E	6/28/91	H0007204F				27000.00
699-43-41E	1/23/92	B01QC3		20000.00		
699-43-41E	1/23/92	B01QC4				24000.00
699-43-41E	4/17/92	B065P4		23000.00		
699-43-41E	4/17/92	B065Q6				24000.00
699-43-41E	6/24/92	B06ZV3		27000.00		
699-43-41E	6/24/92	B06ZW1				26000.00
699-43-41E	1/25/93	B07V09		24000.00		
699-43-41E	1/25/93	B07V13				26000.00
699-43-41F	12/05/89	H000DGG8	18500.00		17700.00	
699-43-41F	12/05/89	H000DGG8				17700.00
699-43-41F	1/25/90	H000DGH2	19400.00		18200.00	
699-43-41F	1/25/90	H000DGH2				17500.00
699-43-41F	4/18/90	H000DGH6	20100.00		17800.00	
699-43-41F	4/18/90	H000DGH6				17100.00
699-43-41F	7/02/91	H00071Y5		24000.00 D		
699-43-41F	7/02/91	H00071Y5F				22000.00
699-43-41F	5/05/92	B065R0		21000.00		
699-43-41F	5/05/92	B065R9				22000.00
699-43-41F	6/25/92	B06ZW7		23000.00		
699-43-41F	6/25/92	B06ZX1				22000.00
699-43-41F	1/22/93	B07V14		17000.00		
699-43-41F	1/22/93	B07V18				17000.00
699-43-41G	1/23/92	B01T74		27000.00		
699-43-41G	1/23/92	B01T75				27000.00
699-43-41G	4/17/92	B065W1		24000.00		
699-43-41G	4/17/92	B065W6				22000.00
699-43-41G	6/26/92	B07007		23000.00		
699-43-41G	6/26/92	B07011				22000.00
699-43-41G	10/28/92	B07JL8		21000.00		
699-43-41G	10/28/92	B07JM2				21000.00
699-43-41G	1/25/93	B07V74		20000.00		
699-43-41G	1/25/93	B07V78				21000.00
699-43-42J	11/22/88	H000DGP2			9830.00	
699-43-42J	11/22/88	H000DGP2				10200.00
699-43-42J	2/24/89	H000DGP6	16000.00		13100.00	
699-43-42J	2/24/89	H000DGP6				13500.00

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Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
699-43-42J	6/15/89	H000DGQ0	16100.00		16400.00	
699-43-42J	6/15/89	H000DGQ0				16500.00
699-43-42J	8/09/89	H000DGQ4	15600.00		14000.00	
699-43-42J	8/09/89	H000DGQ4				15100.00
699-43-42J	8/09/89	H000DGQ7	15000.00		12700.00	
699-43-42J	8/09/89	H000DGQ7				15900.00
699-43-42J	7/02/91	H00071Y6		28000.00 D		
699-43-42J	7/02/91	H00071Y6F				27000.00
699-43-42J	1/31/92	B01S49		34000.00 D		
699-43-42J	1/31/92	B01S51				33000.00 D
699-43-42J	6/25/92	B07012		34000.00		
699-43-42J	6/25/92	B07016				29000.00
699-43-42J	1/21/93	B07V19		36000.00		
699-43-42J	1/21/93	B07V23				35000.00
699-43-43	11/21/88	H000DGR3			7450.00	
699-43-43	11/21/88	H000DGR3				7020.00
699-43-43	2/24/89	H000DGR7	14500.00		7860.00	
699-43-43	2/24/89	H000DGR7				7510.00
699-43-43	2/24/89	H000DGS0	14900.00		8050.00	
699-43-43	2/24/89	H000DGS0				7290.00
699-43-43	6/15/89	H000DGS1	13400.00		8180.00	
699-43-43	6/15/89	H000DGS1				7740.00
699-43-43	8/09/89	H000DGS5	11400.00		7440.00	
699-43-43	8/09/89	H000DGS5				8330.00
699-43-43	1/26/90	H000DGS9	14000.00		7400.00	
699-43-43	1/26/90	H000DGS9				7550.00
699-43-43	7/08/91	H00071Y7		7800.00		
699-43-43	7/08/91	H00071Y7F				7800.00
699-43-43	1/24/92	B01Q67		7900.00 D		
699-43-43	1/24/92	B01Q68				7900.00 D
699-43-43	4/22/92	B065N6		7700.00		
699-43-43	4/22/92	B065N7				7400.00
699-43-43	6/26/92	B070W0		8500.00 D		
699-43-43	6/26/92	B070W1				8300.00
699-43-43	10/26/92	B07JG5		8300.00		
699-43-43	10/26/92	B07JG6				8300.00
699-43-43	1/13/93	B07V24		8100.00		
699-43-43	1/13/93	B07V28				8700.00
699-43-45	12/06/89	H000DGT4	17800.00		11000.00	
699-43-45	12/06/89	H000DGT4				10500.00
699-43-45	1/26/90	H000DGT8	17600.00		10300.00	
699-43-45	1/26/90	H000DGT8				10300.00
699-43-45	4/18/90	H000DGV2	16600.00		10300.00	

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Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
699-43-45	4/18/90	H000DGV2				10300.00
699-43-45	7/08/91	H00071Y8		11000.00		
699-43-45	7/08/91	H00071Y8F				11000.00
699-43-45	9/11/91	B00LG5		10000.00		
699-43-45	9/11/91	B00LG5F				10000.00
699-43-45	1/24/92	B01QD0		9100.00 D		
699-43-45	1/24/92	B01QD1				9400.00 D
699-43-45	4/22/92	B065N8		9200.00		
699-43-45	4/22/92	B065N9				9000.00
699-43-45	6/26/92	B070W2		9700.00 D		
699-43-45	6/26/92	B070W3				9800.00
699-43-45	10/26/92	B07JG7		9700.00		
699-43-45	10/26/92	B07JG8				9600.00
699-43-45	1/13/93	B07V29		9200.00		
699-43-45	1/13/93	B07V33				9100.00
699-44-39B	1/08/93	B07WK1		6300.00		
699-44-39B	1/08/93	B07WK5				7300.00
699-44-42	11/21/88	H000DHK2			14400.00	
699-44-42	11/21/88	H000DHK2				14900.00
699-44-42	2/17/89	H000DHK6	15800.00		16500.00	
699-44-42	2/17/89	H000DHK6				16900.00
699-44-42	6/15/89	H000DHL0	16200.00		16200.00	
699-44-42	6/15/89	H000DHL0				15900.00
699-44-42	8/08/89	H000DHL4	15700.00		14200.00	
699-44-42	8/08/89	H000DHL4				15200.00
699-44-42	1/31/90	H000DHL8	16300.00		15700.00	
699-44-42	1/31/90	H000DHL8				15500.00
699-44-42	7/10/91	H00071Y9		15000.00		
699-44-42	7/10/91	H00071Y9F				15000.00
699-44-42	1/31/92	B01S52		13000.00 D		
699-44-42	1/31/92	B01S54				13000.00 D
699-44-42	6/25/92	B07017		15000.00		
699-44-42	6/25/92	B07021				14000.00
699-44-42	1/13/93	B07V34		13000.00		
699-44-42	1/13/93	B07V35		13000.00		
699-44-42	1/13/93	B07V42				13000.00
699-44-42	1/13/93	B07V43				13000.00
699-44-43B	12/20/89	H000DHM3	18000.00		20400.00	
699-44-43B	12/20/89	H000DHM3				21600.00
699-44-43B	12/20/89	H000DHM6	18300.00		20700.00	
699-44-43B	12/20/89	H000DHM6				21700.00
699-44-43B	1/26/90	H000DHM7	19200.00		25200.00	
699-44-43B	1/26/90	H000DHM7				24000.00

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Well Name	Collection Date	Sample Number	SILICON 35/ppb ./.	SODIUM 34/ppb 300/.	SODIUM 35/ppb ./.	FSODIUM 34/ppb 300/.
699-44-43B	1/26/90	H000DHN0	19200.00		24800.00	
699-44-43B	1/26/90	H000DHN0				24300.00
699-44-43B	4/18/90	H000DHN1	18000.00		19700.00	
699-44-43B	4/18/90	H000DHN1				19600.00
699-44-43B	7/08/91	H00071Z0		20000.00		
699-44-43B	7/08/91	H00071Z0F				21000.00
699-44-43B	9/11/91	B00LG6		19000.00		
699-44-43B	9/11/91	B00LG6F				18000.00
699-44-43B	1/23/92	B01Q69		21000.00		
699-44-43B	1/23/92	B01Q70				20000.00
699-44-43B	4/20/92	B065W9		20000.00		
699-44-43B	4/20/92	B065X5				20000.00
699-44-43B	6/26/92	B01MT4				20000.00
699-44-43B	6/26/92	B07022		20000.00		
699-44-43B	6/26/92	B07023		20000.00		
699-44-43B	6/26/92	B07026				20000.00
699-44-43B	1/27/93	B07V44		20000.00		
699-44-43B	1/27/93	B07V48				20000.00

Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
299-E18-1	8/16/88	H0007ZT7	249.00			
299-E18-1	8/16/88	H0007ZT7		277.00		
299-E18-1	11/10/88	H0007ZV2	249.00			
299-E18-1	11/10/88	H0007ZV2		255.00		
299-E18-1	11/10/88	H0007ZV5	241.00			
299-E18-1	11/10/88	H0007ZV5		241.00		
299-E18-1	2/15/89	H0007ZV8	240.00			
299-E18-1	2/15/89	H0007ZV8		241.00		
299-E18-1	5/26/89	H0007ZW2	257.00			
299-E18-1	5/26/89	H0007ZW2		259.00		
299-E18-1	8/08/89	H0007ZW6	231.00			
299-E18-1	8/08/89	H0007ZW6		283.00		
299-E18-1	10/31/89	H0007ZX0	250.00		.43 U	
299-E18-1	10/31/89	H0007ZX0		265.00		
299-E18-1	7/09/91	H00071X9				130000.00
299-E18-1	1/24/92	B01Q59				140000.00
299-E18-1	6/03/92	B06PH8				130000.00
299-E18-1	12/16/92	B07S32				130000.00

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Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
299-E32-4	9/27/88	H0008ZB8	234.00		.37 U	
299-E32-4	9/27/88	H0008ZB8		214.00		
299-E32-4	12/28/88	H0008ZC2	209.00		-.05 U	
299-E32-4	12/28/88	H0008ZC2		215.00		
299-E32-4	3/01/89	H0008ZC6	233.00			
299-E32-4	3/01/89	H0008ZC6		230.00		
299-E32-4	3/13/89	H0008ZD0	236.00		-.34 U	
299-E32-4	3/13/89	H0008ZD0		231.00		
299-E32-4	6/16/89	H0008ZD4	220.00			
299-E32-4	6/16/89	H0008ZD4		216.00		
299-E32-4	7/19/89	H0008ZD8	228.00		-.17 U	
299-E32-4	7/19/89	H0008ZD8		217.00		
299-E32-4	9/08/89	H0008ZF6	238.00		-.35 U	
299-E32-4	9/08/89	H0008ZF6		212.00		
299-E32-4	1/17/90	H0008ZG0	227.00		.23 U	
299-E32-4	1/17/90	H0008ZG0		230.00		
299-E32-4	1/15/92	B01QK6				59000.00
299-E32-4	4/06/92	B06696				56000.00
299-E32-4	4/09/92	B065B6				57000.00
299-E32-4	7/14/92	B07173				60000.00
699-40-36	12/21/92	B07TB1				7300.00
699-40-36	2/22/93	B08717				17000.00
699-40-39	12/05/89	H000DBX2	169.00		-.05 U	
699-40-39	12/05/89	H000DBX2		169.00		
699-40-39	1/25/90	H000DBX6	173.00			
699-40-39	1/25/90	H000DBX6		163.00		
699-40-39	4/25/90	H000DBY0	170.00			
699-40-39	4/25/90	H000DBY0		175.00		
699-40-39	7/08/91	H00071Y4				3500.00
699-40-39	1/31/92	B01Q65				3900.00
699-40-39	4/17/92	B065P2				3900.00 D
699-40-39	6/24/92	B06ZT7				3600.00
699-40-39	1/14/93	B07TX4				3900.00
699-40-40A	1/24/92	B01T62				17000.00
699-40-40A	4/22/92	B065Q8				16000.00
699-40-40A	6/25/92	B06ZV2				16000.00
699-40-40A	10/21/92	B07JK3				13000.00
699-40-40A	1/26/93	B07V49				18000.00
699-40-40B	1/24/92	B01T64				21000.00
699-40-40B	4/22/92	B065S0				17000.00
699-40-40B	6/29/92	B06ZW2				16000.00 D
699-40-40B	10/21/92	B07JK8				16000.00
699-40-40B	1/26/93	B07V54				16000.00

Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
699-41-35	12/21/92	B07TB9				8500.00
699-41-35	2/22/93	B08707				7500.00
699-41-40	12/05/89	H000DD44	222.00		-.03 U	
699-41-40	12/05/89	H000DD44		218.00		
699-41-40	1/25/90	H000DD48	212.00			
699-41-40	1/25/90	H000DD48		224.00		
699-41-40	4/19/90	H000DD52	226.00			
699-41-40	4/19/90	H000DD52		206.00		
699-41-40	7/10/91	H00071Y1				32000.00
699-41-40	1/31/92	B01QC8				34000.00
699-41-40	4/28/92	B065S5				33000.00 D
699-41-40	4/28/92	B065S6				33000.00 D
699-41-40	6/24/92	B06ZX2				32000.00
699-41-40	1/14/93	B07TX9				35000.00
699-41-42	1/08/93	B07V59				19000.00
699-42-37	12/22/92	B07TC4				25000.00
699-42-37	2/23/93	B08712				25000.00
699-42-39A	1/23/92	B01T66				35000.00 P
699-42-39A	4/17/92	B065T1				37000.00 P
699-42-39A	6/25/92	B06ZX7				37000.00 P
699-42-39A	10/21/92	B07JL3				38000.00 P
699-42-39A	1/27/93	B07V64				36000.00 P
699-42-39B	1/23/92	B01T68				38000.00
699-42-39B	4/17/92	B065T6				40000.00
699-42-39B	6/25/92	B06ZY2				39000.00
699-42-39B	10/28/92	B07JJ2				40000.00
699-42-39B	10/28/92	B07JJ3				40000.00
699-42-39B	1/25/93	B07V69				44000.00
699-42-40A	2/03/83	H000DDX8			-.88	
699-42-40A	2/28/83	H000DDX9			2.42	
699-42-40A	3/28/83	H000DDY0			5.13	
699-42-40A	4/14/83	H000DDY2			0.00	
699-42-40A	5/12/83	H000DDY3			-1.41	
699-42-40A	6/16/83	H000DDY4			1.84	
699-42-40A	7/14/83	H000DDY5			-1.52	
699-42-40A	8/19/83	H000DDY6			-3.65	
699-42-40A	9/27/83	H000DDY7			2.17	
699-42-40A	10/12/83	H000DDY8			-6.35	
699-42-40A	11/07/83	H000DDY9			-4.64	
699-42-40A	12/09/83	H000DDZ0			1.11	
699-42-40A	1/24/84	H000DDZ1			2.10	
699-42-40A	2/28/84	H000DDZ2			7.26	
699-42-40A	4/10/84	H000DDZ3			4.43	

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Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
699-42-40A	4/26/84	H000DDZ4			5.22	
699-42-40A	5/15/84	H000DDZ5			3.75	
699-42-40A	6/05/84	H000DDZ6			.04	
699-42-40A	7/19/84	H000DDZ7			8.77	
699-42-40A	8/10/84	H000DDZ8			-2.08	
699-42-40A	9/11/84	H000DDZ9			2.69	
699-42-40A	10/09/84	H000DF00			4.72	
699-42-40A	11/13/84	H000DF01			.62	
699-42-40A	12/12/84	H000DF02			.75	
699-42-40A	1/16/85	H000DF03			-.16	
699-42-40A	2/11/85	H000DF04			.28	
699-42-40A	3/14/85	H000DF05			.42	
699-42-40A	4/04/85	H000DF06			.64	
699-42-40A	5/03/85	H000DF07			.56	
699-42-40A	6/11/85	H000DF08			-.59 U	
699-42-40A	7/11/85	H000DF10			.29 U	
699-42-40A	8/22/85	H000DF11	300.00 U			
699-42-40A	8/22/85	H000DF15			.30 U	
699-42-40A	10/07/85	H000DF16			.14 U	
699-42-40A	11/02/85	H000DF17			16.30	
699-42-40A	11/06/85	H000DF18			1.77	
699-42-40A	12/14/85	H000DF20			.33 U	
699-42-40A	1/09/86	H000DF21			.01 U	
699-42-40A	2/07/86	H000DF23			.38 U	
699-42-40A	3/07/86	H000DF24			1.65	
699-42-40A	5/06/86	H000DF26			.55 U	
699-42-40A	5/12/86	H000DF27	300.00 U			
699-42-40A	6/06/86	H000DF31			.10 U	
699-42-40A	7/02/86	H000DF32			.45 U	
699-42-40A	8/05/86	H000DF33	300.00 U			
699-42-40A	8/05/86	H000DF37			.03 U	
699-42-40A	9/05/86	H000DF38			.30 U	
699-42-40A	10/24/86	H000DF39			-.06 U	
699-42-40A	11/04/86	H000DF40			.28 U	
699-42-40A	12/10/86	H000DF41			.35 U	
699-42-40A	1/15/87	H000DF42			.83 U	
699-42-40A	4/06/87	H000DF46			.01 U	
699-42-40A	7/09/87	H000DF49			.27 U	
699-42-40A	10/06/87	H000DF52			-.26 U	
699-42-40A	1/08/88	H000DF55		104.00		
699-42-40A	1/08/88	H000DF56			.18 U	
699-42-40A	5/23/88	H000DF57			.29 U	
699-42-40A	7/19/88	H000DF58			.31 U	

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Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
699-42-40A	11/15/88	H000DF59			-.18 U	
699-42-40A	11/22/88	H000DF60	89.00			
699-42-40A	11/22/88	H000DF60		84.00		
699-42-40A	2/06/89	H000DF64			.01 U	
699-42-40A	2/15/89	H000DF65	101.00			
699-42-40A	2/15/89	H000DF65		104.00		
699-42-40A	4/07/89	H000DF69			.41 U	
699-42-40A	5/31/89	H000DF70	102.00			
699-42-40A	5/31/89	H000DF70		96.00		
699-42-40A	8/10/89	H000DF74	78.00			
699-42-40A	8/10/89	H000DF74		99.00		
699-42-40A	1/26/90	H000DF78	113.00			
699-42-40A	1/26/90	H000DF78		113.00		
699-42-40A	7/08/91	H00071Y2				9300.00
699-42-40A	1/23/92	B01Q61				10000.00
699-42-40A	6/25/92	B06ZY7				11000.00
699-42-41	1/24/92	B01T70				13000.00 P
699-42-41	4/17/92	B065V1				12000.00 P
699-42-41	6/29/92	B06ZZ2				12000.00 PD
699-42-41	1/25/93	B07TZ4				12000.00 P
699-42-42B	11/22/88	H000DFT3	156.00			
699-42-42B	11/22/88	H000DFT3		153.00		
699-42-42B	2/24/89	H000DFT7	162.00			
699-42-42B	2/24/89	H000DFT7		150.00		
699-42-42B	6/16/89	H000DFV1	151.00			
699-42-42B	6/16/89	H000DFV1		159.00		
699-42-42B	6/16/89	H000DFV4	145.00			
699-42-42B	6/16/89	H000DFV4		142.00		
699-42-42B	8/09/89	H000DFV5	130.00			
699-42-42B	8/09/89	H000DFV5		163.00		
699-42-42B	7/08/91	H00071Y3				19000.00
699-42-42B	1/24/92	B01Q63				19000.00
699-42-42B	6/24/92	B06ZZ7				17000.00
699-42-42B	1/21/93	B07TZ9				16000.00
699-43-40	1/31/92	B01T72				25000.00 P
699-43-40	4/28/92	B065V6				26000.00 PD
699-43-40	6/26/92	B07002				26000.00 P
699-43-40	1/25/93	B07V04				32000.00 P
699-43-41E	12/05/89	H000DGD6	185.00		.10 U	
699-43-41E	12/05/89	H000DGD6		177.00		
699-43-41E	1/25/90	H000DGF0	185.00			
699-43-41E	1/25/90	H000DGF0		181.00		
699-43-41E	6/28/91	H0007203				30000.00

Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
699-43-41E	6/28/91	H0007204				31000.00
699-43-41E	1/23/92	B01QC3				29000.00
699-43-41E	4/17/92	B065P4				29000.00
699-43-41E	6/24/92	B06ZV3				31000.00
699-43-41E	1/25/93	B07V09				34000.00
699-43-41F	12/05/89	H000DGG8	199.00		-.18 U	
699-43-41F	12/05/89	H000DGG8		203.00		
699-43-41F	1/25/90	H000DGH2	204.00			
699-43-41F	1/25/90	H000DGH2		190.00		
699-43-41F	4/18/90	H000DGH6	200.00			
699-43-41F	4/18/90	H000DGH6		190.00		
699-43-41F	7/02/91	H00071Y5				27000.00
699-43-41F	5/05/92	B065R0				27000.00
699-43-41F	6/25/92	B06ZW7				25000.00
699-43-41F	1/22/93	B07V14				22000.00
699-43-41G	1/23/92	B01T74				28000.00
699-43-41G	4/17/92	B065W1				28000.00
699-43-41G	6/26/92	B07007				28000.00
699-43-41G	10/28/92	B07JL8				31000.00
699-43-41G	1/25/93	B07V74				29000.00
699-43-42J	11/22/88	H000DGP2	102.00			
699-43-42J	11/22/88	H000DGP2		107.00		
699-43-42J	2/24/89	H000DGP6	121.00			
699-43-42J	2/24/89	H000DGP6		121.00		
699-43-42J	6/15/89	H000DGQ0	124.00			
699-43-42J	6/15/89	H000DGQ0		127.00		
699-43-42J	8/09/89	H000DGQ4	107.00			
699-43-42J	8/09/89	H000DGQ4		121.00		
699-43-42J	8/09/89	H000DGQ7	98.00			
699-43-42J	8/09/89	H000DGQ7		123.00		
699-43-42J	7/02/91	H00071Y6				15000.00
699-43-42J	1/31/92	B01S49				19000.00
699-43-42J	6/25/92	B07012				17000.00
699-43-42J	1/21/93	B07V19				16000.00
699-43-43	11/21/88	H000DGR3	112.00			
699-43-43	11/21/88	H000DGR3		105.00		
699-43-43	2/24/89	H000DGR7	120.00			
699-43-43	2/24/89	H000DGR7		110.00		
699-43-43	2/24/89	H000DGS0	121.00			
699-43-43	2/24/89	H000DGS0		110.00		
699-43-43	6/15/89	H000DGS1	126.00			
699-43-43	6/15/89	H000DGS1		119.00		
699-43-43	8/09/89	H000DGS5	109.00			

Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
699-43-43	8/09/89	H000DGS5		126.00		
699-43-43	1/26/90	H000DGS9	121.00			
699-43-43	1/26/90	H000DGS9		122.00		
699-43-43	7/08/91	H00071Y7				9700.00
699-43-43	1/24/92	B01Q67				8000.00
699-43-43	4/22/92	B065N6				8700.00
699-43-43	6/26/92	B070W0				8600.00
699-43-43	10/26/92	B07JG5				7600.00
699-43-43	1/13/93	B07V24				8600.00
699-43-45	12/06/89	H000DGT4	142.00		-.06 U	
699-43-45	12/06/89	H000DGT4		138.00		
699-43-45	1/26/90	H000DGT8	135.00			
699-43-45	1/26/90	H000DGT8		136.00		
699-43-45	4/18/90	H000DGV2	133.00			
699-43-45	4/18/90	H000DGV2		133.00		
699-43-45	7/08/91	H00071Y8				11000.00
699-43-45	1/24/92	B01QD0				9400.00
699-43-45	4/22/92	B065N8				9000.00
699-43-45	6/26/92	B070W2				9300.00
699-43-45	10/26/92	B07JG7				11000.00
699-43-45	1/13/93	B07V29				9800.00
699-44-39B	1/08/93	B07WK1				13000.00
699-44-42	11/21/88	H000DHK2	128.00			
699-44-42	11/21/88	H000DHK2		129.00		
699-44-42	2/17/89	H000DHK6	125.00			
699-44-42	2/17/89	H000DHK6		128.00		
699-44-42	6/15/89	H000DHL0	121.00			
699-44-42	6/15/89	H000DHL0		116.00		
699-44-42	8/08/89	H000DHL4	108.00			
699-44-42	8/08/89	H000DHL4		123.00		
699-44-42	1/31/90	H000DHL8	125.00			
699-44-42	1/31/90	H000DHL8		125.00		
699-44-42	7/10/91	H00071Y9				12000.00
699-44-42	1/31/92	B01S52				11000.00
699-44-42	6/25/92	B07017				12000.00
699-44-42	1/13/93	B07V34				11000.00
699-44-42	1/13/93	B07V35				11000.00
699-44-43B	12/20/89	H000DHM3	168.00		-.49 U	
699-44-43B	12/20/89	H000DHM3		179.00		
699-44-43B	12/20/89	H000DHM6	168.00		-.23 U	
699-44-43B	12/20/89	H000DHM6		182.00		
699-44-43B	1/26/90	H000DHM7	185.00			
699-44-43B	1/26/90	H000DHM7		179.00		

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Well Name	Collection Date	Sample Number	STRONUM 35/ppb ./.	FSTRONUM 34/ppb ./.	SR-90 77/pCi/L ./8	SULFATE 124/ppb 500/250000s
699-44-43B	1/26/90	H000DHN0	184.00			
699-44-43B	1/26/90	H000DHN0		179.00		
699-44-43B	4/18/90	H000DHN1	171.00			
699-44-43B	4/18/90	H000DHN1		171.00		
699-44-43B	7/08/91	H00071Z0				24000.00
699-44-43B	1/23/92	B01Q69				24000.00
699-44-43B	4/20/92	B065W9				23000.00
699-44-43B	6/26/92	B07022				21000.00
699-44-43B	6/26/92	B07023				21000.00
699-44-43B	1/27/93	B07V44				20000.00

Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
299-E18-1	8/16/88	H0007ZT7	168000.00			
299-E18-1	8/16/88	H000GLJ0				22.00
299-E18-1	11/10/88	H0007ZV2	172000.00			
299-E18-1	11/10/88	H0007ZV5	169000.00			
299-E18-1	11/10/88	H000GMG7				21.00
299-E18-1	11/23/88	H000GMN5				20.00
299-E18-1	2/15/89	H0007ZV8	149000.00			
299-E18-1	2/15/89	H000GND6				20.00
299-E18-1	5/26/89	H0007ZW2	151000.00			
299-E18-1	5/26/89	H000GKS2				20.70
299-E18-1	8/08/89	H0007ZW6	153000.00			
299-E18-1	8/08/89	H000GNQ1				21.60
299-E18-1	10/31/89	H0007ZX0	148000.00			
299-E18-1	10/31/89	H000GPC4				20.70
299-E18-1	11/29/89	H000GPJ3				20.60
299-E18-1	5/30/90	H0007ZX5	142000.00			
299-E18-1	5/30/90	H000GRK4				20.00
299-E18-1	7/09/91	H00071X9				21.50
299-E18-1	9/06/91	B00LB6		.30 U		22.30
299-E18-1	1/24/92	B01Q59				21.60
299-E18-1	6/03/92	B06PH8		-.05 U		20.60
299-E18-1	11/03/92	B07LH1				20.20
299-E18-1	12/16/92	B07S32				20.40
299-E32-4	9/27/88	H0008ZB8	59700.00		-.44 U	
299-E32-4	9/27/88	H000GM82				19.00
299-E32-4	12/28/88	H0008ZC2	55900.00		4.50 U	

Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
299-E32-4	12/28/88	H000GMW7				20.00
299-E32-4	3/01/89	H0008ZC6	60800.00			
299-E32-4	3/01/89	H000G2Z1				19.00
299-E32-4	3/13/89	H0008ZD0	67400.00		4.44 U	
299-E32-4	3/13/89	H000G338				18.00
299-E32-4	6/16/89	H0008ZD4	68300.00			
299-E32-4	6/16/89	H000GKS9				19.40
299-E32-4	7/19/89	H0008ZD8	70300.00		6.22 U	
299-E32-4	7/19/89	H000GNK7				18.70
299-E32-4	8/10/89	H000GNR1				18.80
299-E32-4	9/08/89	H0008ZF6	62000.00		13.80	
299-E32-4	9/08/89	H000GP21				18.20
299-E32-4	1/17/90	H0008ZG0	69700.00		3.90 U	
299-E32-4	1/17/90	H000GQB2				18.30
299-E32-4	1/26/90	H000GQ06				18.20
299-E32-4	4/29/90	H000GR37				18.20
299-E32-4	5/09/90	H0008ZG9	64300.00			
299-E32-4	5/09/90	H000GR23				18.50
299-E32-4	8/05/91	H0007264		3.69		19.70
299-E32-4	9/23/91	B00LK5		3.97		18.00
299-E32-4	1/15/92	B01QK6		6.81		18.20
299-E32-4	4/06/92	B06696		5.07		
299-E32-4	4/09/92	B065B6		3.63		18.00
299-E32-4	7/14/92	B07173		3.37		19.00
299-E32-4	4/30/93	B08FZ2				18.40
699-40-36	12/21/92	B07TB1				17.80
699-40-36	2/22/93	B08717				17.20
699-40-36	2/22/93	B08718				17.20
699-40-36	2/22/93	B08719				17.20
699-40-36	2/22/93	B08720				17.20
699-40-39	12/05/89	H000DBX2	4500.00			
699-40-39	12/05/89	H000GPM1				17.30
699-40-39	1/25/90	H000DBX6	4300.00			
699-40-39	1/25/90	H000GQ10				15.40
699-40-39	4/25/90	H000DBY0	3700.00			
699-40-39	4/25/90	H000GQY6				15.50
699-40-39	4/15/91	H000GT21				15.80
699-40-39	7/08/91	H00071Y4				17.90
699-40-39	9/11/91	B00LG1				17.70
699-40-39	1/31/92	B01Q65				15.70
699-40-39	6/24/92	B06ZT7				16.50
699-40-39	10/20/92	B07JM3				16.30
699-40-39	10/20/92	B07JM4				16.20

Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
699-40-39	1/14/93	B07TX4				14.10
699-40-39	1/14/93	B07TX5				14.10
699-40-39	1/14/93	B07TX6				14.10
699-40-39	1/14/93	B07TX7				14.10
699-40-39	4/26/93	B08GK2				15.90
699-40-40A	1/24/92	B01T62				18.80
699-40-40A	6/25/92	B06ZV2				18.40
699-40-40A	10/21/92	B07JK3				18.10
699-40-40A	1/26/93	B07V49				17.30
699-40-40A	1/26/93	B07V50				17.30
699-40-40A	1/26/93	B07V51				17.30
699-40-40A	1/26/93	B07V52				17.30
699-40-40A	4/27/93	B08GG0				18.30
699-40-40B	6/29/92	B06ZW2				17.30
699-40-40B	10/21/92	B07JK8				16.70
699-40-40B	1/26/93	B07V54				17.00
699-40-40B	1/26/93	B07V55				17.10
699-40-40B	1/26/93	B07V56				17.10
699-40-40B	1/26/93	B07V57				17.10
699-40-40B	4/22/93	B08GF5				16.50
699-41-35	12/21/92	B07TB9				17.10
699-41-35	2/22/93	B08707				15.30
699-41-40	12/05/89	H000DD44	31800.00			
699-41-40	12/05/89	H000GPM2				14.70
699-41-40	1/25/90	H000DD48	33700.00			
699-41-40	1/25/90	H000GQ11				15.50
699-41-40	4/19/90	H000DD52	33100.00			
699-41-40	4/19/90	H000GQV9				16.60
699-41-40	4/15/91	H000GT22				15.80
699-41-40	7/10/91	H00071Y1				16.50
699-41-40	9/11/91	B00LG2				17.30
699-41-40	1/31/92	B01QC8				15.00
699-41-40	6/24/92	B06ZX2				16.30
699-41-40	10/20/92	B07JM7				16.10
699-41-40	1/14/93	B07TX9				14.50
699-41-40	1/14/93	B07TY0				14.60
699-41-40	1/14/93	B07TY1				14.60
699-41-40	1/14/93	B07TY2				14.60
699-41-42	1/08/93	B07V59				16.30
699-41-42	4/22/93	B08GG5				16.00
699-42-37	12/22/92	B07TC4				17.30
699-42-37	2/23/93	B08712				16.50
699-42-37	2/23/93	B08713				16.60

Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
699-42-37	2/23/93	B08714				16.60
699-42-37	2/23/93	B08715				16.60
699-42-39A	1/23/92	B01T66				14.80 P
699-42-39A	6/25/92	B06ZX7				16.60 P
699-42-39A	10/21/92	B07JL3				16.40
699-42-39A	1/27/93	B07V64				14.00
699-42-39A	1/27/93	B07V65				14.30
699-42-39A	1/27/93	B07V66				14.40
699-42-39A	1/27/93	B07V67				14.40
699-42-39B	1/23/92	B01T68				17.50
699-42-39B	6/25/92	B06ZY2				17.00
699-42-39B	10/28/92	B07JJ2				16.80
699-42-39B	10/28/92	B07JJ3				16.80
699-42-39B	10/28/92	B07JJ4				16.80
699-42-39B	10/28/92	B07JJ5				16.80
699-42-39B	1/25/93	B07V69				15.90
699-42-40A	8/22/85	H000DF11	16000.00			
699-42-40A	8/22/85	H000GFT8				20.60
699-42-40A	8/22/85	H000GGB6				20.00
699-42-40A	2/07/86	H000GFS0				9.10
699-42-40A	5/12/86	H000DF27	14600.00			
699-42-40A	5/12/86	H000GFH8				13.80
699-42-40A	8/05/86	H000DF33	11800.00			
699-42-40A	8/05/86	H000GGJ6				20.70
699-42-40A	1/08/88	H000DF55	11500.00			
699-42-40A	1/08/88	H000GJP1				10.00
699-42-40A	11/22/88	H000DF60	12200.00			
699-42-40A	11/22/88	H000GMN2				18.00
699-42-40A	2/15/89	H000DF65	13500.00			
699-42-40A	2/15/89	H000GNF1				12.00
699-42-40A	5/31/89	H000DF70	13700.00			
699-42-40A	5/31/89	H000GKN0				13.20
699-42-40A	8/10/89	H000DF74	19100.00			
699-42-40A	8/10/89	H000GNR0				16.60
699-42-40A	1/26/90	H000DF78	13200.00			
699-42-40A	1/26/90	H000GQ07				16.60
699-42-40A	7/08/91	H00071Y2				17.00
699-42-40A	1/08/92	B07TY8				16.10
699-42-40A	1/08/92	B07TZ0				16.00
699-42-40A	1/08/92	B07TZ1				16.00
699-42-40A	1/08/92	B07TZ2				16.10
699-42-40A	1/23/92	B01Q61				15.30
699-42-40A	6/25/92	B06ZY7				16.40

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Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
699-42-40A	10/22/92	B07JN1				16.50
699-42-40A	12/28/92	B07TG4				15.70
699-42-40A	12/28/92	B07TG6				15.80
699-42-40A	12/28/92	B07TG8				15.90
699-42-40A	12/28/92	B07TG9				15.90
699-42-41	1/24/92	B01T70				14.90 P
699-42-41	6/29/92	B06ZZ2				13.70 P
699-42-41	10/22/92	B07JN9				15.50
699-42-41	1/25/93	B07TZ4				9.40
699-42-41	4/21/93	B08GL4				10.90 P
699-42-41	4/21/93	B08GL5				10.70 P
699-42-41	4/21/93	B08GL6				10.20 P
699-42-41	4/21/93	B08GL7				9.90 P
699-42-42B	11/22/88	H000DFT3	19600.00			
699-42-42B	11/22/88	H000GMQ4				15.00
699-42-42B	2/24/89	H000DFT7	18400.00			
699-42-42B	2/24/89	H000G2Z9				17.00
699-42-42B	6/16/89	H000DFV1	18900.00			
699-42-42B	6/16/89	H000DFV4	18800.00			
699-42-42B	6/16/89	H000GKT0				16.20
699-42-42B	8/09/89	H000DFV5	19000.00			
699-42-42B	8/09/89	H000GNK0				16.40
699-42-42B	1/02/90	H000GPS0				15.60
699-42-42B	1/26/90	H000GQ08				16.10
699-42-42B	7/08/91	H00071Y3				16.30
699-42-42B	1/24/92	B01Q63				15.70
699-42-42B	6/24/92	B06ZZ7				17.00
699-42-42B	10/20/92	B07JP3				15.80
699-42-42B	1/21/93	B07TZ9				15.50
699-43-40	1/31/92	B01T72				16.60 P
699-43-40	6/26/92	B07002				16.70 P
699-43-40	10/22/92	B07JP7				15.90
699-43-40	1/25/93	B07V04				15.80
699-43-40	4/22/93	B08GN0				16.70 P
699-43-41E	12/05/89	H000DGD6	33500.00			
699-43-41E	12/05/89	H000GPM0				15.50
699-43-41E	1/25/90	H000DGF0	35400.00			
699-43-41E	1/25/90	H000GPZ6				15.40
699-43-41E	3/19/90	H000GQG7				20.30
699-43-41E	5/01/90	H000GR43				15.80
699-43-41E	5/15/90	H000DGF9	29300.00			
699-43-41E	5/15/90	H000DGG2	30000.00			
699-43-41E	5/15/90	H000GRG8				15.40

Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
699-43-41E	2/07/91	H000GSW6				16.10
699-43-41E	4/18/91	H000GT38				15.60
699-43-41E	6/28/91	H0007203				16.20
699-43-41E	9/11/91	B00LG3				16.80
699-43-41E	1/23/92	B01QC3				16.20
699-43-41E	6/24/92	B06ZV3				16.90
699-43-41E	10/20/92	B07JQ1				15.30
699-43-41E	1/25/93	B07V09				15.30
699-43-41E	4/22/93	B08GN4				15.90
699-43-41F	12/05/89	H000DGG8	25800.00			
699-43-41F	12/05/89	H000GPM3				15.60
699-43-41F	1/25/90	H000DGH2	26500.00			
699-43-41F	1/25/90	H000GPZ7				15.40
699-43-41F	4/18/90	H000DGH6	26000.00			
699-43-41F	4/18/90	H000GQW0				15.40
699-43-41F	5/01/90	H000GR44				15.20
699-43-41F	2/07/91	H000GSW7				16.10
699-43-41F	4/18/91	H000GT37				16.00
699-43-41F	7/02/91	H00071Y5				17.70
699-43-41F	9/11/91	B00LG4				16.20
699-43-41F	5/05/92	B065R0				16.00
699-43-41F	6/25/92	B06ZW7				16.00
699-43-41F	10/21/92	B07JQ5				15.40
699-43-41F	1/22/93	B07V14				14.70
699-43-41F	1/22/93	B07V15				14.70
699-43-41F	1/22/93	B07V16				14.70
699-43-41F	1/22/93	B07V17				14.70
699-43-41G	1/23/92	B01T74				16.50
699-43-41G	6/26/92	B07007				16.30
699-43-41G	10/28/92	B07JL8				15.60
699-43-41G	1/25/93	B07V74				15.80
699-43-41G	4/27/93	B08GJ0				15.70
699-43-42J	11/22/88	H000DGP2	11300.00			
699-43-42J	11/22/88	H000GMQ5				15.00
699-43-42J	2/24/89	H000DGP6	12600.00			
699-43-42J	2/24/89	H000G2Z8				15.00
699-43-42J	6/15/89	H000DGQ0	13900.00			
699-43-42J	6/15/89	H000GKS6				16.00
699-43-42J	8/09/89	H000DGQ4	12800.00			
699-43-42J	8/09/89	H000DGQ7	12800.00			
699-43-42J	8/09/89	H000GNJ8				16.50
699-43-42J	1/02/90	H000GPS1				15.90
699-43-42J	1/31/90	H000DGQ9	20300.00			

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Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
699-43-42J	1/31/90	H000GPZ3				15.10
699-43-42J	7/02/91	H00071Y6				17.40
699-43-42J	1/31/92	B01S49				16.00
699-43-42J	2/25/92	B05Y96				14.90
699-43-42J	6/25/92	B07012				15.60
699-43-42J	10/22/92	B07JQ9				15.80
699-43-42J	12/28/92	B07TH0				15.20
699-43-42J	12/28/92	B07TH1				15.20
699-43-42J	12/28/92	B07TH2				15.00
699-43-42J	12/28/92	B07TH3				15.00
699-43-42J	1/21/93	B07V19				15.20
699-43-43	11/21/88	H000DGR3	9300.00			
699-43-43	11/21/88	H000GMQ3				18.00
699-43-43	2/24/89	H000DGR7	11000.00			
699-43-43	2/24/89	H000DGS0	11000.00			
699-43-43	2/24/89	H000G300				18.00
699-43-43	6/15/89	H000DGS1	12100.00			
699-43-43	6/15/89	H000GKS7				16.40
699-43-43	8/09/89	H000DGS5	10600.00			
699-43-43	8/09/89	H000GNJ9				17.00
699-43-43	1/26/90	H000DGS9	10400.00			
699-43-43	1/26/90	H000GQ09				17.00
699-43-43	4/26/90	H000GR45				16.00
699-43-43	7/08/91	H00071Y7				17.10
699-43-43	1/24/92	B01Q67				16.60
699-43-43	6/26/92	B070W0				16.20
699-43-43	10/26/92	B07JG5				15.60
699-43-43	1/13/93	B07V24				14.00
699-43-43	1/13/93	B07V25				14.00
699-43-43	1/13/93	B07V26				14.00
699-43-43	1/13/93	B07V27				14.00
699-43-45	12/06/89	H000DGT4	14500.00			
699-43-45	12/06/89	H000GPL9				19.10
699-43-45	1/26/90	H000DGT8	14900.00			
699-43-45	1/26/90	H000GQ12				19.10
699-43-45	4/18/90	H000DGV2	14300.00			
699-43-45	4/18/90	H000GQW1				19.40
699-43-45	4/29/90	H000GR48				19.40
699-43-45	7/08/91	H00071Y8				19.20
699-43-45	9/11/91	B00LG5				18.90
699-43-45	1/24/92	B01QD0				18.80
699-43-45	6/26/92	B06ZT2				18.70
699-43-45	10/26/92	B07JG7				18.10

Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
699-43-45	1/13/93	B07V29				16.00
699-43-45	1/13/93	B07V30				16.00
699-43-45	1/13/93	B07V31				16.00
699-43-45	1/13/93	B07V32				16.00
699-43-45	4/26/93	B08DC0				17.70
699-44-39B	1/08/93	B07WK1				15.20
699-44-39B	4/26/93	B08GJ5				18.30
699-44-39B	4/26/93	B08GJ6				18.30
699-44-39B	4/26/93	B08GJ7				18.30
699-44-39B	4/26/93	B08GJ8				18.30
699-44-42	11/21/88	H000DHK2	12000.00			
699-44-42	11/21/88	H000GMQ2				15.00
699-44-42	2/17/89	H000DHK6	14000.00			
699-44-42	2/17/89	H000G301				14.00
699-44-42	6/15/89	H000DHL0	15700.00			
699-44-42	6/15/89	H000GKS5				15.90
699-44-42	8/08/89	H000DHL4	12700.00			
699-44-42	8/08/89	H000GNJ7				16.50
699-44-42	1/31/90	H000DHL8	12100.00			
699-44-42	1/31/90	H000GQ16				15.70
699-44-42	4/26/90	H000GR46				16.50
699-44-42	7/10/91	H00071Y9				16.70
699-44-42	1/31/92	B01S52				15.10
699-44-42	2/25/92	B05Y97				15.10
699-44-42	6/25/92	B07017				16.00
699-44-42	10/22/92	B07JR9				16.10
699-44-42	1/13/93	B07V34				15.20
699-44-42	1/13/93	B07V35				15.20
699-44-42	1/13/93	B07V36				15.20
699-44-42	1/13/93	B07V37				15.20
699-44-42	4/26/93	B08GP6				15.40
699-44-43B	12/20/89	H000DHM3	29600.00		1.82 U	
699-44-43B	12/20/89	H000DHM6	29700.00		1.86 U	
699-44-43B	12/20/89	H000GPS7				16.50
699-44-43B	1/26/90	H000DHM7	35500.00			
699-44-43B	1/26/90	H000DHN0	35700.00			
699-44-43B	1/26/90	H000GQ13				16.50
699-44-43B	4/18/90	H000DHN1	26500.00			
699-44-43B	4/18/90	H000GQW2				17.20
699-44-43B	4/26/90	H000GR47				17.30
699-44-43B	7/08/91	H00071Z0				17.20
699-44-43B	9/11/91	B00LG6				17.30
699-44-43B	1/23/92	B01Q69				17.60

Well Name	Collection Date	Sample Number	SULFATE 46/ppb ./250000s	TC-99 143/pCi/L ./.	TC-99 77/pCi/L ./.	TMP_C 170/DegC .1/.
699-44-43B	6/26/92	B07022				17.00
699-44-43B	10/22/92	B07JS3				16.80
699-44-43B	1/27/93	B07V44				16.20
699-44-43B	4/26/93	B08GQ0				16.30
699-44-43B	4/26/93	B08GQ1				16.30
699-44-43B	4/26/93	B08GQ2				16.30
699-44-43B	4/26/93	B08GQ3				16.30

Well Name	Collection Date	Sample Number	TETPHNL 30/ppb 10/.	TITAN 35/ppb ./.	TC 127/ppb 2000/.	TDS 65/ppm 10/.
299-E18-1	11/10/88	H0007ZV2			21500.00	
299-E18-1	2/15/89	H0007ZV8		60.00 U	23800.00	
299-E18-1	5/26/89	H0007ZW2		60.00 U		
299-E18-1	8/08/89	H0007ZW6		60.00 U	24200.00	
299-E18-1	10/31/89	H0007ZX0		60.00 U	24600.00	347000.00
299-E18-1	1/24/92	B01Q59	10.00 U			
299-E18-1	6/03/92	B06PH8	10.00 U			
299-E18-1	12/16/92	B07SN0	10.00 U			
299-E32-4	9/27/88	H0008ZB8			26600.00	
299-E32-4	12/28/88	H0008ZC2			24900.00	
299-E32-4	3/01/89	H0008ZC6		60.00 U	25900.00	
299-E32-4	3/13/89	H0008ZD0		60.00 U		
299-E32-4	6/16/89	H0008ZD4		60.00 U	28000.00	
299-E32-4	7/19/89	H0008ZD8		60.00 U		
299-E32-4	9/08/89	H0008ZF6		60.00 U	29000.00	
299-E32-4	1/17/90	H0008ZG0		60.00 U	29700.00	
299-E32-4	5/09/90	H0008ZG9			28700.00	
299-E32-4	1/15/92	B01QK6	10.00 U		27000.00	
299-E32-4	4/06/92	B06696	10.00 U		34000.00	
299-E32-4	7/14/92	B07173	10.00 U		32000.00	
699-40-39	12/05/89	H000DBX2		60.00 U	36500.00	183000.00
699-40-39	1/25/90	H000DBX6		60.00 U	34600.00	
699-40-39	4/25/90	H000DBY0		60.00 U	34800.00	
699-40-39	1/31/92	B01Q65	10.00 U			
699-40-39	4/17/92	B065P2	10.00 UD			
699-40-39	6/24/92	B06ZT7	10.00 U			
699-40-39	1/14/93	B07TX4	10.00 U			
699-40-40A	1/24/92	B01T62	10.00 U			
699-40-40A	4/22/92	B065Q8	10.00 U			

Well Name	Collection Date	Sample Number	TETPHNL 30/ppb 10/.	TITAN 35/ppb ./.	TC 127/ppb 2000/.	TDS 65/ppm 10/.
699-40-40A	6/25/92	B06ZV2	10.00 U			
699-40-40A	10/21/92	B07JK3	10.00 U			
699-40-40A	1/26/93	B07V49	10.00 U			
699-40-40B	1/24/92	B01T64	10.00			
699-40-40B	4/22/92	B065S0	10.00 U			
699-40-40B	6/29/92	B06ZW2	10.00 UD			
699-40-40B	10/21/92	B07JK8	10.00 U			
699-40-40B	1/26/93	B07V54	10.00 U			
699-41-40	12/05/89	H000DD44		60.00 U	31400.00	216000.00
699-41-40	1/25/90	H000DD48		60.00 U	30000.00	
699-41-40	4/19/90	H000DD52		60.00 U	30100.00	
699-41-40	1/31/92	B01QC8	10.00 U			
699-41-40	4/28/92	B065S5	10.00 UD			
699-41-40	4/28/92	B065S6	10.00 UD			
699-41-40	6/24/92	B06ZX2	10.00 U			
699-41-40	1/14/93	B07TX9	10.00 U			
699-41-42	1/08/93	B07V59	10.00 U			
699-42-39A	1/23/92	B01T66	10.00 UP			
699-42-39A	4/17/92	B065T1	10.00 UPD			
699-42-39A	6/25/92	B06ZX7	10.00 UP			
699-42-39A	10/21/92	B07JL3	10.00 UP			
699-42-39A	1/27/93	B07V64	10.00 UP			
699-42-39B	1/23/92	B01T68	D			
699-42-39B	4/17/92	B065T6	10.00 UD			
699-42-39B	6/25/92	B06ZY2	10.00 U			
699-42-39B	10/28/92	B07JJ2	10.00 U			
699-42-39B	10/28/92	B07JJ3	10.00 U			
699-42-39B	1/25/93	B07V69	10.00 U			
699-42-40A	8/05/86	H000DF33			11500.00	
699-42-40A	1/08/88	H000DF55			16400.00	
699-42-40A	2/15/89	H000DF65		60.00 U	17700.00	
699-42-40A	5/31/89	H000DF70		60.00 U	18100.00	
699-42-40A	8/10/89	H000DF74		60.00 U	15300.00	
699-42-40A	1/26/90	H000DF78		60.00 U	18400.00	
699-42-40A	1/23/92	B01Q61	10.00 U			
699-42-40A	6/25/92	B06ZY7	10.00 U			
699-42-41	1/24/92	B01T70	10.00 UP			
699-42-41	4/17/92	B065V1	10.00 UPD			
699-42-41	6/29/92	B06ZZ2	10.00 UPD			
699-42-41	1/25/93	B07TZ4	10.00 UP			
699-42-42B	2/24/89	H000DFT7		60.00 U	23100.00	
699-42-42B	6/16/89	H000DFV1		60.00 U	23200.00	
699-42-42B	6/16/89	H000DFV4		60.00 U	23200.00	

Well Name	Collection Date	Sample Number	TETPHNL 30/ppb 10/.	TITAN 35/ppb ./.	TC 127/ppb 2000/.	TDS 65/ppm 10/.
699-42-42B	8/09/89	H000DFV5		60.00 U	24200.00	
699-42-42B	1/26/90	H000DFW0			23900.00	
699-42-42B	1/24/92	B01Q63	10.00 U			
699-42-42B	6/24/92	B06ZZ7	10.00 U			
699-42-42B	1/21/93	B07TZ9	10.00 U			
699-43-40	1/31/92	B01T72	10.00 UP			
699-43-40	4/28/92	B065V6	10.00 UPD			
699-43-40	6/26/92	B07002	10.00 UPD			
699-43-40	1/25/93	B07V04	10.00 UP			
699-43-41E	12/05/89	H000DGD6		60.00 U	26200.00	190000.00
699-43-41E	1/25/90	H000DGF0		60.00 U	25600.00	
699-43-41E	5/15/90	H000DGF9			28700.00	
699-43-41E	1/23/92	B01QC3	10.00 U			
699-43-41E	4/17/92	B065P4	10.00 UD			
699-43-41E	6/24/92	B06ZV3	10.00 U			
699-43-41E	1/25/93	B07V09	10.00 U			
699-43-41F	12/05/89	H000DGG8		60.00 U	26000.00	181000.00
699-43-41F	1/25/90	H000DGH2		60.00 U	25100.00	
699-43-41F	4/18/90	H000DGH6		135.00	26100.00	
699-43-41F	5/05/92	B065R0	10.00 UD			
699-43-41F	6/25/92	B06ZW7	10.00 U			
699-43-41F	1/22/93	B07V14	10.00 U			
699-43-41G	1/23/92	B01T74	10.00 U			
699-43-41G	4/17/92	B065W1	10.00 UD			
699-43-41G	6/26/92	B07007	10.00 UD			
699-43-41G	10/28/92	B07JL8	10.00 U			
699-43-41G	1/25/93	B07V74	10.00 U			
699-43-42J	2/24/89	H000DGP6		60.00 U	23900.00	
699-43-42J	6/15/89	H000DGQ0		60.00 U	25000.00	
699-43-42J	8/09/89	H000DGQ4		60.00 U	23600.00	
699-43-42J	8/09/89	H000DGQ7		60.00 U	23600.00	
699-43-42J	1/31/90	H000DGQ9			26200.00	
699-43-42J	1/31/92	B01S49	10.00 U		30000.00	190.00
699-43-42J	1/31/92	B01S50	10.00 U			
699-43-42J	6/25/92	B07012	10.00 U			
699-43-42J	1/21/93	B07V19	10.00 U			
699-43-43	2/24/89	H000DGR7		60.00 U	20500.00	
699-43-43	2/24/89	H000DGS0		60.00 U	20500.00	
699-43-43	6/15/89	H000DGS1		60.00 U	23100.00	
699-43-43	8/09/89	H000DGS5		60.00 U	23600.00	
699-43-43	1/26/90	H000DGS9		60.00 U	22300.00	
699-43-43	1/24/92	B01Q67	10.00 U			
699-43-43	4/22/92	B065N6	10.00 U			

Well Name	Collection Date	Sample Number	TETPHNL 30/ppb 10/.	TITAN 35/ppb ./.	TC 127/ppb 2000/.	TDS 65/ppm 10/.
699-43-43	6/26/92	B070W0	10.00 UD			
699-43-43	10/26/92	B07JG5	10.00 U			
699-43-43	1/13/93	B07V24	10.00 U			
699-43-45	12/06/89	H000DGT4		60.00 U	25400.00	144000.00
699-43-45	1/26/90	H000DGT8		60.00 U	23400.00	
699-43-45	4/18/90	H000DGV2		60.00 U	23600.00	
699-43-45	1/24/92	B01QD0	10.00 U			
699-43-45	4/22/92	B065N8	10.00 U			
699-43-45	6/26/92	B070W2	10.00 UD			
699-43-45	10/26/92	B07JG7	10.00 U			
699-43-45	1/13/93	B07V29	10.00 U			
699-44-39B	1/08/93	B07WK1	10.00 U			
699-44-42	2/17/89	H000DHK6		60.00 U	22700.00	
699-44-42	6/15/89	H000DHL0		60.00 U	22800.00	
699-44-42	8/08/89	H000DHL4		60.00 U	22900.00	
699-44-42	1/31/90	H000DHL8		60.00 U	23200.00	
699-44-42	1/31/92	B01S52	10.00 U		22000.00	150.00
699-44-42	1/31/92	B01S53	10.00 U			
699-44-42	6/25/92	B07017	10.00 U			
699-44-42	1/13/93	B07V34	10.00 U			
699-44-42	1/13/93	B07V35	10.00 U			
699-44-43B	12/20/89	H000DHM3		60.00 U	26300.00	192000.00
699-44-43B	12/20/89	H000DHM6		60.00 U		
699-44-43B	1/26/90	H000DHM7		60.00 U	25100.00	
699-44-43B	1/26/90	H000DHN0		60.00 U		
699-44-43B	4/18/90	H000DHN1		61.00	24700.00	
699-44-43B	1/23/92	B01Q69	10.00 U			
699-44-43B	4/20/92	B065W9	10.00 U			
699-44-43B	6/26/92	B07022	10.00 UD			
699-44-43B	6/26/92	B07023	10.00 UD			
699-44-43B	1/27/93	B07V44	10.00 U			

Well Name	Collection Date	Sample Number	TRITIUM 142/pCi/L ./20000	TRITIUM 77/pCi/L ./20000	TURBID 126/NTU .1/1	TURBID 76/NTU ./.
299-E18-1	11/10/88	H0007ZV2		-287.00 U		
299-E18-1	2/15/89	H0007ZV8		-55.70 U		1.40
299-E18-1	5/26/89	H0007ZW2		-93.90 U		19.50
299-E18-1	5/26/89	H0007ZW5				19.20
299-E18-1	8/08/89	H0007ZW6		-.96 U		3.00

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Well Name	Collection Date	Sample Number	TRITIUM 142/pCi/L ./20000	TRITIUM 77/pCi/L ./20000	TURBID 126/NTU .1/1	TURBID 76/NTU ./.
299-E18-1	10/31/89	H0007ZX0		86.30 U		11.00
299-E18-1	5/30/90	H0007ZX5				3.50
299-E18-1	7/09/91	H00072Q7	25300.00			
299-E18-1	9/06/91	B00LB6	-150.00 U			
299-E18-1	1/24/92	B01Q59	58.20 U			
299-E18-1	6/03/92	B06PH8	108.00 U		.80	
299-E18-1	12/16/92	B07S32			1.80	
299-E18-1	12/16/92	B07SN0	483.00			
299-E32-4	9/27/88	H0008ZB8		1850.00		
299-E32-4	12/28/88	H0008ZC2		1890.00		
299-E32-4	3/01/89	H0008ZC6		5650.00		.95
299-E32-4	3/13/89	H0008ZD0		5590.00		
299-E32-4	6/16/89	H0008ZD4		24700.00		4.00
299-E32-4	7/19/89	H0008ZD8		41700.00		
299-E32-4	9/08/89	H0008ZF6		320.00		4.40
299-E32-4	1/17/90	H0008ZG0		21500.00		9.60
299-E32-4	5/09/90	H0008ZG9				8.80
299-E32-4	8/05/91	H0007264	7490.00			
299-E32-4	9/23/91	B00LK5	6030.00			
299-E32-4	1/15/92	B01QK6	1300.00		.70	
299-E32-4	4/06/92	B06696	1510.00		1.10	
299-E32-4	4/09/92	B065B6	1030.00			
299-E32-4	7/14/92	B07173	959.00		1.60	
699-40-36	12/21/92	B07TB1	26.80 U			
699-40-36	2/22/93	B08717	-86.50 U			
699-40-39	12/05/89	H000DBX2		57700.00		10.50
699-40-39	1/25/90	H000DBX6		334.00		3.40
699-40-39	4/25/90	H000DBY0		20.20 U		1.10
699-40-39	4/15/91	H0007335	226000.00 F			
699-40-39	7/08/91	H00071Y4	-51.60 U		4.50	
699-40-39	9/11/91	B00LG1	457.00 F			
699-40-39	1/31/92	B01Q65	36.10 U		4.40	
699-40-39	4/17/92	B065P2	-139.00 U		2.20	
699-40-39	6/24/92	B06ZT7	-6.72 U		3.90	
699-40-39	1/14/93	B07TX4	45.20 U		.90	
699-40-40A	1/24/92	B01T62	739.00		36.00	
699-40-40A	4/22/92	B065Q8	1150.00		2.50	
699-40-40A	6/25/92	B06ZV2	791.00		2.80	
699-40-40A	10/21/92	B07JK3	635.00		1.50	
699-40-40A	1/26/93	B07V49	643.00		D	
699-40-40B	1/24/92	B01T64	91.40 U		60.00	
699-40-40B	4/22/92	B065S0	7230.00		1.60	
699-40-40B	6/29/92	B06ZW2	16.30 U		3.50	

Well Name	Collection Date	Sample Number	TRITIUM 142/pCi/L ./20000	TRITIUM 77/pCi/L ./20000	TURBID 126/NTU .1/1	TURBID 76/NTU ./.
699-40-40B	10/21/92	B07JK8	255.00		2.30	
699-40-40B	1/26/93	B07V54	-35.60 U		1.80	
699-41-35	12/21/92	B07TB9	-15.70 U			
699-41-35	2/22/93	B08707	-63.40 U			
699-41-40	12/05/89	H000DD44		232000.00		4.40
699-41-40	1/25/90	H000DD48		17.30 U		6.60
699-41-40	4/19/90	H000DD52		226000.00		1.90
699-41-40	4/15/91	H0007336	213000.00 F			
699-41-40	7/10/91	H00071Y1	189000.00		2.40	
699-41-40	9/11/91	B00LG2	181000.00			
699-41-40	1/31/92	B01QC8	186000.00		3.10	
699-41-40	4/28/92	B065S5	182000.00		.70 Q	
699-41-40	4/28/92	B065S6	181000.00		.50 Q	
699-41-40	6/24/92	B06ZX2	178000.00		2.60	
699-41-40	1/14/93	B07TX9	169000.00		2.10	
699-41-42	1/08/93	B07V59	24900.00		2.10	
699-42-37	12/22/92	B07TC4	186.00 U			
699-42-37	2/23/93	B08712	-18.20 U			
699-42-39A	1/23/92	B01T66	98800.00 P		3.10 P	
699-42-39A	4/17/92	B065T1	87400.00 P		66.00 P	
699-42-39A	6/25/92	B06ZX7	108000.00 P		6.70 P	
699-42-39A	10/21/92	B07JL3	103000.00 P		12.00 P	
699-42-39A	1/27/93	B07V64	97300.00 P		1.70 P	
699-42-39B	1/23/92	B01T68	121000.00		9.10	
699-42-39B	4/17/92	B065T6	99100.00		12.00	
699-42-39B	6/25/92	B06ZY2	126000.00		4.10	
699-42-39B	10/28/92	B07JJ2	111000.00		.90	
699-42-39B	10/28/92	B07JJ3	111000.00		1.00	
699-42-39B	1/25/93	B07V69	108000.00		.70	
699-42-40A	2/03/83	H000DDX8		224000.00		
699-42-40A	2/28/83	H000DDX9		222000.00		
699-42-40A	3/28/83	H000DDY0		224000.00		
699-42-40A	4/14/83	H000DDY2		214000.00		
699-42-40A	5/12/83	H000DDY3		195000.00		
699-42-40A	6/16/83	H000DDY4		212000.00		
699-42-40A	7/14/83	H000DDY5		190000.00		
699-42-40A	8/19/83	H000DDY6		207000.00		
699-42-40A	9/27/83	H000DDY7		200000.00		
699-42-40A	10/12/83	H000DDY8		208000.00		
699-42-40A	11/07/83	H000DDY9		69600.00		
699-42-40A	12/09/83	H000DDZ0		9490.00		
699-42-40A	1/24/84	H000DDZ1		19600.00		
699-42-40A	2/28/84	H000DDZ2		13800.00		

Well Name	Collection Date	Sample Number	TRITIUM 142/pCi/L ./20000	TRITIUM 77/pCi/L ./20000	TURBID 126/NTU .1/1	TURBID 76/NTU ./.
699-42-40A	4/10/84	H000DDZ3		5990.00		
699-42-40A	4/26/84	H000DDZ4		3030.00		
699-42-40A	5/15/84	H000DDZ5		5350.00		
699-42-40A	6/05/84	H000DDZ6		21200.00		
699-42-40A	7/19/84	H000DDZ7		371.00		
699-42-40A	8/10/84	H000DDZ8		9790.00		
699-42-40A	9/11/84	H000DDZ9		822.00		
699-42-40A	10/09/84	H000DF00		11400.00		
699-42-40A	11/13/84	H000DF01		1190.00		
699-42-40A	12/12/84	H000DF02		1180.00		
699-42-40A	1/16/85	H000DF03		1410.00		
699-42-40A	2/11/85	H000DF04		13200.00		
699-42-40A	3/14/85	H000DF05		3630.00		
699-42-40A	4/04/85	H000DF06		1870.00		
699-42-40A	5/03/85	H000DF07		1040.00		
699-42-40A	6/11/85	H000DF08		1080.00 U		
699-42-40A	7/11/85	H000DF10		391.00 U		
699-42-40A	8/22/85	H000DF15		273.00 U		
699-42-40A	10/07/85	H000DF16		2210.00		
699-42-40A	11/02/85	H000DF17		1600.00		
699-42-40A	11/06/85	H000DF18		2380.00		
699-42-40A	12/14/85	H000DF20		376.00 U		
699-42-40A	1/09/86	H000DF21		1210.00 U		
699-42-40A	2/07/86	H000DF23		1270.00 U		
699-42-40A	3/07/86	H000DF24		-57.30 U		
699-42-40A	4/11/86	H000DF25		619.00 U		
699-42-40A	5/06/86	H000DF26		416.00		
699-42-40A	6/06/86	H000DF31		4650.00		
699-42-40A	7/02/86	H000DF32		627.00 U		
699-42-40A	8/05/86	H000DF37		53.80 U		
699-42-40A	9/05/86	H000DF38		-1120.00 U		
699-42-40A	10/24/86	H000DF39		-61.10 U		
699-42-40A	11/04/86	H000DF40		424.00 U		
699-42-40A	12/10/86	H000DF41		151.00 U		
699-42-40A	1/15/87	H000DF42		590.00		
699-42-40A	2/13/87	H000DF43		239.00 U		
699-42-40A	3/07/87	H000DF44		389.00		
699-42-40A	4/06/87	H000DF46		240.00 U		
699-42-40A	5/08/87	H000DF47		306.00		
699-42-40A	6/04/87	H000DF48		185.00 U		
699-42-40A	7/09/87	H000DF49		466.00		
699-42-40A	8/11/87	H000DF50		544.00		
699-42-40A	9/09/87	H000DF51		700.00		

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Well Name	Collection Date	Sample Number	TRITIUM 142/pCi/L ./20000	TRITIUM 77/pCi/L ./20000	TURBID 126/NTU .1/1	TURBID 76/NTU ./.
699-42-40A	10/06/87	H000DF52		3.37 U		
699-42-40A	11/04/87	H000DF53		20.40 U		
699-42-40A	12/01/87	H000DF54		147.00 U		
699-42-40A	1/08/88	H000DF56		216.00 U		
699-42-40A	5/23/88	H000DF57		426.00		
699-42-40A	7/19/88	H000DF58		110.00 U		
699-42-40A	11/15/88	H000DF59		-209.00 U		
699-42-40A	11/22/88	H000DF60		-371.00 U		.40
699-42-40A	2/06/89	H000DF64		237.00 U		
699-42-40A	2/15/89	H000DF65		-25.40 U		.25
699-42-40A	4/07/89	H000DF69		180.00 U		
699-42-40A	5/31/89	H000DF70		-93.80 U		.40
699-42-40A	8/10/89	H000DF74		23.90 U		3.20
699-42-40A	1/26/90	H000DF78		-44.20 U		.60
699-42-40A	7/08/91	H00071Y2	1740.00		.50	
699-42-40A	1/23/92	B01Q61	17.60 U			
699-42-40A	6/25/92	B06ZY7	211.00 U		41.00	
699-42-41	1/24/92	B01T70	170.00 UP		4.10 P	
699-42-41	4/17/92	B065V1	237.00 P		1.90 P	
699-42-41	6/29/92	B06ZZ2	86.30 UP		6.60 P	
699-42-41	1/25/93	B07TZ4	-30.50 UP		.20 P	
699-42-42B	11/22/88	H000DFT3		77800.00		2.00
699-42-42B	2/24/89	H000DFT7		72800.00		.70
699-42-42B	6/16/89	H000DFV1		73700.00		1.30
699-42-42B	6/16/89	H000DFV4		73200.00		
699-42-42B	8/09/89	H000DFV5		79500.00		1.00
699-42-42B	1/26/90	H000DFW0				2.50
699-42-42B	7/08/91	H00071Y3	74600.00		1.30	
699-42-42B	1/24/92	B01Q63	63800.00			
699-42-42B	6/24/92	B06ZZ7	56100.00		.30	
699-42-42B	1/21/93	B07TZ9	50800.00		.30	
699-43-40	1/31/92	B01T72	66300.00 P		5.30 P	
699-43-40	4/28/92	B065V6	62800.00 P		1.40 P	
699-43-40	6/26/92	B07002	62100.00 P		1.50 P	
699-43-40	1/25/93	B07V04	61100.00 P		.60 P	
699-43-41E	12/05/89	H000DGD6		95400.00		2.40
699-43-41E	1/25/90	H000DGF0		64.40 U		2.40
699-43-41E	5/15/90	H000DGF9				4.10
699-43-41E	4/18/91	H0007337	100000.00 F			
699-43-41E	6/28/91	H0007203	83600.00		5.50	
699-43-41E	6/28/91	H0007204	83700.00		5.20	
699-43-41E	1/23/92	B01QC3	86700.00		2.80	
699-43-41E	4/17/92	B065P4	71100.00		.80	

Well Name	Collection Date	Sample Number	TRITIUM 142/pCi/L ./20000	TRITIUM 77/pCi/L ./20000	TURBID 126/NTU .1/1	TURBID 76/NTU ./.
699-43-41E	6/24/92	B06ZV3	78500.00		.90	
699-43-41E	1/25/93	B07V09	78100.00		.40	
699-43-41F	12/05/89	H000DGG8		31.90 U		27.00
699-43-41F	1/25/90	H000DGH2		-65.30 U		6.80
699-43-41F	4/18/90	H000DGH6		58500.00		10.70
699-43-41F	4/18/91	H0007338	60400.00 F			
699-43-41F	7/02/91	H00071Y5	51200.00 F		1.40	
699-43-41F	5/05/92	B065R0	52900.00		2.20	
699-43-41F	6/25/92	B06ZW7	53500.00		7.10	
699-43-41F	1/22/93	B07V14	52600.00		.80	
699-43-41G	1/23/92	B01T74	72300.00		28.00	
699-43-41G	4/17/92	B065W1	70000.00		13.00	
699-43-41G	6/26/92	B07007	71100.00		4.10	
699-43-41G	10/28/92	B07JL8	67500.00		.40	
699-43-41G	1/25/93	B07V74	62600.00		.30	
699-43-42J	11/22/88	H000DGP2		1200.00		1.10
699-43-42J	2/24/89	H000DGP6		2620.00		1.50
699-43-42J	6/15/89	H000DGQ0		1790.00		1.00
699-43-42J	8/09/89	H000DGQ4		1080.00		.80
699-43-42J	8/09/89	H000DGQ7		1160.00		
699-43-42J	1/31/90	H000DGQ9		13000.00		2.00
699-43-42J	7/02/91	H00071Y6	7370.00		.70	
699-43-42J	1/31/92	B01S49	12900.00		.70	
699-43-42J	6/25/92	B07012	13500.00		1.00	
699-43-42J	1/21/93	B07V19	11200.00			
699-43-43	11/21/88	H000DGR3		539.00		.80
699-43-43	2/24/89	H000DGR7		338.00		.50
699-43-43	2/24/89	H000DGS0		432.00		
699-43-43	6/15/89	H000DGS1		283.00		.30
699-43-43	8/09/89	H000DGS5		287.00		.40
699-43-43	1/26/90	H000DGS9		349.00		.40
699-43-43	7/08/91	H00071Y7	394.00		.30	
699-43-43	1/24/92	B01Q67	467.00			
699-43-43	1/24/92	B01T83			.20	
699-43-43	4/22/92	B065N6	303.00 U		.20	
699-43-43	6/26/92	B070W0	479.00		.30	
699-43-43	10/26/92	B07JG5	138.00 U		.20	
699-43-43	1/13/93	B07V24	342.00		.20	
699-43-45	12/06/89	H000DGT4		342.00		.80
699-43-45	1/26/90	H000DGT8		392.00		3.80
699-43-45	4/18/90	H000DGV2		506.00		.60
699-43-45	7/08/91	H00071Y8	444.00		1.00	
699-43-45	9/11/91	B00LG5	429.00			

Well Name	Collection Date	Sample Number	TRITIUM 142/pCi/L ./20000	TRITIUM 77/pCi/L ./20000	TURBID 126/NTU .1/1	TURBID 76/NTU ./.
699-43-45	1/24/92	B01QD0	447.00		.70	
699-43-45	4/22/92	B065N8	496.00		.60	
699-43-45	6/26/92	B070W2	576.00		.30	
699-43-45	10/26/92	B07JG7	402.00		.30	
699-43-45	1/13/93	B07V29	589.00		.40	
699-44-39B	1/08/93	B07WK1	1800.00		.50	
699-44-42	11/21/88	H000DHK2		963.00		.90
699-44-42	2/17/89	H000DHK6		1140.00		.40
699-44-42	6/15/89	H000DHL0		346.00		.30
699-44-42	8/08/89	H000DHL4		437.00		.50
699-44-42	1/31/90	H000DHL8		1040.00		.70
699-44-42	7/10/91	H00071Y9	652.00		.50	
699-44-42	1/31/92	B01S52	1080.00		1.30	
699-44-42	6/25/92	B07017	2030.00		1.00	
699-44-42	1/13/93	B07V34	1640.00		.20	
699-44-42	1/13/93	B07V35	1520.00		.20	
699-44-43B	12/20/89	H000DHM3		40100.00		5.00
699-44-43B	12/20/89	H000DHM6		41400.00		
699-44-43B	1/26/90	H000DHM7		45000.00		3.40
699-44-43B	1/26/90	H000DHN0		44000.00		
699-44-43B	4/18/90	H000DHN1		37300.00		5.20
699-44-43B	7/08/91	H00071Z0	32100.00		7.00	
699-44-43B	9/11/91	B00LG6	21900.00			
699-44-43B	1/23/92	B01Q69	25000.00		2.50	
699-44-43B	4/20/92	B065W9	25600.00		1.30	
699-44-43B	6/26/92	B07022	23900.00		.80	
699-44-43B	6/26/92	B07023	23600.00		.90	
699-44-43B	1/27/93	B07V44	22500.00		.20	

Well Name	Collection Date	Sample Number	UNKNOWN 76/ppb ./.	UNKALI 76/ppb ./.	URANIUM 145/ppb ./.	URANIUM 77/pCi/L ./.
299-E18-1	10/31/89	H0007ZX0				4.56
299-E18-1	9/06/91	B00LB6			6.13	
299-E18-1	6/03/92	B06PH8			5.84	
299-E18-1	12/16/92	B07S32			6.78	
299-E32-4	9/27/88	H0008ZB8				7.73
299-E32-4	12/28/88	H0008ZC2		6.00		2.46
299-E32-4	3/01/89	H0008ZC6				4.15
299-E32-4	3/13/89	H0008ZD0				4.27

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Well Name	Collection Date	Sample Number	UNKNOWN 76/ppb ./.	UNKALI 76/ppb ./.	URANIUM 145/ppb ./.	URANIUM 77/pCi/L ./.
299-E32-4	7/19/89	H0008ZD8				9.32
299-E32-4	9/08/89	H0008ZF6				2.19
299-E32-4	1/17/90	H0008ZG0				4.68
299-E32-4	5/09/90	H0008ZG9				5.31
299-E32-4	8/05/91	H0007264			9.43	
299-E32-4	9/23/91	B00LK5			12.20	
299-E32-4	1/15/92	B01QK6			2.77	
299-E32-4	4/06/92	B06696			4.04	
299-E32-4	4/09/92	B065B6			3.09	
299-E32-4	7/14/92	B07173			2.82	
699-40-39	12/05/89	H000DBX2				1.92
699-41-40	12/05/89	H000DD44				2.51
699-42-40A	3/28/83	H000DDY0				1.64
699-42-40A	6/16/83	H000DDY4				2.08
699-42-40A	9/27/83	H000DDY7				.87
699-42-40A	12/09/83	H000DDZ0				12.90
699-42-40A	1/24/84	H000DDZ1				1.31
699-42-40A	4/26/84	H000DDZ4				1.64
699-42-40A	7/19/84	H000DDZ7				1.50
699-42-40A	10/09/84	H000DF00				2.66
699-42-40A	1/16/85	H000DF03				.92
699-42-40A	5/03/85	H000DF07				1.54
699-42-40A	7/11/85	H000DF10				-.27 U
699-42-40A	10/07/85	H000DF16				.78
699-42-40A	1/09/86	H000DF21				.97
699-42-40A	2/07/86	H000DF23				.49
699-42-40A	3/07/86	H000DF24				1.04
699-42-40A	4/11/86	H000DF25				1.08
699-42-40A	7/02/86	H000DF32				.50
699-42-40A	10/24/86	H000DF39				.53
699-42-40A	1/15/87	H000DF42				1.00
699-42-40A	4/06/87	H000DF46				.97
699-42-40A	7/09/87	H000DF49				.39
699-42-40A	10/06/87	H000DF52				.45
699-42-40A	1/08/88	H000DF56				.81
699-42-40A	5/23/88	H000DF57				.83
699-42-40A	7/19/88	H000DF58				.49
699-42-40A	11/15/88	H000DF59				.83
699-42-40A	2/06/89	H000DF64				.97
699-42-40A	2/15/89	H000DF65				.70
699-42-40A	4/07/89	H000DF69				1.02
699-42-42B	2/24/89	H000DFT7				1.36
699-43-41E	12/05/89	H000DGD6	32.00			1.84

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Well Name	Collection Date	Sample Number	UNKNOWN 76/ppb ./.	UNKALI 76/ppb ./.	URANIUM 145/ppb ./.	URANIUM 77/pCi/L ./.
699-43-41F	12/05/89	H000DGG8				2.39
699-43-42J	2/24/89	H000DGP6				1.51
699-43-45	12/06/89	H000DGT4				1.21
699-44-43B	12/20/89	H000DHM3				1.51
699-44-43B	12/20/89	H000DHM6				1.89

Well Name	Collection Date	Sample Number	U-234 77/pCi/L ./.	U-235 77/pCi/L ./.	U-238 77/pCi/L ./.	VANADUM 34/ppb 30/.
299-E18-1	7/09/91	H00071X9				30.00 U
299-E18-1	9/06/91	B00LB6				30.00 U
299-E18-1	1/24/92	B01Q59				30.00 UD
299-E18-1	6/03/92	B06PH8				30.00 U
299-E18-1	12/16/92	B07S32				30.00 U
299-E32-4	8/05/91	H00071Y0				30.00 UD
299-E32-4	8/05/91	H0007264				30.00 UD
299-E32-4	9/23/91	B00LK5				30.00 U
299-E32-4	1/15/92	B01QK6				30.00 U
299-E32-4	4/06/92	B06696				30.00 U
299-E32-4	7/14/92	B07173				30.00 U
699-40-36	12/21/92	B07TB1				30.00 U
699-40-36	2/22/93	B08717				30.00 U
699-40-39	9/11/91	B00LG1				30.00 U
699-40-39	1/31/92	B01Q65				30.00 UD
699-40-39	4/17/92	B065P2				30.00 U
699-40-39	6/24/92	B06ZT7				30.00 U
699-40-39	1/14/93	B07TX4				30.00 U
699-40-40A	1/24/92	B01T62				30.00 UD
699-40-40A	4/22/92	B065Q8				30.00 U
699-40-40A	6/25/92	B06ZV2				30.00 U
699-40-40A	10/21/92	B07JK3				30.00 U
699-40-40A	1/26/93	B07V49				30.00 U
699-40-40B	1/24/92	B01T64				33.00 D
699-40-40B	4/22/92	B065S0				30.00 U
699-40-40B	6/29/92	B06ZW2				30.00 U
699-40-40B	10/21/92	B07JK8				30.00 U
699-40-40B	1/26/93	B07V54				30.00 U
699-41-35	12/21/92	B07TB9				30.00 U
699-41-35	2/22/93	B08707				30.00 U
699-41-40	7/10/91	H00071Y1				30.00 U

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Well Name	Collection Date	Sample Number	U-234 77/pCi/L ./.	U-235 77/pCi/L ./.	U-238 77/pCi/L ./.	VANADUM 34/ppb 30/.
699-41-40	9/11/91	B00LG2				30.00 U
699-41-40	1/31/92	B01QC8				30.00 UD
699-41-40	4/28/92	B065S5				30.00 U
699-41-40	4/28/92	B065S6				30.00 U
699-41-40	6/24/92	B06ZX2				30.00 U
699-41-40	1/14/93	B07TX9				30.00 U
699-41-42	1/08/93	B07V59				30.00 U
699-42-37	12/22/92	B07TC4				30.00 U
699-42-37	2/23/93	B08712				30.00 U
699-42-39A	1/23/92	B01T66				30.00 UP
699-42-39A	4/17/92	B065T1				33.00 P
699-42-39A	6/25/92	B06ZX7				30.00 UP
699-42-39A	10/21/92	B07JL3				30.00 UP
699-42-39A	1/27/93	B07V64				30.00 UP
699-42-39B	1/23/92	B01T68				30.00 U
699-42-39B	4/17/92	B065T6				30.00 U
699-42-39B	6/25/92	B06ZY2				30.00 U
699-42-39B	10/28/92	B07JJ2				30.00 U
699-42-39B	10/28/92	B07JJ3				30.00 U
699-42-39B	1/25/93	B07V69				30.00 U
699-42-40A	1/08/88	H000DF56	.48	.06	.45	
699-42-40A	5/23/88	H000DF57	.47	.01 U	.33	
699-42-40A	7/19/88	H000DF58	.21	.04	.18	
699-42-40A	11/15/88	H000DF59	.28	.01 U	.25	
699-42-40A	2/06/89	H000DF64	.41	-.00 U	.31	
699-42-40A	4/07/89	H000DF69	.38	.00 U	.29	
699-42-40A	7/08/91	H00071Y2				30.00 U
699-42-40A	1/08/92	B07TY8				30.00 U
699-42-40A	1/23/92	B01Q61				68.00
699-42-40A	6/25/92	B06ZY7				30.00 U
699-42-41	1/24/92	B01T70				30.00 UPD
699-42-41	4/17/92	B065V1				30.00 UP
699-42-41	6/29/92	B06ZZ2				30.00 UP
699-42-41	1/25/93	B07TZ4				30.00 UP
699-42-42B	7/08/91	H00071Y3				33.00
699-42-42B	1/24/92	B01Q63				34.00 D
699-42-42B	6/24/92	B06ZZ7				30.00
699-42-42B	1/21/93	B07TZ9				40.00
699-43-40	1/31/92	B01T72				30.00 UPD
699-43-40	4/28/92	B065V6				30.00 UP
699-43-40	6/26/92	B07002				30.00 UP
699-43-40	1/25/93	B07V04				30.00 UP
699-43-41E	6/28/91	H0007203				30.00 UD

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Well Name	Collection Date	Sample Number	U-234 77/pCi/L ./.	U-235 77/pCi/L ./.	U-238 77/pCi/L ./.	VANADUM 34/ppb 30/.
699-43-41E	6/28/91	H0007204				30.00 UD
699-43-41E	1/23/92	B01QC3				41.00
699-43-41E	4/17/92	B065P4				30.00 U
699-43-41E	6/24/92	B06ZV3				30.00 U
699-43-41E	1/25/93	B07V09				30.00 U
699-43-41F	7/02/91	H00071Y5				30.00 UD
699-43-41F	5/05/92	B065R0				30.00 U
699-43-41F	6/25/92	B06ZW7				30.00 U
699-43-41F	1/22/93	B07V14				30.00 U
699-43-41G	1/23/92	B01T74				30.00 U
699-43-41G	4/17/92	B065W1				30.00 U
699-43-41G	6/26/92	B07007				30.00 U
699-43-41G	10/28/92	B07JL8				30.00 U
699-43-41G	1/25/93	B07V74				30.00 U
699-43-42J	7/02/91	H00071Y6				65.00 D
699-43-42J	1/31/92	B01S49				65.00 D
699-43-42J	6/25/92	B07012				70.00
699-43-42J	1/21/93	B07V19				60.00
699-43-43	7/08/91	H00071Y7				33.00
699-43-43	1/24/92	B01Q67				39.00 D
699-43-43	4/22/92	B065N6				39.00
699-43-43	6/26/92	B070W0				38.00 D
699-43-43	10/26/92	B07JG5				40.00
699-43-43	1/13/93	B07V24				50.00
699-43-45	7/08/91	H00071Y8				33.00
699-43-45	9/11/91	B00LG5				31.00
699-43-45	1/24/92	B01QD0				39.00 D
699-43-45	4/22/92	B065N8				30.00 U
699-43-45	6/26/92	B070W2				34.00 D
699-43-45	10/26/92	B07JG7				30.00
699-43-45	1/13/93	B07V29				40.00
699-44-39B	1/08/93	B07WK1				30.00 U
699-44-42	7/10/91	H00071Y9				56.00
699-44-42	1/31/92	B01S52				46.00 D
699-44-42	6/25/92	B07017				45.00
699-44-42	1/13/93	B07V34				30.00 Q
699-44-42	1/13/93	B07V35				40.00 Q
699-44-43B	7/08/91	H00071Z0				37.00
699-44-43B	9/11/91	B00LG6				33.00
699-44-43B	1/23/92	B01Q69				30.00 U
699-44-43B	4/20/92	B065W9				39.00
699-44-43B	6/26/92	B07022				38.00
699-44-43B	6/26/92	B07023				35.00

Well Name	Collection Date	Sample Number	U-234 77/pCi/L ./.	U-235 77/pCi/L ./.	U-238 77/pCi/L ./.	VANADUM 34/ppb 30/.
699-44-43B	1/27/93	B07V44				40.00

Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
299-E18-1	8/16/88	H0007ZT7	5.00 U			181.00
299-E18-1	8/16/88	H0007ZT7		5.00 U		
299-E18-1	9/22/88	H0007ZV1	5.00			73.00
299-E18-1	9/22/88	H0007ZV1		5.00 U		
299-E18-1	11/10/88	H0007ZV2	6.00			79.00
299-E18-1	11/10/88	H0007ZV2		5.00 U		
299-E18-1	11/10/88	H0007ZV5	5.00 U			53.00
299-E18-1	11/10/88	H0007ZV5		5.00 U		
299-E18-1	2/15/89	H0007ZV8	5.00 U			23.00
299-E18-1	2/15/89	H0007ZV8		6.00		
299-E18-1	5/26/89	H0007ZW2	6.00			30.00
299-E18-1	5/26/89	H0007ZW2		14.00		
299-E18-1	8/08/89	H0007ZW6	12.00			22.00
299-E18-1	8/08/89	H0007ZW6		14.00		
299-E18-1	10/31/89	H0007ZX0	9.00			25.00
299-E18-1	10/31/89	H0007ZX0		8.00		
299-E18-1	7/09/91	H00071X9			12.00	
299-E18-1	7/09/91	H00071X9F		30.00 U		
299-E18-1	9/06/91	B00LB6			12.00	
299-E18-1	9/06/91	B00LB6F		30.00 U		
299-E18-1	1/24/92	B01Q59			10.00 UD	
299-E18-1	1/24/92	B01Q60		30.00 UD		
299-E18-1	6/03/92	B06PH8			10.00 U	
299-E18-1	6/03/92	B06PJ2		30.00 U		
299-E18-1	12/16/92	B07S32			10.00 U	
299-E18-1	12/16/92	B07S36		30.00 U		
299-E32-4	9/27/88	H0008ZB8	19.00			6.00
299-E32-4	9/27/88	H0008ZB8		16.00		
299-E32-4	12/28/88	H0008ZC2	19.00			12.00
299-E32-4	12/28/88	H0008ZC2		12.00		
299-E32-4	3/01/89	H0008ZC6	18.00			22.00
299-E32-4	3/01/89	H0008ZC6		17.00		
299-E32-4	3/13/89	H0008ZD0	20.00			9.00
299-E32-4	3/13/89	H0008ZD0		13.00		
299-E32-4	6/16/89	H0008ZD4	17.00			12.00

Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
299-E32-4	6/16/89	H0008ZD4		13.00		
299-E32-4	7/19/89	H0008ZD8	17.00			5.00 U
299-E32-4	7/19/89	H0008ZD8		16.00		
299-E32-4	9/08/89	H0008ZF6	22.00			9.00
299-E32-4	9/08/89	H0008ZF6		18.00		
299-E32-4	1/17/90	H0008ZG0	16.00			13.00
299-E32-4	1/17/90	H0008ZG0		14.00		
299-E32-4	8/05/91	H00071Y0			23.00 D	
299-E32-4	8/05/91	H00071Y0F		30.00 U		
299-E32-4	8/05/91	H0007264			21.00 D	
299-E32-4	8/05/91	H0007264F		30.00 U		
299-E32-4	9/23/91	B00LK5			10.00 U	
299-E32-4	9/23/91	B00LK5F		30.00 U		
299-E32-4	1/15/92	B01QK6			10.00 UQ	
299-E32-4	1/15/92	B01QK8		30.00 U		
299-E32-4	4/06/92	B06696			14.00	
299-E32-4	4/06/92	B06697		30.00 U		
299-E32-4	7/14/92	B07173			10.00 U	
299-E32-4	7/14/92	B07174		30.00 U		
699-40-36	12/21/92	B07TB1			100.00	
699-40-36	12/21/92	B07TB8		30.00 U		
699-40-36	2/22/93	B08717			690.00	
699-40-36	2/22/93	B08721		30.00 U		
699-40-39	12/05/89	H000DBX2	6.00			31.00
699-40-39	12/05/89	H000DBX2		7.00		
699-40-39	1/25/90	H000DBX6	5.00 U			30.00
699-40-39	1/25/90	H000DBX6		5.00 U		
699-40-39	4/25/90	H000DBY0	5.00			18.00
699-40-39	4/25/90	H000DBY0		6.00		
699-40-39	7/08/91	H00071Y4F		30.00 U		
699-40-39	9/11/91	B00LG1			20.00	
699-40-39	9/11/91	B00LG1F		30.00 U		
699-40-39	1/31/92	B01Q65			24.00 D	
699-40-39	1/31/92	B01Q66		30.00 UD		
699-40-39	4/17/92	B065P2			24.00	
699-40-39	4/17/92	B065Q4		30.00 U		
699-40-39	6/24/92	B06ZT7			23.00	
699-40-39	6/24/92	B06ZV1		30.00 U		
699-40-39	1/14/93	B07TX4			10.00 U	
699-40-39	1/14/93	B07TX8		30.00 U		
699-40-40A	1/24/92	B01T62			490.00 D	
699-40-40A	1/24/92	B01T63		30.00 UD		
699-40-40A	4/22/92	B065Q8			23.00	

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Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
699-40-40A	4/22/92	B065R8		30.00 U		
699-40-40A	6/25/92	B06ZV2			28.00	
699-40-40A	6/25/92	B06ZW0		30.00 U		
699-40-40A	10/21/92	B07JK3			20.00	
699-40-40A	10/21/92	B07JK7		30.00 U		
699-40-40A	1/26/93	B07V49			10.00 U	
699-40-40A	1/26/93	B07V53		30.00 U		
699-40-40B	1/01/92	B01T65		30.00 UD		
699-40-40B	1/24/92	B01T64			1000.00 D	
699-40-40B	4/22/92	B065S0			91.00	
699-40-40B	4/22/92	B065S4		30.00 U		
699-40-40B	6/29/92	B06ZW2			240.00	
699-40-40B	6/29/92	B06ZW6		30.00 U		
699-40-40B	10/21/92	B07JK8			380.00	
699-40-40B	10/21/92	B07JL2		30.00 U		
699-40-40B	1/26/93	B07V54			420.00	
699-40-40B	1/26/93	B07V58		30.00 U		
699-41-35	12/21/92	B07TB9			20.00	
699-41-35	12/21/92	B07TC3		30.00 U		
699-41-35	2/22/93	B08707			40.00	
699-41-35	2/22/93	B08711		30.00 U		
699-41-40	12/05/89	H000DD44	8.00			14.00
699-41-40	12/05/89	H000DD44		9.00		
699-41-40	1/25/90	H000DD48	9.00			20.00
699-41-40	1/25/90	H000DD48		10.00		
699-41-40	4/19/90	H000DD52	10.00			15.00
699-41-40	4/19/90	H000DD52		7.00		
699-41-40	7/10/91	H00071Y1			10.00 U	
699-41-40	7/10/91	H00071Y1F		30.00 U		
699-41-40	9/11/91	B00LG2			16.00	
699-41-40	9/11/91	B00LG2F		30.00 U		
699-41-40	1/31/92	B01QC8			10.00 UD	
699-41-40	1/31/92	B01QC9		30.00 UD		
699-41-40	4/28/92	B065S5			10.00 U	
699-41-40	4/28/92	B065S6			10.00 U	
699-41-40	4/28/92	B065S9		30.00 U		
699-41-40	4/28/92	B065T0		30.00 U		
699-41-40	6/24/92	B06ZX2			17.00	
699-41-40	6/24/92	B06ZX6		30.00 U		
699-41-40	1/14/93	B07TX9			10.00 U	
699-41-40	1/14/93	B07TY3		30.00 U		
699-41-42	1/08/93	B07V59			10.00 U	
699-41-42	1/08/93	B07V63		30.00 U		

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Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
699-42-37	12/22/92	B07TC4			60.00	
699-42-37	12/22/92	B07TC8		30.00 U		
699-42-37	2/23/93	B08712			60.00	
699-42-37	2/23/93	B08716		30.00 U		
699-42-39A	1/23/92	B01T66			52.00 P	
699-42-39A	1/23/92	B01T67		30.00 UP		
699-42-39A	4/17/92	B065T1			43.00 P	
699-42-39A	4/17/92	B065T5		30.00 UP		
699-42-39A	6/25/92	B06ZX7			36.00 P	
699-42-39A	6/25/92	B06ZY1		30.00 UP		
699-42-39A	10/21/92	B07JL3			40.00 P	
699-42-39A	10/21/92	B07JL7		30.00 UP		
699-42-39A	1/27/93	B07V64			20.00 P	
699-42-39A	1/27/93	B07V68		30.00 UP		
699-42-39B	1/23/92	B01T68			42.00	
699-42-39B	1/23/92	B01T69		30.00 U		
699-42-39B	4/17/92	B065T6			39.00	
699-42-39B	4/17/92	B065V0		30.00 U		
699-42-39B	6/25/92	B06ZY2			39.00	
699-42-39B	6/25/92	B06ZY6		30.00 U		
699-42-39B	10/28/92	B07JJ2			10.00 Q	
699-42-39B	10/28/92	B07JJ3			40.00 Q	
699-42-39B	10/28/92	B07JJ6		30.00 U		
699-42-39B	10/28/92	B07JJ7		30.00 U		
699-42-39B	1/25/93	B07V69			20.00	
699-42-39B	1/25/93	B07V73		30.00 U		
699-42-40A	8/22/85	H000DF11	23.00			6.00
699-42-40A	5/12/86	H000DF27	10.00			5.00 U
699-42-40A	8/05/86	H000DF33	12.00			6.00
699-42-40A	1/08/88	H000DF55	5.00 U			5.00 U
699-42-40A	1/08/88	H000DF55		5.00		
699-42-40A	11/22/88	H000DF60	5.00 U			5.00
699-42-40A	11/22/88	H000DF60		5.00 U		
699-42-40A	2/15/89	H000DF65	5.00 U			5.00 U
699-42-40A	2/15/89	H000DF65		5.00 U		
699-42-40A	5/31/89	H000DF70	5.00 U			5.00 U
699-42-40A	5/31/89	H000DF70		9.00		
699-42-40A	8/10/89	H000DF74	10.00			10.00
699-42-40A	8/10/89	H000DF74		12.00		
699-42-40A	1/26/90	H000DF78	5.00 U			34.00
699-42-40A	1/26/90	H000DF78		5.00 U		
699-42-40A	7/08/91	H00071Y2			10.00 U	
699-42-40A	7/08/91	H00071Y2F		30.00 U		

Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
699-42-40A	1/08/92	B07TY8			10.00 U	
699-42-40A	1/08/92	B07TZ3		30.00 U		
699-42-40A	1/23/92	B01Q61			18.00	
699-42-40A	1/23/92	B01Q62		30.00 U		
699-42-40A	6/25/92	B06ZY7			11.00	
699-42-40A	6/25/92	B06ZZ1		30.00 U		
699-42-41	1/24/92	B01T70			11.00 PD	
699-42-41	1/24/92	B01T71		30.00 UPD		
699-42-41	4/17/92	B065V1			19.00 P	
699-42-41	4/17/92	B065V5		30.00 UP		
699-42-41	6/29/92	B06ZZ2			10.00 UP	
699-42-41	6/29/92	B06ZZ6		30.00 UP		
699-42-41	1/25/93	B07TZ4			10.00 UP	
699-42-41	1/25/93	B07TZ8		30.00 UP		
699-42-42B	11/22/88	H000DFT3	25.00			109.00
699-42-42B	11/22/88	H000DFT3		27.00		
699-42-42B	2/24/89	H000DFT7	32.00			52.00
699-42-42B	2/24/89	H000DFT7		31.00		
699-42-42B	6/16/89	H000DFV1	29.00			14.00
699-42-42B	6/16/89	H000DFV1		33.00		
699-42-42B	6/16/89	H000DFV4	29.00			15.00
699-42-42B	6/16/89	H000DFV4		38.00		
699-42-42B	8/09/89	H000DFV5	35.00			13.00
699-42-42B	8/09/89	H000DFV5		33.00		
699-42-42B	7/08/91	H00071Y3			10.00 U	
699-42-42B	7/08/91	H00071Y3F		30.00		
699-42-42B	1/24/92	B01Q63			10.00 UD	
699-42-42B	1/24/92	B01Q64		33.00 D		
699-42-42B	6/24/92	B06ZZ7			10.00 U	
699-42-42B	6/24/92	B07001		35.00		
699-42-42B	1/21/93	B07TZ9			10.00 U	
699-42-42B	1/21/93	B07V03		30.00		
699-43-40	1/31/92	B01T72			38.00 PD	
699-43-40	1/31/92	B01T73		30.00 UPD		
699-43-40	4/28/92	B065V6			54.00 P	
699-43-40	4/28/92	B065W0		30.00 UP		
699-43-40	6/26/92	B07002			15.00 P	
699-43-40	6/26/92	B07006		30.00 UP		
699-43-40	1/25/93	B07V04			10.00 UP	
699-43-40	1/25/93	B07V08		30.00 UP		
699-43-41E	12/05/89	H000DGD6	5.00 U			20.00
699-43-41E	12/05/89	H000DGD6		5.00 U		
699-43-41E	1/25/90	H000DGF0	5.00 U			24.00

Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
699-43-41E	1/25/90	H000DGF0		5.00 U		
699-43-41E	6/28/91	H0007203			27.00 QD	
699-43-41E	6/28/91	H0007203F		30.00 U		
699-43-41E	6/28/91	H0007204			42.00 QD	
699-43-41E	6/28/91	H0007204F		30.00 U		
699-43-41E	1/23/92	B01QC3			10.00 U	
699-43-41E	1/23/92	B01QC4		30.00 U		
699-43-41E	4/17/92	B065P4			10.00 U	
699-43-41E	4/17/92	B065Q6		30.00 U		
699-43-41E	6/24/92	B06ZV3			10.00 U	
699-43-41E	6/24/92	B06ZW1		30.00 U		
699-43-41E	1/25/93	B07V09			10.00 U	
699-43-41E	1/25/93	B07V13		30.00 U		
699-43-41F	12/05/89	H000DGG8	12.00			448.00
699-43-41F	12/05/89	H000DGG8		12.00		
699-43-41F	1/25/90	H000DGH2	15.00			64.00
699-43-41F	1/25/90	H000DGH2		13.00		
699-43-41F	4/18/90	H000DGH6	22.00			66.00
699-43-41F	4/18/90	H000DGH6		17.00		
699-43-41F	7/02/91	H00071Y5			22.00 D	
699-43-41F	7/02/91	H00071Y5F		30.00 U		
699-43-41F	5/05/92	B065R0			10.00 U	
699-43-41F	5/05/92	B065R9		30.00 U		
699-43-41F	6/25/92	B06ZW7			30.00	
699-43-41F	6/25/92	B06ZX1		30.00 U		
699-43-41F	1/22/93	B07V14			10.00 U	
699-43-41F	1/22/93	B07V18		30.00 U		
699-43-41G	1/23/92	B01T74			280.00	
699-43-41G	1/23/92	B01T75		30.00 U		
699-43-41G	4/17/92	B065W1			56.00	
699-43-41G	4/17/92	B065W6		30.00 U		
699-43-41G	6/26/92	B07007			20.00	
699-43-41G	6/26/92	B07011		30.00 U		
699-43-41G	10/28/92	B07JL8			10.00 U	
699-43-41G	10/28/92	B07JM2		30.00 U		
699-43-41G	1/25/93	B07V74			10.00 U	
699-43-41G	1/25/93	B07V78		30.00 U		
699-43-42J	11/22/88	H000DGP2	48.00			8.00
699-43-42J	11/22/88	H000DGP2		51.00		
699-43-42J	2/24/89	H000DGP6	54.00			10.00
699-43-42J	2/24/89	H000DGP6		54.00		
699-43-42J	6/15/89	H000DGQ0	60.00			5.00 U
699-43-42J	6/15/89	H000DGQ0		62.00		

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Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
699-43-42J	8/09/89	H000DGQ4	56.00			5.00 U
699-43-42J	8/09/89	H000DGQ4		61.00		
699-43-42J	8/09/89	H000DGQ7	53.00			5.00 U
699-43-42J	8/09/89	H000DGQ7		64.00		
699-43-42J	7/02/91	H00071Y6			10.00 UD	
699-43-42J	7/02/91	H00071Y6F		67.00		
699-43-42J	1/31/92	B01S49			10.00 UD	
699-43-42J	1/31/92	B01S51		69.00 D		
699-43-42J	6/25/92	B07012			13.00	
699-43-42J	6/25/92	B07016		55.00		
699-43-42J	1/21/93	B07V19			10.00 U	
699-43-42J	1/21/93	B07V23		60.00		
699-43-43	11/21/88	H000DGR3	34.00			5.00 U
699-43-43	11/21/88	H000DGR3		33.00		
699-43-43	2/24/89	H000DGR7	37.00			5.00 U
699-43-43	2/24/89	H000DGR7		32.00		
699-43-43	2/24/89	H000DGS0	37.00			7.00
699-43-43	2/24/89	H000DGS0		32.00		
699-43-43	6/15/89	H000DGS1	28.00			5.00 U
699-43-43	6/15/89	H000DGS1		35.00		
699-43-43	8/09/89	H000DGS5	30.00			5.00 U
699-43-43	8/09/89	H000DGS5		40.00		
699-43-43	1/26/90	H000DGS9	33.00			5.00 U
699-43-43	1/26/90	H000DGS9		32.00		
699-43-43	7/08/91	H00071Y7			10.00 U	
699-43-43	7/08/91	H00071Y7F		33.00		
699-43-43	1/24/92	B01Q67			10.00 UD	
699-43-43	1/24/92	B01Q68		43.00 D		
699-43-43	4/22/92	B065N6			10.00 U	
699-43-43	4/22/92	B065N7		36.00		
699-43-43	6/26/92	B070W0			10.00 UD	
699-43-43	6/26/92	B070W1		35.00		
699-43-43	10/26/92	B07JG5			10.00 U	
699-43-43	10/26/92	B07JG6		40.00		
699-43-43	1/13/93	B07V24			10.00 U	
699-43-43	1/13/93	B07V28		40.00		
699-43-45	12/06/89	H000DGT4	38.00			5.00 U
699-43-45	12/06/89	H000DGT4		36.00		
699-43-45	1/26/90	H000DGT8	36.00			12.00
699-43-45	1/26/90	H000DGT8		34.00		
699-43-45	4/18/90	H000DGV2	37.00			5.00 U
699-43-45	4/18/90	H000DGV2		36.00		
699-43-45	7/08/91	H00071Y8			10.00 U	

Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
699-43-45	7/08/91	H00071Y8F		32.00		
699-43-45	9/11/91	B00LG5			14.00	
699-43-45	9/11/91	B00LG5F		41.00		
699-43-45	1/24/92	B01QD0			10.00 UD	
699-43-45	1/24/92	B01QD1		34.00 D		
699-43-45	4/22/92	B065N8			12.00	
699-43-45	4/22/92	B065N9		30.00		
699-43-45	6/26/92	B070W2			10.00 UD	
699-43-45	6/26/92	B070W3		34.00		
699-43-45	10/26/92	B07JG7			10.00 U	
699-43-45	10/26/92	B07JG8		30.00		
699-43-45	1/13/93	B07V29			10.00 U	
699-43-45	1/13/93	B07V33		30.00 U		
699-44-39B	1/08/93	B07WK1			10.00 U	
699-44-39B	1/08/93	B07WK5		30.00 U		
699-44-42	11/21/88	H000DHK2	40.00			5.00 U
699-44-42	11/21/88	H000DHK2		44.00		
699-44-42	2/17/89	H000DHK6	47.00			5.00 U
699-44-42	2/17/89	H000DHK6		47.00		
699-44-42	6/15/89	H000DHL0	50.00			5.00 U
699-44-42	6/15/89	H000DHL0		53.00		
699-44-42	8/08/89	H000DHL4	45.00			5.00 U
699-44-42	8/08/89	H000DHL4		51.00		
699-44-42	1/31/90	H000DHL8	46.00			7.00
699-44-42	1/31/90	H000DHL8		44.00		
699-44-42	7/10/91	H00071Y9			10.00 U	
699-44-42	7/10/91	H00071Y9F		46.00		
699-44-42	1/31/92	B01S52			10.00 UD	
699-44-42	1/31/92	B01S54		42.00 D		
699-44-42	6/25/92	B07017			13.00	
699-44-42	6/25/92	B07021		50.00		
699-44-42	1/13/93	B07V34			10.00 U	
699-44-42	1/13/93	B07V35			10.00 U	
699-44-42	1/13/93	B07V42		50.00		
699-44-42	1/13/93	B07V43		50.00		
699-44-43B	12/20/89	H000DHM3	34.00			29.00
699-44-43B	12/20/89	H000DHM3		36.00		
699-44-43B	12/20/89	H000DHM6	35.00			27.00
699-44-43B	12/20/89	H000DHM6		36.00		
699-44-43B	1/26/90	H000DHM7	35.00			29.00
699-44-43B	1/26/90	H000DHM7		33.00		
699-44-43B	1/26/90	H000DHN0	35.00			29.00
699-44-43B	1/26/90	H000DHN0		33.00		

(sheet ** of **)

Well Name	Collection Date	Sample Number	VANADUM 35/ppb ./.	FVANADI 34/ppb 30/.	ZINC 34/ppb 10/.	ZINC 35/ppb ./.
699-44-43B	4/18/90	H000DHN1	33.00			57.00
699-44-43B	4/18/90	H000DHN1		32.00		
699-44-43B	7/08/91	H00071Z0			13.00	
699-44-43B	7/08/91	H00071Z0F		40.00		
699-44-43B	9/11/91	B00LG6			12.00	
699-44-43B	9/11/91	B00LG6F		30.00 U		
699-44-43B	1/23/92	B01Q69			14.00	
699-44-43B	1/23/92	B01Q70		43.00		
699-44-43B	4/20/92	B065W9			30.00	
699-44-43B	4/20/92	B065X5		33.00		
699-44-43B	6/26/92	B01MT4		34.00		
699-44-43B	6/26/92	B07022			10.00 U	
699-44-43B	6/26/92	B07023			10.00 U	
699-44-43B	6/26/92	B07026		37.00		
699-44-43B	1/27/93	B07V44			20.00	
699-44-43B	1/27/93	B07V48		30.00		

Well Name	Collection Date	Sample Number	FZINC 34/ppb 10/.
299-E18-1	8/16/88	H0007ZT7	145.00
299-E18-1	9/22/88	H0007ZV1	46.00
299-E18-1	11/10/88	H0007ZV2	26.00
299-E18-1	11/10/88	H0007ZV5	41.00
299-E18-1	2/15/89	H0007ZV8	30.00
299-E18-1	5/26/89	H0007ZW2	12.00
299-E18-1	8/08/89	H0007ZW6	19.00
299-E18-1	10/31/89	H0007ZX0	7.00
299-E18-1	7/09/91	H00071X9F	10.00 U
299-E18-1	9/06/91	B00LB6F	10.00 U
299-E18-1	1/24/92	B01Q60	10.00 UD
299-E18-1	6/03/92	B06PJ2	10.00 U
299-E18-1	12/16/92	B07S36	10.00 U
299-E32-4	9/27/88	H0008ZB8	5.00 U
299-E32-4	12/28/88	H0008ZC2	12.00
299-E32-4	3/01/89	H0008ZC6	8.00
299-E32-4	3/13/89	H0008ZD0	5.00 U
299-E32-4	6/16/89	H0008ZD4	5.00 U
299-E32-4	7/19/89	H0008ZD8	5.00 U
299-E32-4	9/08/89	H0008ZF6	9.00

Well Name	Collection Date	Sample Number	FZINC 34/ppb 10/.	
299-E32-4	1/17/90	H0008ZG0	5.00	U
299-E32-4	8/05/91	H00071Y0F	10.00	U
299-E32-4	8/05/91	H0007264F	10.00	U
299-E32-4	9/23/91	B00LK5F	10.00	U
299-E32-4	1/15/92	B01QK8	10.00	UQ
299-E32-4	4/06/92	B06697	10.00	U
299-E32-4	7/14/92	B07174	10.00	U
699-40-36	12/21/92	B07TB8	10.00	
699-40-36	2/22/93	B08721	10.00	U
699-40-39	12/05/89	H000DBX2	6.00	
699-40-39	1/25/90	H000DBX6	18.00	
699-40-39	4/25/90	H000DBY0	11.00	
699-40-39	7/08/91	H00071Y4F	10.00	U
699-40-39	9/11/91	B00LG1F	11.00	
699-40-39	1/31/92	B01Q66	10.00	UD
699-40-39	4/17/92	B065Q4	10.00	U
699-40-39	6/24/92	B06ZV1	10.00	U
699-40-39	1/14/93	B07TX8	10.00	U
699-40-40A	1/24/92	B01T63	29.00	D
699-40-40A	4/22/92	B065R8	14.00	
699-40-40A	6/25/92	B06ZW0	10.00	U
699-40-40A	10/21/92	B07JK7	10.00	U
699-40-40A	1/26/93	B07V53	10.00	U
699-40-40B	1/01/92	B01T65	94.00	D
699-40-40B	4/22/92	B065S4	55.00	
699-40-40B	6/29/92	B06ZW6	10.00	U
699-40-40B	10/21/92	B07JL2	220.00	F
699-40-40B	1/26/93	B07V58	200.00	
699-41-35	12/21/92	B07TC3	10.00	U
699-41-35	2/22/93	B08711	10.00	U
699-41-40	12/05/89	H000DD44	10.00	
699-41-40	1/25/90	H000DD48	8.00	
699-41-40	4/19/90	H000DD52	12.00	
699-41-40	7/10/91	H00071Y1F	10.00	U
699-41-40	9/11/91	B00LG2F	11.00	
699-41-40	1/31/92	B01QC9	10.00	UD
699-41-40	4/28/92	B065S9	10.00	U
699-41-40	4/28/92	B065T0	13.00	
699-41-40	6/24/92	B06ZX6	10.00	U
699-41-40	1/14/93	B07TY3	10.00	U
699-41-42	1/08/93	B07V63	10.00	U
699-42-37	12/22/92	B07TC8	10.00	U
699-42-37	2/23/93	B08716	10.00	U

Well Name	Collection Date	Sample Number	FZINC 34/ppb 10/.
699-42-39A	1/23/92	B01T67	34.00 P
699-42-39A	4/17/92	B065T5	10.00 UP
699-42-39A	6/25/92	B06ZY1	10.00 UP
699-42-39A	10/21/92	B07JL7	10.00 UP
699-42-39A	1/27/93	B07V68	10.00 UP
699-42-39B	1/23/92	B01T69	18.00
699-42-39B	4/17/92	B065V0	16.00
699-42-39B	6/25/92	B06ZY6	10.00 U
699-42-39B	10/28/92	B07JJ6	10.00 U
699-42-39B	10/28/92	B07JJ7	10.00 U
699-42-39B	1/25/93	B07V73	10.00 U
699-42-40A	1/08/88	H000DF55	5.00 U
699-42-40A	11/22/88	H000DF60	5.00 U
699-42-40A	2/15/89	H000DF65	7.00
699-42-40A	5/31/89	H000DF70	5.00 U
699-42-40A	8/10/89	H000DF74	5.00 U
699-42-40A	1/26/90	H000DF78	5.00 U
699-42-40A	7/08/91	H00071Y2F	10.00 U
699-42-40A	1/08/92	B07TZ3	10.00 U
699-42-40A	1/23/92	B01Q62	10.00 U
699-42-40A	6/25/92	B06ZZ1	11.00
699-42-41	1/24/92	B01T71	10.00 UPD
699-42-41	4/17/92	B065V5	10.00 UP
699-42-41	6/29/92	B06ZZ6	10.00 UP
699-42-41	1/25/93	B07TZ8	10.00 UP
699-42-42B	11/22/88	H000DFT3	43.00
699-42-42B	2/24/89	H000DFT7	31.00
699-42-42B	6/16/89	H000DFV1	13.00
699-42-42B	6/16/89	H000DFV4	12.00
699-42-42B	8/09/89	H000DFV5	13.00
699-42-42B	7/08/91	H00071Y3F	12.00
699-42-42B	1/24/92	B01Q64	10.00 UD
699-42-42B	6/24/92	B07001	10.00 U
699-42-42B	1/21/93	B07V03	10.00 U
699-43-40	1/31/92	B01T73	20.00 PD
699-43-40	4/28/92	B065W0	10.00 UP
699-43-40	6/26/92	B07006	10.00 UP
699-43-40	1/25/93	B07V08	10.00 UP
699-43-41E	12/05/89	H000DGD6	14.00
699-43-41E	1/25/90	H000DGF0	12.00
699-43-41E	6/28/91	H0007203F	10.00 UQ
699-43-41E	6/28/91	H0007204F	15.00 Q
699-43-41E	1/23/92	B01QC4	10.00 U

Well Name	Collection Date	Sample Number	FZINC 34/ppb 10/.
699-43-41E	4/17/92	B065Q6	10.00 U
699-43-41E	6/24/92	B06ZW1	15.00
699-43-41E	1/25/93	B07V13	10.00 U
699-43-41F	12/05/89	H000DGG8	89.00
699-43-41F	1/25/90	H000DGH2	36.00
699-43-41F	4/18/90	H000DGH6	45.00
699-43-41F	7/02/91	H00071Y5F	17.00
699-43-41F	5/05/92	B065R9	11.00
699-43-41F	6/25/92	B06ZX1	11.00
699-43-41F	1/22/93	B07V18	10.00 U
699-43-41G	1/23/92	B01T75	10.00 U
699-43-41G	4/17/92	B065W6	10.00 U
699-43-41G	6/26/92	B07011	10.00 U
699-43-41G	10/28/92	B07JM2	10.00 U
699-43-41G	1/25/93	B07V78	10.00 U
699-43-42J	11/22/88	H000DGP2	8.00
699-43-42J	2/24/89	H000DGP6	5.00 U
699-43-42J	6/15/89	H000DGQ0	5.00 U
699-43-42J	8/09/89	H000DGQ4	5.00 U
699-43-42J	8/09/89	H000DGQ7	5.00 U
699-43-42J	7/02/91	H00071Y6F	10.00 U
699-43-42J	1/31/92	B01S51	10.00 UD
699-43-42J	6/25/92	B07016	10.00 U
699-43-42J	1/21/93	B07V23	10.00 U
699-43-43	11/21/88	H000DGR3	5.00 U
699-43-43	2/24/89	H000DGR7	5.00 U
699-43-43	2/24/89	H000DGS0	5.00 U
699-43-43	6/15/89	H000DGS1	5.00 U
699-43-43	8/09/89	H000DGS5	5.00 U
699-43-43	1/26/90	H000DGS9	5.00 U
699-43-43	7/08/91	H00071Y7F	58.00
699-43-43	1/24/92	B01Q68	10.00 UD
699-43-43	4/22/92	B065N7	10.00 U
699-43-43	6/26/92	B070W1	10.00 U
699-43-43	10/26/92	B07JG6	10.00 U
699-43-43	1/13/93	B07V28	10.00 U
699-43-45	12/06/89	H000DGT4	5.00 U
699-43-45	1/26/90	H000DGT8	5.00 U
699-43-45	4/18/90	H000DGV2	5.00 U
699-43-45	7/08/91	H00071Y8F	10.00 U
699-43-45	9/11/91	B00LG5F	10.00 U
699-43-45	1/24/92	B01QD1	10.00 UD
699-43-45	4/22/92	B065N9	10.00 U

(sheet ** of **)

Well Name	Collection Date	Sample Number	FZINC 34/ppb 10/.
699-43-45	6/26/92	B070W3	10.00 U
699-43-45	10/26/92	B07JG8	10.00 U
699-43-45	1/13/93	B07V33	10.00 U
699-44-39B	1/08/93	B07WK5	10.00 U
699-44-42	11/21/88	H000DHK2	5.00 U
699-44-42	2/17/89	H000DHK6	5.00 U
699-44-42	6/15/89	H000DHL0	5.00 U
699-44-42	8/08/89	H000DHL4	16.00
699-44-42	1/31/90	H000DHL8	5.00 U
699-44-42	7/10/91	H00071Y9F	10.00 U
699-44-42	1/31/92	B01S54	10.00 UD
699-44-42	6/25/92	B07021	10.00 U
699-44-42	1/13/93	B07V42	10.00 U
699-44-42	1/13/93	B07V43	10.00 U
699-44-43B	12/20/89	H000DHM3	44.00
699-44-43B	12/20/89	H000DHM6	25.00
699-44-43B	1/26/90	H000DHM7	16.00
699-44-43B	1/26/90	H000DHN0	20.00
699-44-43B	4/18/90	H000DHN1	21.00
699-44-43B	7/08/91	H00071Z0F	20.00
699-44-43B	9/11/91	B00LG6F	10.00 U
699-44-43B	1/23/92	B01Q70	20.00
699-44-43B	4/20/92	B065X5	10.00 U
699-44-43B	6/26/92	B01MT4	10.00 U
699-44-43B	6/26/92	B07026	10.00 U
699-44-43B	1/27/93	B07V48	10.00 U

For explanation of this table, see Section 1.4 of report.

APPENDIX C

216-B-3 POND SYSTEM PHASE 1 SOIL AND SEDIMENT SAMPLING

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9413096.1196

MAR 31 1991

ENGINEERING DATA TRANSMITTAL

1. EDT 123487

2. To: (Receiving Organization) Distribution

3. From: (Originating Organization) Environmental Engineering Technical Baseline Section

4. Related EDT No: N/A

5. Proj./Prog./Dept/Div: 81223

6. Cog./Proj. Engr: C. D. Kramer

7. Purchase Order No: N/A

8. Originator Remarks: Please sign indicating review and approval of WHC-SD-EN-AP-042, Rev. 0.

9. Equip/Component No: N/A

10. System/Bldg/Facility: N/A

11. Receiver Remarks:

12. Major Assm Dwg No: N/A

13. Permit/Permit Application No. N/A

14. Required Response Date: N/A

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-EN-AP-042		~~1~~ 0	Phase 1 Characterization of the 216-B-3 Pond System	4	1,4	1	

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 see MRP 5.43 and EP-1.7	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp
1,4	1	Cog./Proj. Eng C.D. Kramer	C.D. Kramer	1/16/91	H4-55						
1,4		Cog./Proj. Eng. Mgr. R.P. Henckel		1/17/91	H4-55						
		QA									
		Safety									
1,4	1	F.A. Ruck III	F.A. Ruck III	1/31/91	H4-57						

18.	19.	20.	21. DOE APPROVAL (if required)
C.D. Kramer 1/16/91 Signature of EDT Originator / Date	Authorized Representative for Receiving Organization / Date	RPHenckel 3/31/91 Cognizant/Project Engineer's Manager / Date	Ltr No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments

BD-7400-172 (2/89)

INSTRUCTIONS FOR COMPLETION OF THE ENGINEERING DATA TRANSMITTAL

(USE BLACK INK OR TYPE)

BLOCK	TITLE	
(1)*	EDT	• Enter the assigned EDT number
(2)	To: (Receiving Organization)	• Enter the individual's name, title of the organization, or entity (e.g., Distribution) that the EDT is being transmitted to.
(3)	From: (Orginating Organization)	• Enter the title of the organization originating and transmitting the EDT
(4)	Related EDT	• Enter EDT numbers which relate to the data being transmitted.
(5)*	Project/Program/ Dept//Div	• Enter the Project/Program/Department/Division title or Project/Program acronym or Project Number. Work Order Number or Organization Code.
(6)	Cognizant /Project Engineer	• Enter the name of the individual identified as being responsible for coordinating disposition of the EDT.
(7)	Purchase Order No.	• Enter related Purchase Order (P.O.) Number, if available
(8)*	Originator Remarks	• Enter special or additional comments concerning transmittal, or "Key" retrieval words may be entered.
(9)	Equipment/Component No.	• Enter equipment/component number of affected item, if appropriate.
(10)	System/Bldg./Facility	• Enter appropriate system, building or facility number, if appropriate.
(11)	Receiver Remarks	• Enter special or additional comments concerning transmittal.
(12)	Major Assm. Dwg. No.	• Enter applicable drawing number of major assembly, if appropriate.
(13)	Permit/Permit Application No.	• Enter applicable permit or permit application number, if appropriate.
(14)	Required Response Date	• Enter the date a response is required from individuals identified in Block 17. (Signature/Distribution)
(15)*	Data Transmitted	
	(A)* Item Number	• Enter sequential number, beginning with 1, of the information listed on EDT
	(B)* Document/ Drawing No.	• Enter the unique identification number assigned to the document or drawing being transmitted.
	(C)* Sheet No.	• Enter the sheet number of the information being transmitted. If no sheet number, leave blar
	(D)* Rev. No.	• Enter the revision number of the information being transmitted. If no revision number, leave blank.
	(E) Title or Description of Data Transmitted	• Enter the title of the document or drawing or a brief description of the subject if no title is identified.
	(F) Impact Level	• Enter the appropriate Impact Level (Block 15). Use NA for non-engineering documents.
	(G) Reason for submittal	• Enter the appropriate code to identify the purpose of the data transmittal (see Block 16).
	(H) Originator Disposition	• Enter the appropriate disposition code (see Block 16).
	(I) Receiver Disposition	• Enter the appropriate disposition code (see Block 16).
(16)	Key	• Number codes used in completion of Blocks 15 (G), (H), and (I), and 17 (G), (H) (Signature/Distribution).
(17)	Signature/Distribution	
	(G) Reason	• Enter the code of the reason for transmittal (Block 16).
	(H) Disposition	• Enter the code for the disposition (Block 16).
	(J) Name	• Enter the signature of the individual completing the Disposition 17(H) and the Transmittal
	(L) Date	• Enter date signature is obtained.
	(M) MSIN	• Enter MSIN. Note: If Distribution Sheet is used, show entire distribution (including that indicated on Page 1 of the EDT) on the Distribution Sheet.
(18)	Signature of EDT Originator	• Enter the signature and date of the individual originating the EDT (entered prior to transmittal to Receiving Organization). If the EDT originator is the Cognizant/Project Engineer, sign both Blocks 17 and 18.
(19)	Authorized Representative for Receiving Organization	• Enter the signature and date of the individual identified by the Receiving Organization as authorized to approve disposition of the EDT and acceptance of the data transmitted, as applicable
(20)*	Cognizant/Project Manager	• Enter the signature and date of the Cognizant/Project Engineer's manager. (This signature is authorization for release.)
(21)	DOE Approval	• Enter DOE approval (if required) by letter number and indicate DOE action.

*Asterisk denote the required minimum items checked by Engineering Document Control prior to release; these are the minimum release requirements.

SUPPORTING DOCUMENT

1. Total Pages 115

2. Title
Phase I Characterization of the 216-B-3 Pond System

3. Number
WHC-SD-EN-AP-042

4. Rev. No.
~~1~~ 0
3/21

5. Key Words
216-B-3 Pond Closure, B Pond, Phase I Characterization, Soil, Sediment, RCRA

6. Author
C. D. Kramer
Name (Type or Print)
C. D. Kramer
Signature
81223 / EVRB1
Organization/Charge Code
EC276

7. Abstract

The 216-B-3 Pond System is undergoing closure as a *Resource Conservation and Recovery Act of 1976* treatment, storage, or disposal unit. Characterization of the soil and sediment of the facility is being performed in a phased approach. Phase 1, reported herein, involved sampling near-surface soil and sediment. Organic constituents of interest were not found in meaningful quantities. The appropriateness and knowledge of background is limited to clearly define inorganic pollution on this basis alone. Background soil composition in the undisturbed native area surrounding the facility was different than an adjacent unused Contingency Pond. Many analytes exceed threshold values derived from the native background, but not those derived from the excavated Contingency Pond area. Reference to typical soil concentrations suggests lead, mercury, and cadmium are the most significant observations greater than their threshold values. Even these are far below hazardous levels as defined by the characteristic of extraction procedure toxicity. The data suggest that the soil or sediment at any sampled location would not be classified as dangerous waste under current Washington Administrative Code 173-303, *Dangerous Waste Regulations*.

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1.0 INTRODUCTION

1.1 BACKGROUND

The 216-B-3 Pond System (hereinafter referred to as B Pond) is undergoing evaluation to characterize the potential hazards that may be present in the soil and sediments. The dangerous chemical and radionuclide inventory of the soils and sediments is relatively unknown. Information gathered will assist in evaluating closure and/or remediation activities. The B Pond is part of the 200-BP-11 operable unit (WHC 1989a, p A-35).

A Westinghouse Hanford Company (Westinghouse Hanford) sampling plan, *216-B-3 Pond Characterization of the Hazardous Waste Inventory in the Near-Surface Soil and Sediments* (Roos and Woodworth 1989), governs the characterization effort. The sampling plan sets forth a phased approach toward characterizing the soils and sediments of B Pond. Phase 1 is an initial sampling effort assessing near-surface soil contamination within the 216-B-3 Pond, the 216-B-3-3 Ditch, and the three expansion ponds (216-B-3A, 216-B-3B, and 216-B-3C). This phase includes the estimation of background soil concentrations in the vicinity of the site. Phase 2 is to be an extension of the characterization work utilizing data and knowledge from Phase 1. Phase 3 will examine the vertical distribution of contaminants beneath the surface soil.

This document summarizes the sampling activities undertaken and the analytical results obtained in Phase I of the soil and sediment sampling of B Pond.

1.2 SETTING

The B Pond is located adjacent to the 200 East Area on the Hanford Site in southeast Washington (Figure 1), is classified as a RCRA TSD unit, and for the purposes of this study, comprises the following (Figure 2):

- Open section of the 216-B-3-3 Ditch, approximately 3,700 feet
- 216-B-3 Pond (B-3 Pond), approximately 35 acres
- 216-B-3A Pond (hereinafter referred to as 3A Pond), approximately 11 acres
- 216-B-3B Pond (hereinafter referred to as 3B Pond), approximately 11 acres
- 216-B-3C Pond (hereinafter referred to as 3C Pond), approximately 41 acres.

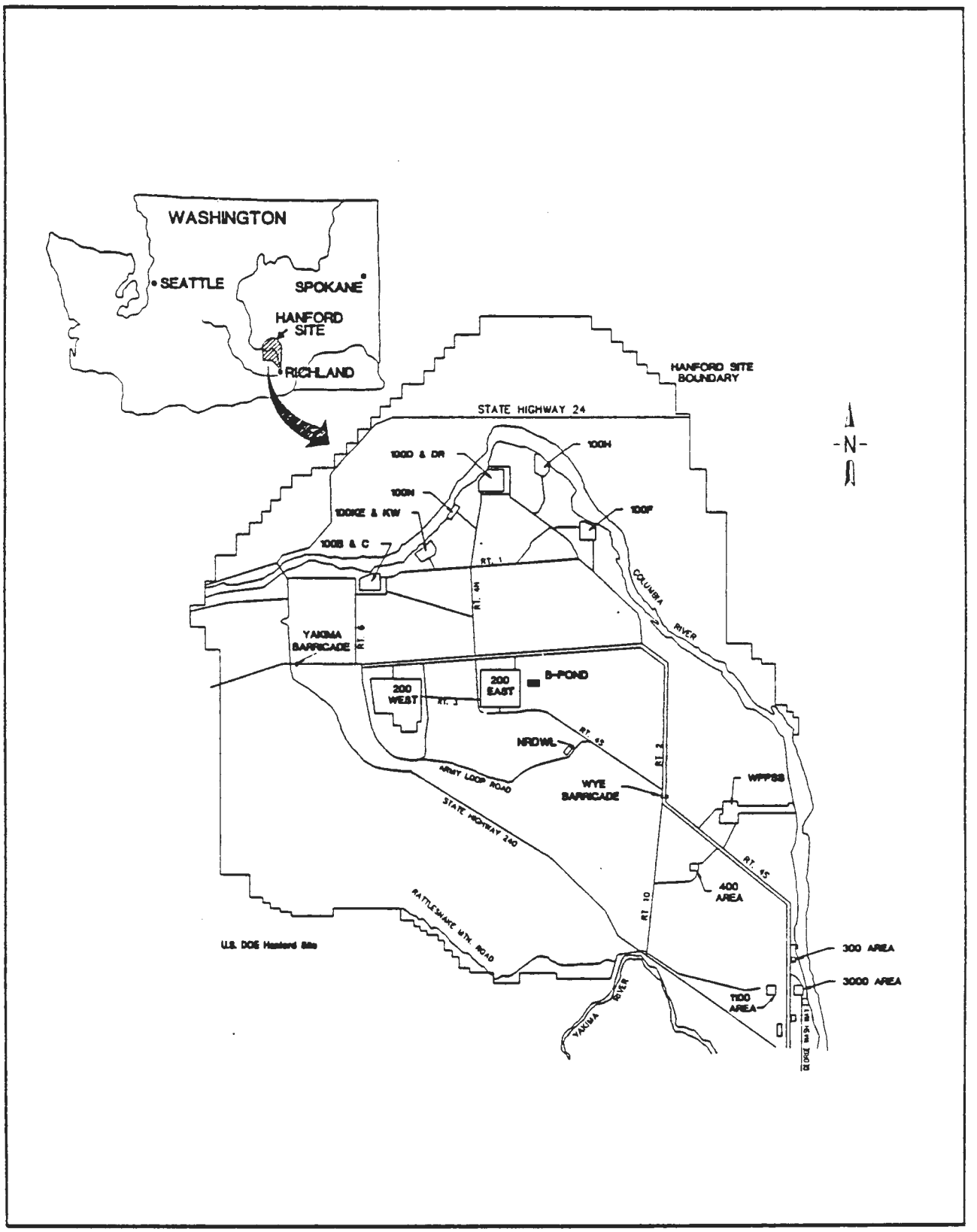

Figure 1. Map of the Hanford Site.

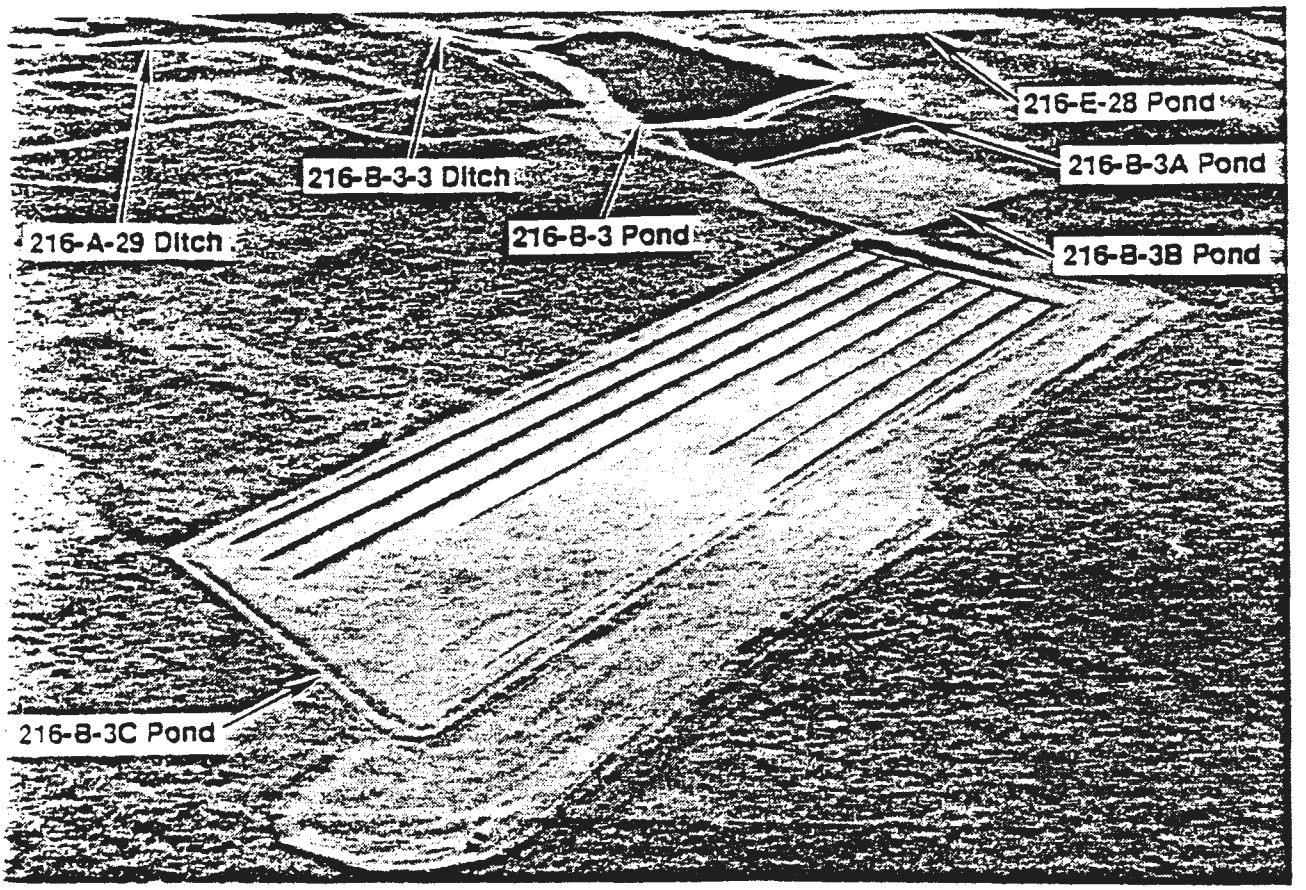

Figure 2. Aerial Photograph of the 216-B-3 Pond System and Surrounding Areas (1988).

Water flows into the B-3 Pond through the 216-B-3-3 Ditch. The B-3 Pond and 3A Pond are normally full of water. Flow to 3A Pond is controlled at the east end of the B-3 Pond. Water from 3A Pond can go to 3B Pond or 3C Pond; currently, 3B Pond is not in use. Although this document uses the term pond, the 3B Pond and the Contingency Pond (labeled 216-E-28 Pond in Figure 2) are actually dry basins. The 3C Pond has a series of eight parallel infiltration trenches into which water from 3A Pond is usually channelled. The water in 3C Pond has never been above the tops of the trenches, which cover a much smaller total area than the pond itself. The trenches are not usually wet along their entire length. The wet area varies with water level.

The Contingency Pond was constructed to provide emergency overflow capability for B Pond. It lies north and slightly west of the B-3 Pond. This facility was constructed in 1987. The area is dry and has not been utilized for waste disposal. Sagebrush and native plants populate the undisturbed areas around B Pond. Both the unused, but man-impacted Contingency Pond area, and the area of native desert vegetation were utilized in Phase 1 as sources for background samples.

The B Pond area has received liquid effluent from activities in the 200 East Area since 1945. Effluent originating within the 200 East Area flows into open ditches upon exit. This liquid effluent provides water to B Pond. The B-3 Pond (sometimes referred to as the main pond) is the oldest pond in the system and contains the largest volume of water; the level of the pond and the inflow have changed with time. Originally, B-3 pond was supplied through the 216-B-3-1 Ditch. In 1964, the 216-B-3-1 Ditch was replaced by the 216-B-3-2 Ditch. In 1970, the 216-B-3-2 Ditch was replaced by the present 216-B-3-3 Ditch. Both the 216-B-3-1 and 216-B-3-2 Ditches were removed from service due to radioactive contamination and filled with soil to reduce contaminant mobility. The three expansion ponds (3A, 3B, and 3C) were placed in service in 1983, 1984, and 1985, respectively. Since taken out of service in May 1985, several feet of soil have been removed from the former 3B Pond bottom in an attempt to increase percolation during future use. The material removed was piled adjacent to the B-3 Pond.

The B Pond primarily received steam condensate, cooling water, chemical sewer discharges, and process waste water. Some mixed waste has been discharged to B Pond. Administrative and physical controls have been implemented to eliminate dangerous waste discharges. The B Pond is still in use for nondangerous waste water disposal and is undergoing closure in accordance with RCRA. The *216-B-3 Pond System Closure/Postclosure Plan* (DOE-RL 1990) provides a broader perspective of this closure and includes chapters on process information and waste characteristics (Chapters 3-4, p 3-1 to 4-14).

2.0 PRESAMPLING ACTIVITIES

2.1 OBJECTIVES

The *216-B-3 Pond System Closure/Postclosure Plan* (DOE-RL 1990, p 7-4) stated four major objectives for Phase 1:

- Assess near-surface soil contamination within the B-3 Pond, 216-B-3-3 Ditch, and three expansion ponds (3A, 3B, and 3C)
- Estimate background values
- Identify constituents of concern
- Estimate the variability of concentrations present at the sites.

2.2 SITE GRID AND ALLOCATION FOR SOIL/SEDIMENT SAMPLING

Sampling sites for Phase 1 were set forth in the sampling plan document (Roos and Woodworth 1989). Reference to that document is appropriate for those desiring the rationale for site selection. The procedure utilized was intended to provide representative sample locations for each of the units of B Pond. Additionally, a small number of sites was selected because information about specific locations was also desired.

A site grid was established to assist in defining the sampling locations within each unit of interest. The perimeters of the 216-B-3 Pond, 3A Pond, 3B Pond, and the Contingency Pond were surveyed and staked relative to the Hanford Site coordinate system.

Most sites within the TSD unit were selected randomly; the sites sampled include the following:

- Nine sites in the 216-B-3-3 Ditch
- Twenty sites in the B-3 Pond
- Seven sites in 3A Pond
- Five sites in 3B Pond
- Eight sites in 3C Pond.

A BASIC random number generator was used to select the sample sites from among a population of grid coordinate intercepts falling within the boundaries of each unit of interest. In the B-3 Pond, a square grid system of 100-foot intervals was used. In 3A and 3B Ponds, the lines of the grid were set at 50-foot intervals due to the smaller acreage. The point N42600, W43600 of the Hanford Site coordinate system corresponded to 0,0 of the B-3 Pond grid. The point N42350, W41750 was the origin for the 3A Pond grid, and N42250, W41100 was the origin for the 3B Pond grid. Randomization in 3A Pond was performed in two blocks. Three locations were randomly allocated from the trenched area, and four locations were randomly allocated from the remainder of the pond. There are eight long infiltration trenches in 3C Pond. In both 3C Pond and the 216-B-3-3 Ditch, potential sampling points were at 100-foot intervals

in the channels. Randomization in 3C Pond was restricted to one random location per ditch for a total of eight sites. These sites were referenced from the northwest end of the 2,200-foot trenches. Locations in the 216-B-3-3 Ditch were randomly allocated within two blocks. After the sampling was initiated, the scope of the project was changed with respect to the 216-B-3-3 Ditch. Sampling was extended upstream from the confluence of the 216-A-29 and 216-B-3-3 Ditches. Four locations were randomly selected from among points at 100-foot intervals in the lower section of the ditch. Five additional random samples were likewise selected from the upper section of the ditch. Locations were referenced from the confluence of the two ditches in the lower section and from the beginning of the 216-B-3-3 Ditch in the upper section.

In addition to randomly allocated sites, samples were to be collected from the following locations:

- The closest possible point to the head end of the 216-B-3-3 Ditch
- The intersection of the 216-B-3-3 and 216-A-29 ditches
- The present inlet area of the B-3 Pond
- The deepest area of the B-3 Pond.

Background samples were to be collected from two types of sites. Five representative samples were to be selected from the Contingency Pond area. This area was surveyed at 100-foot intervals, and the sampled locations were randomly selected from among the population of intercepts within the Contingency Pond. This area was selected for background sampling based on the fact that it has not received influent, is a manmade basin, and is constructed in an adjacent area and fashion. Five additional background samples were to be chosen at sites surrounding B Pond. These sites were recorded in the field logbook using compass headings of several permanent landmarks. It was intended that these samples would provide information concerning the composition and variability of background soil in the area. These samples were taken from areas of native vegetation several hundred feet from the TSD. These locations all appear to be typical of the presystem environment, and were selected by professional judgement on that basis. Figure 3 shows the background sample locations.

2.3 EQUIPMENT PREPARATION

A sampling platform was constructed for use in the B-3 Pond and 3A Pond by connecting two 14-foot, flat-bottom aluminum boats. Stainless-steel scoopulas, spoons, bowls, shovels, and augers were prepared for use in accordance with the laboratory decontamination of field equipment specified in environmental investigation instruction (EII) 5.5, "Decontamination of Equipment for RCRA/CERCLA Sampling" (WHC 1989b). Cleaned equipment was wrapped in aluminum foil by cleaning personnel and remained wrapped until use. Precleaned sample containers were purchased and used for all samples. The containers come presealed from the manufacturer with tamper-indicating seals affixed.

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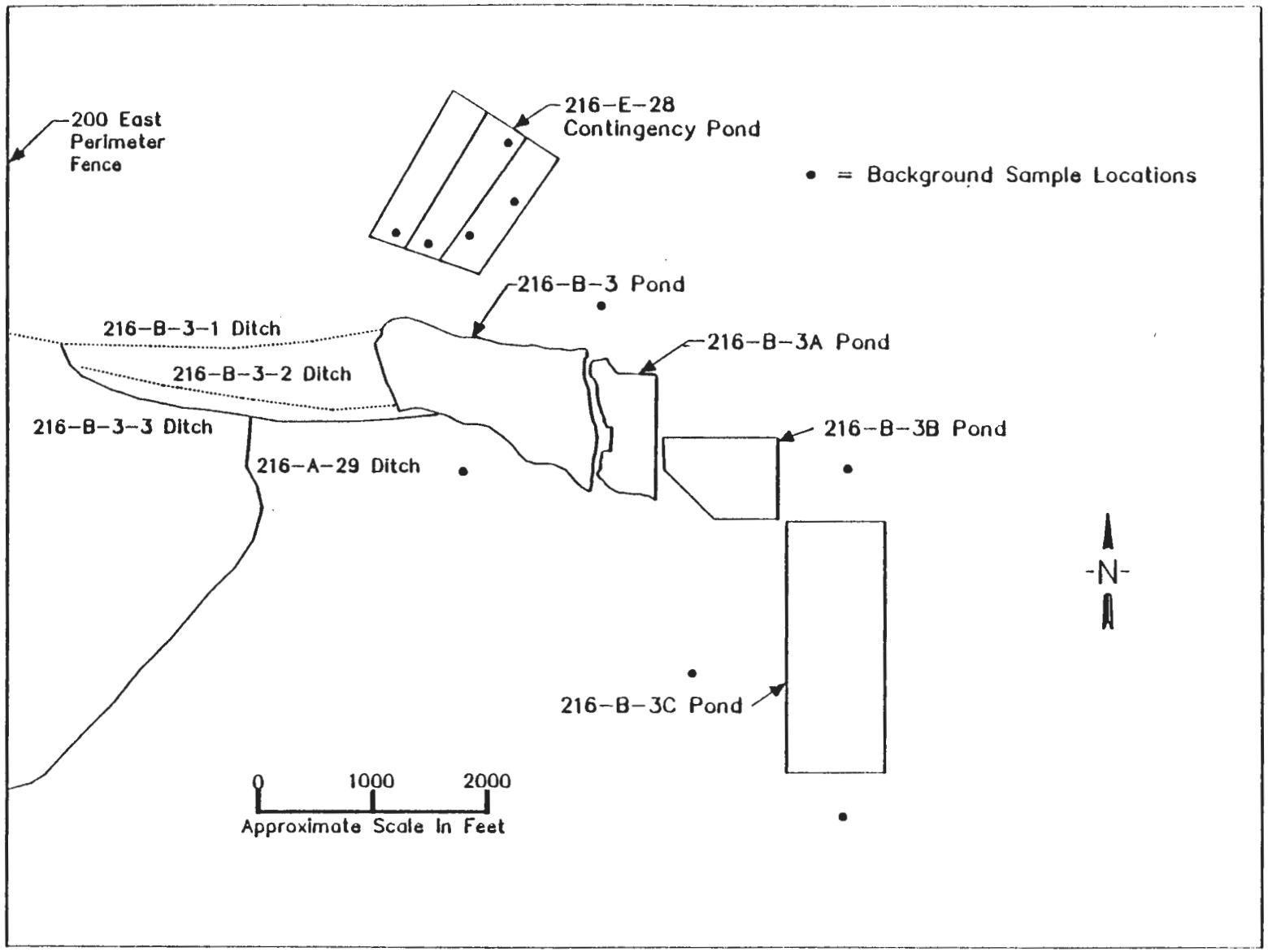

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Figure 3. B Pond System Background Sampling Sites.

2.4 SITE EXPLORATION

Before sample collection in the B-3 Pond, a survey of water and sediment depth was performed. A check of 28 points in the pond showed a maximum water depth of about 12 feet. Sediment depth was assessed by hand-forced penetration of a 0.5-inch-diameter metal rod. The maximum penetration found was 1 foot with an average of about 4 inches. This survey was performed to provide the sampling team with some knowledge of conditions in the 35-acre B-3 Pond prior to initiating the actual sediment sample collection.

3.0 SAMPLING SOILS/SEDIMENTS

3.1 COLLECTION

Table 1 is a sample key for all samples submitted in Phase 1. The table lists sample numbers, date collected, area, coordinates, and sample type. The type category gives additional information about the sample. Replicate samples are those split into two or more portions during the measurement process. Samples from a single location, divided upon collection, and sent to the primary laboratory, are referred to as field duplicates. Split samples were those where a replicate was sent to an alternate laboratory. All samples are soil or sediment samples with the exception of the B-206 through B-211 water samples (H_2O is attached to the type designation to identify water samples). Field conditions prevented sampling at a small number of predesignated locations, so sampling was performed at the closest possible site to that predetermined point, and the new location was documented in the field log. The actual sampled location appears in Table 1. All nonbackground sampling sites for B Pond are shown in Figure 4.

Sampling was conducted between August 3 and September 21, 1989, and collection was performed in accordance with EII 5.2, "Soil and Sediment Sampling" (WHC 1989b). Personnel collecting the samples wore disposable vinyl gloves in addition to other clean protective clothing specified in the approved health and safety plan. These gloves were shed after each sample in an effort to minimize the potential for cross-contamination between samples. All sample collection tools were cleaned before use by standard procedures EII 5.5, "Decontamination of Equipment for RCRA/CERCLA Sampling" (WHC 1989b). Cleaned tools which would contact the sample material remained wrapped in aluminum foil until use. Only large stainless-steel shovels were decontaminated in the field and reused. Other equipment was decontaminated in the laboratory. Clean equipment was used at each sample collection point.

Health and Safety personnel provided and operated an HNU* photoionization detector to detect organic vapors in addition to wind velocity and wet and dry-bulb temperature monitoring. Radiation protection personnel provided monitoring of radiological conditions with Geiger-Mueller counters.

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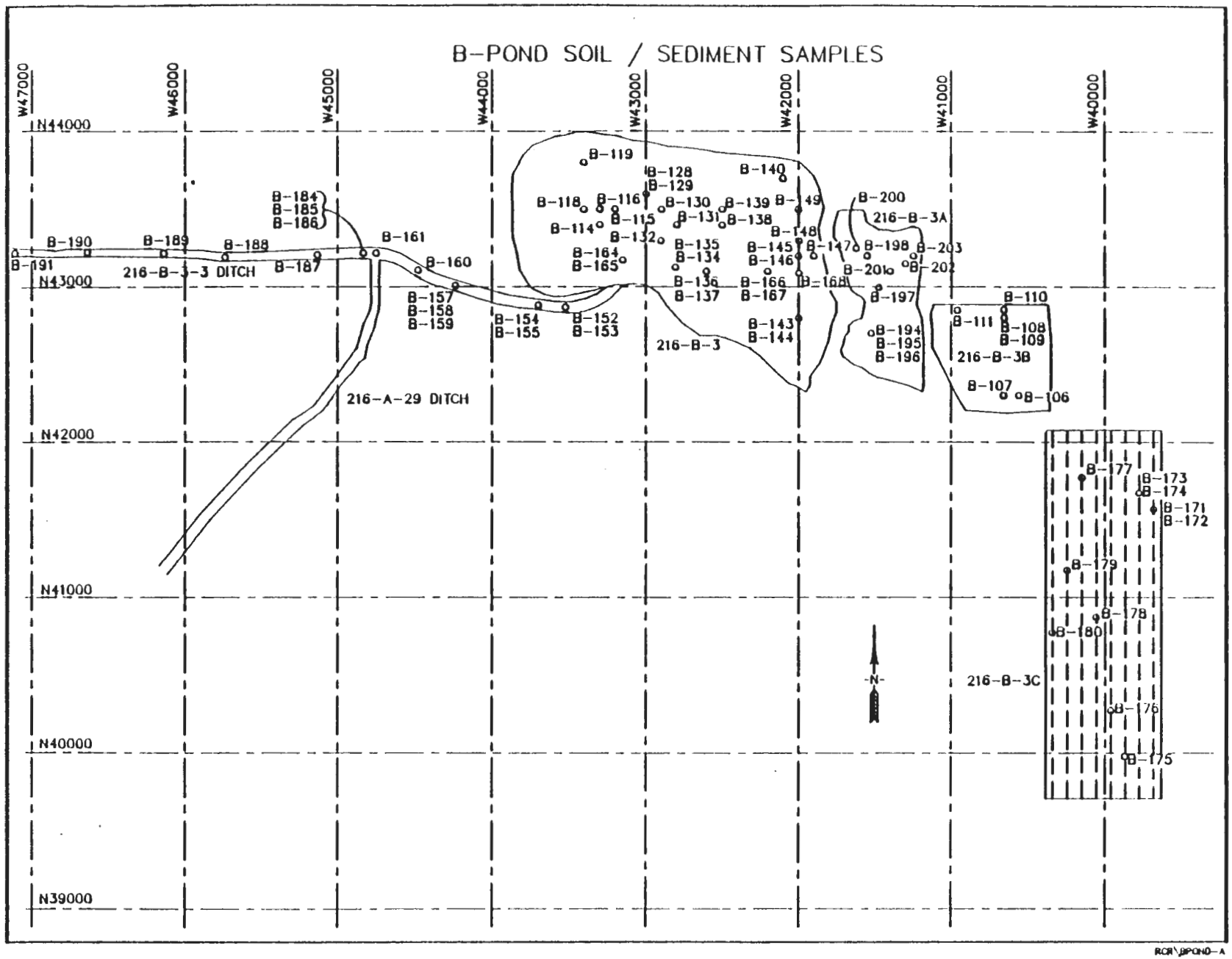

Figure 4. B Pond System Nonbackground Sampling Sites.

Table 1. B Pond Phase 1 Sample Key. (Sheet 1 of 3)

Sample number	Collection date	Site/Pond	Coordinates North	Coordinates West	Sample type
B-101	8/04	Cont Bkg	N44900	W42800	Reg
B-102	8/04	Cont Bkg	N45100	W42600	Reg
B-103	8/04	Cont Bkg	N44800	W43500	Reg
B-104	8/04	Cont Bkg	N44600	W43200	Reg
B-105	8/04	Cont Bkg	N45400	W42500	Reg
B-106	8/04	3B Pond	N42300	W40550	Reg
B-107	8/04	3B Pond	N42300	W40650	Reg
B-108	8/04	3B Pond	N42800	W40650	Fdup
B-108	8/03	3B Pond	N42800	W40650	Split
B-109	8/04	3B Pond	N42800	W40650	Fdup
B-110	8/04	3B Pond	N42850	W40650	Reg
B-111	8/04	3B Pond	N42850	N40950	Reg
B-112	8/04	3B Pond	----	----	Comp 106 to 111
B-113	8/04	3B Pond	----	----	Blk
B-114	8/10	B-3 Pond	N43400	W43300	Reg
B-115	8/10	B-3 Pond	N43500	W43200	Reg
B-116	8/10	B-3 Pond	N43500	W43300	Reg
B-117	8/10	B-3 Pond	----	----	Blk
B-118	8/11	B-3 Pond	N43500	W43400	Reg
B-119	8/11	B-3 Pond	N43800	W43400	Reg
B-120	8/10	Sage Bkg	SW of B-3 Pond		Split
B-121	8/10	Sage Bkg	SW of B-3 Pond		Fdup
B-122	8/10	Sage Bkg	SW of B-3 Pond		Fdup
B-123	8/10	Sage Bkg	W of 3C Pond		Reg
B-124	8/10	Sage Bkg	S of 3C Pond		Reg
B-125	8/10	Sage Bkg	E of 3B Pond		Reg
B-126	8/10	Sage Bkg	NE of B-3 Pond		Reg
B-127	8/11	B-3 Pond	----	----	Comp 118, 119, 116
B-128B	8/11	B-3 Pond	----	----	Blk
B-128	8/17	B-3 Pond	N43600	W43000	Fdup
B-129	8/17	B-3 Pond	N43600	W43000	Fdup
B-130	8/17	B-3 Pond	N43500	W42900	Reg
B-130	8/17	B-3 Pond	N43500	W42900	Split
B-131	8/17	B-3 Pond	N43400	W42800	Reg
B-132	8/17	B-3 Pond	N43300	W42900	Reg
B-133	8/17	B-3 Pond	----	----	Comp 128, 130 to 132, and extra site N43500, W42900
B-134	8/18	B-3 Pond	N43100	W42800	Fdup
B-135	8/18	B-3 Pond	N43100	W42800	Fdup
B-136	8/18	B-3 Pond	N43100	W42600	Reg
B-137	8/18	B-3 Pond	N43100	W42600	Split
B-138	8/18	B-3 Pond	N43400	W42500	Reg
B-139	8/18	B-3 Pond	N43500	W42500	Reg
B-140	8/18	B-3 Pond	N43700	W42100	Reg
B-141	8/18	B-3 Pond	----	----	Comp 134 to 140
B-142	8/18	B-3 Pond	----	----	Blk
B-143	8/18	B-3 Pond	N42800	W42000	Reg
B-144	8/25	B-3 Pond	N42800	W42000	Split
B-145	8/25	B-3 Pond	N43200	W42000	Fdup
B-146	8/25	B-3 Pond	N43200	W42000	Fdup
B-147	8/25	B-3 Pond	N43200	W41900	Reg
B-148	8/25	B-3 Pond	N43300	W42000	Reg
B-149	8/25	B-3 Pond	N43500	W42000	Reg
B-150	8/25	B-3 Pond	----	----	Comp 143 to 149
B-151	8/25	B-3 Pond	----	----	Blk

Table 1. B Pond Phase 1 Sample Key. (Sheet 2 of 3)

Sample number	Collection date	Site/Pond	Coordinates North	Coordinates West	Sample type
B-152	8/28	B-3-3 Ditch	1,279 ft below A-29		Fdup
B-153	8/28	B-3-3 Ditch	1,279 ft below A-29		Fdup
B-154	8/28	B-3-3 Ditch	1,200 ft below A-29		Fdup
B-155	8/28	B-3-3 Ditch	1,200 ft below A-29		Split
B-156	8/28	B-3-3 Ditch	----	----	Blk
B-157	8/31	B-3-3 Ditch	950 ft below A-29		Split
B-158	8/31	B-3-3 Ditch	950 ft below A-29		Reg
B-159	8/31	B-3-3 Ditch	950 ft below A-29		Fdup
B-160	8/31	B-3-3 Ditch	300 ft below A-29		Reg
B-161	8/31	B-3-3 Ditch	0 ft		Select-Junction
B-162	8/31	B-3-3 Ditch	----	----	Comp 152, 154, 157, 160, 161
B-163	8/31	B-3-3 Ditch	----	----	Blk
B-164	9/07	B-3 Pond	N43175	W43150	Select-Inlet, Fdup
B-165	9/07	B-3 Pond	N43175	W43150	Select-Inlet, Fdup
B-166	9/07	B-3 Pond	N43100	W42200	Reg
B-167	9/07	B-3 Pond	N43100	W42200	Split
B-168	9/07	B-3 Pond	N43090	W42000	Select-Deepest
B-169	9/07	B-3 Pond	----	----	Comp 164, 166, 168
B-170	9/07	B-3 Pond	----	----	Blk
B-171	9/08	3C Pond	Ditch 8, 500 ft		Fdup
B-172	9/08	3C Pond	Ditch 8, 500 ft		Fdup
B-173	9/08	3C Pond	Ditch 7, 400 ft		Split
B-174	9/08	3C Pond	Ditch 7, 400 ft		Reg
B-175	9/08	3C Pond	Ditch 6, 2,100 ft		Reg
B-176	9/08	3C Pond	Ditch 5, 1,800 ft		Reg
B-177	9/08	3C Pond	Ditch 3, 300 ft		Reg
B-178	9/08	3C Pond	Ditch 4, 1,200 ft		Reg
B-179	9/08	3C Pond	Ditch 2, 900 ft		Reg
B-180	9/08	3C Pond	Ditch 1, 1,300 ft		Reg
B-181	9/08	3C Pond	(Dry Sites)		Comp 175, 176
B-182	9/08	3C Pond	(Wet Sites)		Comp 171, 173, 177 to 180
B-183	9/08	3C Pond	——	——	Blk
B-184	9/18	B-3-3 Ditch	2,300 ft from head end		Fdup
B-185	9/18	B-3-3 Ditch	2,300 ft from head end		Fdup
B-186	9/18	B-3-3 Ditch	2,300 ft from head end		Split
B-187	9/18	B-3-3 Ditch	2,000 ft from head end		Reg
B-188	9/18	B-3-3 Ditch	1,400 ft from head end		Reg
B-189	9/18	B-3-3 Ditch	1,000 ft from head end		Reg
B-190	9/18	B-3-3 Ditch	500 ft from head end		Reg
B-191	9/18	B-3-3 Ditch	30 ft from head end		Select-Head end
B-192	9/18	B-3-3 Ditch	----	----	Comp 184, 187-191
B-193	9/18	B-3-3 Ditch	----	----	Blk
B-194	9/21	3A Pond	N42700	W41525	Fdup-Trench
B-195	9/21	3A Pond	N42700	W41525	Split-Trench
B-196	9/21	3A Pond	N42700	W41525	Fdup-Trench
B-197	9/21	3A Pond	N43000	W41475	Reg-Trench
B-198	9/21	3A Pond	N43200	W41550	Reg-Trench
B-199	9/21	3A Pond	(Trench)		Comp 194, 197, 198
B-200	9/21	3A Pond	N43250	W41625	Reg
B-201	9/21	3A Pond	N43100	W41400	Reg
B-202	9/21	3A Pond	N43150	W41300	Reg
B-203	9/21	3A Pond	N43200	W41250	Reg
B-204	9/21	3A Pond	(Out of trench)		Comp 200, 201, 203, 204
B-205	9/21	3A Pond	----	----	Blk

Table 1. B Pond Phase 1 Sample Key. (Sheet 3 of 3)

Sample number	Collection date	Site/Pond	Coordinates		Sample type
			North	West	
B-206	9/28	B-3 Pond	60 ft W of SE corner		Fdup-H_2O
B-207	9/28	B-3 Pond	60 ft W of SE corner		Fdup-H_2O
B-208	9/28	B-3 Pond	Inlet		Reg-H_2O
B-209	9/28	B-3 Pond	NW corner		Reg-H_2O
B-210	9/28	B-3 Pond	NE corner		Reg-H_2O
B-211	9/28	B-3 Pond	(H_2O)		Comp 206, 208-210

Cont Bkg = Background: Contingency Pond
3B Pond = 216-B-3B Pond
B-3 Pond = 216-B-3 Pond (main pond)
Sage Bkg = Background: Area of native vegetation
B-3-3 Ditch = 216-B-3-3 Ditch
A-29 = 216-A-29 Ditch
3C Pond = 216-B-3C Pond
3A Pond = 216-B-3A Pond
Blk = Equipment blank -- clean silica sand
Reg = Regular sample
Split = Split samples sent to an alternate laboratory
Fdup = Field duplicate sample sent to primary laboratory
Comp xxx, = Composite of samples B-xxx, ...
Select-y = Nonrandomly selected sample location of attribute y
Trench = Deeper trench area of 216-B-3A Pond
Inlet = Inlet area in 216-B-3 Pond
Junction = Intersection of 216-A-29 and 216-B-3-3 Ditches
H_2O = Pond water sample (not soil sample).

Dry soil samples were collected by removing approximately 6 inches of surface soil prior to sample collection. This was specified in the sampling plan to minimize the influence of any surface disturbances (e.g., windblown material, vegetation) and to obtain a representative sample of the site (Roos and Woodworth 1989). Stainless-steel scoopulas, spoons, trowels, and shovels were used in the sample collection, as appropriate. Tools used to remove overburden were separate from those used to collect the sample (clean tools were used at each location). Soil exposed at the bottom of the hole was immediately collected for volatile organic analysis. Containers appropriate to the rest of the requested analyses were filled as rapidly as possible. All samples from the Contingency Pond, the native background sites, and 3B Pond were dry samples. Samples B-175, B-176, and their composite B-181 were dry samples taken from 3C Pond. Other sampling points in 3C Pond were wet.

Sediment samples were collected from 3A Pond, B-3 Pond, and the 216-B-3-3 Ditch using a 3 x 12-inch i.d. soil recovery auger. A 3 x 30-inch auger was tried during early efforts in the B-3 Pond, but was never superior for collecting deeper sediment samples than the 12-inch auger. Multiple borings were necessary to obtain sufficient quantities of material for all the requested analyses. These were always commingled in a stainless-steel bowl prior to allocation to the individual sample analysis containers sent to the laboratories.

Sediment collection at the water-covered sites of 3C Pond was performed with stainless-steel shovels. Some samples in the lower 216-B-3-3 Ditch were also collected by shovel because of the rocky nature of the sediments. All sediment material collected at a specific sampling location was placed in a large stainless-steel bowl, the excess water was decanted, and the sample was homogenized and packed into containers. As with the dry soil samples, the handling of material submitted for volatile organic analysis was kept to an absolute minimum.

Composite samples were usually collected at a frequency of one per sampling day in accordance with the sampling plan (Roos and Woodworth 1989). They were composed of soil/sediment split from each sample within a particular pond (or ditch) area. Prior to compositing, the material was kept on ice in clean sealed sample jars (125 mL). Upon taking the final sample of the day or area, the respective jars were emptied into a stainless-steel bowl, mixed, and dispensed into sample containers.

Once sample containers were filled, the exterior was wiped and/or rinsed clean, labeled, sealed in plastic bags, and placed on ice. Prior to transport to the laboratory, a tamper-indicating seal was placed on every sample container. Each sample was double checked for proper seal and labeling. Sample number and location were verified as properly recorded in the field logbook. Chain-of-custody and sample-analysis-request forms were completed and checked. All samples were rebagged (double bags) after label verification and placed on ice for transport to the laboratory the same day by collection personnel.

3.2 QUALITY ASSURANCE SAMPLES

The approved sampling plan called for at least one pair of split samples and one pair of duplicates for every 20 samples or one per day, whichever resulted in the greater number of quality assurance (QA) samples. Three types of QA samples were submitted from the field.

- Duplicate samples were defined in this project as samples from the same location submitted as two separate samples for separate analysis at a single laboratory.

- Split samples were defined identical to duplicates except that one sample would be analyzed at one laboratory and the second of the pair would be analyzed at an independent laboratory.

- Equipment blanks of clean silica sand were also submitted for analysis daily. These blanks were prepared by mixing an aliquot of silica sand under field conditions with decontaminated equipment.

Duplicate samples would be used to assess the variability inherent in the solitary estimate available for most sample collection points. Split samples were to serve as interlaboratory comparison. Equipment blanks were used to indicate errors of contamination in the measurement system.

Additional laboratory QA measures included reporting matrix spikes, matrix spike duplicates, blanks, and, in the case of organic analytes -- surrogate recoveries (surrogates are synthetic compounds added by the laboratory to monitor method performance).

3.3 REQUESTED ANALYSES

Table 2a summarizes the types of analyses originally requested for individual soil/sediment samples. Later, it was determined that comparison to background would be more appropriate if the strong acid digestion Method 3050 (EPA 1986) was employed instead of the acetic acid digestion used for Extraction Procedure (EP) toxicity determinations. In February 1990, this analysis was requested on samples held in storage by the laboratory. Analytical results were reported for those elements listed in Table 2b. The method yielded higher concentrations of analytes for the comparisons. In each method, the soils are processed in a digestion procedure, and the extract analyzed. The amounts extracted by the two methods can differ by orders of magnitude due to the different strength of the acids employed. The majority of all site and background values were below the corresponding required contract detection limit (CDL) for the EP-toxicity digestion. This makes comparisons to background error prone due to the uncertainty of quantification. The characteristic of EP toxicity is determined by comparison to regulatory limits using the prescribed EP-toxicity extraction. The only elements regulated or even defined for EP toxicity are arsenic, barium, cadmium, lead, chromium, mercury, selenium, and silver. Because the objective of this study involves comparison to background values, results of other elements listed in the sampling plan under the category of "EP-Toxic Metals, Enhanced" will not be the presented by that digestion method.

Table 2a. Requested Analyses, Individual Samples. (sheet 1 of 2)

Constituent	Method	CDL[a]
Arsenic, µg/g	7060[b]	0.5
Lead, µg/g	7421[b]	0.5
Mercury, µg/g	7470[b]	0.2
Selenium, µg/g	7740[b]	0.5
Thallium, µg/g	7841[b]	1.0
EP Toxic Metals, Enhanced, µg/L	1310[b]	
aluminum		1,500
antimony		1,000
arsenic		500
barium		1,000
beryllium		50
boron		100
cadmium		100
calcium		500
chromium		500
cobalt		200
copper		100
iron		300
lead		500
lithium		100
magnesium		500
manganese		50
mercury		20
molybdenum		400
nickel		100
potassium		1,000
selenium		500
silicon		500
silver		500
sodium		2,000
strontium		100
tin		300
titanium		600
vanadium		50
zinc		50
zirconium		500
Sulfide, µg/g	9030[b]	10.0
Cyanide, µg/g	9010[b]	0.5
Ammonium, µg/g	1426-C/D[c]	0.5
Gross alpha	A-703[c]	N/A
Gross beta	A-703[c]	N/A
Anions, µg/g	300[b]	
bromide		1.0
chloride		1.0
fluoride		1.0
nitrate		1.0
nitrite		1.0
phosphate		2.0
sulfate		1.0
Volatile Organics (Targeted Constituents), µg/kg	8240[b]	
1,1,1-trichloroethane		5
1,1,2-trichloroethane		5
benzene		5
carbon tetrachloride		5
methyl ethyl ketone		10
tetrachloroethylene		5
toluene		5
trichloroethylene		5
xylene (o,p)		5
chloroform		5
1,1-dichloroethane		5
1,2-dichloroethane		500
total-1,2-dichloroethylene		5
methylene chloride		5
vinyl chloride		10
xylene (m)		5

Table 2a. Requested Analyses, Individual Samples. (sheet 2 of 2)

Constituent	Method	CDL[a]
Volatile Organics (Targeted Constituents), µg/kg	8240[b]	
methyl isobutyl ketone		10
acetone		10
tetrahydrofuran		10
p-dichlorobenzene		5
1,4-dioxane		500
pyridine		500
acrolein		10
acrylonitrile		10
bis(chloromethyl) ether		5
bromoacetone		5
methyl bromide		10
carbon disulfide		10
chlorobenzene		5
2-chloroethyl vinyl ether		5
chloromethyl methyl ether		10
methyl chloride		10
crotonaldehyde		10
1,2-dibromo-3-chloropropane		10
1,2-dibromo-ethane		10
dibromomethane		10
1,4-dichloro-2-butene		10
dichlorodifluoromethane		10
1,1-dichloroethylene		10
1,2-dichloropropane		5
1,3-dichloropropene		5
n,n-diethylhydrazine		10
1,1-dimethylhydrazine		10
1,2-dimethylhydrazine		10
iodomethane		10
methacrylonitrile		10
methanethiol		10
pentachloroethane		10
1,1,1,2-tetrachloroethane		10
1,1,2,2-tetrachloroethane		5
bromoform		5
trichloromethanethiol		10
trichloromonofluoromethane		10
1,2,3-trichloropropane		10
acetonitrile		10
formaldehyde		500
ethylene oxide		10
ethyl methacrylate		10
ethylbenzene		5
styrene		5
bromodichloromethane		5
dibromochloromethane		5
2-hexanone		50
allyl chloride		100
chloroethane		10
propionitrile		5
vinyl acetate		5

[a]CDL for EP-toxic metals are listed as concentration in the prescribed extract
[b]EPA 1986
[c]ASTM 1987
CDL = contract detection limit
EP = Extraction Procedure
N/A = standard reference not available.

Table 2b. Metals Analyses Using Methods 3050/6010[a].

Constituent	CDL[b]	Constituent	CDL[b]
aluminum	15.0	manganese	0.5
antimony	10.0	molybdenum	4.0
barium	0.6	nickel	1.0
beryllium	0.5	potassium	10.0
boron	1.0	silicon	20.0
cadmium	0.2	silver	1.0
calcium	5.0	sodium	20.0
chromium	1.0	strontium	1.0
cobalt	2.0	tin	3.0
copper	1.0	titanium	6.0
iron	5.0	vanadium	0.5
lithium	10.0	zinc	0.5
magnesium	5.0	zirconium	5.0

[a]EPA 1986
[b]All values in micrograms per gram.

Instead, the data for digestion Method 3050/inductively coupled plasma (ICP) spectroscopy analysis 6010 (EPA 1986) is presented. Elements not reported by the aforementioned method (arsenic, lead, mercury, selenium, thallium) are those for which a total metal determination was already requested by a more sensitive method.

Composite samples were screened for a broader array of organic analytes than individual samples as verification of waste stream characterization. The list of analytes for composite samples is given in Table 3.

Lists of organic compounds routinely reported by the contract laboratory are included in Tables 2a, 2b, and 3. Additional compounds may be reported. The 'other' compounds may be identified or listed as unknowns (a search of the EPA/NIH Mass Spectral Data Base is included in the analysis).

Tables 2a and 3 reference standard methods and give minimum required CDLs. These limits were set forth in the project QA plan, Appendix C, of the sampling plan (Roos and Woodworth 1989). These limits correspond to the administratively determined CDLs of the primary laboratory. The CDLs given are for soil matrices. Water matrices may have different CDLs. Generally, CDLs correspond to the recommended limits of the referenced method when they exist. At times, they are below a practical quantitation limit (PQL).

The primary laboratory analyzed one-half of the total split samples as regular samples. The alternate laboratory performed EP toxicity, sulfide, cyanide, ammonium, and anion analyses on the remaining split samples. Analysis of matrix spikes (MS), matrix spike duplicates (MSD), blanks, calibration, and/or verification standards were not reported. The results of the 11 split samples delivered to the 325 Laboratory lacked sufficient QA information for Westinghouse Hanford data validation. Data from the these split samples are, therefore, not included with this report.

Table 3. Requested Analyses, Composite Samples. (sheet 1 of 3)

Constituent	CDL
Polychlorinated Biphenyl, µg/g (Method[a] 8080)	
Arochlor 1016	1.0
Arochlor 1221	1.0
Arochlor 1232	1.0
Arochlor 1242	1.0
Arochlor 1248	1.0
Arochlor 1254	1.0
Arochlor 1260	1.0
Herbicides, µg/g (Method[a] 8150)	
2,4-D	1.0
2,4,5-TP (Silvex)	1.0
2,4,5-T	1.0
Enhanced Pesticides, µg/g (Method[a] 8080)	
Endrin	0.01
Methoxychlor	1.0
Toxaphene	1.0
Alpha BHC	0.01
Beta BHC	0.01
Gamma BHC	0.01
Delta BHC	0.01
4,4'-DDD	0.01
4,4'-DDE	0.01
4,4'-DDT	0.01
Heptachlor	0.01
Heptachlorepoxide	0.01
Kepone	1.0
Dieldrin	0.01
Aldrin	0.01
Chlorodane	1.0
Endosulfan alpha	0.01
Endosulfan beta	0.01
Endosulfan sulfate	0.05
Chlorobenzilate	0.3
Phosphorus Pesticides, µg/g (Method[a] 8140)	
Tetraethylpyrophosphate	1.0
Carbophenothion	1.0
Disulfoton	1.0
Dimethoate	0.2
Methylparathion	1.0
Parathion	1.0
Phorate	1.0

Constituent	CDL
Semivolatiles, µg/g (Method[a] 8270)	
Cresol	1.0
1,2-Dichlorobenzene	1.0
1,3-Dichlorobenzene	1.0
p-Dichlorobenzene	1.0
Hexachlorobenzene	1.0
Pentachlorobenzene	1.0
Pentachlorophenol	5.0
1,2,4,5-Tetrachlorobenzene	1.0
1,2,4-Trichlorobenzene	1.0
Hexachlorophene	1.0
Napthalene	1.0
1,2,3-Trichlorobenzene	1.0
Phenol	1.0
1,3,5-Trichlorobenzene	1.0
1,2,3,4-Tetrachlorobenzene	1.0
1,2,3,5-Tetrachlorobenzene	1.0
Kerosene	1,000
Strychnine	5.0
Maleic hydrazide	50.0
Nicotinic acid	10.0
Tributylphosphate	1.0
Chlorobenzene	1.0
Acetophenone	1.0
Warfarin	1.0
2-Acetylaminofluorene	1.0
4-Aminobiphenyl	1.0
5-(Aminomethyl)-3-isoxazolol	1.0
Amitrole	1.0
Aniline	1.0
Aramite	1.0
Auramine	1.0
Benz(c)acridine	1.0
Benz(a)anthracene	1.0
Benzene, dichloromethyl	1.0
Benzenethiol	1.0
Benzidine	1.0
Benzo(b)fluoranthene	1.0
Benzo(j)fluoranthene	1.0
p-Benzoquinone	1.0
Benzyl chloride	1.0
Bis(2-chloroethoxy)methane	1.0
Bis(2-chloroethyl) ether	1.0
Bis(2-ethylhexyl)phthalate	1.0
4-Bromophenyl phenyl ether	1.0
p-Chloroaniline	1.0
p-Chloro-m-cresol	1.0
1-Chloro-2,3-poxypropane	1.0
2-Chloronapththalene	1.0
Chlorophenol	1.0
Chrysene	1.0
Dibenz(a,h)acridine	1.0
Dibenz(a,j)acridine	1.0
Dibenz(a,h)anthracene	1.0
7h-Dibenzo(c,g)carbazole	1.0
Dibenzo(a,e)pyrene	1.0
Dibenzo(a,h)pyrene	1.0
Dibenzo(a,i)pyrene	1.0
Di-n-butyl phthalate	1.0
3,3'-Dichlorobenzidine	1.0
2,4-Dichlorophenol	1.0
2,6-Dichlorophenol	1.0
Diethyl phthalate	1.0
Dihydrosafrole	1.0
3,3'-Dimethozybenzidine	1.0
Thiofanox	1.0

Table 3. Requested Analyses, Composite Samples. (sheet 2 of 3)

Constituent	CDL	Constituent	CDL
Semivolatiles (Cont.)			
Dimethyl phthalate	1.0	2-Cyclohexyl-4,6-dinitrophenol	1.0
m-Dinitrobenzene	1.0	7,12-Dimethylbenz(a)anthracene	1.0
4,6-Dinitro-o-cresol	1.0	Alpha, alpha-dimethyl phenethylamine	1.0
2,4-Dinitrophenol	1.0	4,4-Methylenebis(2-chloro analiline)	1.0
2,4-Dinitrotoluene	1.0	2-Methol-2-(methylthio) propionaldehyde-o-(methylcarbonyl)oxime	1.0
2,6-Dinitrotoluene	1.0	o,o,o-Triethyl phosphorothioate	1.0
Di-n-octyl phthalate	1.0	tris(2,3-Dibromopropyl) phospahte	1.0
Diphenylamine	1.0	bis(2-Chloro-1-methylethyl) ether	1.0
1,2-Diphenylhydrazine	1.0	sym-Trinitrobenzene	1.0
Di-n-propylnitrosamine	1.0	Benzo(a)pyrene	1.0
Ethyleneimine	1.0	Chlornaphazin	1.0
Ethyl methanesulfonate	1.0	bis(2-Chloroisopropyl) ether	1.0
Fluoranthene	1.0	Hexachloropropene	1.0
Hexachlorobutadiene	1.0	Isophorone	1.0
Hexachlorocyclopentadiene	1.0	Acenaphthene	1.0
Hexachloroethane	1.0	Fluorene	1.0
Ideno(1,2,3-cd)pyrene	1.0	Anthracene	1.0
Isosafrole	1.0	Pyrene	1.0
Malononitrile	1.0	o-Nitrophenol	1.0
Melphalan	1.0	2-Methylnaphthalene	1.0
Methapyrilene	1.0	Phenanthrene	1.0
Butyl benzyl phthalate	1.0	Benzyl alcohol	1.0
2-sec-Butyl-4,6-dinitro phenol	1.0	Benzo(k)fluoranthene	1.0
Chloroalkyl ethers	1.0	Benzo(ghi)perylene	1.0
2-Methyllactonitrile	1.0	Dinoseb	1.0
Metholomyl	1.0	Diallate	1.0
2-Methylaziridine	1.0	N-Nitrosodiphenylamine	1.0
3-Methylcholanthrene	1.0	Dibenzofuran	1.0
2,4,6-Trichlorophenol	1.0	Acenaphthalene	1.0
Methyl methacrylate	1.0	o,o-Diethyl o-2-pyrazinyl phosphorothionate	1.0
Methyl methanesulfonane	1.0	Isodrin	1.0
1,4-Naphthoquinone	1.0	o-Nitroaniline	1.0
1-Naphthylamine	1.0	m-Nitroaniline	1.0
2-Naphthylamine	1.0	4-Nitroquinoline-1-oxide	1.0
p-Nitroaniline	1.0	Acetone	1.0
Nitrobenzene	1.0	Thiuram	1.0
p-Nitrophenol	1.0	Methylthiouracil	1.0
N-Nitrosodi-n-butylamine	1.0	p-Dimethylaminoazobenzene	1.0
N-Nitrosodiethanolamine	1.0	3,3'-Dimethybenzidine	1.0
N-Nitrosodiethylamine	1.0	2,4,5 Trichlorophenol	1.0
N-Nitrosodimethylamine	1.0	Toluenediamine	1.0
N-Nitrosomethylethylamine	1.0		
N-Nitroso-n-methylurethane	1.0		
N-Nitrosomethylvinylamine	1.0		
N-Nitrosomorpholine	1.0		
N-Nitrrosiperidine	1.0		
N-Nitrosopyrrolidine	1.0		
5-Nitro-o-toluidine	1.0		
Pentachloronitrobenzene	1.0		
Phenacetin	1.0		
p-Phenylenediamine	1.0		
Phthalic acid esters	1.0		
2-Picoline	1.0		
Reserpine	1.0		
Resorcinol	1.0		
o-Toluidine	1.0		
Safrole	1.0		
2,3,4,6-Tetrachlorophenol	1.0		

Table 3. Requested Analyses, Composite Samples. (sheet 3 of 3)

Constituent	CDL	Constituent	CDL
Gamma scan, pCi/g			
Sodium-22	0.02		
Potassium-40	0.35		
Cobalt-60	0.02		
Zirconium-95,niobium-95	0.03		
Ruthenium-106	0.17		
Cesium-134	0.02		
Cesium-137	0.02		
Cerium-144,praseodymium-144	0.18		
(Others relative to energy and photo yield of cesium-137)			
Strontium-90, pCi/g	0.005		

[a]EPA 1986
BHC = benzene hexachloride
CDL = contract detection limit
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane

4.0 FIELD OBSERVATIONS

4.1 WILDLIFE

Numerous waterfowl use the wet areas of B Pond. The sampling period did not coincide with the peak periods of waterfowl populations in the area. Nevertheless, the presence of very young Coots indicated some waterfowl were utilizing the site for nesting. Great Blue Herons were frequently observed in the 3C Pond trenches. Small goldfish were readily available there. Minnows were also observed while sampling the upper portion of the 216-B-3-3 Ditch. Clams were also present in the ditch. Notable emergences of mayfly adults took place from the B-3 Pond during the sampling effort, but there was a lack of ichthyic surface activity. One snake was observed. Deer tracks could be found in the vicinity of the site. No wildlife was observed within the dry engineered confines of either the 3B Pond or the Contingency Pond.

4.2 VEGETATION

Plant communities bordering and within the sampled areas did not appear highly unusual or indicative of adverse environmental effects due to water-borne contaminates. Vegetation was virtually absent in the Contingency Pond and 3B Pond; however, there was also a lack of topsoil in these areas. Vegetation was clearly less developed in association with 3A and 3C Ponds (newer structures) than around the B-3 Pond. There was a lack of vegetation on the higher ground between the trenches in 3C Pond as well as the drier ends of the trenches. Though sampling took place in the latter part of the summer, there were no significant algal blooms observed. Some submerged macrophytes were visible from the sampling platform in the B-3 Pond. Periphyton appeared thickest in the shallow, warm infiltration trenches of 3C Pond.

The plant community at the native background sample sites differed significantly from those of the pond areas. Plants in the native areas were those common to the surrounding desert -- drought tolerant and drought avoidant species. The vegetation was composed of riparian and aquatic species in the TSD. The differing vegetation not only emphasized that the physical environments were characteristically different, but that both the physical and biological influences on the soil were also different. At the native background sites, the soil was undisturbed. Topsoil was in place. Coarse and fine sand constituted a larger proportion of the total mass than the other areas. There was notably less cobble than within the engineered confines of B Pond or Contingency Pond.

4.3 WEATHER

During sampling collection, the weather was very dry with temperatures generally in the 80°F range. Winds were usually below 15 miles per hour, but at times, particularly as 3C Pond sampling was being completed, ranged

to approximately 25 miles per hour. Use of the sampling craft on the B-3 Pond and 3A Pond was restricted by practical and safety concerns to periods with winds less than 10 miles per hour.

4.4 GEOLOGY

The sediment sampled in the B-3 Pond and 3A Pond consisted primarily of medium to coarse sand overlain by fine sands and silts. Fine sand and silt were more prevalent at these sites than in the rockier 216-B-3-3 Ditch and 3C Pond. The Contingency Pond and 3B Pond structures are mostly cobble gravel with relatively small fractions of sand. Throughout B Pond, organic matter was much more prevalent where water was available (216-B-3-3 Ditch, B-3 Pond, 3A Pond, and the trenches of 3C Pond). Background sites in undisturbed native areas surrounding B Pond lacked the abundance of cobbles, which were chiefly composed of sand and silty sand.

The overlying soil of the Hanford Site is a very young soil by pedogenic standards. The arid climate reduces mineral weathering and soil forming processes. Lack of rainfall reduces the transport of ions to lower horizons in the soil profile. Evaporation can leave enhanced concentrations of easily exchanged elements on or near the surface.

Major minerals in the general area of B Pond as determined from thin section microscopic analysis (Westinghouse geological determination) and X-ray florescence analysis (Hooper and Swanson 1990, p 71) are polycrystalline and monocrystalline quartz, potassium feldspars, plagioclase, and basalts. Major elements found in the minerals of Hanford Site soils include magnesium, calcium, sodium, aluminum, potassium, iron, titanium, and silicon. As rocks decompose from weathering to form soil, the elements change in concentration, proportional composition, and structural arrangement.

4.5 MISCELLANEOUS

The water present in B Pond was clear. The current was strong in the 216-B-3-3 Ditch and the inflow to the infiltration trenches of 3C Pond. No unusual colors or odors were associated with the water; however, a decaying organic odor was noticed while collecting the samples from 3A Pond. An HNU photoionization detector showed an inconsistent reading as high as 1 part per million (the instrument detects total concentrations of many organic and some inorganic gases, but compound identification is not possible). Another sample from the B-3 Pond in about 10 feet of water was also noted as having an organic odor.

5.0 DISCUSSION OF BACKGROUND

The physical and temporal boundaries of background, the representativeness of the TSD, and whether or not the differences between values from the site and the defined background imply a detrimental

condition need to be considered. This section highlights how some of the 'background' issues have been addressed to this point in Phase 1 sampling and analysis.

The waste disposal operations related to B Pond are the reason for the attention of this study to characterize the sediments. RCRA closure requires that action be taken. Site characterization and removal of all waste from the site, and/or isolation of waste detrimental to human health or the environment has been described as the generic goal of the overall RCRA closure activity.

The concentrations derived from a defined background are one possible type of criteria by which the need for action can be assessed. The desirability of background for defining contamination makes some assumptions. One of these is that organisms have at least a tolerance for this background condition. The ecology of a waste site will always be different than that of background. Value judgments are inherent in defining contamination. Cleanup equaling loss of a nutrient source, loss of habitat, reproductive failure, loss of symbionts, changes in microclimate, etc., can be more significant to individual populations than legal definitions of contamination. Definitions of contamination that only reference maximum chemical concentrations are incomplete in an ecological context. All life forms have different susceptibilities, tolerances, and optimum concentration ranges of any given potential 'pollutant'. Even though a given pollutant may not affect a target population directly, it may have significant indirect effects.

For Phase 1, the criterion of contamination was to be background as determined by sampling from sites adjacent to the TSD. One type of site was a dry 2-year old excavated cobbly basin adjacent to the TSD. This is the area referred to as the Contingency Pond. It has never had waste water delivered to it. It is an altered natural environment, constructed similar to most of the B Pond facility and in the same area, but unused for waste disposal. The second type of background site was the native desert environment peripheral to B Pond. These sites are frequently referred to as sagebrush sites to differentiate them from the Contingency Pond. The soil was not exposed to the waste water delivered to the pond areas. None of the sampled soils had been visibly altered by human activities. The chosen sample collection points were more widely spread about the TSD than the first type of background site. Five locations from each background area were selected for sampling.

It was not anticipated that the chemical composition would be different between the two areas. Both sites were believed to be derived from the same parent material, and part of the same geologic formation. Analytical results, however, did show different elemental compositions between the random Contingency Pond sites and those selected by professional judgement from the native desert. Calcium serves as one example of the differences. From the five sites in the Contingency Pond, reported values were 6,830 to 9,923 µg/g (mean 8,700, coefficient of variation 17.2%). From the five sage sites, values ranged from 3,172 to 3,872 µg/g, (mean 3,555, coefficient of variation 8.02%). An equal number of sites were examined in each case, but the data suggested that the sampled parent populations were not equivalent.

Variability is inherent in nature. Both variability and concentration figure into the calculation of pollution defining threshold values. The fact that the two selected backgrounds were compositionally different should not automatically eliminate consideration of each. Some of the natural factors that affect soil composition are parent material, physical and chemical weathering, wind and water transport, geologic processes, climate, plants, and animals -- including microscopic species of the latter two.

For this report, it was determined that the values from the native sagebrush habitat would be utilized for TSD site comparisons with threshold values from the Contingency Pond available for user comparison. The choice of comparing to background values derived from the sagebrush sites is more conservative than using those values derived from the Contingency Pond. The majority of analytes have lower threshold values when calculated from the sagebrush background. For instance, of all the compared ICP total metals, only aluminum and chromium have higher threshold values. This is not an unbiased comparison to background. It may result in flagging locations that are not abnormal in terms of a broader background population. Both are local backgrounds. Neither background is recent pond sediment. Nutrient cycling, weathering, primary productivity, and physical environment are all drastically different between the surrounding desert and an aquatic environment.

6.0 COMPARISONS TO BACKGROUND

Comparisons to background were made using a tolerance interval approach. Analysis followed a scheme similar to that outlined in the EPA guidance *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (EPA 1989a, p 5-19 to 5-22). An analysis of variance (ANOVA) approach was not used because individual values are of prime concern; ANOVA is concerned with mean concentrations.

The tolerance interval approach allows comparison of individual values. It is most useful where there are not large natural spatial variations in the analytes of interest. The tolerance interval approach uses the background data to generate a confidence interval estimate of a quantile. For a one-sided confidence interval, a value is established to below which at least a specified proportion of the population lies with a specified confidence coefficient. EPA recommends using a 95% coverage ratio with a 95% confidence coefficient for RCRA groundwater monitoring (EPA 1989a, p 5-19). Tolerance intervals can be constructed assuming that the data or the transformed data are normally distributed. Nonparametric tolerance intervals can be constructed, but require such a large number of observations for similar coverage and confidence as to be impractical. The parametric tolerance interval is sensitive to departures from the assumed distribution.

The assumption that the data are normally distributed with an unspecified mean and variance may be tested using the Shapiro-Wilk test statistic. A discussion of the computation and use of statistic is provided by Gilbert (1987). Table 4 displays the Shapiro-Wilk test statistic for many of the analytes of the Phase 1 sagebrush area background samples. Unfortunately, the small number of Phase 1 background observations do not provide much data for definitive conclusions. For those analytes where all or nearly all background values are below CDL, the statistic was not calculated. Based on the available data, the assumption of a normal distribution was rejected for ammonium, zinc, and zirconium. If the normal assumption was rejected a lognormal assumption was tested. In this case, the test was applied to the natural logarithms of the observations. Ammonium values may be lognormally distributed. The lognormal assumption is rejected for zinc and zirconium.

The upper tolerance limit is calculated for most samples based on the normal assumption. This means that, given the assumption of a normal distribution and a 95% level of confidence, at least 95% of the background population is expected to be less than the tolerance limit. Using this approach, the upper tolerance limit is equal to the sum of the background average and a factor (K) times the background standard deviation. The value used for K is 4.210 and corresponds to a sample size of five for the stated coverage and confidence (Gilbert 1987, p 256). The calculated upper tolerance limits will be used as the threshold values. For ammonium, the natural antilog of the threshold value based on natural logarithm transformed data is compared to site values. In the cases of zinc and zirconium, a nonparametric approach is used. Here, the threshold value is set equal to the highest of the five observed background concentrations. The coverage and confidence is much less than using the normal assumption for the same sample size. Using a nonparametric, one-sided tolerance interval based on only five random samples, it could be expected with 95% confidence that at least 50% of the background population is less than the observed maximum value. Coverage of 95% and a confidence level of 95% would require a sample size of 59 (Conover 1980, p 447).

When data below the administratively determined CDL were available for calculating a limit, they were used with caution. The threshold values based on such data may have associated <u>relative</u> errors larger than those analytes for which quantitation is more certain. This is a matter of degree. The absolute errors may still be quite small. Substitution of arbitrary values for real data is not a preferable alternative (see Gilbert 1987, p 178). If the calculated threshold value was below a respective CDL, the CDL became the defacto threshold value since the project had established these a priori as minimum required levels (the project QA plan [Roos and Woodworth 1989] established minimum project requirements). The laboratory was accountable for individual values to that limit. When the threshold value exceeded the CDL, the comparisons were made in the usual fashion.

Table 4. Shapiro-Wilk W Test for Normality ($W_{0.05}$).

Analyte	W-statistic		Analytes not calculated
	Raw data[a]	Log values[b]	
Ammonium	0.749 Reject	0.863 Accept	Selenium
Arsenic	0.842 Accept		Cyanide
Lead	0.906 Accept		Mercury
Sulfide	0.979 Accept		Thallium
Chloride	0.898 Accept		Bromide
Nitrite	0.958 Accept		Fluoride
Nitrate	0.792 Accept		Arsenic[c]
Phosphate	0.854 Accept		Barium[c]
Sulfate	0.935 Accept		Cadmium[c]
Gross alpha	0.907 Accept		Chromium[c]
Gross beta	0.902 Accept		Lead[c]
Aluminum	0.877 Accept		Selenium[c]
Cadmium	0.923 Accept		Silver[c]
Calcium	0.946 Accept		Mercury[c]
Chromium	0.790 Accept		Boron
Cobalt	0.892 Accept		Molybdenum
Copper	0.906 Accept		
Iron	0.939 Accept		
Lithium	0.901 Accept		
Magnesium	0.969 Accept		
Manganese	0.900 Accept		
Nickel	0.781 Accept		
Potassium	0.953 Accept		
Silver	0.957 Accept		
Sodium	0.852 Accept		
Strontium	0.804 Accept		
Titanium	0.951 Accept		
Vanadium	0.897 Accept		
Zinc	0.646 Reject	0.650 Reject	
Zirconium	0.739 Reject	0.745 Reject	
Acetone	0.816 Accept		

[a]Null hypothesis: Distribution normal
[b]Null hypothesis: Distribution lognormal
[c]EP toxicity.

Multiple observations (field and/or laboratory duplicates) from a single jar or bowl of soil were not used as independent estimates of the overall site population parameters. Most locations in the study were represented by a single estimate. When multiple values were available, they were used to generate estimates of the population from which they were randomly allocated by using their mean. Laboratory duplicates represented the multiple observations on the individual sample. Likewise, field duplicates represented multiple observations at the specific sampling location. Thus, if sampling point values for a hypothetical analyte were 22, 10, 44, 25, and at a field-duplicated point (48 and 46), the overall population mean and standard deviation would be calculated based on the first four values and 47 as the representative fifth value.

The background threshold value for each analyte is recorded in Appendix A. Each was compared to every observed value. All observations exceeding their threshold value were recorded. Background observations from the unused dry contingency basin were also compared for reference. Only sample observations exceeding the threshold value are recorded in the list.

An asterisk in the far right-hand column of Appendix A denotes those field and/or laboratory duplicate samples whose respective average was less than the threshold value.

7.0 TABULATION OF DATA

7.1 DETECTION LIMIT AND OTHER QA FLAGS

Appendix B is a compilation of total metals data using a strong acid digestion and analysis by ICP. Appendix C contains data collected for other analyses. Not included in the summaries are data for those analytes that were entirely below detection limits. "Detection limit" as used throughout this report refers to a CDL, except where noted. A CDL is commonly used as a minimum goal required by a laboratory hired to do chemical analyses. In many cases this limit is derived directly from the prescribed standard procedure.

There are several ways of defining detection limits. The limit of detection (LOD) is a commonly used term referring to the mean plus three standard deviations of the signal from a reagent blank (this definition is clearly limited to those determinations that do not involve subtraction of a blank). The term method detection limit (MDL) is another form of detection limit definition based on a sample that actually contains the analyte at low levels. The EPA uses a multiple of the standard deviation of such observations to define MDL (EPA 1986, Revision 1, p one-16). The limit of quantitation (LOQ) is calculated from reagent blanks like an LOD but is a factor of 10 standard deviations from the mean of the blanks instead of three. Ideally, all measurements would be in excess of a quantitation limit for the method. Data in the appendices are flagged based on reagent blanks analyzed during the same period as Phase 1 data, and on the silica sand field blanks.

This report has attempted to present all data for those analytes above CDLs and appearing as potential contributors to any hazardous waste inventory at B Pond. Beryllium, barium, antimony, silicon, and tin are not listed among the elements disposed at B Pond according to the 216-B-3 closure plan (DOE-RL 1990, p 4-1 to 4-14). These five analytes are <u>only</u> considered in the Analyte Summary (Section 8), with the exception of EP-toxicity barium. In some cases, analytes are shown even though all site data were below CDL (most such data are summarized in Section 8). Much of the data presented in the appendices are below CDLs and flagged as such. The information was obtained from chemist bench sheets and should be considered as auxiliary, semi-quantitative information. Values calculated need to be used appropriately. Information below these limits can be useful to the data analyst.

Reagent blank data for the period of analyses, adjusted for nominal soil sample size, and data from the silica sand field blanks were scrutinized for evidence as to whether or not the contract laboratory was meeting CDL goals. There is evidence that the CDLs for total lead, mercury, sulfide, and selenium were ambitious. Except mercury, each estimated LOD for these analytes was below it's CDL, but LOQs were slightly in excess of these limits. Background noise on which LOD and LOQ are dependent can become magnified by dilution factors or inversely sample size used in the analysis and subsequent calculations. This has significance in the case of B Pond total mercury estimates. Based on nine reagent blanks and a nominal sample size of 0.2 g, mercury had an LOD of 0.39 µg/g and an LOQ of 2.92 µg/g -- both in excess of the 0.2 µg/g CDL.

Another purpose of the data tables in Appendices B and C are to help integrate a variety of QA flags with the numerical data. Reagent blanks, field blanks, MS/MSD, estimates of detection or quantitation limits, surrogate recoveries, etc., are used in constructing the tables. Laboratory quality control (QC) was not performed on a sample delivery batch basis but on a process basis. Because sample delivery groups were not traceable through the analytical process, flags for blanks and matrix recoveries were done on a per-analytical-day basis. Field blanks, though collected with a sample, were not necessarily analyzed the same day as associated samples, which makes batch interpretation very difficult. A single problem with a QA sample may generate flags on multiple analytical dates, unless there was contrary evidence to disassociate that QA anomaly with collection, extraction, <u>and</u> analytical dates. Holding times originate from the RCRA groundwater monitoring limits. The holding times are based upon liquid samples.

7.2 ACCURACY AND PRECISION ESTIMATES

Accuracy was assessed by MS and MSD on a project basis. Table 5 lists accuracy achieved on samples submitted in Phase 1. The average percent recovery, standard deviation of the percent recovery, and number of spikes (observations) is displayed. The laboratory determined which samples to spike as part of their routine QC.

Precision was assessed by field duplicates. No field duplicates were submitted for the analyses done on composite samples. Precision estimates are shown in Tables 6a and 6b. Both standard deviation and relative standard deviation are shown. Relative variability increases dramatically below the CDL, but is usually stable over a wider range than absolute variability. For those analytes where variability markedly trends upward with concentration, a graph is provided in Appendix D to help assess precision at the concentration of interest. A normal regression curve is not drawn through the points because standard deviation would not be expected to be normally distributed.

Table 5. Summary of Matrix Spike/Matrix Spike Duplicate Results.

Analyte	Spike Level		% Recovery					
			Soil/Sediment			Water		
	Soil, µg/g	Water, µg/L	Avg	Std Dev	n	Avg	Std Dev	n
EP Toxic Metals[a]								
Arsenic, µg/L	1,000	1,000	87.8	18.92	16	100.1	0.41	2
Barium, µg/L	2,000	2,000	103.3	4.87	18	103.8	0.81	2
Cadmium, µg/L	50	50	100.8	4.26	18	110.0	2.83	2
Chromium, µg/L	200	200	103.1	6.86	18	102.3	1.06	2
Lead, µg/L	500	500	95.1	4.91	16	103.1	0.14	2
Selenium, µg/L	1,000	1,000	94.8	6.75	16	99.8	1.48	2
Silver, µg/L	50	50	91.9	5.37	18	83.0	1.41	2
Mercury, µg/L	0.3	0.3	100.0	4.71	4	100.0	0.00	2[c]
Metals								
Aluminum	400		102.0	7.07	2			
Antimony	50		55.6	13.22	16			
Barium	400		96.2	4.37	16			
Beryllium	5		94.1	3.70	16			
Boron	50		84.6	4.11	16			
Cadmium	5		103.0	15.66	16			
Calcium	1,000		113.8	12.40	6			
Chromium	20		96.8	10.40	16			
Cobalt	50		93.8	6.23	16			
Copper	25		96.6	13.11	16			
Iron	100		135.0	65.05	2			
Lithium	50		101.5	4.50	16			
Magnesium	200		103.5	12.01	4			
Manganese	50		103.3	9.95	6			
Molybdenum	50		93.5	3.48	16			
Nickel	50		92.1	6.85	16			
Potassium	400		108.1	14.90	16			
Silicon	50		105.3	22.48	3			
Silver	5		83.9	11.86	16			
Sodium	800		110.8	10.63	16			
Strontium	50		107.2	8.08	16			
Tin	50		91.8	4.33	16			
Titanium	50		101.0	4.24	2			
Vanadium	50		118.9	19.59	16			
Zinc	50		100.7	11.93	16			
Zirconium	50		99.4	8.62	16			
Arsenic	5	50	83.7	5.12	14	90.0	2.83	2
Lead	5	50	95.1	6.15	14	95.0	1.41	2
Mercury[a]	1	0.3	110.0	8.94	16	101.7	1.91	4
Selenium	5	50	91.3	3.91	14	101.0	1.41	2
Thallium	5	50	92.6	5.73	14	89.0	1.41	2
Ions								
Cyanide	5	100/50	92.6	4.33	14	99.4	0.28	2
Sulfide	100	5,000	74.7	15.81	18	85.3	0.85	2
Ammonium	20	200	81.8	14.50	16	108.5	0.71	2
Bromide	1	1,000	105.1	9.51	20	102.7	0.35	2
Chloride[b]	1	1,000	106.4	7.48	18	103.5	0.71	2
Fluoride	1	1,000	74.6	16.03	20	95.7	1.20	2
Nitrate	4	4,000	97.1	10.77	20	97.3	0.34	2
Nitrite	1	1,000	97.5	36.07	20	102.4	1.48	2
Phosphate	4	4,000	54.8	29.36	20	91.5	2.12	2
Sulfate[b]	4	4,000	98.5	12.57	18	99.2	0.07	2
Volatiles								
Benzene	0.2 to 0.5	20	94.1	10.8	18	136.0	7.1	2
Toluene	0.2 to 0.5	20	93.7	12.2	18	128.0	9.9	2
Trichloroethene	0.2 to 0.5	20	91.9	11.5	18	127.5	7.8	2
Chlorobenzene	0.2 to 0.5	20	103.0	11.3	18	123.5	9.2	2
1,1-Dichloroethene	0.2 to 0.5	20	74.6	21.8	18	129.5	12.0	2

[a]Statistics for water matrices derived from contract laboratory QC report for first quarter FY90. (Matrix spike recoveries were not reported for B Pond-specific water samples.)
[b]Excludes B-105 soil matrix spike/matrix spike duplicates due to level in sample.

Table 6a. Field Duplicates/Precision
B Pond Phase 1 Soil/Sediment Samples (11 Duplicate Pairs).

Analyte	Absolute Std Dev	Relative Std Dev, %	Comments
EP Toxic Metals, µg/L			
Arsenic	8.42	NC	All below CDL
Barium	20.1	9.71	All below CDL
Cadmium	4.21	76.2	All below CDL
Chromium	1.67	NC	All below CDL
Lead	3.81	NC	All below CDL
Selenium	13.1	NC	All below CDL
Silver	0.52	NC	All below CDL
Mercury	NC	NC	Reported as <CDL
Metals, µg/g			
Arsenic	0.41	21.7	
Lead	35.6	31.7	See Appendix D
Mercury	0.33	39.6	See Section 8.1.3
Selenium	0.06	58.0	All below CDL
Thallium	0.05	45.7	All below CDL
Aluminum	963.0	15.0	
Boron	0.1	NC	All below CDL
Cadmium	0.690	9.76	
Calcium	532.0	9.36	
Chromium	1.85	21.5	
Cobalt	0.795	10.0	
Copper	1.62	10.6	
Iron	2,273.0	9.58	
Lithium	0.823	12.5	
Magnesium	454.0	9.20	See Appendix D
Manganese	54.3	14.7	
Molybdenum	NC	NC	All below CDL
Nickel	1.77	18.9	
Potassium	159.0	17.8	
Silver	0.20	90.3	
Sodium	26.4	10.2	
Strontium	1.97	8.08	
Titanium	201.0	11.8	
Vanadium	5.90	12.3	
Zinc	8.60	14.8	See Appendix D
Zirconium	2.84	12.5	See Appendix D
Ions, µg/g			
Cyanide	0.013	27.3	All below CDL
Sulfide	0.778	147.0	All below CDL
Ammonium[a]	1.17	50.8	See Appendix D
Bromide	0.00	NC	All below CDL
Chloride	0.457	29.6	See Appendix D
Fluoride	0.082	18.4	All below CDL
Nitrate	0.179	68.3	All below CDL with two exceptions
Nitrite	0.022	14.7	All below CDL
Phosphate	0.347	19.1	All below CDL with one exception
Sulfate	8.61	19.4	See Appendix D
Radiological, pCi/g			
Gross alpha	0.655	39.0	
Gross beta	3.94	5.89	
Volatiles[b], µg/g (All <SW-846 PQL)			
Acetone	0.036	63.7	7 of 22 observations <CDL
Methyl ethyl ketone	0.0024	5.61	All below CDL

[a]Values given are on the untransformed data. The standard deviation and coefficient of variation on the natural-log transformation of the data are 0.299 and 42.9%, respectively.
[b]Based on nine paired duplicates (two pair lost due to freezing).
CDL = contract detection limit.
NC = not calculated.
PQL = practical quantitation limit.

Table 6b. Field Duplicates/Precision Water Samples (One Duplicate Pair)[a].

Analyte	Absolute Std Dev, µg/L	Relative Std Dev, %	Analyte	Absolute Std Dev, µg/L	Relative Std Dev, %
EP Toxic Metals			Ions		
Arsenic	2.83	20.2	Cyanide	NC	NC
Barium	1.41	4.71	Sulfide	NC	NC
Cadmium	0.00	NC	Ammonium	NC	NC
Chromium	0.00	NC	Bromide	NC	NC
Lead	8.49	141.0	Chloride	53.0	2.0
Selenium	0.71	4.29	Fluoride	2.1	1.5
Silver	0.71	141.0	Nitrate	149.0	64.4
Mercury	0.00	NC	Nitrite	NC	NC
			Sulfate	25.5	0.0
Metals					
Arsenic	0.0007	47.1	Radiological, pCi/L		
Lead	0.0007	141.0			
Mercury	0.00	NC	Gross alpha	0.54	19.0
Selenium	0.0007	141.0	Gross beta	2.16	101.6[b]
Thallium	0.0007	20.2			
			Volatiles (none detected)		

[a]Data used to compute precision were <CDL except for chloride, sulfate, and gross alpha
[b]One of two lab-estimated analytical error (2 sigma)
CDL = contract detection limit.

8.0 ANALYTE SUMMARY

8.1 SUMMARY OF METAL ANALYSES

Metals requested for analysis (Tables 2a and 2b) will be described relative to holding time, concentrations exceeding the threshold value, and CDL. According to RCRA, B Pond is categorized as a surface impoundment, which is a depression or diked area used for storage, treatment, and disposal of hazardous waste in liquid or semisolid form. The compliance of such a facility is influenced by 40 CFR 264 (EPA 1989b). Metals listed in *Groundwater Monitoring List*, 40 CFR 264, Appendix IX, will be of priority concern. The following list represents those metals requested for analysis using ICP analysis, Method 3050/6010; atomic absorption/graphite furnace analysis, Method 7421; and cold vapor atomic absorption analysis, Method 7470. The metals of the EPA groundwater monitoring list (EPA 1989b) are underlined.

aluminum	cadmium	lead	nickel	strontium	zirconium
antimony	calcium	lithium	potassium	thallium	
arsenic	chromium	magnesium	selenium	tin	
barium	cobalt	manganese	silicon	titanium	
beryllium	copper	mercury	silver	vanadium	
boron	iron	molybdenum	sodium	zinc	

Aluminum, boron, calcium, iron, lithium, magnesium, manganese, molybdenum, potassium, silicon, strontium, titanium, and zirconium are metals that are common to most soils in concentrations less toxic than other metals. These metals are also easily complexed by other soil components. For these reasons, these metals have been omitted or not included in the *Groundwater Monitoring List*, 40 CFR 264, (EPA 1989b, Appendix IX). These elements are naturally occurring in soil and geologic minerals that eventually undergo dissolution and become components of the soil. Table 7 lists these elements in typical soil concentration ranges throughout the world (Clark and Washington 1924, Swaine 1955, Vinogradov 1959, Jackson 1964, Mitchell 1964, Taylor 1964, Bowen 1966, Lindsay 1979, Barber 1984, and Bohn et al. 1985). The far right column represents the highest value above the background level for that particular element in B Pond.

Apparent from comparing the two sets of data in Table 7, concentrations of those elements, determined by ICP Method 3050/6010 for B Pond, are within normal soil concentration ranges. Amended by the omission from the EPA groundwater monitoring list (EPA 1989b, Appendix IX), the above soil concentrations pose little threat for human, animal, or plant health of B Pond.

The metals from the groundwater monitoring list are listed in Table 8 with respective typical soil concentration ranges throughout the world (Clark and Washington 1924, Swaine 1955, Vinogradov 1959, Jackson 1964, Mitchell 1964, Taylor 1964, Bowen 1966, Lindsay 1979, Barber 1984, Bowen 1979, and Bohn et al. 1985). The far right column represents the highest observed value for that particular element in B Pond. Apparent from comparing the two sets of data in Table 8, cadmium, lead, and mercury total metal concentrations for B Pond are higher than the upper limits of the common ranges for soils and higher than background levels of B Pond. Neither these elements nor arsenic, barium, chromium, selenium, or silver were close to levels demonstrating the characteristic of EP toxicity. Only a single sample in Phase 1 exceeded any respective EP toxic CDL. Except for selenium, CDLs were an order of magnitude below the EP toxic defined levels. The selenium CDL was one-half of the EP toxic defined concentration. A discussion of total cadmium, lead, and mercury, as differentiated from EP leachable, is presented relative to the threshold values and common concentration ranges.

8.1.1 Cadmium

Holding times for the sagebrush site samples were slightly exceeded. This should not significantly affect the results. Concentrations exceeding the threshold value were found in the 3A Pond, B-3 Pond, and B-3-3 Ditch. Of the eight samples taken from the 3A Pond, one was above the threshold value. Of the 30 samples taken from the B-3 Pond, 70% were above the threshold value. Of the 15 samples taken from the B-3-3 Ditch, 20% were above the threshold value. Numerous sites in the 3A Pond, B-3 Pond, and the B-3-3 Ditch exceeded the upper common soil range (7.0 µg/g) found in referenced literature. Background observations were close to this referenced value.

Table 7. Metal Concentrations in Soils.

Element	Common range for soils, µg/g	Highest observed value (Method 3050), µg/g
aluminum	10,000 to 300,000	16,699
boron	2 to 100	<1.0 CDL
calcium	7,000 to 500,000	16,510
iron	7,000 to 550,000	37,479
lithium	5 to 200	16
magnesium	600 to 10,200	7,423
manganese	20 to 3,000	856
molybdenum	0.2 to 5	<4.0 CDL
potassium	400 to 30,000	2,867
silicon	230,000 to 350,000	2,093
sodium	750 to 7,500	465
strontium	50 to 1,000	46
titanium	1,000 to 10,000	2,917
zirconium	60 to 2,000	39

Table 8. Groundwater Monitoring List Metals (EPA 1989a).

Element	Common range for soils, µg/g	Highest observed value (Method 3050), µg/g
antimony	0.2 to 10	<10.0 CDL
arsenic	1 to 50	<background of 4.9
barium	100 to 3,000	116.4
beryllium	0.1 to 40	<0.5 CDL
cadmium	0.01 to 7	22.6
chromium	1 to 1,000	34.5
cobalt	1 to 40	11.2
copper	2 to 100	43.1
lead	2 to 200	618.0
mercury	0.01 to 0.3	15.6
nickel	5. to 500	19.2
selenium	0.1 to 2	<1.0 CDL
silver	0.01 to 5	5.1
thallium	0.1 to 0.8	<1.0 CDL
tin	2 to 200	11.8
vanadium	20 to 500	81.8
zinc	10 to 300	111.3

8.1.2 Lead

Lead was determined using Method 7421, atomic absorption/graphite furnace analysis. This analysis also employs Method 3050 extraction technique. Concentrations exceeding the threshold value were found in B-3 Pond. Of the 30 samples taken from B-3 Pond, 70% were above the threshold value. Three of the 22 sample collection points were above the upper limit of 200 µg/g lead for soils.

8.1.3 Mercury

Mercury was determined using cold vapor atomic absorption analysis. For the five sage site samples, all values for mercury analysis were less than the CDL of 0.2 µg/g. All values less than this were reported by the laboratory only as less-than values. For computation of precision statistics, all mercury less-than values were assigned a value equal to 0.2 µg/g. Values exceeding the CDL were found in the B-3 Pond and the B-3-3 Ditch. Of the 30 samples taken from the B-3 Pond, 73% were above the threshold values. Of this 73%, 95% were above the upper limit of 0.3 µg/g mercury for soils. Of the 15 samples taken from B-3-3 Ditch, 20% were above the threshold values. Of this 20%, 33% were above the upper limit of 0.3 µg/g mercury for soils. Only two observations from the main pond (7.0 and 15.6 µg/g) were above both a dilution adjusted LOQ and LOD.

8.2 IONS

8.2.1 Ammonium

Many holding times were exceeded for this analysis. All background samples exceeded the 28-day allowed holding time by approximately 2 weeks. The threshold value may be biased by the affect of holding time. The MS/MSD associated with these background samples was also the lowest recorded, (average = 57.5%).

Sampling site values in 3A Pond and B-3 Pond exceed the threshold value estimated from available data. All water samples from the main pond were found to have ammonium levels below the 50 µg/L CDL.

Ammonium compounds were among those known to have been disposed of in B Pond. It is doubtful that these contributed to any elevated levels in the present-day sediments at the TSD. Ammonium readily undergoes physical and biological transformations. Ammonia is generated by heterotrophic bacteria as the primary end product of decomposition of organic matter (it is also a major excretory product of aquatic animals). Ammonia in solution is present primarily as ammonium. The measurement procedure does not differentiate between these two forms of nitrogen. High ammonium levels are typically associated with pollution from degradable organic matter. This type of pollution is not a viable concern given the types of effluents disposed of in B Pond. Normal sediment ammonium concentrations still need definition. Ammonification in pond sediments and subsequent sorption to the sediments, as well as accumulation in the interstitial water, would normally contribute to higher concentrations of ammonium in pond sediments than in a desert. Wetzel (1975, p 196) reports fixed and exchangeable ammonium in Wisconsin hard water oligotrophic lake sediments at 66 mg/kg each (total 132 mg/kg). Eutrophic lakes have higher total sediment ammonium concentrations. The maximum concentration found in Phase 1 samples was 16.2 µg/g. This concentration does not appear abnormally high for sediment. Production and decomposition of organic material in either the dry 3B Pond, the dry Contingency Pond, or native desert are inhibited by a lack of moisture.

8.2.2 Bromide

All bromide results were far below the 1.0 µg/g CDL. Accuracy on spike recoveries in soil averaged 105%. Precision on field duplicates was not calculated because all values were equal to zero according to chemist sheets. Clearly this is not to be a future constituent of concern.

8.2.3 Chloride

Chloride was the second most frequently detected anion behind sulfate. Chloride data are presented in Appendix C, Table C-5. The chloride values of the background sagebrush areas are below reliable detection levels. Chloride is introduced via water to B Pond. It does not appear that it is anywhere close to levels of environmental significance. The highest levels were actually found in samples from the dry unused Contingency Pond background site.

8.2.4 Cyanide

All cyanide measurements were below their respective CDL (0.5 µg/g soil, 10 µg/L water). Holding times were exceeded for all sample numbers prior to B-144. This included all background samples and all samples from 3B Pond. The holding time is 14 days. Some samples were held as long as 28 days and three were held for 5 weeks. Samples not exceeding holding times were consistent with those that did exceed holding times - no detectable cyanide. There was no detectable concentration of cyanide in the B-3 Pond water samples. All MS recoveries were acceptable.

8.2.5 Fluoride

Data for fluoride are displayed in Appendix C, Table C-6. Virtually all the data are below the CDL. The only samples reported above 1 µg/g were those with matrix effects. The one exception to this is a 1.3 µg/g value from a sample in the B-3-3 Ditch. Fluoride is not at hazardous levels in the near-surface soils and sediments of B Pond.

8.2.6 Nitrate, Nitrite

The nitrate and nitrite data are presented in Table C-7 of Appendix C. Nitrate is the predominate form of the two. There are no observed concentrations greater than the threshold value in B Pond. Levels are clearly higher in the dry sites of 3B Pond, the background sites, and the two dry sample sites of 3C Pond. The highest nitrate concentration was associated with a native background site.

8.2.7 Phosphate

Phosphate data are displayed in Table C-8 of Appendix C. All site data are below CDL. There are no observed concentrations greater than the threshold values at the site. Levels are higher in the native sage area than the soils and sediments of B Pond. Phosphate should no longer be an analyte of concern in the near-surface soils and sediments of B Pond.

8.2.8 Sulfate

Sulfate data are displayed in Appendix C, Table C-9. The graph of field duplicates, Appendix D, shows a strong correlation between variability and concentration over the ranges found at B Pond. Under the normal distribution, the mean and standard deviation are uncorrelated. If the mean and standard deviation estimates generated from repeated sampling are proportional to each other, then the parent population is not normally distributed. A lognormal tolerance interval would be a better choice to apply in this case. Although field duplicate data were not restricted to background sites, they suggest that the tolerance interval should not be based on a normal distribution. A lognormal distribution would result in a higher threshold value. Only observations associated with the B-3 Pond would exceed value. Note that in either case, the unused Contingency Pond is far higher in sulfate than the TSD unit. This anion can be found in higher concentrations from natural weathering of soil materials and other processes than is found in B Pond.

8.2.9 Sulfide

Only two samples were above the CDL (10 µg/g) among all sites. Sample B-179 from 3C Pond was reported at 10.9 µg/g and sample B-198 from 3A Pond was reported at 25.7. All background samples were analyzed 1 to 2 weeks after holding times had expired. Both associated pairs of MS/MSD analyzed that day had low-spike recoveries (58%/60% and 50%/49%). The low recovery was attributed by the laboratory to a matrix effect. The average of either type of background site was below one-half the CDL. A LOD calculated from the five reagent blanks, (average + 3s), is below the CDL, but an LOQ (average + 10s) is equal to 16.7 µg/g.

The holding time of 7 days was exceeded by 1 to 2 weeks for samples B-101 through B-142. Samples B-152 to B-163 and B-184 to B-193 exceeded the holding time by 1 to 4 days. This problem affects all measurements from either background, 3B Pond, and the B-3-3 Ditch. Sample B-118, a sample from the B-3 Pond analyzed 28 days after collection, also had low spike recoveries attributed to matrix effects. Another sediment sample from the B-3 Pond analyzed on the same day had satisfactory recoveries. All water samples analyzed for sulfide were reported below CDL (1 µg/mL).

The data are weak, but do not indicate dangerous concentrations of sulfide. It is a naturally occurring compound in pond sediments and would be consistent with observed concentrations of sulfate in excess of that observed from the sagebrush sites.

8.3 ORGANICS

8.3.1 Chlorinated Herbicides

All composite samples were tested for the herbicides 2,4-D, 2,4,5-T, and 2,4,5-TP (Silvex). The CDL were 1.0 µg/g for each analyte in soil samples and 2.0 µg/L in water. None of the herbicides were found present in any of the samples. The surrogate 2,4-DB was reported slightly out of limits for sample B-162 (60%) and B-169 (44%) versus the 63% to 151% allowable range. Sample B-162 was the composite sample from the lower part of the B-3-3 Ditch. Sample B-169 was a composite containing material from the inlet area of the pond, the deepest sampling location, and one other site. Another aliquot of this sample was reextracted and reanalyzed, and the results were consistent. The laboratory attributed the low surrogate recovery to a matrix effect. The sample was noted to have formed an emulsion during the extraction process. The MS/MSD analyses are not available for B Pond samples. Method performance for soil matrices appears very poor based on reported spike recoveries for the scant data several months prior to and after analysis of B Pond samples. The allowed QC limits referred to previously were established by the laboratory, but it is not clear from the available data that the method was capable of meeting those limits. Phase 1 data do not contradict that the site is clean with respect to the aforementioned herbicides, but the analytical evidence is not conclusive. The volume of water passing through the system and site disposal practices argue against significant quantities of these herbicides being present in the sediments of the pond.

8.3.2 Chloropesticides

Analysis for the chloropesticides consisted of all the analytes listed in Table 3 under the heading "Pesticides, Enhanced". Respective soil and water matrix minimum CDL are also given in Table 3. Several samples required raising the reported less-than value due sample specific matrix effects. Samples B-150, one of five composite sediment samples from the main pond, was associated with a twentyfold increase in reported less-than levels for all analytes. Samples B-133, B-141, and B-169 had detection levels increased tenfold for those analytes with retention times less than 10 minutes. These three composite samples were also from B-3 Pond. Analytes reported to higher detection limits included all four benzene hexachloride (BHC) compounds, heptachlor, heptachlorepoxide, aldrin, and alpha endosulfan. Samples B-199 and B-204 were reported likewise. Additionally, DDE was reported as less than a tenfold increased limit due to matrix effects in these two samples from 3A Pond. Surrogate recoveries for dibutylchlorendate and/or 2,4,5,6-tetrachloro-meta-xylene were all within acceptable limits. A MS/MSD was performed on sample B-181. Spikes of endrin, lindane (gamma BHC), DDT, heptachlor, dieldrin, and aldrin at 0.2 to 0.5 µg/g were performed. Recoveries of endrin were high; however, the problem was later traced to interference in the standard (high chlorobenzilate concentration). All remaining spikes had acceptable recoveries that ranged between 95 and 126%. Phase 1 data supports the initial perceptions that the chloropesticides are not a serious constituent of concern in the soil and sediments of B Pond.

8.3.3 Phosphorous Pesticides

Phosphorous pesticides analyzed for include tetraethylpyrophosphate, carbophenothion, disulfoton, dimethoate, methylparathion, parathion, and phorate. The soil CDL was 1.0 µg/g for all except dimethoate, which was 2.0 µg/g. Water CDLs were 2.0 µg/L for all compounds. No compound was reported at or above it's respective limit. A MS/MSD was performed on sample B-181. The respective recoveries were an acceptable 76 and 88% using a spike level of 2.0 µg/g. A spike was not performed on the single B Pond water sample submitted for this analysis, but the laboratory QC-report for the respective quarter shows 10 MS during the quarter; all were acceptable and ranged 88 to 118%. All holding times were met.

The organophosphate pesticides are known to degrade rapidly in soil, and the rate of degradation increases with moisture content (Guenzi 1974). According to Pionke and Chesters (1973) most organophosphorus insecticides, with the exception of diazanon which degrades in acid, are hydrolyzed in water at alkaline pH. Phase 1 sampling confirmed that the above phosphorus pesticides are not a constituent of concern in the sediments of B Pond.

8.3.4 Polychlorinated Biphenyls

Polychlorinated biphenyls tested for included arochlors 1016, 1221, 1232, 1242, 1248, 1254, and 1260. The minimum CDL for soil is 1.0 µg/g and the minimum for water is 1.0 µg/L. Matrix effects required dilution and upward adjustment of the reported less-than values twentyfold on samples B-150 (for arochlors 1016-1254), and B-199 (for arochlors 1221, 1232, 1242, and 1260). Tenfold adjustments were required on sample B-204 for the same arochlors adjusted in reporting sample B-199. Fivefold dilutions were required due to high background noise in samples B-133 and B-141 for the above arochlors. The remaining seven composite samples did not require dilutions. All samples were reported as less than their respective detection limits. A MS/MSD was run on sample B-192 using arochlor 1254. The recoveries of 116 and 120% were well within the acceptable limits. All surrogate recoveries for each sample were within acceptable limits with one exception. Sample B-127, a composite of three samples from the B-3 Pond, had a low recovery for surrogate dibutylchlorendate (1.3%) and a high surrogate recovery for 2,4,5,6-tetrachloro-meta-xylene (289%). Typical recoveries range 20 to 150%. Other composite samples from the B-3 Pond showed no evidence of contamination. Surrogate recoveries for the single composite water sample from the B-3 Pond were acceptable. A MS was not done on this specific sample, but all six water sample MS reported in the laboratory QC report for the respective quarter were acceptable. Phase 1 data do not indicate polychlorinated biphenyls contamination in the near-surface sediments of B Pond.

8.3.5 Semivolatiles

Bis(2-ethylhexyl)phthalate was the only compound identified from the entire target list of Table 3 for either soil, sediment, or water samples. It was identified at 2.4 µg/g in sample B-169, 3.5 µg/g in B-181, and

6.7 µg/g in B-182. All three results are considered qualified nondetects due to associated blank contamination at 8.0 µg/g. Six compounds were used as surrogates in the analysis, (2-fluorophenol, phenol-D5, nitrobenzene-D5, 2-fluorobiphenyl, 2,4,6-tribromophenol, and p-terphenyl). All surrogate recoveries were within acceptable limits as determined by EPA methods (EPA 1986).

Matrix spikes were run on sediment sample B-127 for several compounds as shown in Table 9. Spike recovery for one compound was less than 10% over its respective advisory limit. All other spike recoveries are within guideline limits. There is no indication that any of the long list of compounds analyzed by this method should continue to be constituents of concern in the near-surface sediments of B Pond.

Table 9. Semivolatile Spike Recoveries.

Compound	Spike added, ng	% Rec	
		MS	MSD
p-chloro m-cresol	100	55.6	54.0
2-chlorophenol	100	49.8	60.3
di-n-butylphthalate	50	127.4[a]	72.8
1,4-dichlorobenzene	50	39.8	45.4
2,4-dinitrotoluene	50	71.6	59.2
n-nitroso-di-n-propylamine	50	47.4	60.2
4-nitrophenol	100	71.2	80.3
pentachlorophenol	100	93.3	79.0
1,2,4-trichlorobenzene	50	61.0	54.2
phenol	100	39.7	36.8
acenaphthene	50	51.0	89.4
pyrene	50	63.6	65.6

[a]Spike recovery outside advisory QC limits for this compound from water.

8.3.6 Volatile Organics

Volatile organics found were generally insignificant. Data for the volatiles are shown in Appendix C, Tables C-10 through C-13. Acetone was present in more samples than any other organic compound. None was reported in the Contingency Pond samples, but all other categories including the field equipment sand blanks, samples from the native sagebrush area, and laboratory blanks had some samples with acetone above the 10 µg/kg CDL.

The two highest concentrations of acetone reported were from samples B-115 (333 µg/kg) and B-129 (160 µg/kg); both samples were from the B-3 Pond. Neither is believed to be representative of actual field conditions. Sample B-129 was a field duplicate. Acetone reported in it's respective pair (B-128) was less than the 10 µg/kg CDL (moisture considered). Sample B-115 not only had the highest reported concentration for acetone, but also the other common laboratory contaminants. The sample had the highest reported values for methyl ethyl ketone and methylene chloride. Some methyl ethyl ketone was thought to originate from fresh paint in one of the laboratory rooms according to the quarterly QC report

supplied by the contract laboratory. Methylene chloride is a common laboratory solvent. The reported sample was run on August 22, 1989; however, the MS/MSD were run prior to this date on August 16, 1989. There are no reported sample results for this date. With the exception of problem sample B-115, all other compounds found in the B-3 Pond are below the practical quantitation guidelines of EPA (1986, Revision 1).

The contract laboratory program guidelines use a 10x rule for evaluating common laboratory contaminants in environmental samples. If an associated blank is noted to have a certain level of a common laboratory contaminant, the data are qualified as a nondetect when they are above the CDL but within 10 times the concentration found in the blank.

A tentatively identified compound (1,3-dichlorobenzene) was found in two 3B Pond samples. One of these samples was a field duplicate. It's respective pair had no detectable trace of the compound. This compound has also been reported in the laboratory QC report as one of several present in water matrix (volatile organic analysis) blanks during the respective quarter and in a soil (volatile organic analysis) blank in the following quarter. The fact that it is at a very low level was not present in any of the other samples from 3B Pond and is known to have potential as a laboratory contaminant suggest it is an artifact of the measurement system.

8.4 RADIONUCLIDES

The data on gross alpha, gross beta, strontium-90 concentration, and gamma activities are listed in Appendix C, Tables C-14 and C-15. These parameters are not regulated under current RCRA regulations. The data are presented in the appendix because they were collected as part of the Phase 1 B Pond investigations. Background samples were not collected, nor were comparisons made. Levels of radioactivity were surprisingly low in the sampled material. The highest observed gross beta measurement (718 pCi/g) was from a 3C Pond sample.

9.0 CONCLUSIONS

Phase 1 characterization efforts show additional work is needed to define acceptable levels of many naturally occurring compounds; particularly where the background is not strictly comparable. Natural spatial and seasonal differences in background may be poorly represented in highly localized background measurements.

Many analytes were investigated in Phase 1. These compounds do not appear present at hazardous levels in the sampled near-surface soils and sediments of B Pond. There are many observations greater than native background in the B-3 Pond. Lead, cadmium, and mercury are believed to be the most significant. Each element was far below levels exhibiting the characteristic of EP toxicity. None of the data indicate that the near-surface soil/sediment would be classified dangerous waste under any of the WAC 173-303, *Dangerous Waste Regulations* (Ecology 1989). Further

characterization activities of the soil profile with depth should pay close attention to QA for volatile organic analysis sampling. Sampling for other organic analyses is not justified based on Phase 1 results.

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APPENDIX A

OBSERVATIONS EXCEEDING BACKGROUND TOLERANCE LIMIT

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APPENDIX A

OBSERVATIONS EXCEEDING BACKGROUND TOLERANCE LIMIT

Appendix A contains a list of observations exceeding a soil background tolerance limit, or when applicable, a regulatory or contract detection limit (CDL). Each observation was compared to determine if it exceeded the stated value. Where possible, an alternate background limit from the contingency pond data is provided. Inorganic analytes appear first in alphabetical order. An asterisk in "Type" column denotes those field and/or laboratory duplicate samples whose respective duplicate average is below the threshold value. (The type "Select" is used to denote those samples from judgement selected locations, i.e., nonrandom). The designation "EP" denotes results of the extraction procedure toxicity analyses for those elements previously defined for that waste characteristic. The EP results immediately follow total metal determinations where applicable. The list concludes with the organic analytes in the following order: volatile organics, semivolatiles, herbicides, pesticides, phosphorous pesticides, and polychlorinated biphenyls.

INORGANIC ANALYTES

Aluminum--Threshold value: 11,238 µg/g
(Alternate background limit: 10,090 µg/g)

Area	Sample	µg/g	Coordinates		Type
B-3 Pond	B-114	12,189	N43400	W43300	Regular
B-3 Pond	B-129	12,327	N43600	W43000	Field duplicate*
B-3 Pond	B-130	14,913	N43500	W42900	Regular
B-3 Pond	B-132	13,370	N43300	W42900	Regular
B-3 Pond	B-134	12,052	N43100	W42800	Field duplicate
B-3 Pond	B-135	12,537	N43100	W42800	Field duplicate
B-3 Pond	B-145	11,424	N43200	W42000	Field duplicate
B-3 Pond	B-146	12,381	N43200	W42000	Field duplicate
B-3 Pond	B-147	14,119	N43200	W41900	Laboratory duplicate
B-3 Pond	B-147	16,699	N43200	W41900	Laboratory duplicate
B-3 Pond	B-148	11,384	N43300	W42000	Regular
B-3-3 Ditch	B-191	11,747	30' from head end		Select

Ammonium--Threshold value: 6.26 µg/g; lognormal TI used
(Alternate background limit: 13.98 µg/g, lognormal TI)

Area	Sample	µg/g	Coordinates		Type
3A Pond	B-198	7.59	N43200	W41550	Regular
3A Pond	B-203	7.79	N43200	W41250	Regular
B-3 Pond	B-114	7.39	N43400	W43300	Regular
B-3 Pond	B-115	8.31	N43500	W43200	Regular
B-3 Pond	B-116	9.62	N43500	W43300	Regular
B-3 Pond	B-118	9.46	N43500	W43400	Regular

Ammonium (Cont)

Area	Sample	µg/g	Coordinates		Type
B-3 Pond	B-119	6.91	N43800	W43400	Regular
B-3 Pond	B-128	7.33	N43600	W43000	Field duplicate
B-3 Pond	B-129	11.77	N43600	W43000	Field duplicate
B-3 Pond	B-130	9.61	N43500	W42900	Regular
B-3 Pond	B-131	10.28	N43400	W42800	Regular
B-3 Pond	B-132	9.23	N43300	W42900	Regular
B-3 Pond	B-134	10.41	N43100	W42800	Field duplicate
B-3 Pond	B-135	11.26	N43100	W42800	Field duplicate
B-3 Pond	B-138	15.59	N43400	W42500	Regular
B-3 Pond	B-139	8.44	N43500	W42500	Regular
B-3 Pond	B-140	10.23	N43700	W42100	Regular
B-3 Pond	B-143	9.9	N42800	W42000	Regular
B-3 Pond	B-145	16.2	N43200	W42000	Field duplicate
B-3 Pond	B-146	15.4	N43200	W42000	Field duplicate
B-3 Pond	B-147	14.5	N43200	W41900	Regular
B-3 Pond	B-148	11.6	N43300	W42000	Regular
B-3 Pond	B-149	7.0	N43500	W42000	Regular
B-3 Pond	B-165	6.7	N43175	W43150	Select
B-3 Pond	B-166	10.2	N43100	W42200	Regular
B-3 Pond	B-168	15.7	N43090	W42000	Select

Arsenic--Threshold value: 4.91 µg/g
(Alternate background limit: 7.59 µg/g)
All observations below threshold

Arsenic, (EP)--Regulatory threshold value: 5 mg/L
CDL = 500 µg/L
No observations >CDL

Barium, (EP)--Regulatory threshold value: 100 mg/L
CDL = 1,000 µg/L
No observations >CDL

Boron--Regulatory threshold value: not calculated (NC)
All values <CDL

Bromide--Threshold value: NC
All values <CDL

Cadmium--Threshold value: 8.23 µg/g
(Alternate background limit: 9.58 µg/g)

Area	Sample	µg/g	Coordinates		Type
3A Pond	B-196	8.7	N42700	W41525	Field duplicate*
B-3 Pond	B-114	9.9	N43400	W43300	Regular
B-3 Pond	B-115	8.8	N43500	W43200	Laboratory duplicate
B-3 Pond	B-115	8.6	N43500	W43200	Laboratory duplicate
B-3 Pond	B-116	9.8	N43500	W43300	Regular
B-3 Pond	B-118	8.8	N43500	W43400	Regular
B-3 Pond	B-119	22.6	N43800	W43400	Laboratory duplicate

Cadmium (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-119	20.8	N43800 W43400	Laboratory duplicate
B-3 Pond	B-129	9.1	N43600 W43000	Field duplicate
B-3 Pond	B-130	11.7	N43500 W42900	Regular
B-3 Pond	B-131	11.2	N43400 W42800	Regular
B-3 Pond	B-132	12.2	N43300 W42900	Regular
B-3 Pond	B-134	15.8	N43100 W42800	Field duplicate
B-3 Pond	B-135	16.1	N43100 W42800	Field duplicate
B-3 Pond	B-146	8.8	N43200 W42000	Field duplicate
B-3 Pond	B-147	11.1	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	12.3	N43200 W41900	Laboratory duplicate
B-3 Pond	B-149	17.9	N43500 W42000	Regular
B-3 Pond	B-168	9.1	N43090 W42000	Select
B-3-3 Ditch	B-154	9.4	1,200' from A-29	Regular
B-3-3 Ditch	B-161	9.2	At A-29 junction	Select
B-3-3 Ditch	B-191	9.5	30' from head end	Select

Cadmium, (EP)--Regulatory threshold value: 1 mg/L
CDL = 100 µg/L
One observation >CDL; none exceeding regulatory limit

Area	Sample	µg/L	Coordinates	Type
B-3 Pond	B-119	259	N43800 W43400	Regular

Calcium--Threshold value: 4,755 µg/g
(Alternate background limit: 14,997 µg/g)

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-194	5,200	N42700 W41525	Field duplicate
3A Pond	B-196	5,948	N42700 W41525	Field duplicate
3A Pond	B-197	9,463	N43000 W41475	Regular
3A Pond	B-200	16,510	N43250 W41625	Regular
3A Pond	B-201	9,684	N43100 W41400	Regular
3A Pond	B-202	11,808	N43150 W41300	Regular
3A Pond	B-203	8,265	N43200 W42500	Regular
3B Pond	B-106	9,331	N42300 W40550	Regular
3B Pond	B-107	7,683	N42300 W40650	Regular
3B Pond	B-108	7,704	N42800 W40650	Field duplicate
3B Pond	B-109	7,366	N42800 W40650	Field duplicate
3B Pond	B-110	9,099	N42850 W40650	Regular
3B Pond	B-111	6,986	N42850 W40950	Regular
3C Pond	B-171	5,154	Ditch 8, 500'	Field duplicate
3C Pond	B-172	5,326	Ditch 8, 500'	Field duplicate
3C Pond	B-175	4,788	Ditch 6, 2,100'	Regular
3C Pond	B-176	5,331	Ditch 5, 1,800'	Regular
3C Pond	B-178	5,818	Ditch 4, 1,200'	Regular
B-3 Pond	B-146	4,906	N43200 W42000	Field duplicate*
B-3 Pond	B-147	5,315	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	5,400	N43200 W41900	Laboratory duplicate
B-3-3 Ditch	B-152	5,090	1,279' from A-29	Field duplicate

Calcium (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3-3 Ditch	B-153	7,211	1,279' from A-29	Field duplicate
B-3-3 Ditch	B-154	9,381	1,200' from A-29	Regular
B-3-3 Ditch	B-158	5,419	950' from A-29	Field duplicate, Laboratory duplicate
B-3-3 Ditch	B-158	4,885	950' from A-29	Field duplicate, Laboratory duplicate
B-3-3 Ditch	B-159	4,889	950' from A-29	Field duplicate
B-3-3 Ditch	B-189	5,259	1,000' from head end	Regular
B-3-3 Ditch	B-191	5,064	30' from head end	Select
Cont. Bkg.	B-101	6,830	N44900 W42800	Regular
Cont. Bkg.	B-102	9,831	N45100 W42600	Regular
Cont. Bkg.	B-103	9,923	N44800 W43500	Regular
Cont. Bkg.	B-104	7,328	N44600 W43200	Regular
Cont. Bkg.	B-105	9,764	N45400 W42500	Laboratory duplicate
Cont. Bkg.	B-105	9,416	N45400 W42500	Laboratory duplicate

Chloride--Threshold value: 1.47 µg/g
(Alternate background limit: 97.0 µg/g; excluding indeterminate results)
NOTE: All sagebrush background observations are <CDL

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-198	1.49	N43200 W41550	Regular
3A Pond	B-201	3.71	N43100 W41400	Regular
3A Pond	B-203	1.67	N43200 W42500	Regular
3C Pond	B-177	7.90	Ditch 3, 300'	Regular
B-3 Pond	B-114	4.04	N43400 W43300	Regular
B-3 Pond	B-115	1.63	N43500 W43200	Regular
B-3 Pond	B-116	2.01	N43500 W43300	Regular
B-3 Pond	B-119	2.05	N43800 W43400	Regular
B-3 Pond	B-130	2.56	N43500 W42900	Regular
B-3 Pond	B-131	5.58	N43400 W42800	Regular
B-3 Pond	B-132	3.60	N43300 W42900	Regular
B-3 Pond	B-134	1.81	N43100 W42800	Field duplicate
B-3 Pond	B-135	3.80	N43100 W42800	Field duplicate
B-3 Pond	B-136	4.22	N43100 W42600	Regular
B-3 Pond	B-140	2.13	N43700 W42100	Regular
B-3 Pond	B-143	1.51	N42800 W42000	Regular
B-3 Pond	B-147	4.74	N43200 W41900	Regular
B-3 Pond	B-168	1.93	N43090 W42000	Select
B-3-3 Ditch	B-154	1.84	1,200' from A-29	Regular
B-3-3 Ditch	B-161	1.83	0' from A-29	Select
B-3-3 Ditch	B-191	2.00	30' from head end	Select
Cont. Bkg.	B-101	21.7	N44900 W42800	Regular
Cont. Bkg.	B-104	17.6	N44600 W43200	Regular

Cont. Bkg. = Contingency pond background.

Chromium--Threshold value: 12.86 µg/g
(Alternate background limit: 8.78 µg/g)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-115	13.6	N43500 W43200	Laboratory duplicate
B-3 Pond	B-115	12.9	N43500 W43200	Laboratory duplicate
B-3 Pond	B-116	13.1	N43500 W43300	Regular
B-3 Pond	B-130	34.5	N43500 W42900	Regular
B-3 Pond	B-131	18.5	N43400 W42800	Regular
B-3 Pond	B-132	18.1	N43300 W42900	Regular
B-3 Pond	B-135	13.5	N43100 W42800	Field duplicate
B-3 Pond	B-138	13.2	N43400 W42500	Laboratory duplicate
B-3 Pond	B-138	12.9	N43400 W42500	Laboratory duplicate
B-3 Pond	B-145	19.5	N43200 W42000	Field duplicate
B-3 Pond	B-146	25.5	N43200 W42000	Field duplicate
B-3 Pond	B-147	26.2	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	29.1	N43200 W41900	Laboratory duplicate
B-3-3 Ditch	B-191	18.6	30' from head end	Select

Chromium, (EP)--Regulatory threshold value: 5 mg/L
CDL = 500 µg/L
No observations >CDL

Cobalt--Threshold value: 9.7 µg/g
(Alternate background limit: 12.8 µg/g)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-138	9.7	N43400 W42500	Laboratory duplicate*
B-3 Pond	B-145	10.2	N43200 W42000	Field duplicate
B-3 Pond	B-146	10.5	N43200 W42000	Field duplicate
B-3 Pond	B-147	9.8	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	10.6	N43200 W41900	Laboratory duplicate
B-3-3 Ditch	B-152	11.2	1,279' from A-29	Field duplicate
B-3-3 Ditch	B-189	9.9	1,000' from head end	Regular
B-3-3 Ditch	B-191	10.3	30' from head end	Select

Copper--Threshold value: 15.96 µg/g
(Alternate background limit: 22.76 µg/g)

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-196	17.2	N42700 W41525	Field duplicate*
3A Pond	B-201	18.6	N43100 W41400	Regular
3A Pond	B-202	20.1	N43150 W41300	Regular
3B Pond	B-108	16.1	N42800 W40650	Field duplicate*
3C Pond	B-171	16.3	Ditch 8, 500'	Field duplicate
3C Pond	B-172	17.9	Ditch 8, 500'	Field duplicate
3C Pond	B-177	18.5	Ditch 3, 300'	Regular
3C Pond	B-180	16.9	Ditch 1, 1,300'	Laboratory duplicate
3C Pond	B-180	16.2	Ditch 1, 1,300'	Laboratory duplicate
B-3 Pond	B-114	20.4	N43400 W43300	Regular

Copper (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-115	19.2	N43500 W43200	Laboratory duplicate
B-3 Pond	B-115	17.3	N43500 W43200	Laboratory duplicate
B-3 Pond	B-116	17.7	N43500 W43300	Regular
B-3 Pond	B-128	17.9	N43600 W43000	Field duplicate
B-3 Pond	B-130	32.9	N43500 W42900	Regular
B-3 Pond	B-131	25.6	N43400 W42800	Regular
B-3 Pond	B-132	16.7	N43300 W42900	Regular
B-3 Pond	B-135	17.6	N43100 W42800	Field duplicate
B-3 Pond	B-138	17.7	N43400 W42500	Laboratory duplicate
B-3 Pond	B-138	16.7	N43400 W42500	Laboratory duplicate
B-3 Pond	B-145	18.2	N43200 W42000	Field duplicate
B-3 Pond	B-146	20.4	N43200 W42000	Field duplicate
B-3 Pond	B-147	25.2	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	27.7	N43200 W41900	Laboratory duplicate
B-3 Pond	B-148	17.4	N43300 W42000	Regular
B-3 Pond	B-164	16.9	N43175 W43150	Select-Field duplicate
B-3-3 Ditch	B-154	23.5	1,200' from A-29	Regular
B-3-3 Ditch	B-161	19.7	At A-29 junction	Select
B-3-3 Ditch	B-188	17.5	1,400' from head end	Regular
B-3-3 Ditch	B-189	17.6	1,000' from head end	Regular
B-3-3 Ditch	B-190	19.4	500' from head end	Regular
B-3-3 Ditch	B-191	43.1	30' from head end	Select
Cont. Bkg.	B-103	18.1	N44800 W43500	Regular
Cont. Bkg.	B-104	16.4	N44600 W43200	Regular
Cont. Bkg.	B-105	16.2	N45400 W42500	Laboratory duplicate*

Cyanide--Threshold value: NC
All values <CDL

Fluoride--Threshold Value: < CDL
Default to CDL, 1.0 µg/g
NOTE: All sagebrush background observations are <1/2 CDL. All contingency pond background observations are <CDL or have matrix interferences.

Area	Sample	µg/g	Coordinates	Type
B-3-3 Ditch	B-161	1.29	0'	Select

Iron--Threshold value: 29,437 µg/g
(Alternate background limit: 40,909 µg/g)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-129	30,750	N43600 W43000	Field duplicate*
B-3 Pond	B-131	30,250	N43400 W42800	Regular
B-3 Pond	B-132	35,716	N43300 W42900	Regular

Iron (Cont)

Area	Sample	µg/g	Coordinates		Type
B-3 Pond	B-135	29,724	N43100	W42800	Field duplicate*
B-3 Pond	B-138	31,085	N43400	W42500	Laboratory duplicate
B-3 Pond	B-138	29,511	N43400	W42500	Laboratory duplicate
B-3 Pond	B-146	30,006	N43200	W42000	Field duplicate
B-3 Pond	B-147	32,099	N43200	W41900	Laboratory duplicate
B-3 Pond	B-147	36,021	N43200	W41900	Laboratory duplicate
B-3 Pond	B-148	32,809	N43300	W42000	Regular
B-3-3 Ditch	B-191	37,479	30' from head end		Select
Cont. Bkg.	B-103	29,671	N44800	W43500	Regular

Lead--Threshold value: 15.16 µg/g
(Alternate background limit: 7.13 µg/g)

Area	Sample	µg/g	Coordinates		Type
B-3 Pond	B-130	356	N43500	W42900	Regular
B-3 Pond	B-131	618	N43400	W42800	Regular
B-3 Pond	B-132	112	N43300	W42900	Regular
B-3 Pond	B-135	19.1	N43100	W42800	Field duplicate
B-3 Pond	B-136	16.9	N43100	W42600	Regular
B-3 Pond	B-138	46.6	N43400	W42500	Regular
B-3 Pond	B-139	286	N43500	W42500	Regular
B-3 Pond	B-140	25.1	N43700	W42100	Laboratory duplicate
B-3 Pond	B-140	23.9	N43700	W42100	Laboratory duplicate
B-3 Pond	B-114	16.2	N43400	W43300	Regular
B-3 Pond	B-115	50.5	N43500	W43200	Regular
B-3 Pond	B-116	58.2	N43500	W43300	Regular
B-3 Pond	B-143	67	N42800	W42000	Regular
B-3 Pond	B-145	59	N43200	W42000	Field duplicate
B-3 Pond	B-146	226	N43200	W42000	Field duplicate
B-3 Pond	B-147	163	N43200	W41900	Regular
B-3 Pond	B-148	116	N43300	W42000	Regular
B-3 Pond	B-149	17	N43500	W42000	Regular
B-3 Pond	B-164	16.6	N43175	W43150	Select-Field duplicate*
B-3 Pond	B-166	76.9	N43100	W42200	Regular
B-3 Pond	B-168	74.4	N43090	W42000	Select

Lead, (EP)--Regulatory threshold value: 5 mg/L
CDL = 500 µg/L
No observations >CDL

Lithium--Threshold value: 10.2 µg/g
(Alternate background limit: 11.9 µg/g)
NOTE: All background observations are slightly below the 10 µg/g CDL

Area	Sample	µg/g	Coordinates		Type
B-3 Pond	B-114	11.8	N43400	W43300	Regular
B-3 Pond	B-129	10.8	N43600	W43000	Field duplicate*

Lithium (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-130	16.1	N43500 W42900	Regular
B-3 Pond	B-131	11.4	N43400 W42800	Regular
B-3 Pond	B-132	11.8	N43300 W42900	Regular
B-3 Pond	B-134	10.6	N43100 W42800	Field duplicate
B-3 Pond	B-135	11.4	N43100 W42800	Field duplicate
B-3 Pond	B-147	13.0	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	13.9	N43200 W41900	Laboratory duplicate
B-3-3 Ditch	B-154	10.8	1,200' from A-29	Regular
B-3-3 Ditch	B-191	10.8	30' from head end	Select

Magnesium--Threshold value: 6,408 µg/g
(Alternate background limit: 9,027 µg/g)

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-200	6,546	N43250 W41625	Regular
B-3 Pond	B-135	6,439	N43100 W42800	Field duplicate*
B-3 Pond	B-147	6,553	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	7,423	N43200 W41900	Laboratory duplicate
B-3 Pond	B-148	6,649	N43300 W42000	Regular
B-3-3 Ditch	B-154	6,635	1,200' from A-29	Regular

Manganese--Threshold value: 391 µg/g
(Alternate background limit: 585 µg/g)

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-194	518	N42700 W41525	Field duplicate
3A Pond	B-200	427	N43250 W41625	Regular
3A Pond	B-201	856	N43100 W41400	Regular
B-3-3 Ditch	B-152	427	1,279' from A-29	Field duplicate*
B-3-3 Ditch	B-188	427	1,400' from head end	Regular
B-3-3 Ditch	B-189	395	1,000' from head end	Regular
B-3-3 Ditch	B-190	570	500' from head end	Regular
Cont. Bkg.	B-103	398	N44800 W43500	Regular

Mercury--Threshold value: NC
Default to CDL, 0.2 µg/g
NOTE: Based on nine reagent blanks -- LOD = 0.39 µg/g; LOQ = 2.92 µg/g
All values including background censored by laboratory below CDL
Sagebrush sites -- 0 of 5 >CDL
Contingency pond area -- 0 of 5 >CDL
18 of 22 sites in the B-3 Pond >CDL (22 of 18 observations)
3 of 11 sites in the B-3-3 Ditch >CDL (3 of 15 observations)

Mercury (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-114	1.7	N43400 W43300	Laboratory duplicate
B-3 Pond	B-114	1.4	N43400 W43300	Laboratory duplicate
B-3 Pond	B-115	2.4	N43500 W43200	Regular
B-3 Pond	B-116	3.2	N43500 W43300	Regular
B-3 Pond	B-130	11.6	N43500 W42900	Regular
B-3 Pond	B-131	7.0	N43400 W42800	Regular
B-3 Pond	B-132	15.6	N43300 W42900	Regular
B-3 Pond	B-134	0.7	N43100 W42800	Field duplicate
B-3 Pond	B-135	1.1	N43100 W42800	Field duplicate
B-3 Pond	B-136	1.7	N43100 W42600	Regular
B-3 Pond	B-138	1.7	N43400 W42500	Regular
B-3 Pond	B-139	1.4	N43500 W42500	Regular
B-3 Pond	B-140	0.7	N43700 W42100	Regular
B-3 Pond	B-143	1.2	N42800 W42000	Laboratory duplicate
B-3 Pond	B-143	1.0	N42800 W42000	Laboratory duplicate
B-3 Pond	B-145	1.6	N43200 W42000	Field duplicate
B-3 Pond	B-147	3.7	N43200 W41900	Regular
B-3 Pond	B-148	1.2	N43300 W42000	Regular
B-3 Pond	B-164	0.8	N43175 W43150	Select-Field duplicate
B-3 Pond	B-165	0.3	N43175 W43150	Select-Field duplicate
B-3 Pond	B-166	0.6	N43100 W42200	Regular
B-3 Pond	B-168	0.7	N43090 W42000	Select
B-3-3 Ditch	B-154	0.2	1,200' from A-29	Regular
B-3-3 Ditch	B-161	0.6	At A-29 junction	Select
B-3-3 Ditch	B-188	0.4	1,400' from head end	Regular

Mercury, (EP)--Regulatory threshold value: 0.2 mg/L
CDL = 20 µg/L
No observations >CDL

Molybdenum--Threshold value: NC
All values <CDL

Nickel--Threshold value: 12.3 µg/g
(Alternate background limit: 22.0 µg/g)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-130	14.6	N43500 W42900	Regular
B-3 Pond	B-147	13.7	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	15.0	N43200 W41900	Laboratory duplicate
B-3-3 Ditch	B-184	13.5	2,300' from head end	Field duplicate*
B-3-3 Ditch	B-191	19.2	30' from head end	Select
Cont. Bkg.	B-102	13.9	N45100 W42600	Regular

Nitrate--Threshold value: 22.7 µg/g
(Alternate background limit: 5.33 µg/g)
No observations above threshold

Nitrite--Threshold value: 2.44 µg/g
(Alternate background limit: NC; all values <1/2 CDL)
No observations above threshold
NOTE: Most sagebrush background observations <CDL

Phosphate--Threshold value: 4.56 µg/g
(Alternate background limit: default to CDL, 2.0 µg/g)
No observations above threshold

Potassium--Threshold value: 1,758 µg/g
(Alternate background limit: 1,883 µg/g)

Area	Sample	µg/g	Coordinates		Type
B-3 Pond	B-114	1,841	N43400	W43300	Regular
B-3 Pond	B-129	2,019	N43600	W43000	Field duplicate
B-3 Pond	B-130	2,021	N43500	W42900	Regular
B-3 Pond	B-132	2,276	N43300	W42900	Regular
B-3 Pond	B-134	1,851	N43100	W42800	Field duplicate
B-3 Pond	B-135	1,939	N43100	W42800	Field duplicate
B-3 Pond	B-140	1,827	N43700	W42100	Regular
B-3 Pond	B-146	1,884	N43200	W42000	Field duplicate
B-3 Pond	B-147	2,522	N43200	W41900	Laboratory duplicate
B-3 Pond	B-147	2,867	N43200	W41900	Laboratory duplicate

Selenium--Threshold value: NC
All values <CDL

Selenium, (EP)--Regulatory threshold value: 1 mg/L
CDL = 500 µg/L
No observations >CDL

Silver--Threshold value: NC
Default to CDL, 1.0 µg/g
Sagebrush sites -- 0 of 5 >1/2 CDL
Contingency pond area -- 0 of 5 sites >1/2 CDL
Based on reagent blanks -- LOD = 0.45 µg/g; LOQ = 1.45 µg/g
1 of 8 sites in the 3C Pond >CDL, (1 of 10 observations)
11 of 22 sites in main pond >CDL, (16 of 30 observations)

Area	Sample	µg/g	Coordinates		Type
3C Pond	B-177	1.2	Ditch 3, 300'		Regular
B-3 Pond	B-115	2.5	N43500	W43200	Laboratory duplicate
B-3 Pond	B-115	2.1	N43500	W43200	Laboratory duplicate
B-3 Pond	B-116	1.7	N43500	W43300	Regular
B-3 Pond	B-130	4.6	N43500	W42900	Regular
B-3 Pond	B-131	3.6	N43400	W42800	Regular
B-3 Pond	B-132	2.2	N43300	W42900	Regular
B-3 Pond	B-135	1.2	N43100	W42800	Field duplicate
B-3 Pond	B-138	1.0	N43400	W42500	Laboratory duplicate
B-3 Pond	B-138	1.2	N43400	W42500	Laboratory duplicate
B-3 Pond	B-139	2.1	N43500	W42500	Regular
B-3 Pond	B-145	2.0	N43200	W42000	Field duplicate

Silver (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-146	2.0	N43200 W42000	Field duplicate
B-3 Pond	B-147	3.5	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	5.1	N43200 W41900	Laboratory duplicate
B-3 Pond	B-148	1.1	N43300 W42000	Regular
B-3 Pond	B-168	1.0	N43090 W42000	Select

Silver, (EP)--Regulatory threshold value: 5 mg/L
CDL = 500 µg/L
No observations >CDL

Sodium--Threshold value: 280.2 µg/g
(Alternate background limit: 493.5 µg/g)

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-202	465	N43150 W41300	Regular
3C Pond	B-176	283	Ditch 5, 1,800'	Regular
B-3 Pond	B-118	289	N43500 W43400	Regular
B-3 Pond	B-130	302	N43500 W42900	Regular
B-3 Pond	B-132	302	N43300 W42900	Regular
B-3 Pond	B-134	329	N43100 W42800	Field duplicate
B-3 Pond	B-135	296	N43100 W42800	Field duplicate
B-3 Pond	B-138	293	N43400 W42500	Laboratory duplicate*
B-3 Pond	B-145	289	N43200 W42000	Field duplicate
B-3 Pond	B-146	328	N43200 W42000	Field duplicate
B-3 Pond	B-147	290	N43200 W41900	Laboratory duplicate*
B-3 Pond	B-164	309	N43175 W43150	Select-Field duplicate
B-3 Pond	B-165	337	N43175 W43150	Select-Field duplicate
B-3 Pond	B-166	282	N43100 W42200	Regular
B-3-3 Ditch	B-153	292	1,279' from A-29	Field duplicate*
B-3-3 Ditch	B-154	307	1,200' from A-29	Regular
B-3-3 Ditch	B-158	291	950' from A-29	Field duplicate, Laboratory duplicate*
B-3-3 Ditch	B-188	309	1,400' from head end	Regular
B-3-3 Ditch	B-189	282	1,000' from head end	Regular
B-3-3 Ditch	B-191	293	30' from head end	Select
Cont. Bkg.	B-101	332	N44900 W42800	Regular
Cont. Bkg.	B-102	384	N45100 W42600	Regular
Cont. Bkg.	B-103	378	N44800 W43500	Regular
Cont. Bkg.	B-104	332	N44600 W43200	Regular
Cont. Bkg.	B-105	406	N45400 W42500	Laboratory duplicate
Cont. Bkg.	B-105	389	N45400 W42500	Laboratory duplicate

Strontium--Threshold value: 30.1 µg/g
(Alternate background limit: 33.1 µg/g)

Area	Sample	µg/g	Coordinates		Type
3A Pond	B-197	30.6	N43000	W41475	Regular
3A Pond	B-200	46.1	N43250	W41625	Regular
3A Pond	B-201	31.0	N43100	W41400	Regular
3A Pond	B-202	31.7	N43150	W41300	Regular
B-3 Pond	B-130	34.7	N43500	W42900	Regular
B-3 Pond	B-147	31.5	N43200	W41900	Laboratory duplicate
B-3 Pond	B-147	33.7	N43200	W41900	Laboratory duplicate
B-3-3 Ditch	B-154	34.8	1,200' from A-29		Regular

Sulfate--Threshold value: 5.55 µg/g
(Alternate background limit: 3,347 µg/g)
Alternate threshold value: 68.8 µg/g
(Based on lognormal tolerance interval, see text.)

Area	Sample	µg/g	Coordinates		Type
3A Pond	B-198	1.49	N43200	W41550	Regular
3A Pond	B-194	22.31	N42700	W41525	Field duplicate
3A Pond	B-196	36.90	N42700	W41525	Field duplicate
3A Pond	B-197	14.52	N43000	W41475	Regular
3A Pond	B-198	7.73	N43200	W41550	Regular
3A Pond	B-201	6.80	N43100	W41400	Regular
3A Pond	B-202	5.61	N43150	W41300	Regular
3A Pond	B-203	12.55	N43200	W42500	Regular
3C Pond	B-178	5.98	Ditch 4, 1200'		Regular
3C Pond	B-179	16.33	Ditch 2, 900'		Regular
3C Pond	B-180	5.62	Ditch 1, 1300'		Regular
B-3 Pond	B-114	141.20	N43400	W43300	Regular
B-3 Pond	B-115	172.40	N43500	W43200	Regular
B-3 Pond	B-116	208.80	N43500	W43300	Regular
B-3 Pond	B-118	35.80	N43500	W43400	Regular
B-3 Pond	B-119	8.80	N43800	W43400	Regular
B-3 Pond	B-128	9.69	N43600	W43000	Field duplicate
B-3 Pond	B-129	11.64	N43600	W43000	Field duplicate
B-3 Pond	B-130	27.67	N43500	W42900	Regular
B-3 Pond	B-131	14.94	N43400	W42800	Regular
B-3 Pond	B-132	8.17	N43300	W42900	Regular
B-3 Pond	B-134	88.70	N43100	W42800	Field duplicate
B-3 Pond	B-135	126.20	N43100	W42800	Field duplicate
B-3 Pond	B-138	11.30	N43400	W42500	Regular
B-3 Pond	B-139	20.02	N43500	W42500	Regular
B-3 Pond	B-140	29.07	N43700	W42100	Regular
B-3 Pond	B-143	11.20	N42800	W42000	Regular
B-3 Pond	B-145	8.27	N43200	W42000	Field duplicate
B-3 Pond	B-146	10.40	N43200	W42000	Field duplicate
B-3 Pond	B-147	31.47	N43200	W41900	Regular
B-3 Pond	B-148	8.23	N43300	W42000	Regular
B-3 Pond	B-149	6.85	N43500	W42000	Regular
B-3 Pond	B-168	5.87	N43090	W42000	Select

Sulfate (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3-3 Ditch	B-161	6.94	At A-29 junction	Select
B-3-3 Ditch	B-191	7.12	30' from head end	Select
Cont. Bkg.	B-101	84.2	N44900 W42800	Regular
Cont. Bkg.	B-103	1,664	N44800 W43500	Regular
Cont. Bkg.	B-104	281	N44600 W43200	Regular
Cont. Bkg.	B-105	192	N45400 W42500	Regular

Sulfide--Threshold value: NC
All values <CDL except two
Default to CDL, 10 µg/g
Sagebrush sites -- 0 of 5 <1/2 CDL
Contingency pond area -- 0 of 5 sites <1/2 CDL
Based on reagent blanks -- LOD = 5.63 µg/g; LOQ = 16.7 µg/g
1 of 7 sites in the 3A Pond >CDL, (1 of 8 observations)
1 of 8 sites in 3C Pond >CDL, (1 of 9 observations)

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-198	25.7	N43200 W41550	Regular
3C Pond	B-179	10.9	Ditch 2, 900'	Regular

Thallium--Threshold value: NC
All values <CDL

Titanium--Threshold value: 2,552 µg/g
(Alternate background limit: 3,931 µg/g)

Area	Sample	µg/g	Coordinates	Type
3B Pond	B-106	2,599	N42300 W40550	Regular
B-3 Pond	B-129	2,620	N43600 W43000	Field duplicate*
B-3 Pond	B-132	2,848	N43300 W42900	Regular
B-3 Pond	B-138	2,864	N43400 W42500	Laboratory duplicate
B-3 Pond	B-138	2,821	N43400 W42500	Laboratory duplicate
B-3 Pond	B-139	2,917	N43500 W42500	Regular
B-3 Pond	B-145	2,748	N43200 W42000	Field duplicate
B-3 Pond	B-146	2,668	N43200 W42000	Field duplicate
B-3 Pond	B-148	2,646	N43300 W42000	Regular
B-3-3 Ditch	B-153	2,560	1,279' from A-29	Field duplicate*
Cont. Bkg.	B-103	2,714	N44800 W43500	Regular
Cont. Bkg.	B-105	2,806	N45400 W42500	Laboratory duplicate
Cont. Bkg.	B-105	2,762	N45400 W42500	Laboratory duplicate

Vanadium--Threshold value: 63.8 µg/g
(Alternate background limit: 95.3 µg/g)

Area	Sample	µg/g	Coordinates	Type
3B Pond	B-106	71.1	N42300 W40550	Regular
3B Pond	B-107	68.1	N42300 W40650	Regular

Vanadium (Cont)

Area	Sample	µg/g	Coordinates		Type
3B Pond	B-108	70.9	N42800	W40650	Field duplicate
B-3 Pond	B-118	65.0	N43500	W43400	Regular
B-3 Pond	B-119	67.2	N43800	W43400	Laboratory duplicate
B-3 Pond	B-129	69.3	N43600	W43000	Field duplicate
B-3 Pond	B-131	66.3	N43400	W42800	Regular
B-3 Pond	B-132	81.8	N43300	W42900	Regular
B-3 Pond	B-134	65.3	N43100	W42800	Field duplicate
B-3 Pond	B-135	68.8	N43100	W42800	Field duplicate
B-3 Pond	B-138	76.8	N43400	W42500	Laboratory duplicate
B-3 Pond	B-138	72.5	N43400	W42500	Laboratory duplicate
B-3 Pond	B-139	73.5	N43500	W42500	Regular
B-3 Pond	B-140	65.6	N43700	W42100	Regular
B-3 Pond	B-145	70.6	N43200	W42000	Field duplicate
B-3 Pond	B-146	72.6	N43200	W42000	Field duplicate
B-3 Pond	B-147	65.5	N43200	W41900	Laboratory duplicate
B-3 Pond	B-147	67.7	N43200	W41900	Laboratory duplicate
B-3-3 Ditch	B-152	65.6	1,279' from A-29		Field duplicate
B-3-3 Ditch	B-189	69.4	1,000' from head end		Regular
Cont. Bkg.	B-103	68.7	N44800	W43500	Regular
Cont. Bkg.	B-105	72.4	N45400	W42500	Laboratory duplicate
Cont. Bkg.	B-105	73.2	N45400	W42500	Laboratory duplicate

Zinc--Threshold value: maximum of five background values, 41.3 µg/g
(Alternate background maximum: 44 µg/g)

Area	Sample	µg/g	Coordinates		Type
3A Pond	B-194	41.7	N42700	W41525	Field duplicate
3A Pond	B-196	51.6	N42700	W41525	Field duplicate
3A Pond	B-197	49.5	N43000	W41475	Regular
3A Pond	B-198	46.5	N43200	W41550	Regular
3A Pond	B-200	42.7	N43250	W41625	Regular
3A Pond	B-201	47.7	N43100	W41400	Regular
3A Pond	B-201	47.7	N43100	W41400	Regular
3A Pond	B-202	55.0	N43150	W41300	Regular
3A Pond	B-203	45.4	N43200	W42500	Regular
3B Pond	B-106	41.4	N42300	W40550	Regular
3C Pond	B-171	43.1	Ditch 8, 500'		Field duplicate
3C Pond	B-172	77.7	Ditch 8, 500'		Field duplicate
3C Pond	B-176	49.4	Ditch 5, 1800'		Regular
3C Pond	B-177	68.5	Ditch 3, 300'		Regular
3C Pond	B-178	53.8	Ditch 4, 1200'		Regular
3C Pond	B-180	41.7	Ditch 1, 1300'		Laboratory duplicate*
B-3 Pond	B-114	92.6	N43400	W43300	Regular
B-3 Pond	B-115	58.0	N43500	W43200	Laboratory duplicate
B-3 Pond	B-115	55.9	N43500	W43200	Laboratory duplicate
B-3 Pond	B-116	70.2	N43500	W43300	Regular
B-3 Pond	B-118	48.7	N43500	W43400	Regular
B-3 Pond	B-119	55.7	N43800	W43400	Laboratory duplicate

Zinc (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3 Pond	B-119	53.8	N43800 W43400	Laboratory duplicate
B-3 Pond	B-128	48.5	N43600 W43000	Field duplicate
B-3 Pond	B-129	57.0	N43600 W43000	Field duplicate
B-3 Pond	B-130	111.8	N43500 W42900	Regular
B-3 Pond	B-131	82.1	N43400 W42800	Regular
B-3 Pond	B-132	73.5	N43300 W42900	Regular
B-3 Pond	B-134	66.8	N43100 W42800	Field duplicate
B-3 Pond	B-135	70.4	N43100 W42800	Field duplicate
B-3 Pond	B-136	43.3	N43100 W42600	Regular
B-3 Pond	B-138	63.6	N43400 W42500	Laboratory duplicate
B-3 Pond	B-138	60.6	N43400 W42500	Laboratory duplicate
B-3 Pond	B-139	48.4	N43500 W42500	Regular
B-3 Pond	B-140	53.0	N43700 W42100	Regular
B-3 Pond	B-143	48.3	N42800 W42000	Regular
B-3 Pond	B-145	83.2	N43200 W42000	Field duplicate
B-3 Pond	B-146	84.5	N43200 W42000	Field duplicate
B-3 Pond	B-147	84.5	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	92.5	N43200 W41900	Laboratory duplicate
B-3 Pond	B-148	57.0	N43300 W42000	Regular
B-3 Pond	B-149	54.9	N43500 W42000	Regular
B-3 Pond	B-164	70.3	N43175 W43150	Select-Field duplicate
B-3 Pond	B-165	65.1	N43175 W43150	Select-Field duplicate
B-3 Pond	B-166	50.4	N43100 W42200	Regular
B-3 Pond	B-168	52.9	N43090 W42000	Select
B-3-3 Ditch	B-153	43.0	1,279' from A-29	Field duplicate
B-3-3 Ditch	B-154	74.1	1,200' from A-29	Regular
B-3-3 Ditch	B-158	58.5	950' from A-29	Field duplicate, Laboratory duplicate
B-3-3 Ditch	B-158	51.1	950' from A-29	Field duplicate, Laboratory duplicate
B-3-3 Ditch	B-159	46.3	950' from A-29	Field duplicate
B-3-3 Ditch	B-160	45.7	300' from A-29	Regular
B-3-3 Ditch	B-161	58.4	At A-29 junction	Select
B-3-3 Ditch	B-184	65.6	2,300' from head end	Field duplicate
B-3-3 Ditch	B-185	57.7	2,300' from head end	Field duplicate
B-3-3 Ditch	B-187	47.1	2,000' from head end	Regular
B-3-3 Ditch	B-188	76.9	1,400' from head end	Regular
B-3-3 Ditch	B-189	70.5	1,000' from head end	Regular
B-3-3 Ditch	B-191	111.3	30' from head end	Select
Cont. Bkg.	B-103	43.3	N44800 W43500	Regular
Cont. Bkg.	B-105	44.0	N45400 W42500	Laboratory duplicate

Zirconium--Threshold value: maximum of five background values, 23.1 µg/g
(Alternate background maximum: 28.7 µg/g)

Area	Sample	µg/g	Coordinates	Type
3A Pond	B-196	27.9	N42700 W41525	Field duplicate
3A Pond	B-197	24.8	N43000 W41475	Regular
3A Pond	B-200	25.0	N43250 W41625	Regular
3A Pond	B-201	29.8	N43100 W41400	Regular
3A Pond	B-202	29.5	N43150 W41300	Regular
3A Pond	B-203	29.0	N43200 W42500	Regular
3B Pond	B-106	28.2	N42300 W40550	Regular
3B Pond	B-107	26.5	N42300 W40650	Regular
3B Pond	B-108	27.3	N42800 W40650	Field duplicate
3B Pond	B-109	26.8	N42800 W40650	Field duplicate
3B Pond	B-110	27.6	N42850 W40650	Regular
3B Pond	B-111	26.4	N42850 W40950	Regular
3C Pond	B-176	25.8	Ditch 5, 1800'	Regular
3C Pond	B-180	26.2	Ditch 1, 1300'	Laboratory duplicate
3C Pond	B-180	23.3	Ditch 1, 1300'	Laboratory duplicate
B-3 Pond	B-115	25.0	N43500 W43200	Laboratory duplicate
B-3 Pond	B-115	24.1	N43500 W43200	Laboratory duplicate
B-3 Pond	B-116	24.9	N43500 W43300	Regular
B-3 Pond	B-118	26.7	N43500 W43400	Regular
B-3 Pond	B-119	29.8	N43800 W43400	Laboratory duplicate
B-3 Pond	B-119	27.6	N43800 W43400	Laboratory duplicate
B-3 Pond	B-128	30.1	N43600 W43000	Field duplicate
B-3 Pond	B-129	33.7	N43600 W43000	Field duplicate
B-3 Pond	B-130	26.0	N43500 W42900	Regular
B-3 Pond	B-131	30.7	N43400 W42800	Regular
B-3 Pond	B-132	39.5	N43300 W42900	Regular
B-3 Pond	B-134	28.5	N43100 W42800	Field duplicate
B-3 Pond	B-135	31.2	N43100 W42800	Field duplicate
B-3 Pond	B-138	36.1	N43400 W42500	Laboratory duplicate
B-3 Pond	B-138	33.4	N43400 W42500	Laboratory duplicate
B-3 Pond	B-139	32.6	N43500 W42500	Regular
B-3 Pond	B-140	30.5	N43700 W42100	Regular
B-3 Pond	B-143	25.9	N42800 W42000	Regular
B-3 Pond	B-145	34.6	N43200 W42000	Field duplicate
B-3 Pond	B-146	37.0	N43200 W42000	Field duplicate
B-3 Pond	B-147	29.1	N43200 W41900	Laboratory duplicate
B-3 Pond	B-147	31.2	N43200 W41900	Laboratory duplicate
B-3 Pond	B-148	30.9	N43300 W42000	Regular
B-3 Pond	B-149	28.1	N43500 W42000	Regular
B-3 Pond	B-164	24.2	N43175 W43150	Select-Field duplicate
B-3 Pond	B-165	25.7	N43175 W43150	Select-Field duplicate
B-3 Pond	B-166	26.4	N43100 W42200	Regular
B-3 Pond	B-168	29.5	N43090 W42000	Select
B-3-3 Ditch	B-152	26.0	1,279' from A-29	Field duplicate
B-3-3 Ditch	B-153	26.8	1,279' from A-29	Field duplicate
B-3-3 Ditch	B-158	24.9	950' from A-29	Field duplicate, Laboratory duplicate*
B-3-3 Ditch	B-161	27.8	At A-29 junction	Select

Zirconium (Cont)

Area	Sample	µg/g	Coordinates	Type
B-3-3 Ditch	B-188	26.1	1,400' from head end	Regular
B-3-3 Ditch	B-189	25.5	1,000' from head end	Regular
B-3-3 Ditch	B-191	26.8	30' from head end	Select
Cont. Bkg.	B-102	23.8	N45100 W42600	Regular
Cont. Bkg.	B-103	28.7	N44800 W43500	Regular
Cont. Bkg.	B-104	27.8	N44600 W43200	Regular
Cont. Bkg.	B-105	28.5	N45400 W42500	Laboratory duplicate
Cont. Bkg.	B-105	27.8	N45400 W42500	Laboratory duplicate

VOLATILE ORGANICS

Acetone--Threshold value: 218 µg/kg
(Alternate background limit: acetone nondetectable)
SW-846 PQL = 100 µg/kg

Area	Sample	µg/kg	Coordinates	Type
B-3 Pond	B-115	333	N43500 W43200	Regular

Carbon Disulfide--Threshold value: <CDL
Default to CDL, 10 µg/kg
Observed in a single sample; <1/2 SW-846 PQL
SW-846 PQL = 100 µg/kg

Area	Sample	µg/kg	Coordinates	Type
B-3 Pond	B-114	34	N43400 W43300	Regular

1,3 Dichlorobenzene--Threshold value: 26 µg/kg; maximum of five background sites.
(Alternate background limit: nondetectable)
No observations above threshold

Methylene chloride--Threshold value: <CDL
Default to CDL, 5 µg/kg
1 of 8 sites in 3C Pond >CDL (1 of 9 observations)
3 of 22 sediment sites in B-3 Pond >CDL, (3 of 25 observations)
1 of 11 sites in the B-3-3 ditch >CDL (1 of 13 observations)
1 of 5 sites in the contingency pond >nondetect, (3 µg/kg), but <CDL
2 of 11 silica sand blanks >nondetect, (3,4 µg/kg), but <CDL
SW-846 PQL = 5 µg/kg

Methylene chloride (Cont)

Area	Sample	µg/kg	Coordinates	Type
3C Pond	B-178	6	Ditch 4, 1,200'	Regular
B-3 Pond	B-115	92	N43500 W43200	Regular
B-3 Pond	B-131	7	N43400 W42800	Regular
B-3 Pond	B-143	6	N42800 W42000	Regular
B-3-3 Ditch	B-154	14[b]	1,200' from A-29	Regular

Methyl ethyl ketone--Threshold value: <CDL
(Alternate background limit: 12.5 µg/kg)
Default to CDL, 10 µg/kg
SW-846 PQL 100 µg/kg

Area	Sample	µg/kg	Coordinates	Type
B-3 Pond	B-114	34	N43400 W43300	Regular
3C Pond	B-177	12[b]	Ditch 3, 300'	Regular
B-3 Pond	B-114	13	N43400 W43300	Regular
B-3 Pond	B-115	74	N43500 W43200	Regular
B-3 Pond	B-147	19[b]	N43200 W41900	Regular
B-3-3 Ditch	B-191	11	30' from head end	Select

SEMIVOLATILES

Bis (2-ethylhexyl) phthalate--Threshold Value: NC
Background not tested for semivolatiles
All observations >CDL (1.0 µg/g) are listed. All observations >CDL are qualified due to problems with their associated laboratory reagent blanks

Area	Sample	µg/g	Type
B-3 Pond	B-169	2.4[a]	Composite of B-164, 166, 168
3C Pond	B-181	3.5[b]	Composite of B-175, 176
3C Pond	B-182	6.7[b]	Composite of B-171, 173, 177 to 180

OTHER ORGANIC ANALYTES

Herbicides--Threshold value: NC, all values nondetectable.

Pesticides, Enhanced--Threshold value: NC, all values nondetectable.

Pesticides, Phosphorous--Threshold value: NC, all values nondetectable.

Polychlorinated Biphenyls--Threshold value: NC, all values nondetectable.

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[a]Associated laboratory reagent blank not identifiable for this sample.
[b]Denotes qualification as a nondetect due to the occurrence of the analyte at least 1/10th the listed concentration in an associated blank.

APPENDIX B

ELEMENTS BY ICP

9413095.1265

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Table B-1. Elements by ICP (EPA Method 3050/6010) 3A Pond.

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Magnesium	Manganese
B-194	4953 D20	7.0	5200	5.4 B	6.6	12.8	19530 D20	4296 D20	517.8
B-196	6750 D20	8.7	5948	6.1 B	7.8	17.2	26441 D20	4641 D20	335.9
B-197	4789 D20	8.0	9463 D20	3.9 B	6.4	14.8	21457 D20	3838 D20	308.6
B-198	5299 D20	7.3	4739	5.6 B	6.7	15.6	21656 D20	3760 D20	212.7
B-200	7091 D20	7.2	16510 D20	7.1 B	8.4	15.1	26363 D20	6546 D20	426.8
B-201	9741 D20	7.6	9684 D20	9.4 B	9.4	18.6	28566 D20	6113 D20	856.4
B-202	10339 D20	7.8	11808 D20	9.7 B	9.4	20.1	27854 D20	6026 D20	342.1
B-203	9404 D20	7.3	8265 D20	9.0 B	8.5	14.9	28470 D20	6088 D20	294.3

	Nickel	Potassium	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-194	10.5	643.3	200.0 B	25.6	1458 D20	40.9	41.7	18.5
B-196	7.6	673.1	256.1 B	28.9	2101 D20	56.3	51.6	27.9
B-197	5.2	498.9	236.0 B	30.6	1767 D20	43.4	49.5	24.8
B-198	6.0	579.2	265.3 B	18.4	1694 D20	45.9	46.5	21.8
B-200	8.3	1099.1	243.3 B	46.1	2119 D20	53.7	42.7	25.0
B-201	11.4	1637.1	240.9 B	31.0	1955 D20	52.1	47.7	29.8
B-202	10.6	1541.7	464.6 B	31.7	1938 D20	55.5	55.0	29.5
B-203	9.7	1492.9	231.1 B	29.8	2279 D20	57.5	45.4	29.0

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-194	9/21/89	03/06	03/07/90	167	Fdup
B-196	9/21/89	03/06	03/07/90	167	Fdup
B-197	9/21/89	03/06	03/07/90	167	Reg
B-198	9/21/89	03/06	03/07/90	167	Reg +
B-200	9/21/89	03/06	03/07/90	167	Reg
B-201	9/21/89	03/06	03/07/90	167	Reg
B-202	9/21/89	03/06	03/07/90	167	Reg
B-203	9/21/89	03/06	03/07/90	167	Reg

Reagent Blanks Greater than CDL

Analyte	Date	Value µg/g	GT	LT	CDL µg/g
Chromium	3/07/90	1.1	1	3	1.0
Sodium	3/07/90	26.7	2	2	20.0
Sodium	3/07/90	24.1	-	-	

B = A reagent blank was greater than (GT) the contract detection limit (CDL).
Dx = Sample further diluted by x when analyzed.
Fdup = Field Duplicate.
Reg = Regular sample.
+ = Chosen by lab for matrix spike.

Table B-2. Elements by ICP (EPA Method 3050/6010) 3B Pond.

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Magnesium	Manganese
B-106	5428 D20	6.3	9331 D20	4.7	9.4	15.3	27397 D20	4721 D20	319.8
B-107	5269 D20	6.2	7683	5.6	8.4	14.4	26473 D20	4365 D20	290.6
B-108	6211 D20	7.0	7704	6.5	8.9	16.1	29081 D20	4902 D20	332.0
B-109	5735 D20	5.9	7366	5.3	8.8	15.0	25847 D20	4699 D20	301.8
B-110	6265 D20	6.5	9099 D20	5.5	8.9	13.9	27210 D20	5206 D20	342.5
B-111	5062 D20	5.8	6986	6.2	8.2	13.7	23855 D20	4245 D20	293.2

	Nickel	Potassium	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-106	7.1	780.6 HM	249.2	27.1	2599 D20	71.1	41.4	28.2
B-107	6.9	771.9 HM	206.1	23.8	2515 D20	68.1	39.0	26.5
B-108	8.3	1068.2 HM	207.3	26.4	2354 D20	70.9	41.1	27.3
B-109	6.8	879.0 HM	198.5	24.6	2211 D20	63.6	41.0	26.8
B-110	6.6	1071.7 HM	223.3	27.3	2402 D20	63.5	41.2	27.6
B-111	6.6	842.8 HM	210.4	25.9	2324 D20	61.8	38.5	26.4

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-106	8/4/89	02/20	02/23/90	203 H	Reg
B-107	8/4/89	02/20	02/23/90	203 H	Reg
B-108	8/4/89	02/20	02/23/90	203 H	Fdup
B-109	8/4/89	02/20	02/23/90	203 H	Fdup
B-110	8/4/89	02/20	02/23/90	203 H	Reg +
B-111	8/4/89	02/20	02/23/90	203 H	Reg

B = Sample further diluted by x when analyzed.
Fdup = Field duplicate.
HM = Associated matrix recovery high; see Table B-9.
H = Holding time exceeded (6 months).
Reg = Regular sample.
+ = Chosen by lab for matrix spike.

Table B-3. Elements by ICP (EPA Method 3050/6010) 3C Pond.

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Magnesium	Manganese
B-171	3920 D20	5.2	5154	3.3	8.4	16.3	20759 D20	3649 D20	253.9
B-172	6850 D20	4.2	5326	7.2	6.2	17.9	17097 D20	4403 D20	305.8
B-174	4925 D20	5.1	4641	4.3	7.5	12.5	21496 D20	4280 D20	287.7
B-175	4811 D20	5.3	4788	3.5	6.6	13.4	20927 D20	3958 D20	230.8
B-176	6386 D20	6.3	5331	6.1	8.5	15.4	24957 D20	4787 D20	287.4
B-177	4448 D20	2.0	3403	6.1	3.0	18.5	7291 D20	2130 D20	101.4
B-178	4866 D20	4.9	5818	4.5	6.2	13.0	18849 D20	3586 D20	281.9
B-179	3743 D20	4.0	3977	4.3	5.3	11.1 Q	15874 D20	3120 D20	176.1
B-180	4746 D20	5.4	4535	4.0	7.5	16.9	21308 D20	3875 D20	248.6
B-180	5003 D20	5.5	4140	5.5	6.4	16.2	20368 D20	3963 D20	228.9

	Nickel	Potassium	Silver	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-171	5.3	480.4	0.0 *	271.3 B	21.0	1521 D20	48.6 HM	43.1	21.2
B-172	7.9	1038.6	0.3 *	224.0 B	26.1	1072 D20	32.5 HM	77.7	15.8
B-174	8.2	559.3	0.1 *	243.0 B	21.0	1965 D20	49.2 HM	38.6	22.3
B-175	5.5	657.5	0.0 *	230.3 B	20.7	1541 D20	46.0 HM	33.6	20.5
B-176	7.8	912.8	0.1 *	282.5 B HM	25.9	1934 D20	53.2 HM	49.4	25.8
B-177	4.9	637.8	1.2 Q	129.5 B HM	14.9	401	12.8 HM	68.6	6.9
B-178	5.5	638.7	0.1 *	229.9 B HM	22.5	1567 D20	41.1 HM	53.8	20.5
B-179	5.0	385.1	0.2 *	198.1 B HM	18.9	1182 D20	32.2 HM	33.9	15.5
B-180	5.9	426.4	0.2 *	246.4 B HM	18.8	1868 D20	47.7 HM	41.7	26.2
B-180	6.7	472.7	0.1 *	270.5 B HM	19.4	1642 D20	45.8 HM	40.3	23.3

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-171	9/8/89	03/08	03/10/90	183	Fdup
B-172	9/8/89	03/08	03/10/90	183	Fdup
B-174	9/8/89	03/08	03/10/90	183	Reg
B-175	9/8/89	03/08	03/10/90	183	Reg +
B-176	9/8/89	03/05	03/12/90	185 H	Reg
B-177	9/8/89	03/05	03/12/90	185 H	Reg
B-178	9/8/89	03/05	03/12/90	185 H	Reg
B-179	9/8/89	03/05	03/12/90	185 H	Reg
B-180	9/8/89	03/05	03/12/90	185 H	Ldup
B-180	9/8/89	03/05	03/12/90	185 H	Ldup

Reagent Blanks Greater than CDL

Analyte	Date	Value µg/g	GT	LT	CDL µg/g
Sodium	3/10/90	22.8	2	0	20.0
Sodium	3/10/90	22.7	-	-	
Sodium	3/12/90	23.4	1	2	

B = A reagent blank was greater than (GT) the contract detection limit (CDL) on the date of analysis. The number of <CDL blanks on that day is shown in the less than (LT) column above.
Dx = Sample further diluted by x when analyzed.
Fdup = Field duplicate.
H = Holding time exceeded (6 months).
HM = Associated matrix recovery high; see Table B-9.
Ldup = Lab duplicate.
Q = Sample is above the contract detection limit (CDL) but below a limit of quantitation based on reagent blanks.
Reg = Regular sample.
+ = Chosen by lab for matrix spike.
* = Sample is below the laboratory CDL.

Table B-4. Elements by ICP (EPA Method 3050/6010) B-3 Pond. (sheet 1 of 2)

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lithium	Magnesium
B-114	12189 D20	9.9	3587 HM	12.7	7.4	20.4 B	26574 D20	11.8	6406 D20
B-115	9350 D20	8.8	3116 HM	13.6	5.8	19.2 B	23240 D20	8.7 *	4647 D20
B-115	9686 D20	8.6	2801 HM	12.9	5.4	17.3 B	23971 D20	8.8 *	4812 D20
B-116	11229 D20	9.8	3857 HM	13.1	6.7	17.7 B	25277 D20	10.2	5467 D20
B-118	10011 D20	8.8	4089 HM	10.8	8.6	13.0 B	28573 D20	8.1 *	5314 D20
B-119	9966 D20	22.6	3910 HM	10.7	9.3	14.1 B	28345 D20	8.7 *	5505 D20
B-119	10293 D20	20.8	3576 HM	9.8	8.5	14.1 B	28107 D20	9.1 *	5648 D20
B-128	9895 D20	7.5	3510	9.9	8.1	17.9 FB LM	26099 D20 HM	8.8 *	4936 D20
B-129	12327 D20	9.1	3976	11.6	9.0	14.8 FB LM	30750 D20 HM	10.8	6095 D20
B-130	14913 D20	11.7	4773	34.5	7.6	32.9 FB LM	28438 D20 HM	16.1	7494 D20
B-131	10995 D20	11.2	4500	18.5	7.5	25.6 FB LM	30250 D20 HM	11.4	6054 D20
B-132	13370 D30	12.2	4066	18.1	6.9	16.7 FB LM	35716 D30 HM	11.8	5657 D30
B-134	12052 D20	15.8	4077	12.2	7.8	15.9 FB LM	28025 D20 HM	10.6	5697 D20
B-135	12537 D20	16.1	4556	13.5	8.3	17.6 FB LM	29724 D20 HM	11.4	6439 D20
B-136	9026 D20	6.4	2691	9.9	4.8	10.2 Q FB LM	22664 D20 HM	8.5 *	4189 D20
B-138	10676 D20	7.8	4588	13.2	9.7	17.7 FB LM	31085 D20 HM	9.2 *	5511 D20
B-138	10179 D20	7.6	4246	12.9	8.7	16.7 FB LM	29511 D20 HM	8.8 *	5213 D20
B-139	8661 D20	7.1	3715	9.2	5.9	12.8 FB LM	27325 D20 HM	7.2 *	4553 D20
B-140	11044 D20	7.4	3738	11.4	6.1	14.8 FB LM	27136 D20 HM	10.0	5551 D20
B-143	9841 D20	6.0	3756	10.5	7.3	13.9 FB LM	24567 D20 HM	9.3 *	4996 D20
B-145	11424 D20	7.7	4503	19.5	10.2	18.2 FB LM	29316 D20 HM	9.1 *	5175 D20
B-146	12381 D20	8.8	4906	25.5	10.5	20.4 FB LM	30006 D20 HM	9.9 *	5499 D20
B-147	14119 D20	11.1	5315	26.2	9.8	25.2	32099 D20	13.0	6553 D20
B-147	16699 D20	12.3	5400	29.1	10.6	27.7	36021 D20	13.9	7423 D20
B-148	11384 D20	7.9	3747	12.2	9.3	17.4	32809 D20	9.4 *	6649 D20
B-149	8803 D20	17.9	3845	9.7	8.8	12.7	27016 D20	8.8 *	5297 D20
B-164	9657 D20	7.9	4373	10.7 LM	9.0	16.9	27295 D20	9.8 *	5885 D20
B-165	9481 D20	7.8	4700	7.9 LM	7.9	15.1	26419 D20	8.7 *	5627 D20
B-166	11231 D20	8.1	3716	12.0 LM	8.6	14.1	27903 D20	9.3 *	5547 D20
B-168	10733 D20	9.1	3841	12.4 LM	8.3	13.3	27460 D20	8.5 *	4944 D20

	Manganese	Nickel	Potassium	Silver	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-114	198.6	11.6	1841	1.0 QLM	268.6	27.2	1737 D20	48.5	92.6	21.3
B-115	167.5	9.6	1491	2.5 LM	216.6	21.3	1908 D20	56.5	58.0	25.0
B-115	163.9	8.8	1526	2.1 LM	213.7	21.1	1962 D20	56.9	55.9	24.1
B-116	174.5	10.1	1732	1.7 QLM	261.9	26.2	1968 D20	56.7	70.2	24.9
B-118	274.0	10.6	1442	0.2 *LM	289.0	27.4	2312 D20	65.0	48.7	26.7
B-119	233.3	9.7	1608	0.3 *LM	235.5	24.1	2390 D20	67.2	55.7	29.8
B-119	238.4	10.0	1616	0.6 *LM	230.5	22.6	2291 D20	60.7	53.8	27.6
B-128	203.1	9.7	1684	0.0 *LM	225.1	21.1	2353 D20	61.0	48.5	30.1
B-129	225.1	11.0	2019	0.3 *LM	245.3	23.9	2620 D20	69.3	57.0	33.7
B-130	233.7	14.6	2021	4.6 LM	302.2	34.7	1633	51.0	111.8	26.0
B-131	214.4	10.6	1358	3.6 LM	262.3	26.8	2473 D20	66.3	82.1	30.7
B-132	255.8	11.2	2276 D30	2.2 LM	302.2	28.0	2848 D30	81.8	73.5	39.5
B-134	212.4	10.7	1851	0.8 *LM	328.9	27.7	2299 D20	65.3	66.8	28.5
B-135	226.7	12.1	1939	1.2 QLM	296.4	29.8	2445 D20	68.8	70.4	31.2
B-136	185.9	7.7	1521	0.4 *LM	219.3	20.1	1732	52.0	43.3	22.1
B-138	257.0	10.6	1699	1.0 QLM	293.4	23.8	2864 D20	76.8	63.6	36.1
B-138	232.8	9.5	1637	1.2 QLM	256.3	21.5	2821 D20	72.5	60.6	33.4
B-139	195.7	7.3	1235	2.1 LM	254.8	18.3	2917 D20	73.5	48.4	32.6
B-140	189.2	9.0	1827	0.8 *LM	258.9	23.0	2431 D20	65.6	53.0	30.5
B-143	206.2	8.2	1569	0.7 *LM	263.0	22.0	2079	59.4	48.3	25.9
B-145	241.3	11.6	1649	2.0 LM	289.3	23.2	2748 D20	70.6	83.2	34.6
B-146	257.3	11.6	1884	2.0 LM	328.2	26.8	2668 D20	72.6	84.5	37.0
B-147	353.1	13.7	2522 HM	3.5	243.0	31.5	2196 D20	65.5	84.5	29.1
B-147	353.5	15.0	2867 HM	5.1	290.4	33.7	2462 D20	67.7	92.5	31.2
B-148	252.3	10.5	1678 HM	1.1 Q	181.7	20.4	2646 D20	60.5	57.0	30.9
B-149	248.0	10.0	1455 HM	0.3 *	193.6	21.0	2242 D20	62.2	54.9	28.1
B-164	291.6	11.0	1140 HM	0.7 *	308.9 HM	26.7	2226 D20	58.9 HM	70.3	24.2
B-165	267.2	9.5	1142 HM	0.0 *	336.9 HM	25.8	2248 D20	60.0 HM	65.1	25.7
B-166	229.5	11.1	1580 HM	0.7 *	281.7 HM	25.8	2283 D20	58.5 HM	50.4	26.4
B-168	220.8	10.0	1580 HM	1.0 Q	261.8 HM	24.0	2279 D20	59.0 HM	52.9	29.5

Table B-4. Elements by ICP (EPA Method 3050/6010) B-3 Pond. (sheet 2 of 2)

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-114	8/10/89	02/22	03/06/90	208 H	Reg
B-115	8/10/89	02/22	03/06/90	208 H	Ldup
B-115	8/10/89	02/22	03/06/90	208 H	Ldup
B-116	8/10/89	02/22	03/06/90	208 H	Reg
B-118	8/11/89	02/22	03/06/90	207 H	Reg
B-119	8/11/89	02/22	03/06/90	207 H	Ldup
B-119	8/11/89	02/22	03/06/90	207 H	Ldup
B-128	8/17/89	02/19	02/20/90	187 H	Fdup
B-129	8/17/89	02/19	02/20/90	187 H	Fdup
B-130	8/17/89	02/19	02/20/90	187 H	Reg
B-131	8/17/89	02/19	02/20/90	187 H	Reg
B-132	8/17/89	02/19	02/20/90	187 H	Reg
B-134	8/18/89	02/19	02/20/90	186 H	Fdup
B-135	8/18/89	02/19	02/20/90	186 H	Fdup
B-136	8/18/89	02/19	02/20/90	186 H	Reg
B-138	8/18/89	02/19	02/20/90	186 H	Ldup
B-138	8/18/89	02/19	02/20/90	186 H	Ldup
B-139	8/18/89	02/19	02/20/90	186 H	Reg
B-140	8/18/89	02/19	02/20/90	186 H	Reg
B-143	8/25/89	02/19	02/20/90	179	Reg
B-145	8/25/89	02/19	02/20/90	179	Fdup
B-146	8/25/89	02/19	02/20/90	179	Fdup
B-147	8/25/89	02/20	02/23/90	182	Ldup
B-147	8/25/89	02/20	02/23/90	182	Ldup
B-148	8/25/89	02/20	02/23/90	182	Reg
B-149	8/25/89	02/20	02/23/90	182	Reg
B-164	9/07/89	02/24	03/07/90	181	Select-Fdup
B-165	9/07/89	02/24	03/07/90	181	Select-Fdup
B-166	9/07/89	02/24	03/07/90	181	Reg
B-168	9/07/89	02/24	03/07/90	181	Select

Reagent Blanks Greater than CDL

Analyte	Date	Value µg/g	GT	LT	CDL µg/g
Copper	3/06/90	1.3	1	1	1.0

B = A reagent blank was greater than (GT) the contract detection limit (CDL) on the date of analysis. The number of <CDL blanks on that day is shown in the less than (LT) column above.
Dx = Sample further diluted by x when analyzed.
FB = Field blank high collected &/or analyzed on the same date; see Table B-8.
Fdup = Field duplicate.
HM = Associated matrix recovery high; see Table B-9.
H = Holding time exceeded (6 months).
Ldup = Lab duplicate.
LM = Associated matrix recovery low; see Table B-9.
Q = Sample is above the contract detection limit (CDL) but below a limit of quantitation based on reagent blanks.
Reg = Regular sample.
Select = A nonrandomly selected sample.
* = Sample is below the laboratory contract detection limit.

Table B-5. Elements by ICP (EPA Method 3050/6010) B-3-3 Ditch. (sheet 1 of 2)

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lithium	Magnesium
B-152	4906 D20	7.0	5090	4.4	11.2	12.8	26106 D20	4.2 *	4128 D20
B-153	5906 D20	7.5	7211 D20	5.0	9.3	14.3	27866 D20	5.2 *	5110 D20
B-154	9823 D20	9.4	9381 D20	11.0	9.1	23.5	26168 D20	10.8	6635 D20
B-158	6978 D20	7.3	5419 FB	6.5	7.6	15.7	25207 D20	6.1 *	4705 D20 FB
B-158	5965 D20	6.5	4885 FB	6.1	7.4	14.5	20943 D20	6.5 *	4616 D20 FB
B-159	6456 D20	6.2	4889 FB	7.5	6.6	12.4	21672 D20	6.6 *	4536 D20 FB
B-160	6060 D20	6.6	4107 FB	5.2	6.1	11.7	20979 D20	6.2 *	4041 D20 FB
B-161	7439 D20	9.2	3703 FB	8.4	6.9	19.7	25511 D20	6.4 *	4088 D20 FB
B-184	6409 D20	5.4	4253	7.9	7.2	14.7	20904 D20	7.4 *	5340 D20
B-185	6379 D20	5.2	4112	5.5	6.4	14.7	21743 D20	6.6 *	4549 D20
B-187	5306 D20	5.2	3925	8.4	6.1	12.1	20482 D20	6.3 *	4166 D20
B-188	9024 D20	6.5	4674	8.7	9.1	17.5	26393 D20	9.6 *	5930 D20
B-189	6780 D20	6.2	5259	9.4	9.9	17.6	27627 D20	6.9 *	4881 D20
B-190	6158 D20	5.2	3900	9.3	6.6	19.4	20563 D20	6.9 *	4611 D20
B-191	11747 D20	9.5	5064	18.6	10.3	43.1	37479 D20	10.8	6072 D20

	Manganese	Nickel	Potassium	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-152	426.7	7.3	519.0	249.0	22.1	2491 D20	65.6	40.1	26.0
B-153	309.1	7.8	616.6	291.7	25.5	2560 D20	63.0	43.0	26.8
B-154	336.8	11.8	1388.3	307.3	34.8	1881 D20	53.0	74.1	22.5
B-158	282.0	7.4	845.7	291.3	25.9	2266 D20	60.9	58.5	24.9
B-158	273.8	7.5	731.4	242.1	23.6	1739 D20	48.5	51.1	20.6
B-159	262.9	7.4	878.6	240.6	23.7	1885 D20	50.1	46.3	19.6
B-160	254.1	6.5	671.3	216.5	21.3	1706 D20	48.5	45.7	20.2
B-161	340.4	7.3	832.8	273.2	21.6	2411 D20	56.9	58.4	27.8
B-184	381.1	13.5	767.4	227.3 BHM	23.4	1647 D20	44.4 HM	65.6	17.8
B-185	270.1	6.9	645.0	269.0 BHM	21.8	1648 D20	42.3 HM	57.7	19.4
B-187	263.6	8.0	471.4	183.6 BHM	17.8	1390 D20	40.4 HM	47.1	20.6
B-188	426.6	9.9	1032.6	308.9 BHM	28.0	2042 D20	52.5 HM	76.9	26.1
B-189	395.1	8.5	749.3	281.5 BHM	23.3	2291 D20	69.4 HM	70.5	25.5
B-190	570.1	11.0	721.6	185.8 BHM	22.9	1379 D20	40.9 HM	41.3	15.2
B-191	262.0	19.2	1584.1	292.9 BHM	30.0	1863 D20	54.1 HM	111.3	26.8

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-152	8/28/89	02/24	03/07/90	191 H	Fdup +
B-153	8/28/89	02/24	03/07/90	191 H	Fdup
B-154	8/28/89	02/24	03/07/90	191 H	Reg
B-158	8/31/89	02/24	03/07/90	188 H	Fdup,Ldup
B-158	8/31/89	02/24	03/07/90	188 H	Fdup,Ldup
B-159	8/31/89	02/24	03/07/90	188 H	Fdup
B-160	8/31/89	02/24	03/07/90	188 H	Reg
B-161	8/31/89	02/24	03/07/90	188 H	Select
B-184	9/18/89	03/05	03/12/90	175	Fdup
B-185	9/18/89	03/05	03/12/90	175	Fdup
B-187	9/18/89	03/05	03/12/90	175	Reg +
B-188	9/18/89	03/05	03/12/90	175	Reg
B-189	9/18/89	03/10	03/12/90	175	Reg
B-190	9/18/89	03/05	03/12/90	175	Reg
B-191	9/18/89	03/05	03/12/90	175	Select

Table B-5. Elements by ICP (EPA Method 3050/6010) B-3-3 Ditch. (sheet 2 of 2)

Reagent Blanks Greater than CDL

Analyte	Date	Value µg/g	GT	LT	CDL µg/g
Sodium	3/12/90	23.4	1	2	20.0

B = A reagent blank was greater than (GT) contract detection limit (CDL) on the date of analysis. The number of <CDL blanks on that day is shown in the less than (LT) column above.
Dx = Sample further diluted by x when analyzed.
FB = Field blank high collected &/or analyzed on the same date; see Table B-8.
Fdup = Field duplicate.
H = Holding time exceeded (6 months).
HM = Associated matrix recovery high; see Table B-9.
Ldup = Lab duplicate.
Reg = Regular sample.
+ = Chosen by lab for matrix spike.
* = Sample is below the laboratory contract detection limit.

Table B-6. Elements by ICP (EPA Method 3050/6010)
Background 1 - Contingency Pond.

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lithium	Magnesium	Manganese
B-101	5118 D20	5.3	6830	4.1	6.8	14.1	21232 D20	5.7 *	4284 D20	243.7
B-102	6120 D20	6.2	9831 D20	5.2	8.9	14.1	26085 D20	7.1 *	6308 D20	377.0
B-103	7650 D20	7.3	9923 D20	6.3	9.4	18.1	29671 D20	8.7 *	6260 D20	397.7
B-104	5925 D20	6.7	7328	5.8	8.9	16.4	27853 D20	6.1 *	5154 D20	313.5
B-105	5590 D20	6.7	9764 D20	5.4	8.8	16.2	28433 D20	6.0 *	5715 D20	336.6
B-105	5682 D20	6.7	9416 D20	5.0	8.8	15.0	29369 D20	6.1 *	5108 D20	318.6

	Nickel	Potassium	Silver	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-101	5.4	899.9	0.0 *	331.6	21.1	1884 D20	53.3	33.1	21.9
B-102	13.9	1216.8	0.2 *	383.5	25.1	2312 D20	60.6	38.7	23.8
B-103	8.5	1350.0	0.0 *	378.2	23.6	2714 D20	68.7	43.3	28.7
B-104	7.5	999.9	0.0 *	331.9	25.4	2310 D20	62.5	42.1	27.8
B-105	11.0	970.3	0.1 *	405.5	24.9	2806 D20	72.4	42.1	28.5
B-105	6.8	961.1 HM	0.3 *	388.8	28.0	2762 D20	73.2	44.0	27.8

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-101	8/04/89	02/20	02/21/90[1]	201 H	Reg
B-102	8/04/89	02/20	02/21/90	201 H	Reg
B-103	8/04/89	02/20	02/21/90	201 H	Reg
B-104	8/04/89	02/20	02/21/90	201 H	Reg
B-105	8/04/89	02/20	02/21/90	201 H	Ldup
B-105	8/04/89	02/20	02/23/90	203 H	Ldup

Dx = Sample further diluted by x when analyzed.
H = Holding time exceeded (6 months.)
HM = Associated matrix recovery high; see Table B-9.
Ldup = Lab duplicate.
Reg = Regular sample.
* = Sample is below the laboratory contract detection limit.

[1] No matrix spike (nor matrix spike duplicate) was reported for samples analyzed on 02/21/90. One of the B-105 lab duplicates was analyzed on 2/23/90 and supported by MS/MSD data.

Table B-7. Elements by ICP (EPA Method 3050/6010)
Background 2 - Undisturbed Native Area.

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lithium	Magnesium	Manganese
B-121	8076 D20	6.4	3138 HM	8.2	7.2	9.6 QB	22324 D20	7.3 *	4334 D20	312.2
B-122	8162 D20	6.5	3206 HM	9.7	7.3	10.6 QB	22231 D20	7.4 *	4692 D20	318.9
B-123	7695 D20	7.2	3872 HM	6.8	7.1	9.9 QB	24131 D20	6.4 *	4577 D20	309.5
B-124	9204 D20	7.0	3726 HM	9.1	8.3	11.8 B	25620 D20	7.5 *	4970 D20	345.8
B-125	7948 D20	6.4	3354 HM	7.4	6.9	8.7 QB	22676 D20	6.0 *	4142 D20	306.7
B-126	9027 D20	6.8	3649 HM	9.1	7.5	11.7 B	24242 D20	7.8 *	5193 D20	331.5

	Nickel	Potassium	Silver	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-121	8.8	1445	0.3 *LM	185.2	19.9	1799 D20	49.9	37.5	21.4
B-122	10.0	1505	0.2 *LM	188.7	20.6	1755 D20	48.6	37.6	21.3
B-123	7.8	1443	0.5 *LM	196.4	21.7	2143 D20	52.9	37.5	21.6
B-124	9.5	1538	0.4 *LM	226.2	23.9	2032 D20	56.3	37.8	23.1
B-125	8.2	1404	0.3 *LM	188.4	24.0	1870 D20	50.1	37.9	21.5
B-126	9.5	1561	0.2 *LM	219.6	24.1	1888 D20	50.7	41.3	21.2

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-121	8/10/89	02/22	03/06/90	208 H	Fdup
B-122	8/10/89	02/22	03/06/90	208 H	Fdup
B-123	8/10/89	02/22	03/06/90	208 H	Reg +
B-124	8/10/89	02/22	03/06/90	208 H	Reg
B-125	8/10/89	02/22	03/06/90	208 H	Reg
B-126	8/10/89	02/22	03/06/90	208 H	Reg

Reagent Blanks Greater than CDL

Analyte	Date	Value µg/g	GT	LT	CDL µg/g
Copper	3/06/90	1.3	1	1	1.0

B = A reagent blank was greater than (GT) CDL on the date of analysis. The number of <CDL blanks on that day is shown in the less than (LT) column above.
Dx = Sample further diluted by x when analyzed.
Fdup = Field duplicate.
H = Holding time exceeded.
HM = Associated matrix recovery high; see Table B-9.
LM = Associated matrix recovery low; see Table B-9.
Q = Sample is above the contract detection limit (CDL) but below a limit of quantitation based on reagent blanks.
Reg = Regular sample.
* = Sample is below the laboratory CDL.
+ = Chosen by lab for matrix spike.

Table B-8. Elements by ICP (EPA Method 3050/6010)
Silica Sand Field Blanks. (sheet 1 of 2)

Sample	Aluminum	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lithium	Magnesium	Manganese
B-113	227.8	0.2 *	43.2 QHM	0.3 *	0.2 *	1.3 Q B LD	302.0	0.2 *	35.6	5.9
B-117	159.5	0.0 *	28.0 QHM	0.0 *	0.0 *	0.5 * B	205.4	0.1 *	17.9	5.8
B-142	159.9	0.0 *	25.4 Q	0.1 *	0.0 *	5.7 Q FB LM	186.7 HM	0.1 *	15.9	4.4
B-151	131.9	0.4 Q	27.0 Q	0.0 *	0.3 *	0.4 *	924.0	0.1 *	15.3	25.3
B-156	202.4	0.7 Q	37.7 Q	0.4 *LM	0.1 *	0.3 *	517.7	0.3 *	23.9	10.5
B-163	158.2	0.5 Q	346.4 FB	0.4 *LM	0.1 *	0.3 *	212.2	0.2 *	86.0 FB	5.1
B-170	165.0	0.8 Q	35.0 Q	0.4 *LM	0.4 *	0.4 *	845.2	0.2 *	19.7	92.6
B-170	152.8	0.1 *	32.6 Q	0.3 *LM	0.0 *	0.2 *	188.6	0.1 *	17.5	4.4
B-193	165.3	0.0 *	38.0 Q	0.1 *	0.0 *	0.3 *	203.6	0.1 *	19.8	5.4
B-193	147.0	0.0 *	28.4 Q	0.2 *	0.1 *	0.2 *	194.1	0.0 *	16.8	4.9
B-205	152.3	0.1 *	31.9 Q	0.1 *LM	0.3 *	0.9 *	613.1	0.1 *	18.8	4.0

	Nickel	Potassium	Silver	Sodium	Strontium	Titanium	Vanadium	Zinc	Zirconium
B-113	0.4 *	44.6	0.2 *LM	14.9 *	0.7 *	4.9 *	0.6 Q	1.3 Q	1.2 *
B-117	0.3 *	42.9	0.0 *LM	16.7 *	0.5 *	4.1 *	0.0 *	0.9 Q	0.7 *
B-142	0.1 *	38.2	0.0 *	9.0 *	0.4 *	4.1 *	0.1 *	1.0 Q	0.8 *
B-151	0.3 *	30.8	0.2 *	14.8 *	0.5 *	40.8 *	0.8 Q	1.0 Q	0.6 *
B-156	0.8 *	43.9 HM	0.0 *	13.8 *HM B	0.7 *	5.7 *	0.4 *HM	1.0 Q	0.9 *
B-163	0.8 *	40.1 HM	0.0 *	10.4 *HM B	0.6 *	4.5 *	0.3 *HM	0.8 Q	0.8 *
B-170	0.8 *	40.0 HM	0.0 *	11.7 *HM B	0.7 *	5.5 *	0.4 *HM	1.7 Q	0.9 *
B-170	0.5 *	34.4 HM	0.1 *	11.3 *HM B	0.5 *	4.3 *	0.2 *HM	0.7 QLD	0.7 *
B-193	0.2 *	38.5	0.0 *	20.1 QHM B	0.5 *	4.6 *	0.5 *HM	5.7	0.7 *
B-193	0.3 *	34.8	0.3 *	23.2 QHM B	0.6 *	4.0 *	0.5 *HM	0.9 Q	0.3 *
B-205	0.0 *	31.8 HM	0.1 *	32.5 QHM B	0.6 *	4.0 *	0.4 *HM	2.0 Q	0.7 *

Sampling Parameters

Sample	Collect date	Digest date	Analysis date	Days elapsed	Type
B-113	8/04/89	2/22	3/06/90	214 H	Blk
B-117	8/10/89	2/22	3/06/90	208 H	Blk
B-142	8/18/89	2/19	2/20/90	186 H	Blk +
B-151	8/25/89	2/20	2/21/90	180	Blk
B-156	8/28/89	2/24	3/07/90	191 H	Blk
B-163	8/31/89	2/24	3/07/90	188 H	Blk
B-170	9/07/89	2/24	3/07/90	181	Blk-Ldup
B-170	9/07/89	2/24	3/07/90	181	Blk-Ldup
B-193	9/18/89	3/05	3/12/90	175	Blk-Ldup
B-193	9/18/89	3/05	3/12/90	175	Blk-Ldup
B-205	9/21/89	3/06	3/07/90	167	Blk

Table B-8. Elements by ICP (EPA Method 3050/6010)
Silica Sand Field Blanks. (sheet 2 of 2)

Reagent Blanks Greater than CDL

Analyte	Date	Value µg/g	GT	LT	CDL µg/g
Copper	3/06/90	1.3	1	1	1.0
Sodium	3/07/90	26.7	2	2	20.0
Sodium	3/07/90	24.1	-	-	
Sodium	3/12/90	23.4	1	2	

B = A reagent blank was greater than (GT) CDL on date of analysis. The number of <CDL blanks on that day is shown on the following page in the less than (LT) column.
Blk = Silica sand field blank.
FB = Field blank high--exceeds 99th percentile of the distribution.
H = Holding time exceeded (6 months).
HM = Associated matrix recovery high; see Table B-9.
LD = Sample is above CDL but below a limit of detection, (avg + 3s), based on reagent blanks.
Ldup = Lab duplicate.
LM = Associated matrix recovery low; see Table B-9.
Q = Sample is above contract detection limit (CDL) but below a limit of quantitation, (avg + 10s), based on reagent blanks.
* = Sample is below CDL limit.
+ = Chosen by lab for matrix spike.

[2] No matrix spike (nor matrix spike duplicate) was reported for samples analyzed on 02/21/90.

Table B-9. Matrix Spike/Matrix Spike Duplicate Anomally Summary for ICP Analytes.

Sample	Digest Date	Analysis Date	Low Recovery[a]	Analyte High Recovery[a]	Spike Level Inappropriate	Sample Spikes Site/Source
B-133 S1	2/19	2/20/90	Ag(72%)		Al, Fe, Mg, Ti	Composite fr. B-3 Pond
B-133 S2	2/19	2/20/90			Al, Fe, Ti	
B-142 S1	2/19	2/20/90	Cu(73%)			Silica sand blank
B-142 S2	2/19	2/20/90	Cu(75%)	Fe(181%)		
B-110 S1	2/20	2/23/90			Ca, Al, Fe, Mg, Ti	3B Pond
B-110 S2	2/20	2/23/90		K(128%)	Ca, Al, Fe, Mg, Ti	
B-123 S1	2/22	3/06/90	Ag(71%)	Ca(128%)	Al, Mn, Fe, Mg, Ti	Background (Sage. site)
B-123 S2	2/22	3/06/90	Ag(74%)	Ca(129%)	Al, Mn, Fe, Ti	
B-152 S1	2/24	3/07/90			Ca, Al, Mn, Fe, Mg, Ti	B-3-3 Ditch
B-152 S2	2/24	3/07/90			Ca, Al, Mn, Fe, Mg, Ti	
B-162 S1	2/24	3/07/90	Cr(73%)	Cd(130%), Na(130%), V(152%), K(131%)	Ca, Al, Fe, Mg, Ti	Composite fr. B-3-3 Ditch
B-162 S2	2/24	3/07/90		Cd(130%), Na(128%), V(147%), K(143%)	Ca, Al, Mn, Fe, Mg, Ti	
B-198 S1	3/06	3/07/90			Ca, Al, Mn, Fe, Mg, Ti	3A Pond
B-198 S2	3/06	3/07/90			Ca, Al, Fe, Mg, Ti	
B-175 S1	3/08	3/10/90		V(134%)	Ca, Al, Mn, FE, Mg, Ti	3C Pond (dry site)
B-175 S2	3/08	3/10/90		V(131%)	Ca, Al, Mn, Fe, Mg, Ti	
B-187 S1	3/05	3/12/90		Na(126%), V(141%)	Ca, Al, Mn, Fe, Mg, Ti	B-3-3 Ditch
B-187 S2	3/05	3/12/90		V(147%)	Ca, Al, Mn, Fe, Mg, Ti	

[a] = Acceptable guideline recoveries are 75 to 125%.

APPENDIX C

SELECTED DATA OTHER THAN ICP ANALYSES

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APPENDIX C

SELECTED DATA OTHER THAN ICP ANALYSES

Appendix C contains tabulations of total metals by atomic absorption, ammonium, common anions by liquid chromatography, volatile organics by gas chromatography/mass spectrometry, and radioactivity measurements. Many analytes investigated in Phase 1 were below concentrations measurable by the referenced procedures. Those selected for display in this appendix generally include analytes reported above the contract detection limit (CDL) in at least some samples and not listed in the previous appendix. Analytes are presented in the following order: arsenic, lead, mercury, ammonium, chloride, fluoride, nitrate, nitrite, phosphate, sulfate, volatile organics, gross alpha, gross beta, strontium-90, and radionuclides by gamma scan.

Key to sample type abbreviations of Appendix C

Fdup = Field duplicate
Ldup = Laboratory duplicate
Reg = Regular sample
Select = Nonrandomly selected sample
Blk = Silica sand field blank
H_2O = Pond water sample
MS = Matrix spike sample
MSD = Matrix spike duplicate sample.

Table C-1. Arsenic Data (EPA Method 7060)
Soil CDL = 0.5 µg/g. (sheet 1 of 2)

Site	Sample	Arsenic (µg/g)	QC-flags	Collect date	Digest date	Analysis date	Type
3A Pond	B-194	1.10		9/21	9/25	9/26	Fdup
3A Pond	B-196	0.97		9/21	9/25	9/26	Fdup
3A Pond	B-197	0.84		9/21	9/25	9/26	Ldup
3A Pond	B-197	0.89		9/21	9/25	9/26	Ldup
3A Pond	B-198	1.07		9/21	9/25	9/26	Reg
3A Pond	B-200	4.69		9/21	9/25	9/26	Reg
3A Pond	B-201	2.66		9/21	9/25	9/26	Reg
3A Pond	B-202	1.35		9/21	9/25	9/26	Reg
3A Pond	B-203	2.12		9/21	9/25	9/26	Reg
3B Pond	B-106	1.64		8/04	8/31	9/05	Ldup
3B Pond	B-106	2.54		8/04	8/31	9/05	Ldup
3B Pond	B-107	1.92		8/04	8/31	9/05	Reg
3B Pond	B-108	1.87		8/04	8/31	9/05	Fdup
3B Pond	B-109	2.26		8/04	9/05	9/08	Fdup
3B Pond	B-110	3.43		8/04	9/05	9/08	Reg
3B Pond	B-111	1.78		8/04	9/05	9/08	Reg
3C Pond	B-171	0.97		9/08	9/13	9/15	Fdup
3C Pond	B-172	2.20		9/08	9/13	9/15	Fdup
3C Pond	B-174	0.99		9/08	9/13	9/15	Reg
3C Pond	B-175	1.95		9/08	9/13	9/15	Reg
3C Pond	B-176	1.14		9/08	9/13	9/15	Ldup
3C Pond	B-176	1.32		9/08	9/13	9/15	Ldup
3C Pond	B-177	0.94		9/08	9/13	9/15	Reg
3C Pond	B-178	0.83		9/08	9/13	9/15	Reg
3C Pond	B-179	1.13		9/08	9/13	9/15	Reg
3C Pond	B-180	0.84		9/08	9/13	9/15	Reg
B-3 Pond	B-114	2.24		8/10	9/05	9/08	Reg
B-3 Pond	B-115	1.75		8/10	9/05	9/08	Reg
B-3 Pond	B-116	1.57		8/10	9/05	9/08	Reg
B-3 Pond	B-118	2.67		8/11	9/15	9/18	Reg
B-3 Pond	B-119	2.17		8/11	9/15	9/18	Reg
B-3 Pond	B-128	1.54		8/17	9/15	9/18	Fdup
B-3 Pond	B-129	1.60		8/17	9/15	9/18	Fdup
B-3 Pond	B-130	2.32		8/17	9/15	9/18	Reg
B-3 Pond	B-131	2.36		8/17	9/15	9/18	Reg
B-3 Pond	B-132	2.46		8/17	9/15	9/18	Reg
B-3 Pond	B-134	2.18		8/18	9/21	9/22	Fdup
B-3 Pond	B-135	3.10		8/18	9/21	9/22	Fdup
B-3 Pond	B-136	2.32		8/18	9/21	9/22	Reg
B-3 Pond	B-138	1.38		8/18	9/21	9/22	Reg
B-3 Pond	B-139	1.13		8/18	9/21	9/22	Reg
B-3 Pond	B-140	1.52		8/18	9/21	9/22	Ldup
B-3 Pond	B-140	1.40		8/18	9/21	9/22	Ldup
B-3 Pond	B-143	1.15		8/25	8/29	8/30	Reg
B-3 Pond	B-145	1.32		8/25	8/29	8/30	Fdup
B-3 Pond	B-146	1.23		8/25	8/29	8/30	Fdup
B-3 Pond	B-147	2.05		8/25	8/29	8/30	Reg
B-3 Pond	B-148	3.34		8/25	8/29	8/30	Reg
B-3 Pond	B-149	2.65		8/25	8/29	8/30	Reg
B-3 Pond	B-164	2.63		9/07	9/13	9/15	Select-Fdup
B-3 Pond	B-165	2.91		9/07	9/13	9/15	Select-Fdup
B-3 Pond	B-166	1.45		9/07	9/13	9/15	Reg
B-3 Pond	B-168	1.56		9/07	9/13	9/15	Select
B-3-3 Dit.	B-152	1.59		8/28	8/31	9/05	Fdup
B-3-3 Dit.	B-153	1.22		8/28	8/31	9/05	Fdup
B-3-3 Dit.	B-154	3.09		8/28	8/31	9/05	Reg
B-3-3 Dit.	B-158	2.56		8/31	9/05	9/08	Fdup
B-3-3 Dit.	B-159	1.86		8/31	9/05	9/08	Fdup
B-3-3 Dit.	B-160	1.28		8/31	9/05	9/08	Reg
B-3-3 Dit.	B-161	1.29		8/31	9/05	9/08	Select

Table C-1. Arsenic Data (EPA Method 7060)
Soil CDL = 0.5 µg/g. (sheet 2 of 2)

Site	Sample	Arsenic (µg/g)	QC-flags	Collect date	Digest date	Analysis date	Type
B-3-3 Dit.	B-184	2.99		9/18	9/21	9/22	Fdup
B-3-3 Dit.	B-185	2.93		9/18	9/21	9/22	Fdup
B-3-3 Dit.	B-187	1.84		9/18	9/21	9/22	Reg
B-3-3 Dit.	B-188	4.45		9/18	9/21	9/22	Reg
B-3-3 Dit.	B-189	3.69		9/18	9/21	9/22	Ldup
B-3-3 Dit.	B-189	2.16		9/18	9/21	9/22	Ldup
B-3-3 Dit.	B-190	2.63		9/18	9/21	9/22	Reg
B-3-3 Dit.	B-191	2.85		9/18	9/21	9/22	Select
Cont Bkg	B-101	3.51		8/04	8/31	9/05	Reg
Cont Bkg	B-102	4.75		8/04	8/31	9/05	Reg
Cont Bkg	B-103	3.45		8/04	8/31	9/05	Reg
Cont Bkg	B-104	2.14		8/04	8/31	9/05	Reg
Cont Bkg	B-105	2.45		8/04	8/31	9/05	Reg
Sage Bkg	B-121	1.90		8/10	9/05	9/08	Fdup
Sage Bkg	B-122	2.56		8/10	9/15	9/18	Ldup, Fdup
Sage Bkg	B-122	2.51		8/10	9/15	9/18	Ldup, Fdup
Sage Bkg	B-123	1.87		8/10	9/15	9/18	Reg
Sage Bkg	B-124	1.68		8/10	9/15	9/18	Reg
Sage Bkg	B-125	1.58		8/10	9/15	9/18	Reg
Sage Bkg	B-126	3.22		8/10	9/15	9/18	Reg
Silica sand	B-113	0.04	*+	8/04	9/05	9/08	Blk
Silica sand	B-117	0.01	*	8/10	9/05	9/08	Blk
Silica sand	B-1288	0.08	*+	8/11	9/15	9/18	Blk
Silica sand	B-142	0.00	*+	8/18	9/21	9/22	Blk
Silica sand	B-151	0.02	*+	8/25	8/29	8/30	Blk
Silica sand	B-156	0.00	*+	8/28	8/31	9/05	Blk
Silica sand	B-163	0.00	*	8/31	9/05	9/08	Blk
Silica sand	B-170	0.04	*+	9/07	9/13	9/15	Blk
Silica sand	B-183	0.00	*	9/08	9/13	9/15	Blk
Silica sand	B-193	0.08	*	9/18	9/21	9/22	Blk
Silica sand	B-205	0.03	*+	9/21	9/25	9/26	Blk
WATER SAMPLES (µg/L)[1]							
B-3 Pond	B-206	1	*+	9/28	10/09	10/13	Fdup-H_2O
B-3 Pond	B-207	2	*	9/28	10/09	10/13	Fdup-H_2O
B-3 Pond	B-208	1	*	9/28	10/09	10/13	Reg-H_2O
B-3 Pond	B-209	1	*	9/28	10/09	10/13	Reg-H_2O
B-3 Pond	B-210	1	*	9/28	10/09	10/13	Reg-H_2O

[1]CDL for water = 5 µg/L

SPIKE RECOVERIES (%-Rec.)

Sample	MS	MSD
B-151	79	79
B-156	78	82
B-113	84	84
B-170	82	82
B-128	94	92
B-142	86	90
B-205	82	78
B-206 (Water)	88	92

* = Estimated value <CDL.
\+ = Sample chosen by laboratory for MS/MSD.

Table C-2. Lead Data (EPA Method 7421)
Soil CDL = 0.5 µg/g. (sheet 1 of 2)

Site	Sample	Lead (µg/g)	QC-flags	Collect date	Digest date	Analysis date	Type
3A Pond	B-194	4.41		9/21	9/25	9/26	Fdup
3A Pond	B-196	4.29		9/21	9/25	9/26	Fdup
3A Pond	B-197	2.97		9/21	9/25	9/26	Ldup
3A Pond	B-197	4.01		9/21	9/25	9/26	Ldup
3A Pond	B-198	5.22		9/21	9/25	9/26	Reg
3A Pond	B-200	6.28		9/21	9/25	9/26	Reg
3A Pond	B-201	7.29		9/21	9/25	9/26	Reg
3A Pond	B-202	3.76		9/21	9/25	9/26	Reg
3A Pond	B-203	6.36		9/21	9/25	9/26	Reg
3B Pond	B-106	2.63		8/04	8/31	9/06	Ldup
3B Pond	B-106	3.11		8/04	8/31	9/06	Ldup
3B Pond	B-107	2.92		8/04	8/31	9/06	Reg
3B Pond	B-108	3.12		8/04	8/31	9/06	Fdup
3B Pond	B-109	3.84	FB	8/04	9/05	9/07	Fdup
3B Pond	B-110	3.03	FB	8/04	9/05	9/07	Reg
3B Pond	B-111	2.07	FB	8/04	9/05	9/07	Reg
3C Pond	B-171	3.37		9/08	9/13	9/14	Fdup
3C Pond	B-172	5.22		9/08	9/13	9/14	Fdup
3C Pond	B-174	2.92		9/08	9/13	9/14	Reg
3C Pond	B-175	4.65		9/08	9/13	9/14	Reg
3C Pond	B-176	3.48		9/08	9/13	9/14	Ldup
3C Pond	B-176	3.31		9/08	9/13	9/14	Ldup
3C Pond	B-177	6.09		9/08	9/13	9/14	Reg
3C Pond	B-178	3.30		9/08	9/13	9/14	Reg
3C Pond	B-179	3.84		9/08	9/13	9/14	Reg
3C Pond	B-180	3.04		9/08	9/13	9/14	Reg
B-3 Pond	B-114	16.20	D10 FB	8/10	9/05	9/09	Reg
B-3 Pond	B-115	50.50	D50 FB E	8/10	9/05	9/09	Reg
B-3 Pond	B-116	58.20	D10 FB	8/10	9/05	9/09	Reg
B-3 Pond	B-118	8.14		8/11	9/15	9/18	Reg
B-3 Pond	B-119	9.60	D10 E	8/11	9/15	9/18	Reg
B-3 Pond	B-128	13.50	D10	8/17	9/15	9/18	Fdup
B-3 Pond	B-129	13.00	D10	8/17	9/15	9/18	Fdup
B-3 Pond	B-130	356.00	D100	8/17	9/15	9/20	Reg
B-3 Pond	B-131	618.00	D100	8/17	9/15	9/20	Reg
B-3 Pond	B-132	112.00	D100 E	8/17	9/15	9/20	Reg
B-3 Pond	B-134	14.50	D10	8/18	9/21	9/22	Fdup
B-3 Pond	B-135	19.10	D10	8/18	9/21	9/22	Fdup
B-3 Pond	B-136	16.90	D10	8/18	9/21	9/22	Reg
B-3 Pond	B-138	46.60	D10	8/18	9/21	9/22	Reg
B-3 Pond	B-139	286.00	D100	8/18	9/21	9/23	Reg
B-3 Pond	B-140	25.10	D10	8/18	9/21	9/22	Ldup
B-3 Pond	B-140	23.90	D10	8/18	9/21	9/22	Ldup
B-3 Pond	B-143	67.00	D10	8/25	8/29	8/31	Reg
B-3 Pond	B-145	59.00	D10	8/25	8/29	8/31	Fdup
B-3 Pond	B-146	226.00	D100	8/25	8/29	9/01	Fdup
B-3 Pond	B-147	163.00	D100	8/25	8/29	9/01	Reg
B-3 Pond	B-148	116.00	D100	8/25	8/29	9/01	Reg
B-3 Pond	B-149	17.00	D10	8/25	8/29	8/31	Reg
B-3 Pond	B-164	16.60	D10	9/07	9/13	9/16	Select-Fdup
B-3 Pond	B-165	13.00	D10	9/07	9/13	9/16	Select-Fdup
B-3 Pond	B-166	76.90	D10	9/07	9/13	9/16	Reg
B-3 Pond	B-168	74.40	D10	9/07	9/13	9/16	Select
B-3-3 Dit.	B-152	3.22		8/28	8/31	9/06	Fdup
B-3-3 Dit.	B-153	2.38		8/28	8/31	9/06	Fdup
B-3-3 Dit.	B-154	8.65		8/28	8/31	9/06	Reg
B-3-3 Dit.	B-158	5.69	FB	8/31	9/05	9/07	Fdup
B-3-3 Dit.	B-159	4.51	FB	8/31	9/05	9/07	Fdup
B-3-3 Dit.	B-160	5.62	FB	8/31	9/05	9/07	Reg

Table C-2. Lead Data (EPA Method 7421)
Soil CDL = 0.5 µg/g. (sheet 2 of 2)

Site	Sample	Lead (µg/g)	QC-flags	Collect date	Digest date	Analysis date	Type
B-3-3 Dit.	B-161	31.00	D10 FB	8/31	9/05	9/09	Select
B-3-3 Dit.	B-184	7.42		9/18	9/21	9/22	Fdup
B-3-3 Dit.	B-185	7.84		9/18	9/21	9/22	Fdup
B-3-3 Dit.	B-187	3.38		9/18	9/21	9/22	Reg
B-3-3 Dit.	B-188	10.80	D10	9/18	9/21	9/22	Reg
B-3-3 Dit.	B-189	5.15		9/18	9/21	9/22	Ldup
B-3-3 Dit.	B-189	4.15		9/18	9/21	9/22	Ldup
B-3-3 Dit.	B-190	3.75		9/18	9/21	9/22	Reg
B-3-3 Dit.	B-191	2.36		9/18	9/21	9/22	Select
Cont Bkg	B-101	4.84		8/04	8/31	9/06	Reg
Cont Bkg	B-102	3.80		8/04	8/31	9/06	Reg
Cont Bkg	B-103	5.04		8/04	8/31	9/06	Reg
Cont Bkg	B-104	3.55		8/04	8/31	9/06	Reg
Cont Bkg	B-105	3.69		8/04	8/31	9/06	Reg
Sage Bkg	B-121	3.96	FB	8/10	9/05	9/07	Fdup
Sage Bkg	B-122	7.30	FB	8/10	9/15	9/18	Fdup,Ldup
Sage Bkg	B-122	7.13	FB	8/10	9/15	9/18	Fdup,Ldup
Sage Bkg	B-123	6.81	FB	8/10	9/15	9/18	Reg
Sage Bkg	B-124	4.70	FB	8/10	9/15	9/18	Reg
Sage Bkg	B-125	6.81	FB	8/10	9/15	9/18	Reg
Sage Bkg	B-126	9.96	FB	8/10	9/15	9/18	Reg
Silica sand	B-113	0.52	E Q	+ 8/04	9/05	9/07	Blk
Silica sand	B-117	1.58	FB	8/10	9/05	9/07	Blk
Silica sand	B-128B	0.32 *		+ 8/11	9/15	9/18	Blk
Silica sand	B-142	0.23 *		+ 8/18	9/21	9/22	Blk
Silica sand	B-151	0.31 *		+ 8/25	8/29	8/31	Blk
Silica sand	B-156	0.30 *		+ 8/28	8/31	9/06	Blk
Silica sand	B-163	0.71	E Q	8/31	9/05	9/07	Blk
Silica sand	B-170	0.26 *		+ 9/07	9/13	9/14	Blk
Silica sand	B-183	0.25 *		9/08	9/13	9/14	Blk
Silica sand	B-193	0.24 *		9/18	9/21	9/22	Blk
Silica sand	B-205	0.39 *		+ 9/21	9/25	9/26	Blk
WATER SAMPLES (µg/L)[1]							
B-3 Pond	B-206	1 *		9/28	-	10/11	Fdup-H_2O
B-3 Pond	B-207	0 *		9/28	-	10/11	Fdup-H_2O
B-3 Pond	B-208	1 *		+ 9/28	-	10/11	Reg-H_2O
B-3 Pond	B-209	1 *		9/28	-	10/11	Reg-H_2O
B-3 Pond	B-210	0 *		9/28	-	10/11	Reg-H_2O

[1]CDL for water = 5 µg/L

SPIKE RECOVERIES

Sample	MS	MSD	Sample	MS	MSD
B-151	89	93	B-205	100	104
B-113	84	84	B-156	96	98
B-142	94	96	B-128	96	104
B-128	96	104	B-170	98	96
			B-208 (Water)	94	96

Dx = Sample diluted during analysis by an extra factor of x.
E = Estimate is greater than a dilution-adjusted CDL, but <3 times the standard deviation of the field blanks multiplied by any additional dilution factor.
FB = Assoc. field blank high -- exceeds 99th percentile of the t distribution.
Q = Estimate is greater than a dilution-adjusted CDL, but below an LOQ derived from the mean and standard deviation of reagent blanks, (avg. + 10s), and adjusted for nominal sample size/dilution; LOQ = 0.73 µg/g.
+ = Sample chosen by laboratories for MS/MSD.
* = Estimated value below CDL.

Table C-3. Mercury Data (EPA Methods 7470 and 7471)
Soil CDL = 0.2 µg/g. (sheet 1 of 2)

Site	Sample	Mercury (µg/g)	QC-flags	Collect date	Analysis date	Days elapsed	Type
3A Pond	B-194	< 0.2 *		9/21	9/26	5	Fdup
3A Pond	B-196	< 0.2 *		9/21	9/26	5	Fdup
3A Pond	B-197	< 0.2 *		9/21	9/26	5	Reg
3A Pond	B-198	< 0.2 *		9/21	9/26	5	Reg
3A Pond	B-200	< 0.2 *		9/21	9/26	5	Reg
3A Pond	B-201	< 0.2 *		9/21	9/26	5	Reg
3A Pond	B-202	< 0.2 *		+ 9/21	9/26	5	Reg
3A Pond	B-203	< 0.2 *		9/21	9/26	5	Reg
3B Pond	B-106	< 0.2 *		8/04	8/11	7	Reg
3B Pond	B-107	< 0.2 *		8/04	8/11	7	Reg
3B Pond	B-108	< 0.2 *		8/04	8/11	7	Fdup
3B Pond	B-109	< 0.2 *		8/04	8/11	7	Fdup
3B Pond	B-110	< 0.2 *		8/04	8/11	7	Reg
3B Pond	B-111	< 0.2 *		8/04	8/11	7	Reg
3C Pond	B-171	< 0.2 *		9/08	9/14	6	Fdup
3C Pond	B-172	< 0.2 *		9/08	9/14	6	Fdup
3C Pond	B-174	< 0.2 *		9/08	9/14	6	Reg
3C Pond	B-175	< 0.2 *		9/08	9/14	6	Reg
3C Pond	B-176	< 0.2 *		+ 9/08	9/14	6	Reg
3C Pond	B-177	< 0.2 *		9/08	9/18	10	Reg
3C Pond	B-178	< 0.2 *		9/08	9/18	10	Reg
3C Pond	B-179	< 0.2 *		9/08	9/18	10	Reg
3C Pond	B-180	< 0.2 *		9/08	9/18	10	Reg
B-3 Pond	B-114	1.4	Q	8/10	8/24	14	Ldup
B-3 Pond	B-114	1.7	Q	8/10	8/24	14	Ldup
B-3 Pond	B-115	2.4	D2 Q	+ 8/10	8/29	19	Reg
B-3 Pond	B-116	3.2		8/10	8/24	14	Reg
B-3 Pond	B-118	< 0.2 *		8/11	8/24	13	Reg
B-3 Pond	B-119	< 0.2 *		8/11	8/24	13	Reg
B-3 Pond	B-128	< 0.2 *		8/17	8/24	7	Fdup
B-3 Pond	B-129	< 0.2 *		8/17	8/24	7	Fdup
B-3 Pond	B-130	11.6	D4 Q	8/17	8/29	12	Reg
B-3 Pond	B-131	7.0	D2	8/17	8/29	12	Reg
B-3 Pond	B-132	15.6	D4	8/17	8/29	12	Reg
B-3 Pond	B-134	0.7	Q	8/18	8/24	6	Fdup
B-3 Pond	B-135	1.1	Q	8/18	8/24	6	Fdup
B-3 Pond	B-136	1.7	Q	8/18	8/24	6	Reg
B-3 Pond	B-138	1.7	Q	8/18	8/24	6	Reg
B-3 Pond	B-139	1.4	Q	8/18	8/24	6	Reg
B-3 Pond	B-140	0.7	Q	8/18	8/24	6	Reg
B-3 Pond	B-143	1.0	Q	8/25	8/29	4	Ldup
B-3 Pond	B-143	1.2	Q	8/25	8/29	4	Ldup
B-3 Pond	B-145	1.6	Q	8/25	8/29	4	Fdup
B-3 Pond	B-146	< 0.2 *		8/25	8/29	4	Fdup
B-3 Pond	B-147	3.7	D2 Q	8/25	8/30	5	Reg
B-3 Pond	B-148	1.2	Q	8/25	8/29	4	Reg
B-3 Pond	B-149	< 0.2 *		8/25	8/29	4	Reg
B-3 Pond	B-164	0.8	Q	9/07	9/14	7	Select-Fdup
B-3 Pond	B-165	0.3	Q LD	9/07	9/14	7	Select-Fdup
B-3 Pond	B-166	0.6	Q	9/07	9/14	7	Reg
B-3 Pond	B-168	0.7	Q	9/07	9/14	7	Select
B-3-3 Dit.	B-152	< 0.2 *		8/28	8/30	2	Fdup
B-3-3 Dit.	B-153	< 0.2 *		8/28	8/30	2	Fdup
B-3-3 Dit.	B-154	0.2	Q LD	8/28	8/30	2	Reg
B-3-3 Dit.	B-158	< 0.2 *		8/31	9/05	5	Ldup, Fdup
B-3-3 Dit.	B-158	< 0.2 *		8/31	9/05	5	Ldup, Fdup
B-3-3 Dit.	B-159	< 0.2 *		8/31	9/05	5	Fdup
B-3-3 Dit.	B-160	< 0.2 *		8/31	9/05	5	Reg
B-3-3 Dit.	B-161	0.6	Q	8/31	9/05	5	Select
B-3-3 Dit.	B-184	< 0.2 *		9/18	9/22	4	Fdup
B-3-3 Dit.	B-185	< 0.2 *		9/18	9/22	4	Fdup

Table C-3. Mercury Data (EPA Method 7470)
Soil CDL = 0.2 µg/g. (sheet 2 of 2)

Site	Sample	Mercury (µg/g)	QC-flags	Collect date	Analysis date	Days elapsed	Type
B-3-3 Dit.	B-187	< 0.2 *		9/18	9/22	4	Reg
B-3-3 Dit.	B-188	0.4	Q LD	9/18	9/22	4	Reg
B-3-3 Dit.	B-189	< 0.2 *		9/18	9/22	4	Reg
B-3-3 Dit.	B-190	< 0.2 *		9/18	9/22	4	Reg
B-3-3 Dit.	B-191	< 0.2 *		9/18	9/22	4	Select
Cont Bkg	B-101	< 0.2 *		8/04	8/11	7	Ldup
Cont Bkg	B-101	< 0.2 *		8/04	8/11	7	Ldup
Cont Bkg	B-102	< 0.2 *		+ 8/04	8/11	7	Reg
Cont Bkg	B-103	< 0.2 *		8/04	8/11	7	Reg
Cont Bkg	B-104	< 0.2 *		8/04	8/11	7	Reg
Cont Bkg	B-105	< 0.2 *		8/04	8/11	7	Reg
Sage Bkg	B-121	< 0.2 *		8/10	8/24	14	Fdup
Sage Bkg	B-122	< 0.2 *		8/10	8/24	14	Fdup
Sage Bkg	B-123	< 0.2 *		8/10	8/24	14	Reg
Sage Bkg	B-124	< 0.2 *		8/10	8/24	14	Reg
Sage Bkg	B-125	< 0.2 *		8/10	8/24	14	Reg
Sage Bkg	B-126	< 0.2 *		8/10	8/24	14	Reg
Silica sand	B-113	< 0.2 *		8/04	8/11	7	Blk
Silica sand	B-117	< 0.2 *		8/10	8/24	14	Blk
Silica sand	B-128B	< 0.2 *		8/11	8/24	13	Blk
Silica sand	B-142	< 0.2 *		8/18	8/24	6	Blk
Silica sand	B-151	< 0.2 *		8/25	8/29	4	Blk
Silica sand	B-156	< 0.2 *		+ 8/28	8/30	2	Blk
Silica sand	B-163	< 0.2 *		+ 8/31	9/05	5	Blk
Silica sand	B-170	< 0.2 *		9/07	9/14	7	Blk
Silica sand	B-183	< 0.2 *		+ 9/08	9/18	10	Blk
Silica sand	B-193	< 0.2 *		+ 9/18	9/22	4	Blk
Silica sand	B-205	< 0.2 *		9/21	9/26	5	Blk
WATER SAMPLES	µg/L[1]						
B-3 Pond	B-206	< 0.1 *		9/28	10/03	5	Fdup-H_2O
B-3 Pond	B-207	< 0.1 *		9/28	10/04	6	Fdup-H_2O
B-3 Pond	B-208	< 0.1 *		9/28	10/04	6	Reg-H_2O
B-3 Pond	B-209	< 0.1 *		9/28	10/04	6	Reg-H_2O
B-3 Pond	B-210	< 0.1 *		9/28	10/04	6	Reg-H_2O

[1] CDL for water = 0.1 µg/L

SPIKE RECOVERIES

Sample	%-Rec. MS	%-Rec. MSD	Sample	%-Rec. MS	%-Rec. MSD
B-102	120	100	B-176	120	100
B-115	100	120	B-183	100	120
B-156	120	120	B-193	100	100
B-163	110	110	B-202	110	110

Dx = Sample size reduced in analysis by an extra factor of x.
LD = Estimate is greater than a dilution adjusted CDL, but below a limit of detection, (LOD), derived from the mean and standard deviation of reagent blanks, (avg. + 3s), and adjusted for nominal sample size/dilution. LOD = 0.4 µg/g
Q = Estimate is greater than a dilution adjusted CDL, but below a limit of quantification, (LOQ), derived from the mean and standard deviation of reagent blanks, (avg. + 10s), and adjusted for nominal sample size/dilution. LOQ = 2.9 µg/g
+ = Sample chosen by lab for matrix spike MS/MSD.
* = Estimated value below CDL.

Table C-4. Ammonium Data (ASTM-D-1426 C/D)
Soil CDL = 0.5 µg/g. (sheet 1 of 2)

Site	Sample	Ammonium (µg/g)	QC-flags	Collect date	Analysis date	Days elapsed	Type
3A Pond	B-194	2.96		9/21	9/26	5	Fdup
3A Pond	B-196	1.46		9/21	9/26	5	Fdup
3A Pond	B-197	2.09		9/21	9/26	5	Reg
3A Pond	B-198	7.59		9/21	9/26	5	Reg
3A Pond	B-200	0.25 *		9/21	9/26	5	Reg
3A Pond	B-201	3.47		9/21	9/26	5	Reg
3A Pond	B-202	3.17		9/21	9/26	5	Reg
3A Pond	B-203	7.79		9/21	9/26	5	Reg
3B Pond	B-106	1.00	H	8/04	9/18	45	Reg
3B Pond	B-107	0.90	H	8/04	9/18	45	Reg
3B Pond	B-108	0.40 *	H	8/04	9/18	45	Fdup
3B Pond	B-109	0.40 *	H	8/04	9/18	45	Fdup
3B Pond	B-110	-0.04 *	H	8/04	9/18	45	Reg
3B Pond	B-111	0.00 *	H	8/04	9/18	45	Reg
3C Pond	B-171	3.00		9/08	9/11	3	Fdup
3C Pond	B-172	3.50		9/08	9/11	3	Fdup
3C Pond	B-174	-0.01 *		9/08	9/11	3	Reg
3C Pond	B-175	5.60		9/08	9/11	3	Reg
3C Pond	B-176	0.80	+	9/08	9/11	3	Reg
3C Pond	B-177	0.20 *		9/08	9/11	3	Reg
3C Pond	B-178	0.20 *		9/08	9/11	3	Reg
3C Pond	B-179	2.70		9/08	9/11	3	Reg
3C Pond	B-180	0.20 *		9/08	9/11	3	Reg
B-3 Pond	B-114	7.39	H LM	8/10	9/23	44	Reg
B-3 Pond	B-115	8.31	H LM	8/10	9/23	44	Reg
B-3 Pond	B-116	9.62	H LM	8/10	9/23	44	Reg
B-3 Pond	B-118	9.46	H LM	8/11	9/23	43	Reg
B-3 Pond	B-119	6.91	H LM	8/11	9/23	43	Reg
B-3 Pond	B-128	7.33	H	8/17	9/27	41	Fdup
B-3 Pond	B-129	11.77	H	8/17	9/27	41	Fdup
B-3 Pond	B-130	9.61	H	8/17	9/27	41	Reg
B-3 Pond	B-131	10.28	H	8/17	9/27	41	Reg
B-3 Pond	B-132	9.23	H	8/17	9/27	41	Reg
B-3 Pond	B-134	10.41	H	8/18	9/27	40	Fdup
B-3 Pond	B-135	11.26	H	8/18	9/27	40	Fdup
B-3 Pond	B-136	3.83	H	8/18	9/27	40	Reg
B-3 Pond	B-138	15.59	H	8/18	9/27	40	Reg
B-3 Pond	B-139	8.44	H	8/18	9/27	40	Reg
B-3 Pond	B-140	10.23	H	8/18	9/27	40	Reg
B-3 Pond	B-143	9.90	LM	8/25	9/01	7	Reg
B-3 Pond	B-145	16.20	LM	8/25	9/01	7	Fdup
B-3 Pond	B-146	15.40	LM	8/25	9/01	7	Fdup
B-3 Pond	B-147	14.50	LM	8/25	9/01	7	Reg
B-3 Pond	B-148	11.60	LM	8/25	9/01	7	Reg
B-3 Pond	B-149	7.00	LM	8/25	9/01	7	Reg
B-3 Pond	B-164	4.40		9/07	9/11	4	Select-Fdup
B-3 Pond	B-165	6.70		9/07	9/11	4	Select-Fdup
B-3 Pond	B-166	10.20		9/07	9/11	4	Reg
B-3 Pond	B-168	15.70		9/07	9/11	4	Select
B-3-3 Dit.	B-152	0.40 *	LM	8/28	9/01	4	Fdup
B-3-3 Dit.	B-153	0.20 *	LM	8/28	9/01	4	Fdup
B-3-3 Dit.	B-154	0.40 *	LM	8/28	9/01	4	Reg
B-3-3 Dit.	B-158	0.30 *	LM	8/31	9/01	1	Fdup
B-3-3 Dit.	B-159	0.00 *	LM	8/31	9/01	1	Fdup

Table C-4. Ammonium Data (ASTM-D-1426 C/D)
Soil CDL = 0.5 µg/g. (sheet 2 of 2)

Site	Sample	Ammonium (µg/g)	QC-flags	Collect date	Analysis date	Days elapsed	Type
B-3-3 Dit.	B-160	0.00 *	LM	8/31	9/01	1	Reg
B-3-3 Dit.	B-161	0.10 *	LM	8/31	9/01	1	Select
B-3-3 Dit.	B-184	0.72		9/18	9/23	5	Fdup
B-3-3 Dit.	B-185	0.79		9/18	9/23	5	Fdup
B-3-3 Dit.	B-187	0.73		9/18	9/23	5	Reg
B-3-3 Dit.	B-188	0.62		9/18	9/23	5	Reg
B-3-3 Dit.	B-189	0.70		9/18	9/23	5	Reg
B-3-3 Dit.	B-190	0.56		9/18	9/23	5	Reg
B-3-3 Dit.	B-191	0.89		9/18	9/23	5	Select
Cont Bkg	B-101	0.40 *	H	8/04	9/18	45	Reg
Cont Bkg	B-102	0.40 *	H	8/04	9/18	45	Reg
Cont Bkg	B-103	0.70	H	8/04	9/18	45	Reg
Cont Bkg	B-104	0.30 *	H	8/04	9/18	45	Reg
Cont Bkg	B-105	2.00	H	8/04	9/18	45	Reg
Sage Bkg	B-121	2.04	H LM	8/10	9/23	44	Fdup
Sage Bkg	B-122	1.11	H LM	8/10	9/23	44	Fdup
Sage Bkg	B-123	0.48 *	H LM	8/10	9/23	44	Reg
Sage Bkg	B-124	0.62	H LM	8/10	9/23	44	Reg
Sage Bkg	B-125	0.75	H LM	8/10	9/23	44	Reg
Sage Bkg	B-126	0.61	H LM+	8/10	9/23	44	Reg
Silica sand	B-113	0.20 *	H +	8/04	9/18	45	Blk
Silica sand	B-117	0.15 *	H	8/10	9/23	44	Blk
Silica sand	B-128B	-0.05 *	H LM	8/17	9/23	37	Blk
Silica sand	B-142	0.16 *	H +	8/18	9/27	40	Blk
Silica sand	B-151	0.20 *		8/25	9/01	7	Blk
Silica sand	B-156	0.30 *	LM+	8/28	9/01	4	Blk
Silica sand	B-163	0.20 *	LM+	8/31	9/01	1	Blk
Silica sand	B-170	0.04 *		9/07	9/11	4	Blk
Silica sand	B-183	0.10 *		9/08	9/11	3	Blk
Silica sand	B-193	0.04 *	+	9/18	9/23	5	Blk
Silica sand	B-205	0.64	+	9/21	9/26	5	Blk
WATER SAMPLES	µg/L[1]						
B-3 Pond	B-206	<50 *		9/28	10/02	4	Fdup-H_2O
B-3 Pond	B-207	<50 *		9/28	10/02	4	Fdup-H_2O
B-3 Pond	B-208	<50 *		9/28	10/02	4	Reg-H_2O
B-3 Pond	B-209	<50 *	+	9/28	10/02	4	Reg-H_2O
B-3 Pond	B-210	<50 *		9/28	10/02	4	Reg-H_2O

[1]CDL for water = 50 µg/L

SPIKE RECOVERIES

Sample	%-Rec. MS	MSD
B-176	87.0	80.0
B-126	56.5	58.5
B-113	78.0	81.0
B-142	103.0	102.0
B-156	69.5	72.0
B-163	73.0	73.5
B-193	97.5	100.0
B-205	85.5	91.0
B-209(Water)	109.0	108.0

H = Holding time exceeded, (28 days)
LM = Associated matrix spike recovery low -- outside CLP guidelines (+/- 25%).
+ = Sample chosen by lab for MS/MSD.
* = Estimated value below CDL.

Table C-5. Chloride Data (EPA Method 300)
Soil CDL = 1.0 µg/g. (sheet 1 of 2)

Site	Sample	Chloride (µg/g)		Collect date	Digest date	Analysis date	Days elapsed	Type
3A Pond	B-194	0.94 *		9/21	9/28	9/28	7	Fdup
3A Pond	B-196	1.21		9/21	9/28	9/28	7	Fdup
3A Pond	B-197	1.08		9/21	9/28	9/28	7	Reg
3A Pond	B-198	1.49		9/21	9/28	9/28	7	Reg
3A Pond	B-200	0.51 *		9/21	9/28	9/28	7	Reg
3A Pond	B-201	3.71		9/21	9/28	9/28	7	Reg
3A Pond	B-202	0.79 *		9/21	9/28	9/28	7	Reg
3A Pond	B-203	1.67		9/21	9/28	9/28	7	Reg
3B Pond	B-106	0.00 *		8/04	8/31	8/31	27	Reg
3B Pond	B-107	0.08 *		8/04	8/31	8/31	27	Reg
3B Pond	B-108	0.08 *		8/04	8/31	8/31	27	Fdup
3B Pond	B-109	0.08 *		8/04	8/31	8/31	27	Fdup
3B Pond	B-110	0.14 *		8/04	8/31	8/31	27	Reg
3B Pond	B-111	0.10 *		8/04	8/31	8/31	27	Reg
3C Pond	B-171	0.52 *		9/08	9/14	9/14	6	Fdup
3C Pond	B-172	0.39 *	+	9/08	9/14	9/14	6	Fdup
3C Pond	B-174	1.31		9/08	9/14	9/14	6	Reg
3C Pond	B-175	0.46 *		9/08	9/14	9/14	6	Reg
3C Pond	B-176	0.07 *		9/08	9/14	9/14	6	Reg
3C Pond	B-177	7.90	D5	9/08	9/14	9/18	10	Reg
3C Pond	B-178	0.70 *		9/08	9/14	9/14	6	Reg
3C Pond	B-179	1.27		9/08	9/14	9/14	6	Reg
3C Pond	B-180	0.46 *		9/08	9/14	9/14	6	Reg
B-3 Pond	B-114	4.04	H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-115	1.63	H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-116	2.01	H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-118	0.56 *	H	8/11	9/22	9/22	42	Reg
B-3 Pond	B-119	2.05	H	8/11	9/22	9/22	42	Reg
B-3 Pond	B-128	0.85 *	H	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-129	1.12	H	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-130	2.56	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-131	5.58	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-132	3.60	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-134	1.81	H	8/18	10/05	10/05	48	Fdup
B-3 Pond	B-135	3.80	H	8/18	10/05	10/05	48	Fdup
B-3 Pond	B-136	4.22	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-138	1.27	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-139	1.46	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-140	2.13	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-143	1.51		8/25	8/31	8/31	6	Reg
B-3 Pond	B-145	1.25		8/25	8/31	8/31	6	Fdup
B-3 Pond	B-146	1.34		8/25	8/31	8/31	6	Fdup
B-3 Pond	B-147	4.74		8/25	8/31	8/31	6	Reg
B-3 Pond	B-148	1.20	+	8/25	8/31	8/31	6	Reg
B-3 Pond	B-149	0.76 *		8/25	8/31	8/31	6	Reg
B-3 Pond	B-164	0.61 *		9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-165	0.59 *		9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-166	0.95 *		9/07	9/14	9/14	7	Reg
B-3 Pond	B-168	1.93		9/07	9/14	9/14	7	Select
B-3-3 Dit.	B-152	0.28 *		8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-153	0.63 *		8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-154	1.84		8/28	9/08	9/09	12	Reg
B-3-3 Dit.	B-158	1.19	+	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-159	0.65 *		8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-160	0.43 *		8/31	9/08	9/09	9	Reg
B-3-3 Dit.	B-161	1.83		8/31	9/08	9/09	9	Select
B-3-3 Dit.	B-184	0.56 *		9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-185	0.33 *		9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-187	0.82 *		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-188	0.92 *		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-189	1.10		9/18	9/22	9/22	4	Reg

Table C-5. Chloride Data (EPA Method 300)
Soil CDL = 1.0 µg/g. (sheet 2 of 2)

Site	Sample	Chloride (µg/g)	QC flags	Collect date	Digest date	Analysis date	Days elapsed	Type
B-3-3 Dit.	B-190	0.80 *		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-191	2.00		9/18	9/22	9/22	4	Select
Cont Bkg	B-101	21.70	D10 HM	8/04	8/31	9/01	28	Reg
Cont Bkg	B-102	1.08		8/04	8/31	8/31	27	Reg
Cont Bkg	B-103	18.30	MIR D10 HM	8/04	8/31	9/01	28	Reg
Cont Bkg	B-104	17.60	D10 HM	8/04	8/31	9/01	28	Reg
Cont Bkg	B-105	5.79	MIR HM +	8/04	8/31	8/31	27	Reg
Sage Bkg	B-121	0.00 *	H	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-122	0.00 *	H	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-123	0.28 *	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-124	0.00 *	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-125	0.35 *	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-126	0.69 *	H	8/10	9/22	9/22	43	Reg
Silica sand	B-113	1.52		8/04	8/31	8/31	27	Blk
Silica sand	B-117	0.78 *	H+	8/10	9/22	9/22	43	Blk
Silica sand	B-128B	0.67 *	H+	8/11	9/22	9/22	42	Blk
Silica sand	B-142	1.74	H+	8/18	10/05	10/05	48	Blk
Silica sand	B-151	1.05		8/25	8/31	8/31	6	Blk
Silica sand	B-156	1.03		8/28	9/08	9/09	12	Blk
Silica sand	B-163	1.17		8/31	9/08	9/09	9	Blk
Silica sand	B-170	1.05		9/07	9/14	9/14	7	Blk
Silica sand	B-183	0.94 *	+	9/08	9/14	9/14	6	Blk
Silica sand	B-193	1.37 *	+	9/18	9/22	9/22	4	Blk
Silica sand	B-205	1.10	+	9/21	9/28	9/28	7	Blk
WATER SAMPLES	mg/L[1]							
B-3 Pond	B-206	2.64	+	9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-207	2.71		9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-208	1.61		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-209	2.77		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-210	2.87		9/28	-	9/29	1	Reg-H_2O

[1]CDL for water = .5 mg/L

SPIKE RECOVERIES

Sample	%-Rec. MS	%-Rec. MSD	Sample	%-Rec. MS	%-Rec. MSD
B-105	-	-	B-206(Water)	104	103
B-148	113	99			
B-158	113	120			
B-172	102	104			
B-183	116	104			
B-117	112	102			
B-128	99	110			
B-193	96	103			
B-205	118	106			
B-142	102	96			

Dx = Sample diluted during analysis by an extra factor of x.
HM = Associated matrix spike recovery high--outside CLP guidelines (+/-25%).
H = Holding time exceeded, (28 days)
+ = Sample chosen by lab for MS/MSD.
* = Estimated value below CDL.
MIR = Matrix effect, indeterminate result. A matrix effect inhibits accurate quantification of the analyte according to laboratory chemist.

Table C-6. Fluoride Data (EPA Method 300)
Soil CDL = 1.0 µg/g. (sheet 1 of 2)

Site	Sample	Fluoride (µg/g)	QC flags	Collect date	Digest date	Analysis date	Days elapsed	Type
3A Pond	B-194	0.2 *		9/21	9/28	9/28	7	Fdup
3A Pond	B-196	0.2 *		9/21	9/28	9/28	7	Fdup
3A Pond	B-197	0.2 *		9/21	9/28	9/28	7	Reg
3A Pond	B-198	0.2 *		9/21	9/28	9/28	7	Reg
3A Pond	B-200	0.1 *		9/21	9/28	9/28	7	Reg
3A Pond	B-201	1.4	MIR	9/21	9/28	9/28	7	Reg
3A Pond	B-202	0.2 *		9/21	9/28	9/28	7	Reg
3A Pond	B-203	0.2 *		9/21	9/28	9/28	7	Reg
3B Pond	B-106	0.3 *	LM	8/04	8/31	8/31	27	Reg
3B Pond	B-107	0.2 *	LM	8/04	8/31	8/31	27	Reg
3B Pond	B-108	0.4 *	LM	8/04	8/31	8/31	27	Fdup
3B Pond	B-109	0.5 *	LM	8/04	8/31	8/31	27	Fdup
3B Pond	B-110	0.5 *	LM	8/04	8/31	8/31	27	Reg
3B Pond	B-111	0.3 *	LM	8/04	8/31	8/31	27	Reg
3C Pond	B-171	0.9 *	LM	9/08	9/14	9/14	6	Fdup
3C Pond	B-172	1.3	MIR LM +	9/08	9/14	9/14	6	Fdup
3C Pond	B-174	0.0 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-175	0.2 *		9/08	9/14	9/14	6	Reg
3C Pond	B-176	0.0 *		9/08	9/14	9/14	6	Reg
3C Pond	B-177	19.0	MIR D10 LM	9/08	9/14	9/15	7	Reg
3C Pond	B-178	0.0 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-179	0.3 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-180	0.1 *	LM	9/08	9/14	9/14	6	Reg
B-3 Pond	B-114	-	MIR H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-115	-	MIR H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-116	-	MIR H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-118	0.2 *	H	8/11	9/22	9/22	42	Reg
B-3 Pond	B-119	0.2 *	H	8/11	9/22	9/22	42	Reg
B-3 Pond	B-128	0.2 *	H	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-129	0.3 *	H	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-130	0.4 *	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-131	0.5 *	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-132	0.2 *	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-134	0.0 *	H	8/18	10/05	10/05	48	Fdup
B-3 Pond	B-135	0.0 *	H	8/18	10/05	10/05	48	Fdup
B-3 Pond	B-136	0.4	MIR H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-138	0.2	MIR H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-139	0.2	MIR H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-140	0.7	MIR H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-143	0.4 *	LM	8/25	8/31	8/31	6	Reg
B-3 Pond	B-145	0.5 *	LM	8/25	8/31	8/31	6	Fdup
B-3 Pond	B-146	0.5 *	LM	8/25	8/31	8/31	6	Fdup
B-3 Pond	B-147	0.9 *	LM	8/25	8/31	8/31	6	Reg
B-3 Pond	B-148	0.3 *	LM +	8/25	8/31	8/31	6	Reg
B-3 Pond	B-149	0.2 *	LM	8/25	8/31	8/31	6	Reg
B-3 Pond	B-164	0.2 *		9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-165	0.2 *		9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-166	0.3 *		9/07	9/14	9/14	7	Reg
B-3 Pond	B-168	0.7 *		9/07	9/14	9/14	7	Select
B-3-3 Dit.	B-152	0.2 *	LM	8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-153	0.1 *	LM	8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-154	0.2 *	LM	8/28	9/08	9/09	12	Reg
B-3-3 Dit.	B-158	0.2 *	LM +	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-159	0.2 *	LM	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-160	0.1 *	LM	8/31	9/08	9/09	9	Reg
B-3-3 Dit.	B-161	1.3	LM	8/31	9/08	9/09	9	Select
B-3-3 Dit.	B-184	0.2 *		9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-185	0.2 *		9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-187	0.1 *		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-188	0.1 *		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-189	0.1 *		9/18	9/22	9/22	4	Reg

Table C-6. Fluoride Data (EPA Method 300)
Soil CDL = 1.0 µg/g. (sheet 2 of 2)

Site	Sample	Fluoride (µg/g)	QC flags	Collect date	Digest date	Analysis date	Days elapsed	Type
B-3-3 Dit.	B-190	0.2 *		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-191	0.3 *		9/18	9/22	9/22	4	Select
Cont Bkg	B-101	0.6 MIR		8/04	8/31	9/01	28	Reg
Cont Bkg	B-102	0.3 *		8/04	8/31	8/31	27	Reg
Cont Bkg	B-103	2.3 MIR		8/04	8/31	9/01	28	Reg
Cont Bkg	B-104	0.7 MIR		8/04	8/31	9/01	28	Reg
Cont Bkg	B-105	0.7 *	+	8/04	8/31	9/01	28	Reg
Sage Bkg	B-121	0.2 *	H	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-122	0.2 *	H	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-123	0.2 *	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-124	0.2 *	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-125	0.2 *	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-126	0.2 *	H	8/10	9/22	9/22	43	Reg
Silica sand	B-113	0.2 *		8/04	8/31	8/31	27	Blk
Silica sand	B-117	0.1 *	H+	8/10	9/22	9/22	43	Blk
Silica sand	B-128B	0.2 *	H+	8/11	9/22	9/22	42	Blk
Silica sand	B-142	0.2 *	H+	8/18	10/05	10/05	48	Blk
Silica sand	B-151	0.3 *		8/25	8/31	8/31	6	Blk
Silica sand	B-156	0.1 *	LM	8/28	9/08	9/09	12	Blk
Silica sand	B-163	0.2 *	LM	8/31	9/08	9/09	9	Blk
Silica sand	B-170	0.2 *		9/07	9/14	9/14	7	Blk
Silica sand	B-183	0.1 *	+	9/08	9/14	9/14	6	Blk
Silica sand	B-193	0.2 *	+	9/18	9/22	9/22	4	Blk
Silica sand	B-205	0.2 *	+	9/21	9/28	9/28	7	Blk
WATER SAMPLES (mg/L)[1]								
B-3 Pond	B-206	0.1 *	+	9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-207	0.1 *		9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-208	0.1 *		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-209	0.1 *		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-210	0.1 *		9/28	-	9/29	1	Reg-H_2O

[1]CDL for water = 500 mg/L

SPIKE RECOVERIES

Sample	%-Rec. MS	%-Rec. MSD	Sample	%-Rec. MS	%-Rec. MSD
B-105	85	79	B-205	81	79
B-148	37	40	B-142	71	72
B-158	71	72	B-206 (Water)	94.8	96.5
B-172	49	55			
B-183	85	83			
B-117	89	85			
B-128	80	83			
B-193	81	85			

Dx = Sample diluted during analysis by an extra factor of x.
H = Holding time exceeded, (28 days)
LM = Associated matrix spike recovery low--outside CLP guidelines (+/- 25%).
+ = Sample chosen by lab for MS/MSD.
* = Estimated value below CDL.
MIR = Matrix effect, indeterminate result. A matrix effect inhibits accurate quantification of the analyte according to lab.

Table C-7. Nitrate-Nitrite Data (EPA Method 300)
Soil CDL = 1.0 µg/g each. (sheet 1 of 3)

Site	Sample	Nitrite (µg/g)	QC-flags nitrite	Nitrate (µg/g)	QC-flags nitrate	Collect date	Digest date	Analysis date	Days elapsed	Type
3A Pond	B-194	0.00 *		0.00 *		9/21	9/28	9/28	7	Fdup
3A Pond	B-196	0.00 *		0.00 *		9/21	9/28	9/28	7	Fdup
3A Pond	B-197	0.00 *		0.00 *		9/21	9/28	9/28	7	Reg
3A Pond	B-198	0.00 *		0.00 *		9/21	9/28	9/28	7	Reg
3A Pond	B-200	0.57 *		0.50 *		9/21	9/28	9/28	7	Reg
3A Pond	B-201	0.00 *		0.00 *		9/21	9/28	9/28	7	Reg
3A Pond	B-202	0.00 *		0.00 *		9/21	9/28	9/28	7	Reg
3A Pond	B-203	0.00 *		0.00 *		9/21	9/28	9/28	7	Reg
3B Pond	B-106	0.00 *	LM, HM	1.21		8/04	8/31	8/31	27	Reg
3B Pond	B-107	0.00 *	LM, HM	0.77 *		8/04	8/31	8/31	27	Reg
3B Pond	B-108	0.00 *	LM, HM	1.05		8/04	8/31	8/31	27	Fdup
3B Pond	B-109	0.00 *	LM, HM	0.82 *		8/04	8/31	8/31	27	Fdup
3B Pond	B-110	0.00 *	LM, HM	1.56		8/04	8/31	8/31	27	Reg
3B Pond	B-111	0.00 *	LM, HM	1.58		8/04	8/31	8/31	27	Reg
3C Pond	B-171	0.16 *		0.12 *		9/08	9/14	9/14	6	Fdup
3C Pond	B-172	0.08 *+		0.00 *+		9/08	9/14	9/14	6	Fdup
3C Pond	B-174	0.00 *		0.27 *		9/08	9/14	9/14	6	Reg
3C Pond	B-175	0.17 *		5.01		9/08	9/14	9/14	6	Reg
3C Pond	B-176	0.25 *		4.67		9/08	9/14	9/14	6	Reg
3C Pond	B-177	0.00 *		0.00 *		9/08	9/14	9/14	6	Reg
3C Pond	B-178	0.00 *		0.00 *		9/08	9/14	9/14	6	Reg
3C Pond	B-179	0.00 *		0.00 *		9/08	9/14	9/14	6	Reg
3C Pond	B-180	0.00 *		0.14 *		9/08	9/14	9/14	6	Reg
B-3 Pond	B-114	0.00 *	H	0.00 *	H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-115	0.00 *	H	0.00 *	H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-116	0.00 *	H	0.00 *	H	8/10	9/22	9/22	43	Reg
B-3 Pond	B-118	0.00 *	H	0.00 *	H	8/11	9/22	9/22	42	Reg
B-3 Pond	B-119	0.00 *	H	0.00 *	H	8/11	9/22	9/22	42	Reg
B-3 Pond	B-128	0.00 *+	H	0.00 *+	H	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-129	0.00 *	H	0.00 *	H	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-130	0.00 *	H	0.00 *	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-131	0.00 *	H	0.00 *	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-132	0.00 *	H	0.00 *	H	8/17	9/22	9/22	36	Reg
B-3 Pond	B-134	0.00 *	H	0.14 *	H	8/18	10/05	10/05	48	Fdup
B-3 Pond	B-135	0.00 *	H D1.3	0.00 *	H D1.3	8/18	10/05	10/05	48	Fdup
B-3 Pond	B-136	0.00 *	H	0.00 *	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-138	0.00 *	H	0.00 *	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-139	0.00 *	H	0.00 *	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-140	0.00 *	H	0.13 *	H	8/18	10/05	10/05	48	Reg
B-3 Pond	B-143	0.00 *	LM,HM	0.00 *		8/25	8/31	8/31	6	Reg
B-3 Pond	B-145	0.00 *	LM,HM	0.00 *		8/25	8/31	8/31	6	Fdup
B-3 Pond	B-146	0.00 *	LM,HM	0.00 *		8/25	8/31	8/31	6	Fdup
B-3 Pond	B-147	0.00 *	LM,HM D1.1	0.00 *	D1.1	8/25	8/31	8/31	6	Reg
B-3 Pond	B-148	0.00 *+	LM,HM	0.00 *+		8/25	8/31	8/31	6	Reg
B-3 Pond	B-149	0.00 *	LM,HM	0.47 *		8/25	8/31	8/31	6	Reg
B-3 Pond	B-164	0.00 *		0.00 *		9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-165	0.00 *		0.00 *		9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-166	0.00 *		0.00 *		9/07	9/14	9/14	7	Reg
B-3 Pond	B-168	1.00 *		0.00 *		9/07	9/14	9/14	7	Select

Table C-7. Nitrate-Nitrite Data (EPA Method 300)
Soil CDL = 1.0 µg/g each. (sheet 2 of 3)

Site	Sample	Nitrite (µg/g)	QC-flags nitrite	Nitrate (µg/g)	QC-flags nitrate	Collect date	Digest date	Analysis date	Days elapsed	Type
B-3-3 Dit.	B-152	0.00 *		0.14 *	HM	8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-153	0.00 *		0.90 *	HM	8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-154	0.00 *		0.52 *	HM	8/28	9/08	9/09	12	Reg
B-3-3 Dit.	B-158	0.00 *+		0.38 *+	HM	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-159	0.00 *		0.29 *	HM	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-160	0.00 *		0.61 *	HM	8/31	9/08	9/09	9	Reg
B-3-3 Dit.	B-161	0.00 *		0.00 *	HM	8/31	9/08	9/09	9	Select
B-3-3 Dit.	B-184	0.00 *		0.98		9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-185	0.00 *		1.01		9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-187	0.08 *		1.50		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-188	0.00 *		0.78		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-189	0.00 *		0.61 *		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-190	0.00 *		1.67		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-191	0.00 *		0.00 *		9/18	9/22	9/22	4	Select
Cont Bkg	B-101	0.00 *	LM, HM	2.97		8/04	8/31	8/31	27	Reg
Cont Bkg	B-102	0.00 *	LM, HM	1.12		8/04	8/31	8/31	27	Reg
Cont Bkg	B-103	0.00 *	LM, HM	0.71 *		8/04	8/31	8/31	27	Reg
Cont Bkg	B-104	0.00 *	LM, HM	0.66 *		8/04	8/31	8/31	27	Reg
Cont Bkg	B-105	0.00 *+	LM, HM	1.29 +		8/04	8/31	8/31	27	Reg
Sage Bkg	B-121	0.30 *	H	2.51	H	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-122	0.36 *	H	2.69	H	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-123	0.72 *	H	1.65	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-124	0.20 *	H	3.46	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-125	0.85 *	H	4.68	H	8/10	9/22	9/22	43	Reg
Sage Bkg	B-126	1.25	H	12.22	H	8/10	9/22	9/22	43	Reg
Silica sand	B-113	0.00 *	LM, HM	0.25 *		8/04	8/31	8/31	27	Blk
Silica sand	B-117	0.00 *+	H	0.12 *+	H	8/10	9/22	9/22	43	Blk
Silica sand	B-1288	0.00 *	H	0.00 *	H	8/11	9/22	9/22	42	Blk
Silica sand	B-142	0.00 *+	H	0.45 *+	H	8/18	10/05	10/05	48	Blk
Silica sand	B-151	0.00 *	LM, HM	0.00 *		8/25	8/31	8/31	6	Blk
Silica sand	B-156	0.00 *		0.16 *	HM	8/28	9/08	9/09	12	Blk
Silica sand	B-163	0.00 *		0.15 *	HM	8/31	9/08	9/09	9	Blk
Silica sand	B-170	0.23 *		0.24 *		9/07	9/14	9/14	7	Blk
Silica sand	B-183	0.00 *+		0.13 *+		9/08	9/14	9/14	6	Blk
Silica sand	B-193	0.00 *+		0.14 *+		9/18	9/22	9/22	4	Blk
Silica sand	B-205	0.00 *+		0.16 *+		9/21	9/28	9/28	7	Blk
WATER SAMPLES (mg/L)[1]										
B-3 Pond	B-206	0.00 *		0.13 *+		9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-207	0.00 *		0.34 *		9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-208	0.00 *		0.89		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-209	0.00 *		0.19 *		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-210	0.00 *		0.00 *		9/28	-	9/29	1	Reg-H_2O

[1] CDL for water = 0.5 mg/L

Table C-7. Nitrate-Nitrite Data (EPA Method 300)
Soil CDL = 1.0 µg/g each. (sheet 3 of 3)

Site	Sample	Nitrite (µg/g)	QC-flags nitrite	Nitrate (µg/g)	QC-flags nitrate	Collect date	Digest date	Analysis date	Days elapsed	Type

SPIKE RECOVERIES

Sample	%Rec NO3 MS	%Rec NO3 MSD	%Rec NO2 MS	%Rec NO2 MSD
B-105	109.0	99.8	0.0	0.0
B-148	93.8	97.8	148.0	137.0
B-158	125.3	121.8	115.0	120.0
B-172	82.8	81.0	116.0	115.0
B-183	98.0	95.8	98.0	99.0
B-117	96.0	93.0	103.0	100.0
B-128	94.3	94.5	95.0	100.0
B-193	91.8	92.5	97.0	102.0
B-205	97.8	95.8	100.0	99.0
B-146	91.5	89.5	102.0	103.0
B-206(Water)	97.5	97.0	103.4	101.3

Dx = Sample diluted during analysis by an extra factor of x.
H = Holding time, (28 days), for combined reporting of Nitrate, Nitrite exceeded.
HM = Associated matrix spike recovery high -- outside CLP guidelines (+/- 25%).
LM = Associated matrix spike recovery low -- outside CLP guidelines (+/- 25%).
+ = Sample chosen by lab for matrix spike MS/MSD.
* = Estimated value below CDL.

Table C-8. Phosphate Data (EPA Method 300)
Soil CDL = 2.0 µg/g. (sheet 1 of 2)

Site	Sample	Phosphate (µg/g)	QC flags	Collect date	Digest date	Analysis date	Days elapsed	Type
3A Pond	B-194	0.0 *		9/21	9/28	9/28	7	Fdup
3A Pond	B-196	0.0 *		9/21	9/28	9/28	7	Fdup
3A Pond	B-197	0.0 *		9/21	9/28	9/28	7	Reg
3A Pond	B-198	0.0 *		9/21	9/28	9/28	7	Reg
3A Pond	B-200	0.0 *		9/21	9/28	9/28	7	Reg
3A Pond	B-201	0.0 *		9/21	9/28	9/28	7	Reg
3A Pond	B-202	0.0 *		9/21	9/28	9/28	7	Reg
3A Pond	B-203	0.0 *		9/21	9/28	9/28	7	Reg
3B Pond	B-106	0.0 *	LM	8/04	8/31	8/31	27	Reg
3B Pond	B-107	0.0 *	LM	8/04	8/31	8/31	27	Reg
3B Pond	B-108	0.0 *	LM	8/04	8/31	8/31	27	Fdup
3B Pond	B-109	0.0 *	LM	8/04	8/31	8/31	27	Fdup
3B Pond	B-110	0.0 *	LM	8/04	8/31	8/31	27	Reg
3B Pond	B-111	0.0 *	LM	8/04	8/31	8/31	27	Reg
3C Pond	B-171	0.0 *	LM	9/08	9/14	9/14	6	Fdup
3C Pond	B-172	0.0 *	LM+	9/08	9/14	9/14	6	Fdup
3C Pond	B-174	0.0 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-175	0.7 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-176	0.0 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-177	0.0 *	LM	9/08	9/14	9/18	10	Reg
3C Pond	B-178	0.0 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-179	0.0 *	LM	9/08	9/14	9/14	6	Reg
3C Pond	B-180	0.0 *	LM	9/08	9/14	9/14	6	Reg
B-3 Pond	B-114	0.0 *H	LM	8/10	9/22	9/22	43	Reg
B-3 Pond	B-115	0.0 *H	LM	8/10	9/22	9/22	43	Reg
B-3 Pond	B-116	0.0 *H	LM	8/10	9/22	9/22	43	Reg
B-3 Pond	B-118	0.0 *H	LM	8/11	9/22	9/22	42	Reg
B-3 Pond	B-119	0.0 *H	LM	8/11	9/22	9/22	42	Reg
B-3 Pond	B-128	0.0 *H	LM	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-129	0.0 *H	LM	8/17	9/22	9/22	36	Fdup
B-3 Pond	B-130	0.0 *H	LM	8/17	9/22	9/22	36	Reg
B-3 Pond	B-131	0.0 *H	LM	8/17	9/22	9/22	36	Reg
B-3 Pond	B-132	0.0 *H	LM	8/17	9/22	9/22	36	Reg
B-3 Pond	B-134	0.0 *H		8/18	10/05	10/05	48	Fdup
B-3 Pond	B-135	0.0 *H		8/18	10/05	10/05	48	Fdup
B-3 Pond	B-136	0.0 *H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-138	0.0 *H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-139	0.0 *H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-140	0.0 *H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-143	0.0 *	LM	8/25	8/31	8/31	6	Reg
B-3 Pond	B-145	0.0 *	LM	8/25	8/31	8/31	6	Fdup
B-3 Pond	B-146	0.0 *	LM	8/25	8/31	8/31	6	Fdup
B-3 Pond	B-147	0.0 *	LM	8/25	8/31	8/31	6	Reg
B-3 Pond	B-148	0.0 *	LM+	8/25	8/31	8/31	6	Reg
B-3 Pond	B-149	0.0 *	LM	8/25	8/31	8/31	6	Reg
B-3 Pond	B-164	0.0 *	LM	9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-165	0.0 *	LM	9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-166	0.0 *	LM	9/07	9/14	9/14	7	Reg
B-3 Pond	B-168	0.0 *	LM	9/07	9/14	9/14	7	Select
B-3-3 Dit.	B-152	0.0 *	LM	8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-153	0.0 *	LM	8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-154	0.0 *	LM	8/28	9/08	9/09	12	Reg
B-3-3 Dit.	B-158	0.0 *	LM+	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-159	0.0 *	LM	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-160	0.0 *	LM	8/31	9/08	9/09	9	Reg
B-3-3 Dit.	B-161	0.0 *	LM	8/31	9/08	9/09	9	Select
B-3-3 Dit.	B-184	0.0 *	LM	9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-185	0.0 *	LM	9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-187	0.0 *	LM	9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-188	0.0 *	LM	9/18	9/22	9/22	4	Reg

Table C-8. Phosphate Data (EPA Method 300)
Soil CDL = 2.0 µg/g. (sheet 2 of 2)

Site	Sample	Phosphate (µg/g)	QC flags	Collect date	Digest date	Analysis date	Days elapsed	Type
B-3-3 Dit.	B-189	0.0 *	LM	9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-190	0.0 *	LM	9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-191	0.0 *	LM	9/18	9/22	9/22	4	Select
Cont Bkg	B-101	0.0 *	LM	8/04	8/31	9/01	28	Reg
Cont Bkg	B-102	0.8 *	LM	8/04	8/31	8/31	27	Reg
Cont Bkg	B-103	0.0 *	LM	8/04	8/31	9/01	28	Reg
Cont Bkg	B-104	0.0 *	LM	8/04	8/31	9/01	28	Reg
Cont Bkg	B-105	0.0 *	LM+	8/04	8/31	8/31	27	Reg
Sage Bkg	B-121	2.6 H	LM	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-122	1.0 *H	LM	8/10	9/22	9/22	43	Fdup
Sage Bkg	B-123	0.7 *H	LM	8/10	9/22	9/22	43	Reg
Sage Bkg	B-124	0.9 *H	LM	8/10	9/22	9/22	43	Reg
Sage Bkg	B-125	2.2 H	LM	8/10	9/22	9/22	43	Reg
Sage Bkg	B-126	2.2 H	LM	8/10	9/22	9/22	43	Reg
Silica sand	B-113	0.0 *	LM	8/04	8/31	8/31	27	Blk
Silica sand	B-117	0.0 *H	+	8/10	9/22	9/22	43	Blk
Silica sand	B-128B	0.0 *H	+	8/11	9/22	9/22	42	Blk
Silica sand	B-142	0.0 *H	+	8/18	10/05	10/05	48	Blk
Silica sand	B-151	0.0 *	LM	8/25	8/31	8/31	6	Blk
Silica sand	B-156	0.0 *	LM	8/28	9/08	9/09	12	Blk
Silica sand	B-163	0.4 *	LM	8/31	9/08	9/09	9	Blk
Silica sand	B-170	0.0 *	LM	9/07	9/14	9/14	7	Blk
Silica sand	B-183	0.0 *	+	9/08	9/14	9/14	6	Blk
Silica sand	B-193	0.0 *	LM+	9/18	9/22	9/22	4	Blk
Silica sand	B-205	0.0 *	+	9/21	9/28	9/28	7	Blk
WATER SAMPLES (mg/L)[1]								
B-3	B-206	0.0 *	+	9/28	-	9/29	1	Fdup-H_2O
B-3	B-207	0.0 *		9/28	-	9/29	1	Fdup-H_2O
B-3	B-208	0.0 *		9/28	-	9/29	1	Reg-H_2O
B-3	B-209	0.0 *		9/28	-	9/29	1	Reg-H_2O
B-3	B-210	0.0 *		9/28	-	9/29	1	Reg-H_2O

[1] CDL for water = 1.0 mg/L

SPIKE RECOVERIES

Sample	%-Rec. MS	%-Rec. MSD	Sample	%-Rec. MS	%-Rec. MSD
B-105	36	36	B-206(Water)	90	93
B-148	0	0			
B-158	23	23			
B-172	28	25			
B-183	78	80			
B-117	78	75			
B-128	75	75			
B-193	70	75			
B-205	83	80			
B-142	77	78			

* = Estimated value below CDL.
H = Holding time exceeded, (28 days).
LM = Associated matrix spike recovery low--outside CLP guidelines (+/-25%).
\+ = Sample chosen by lab for MS/MSD.

Table C-9. Sulfate Data (EPA Method 300)
Soil CDL = 1.0 µg/g. (sheet 1 of 2)

Site	Sample	Sulfate (µg/g)			QC flags	Collect date	Digest date	Analysis date	Days elapsed	Type
3A Pond	B-194	22.3				9/21	9/28	9/28	7	Fdup
3A Pond	B-196	36.9	D10			9/21	9/28	9/28	7	Fdup
3A Pond	B-197	14.5				9/21	9/28	9/28	7	Reg
3A Pond	B-198	7.7				9/21	9/28	9/28	7	Reg
3A Pond	B-200	4.1				9/21	9/28	9/28	7	Reg
3A Pond	B-201	6.8				9/21	9/28	9/28	7	Reg
3A Pond	B-202	5.6				9/21	9/28	9/28	7	Reg
3A Pond	B-203	12.6				9/21	9/28	9/28	7	Reg
3B Pond	B-106	0.8	*			8/04	8/31	8/31	27	Reg
3B Pond	B-107	1.0				8/04	8/31	8/31	27	Reg
3B Pond	B-108	1.2				8/04	8/31	8/31	27	Fdup
3B Pond	B-109	1.2				8/04	8/31	8/31	27	Fdup
3B Pond	B-110	1.8				8/04	8/31	8/31	27	Reg
3B Pond	B-111	1.5				8/04	8/31	8/31	27	Reg
3C Pond	B-171	3.0				9/08	9/14	9/14	6	Fdup
3C Pond	B-172	2.6			+	9/08	9/14	9/14	6	Fdup
3C Pond	B-174	5.4				9/08	9/14	9/14	6	Reg
3C Pond	B-175	2.3				9/08	9/14	9/14	6	Reg
3C Pond	B-176	1.7				9/08	9/14	9/14	6	Reg
3C Pond	B-177	3.8				9/08	9/14	9/14	6	Reg
3C Pond	B-178	6.0				9/08	9/14	9/14	6	Reg
3C Pond	B-179	16.3				9/08	9/14	9/14	6	Reg
3C Pond	B-180	5.6				9/08	9/14	9/14	6	Reg
B-3 Pond	B-114	141.2	D10	H		8/10	9/22	9/22	43	Reg
B-3 Pond	B-115	172.4	D10	H		8/10	9/22	9/22	43	Reg
B-3 Pond	B-116	208.8	D10	H		8/10	9/22	9/22	43	Reg
B-3 Pond	B-118	35.8	D5	H		8/11	9/22	9/22	42	Reg
B-3 Pond	B-119	8.8		H		8/11	9/22	9/22	42	Reg
B-3 Pond	B-128	9.7		H		8/17	9/22	9/22	36	Fdup
B-3 Pond	B-129	11.6		H		8/17	9/22	9/22	36	Fdup
B-3 Pond	B-130	27.7		H		8/17	9/22	9/22	36	Reg
B-3 Pond	B-131	14.9		H		8/17	9/22	9/22	36	Reg
B-3 Pond	B-132	8.2		H		8/17	9/22	9/22	36	Reg
B-3 Pond	B-134	88.7	D10	H		8/18	10/05	10/05	48	Fdup
B-3 Pond	B-135	126.2	D10	H		8/18	10/05	10/05	48	Fdup
B-3 Pond	B-136	1.7		H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-138	11.3		H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-139	20.0		H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-140	29.1		H		8/18	10/05	10/05	48	Reg
B-3 Pond	B-143	11.2				8/25	8/31	8/31	6	Reg
B-3 Pond	B-145	8.3				8/25	8/31	8/31	6	Fdup
B-3 Pond	B-146	10.4				8/25	8/31	8/31	6	Fdup
B-3 Pond	B-147	31.5				8/25	8/31	8/31	6	Reg
B-3 Pond	B-148	8.2			+	8/25	8/31	8/31	6	Reg
B-3 Pond	B-149	6.9				8/25	8/31	8/31	6	Reg
B-3 Pond	B-164	3.5				9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-165	3.1				9/07	9/14	9/14	7	Select-Fdup
B-3 Pond	B-166	3.2				9/07	9/14	9/14	7	Reg
B-3 Pond	B-168	5.9				9/07	9/14	9/14	7	Select
B-3-3 Dit.	B-152	1.6		HM		8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-153	2.0		HM		8/28	9/08	9/09	12	Fdup
B-3-3 Dit.	B-154	4.7		HM		8/28	9/08	9/09	12	Reg
B-3-3 Dit.	B-158	3.1		HM	+	8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-159	2.2		HM		8/31	9/08	9/09	9	Fdup
B-3-3 Dit.	B-160	2.7		HM		8/31	9/08	9/09	9	Reg
B-3-3 Dit.	B-161	6.9		HM		8/31	9/08	9/09	9	Select
B-3-3 Dit.	B-184	3.3				9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-185	2.3				9/18	9/22	9/22	4	Fdup
B-3-3 Dit.	B-187	3.2				9/18	9/22	9/22	4	Reg

Table C-9. Sulfate Data (EPA Method 300)
Soil CDL = 1.0 µg/g. (sheet 2 of 2)

Site	Sample	Sulfate (µg/g)	QC flags	Collect date	Digest date	Analysis date	Days elapsed	Type
B-3-3 Dit.	B-188	3.3		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-189	3.5		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-190	3.2		9/18	9/22	9/22	4	Reg
B-3-3 Dit.	B-191	7.1		9/18	9/22	9/22	4	Select
Cont Bkg	B-101	84.2	D10	8/04	8/31	9/01	28	Reg
Cont Bkg	B-102	5.0		8/04	8/31	8/31	27	Reg
Cont Bkg	B-103	1664.0	D100	8/04	8/31	9/01	28	Reg
Cont Bkg	B-104	281.0	D10	8/04	8/31	9/01	28	Reg
Cont Bkg	B-105	192.0	D10	+ 8/04	8/31	9/01	28	Reg
Sage Bkg	B-121	0.8 *		H 8/10	9/22	9/22	43	Fdup
Sage Bkg	B-122	1.0		H 8/10	9/22	9/22	43	Fdup
Sage Bkg	B-123	1.7		H 8/10	9/22	9/22	43	Reg
Sage Bkg	B-124	1.0		H 8/10	9/22	9/22	43	Reg
Sage Bkg	B-125	2.3		H 8/10	9/22	9/22	43	Reg
Sage Bkg	B-126	3.0		H 8/10	9/22	9/22	43	Reg
Silica sand	B-113	2.2		8/04	8/31	8/31	27	Blk
Silica sand	B-117	1.5		H+ 8/10	9/22	9/22	43	Blk
Silica sand	B-1288	1.4		H+ 8/11	9/22	9/22	42	Blk
Silica sand	B-142	2.5		H+ 8/18	10/05	10/05	48	Blk
Silica sand	B-151	1.6		8/25	8/31	8/31	6	Blk
Silica sand	B-156	1.7	HM	8/28	9/08	9/09	12	Blk
Silica sand	B-163	1.6	HM	8/31	9/08	9/09	9	Blk
Silica sand	B-170	1.4		9/07	9/14	9/14	7	Blk
Silica sand	B-183	1.3		+ 9/08	9/14	9/14	6	Blk
Silica sand	B-193	1.8		+ 9/18	9/22	9/22	4	Blk
Silica sand	B-205	1.5		+ 9/21	9/28	9/28	7	Blk
WATER SAMPLES (ppm)[1]								
B-3 Pond	B-206	10.9		+ 9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-207	10.9		9/28	-	9/29	1	Fdup-H_2O
B-3 Pond	B-208	10.6		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-209	10.9		9/28	-	9/29	1	Reg-H_2O
B-3 Pond	B-210	10.8		9/28	-	9/29	1	Reg-H_2O

[1] CDL for water = 0.5 ppm

SPIKE RECOVERIES

Sample	%-Rec. MS	%-Rec. MSD	Sample	%-Rec. MS	%-Rec. MSD
B-105	-	-	B-206(Water)	99.2	99.1
B-148	108	97			
B-158	128	130			
B-172	98	98			
B-183	100	100			
B-117	95	93			
B-128	88	90			
B-193	90	93			
B-205	100	95			
B-142	88	82			

Dx = Sample diluted during analysis by an extra factor of x.
HM = Associated matrix spike recovery high--outside CLP guidelines (+/-25%).
H = Holding time exceeded, (28 days).
* = Estimated value below CDL.
+ = Sample chosen by lab for MS/MSD.

Table C-10. Volatile Organic Analysis Summary[1] (EPA Method 8240) µg/kg. (sheet 1 of 2)

Site	Sample	Analyte Codes Methone	Acetone	Collect date	Analysis date	Type
3A Pond	B-194	ND	26 PB	9/21	9/22	Fdup
3A Pond	B-196	8 *P	42 PB	9/21	9/22	Fdup
3A Pond	B-197	6 *P	29 PB	9/21	9/22	Reg
3A Pond	B-198	8 *P	20 PB	9/21	9/22	Reg
3A Pond	B-200	7 *P	11 PB	9/21	9/22	Reg
3A Pond	B-201 +	5 *P	13 PB	9/21	9/22	Reg
3A Pond	B-203	ND	13 PB	9/21	9/22	Reg
3A Pond	(1 other sample -- all analytes ND)					

		Methone	Acetone	(13DCLBV)			
3B Pond	B-107 SOL	ND	8 *P	ND	8/04	8/11	Reg
3B Pond	B-108	ND	ND	11	8/04	8/11	Fdup
3B Pond	B-109	6 *P	16 P	ND	8/04	8/10	Fdup
3B Pond	B-110	ND	ND	11	8/04	8/11	Reg
3B Pond	B-111	ND	18 P	ND	8/04	8/11	Reg
3B Pond	(1 other sample -- all analytes ND)						

		Methone	Acetone	Methlch			
3C Pond	B-171	ND	8 *PB	ND	9/08	9/15	Fdup
3C Pond	B-172	ND	12 PB	ND	9/08	9/15	Fdup
3C Pond	B-175	ND	12 P	ND	9/08	9/18	Reg
3C Pond	B-177	12 PL	20 P	ND	9/08	9/19	Reg
3C Pond	B-178	ND	ND	6 *P	9/08	9/16	Reg
3C Pond	(4 other samples -- all analytes ND)						

		Methone	Carbide	Methych	Acetone			
B-3 Pond	B-114	13 *P	34 P	ND	21 P	8/10	8/16	Reg
B-3 Pond	B-115 +	74 P	ND	92	333	8/10	8/22	Reg
B-3 Pond	B-128	ND	ND	ND	10 P	8/17	8/29	Fdup
B-3 Pond	B-129 +	ND	ND	ND	160	8/17	8/29	Fdup
B-3 Pond	B-130	ND	ND	ND	10 P	8/17	8/29	Reg
B-3 Pond	B-131	ND	ND	7 *P	8 *P	8/17	8/23	Reg
B-3 Pond	B-134	ND	ND	ND	8 *PB	8/18	8/29	Fdup
B-3 Pond	B-135	ND	ND	ND	6 *PB	8/18	8/30	Fdup
B-3 Pond	B-136	6 *P	ND	ND	ND	8/18	8/30	Reg
B-3 Pond	B-138	ND	ND	ND	8 *PB	8/18	8/29	Reg
B-3 Pond	B-139	ND	ND	ND	6 *PB	8/18	8/30	Reg
B-3 Pond	B-143	9 *PB	ND	6 *P	27 PBL	8/25	9/01	Reg
B-3 Pond	B-146	ND	ND	ND	11 PB	8/25	8/31	Fdup
B-3 Pond	B-147 SOL	19 PB	ND	ND	82 PBL	8/25	9/01	Reg
B-3 Pond	B-148 SOL	7 *PB	ND	ND	42 PBL	8/25	9/01	Reg
B-3 Pond	B-149	9 *PB	ND	ND	54 PBL	8/25	9/01	Reg
B-3 Pond	(9 other sediment samples -- all analytes ND)							
B-3 Pond	B-210	ND	ND	ND	10 PB	9/28	10/04	Reg-H_2O
B-3 Pond	(4 other water samples -- all analytes ND)							

		Methone	Methych	Acetone	(DMDS)			
B-3-3 Dit.	B-152 H7	ND	ND	11 PB	19	8/28	9/18	Reg
B-3-3 Dit.	B-154 H4	ND	14 B	ND B	ND	8/28	9/15	Reg
B-3-3 Dit.	B-158	ND	ND	29 PB	ND	8/31	9/06	Fdup
B-3-3 Dit.	B-160	ND	ND	28 PB	ND	8/31	9/06	Reg
B-3-3 Dit.	B-161	7 *PB	ND	54 PB	ND	8/31	9/06	Select

		Contract Detection Limit	SW-846 PQL
Acetone	Acetone	10 µg/kg	100 µg/kg
Carbide	Carbon disulfide	10 µg/kg	100 µg/kg
Methone	Methyl ethyl ketone	10 µg/kg	100 µg/kg
Methlch	Methyl chloride	10 µg/kg	10 µg/kg
(13DCLBV)	1,3-Dichlorobenzene	N/A	A tentatively identified compound.
(DMDS)	Dimethyldisulfide	N/A	A tentatively identified compound.

Table C-10. Volatile Organic Analysis µg/kg
Summary (EPA Method 8240). (sheet 2 of 2)

Site	Sample	Analyte Codes Methone	Acetone	Collect date	Analysis date	Type
B-3-3 Dit.	B-184	ND	39 PB	9/18	9/21	Fdup
B-3-3 Dit.	B-185	ND	41 PB	9/18	9/21	Fdup
B-3-3 Dit.	B-187	ND	8 *PB	9/18	9/21	Reg
B-3-3 Dit.	B-189	ND	31 PBL	9/18	9/22	Reg
B-3-3 Dit.	B-191	11 PBL	90 PBL	9/18	9/22	Select
B-3-3 Dit.	(3 other samples -- all analytes ND)					
		Methone	Methych			
Cont Bkg	B-102	ND	3 *P	8/04	8/10	Reg
Cont Bkg	B-105	6 *P	ND	8/04	8/10	Reg
Cont Bkg	(3 other samples -- all analytes ND)					
		Methone / Tricene / 14BDEN	Acetone			
Sage Bkg	B-121	ND / ND / ND	8 *P	8/10	8/18	Fdup
Sage Bkg	B-122	ND / ND / ND	6 *P	8/10	8/22	Fdup
Sage Bkg	B-123 H8	7 *PB / 53 / ND	40 PBL	8/10	9/01	Reg
Sage Bkg	B-125	ND / ND / 5	14 P	8/10	8/23	Reg
Sage Bkg	(1 other sample -- all analytes ND)					
		Methone / Methych	Acetone			
Silica sand	B-128B	ND / 3 *P	ND	8/11	8/23	Blk
Silica sand	B-142 +	ND / ND	5 *P	8/18	8/30	Blk
Silica sand	B-151	7 *P / ND	16 PL	8/25	9/01	Blk
Silica sand	B-156 H4	ND / 4 *P	8 *P	8/28	9/15	Blk
Silica sand	B-163 +	6 *P / ND	52 P	8/31	9/06	Blk
Silica sand	B-170	ND / ND	7 *P	9/07	9/15	Blk
Silica sand	B-193	ND / ND	25 PL	9/18	9/22	Blk
Silica sand	(4 other samples -- all analytes ND)					

		Contract Detection Limit	SW-846 PQL
Acetone	Acetone	10 µg/kg	100 µg/kg
Carbide	Carbon disulfide	10 µg/kg	100 µg/kg
Methone	Methyl ethyl ketone	10 µg/kg	100 µg/kg
Methych	Methylene chloride	5 µg/kg	5 µg/kg
Tricene	Trichloroethylene	5 µg/kg	5 µg/kg
14DBEN	p-Dichlorobenzene	5 µg/kg	--

B = Analyte >ND in a field blank collected and/or analyzed on the listed day.
Hx = Holding time, (14 days), exceeded by x days for all analytes.
L = Lab reagent blank contamination noted by chemist (see Table C-12).
ND = Non-detectable.
P = Result is below SW-846 (December 1987) Practical Quantitation Limit (PQL) guidelines. PQLs listed in SW-846 for soil/sediment are based on wet weight sample size. PQLs for comparison were adjusted upward based on sample moisture since results shown are on a dry weight basis.
SOL = Surrogate out of limits (see Table C-12).
* = Estimated value below CDL, (adjusted for dry sample size).
+ = Sample chosen by lab for MS/MSD.

[1] Only samples with an analyte >ND displayed)

Table C-11. Volatile Organic Analysis
Lab Reagent Blanks for the Period 8/89 - 9/89.

Analysis Date	Constituent Identified	Result (ppb)
8/03/89	Methylene chloride	3
8/09/89	None	-
8/10/89	None	-
8/11/89	None	-
8/16/89	None	-
8/17/89	None	-
8/21/89	None	-
8/22/89	None	-
8/23/89	None	-
8/28/89	None	-
8/29/89	None	-
8/30/89	None	-
8/31/89	None	-
9/01/89	Acetone	8
9/06/89	None	-
9/16/89	None	-
9/18/89	None	-
9/19/89	Methyl ethyl ketone	6
9/20/89	None	-
9/21/89	None	-
9/22/89	Methyl ethyl ketone	6
--	Acetone	6
9/22/89	None	-
9/28/89	None	-

Table C-12. Volatile Organic Analysis Holding Times and Surrogate Recoveries. (sheet 1 of 2)

Lobe	Sample	Collect date	Analysis date	Elapsed days	% - Rec. 12DCAD4	TOLUD8	BFB	Type
3A Pond	B-194	9/21	9/22	1	98	100	92	Fdup
3A Pond	B-196	9/21	9/22	1	96	100	94	Fdup
3A Pond	B-197	9/21	9/22	1	92	100	96	Reg
3A Pond	B-198	9/21	9/22	1	108	102	92	Reg
3A Pond	B-200	9/21	9/22	1	90	100	96	Reg
3A Pond	B-201	9/21	9/22	1	94	100	96	Reg
3A Pond	B-202	9/21	9/28	7	90	98	94	Reg
3A Pond	B-203	9/21	9/22	1	96	100	96	Reg
3B Pond	B-106	8/04	8/11	7	104	112	107	Reg
3B Pond	B-107	8/04	8/11	7	95	85	104	Reg
3B Pond	B-108	8/04	8/11	7	92	107	102	Fdup
3B Pond	B-109	8/04	8/10	6	87	103	99	Fdup
3B Pond	B-110	8/04	8/11	7	88	105	104	Reg
3B Pond	B-111	8/04	8/11	7	90	107	97	Reg
3C Pond	B-171	9/08	9/15	7	118	100	104	Fdup
3C Pond	B-172	9/08	9/15	7	110	102	102	Fdup
3C Pond	B-174	9/08	9/15	7	112	98	104	Fdup
3C Pond	B-175	9/08	9/18	10	100	108	112	Reg
3C Pond	B-176	9/08	9/18	10	100	108	112	Reg
3C Pond	B-177	9/08	9/19	11	88	106	96	Reg
3C Pond	B-178	9/08	9/16	8	118	106	108	Reg
3C Pond	B-179	9/08	9/18	10	118	106	114	Reg
3C Pond	B-180	9/08	9/16	8	106	104	106	Reg
B-3 Pond	B-114	8/10	8/16	6	103	92	102	Reg
B-3 Pond	B-115	8/10	8/22	12	111	113	95	Reg
B-3 Pond	B-116	8/10	8/22	12	150	112	102	Reg
B-3 Pond	B-118	8/11	8/23	12	96	98	88	Reg
B-3 Pond	B-119	8/11	8/23	12	115	103	94	Reg
B-3 Pond	B-128	8/17	8/29	12	101	100	97	Fdup
B-3 Pond	B-129	8/17	8/29	12	114	100	101	Fdup
B-3 Pond	B-130	8/17	8/29	12	107	97	101	Reg
B-3 Pond	B-131	8/17	8/31	14	93	108	84	Reg
B-3 Pond	B-132	8/17	8/23	6	135	111	123	Reg
B-3 Pond	B-134	8/18	8/29	11	109	103	104	Fdup
B-3 Pond	B-135	8/18	8/30	12	74	100	98	Fdup
B-3 Pond	B-136	8/18	8/30	12	102	96	112	Reg
B-3 Pond	B-138	8/18	8/29	11	116	105	103	Reg
B-3 Pond	B-139	8/18	8/30	12	94	100	100	Reg
B-3 Pond	B-140	8/18	8/29	11	109	99	102	Reg
B-3 Pond	B-143	8/25	9/01	7	118	100	92	Reg
B-3 Pond	B-145	8/25	8/31	6	110	104	100	Fdup
B-3 Pond	B-146	8/25	8/31	6	114	104	108	Fdup
B-3 Pond	B-147	8/25	9/01	7	130	104	104	Reg
B-3 Pond	B-148	8/25	9/01	7	128	106	110	Reg
B-3 Pond	B-149	8/25	9/01	7	118	102	106	Reg
B-3 Pond	B-165	9/07	9/15	8	112	102	102	Select
B-3 Pond	B-166	9/07	9/15	8	112	100	102	Fdup
B-3 Pond	B-168	9/07	9/15	8	106	102	104	Select
B-3 Pond	B-206	9/28	10/04	6	95	102	105	Fdup-H_2O
B-3 Pond	B-207	9/28	10/04	6	93	100	105	Fdup-H_2O
B-3 Pond	B-208	9/28	10/04	6	91	100	106	Reg-H_2O
B-3 Pond	B-209	9/28	10/04	6	93	101	105	Reg-H_2O
B-3 Pond	B-210	9/28	10/04	6	88	101	102	Reg-H_2O
B-3-3 Dit.	B-152	8/28	9/18	21	102	101	102	Fdup
B-3-3 Dit.	B-154	8/28	9/15	18	102	102	102	Reg
B-3-3 Dit.	B-158	8/31	9/06	6	106	100	90	Fdup
B-3-3 Dit.	B-159	8/31	9/06	6	102	104	98	Fdup
B-3-3 Dit.	B-160	8/31	9/06	6	110	98	102	Reg
B-3-3 Dit.	B-161	8/31	9/06	6	106	102	94	Select

Table C-12. Volatile Organic Analysis Holding Times and Surrogate Recoveries. (sheet 2 of 2)

Lobe	Sample	Collect date	Analysis date	Elapsed days	% - Rec. 12DCAD4	TOLUD8	BFB	Type
B-3-3 Dit.	B-184	9/18	9/21	3	100	98	102	Fdup
B-3-3 Dit.	B-185	9/18	9/21	3	98	98	100	Fdup
B-3-3 Dit.	B-187	9/18	9/21	3	106	100	106	Reg
B-3-3 Dit.	B-188	9/18	9/21	3	112	96	100	Reg
B-3-3 Dit.	B-189	9/18	9/22	4	116	96	112	Reg
B-3-3 Dit.	B-190	9/18	9/22	4	94	100	98	Reg
B-3-3 Dit.	B-191	9/18	9/22	4	100	96	92	Select
Cont Bkg.	B-101	8/04	8/09	5	95	99	108	Reg
Cont Bkg.	B-102	8/04	8/10	6	99	97	99	Reg
Cont Bkg.	B-103	8/04	8/09	5	100	106	96	Reg
Cont Bkg.	B-104	8/04	8/10	6	88	91	94	Reg
Cont Bkg.	B-105	8/04	8/10	6	85	101	97	Reg
Sage Bkg.	B-121	8/10	8/18	8	101	105	109	Fdup
Sage Bkg.	B-122	8/10	8/22	12	115	103	105	Fdup
Sage Bkg.	B-123	8/10	9/01	22	116	112	78	Reg
Sage Bkg.	B-124	8/10	8/23	13	115	103	111	Reg
Sage Bkg.	B-125	8/10	8/23	13	117	115	110	Reg
Sage Bkg.	B-126	8/10	8/23	13	97	106	84	Reg
Silica sand	B-113	8/04	8/17	13	119	104	107	Blk
Silica sand	B-117	8/10	8/17	7	101	106	110	Blk
Silica sand	B-128B	8/11	8/23	12	100	104	104	Blk
Silica sand	B-142	8/18	8/30	12	100	102	98	Blk
Silica sand	B-151	8/25	9/01	7	104	104	96	Blk
Silica sand	B-156	8/28	9/15	18	108	102	104	Blk
Silica sand	B-163	8/31	9/06	6	106	100	98	Blk
Silica sand	B-170	9/07	9/15	8	108	104	106	Blk
Silica sand	B-183	9/08	9/18	10	98	108	106	Blk
Silica sand	B-193	9/18	9/22	4	102	100	102	Blk
Silica sand	B-205	9/21	9/28	7	92	88	104	Blk

12DCAD4 = 1,2-Dichloroethane-D4.
TOLUD8 = Toluene-D8.
BFB = 4-Bromofluorobenzene.

Table C-13. Volatile Organic Analysis Spike and Surrogate Recoveries.

Sample		Matrix Spike Recoveries (%)					Analysis	Surrogate Recoveries (%)		
		Benzene	Toluene	Trichloroethene	Chlorobenzene	1,1-Dichloroethene	Date	1,2-Dichloroethane-D4	Toluene-D8	4-Bromofluorobenzene
B-103	MS	95.8	100.4	105.8	101.6	102.6	8/09/89	95.8	103.2	101.6
	MSD	117.4	109.2	109.4	116.6	111.8	8/09/89	90.6	95	89.6
B-115	MS	115	115	115	130	105	8/16/89	106	94	106
	MSD	100	95	105	115	85	8/16/89	98	92	96
B-121	MS	96	101.5	86	104	85.5	8/18/89	99.2	109.6	107.6
	MSD	106.5	109	107.5	118.5	107	8/21/89	115.4	99.4	98.6
B-129	MS	90	90	88	98	52	8/28/89	98	100	100
	MSD	83	87	81	96	53	8/28/89	100	100	100
B-142	MS	84	92	88	102	70	8/30/89	112	104	118
	MSD	98	102	96	112	74	8/30/89	98	100	108
B-163	MS	100	62	88	94	74	9/06/89	114	66	96
	MSD	86	78	76	84	62	9/06/89	112	94	110
B-174	MS	88	96	84	102	54	9/15/89	112	100	102
	MSD	84	94	84	98	44	9/18/89	110	104	108
B-190	MS	78	84	84	94	40	9/22/89	108	94	94
	MSD	92	90	88	94	76	9/22/89	102	98	96
B-201	MS	88	90	82	96	74	9/23/89	94	100	96
	MSD	92	92	86	98	72	9/23/89	96	98	94
Average		94.1	93.7	91.9	103.0	74.6				
Std. Dev.		10.8	12.2	11.5	11.3	21.8				
%CV		11.5	13.0	12.5	11.0	29.2				
B-206	MS	141	135	133	130	138	10/4/89	93.8	99.2	106
(Water)	MSD	131	121	122	117	121	10/4/89	88.4	100	106

Table C-14. Radioactivity, pCi/g. (sheet 1 of 2)

Site lobe	Sample number	Gross alpha	Gross beta	Type
3A Pond	B-194	3.3	51.8	Fdup
3A Pond	B-196	4.6	55.5	Fdup
3A Pond	B-197	5.3	42.7	Reg
3A Pond	B-198	6.3	68.1	Reg
3A Pond	B-200	4.8	23.6	Reg
3A Pond	B-201	1.0 *	21.6	Reg
3A Pond	B-202	3.9	18.8	Reg
3A Pond	B-203	4.1	18.5	Reg
3B Pond	B-106	2.5	16.8	Reg
3B Pond	B-107	1.3 *	20.2	Reg
3B Pond	B-108	3.2	18.4	Fdup
3B Pond	B-109	0.6 *	18.3	Fdup
3B Pond	B-110	4.4	17.1	Reg
3B Pond	B-111	6.4	18.6	Reg
3C Pond	B-171	6.5	399.0	Fdup
3C Pond	B-172	7.6	393.0	Fdup
3C Pond	B-174	7.8	31.2	Reg
3C Pond	B-175	6.2	139.0	Reg
3C Pond	B-176	4.7	153.0	Reg
3C Pond	B-177	18.4	488.0	Reg
3C Pond	B-178	13.5	718.0	Reg
3C Pond	B-179	10.4	343.0	Reg
3C Pond	B-180	3.3	159.0	Reg
B-3 Pond	B-114	13.1	84.5	Reg
B-3 Pond	B-115	11.2	36.1	Reg
B-3 Pond	B-116	13.4	66.9	Reg
B-3 Pond	B-118	4.3	24.8	Reg
B-3 Pond	B-119	7.9	36.3	Reg
B-3 Pond	B-128	3.0	33.9	Fdup
B-3 Pond	B-129	11.5	34.0	Fdup
B-3 Pond	B-130	17.7	334.0	Reg
B-3 Pond	B-131	14.1	71.8	Reg
B-3 Pond	B-132	13.2	91.9	Reg
B-3 Pond	B-134	8.3	35.4	Fdup
B-3 Pond	B-135	9.7	43.0	Fdup
B-3 Pond	B-136	10.4	31.7	Reg
B-3 Pond	B-138	8.6	34.4	Reg
B-3 Pond	B-139	6.1	55.0	Reg
B-3 Pond	B-140	9.6	30.1	Reg
B-3 Pond	B-143	5.4	161.0	Reg
B-3 Pond	B-145	11.3	222.0	Fdup
B-3 Pond	B-146	11.5	208.0	Fdup
B-3 Pond	B-147	5.8	194.0	Reg
B-3 Pond	B-148	2.9	167.0	Reg
B-3 Pond	B-149	5.0	181.0	Reg
B-3 Pond	B-164	8.6	270.0	Select-Fdup
B-3 Pond	B-165	10.1	271.0	Select-Fdup
B-3 Pond	B-166	6.6	155.0	Reg
B-3 Pond	B-168	2.9	190.0	Select
B-3-3 Dit.	B-152	2.3	29.9	Fdup
B-3-3 Dit.	B-153	2.0	25.4	Fdup
B-3-3 Dit.	B-154	5.8	64.4	Reg
B-3-3 Dit.	B-158	7.8	57.7	Fdup
B-3-3 Dit.	B-159	8.6	58.0	Fdup
B-3-3 Dit.	B-160	6.4	73.3	Reg
B-3-3 Dit.	B-161	11.8	69.3	Select
B-3-3 Dit.	B-184	9.8	76.3	Fdup
B-3-3 Dit.	B-185	8.3	80.4	Fdup
B-3-3 Dit.	B-187	4.6	35.6	Reg
B-3-3 Dit.	B-188	6.2	67.6	Reg
B-3-3 Dit.	B-189	2.3 *	93.4	Reg
B-3-3 Dit.	B-190	7.3	77.1	Reg
B-3-3 Dit.	B-191	5.0	493.0	Select

Table C-14. Radioactivity, pCi/g. (sheet 2 of 2)

Site lobe	Sample number	Gross alpha	Gross beta	Type
Cont Bkg	B-101	3.2	20.8	Reg
Cont Bkg	B-102	2.2 *	17.0	Reg
Cont Bkg	B-103	1.7 *	17.9	Reg
Cont Bkg	B-104	3.9	18.2	Reg
Cont Bkg	B-105	2.7	14.9	Reg
Sage Bkg	B-121	5.6	22.6	Fdup
Sage Bkg	B-122	5.9	22.4	Fdup
Sage Bkg	B-123	3.4	19.9	Reg
Sage Bkg	B-124	6.2	20.5	Reg
Sage Bkg	B-125	3.7	21.8	Reg
Sage Bkg	B-126	5.1	20.3	Reg
Silica sand	B-113	1.2 *	8.0	Blk
Silica sand	B-117	1.4 *	9.6	Blk
Silica sand	B-128B	0.3 *	6.0	Blk
Silica sand	B-142	0.8 *	9.0	Blk
Silica sand	B-151	3.3	30.0	Blk
Silica sand	B-156	1.9	19.7	Blk
Silica sand	B-163	2.0	0.7	Blk
Silica sand	B-170	1.1 *	49.7	Blk
Silica sand	B-183	1.1 *	48.6	Blk
Silica sand	B-193	0.0 *	9.7	Blk
Silica sand	B-205	-0.7 *	9.7	Blk
	WATER SAMPLES (pCi/L)			
B-3 Pond	B-206	2.1	0.6 *	Reg-H_2O
B-3 Pond	B-207	1.3	3.7	Fdup-H_2O
B-3 Pond	B-208	0.5 *	5.1	Reg-H_2O
B-3 Pond	B-209	0.4 *	4.5	Reg-H_2O
B-3 Pond	B-210	1.4	4.2	Reg-H_2O

* = Result less than the lab-estimated analytical error, (2 sigma). (All samples met 6 month holding time limits.)

Table C-15. Radionuclides SR-90** and Gamma Scan pCi/g.

Site lobe	Sample number	Reported Constituents							
		Sr-90	K-40	Nb-95	ZrNb-95	Zr-95	Cs-137DA	Na-22	Ru-106DA
3A Pond	B-199	0.359	11.2	0.10	ND	ND	9.78	ND	ND
3A Pond	B-204	0.191	13.9	ND	ND	ND	1.50	ND	ND
3B Pond	B-112	0.040	10.6	ND	ND	ND	0.01 *	ND	ND
3C Pond	B-181	0.354	10.5	ND	0.31	ND	1.24	ND	ND
3C Pond	B-182	0.317	12.2	ND	ND	ND	10.90	ND	ND
B-3 Pond	B-127	0.714	13.6	ND	ND	ND	15.90	ND	ND
B-3 Pond	B-133	2.48	19.7	ND	ND	ND	290.00	ND	ND
B-3 Pond	B-141	1.74	16.2	0.15	ND	0.05	20.80	ND	ND
B-3 Pond	B-150	1.06	16.5	-0.03 *	ND	0.03 *	11.40	ND	ND
B-3 Pond	B-169	1.04	14.0	ND	ND	ND	25.60	ND	ND
B-3-3 Dit.	B-162	0.169	12.5	ND	ND	ND	33.40	ND	ND
B-3-3 Dit.	B-192	4.03	11.8	ND	0.47	ND	183.00	0.21	ND
			WATER SAMPLE (pCi/L)						
B-3 Pond	B-211	0.088 *	ND	ND	ND	ND	1.66 *	ND	35.00 *

		Reported Constituents						
		Cs-134	Ce-144	CePr-144	Co-57	Co-60	Pb-212	Pb-214
3A Pond	B-199	0.08	2.03	ND	ND	ND	0.65	0.37
3A Pond	B-204	ND	ND	ND	ND	ND	0.75	0.56
3B Pond	B-112	ND	ND	ND	ND	ND	0.39	0.37
3C Pond	B-181	ND	ND	1.58	ND	ND	0.52	0.47
3C Pond	B-182	ND	ND	10.50	ND	ND	0.67	0.51
B-3 Pond	B-127	ND	ND	0.38	ND	ND	0.76	0.66
B-3 Pond	B-133	ND	ND	ND	ND	ND	0.72	ND
B-3 Pond	B-141	ND	0.62	ND	ND	ND	0.92	0.74
B-3 Pond	B-150	ND	0.13	ND	ND	ND	0.87	0.75
B-3 Pond	B-169	ND	ND	0.97	ND	ND	0.84	0.69
B-3-3 Dit.	B-162	0.14	1.34	ND	ND	ND	0.49	0.54
B-3-3 Dit.	B-192	0.31	2.25	ND	0.33	ND	0.44	ND
B-3 Pond	B-211	ND	ND	ND	ND	2.84 *	ND	ND

* = Denotes result less than lab-estimated 2 sigma.
** = Strontium-90 is determined separately.
ND = Non-detectable.
DA = May include unresolved daughters.

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APPENDIX D

FIELD DUPLICATE GRAPHS

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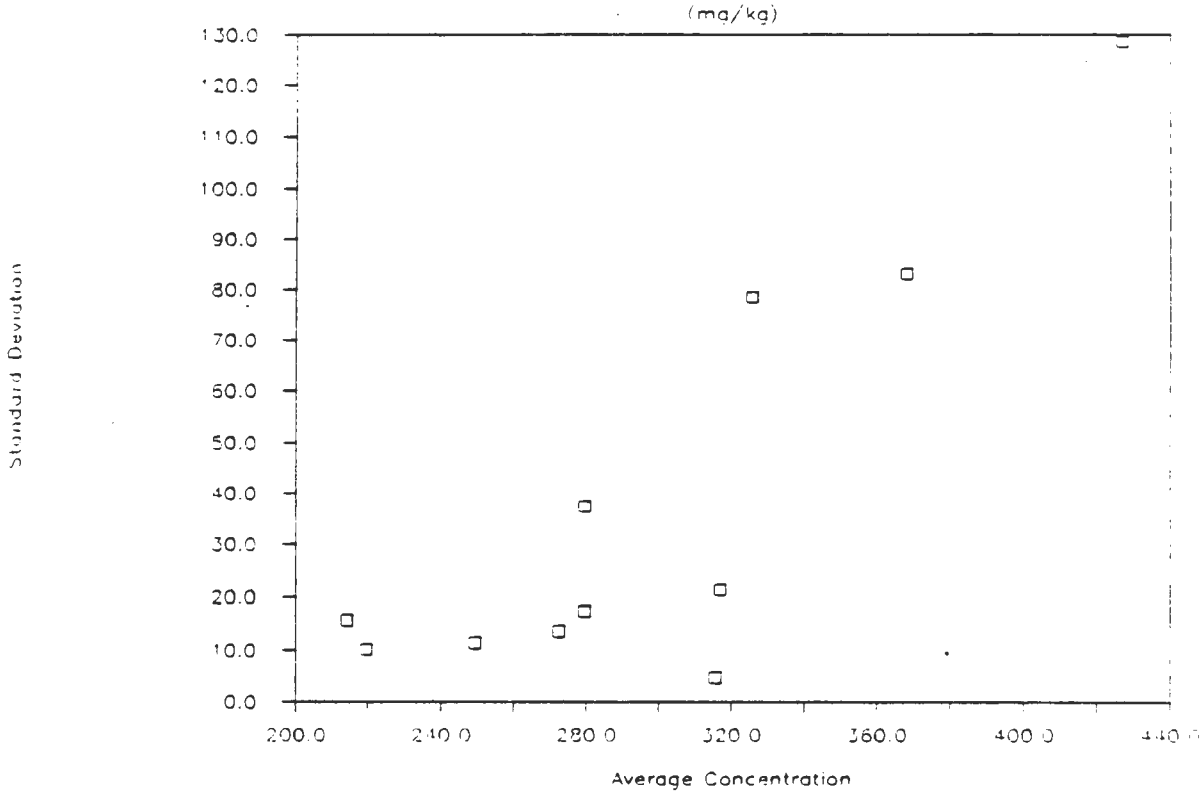
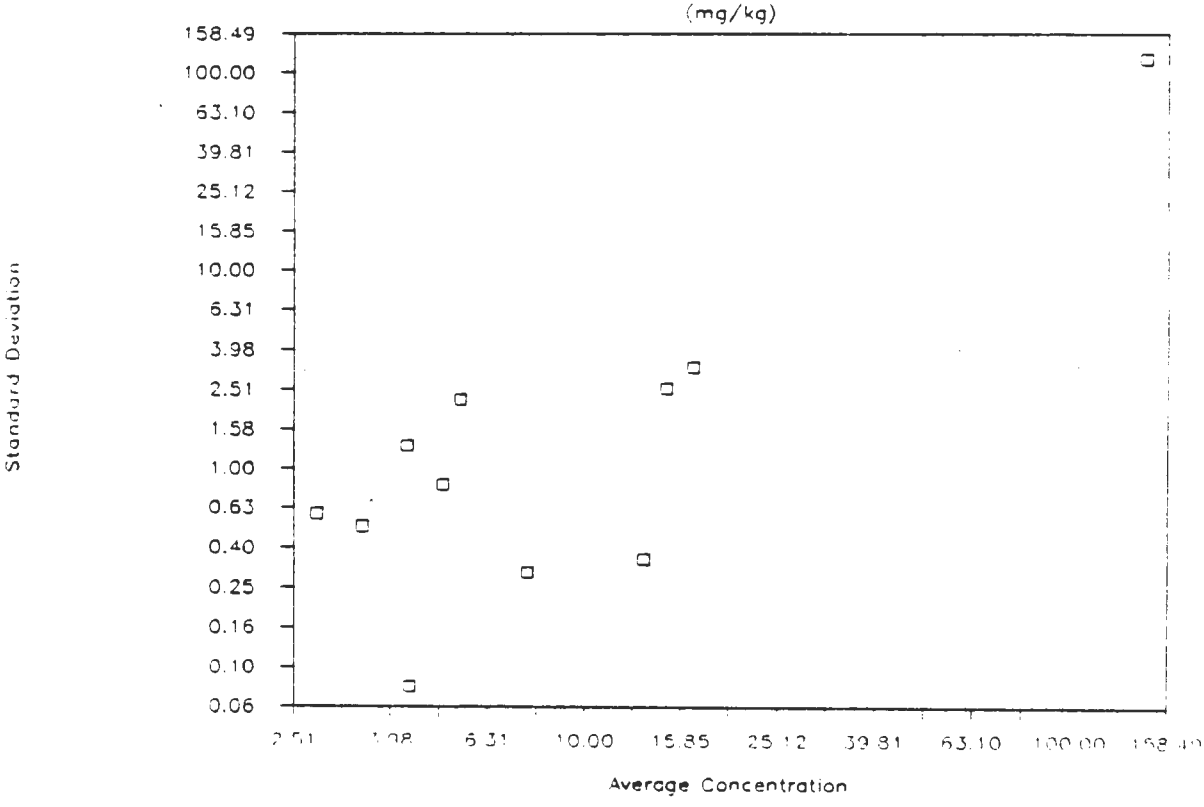
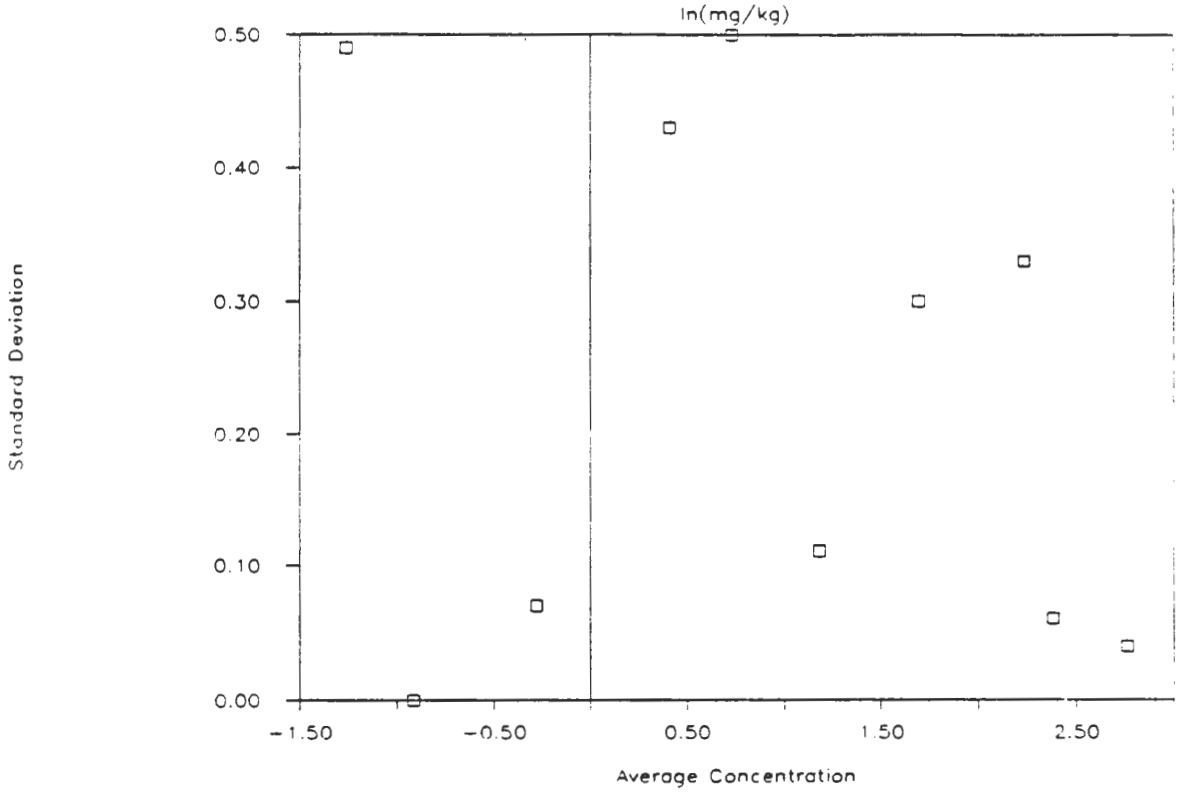
Manganese - Field Duplicate Pairs



Lead - Field Duplicate Pairs



Ammonium - Ln(x) Transformed Data



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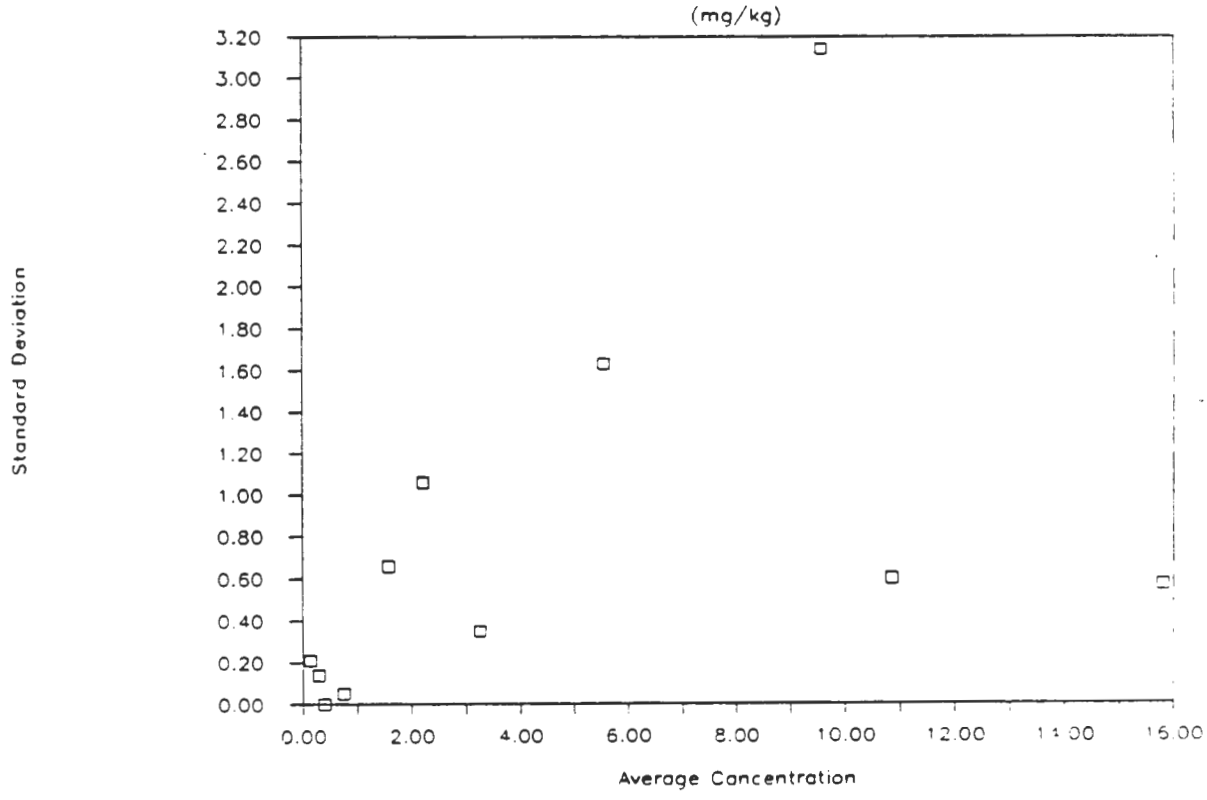

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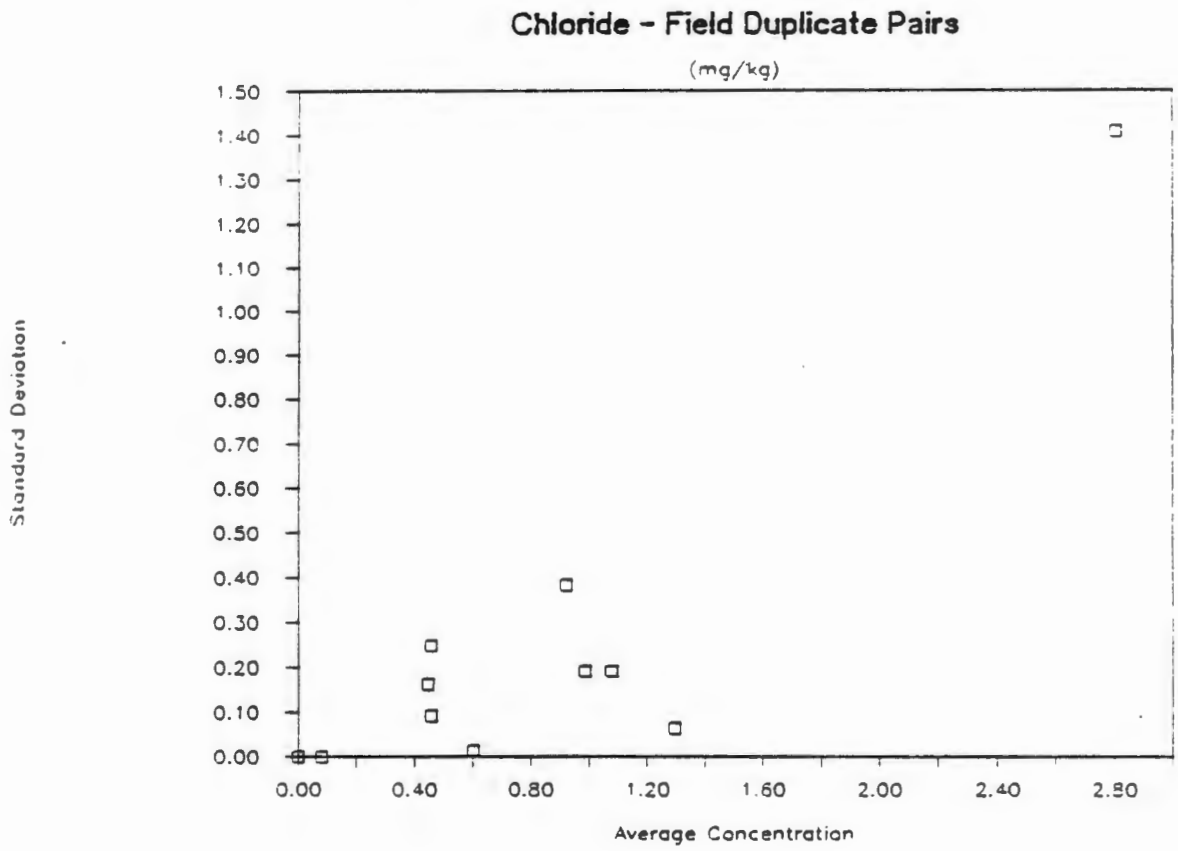
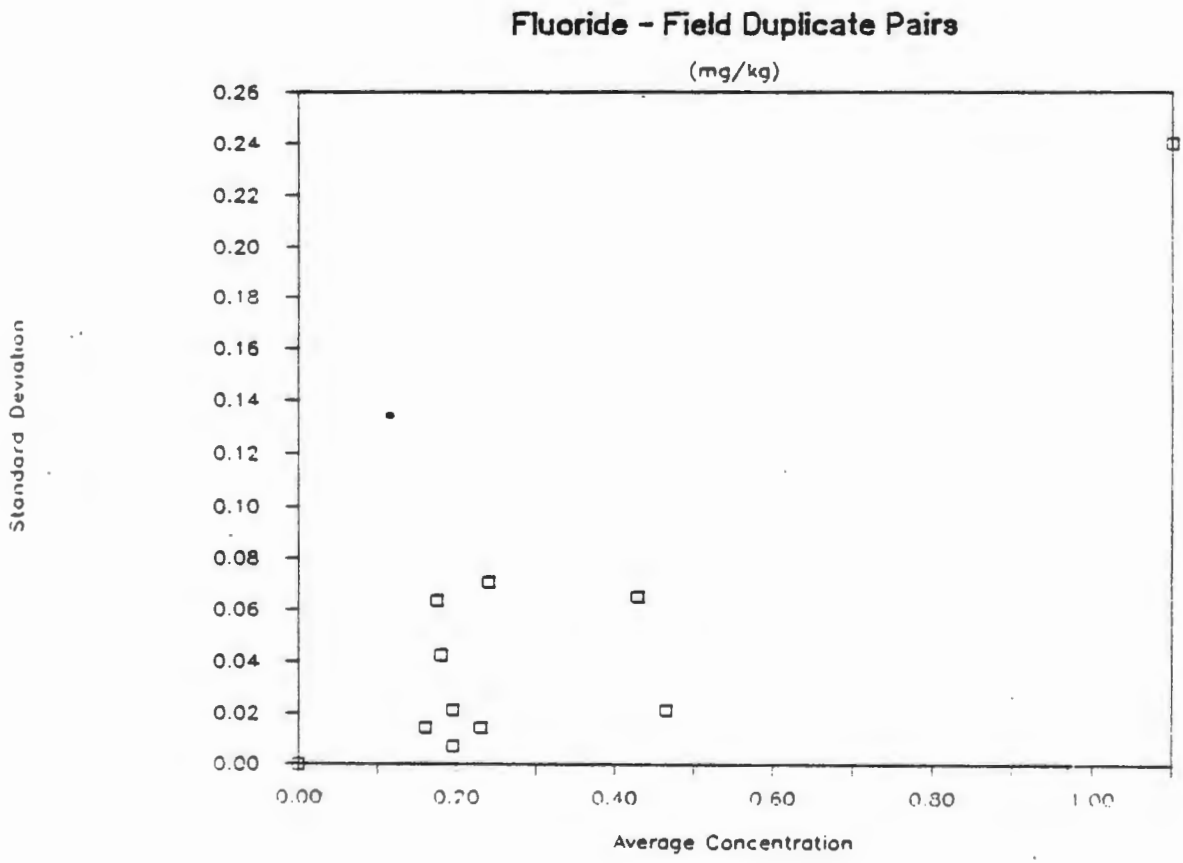
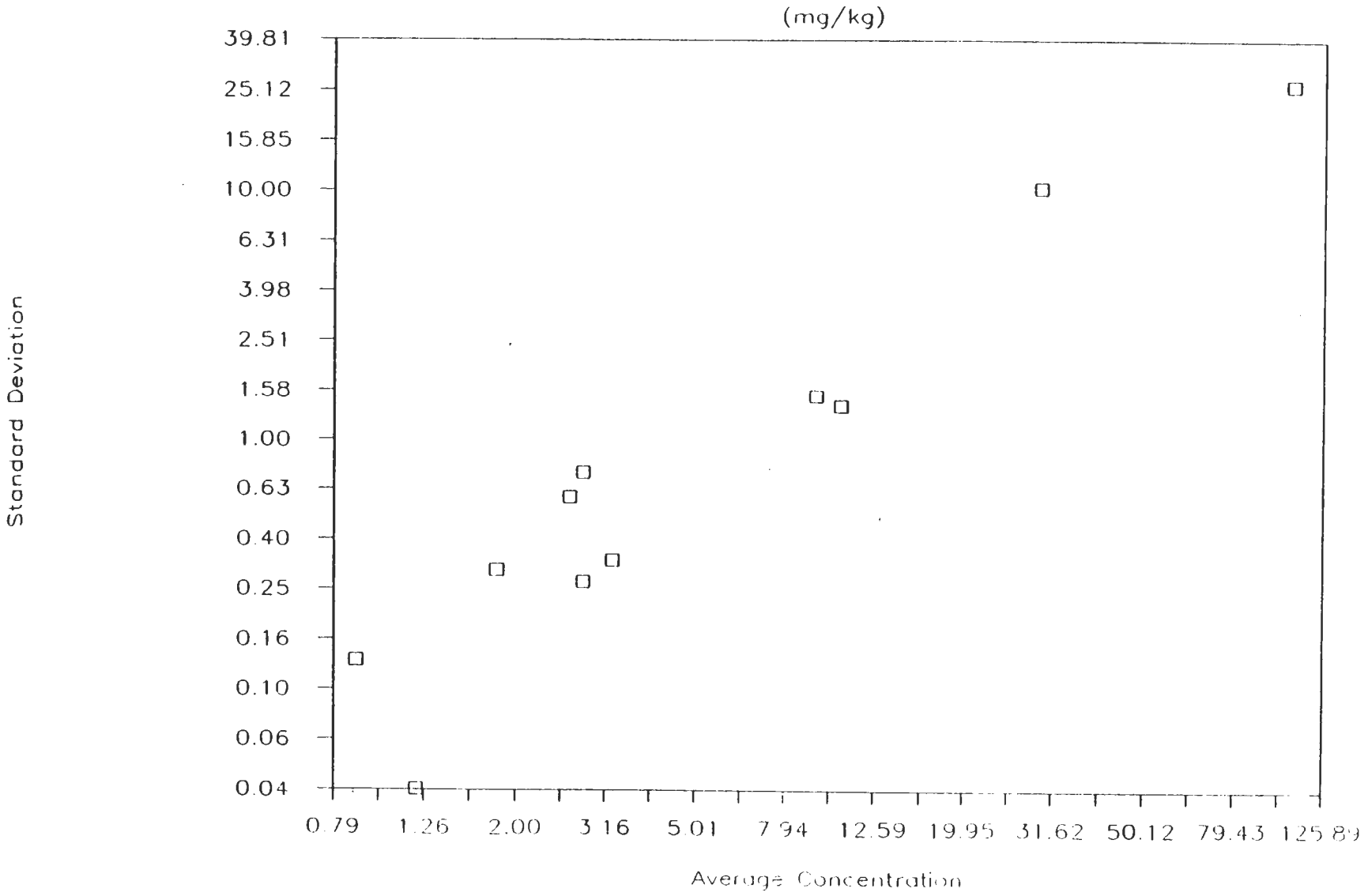




Sulfate - Field Duplicate Pairs



APPENDIX D

216-B-3 POND SYSTEM PHASE 2 SOIL AND SEDIMENT SAMPLING OF A, B, AND C LOBES

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ACRONYMS

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
HEIS	Hanford Environmental Information System
ICP	inductively coupled plasma
LOD	Limit of Detection
LOQ	Limit of Quantification
MTCA	Model Toxics Control Act
PCB	polychlorinated biphenyl
QA/QC	Quality Assurance/Quality Control
RCRA	*Resource Conservation and Recovery Act of 1976*
RPD	relative percent difference
SOW	statement of work
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TSD	treatment, storage, and disposal
VOA	volatile organics analysis
WAC	Washington Administrative Code

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1.0 INTRODUCTION

This report summarizes the sampling activities undertaken and the analytical results obtained in a soil and sediment sampling study performed at the three expansion ponds in the 216-B-3 Pond (B Pond) System. This sampling effort, referred to as the Phase 2 characterization study, was performed to confirm the results of previous sampling efforts at the B Pond system. Results were compared to Hanford Site Background thresholds for soils and the Model Toxics Control Act (MTCA) residential limits. No organic compounds or inorganic constituents were found in sufficient concentrations to cause the investigated soil and sediment to be regulated as dangerous waste. The results of the Phase 2 study are consistent with the earlier findings.

While this sampling event focused on soil and sediments at the 216-B-3 Pond System, at the request of the Washington State Department of Ecology (Ecology), liquid samples were taken from the two expansions ponds that contained water and the results also are reported in this document.

1.1 REGULATORY BACKGROUND

The U.S. Environmental Protection Agency (EPA) and Ecology jointly administer the *Resource Conservation and Recovery Act of 1976* (RCRA) in the State of Washington. The EPA retains oversight authority while delegating to Ecology enforcement of a state program that is consistent with or more stringent than the corresponding federal program. The implementing regulations can be found in the Washington Administrative Code (WAC) 173-303, "Dangerous Waste Regulations," and Title 40, Code of Federal Regulations (CFR), Parts 260-270. Ecology's authorization includes administering treatment, storage, and disposal (TSD) closures. However, the state currently is not authorized to enforce the federal *Hazardous and Solid Waste Amendments of 1984*, which includes RCRA corrective-action provisions.

The U.S. Department of Energy (DOE), EPA, and Ecology have entered into an agreement called the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989), commonly referred to as the Tri-Party Agreement. This agreement affects environmental regulation at the Hanford Site. One purpose of this agreement is to ensure environmental impacts associated with past activities are investigated and appropriate response actions taken as necessary to protect human health and the environment. The agreement seeks to promote this goal, in part, by identifying TSD units, identifying which units will undergo closure, and promoting compliance with relevant RCRA permitting requirements.

B Pond is identified as a RCRA TSD unit that will be closed in accordance with applicable laws and regulations. B Pond is considered an interim status, surface impoundment disposal unit (DOE-RL 1990). Clean closure is the planned option for the portion of B Pond addressed by this report: the 216-B-3A expansion pond, the 216-B-3B expansion pond, and the 216-B-3C expansion pond (DOE-RL 1990).

1.2 BACKGROUND

The B Pond is undergoing evaluation to characterize the potential hazards that may be present in the soil and sediments. The potential dangerous chemical and radionuclide inventory of the soils and sediments is known only from information about past discharges to the ponds and previous sampling efforts. Information gathered will assist in evaluating closure options. B Pond is part of the 200-BP-11 operable unit (WHC 1989b).

A sampling plan, *216-B-3 Pond Characterization of the Hazardous Waste Inventory in the Near-Surface Soil and Sediments* (Roos and Woodworth 1989), governs the characterization effort. The sampling plan sets forth a phased approach toward characterizing the soils and sediments of B Pond. Phase 1 was an initial sampling effort assessing near-surface soil contamination within the 216-B-3 Pond, the 216-B-3-3 Ditch, and the three expansion ponds (216-B-3A, 216-B-3B, and 216-B-3C). This phase includes the estimation of background soil concentrations in the vicinity of the site. Phase 2 is an extension of the characterization work using data and knowledge from Phase 1. Phase 3 examined the vertical distribution of contaminants beneath the surface soil.

1.3 SETTING

B Pond is located adjacent to the 200 East Area on the Hanford Site in southeast Washington State (Figure 1). B Pond is composed of the following units (Figure 2):

- Open section of the 216-B-3-3 Ditch, approximately 3,700 ft
- 216-B-3 Pond (B-3 Pond), approximately 35 acres
- 216-B-3A Pond (3A Pond), approximately 11 acres
- 216-B-3B Pond (3B Pond), approximately 11 acres
- 216-B-3C Pond (3C Pond), approximately 41 acres.

The B-3 Pond is the oldest pond in the system. It contains the largest volume of water. The level of the pond and the inflow have changed with time. Originally the pond was supplied through the 216-B-3-1 Ditch. In 1964, this ditch was replaced by the 216-B-3-2 Ditch. This second ditch was replaced in 1970 by the present 216-B-3-3 Ditch. Both the 216-B-3-1 and 216-B-3-2 Ditches were removed from service due to radioactive contamination and were filled with soil to reduce contaminant mobility. The three expansion ponds, 216-B-3A (3A), 216-B-3B (3B), and 216-B-3C (3C), were placed in service in 1983, 1984, and 1985, respectively. The 3B Pond has not been used since taken out of service in May 1985. Several feet of material were subsequently removed from the former pond bottom in an attempt to increase percolation should the pond be used again.

Figure 1. Map of the Hanford Site.

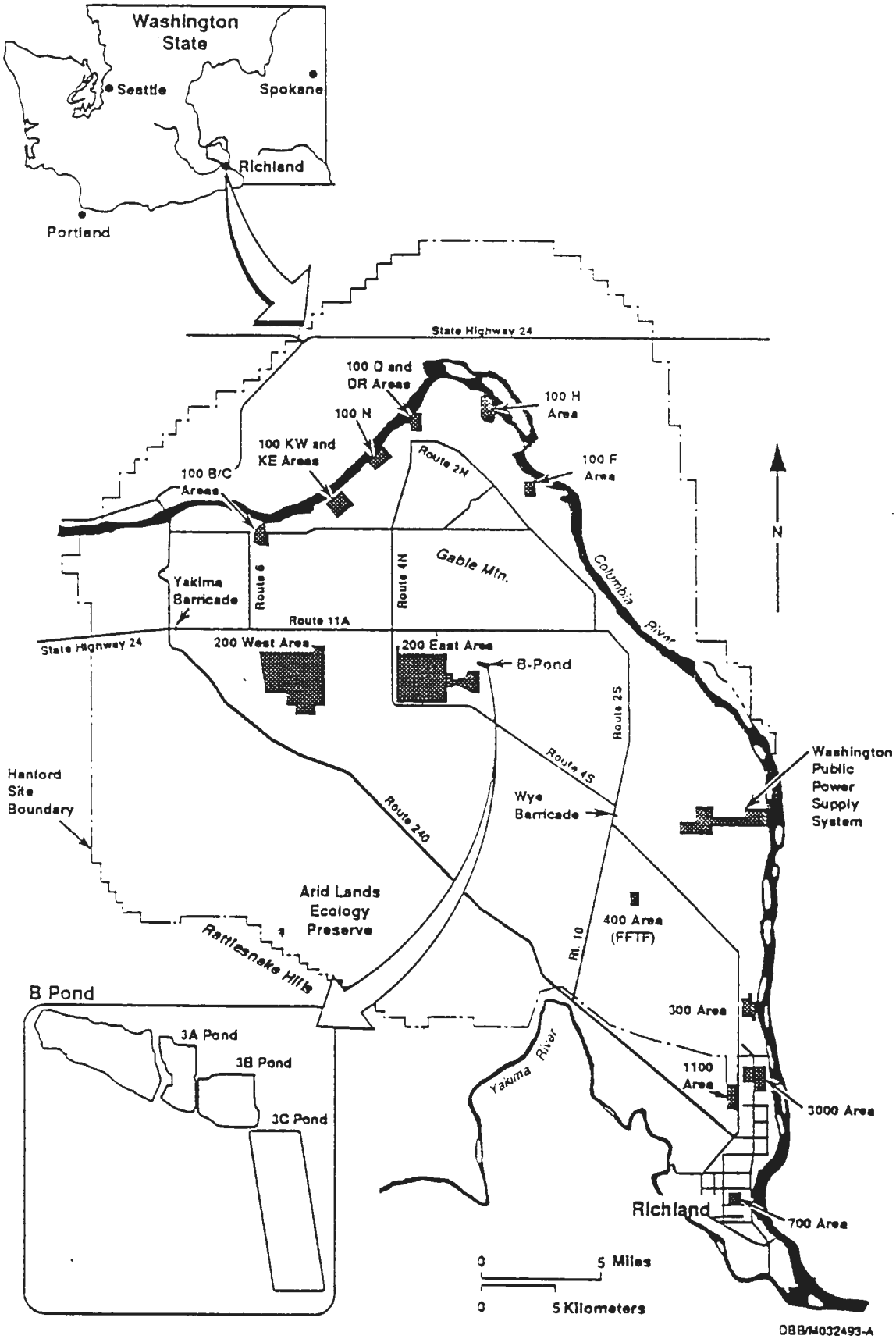
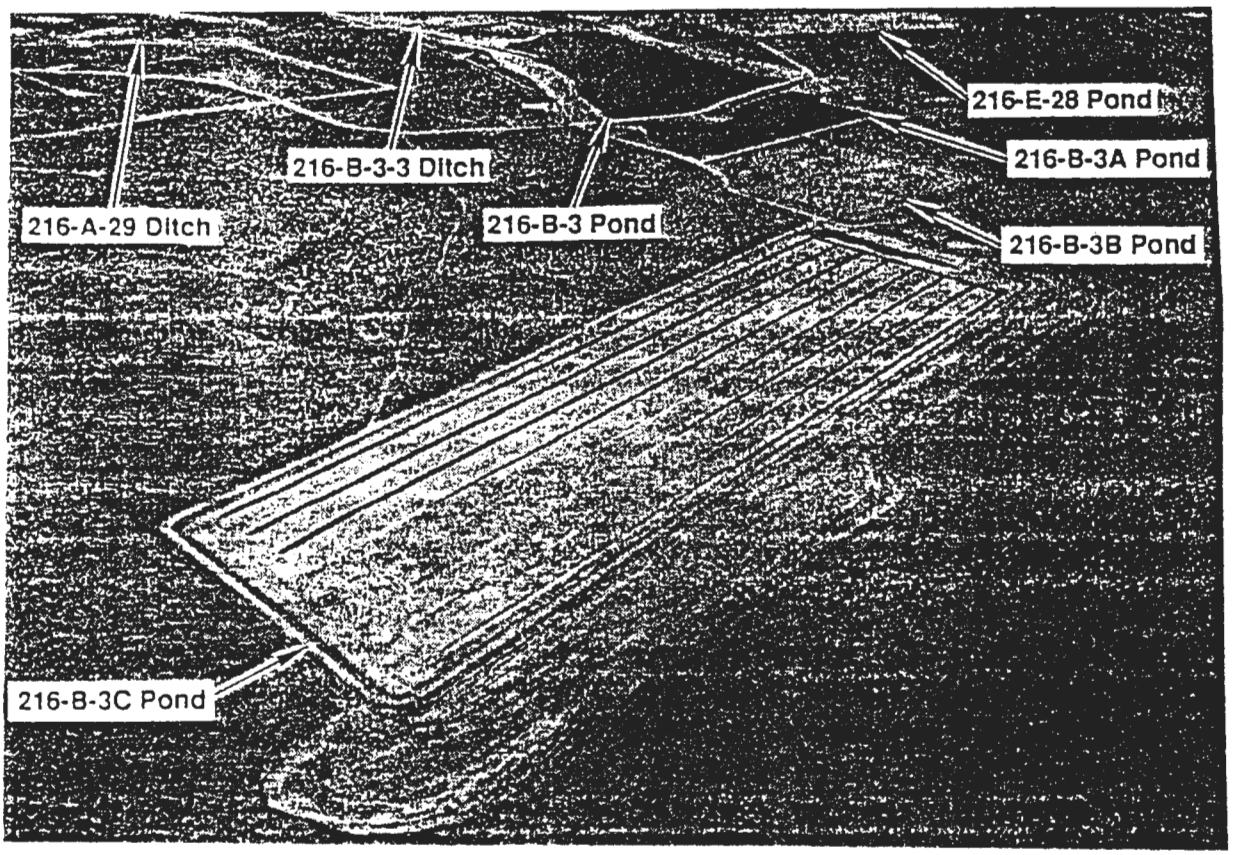


Figure 2. Aerial Photograph of the 216-B-3 Pond System and Surrounding Areas (1988).



The B Pond area has received liquid effluent from activities in the 200 East Area since 1945. B Pond primarily has received steam condensate, cooling water, chemical sewer discharges, and process wastewater. Some mixed waste also has been discharged to B Pond. Administrative and physical controls have been implemented to eliminate dangerous waste discharges. B Pond is still in use for nondangerous wastewater disposal. With respect to hazardous waste, it is undergoing closure in accordance with RCRA. The *216-B-3 Pond System Closure/Postclosure Plan* (DOE-RL 1990) provides a broader perspective of this closure and includes chapters on process information and waste characteristics (Chapters 3-4, pp. 3-1 to 4-14).

Water flows into the B-3 Pond through the 216-B-3-3 Ditch. Flow from the B-3 Pond to the 3A Pond is controlled at the east end of the B-3 Pond. The B-3 Pond and the 3A Pond normally contain water. Water from the 3A Pond currently is directed to the 3C Pond. The 3B Pond currently is not in use. The 3C Pond has a series of eight parallel infiltration trenches into which water usually is channelled. The water in the 3C Pond has never been above the tops of the trenches, which cover a much smaller total area than the pond itself. The trenches usually are not wet along their entire length. The wet area varies with water level.

The Contingency Pond, 216-E-28, was constructed in 1987 to provide emergency overflow capability for B Pond. It lies north and slightly west of the B-3 Pond. The area is dry and has not been used for waste disposal. Both the unused contingency pond area and an area of native desert vegetation (sagebrush and native plants) were used in Phase 1 as sources for background soil samples. For the purposes of this study, only the 3A, 3B, and 3C Ponds underwent sampling during Phase 2. Although this document uses the term 'pond', the reader should keep in mind that the 3B Pond and the Contingency Pond are actually dry basins.

2.0 SAMPLING ACTIVITIES

Characterization of the B Pond System was accomplished by a three-phase sampling approach. Phase 1 was conducted from August through September 1989. Phase 1 results are described in *Phase 1 Characterization of the 216-B-3 Pond System* (WHC 1991). Phase 3, examination of the vadose zone, was conducted from February through March 1991. Phase 3 sample results are described in *Vadose Zone Investigation of the 216-B-3A, 216-B-3B, and 216-B-3C Ponds* (WHC 1992b). The following provides the reader with a brief overview of the phased sampling approach and describes the need for initiating Phase 2 for the B Pond characterization effort.

2.1 PHASE 1

Phase 1 was an initial sampling effort assessing near-surface soil contamination within the B-3 Pond, the 216-B-3-3 Ditch, and the three expansion ponds. The objectives of Phase 1 also included estimating background values, identifying constituents of concern, and estimating contamination variability. All but four sample locations within the TSD unit were selected randomly. Randomly allocated sample locations included sites in the 216-B-3-3 Ditch, the B-3 Pond, the 3A Pond, the 3B Pond, and the 3C Pond. Randomly allocated sample locations included sites in the closest possible point to the head end of the 216-B-3-3 Ditch, the intersection of the 216-B-3-3 and 216-A-29 Ditches, the present inlet area of the B-3 Pond, and the deepest area of the B-3 Pond. Sample collection methods are detailed in WHC-SD-EN-AP-042, *Phase 1 Characterization of the 216-B-3 Pond System* (WHC 1991).

Phase 1 also included measuring constituents in two types of background areas in the vicinity of the site. This involved taking five samples from the never-used 216-E-28 Contingency Pond and five samples from the area of native desert vegetation.

Characterization of the soils during the Phase 1 study focused on inorganic analytes. Table 1 summarizes the analyses requested for soil/sediment samples. In February 1990 it was decided that comparison to background would be more appropriate if the strong acid digestion method 3050 (EPA 1986) was employed for background and onsite samples instead of the acetic acid digestion used for EP-toxicity determinations. This analysis was requested at that time on samples still held in storage by the laboratory. The method yielded higher concentrations of analytes for the comparisons.

Table 1. Phase 1 Analytical Methods.

Constituent	Method[a]	Method detection limit
Arsenic	7060	0.5 μg/g
Lead	7421	0.5 μg/g
Mercury	7470	0.2 μg/g
Selenium	7740	0.5 μg/g
Thallium	7841	1.0 μg/g
EP-Tox metals, enhanced[b]	1310	.02-1.5 μg/L
Anions	300	1.0 μg/g
Volatile organics	8240	5-500 ng/g
Gross alpha	A-703[c]	N/A
Gross beta	A-703[c]	N/A
Sulfide	9030	10.0 μg/g
Cyanide	9010	.5 μg/g
Ammonium	D 1426-C/D[c]	.5 μg/g
Metals	3050/6010	.5-300 μg/g

N/A = not applicable (standard reference not available).
[a]EPA (1986), unless noted.
[b]Laboratory-specific method consisting of EP-Tox analysis with additional analyses.
[c]ASTM (1987).

Analytical results for site samples were compared to threshold values derived from the two limited background sampling efforts. Contractually defined detection limits, as set forth in the quality assurance project plan (Roos and Woodworth 1989), were used for some comparisons. In these cases, the constituents were not found in concentrations great enough to calculate threshold values. Organic constituents were not found in reliably measurable quantities. Background soil composition in the undisturbed native area surrounding the facility was different than an adjacent background area of anthropic influence. Many analytes exceed threshold values derived from the native background, but not those derived from an unused contingency pond area. Reference to typical soil concentrations suggests lead, mercury, and cadmium are the most significant exceedances. Even these are far below hazardous levels as defined by the characteristic of EP-toxicity. The data suggest that the soil or sediment at any sampled location would <u>not</u> be classified as dangerous waste under any of the WAC-173-303 Dangerous Waste Regulations.

2.2 PHASE 3

The objective of Phase 3 characterization sampling was to collect data addressing the issue of potential vadose zone chemical contamination with dangerous waste and examine the vertical distribution of potential contaminants beneath the surface soil. Efforts focused on the subsurface of the three expansion ponds. The investigation was limited to the vadose zone; it did not address groundwater. The investigation involved the construction of three temporary characterization boreholes, designated as 699-43-41H, 699-42-41B, and 699-41-41 in the 3A, 3B, and 3C Ponds, respectively. Samples were collected as described in WHC-SD-EN-AP-104, *Vadose Zone Investigation of the 216-B-3A, 216-B-3B, and 216-B-3C Ponds* (WHC 1992b).

Table 2 summarizes the analyses requested for borehole soil/sediment samples.

The B Pond Phase 3 vadose zone investigation did not indicate that hazardous levels of waste constituents exist in the vadose zone of the 216-B-3A, 216-B-3B, or 216-B-3C Ponds. No organic compounds or inorganic constituents were found in sufficient representative concentrations to cause the investigated vadose soils to be regulated as a dangerous waste.

2.3 PHASE 2

Phase 2 soil and sediment sampling was initiated to assess the possibility of surface soil contamination in the B Pond expansion ponds. In addition, Ecology expressed concern over the quality control and data validation associated with the Phase 1 soil and sediment sampling results. Documentation received from the laboratory was not sufficient to perform the level of data validation requested by Ecology. This Phase 2 sampling effort is, in part, to substantiate the conclusions that were based on the Phase 1 sampling effort.

2.3.1 Sample Location

Because of the different nature of the 3A, 3B, and 3C Ponds, each pond was sampled as a separate entity. However, the same basic sampling pattern was used for each of the three expansion ponds (WHC 1992a). All sample points are referenced in Figure 3. The sampling strategy identified the following three sample points for each pond.

- One sample was collected at the influent point of each pond. This location would be expected to be contaminated with any heavy solids, should any contamination be present.

- A second sample was collected from the deepest point in the pond. Should any contamination be present, light materials and fines would be expected to settle at this point.

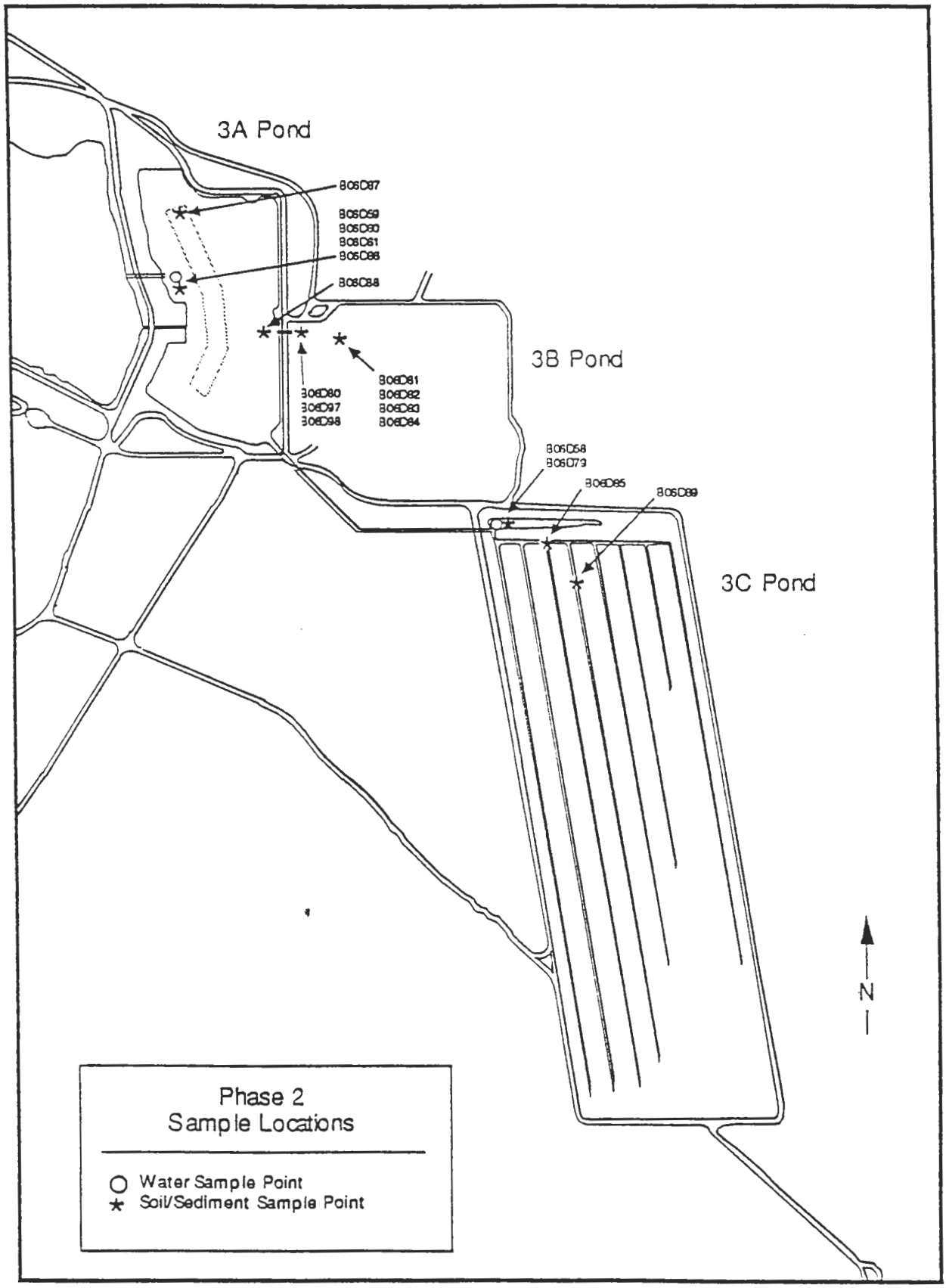
- A third sample was collected at a point expected to contain high levels of the analytes of concern (relative to other locations), as determined by an evaluation of Phase 1 sample results (WHC 1991) and by field observation.

Table 2. Phase 3 Analytical Methods.

Constituent	Method[a]
Arsenic	7060
Lead	7421
Mercury	7470
Selenium	7740
Thallium	7841
Ammonia	350.1
Cyanide	9010
Sulfide	376.1
Anions[b]	300
Metals[c]	6010
Gross alpha	EPA-900[d]
Gross gamma	EPA-900[d]
Pesticides/polychlorinated biphenyls	8080
Herbicides	8150
Organophosphorous pesticides	8140
Dioxins/furans	8280
Volatile organic compounds	ACD 2440[e]
Base/neutral/acid compounds	ACD 2470[f]
Strontium-90	906
Gross beta	EPA-900[d]

[a]EPA (1986), unless noted.
[b]Excluding bromide, nitrate, and phosphate.
[c]Excluding tin, titanium, and zirconium.
[d]Analyses were conducted using EPA-900 series procedures.
[e]Laboratory-specific, volatile organics analysis method based on Contract Laboratory Program protocol.
[f]Laboratory-specific, base/neutral/acid analysis method based on Contract Laboratory Program protocol.

Figure 3. Phase 2 Sample Locations.



In the 3A and 3C Ponds, which are wet ponds, the location of the second sample point (deepest point) was determined by measuring the water depth visually and then confirming the relative depth with a probe. The probe consisted of conduit pipe with marks at 1-ft increments.

Additionally, while this sampling event focused on soil and sediments at the 216-B-3 Pond System, at the request of Ecology water samples were taken from the two wet ponds.

In the 3A Pond, the first sample point was located at the influent point at which water from the 216-3-B (main) Pond entered the 3A Pond. Water samples also were taken at this point. A second soil/sediment sample was taken from the deepest portion of the pond. This point was located at the north end of the underwater trench running through the 3A Pond. A water sample also was taken in this vicinity. The third soil/sediment sample point was located at the east side of the pond near the outfall to the dry 3B Pond. Sedimentation was found to be unusually heavy at this location.

The "deep point" of the 3B Pond was not sampled because stabilization of the pond had made it impractical. The location of the "deep point" of the 3B Pond could not be determined. A sample of soil/sediments was taken near the pond influent gates, approximately 10 ft east of the surface contamination area. The next sample point was a location approximately 100 ft east and 15 ft south of the influent gates. The gradual downslope of the terrain suggested that settleable contaminants would have been likely to deposit at this point while the pond was in use. Discrete samples of surface soils and underlying soils were taken at this point.

Three sample points were identified for the 3C Pond. The first point sampled was located 70 ft downstream and 15 ft north of the 3C Pond influent pipe. This area was characterized by heavy sedimentation. A water sample also was taken at this location. The high flowrate of the influent made sampling in the direct vicinity of the influent pipe impractical. Soil/sediment samples were taken at the intersection of the third north/south trench and the main east/west feed trench. A visual inspection of the pond determined this location to be the deepest point in the pond. A final sample was taken of dry sediments located approximately 100 ft down (south of the feed trench) the fourth trench.

2.3.2 Sample Collection

Samples were collected in the same manner as for the Phase 1 sampling effort. The sampling equipment used included a long pole and a 3.25-in. by 12-in. soil recovery auger. Multiple borings were necessary to obtain sufficient quantities of material for all the requested analyses. These were always commingled in a stainless steel bowl prior to allocation to the individual sample analysis containers sent to the laboratories. Stainless steel shovels were used to collect samples in the northern portion of 3C Pond, near the influent point. Stainless steel scoopulas, spoons, bowls, shovels, and augers were prepared for use in accordance with the laboratory decontamination of field equipment specified in Environmental Investigations Instruction 5.5, "Decontamination of Equipment for RCRA/CERCLA Sampling" (WHC 1989a). Cleaned equipment was wrapped in aluminum foil by the cleaning personnel and maintained wrapped until used. Precleaned sample containers

were purchased and used for all samples. The containers come presealed from the manufacturer with tamper-indicating seals affixed to the packaging. Personnel collecting the samples wore disposable vinyl gloves in addition to other clean protective clothing. These gloves were shed after each sample in an effort to minimize the potential for cross-contamination between samples. Only the large stainless steel shovels were decontaminated in the field and reused. Sample media were monitored for radiation. Work was performed according to the applicable description of work (WHC 1992b).

For samples collected in the 3A Pond, samplers were permitted to sample from a flat-bottom aluminum boat. Health Physics coverage was supplied from a similar adjacent boat. The two boats were stabilized by securing the oar locks together with rope.

2.3.3 Field Quality Assurance/Quality Control

Field quality assurance/quality control (QA/QC) is used to provide the sampler with a basis by which laboratory accuracy and reproducibility can be measured. Field duplicates and equipment blanks are used to assess precision and bias of sampling. The estimated precision and bias will contain components of the laboratory's precision and bias, but alone cannot be used to assess those factors for the laboratory. Field splits are used to assess laboratory reproducibility. Additional information with regards to laboratory cleanliness and sample handling protocol can be inferred by the results to blank analysis. Trip blanks are used to provide information with regards to sample handling and shipping prior to receipt by the laboratory. Field duplicates, splits, and blanks were prepared to address issues related to laboratory QA/QC.

A water sample duplicate was taken and a split was made at the 3A Pond. A soil/sediment sample duplicate was taken and a split was made at the 3B Pond for chemical and radiological analyses. Two equipment blanks were prepared, one for the water matrix and one for the soil matrix. Trip blanks in the water matrix were shipped with all sample shipping containers. All shipping containers containing soil/sediment samples were shipped with trip blanks of clean silica sand. Table 3 summarizes sample identification, location, and QA/QC designation.

2.3.4 Sample Analysis

Table 4 summarizes the analyses requested for water and soil/sediment samples.

For each sample, Table 3 lists the laboratory that performed the analyses and the analyses performed on each sample. Trip blanks were analyzed for volatile organics only. The majority of the samples were analyzed by Roy F. Weston, Inc., Lionville Analytical Laboratory (Weston) in Lionville, Pennsylvania. TMA/NORCAL (TMA) in Richmond, California, was used as a split laboratory. Appendix A lists all analytes for each specific analytical method as well as the detection limits reported for each laboratory.

Table 3. Phase 2 Sample Inventory and Analyses. (sheet 1 of 2)

HEIS Number	Location	Matrix	Field QA/QC designation	Laboratory	Analysis requested
B06D58	Influent to 3C Pond	Water	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D59	Influent to 3A Pond	Water	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D60	Influent to 3A Pond	Water	Duplicate of B06D59	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D61	Influent to 3A Pond	Water	Split of B06D59	TMA	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D62	N/A	Water	Equipment blank	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D63	N/A	Water	Trip blank	Weston	VOA
B06D64	N/A	Water	Trip blank	Weston	VOA
B06D76	N/A	Water	Trip blank	Weston	VOA
B06D77	N/A	Water	Trip blank	TMA	VOA
B06D78	N/A	Water	Trip blank	Weston	VOA
B06D79	Influent to 3C Pond	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D80	Influent to 3B Pond	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D81	3B Pond, surface	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D82	3B Pond	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN
B06D83	3B Pond	Soil	Duplicate of B06D82	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN
B06D84	3B Pond	Soil	Split of B06D82	TMA	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN
B06D85	3C Pond, dry sediment	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN

Table 3. Phase 2 Sample Inventory and Analyses. (sheet 2 of 2)

HEIS Number	Location	Matrix	Field QA/QC designation	Laboratory	Analysis requested
B06D86	Influent to 3A Pond	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN
B06D87	Deep point of 3A Pond	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN, rad
B06D88	3A Pond	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN
B06D89	Deep point of 3C Pond	Soil	Routine	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN
B06D91	N/A	Soil	Equipment blank	Weston	VOA, Semi-VOA, PCB/Pest, ICP, GFAA, Hg, CN
B06D92	N/A	Soil	Trip blank	Weston	VOA
B06D94	N/A	Soil	Trip blank	TMA	VOA
B06D95	N/A	Soil	Trip blank	Weston	VOA
B06D96	N/A	Soil	Trip blank	Weston	VOA
B06D97	Influent to 3B Pond	Soil	Duplicate of B06D80	Weston	rad
B06D98	Influent to 3B Pond	Soil	Split of B06D80	TMA	rad

GFAA = graphite furnace atomic absorption.
ICP = inductively coupled plasma.
N/A = not applicable.
PCB/Pest = polychlorinated biphenyls/pesticides.
VOA = volatile organics analysis.

QA/QC blanks shipped as follows:

B06D63 shipped with B06D58
B06D64 shipped with B06D62
B06D76 shipped with B06D59
B06D77 shipped with B06D61, B06D84, B06D94, B06D98
B06D78 shipped with B06D60
B06D92 shipped with B06D79, B06D85, B06D89
B06D94 shipped with B06D61, B06D77, B06D84, B06D98
B06D95 shipped with B06D86, B06D87, B06D88
B06D96 shipped with B06D80, B06D81, B06D91

Table 4. Phase 2 Analytical Methods.

Constituent	Method[a]
Volatile organics	8240
Pesticides/polychlorinated biphenyls	8080
Inductively coupled plasma metals	6010
Strontium-90	b
Gross alpha	b
Gross gamma	b
Semivolatile organics	8270
Graphite furnace atomic absorption metals	7000[c]
Mercury	7471
Cyanide	9010
Gross beta	b

[a]EPA (1986).
[b]Laboratory-specific. (No standard methods have been established.)
[c]Analyses were conducted using EPA-7000 series procedures.

3.0 DATA VALIDATION

Analytical results underwent data validation by the Hanford Analytical Services Management organization. Data validation activities were performed in accordance with the RCRA procedure (Level B) contained within the *Sample Management and Administration Manual*, WHC-CM-5-3 (WHC 1990). This section summarizes procedures used for validation of data received from the laboratories. Further information on the procedures and details of how these procedures are applied are available in WHC-CM-5-3 (WHC 1990).

The data validation process included a review of the following QC elements performed by the laboratories and reported in the associated data deliverables:

- Holding times
- Blank analyses
- Surrogates
- Matrix spikes
- Duplicates.

The validation procedure establishes the following qualifiers and definitions to describe the associated data:

U The material was analyzed for, but was not detected. The associated value is the detection/quantitation limit.

UJ The material was analyzed for, but was not detected. The associated detection/quantitation limit is an estimated value.

J The associated value is estimated.

R The data are unusable.

Phase 2 sample results with appropriate data qualifiers are displayed in Chapter 3.0.

3.1 WESTON LABORATORIES

After completion of the validation process, all data received from Weston were determined to be acceptable with the exception of the initial semi-volatile organic analysis of sample B06D80. Initial results for sample B06D80 were qualified as unusable due to very low surrogate recoveries. Because of the problems with the initial analysis, results from a re-extraction of sample B06D80 are reported in Chapter 3.0. Based on the results of B06D81 and sampling done in Phase 1, it is unlikely that semivolatile organic compounds are present in detectable levels in the 3B Pond.

All holding time criteria were met for both water and soil samples analyzed by Weston with the exception of semivolatile and pesticide/PCB extraction criteria (exceeded by 1 day) for sample B06D58. No holding times were established for the semivolatile analysis of soils. This is considered to have a minimal impact on the analysis, and the results were qualified accordingly.

Weston prepared and analyzed laboratory blanks for both the soil and water sample matrices. Analyses of the blanks identified some potential laboratory contamination for the following compounds:

- Volatile organics
  - Acetone (soil blanks only)
  - Methylene chloride
- Semivolatile organics
  - Di-n-butylphthalate
  - Bis-(2-ethylhexyl)-phthalate
- Metals
  - Copper, lead, and zinc.

Compounds detected in the organics blanks were below the contract-required quantitation limit and are estimated values. Analytes detected in the metals blanks were at levels less than the contract-required detection limit. When evidence of blank contamination was present, blank validation criteria were applied to determine appropriate qualification for associated sample results.

Weston prepared and analyzed matrix spike samples and reported the results as percent recovery as an indication of accuracy. Matrix spike recovery is used as a general correlation for all samples in the analytical batch based on the fact that the samples are related to the same site and have relatively similar analyte concentrations. Spiked sample results generally were within control limits for percent recovery. Matrix spike recovery for thallium, lead, and silver were low in one or more of the Weston delivery groups. Weston also analyzed surrogate compounds for organics analyses and reported results in terms of percent recovery as another indication of accuracy. Surrogate recoveries provide an indication of accuracy for laboratory sample preparation and determinative procedures. Reported surrogate recoveries were outside control limits for several volatile, semivolatile, and pesticide/PCB samples in one or more of the Weston delivery groups. Results that fell outside of the applicable control limits were qualified according to the validation procedure. No indication of significant matrix effects were observed in the sample results.

Duplicate samples were prepared and analyzed, and data were reported as relative percent difference (RPD) by Weston as an indication of laboratory precision. For organics analyses, RPD calculations were made between matrix spike/matrix spike duplicate samples. For inorganics analyses, RPD calculations were made between initial and duplicate sample results. Reported RPDs for duplicate samples were high for aluminum, magnesium, and zinc in one or more of the Weston delivery groups. Results that fell outside of the applicable control limits were qualified according to the validation procedure.

Weston used Contract Laboratory Program (CLP 3/90) protocols to perform sample analyses instead of the requested SW-846 methods. The use of CLP protocols is expected to have minimal impact on the data. The detection levels achieved using CLP were adequate for making decisions regarding B Pond closure. It is concluded that the data are acceptable with the qualifiers listed. These qualifiers were taken into account in further evaluations of the data set performed by project personnel.

3.2 TMA LABORATORIES

After completion of the validation process, all data received from TMA were determined to be acceptable with the exception of the antimony result for sample B06D84. The antimony result for the subject sample was qualified as unusable due to a very low matrix spike recovery.

Holding time criteria were met for the analysis of soil and water samples with the following exception of cyanide for samples B06D61 and B06D84. Based on criteria established for water samples, the nolding times for these cyanide analyses were exceeded by 42 days. The reported results have been qualified accordingly. In addition, both cyanide samples were split samples, and cyanide data, from the samples analyzed within holding time, exist in the Weston data for both sampling locations. Therefore, any limitations on the use of the cyanide results for these samples are expected to have minimal impact on data interpretation.

TMA prepared and analyzed laboratory blanks for both the soil and water sample matrices. Analyses of the blanks identified some potential laboratory contamination for the following compounds:

- Volatile organics
  - Acetone
  - Benzene
- Semivolatile organics
  - Butylbenzylphthalate
- Metals
  - Aluminum, calcium, copper, iron, magnesium, mercury, silver, sodium, vanadium, and zinc.

Target compounds and tentatively identified compounds detected in the organics blanks were below the contract-required quantitation limit and are estimated values. Analytes detected in metals blanks were at levels less than the contract-required detection limit. When evidence of blank contamination was present, blank validation criteria were applied to determine appropriate qualification for associated sample results.

TMA prepared and analyzed matrix spike samples and reported the results as percent recovery as an indication of accuracy. Spiked sample results were generally within control limits for percent recovery. Aluminum, cadmium, iron, thallium, antimony, and zinc matrix spike recoveries were outside control limits in one or more of the TMA QC samples. TMA also analyzed surrogate compounds for organics analyses and reported results in terms of percent recovery as another indication of accuracy. Results that fell outside of the applicable control limits were qualified according to the validation procedure. No indication of significant matrix effects was observed in the sample results.

Duplicate samples were prepared and analyzed, and data were reported as RPD by TMA as an indication of laboratory precision. For organics analyses, RPD calculations were made between matrix spike/matrix spike duplicate samples. For inorganics analyses, RPD calculations were made between initial and duplicate sample results. Reported RPDs for duplicate samples were high for aluminum, barium, iron, arsenic, lead, and sodium in one or more of the TMA QC samples. Results that fell outside of the applicable control limits were qualified according to the validation procedure.

TMA analyzed samples using SW-846 protocols.

4.0 ANALYTICAL RESULTS AND DATA TABULATION

Analytical results are summarized and evaluated in this chapter. Analytical results were compared to background levels and health-based limits. For background, both the Hanford Site Background threshold values and the local background concentrations determined during the Phase 1 sampling effort were used. Hanford Site Background threshold values are from the *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 1 (DOE-RL 1993), and are listed in Appendix B. For health-based levels WAC-173-340, the Model Toxics Control Act (MTCA) Cleanup Regulations, was used. Calculations for these health-based levels are described in Appendix D.

Hanford Site Background is a Site-wide approach to determining background levels and was developed as an alternative to local unit-based background determinations at the Hanford Site. Using local backgrounds for each unit can lead to different definitions of contamination and different assessments of remediation goals and risk for different units. The Hanford Site Background approach is based on the premise that all of the waste management units are part of a common sequence of vadose zone sediments, and that the basic characteristics that control the chemical composition of these sediments are similar throughout the Hanford Site. The range of natural soil compositions is then used to establish a single set of soil background data. Use of the Hanford Site Background for environmental restoration at the Hanford Site is technically preferable to the use of the unit-based background because it more accurately represents the range of natural variability in soil composition, and also provides a more consistent, credible, and efficient basis for evaluating contamination in soil.

The Hanford Site Background threshold values are summarized in Appendix B of this report. The background threshold is the concentration level defining the upper limit of what is considered part of the background population. Background thresholds are based on a tolerance interval approach. The calculated threshold levels depend on the confidence interval and percentile used in the calculation. The WAC 173-340-708(11)(d) specifies a tolerance coefficient of 95% and a coverage of 95%. The Hanford Site Background threshold values are based on a 95/95 confidence interval. Statistical calculations are described in the source document.

Tables 5 and 6 summarize results from the analyses performed on samples from Phase 2 sampling. Table 6 also provides the range of concentrations detected in soils from the Phase 1 sampling of the three expansion ponds, the contingency pond, and the local background area. Table 6 includes the MTCA cleanup levels (Appendix D) for reference. Appendix C provides a quick reference table indicating common elemental concentration ranges in soils (Dragun 1988). An examination of the results indicates that none of the analytes detected were present at levels regulated by the Washington State Administrative Code. The data suggest that the soil or sediment at any sampled location would <u>not</u> be classified as dangerous waste under any of the WAC-173-303 Dangerous Waste Regulations.

Table 5. Results of Phase 2 Organics Analyses: Target Compound List. (sheet 1 of 2)

HEIS Number	Organic constituents		Pesticides and PCBs
	Volatile organics	Semivolatile organics	
B06D58	ND	5 Methoxyethoxyethanol[J]	ND
B06D59	ND	3 Methoxyethoxyethanol[J]	ND
B06D60	ND	3 Methylcyclopentanol[J]	ND
B06D61	ND	ND	ND
B06D62	ND	4 Methoxyethoxyethanol[J]	ND
B06D63	ND	NR	NR
B06D64	ND	NR	NR
B06D76	ND	NR	NR
B06D77	ND	NR	NR
B06D78	ND	NR	NR
B06D79	ND	ND	ND
B06D80	ND	ND	ND
B06D81	370 Toluene[D]	ND	ND
B06D82	2 Toluene[J]	ND	ND
B06D83	2 Toluene[J]	ND	ND
B06D84	ND	ND	ND
B06D85*	150 Methylene chloride[J], 86 Acetone[J], 120 Toluene[J]	ND	ND
B06D85RE*	140 Methylene chloride[J], 77 Acetone[J], 160 Toluene[J]	--	--
B06D86	8 Toluene[J]	ND	ND
B06D87	ND	ND	ND
B06D88	ND	ND	ND
B06D89	ND	ND	ND
B06D91	ND	ND	ND
B06D92	ND	NR	NR
B06D94	1 Chloroform[J], 1 111-TCA[J], 5 Toluene, 3 Chlorobenzene[J], 2 Xylene[J], 2 Trichloroethane[J]	NR	NR
B06D95	ND	NR	NR
B06D96	ND	NR	NR

Table 5. Results of Phase 2 Organics Analyses: Target Compound List. (sheet 2 of 2)

HEIS Number	Organic constituents		Pesticides and PCBs
	Volatile organics	Semivolatile organics	
B06D97	NR	NR	NR
B06D98	NR	NR	NR

NOTE: Concentrations in µg/L (water matrix) and µg/kg (soil matrix); TICs (Tentatively Identified Compounds) are not listed.

*For VOA analysis: sample B06D85 internal standards were outside of limits. Sample was reanalyzed. Results from the reanalysis, B06D85RE, were qualified as estimated due to poor surrogate recoveries.

ND = non-detect.

NR = not requested.

[J]Estimated concentration.

[D]Sample dilution was required, surrogate recoveries unavailable.

Table 6. Results of Phase 2 Inorganics Analyses. (sheet 1 of 3)

HEIS Number	Constituent											
	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
B06D58	102[a]	60[U]	2[U]	29.8[a]	1[U]	7[U]	17700	9[U]	9[U]	8[U]	144	2.3[U]
B06D59	49[U]	60[U]	2[U]	29.2[a]	1[U]	7[U]	19100	9[U]	9[U]	8[U]	154	2[U]
B06D60	49[U]	60[U]	2[U]	30.7[a]	1[U]	7[U]	20100	9[U]	9[U]	8[U]	15[U]	2.6[U]
B06D61	165.2[UJ]	18[U]	1	10.7[J]	1[U]	10[UJ]	12120	7[U]	7[U]	4[U]	291.5[UJ]	1[U]
B06D62	49[U]	60[U]	2[U]	14[U]	1[U]	7[U]	334[a]	9[U]	9[U]	8[U]	15[U]	2[U]
B06D79	8540[J]	68.9[U]	4.7[a]	106[a]	1.15[U]	8.04[U]	5460[a]	19.4	15.7[a]	59.6	19200	29.6[J]
B06D80	3910[J]	12.3[U]	3.7	76.8	0.37[a]	1.43[U]	8800	3.1	9.7[a]	10.3	18400	4.4[J]
B06D81	5520[J]	12.2[U]	7	103	0.47[a]	1.42[U]	11900	7.1	11.4	10.9	19300	6.2[J]
B06D82	3310[J]	12.2[U]	4.7	64.4	0.26[a]	1.42[U]	8730	5	7.2[a]	8.3	12900	5[J]
B06D83	4480[J]	12.1[U]	3.9	93.9	0.3[a]	1.41[U]	11200	5.2	9.1[a]	11.9	17900	4.5[J]
B06D84	5443	1.8[a]	3.3[J]	83.6	0.1	1[UJ]	12710	8.2	6.8	15	21360	4.4[J]
B06D85	9460[J]	18.9	3.4	111	0.62[a]	3.3	6720	19.5	12.6	67.3	18600	32.3[J]
B06D86	2310[J]	14.4[U]	1.8[a]	67.2	0.24[U]	3.4	2620	2.4[a]	4.9[a]	7.4	9890	5.2[J]
B06D87	2600[J]	15.7[U]	1.2[a]	54.2	0.26[U]	4.9	2670	4.4	5.3[a]	11.3	11300	4.8[J]
B06D88	3370[J]	15.1[U]	3.9	62.7	0.25[U]	1.76[U]	5460	3	7.5[a]	8.8	12300	6.6[J]
B06D89	5660[J]	25.6[U]	3.2[a]	74.1[a]	0.43[U]	7.9	4160	10.8	10.1[a]	29.4	15500	9.6[J]
B06D91	49.6[J]	12[U]	0.40[U]	2.8[U]	0.2[U]	1.4[U]	67.6[a]	1.8[U]	1.8[U]	1.6[U]	231	0.4[UJ]
Phase 1 Result Summary												
3A Pond	4789-10339	NA	0.84-4.69	NA	NA	7.0-8.0	5200-16510	3.9-9.7	6.4-9.4	12.8-20.1	19530-28566	2.97-7.29
3B Pond	5062-6265	NA	1.64-3.43	NA	NA	5.8-7.0	7366-9331	4.7-6.5	8.2-9.4	13.7-16.1	23855-29081	2.07-3.84
3C Pond	3743-6850	NA	0.83-2.20	NA	NA	2.0-6.3	4140-5818	3.3-7.2	3.0-8.5	11.1-18.5	7291-24957	3.04-6.09
Contingency pond	5118-7650	NA	2.14-4.75	NA	NA	5.3-7.3	6830-9923	4.1-6.3	6.8-9.4	14.1-18.1	21232-29671	3.80-5.04
Background	7695-9204	NA	1.58-3.22	NA	NA	6.4-7.2	3138-3872	6.8-9.7	6.9-8.3	8.7-11.8	22231-25620	3.96-9.96
MTCA	NA	24	32	5600	0.2	80	NA	400	NA	3200	NA	250

Table 6. Results of Phase 2 Inorganics Analyses. (sheet 2 of 3)

HEIS Number	Constituent											
	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Cyanide
B06D58	4120^{B}	4^{U}	0.1^{U}	20^{U}	1340^{U}	2^{U}	10^{U}	2350^{B}	2^{UJ}	8^{U}	36.3^{U}	20^{U}
B06D59	4380^{B}	4^{U}	0.1^{U}	20^{U}	1340^{U}	2^{U}	10^{U}	2540^{B}	2^{UJ}	8^{U}	15.6^{U}	10^{U}
B06D60	4570^{B}	4^{U}	0.1^{U}	20^{U}	1340^{U}	2^{U}	10^{U}	2520^{B}	2^{UJ}	8^{U}	20.9^{U}	10^{U}
B06D61	3100	2^{U}	0.8^{U}	12^{U}	1260^{U}	2^{U}	7.4^{U}	2086	2^{UJ}	4^{U}	62.2^{UJ}	0.02^{UJ}
B06D62	68^{U}	4^{U}	0.1^{U}	20^{U}	1340^{U}	2^{U}	10^{U}	562^{B}	2^{UJ}	8^{U}	14.6^{U}	10^{U}
B06D79	6270	148^{J}	0.31^{B}	23^{U}	1810^{B}	2.3^{U}	11.5^{UJ}	173^{U}	2.3^{U}	31.1^{B}	450^{J}	5.74^{U}
B06D80	4350	319^{J}	0.05^{U}	4.5^{B}	1050	0.41^{U}	2.05^{UJ}	99.9^{B}	0.41^{U}	32.1	35.5^{J}	1.02^{U}
B06D81	5600	369^{J}	0.05^{U}	9	1750	0.4^{U}	2.02^{UJ}	149^{B}	0.4^{U}	33.6	41.9^{J}	1.01^{U}
B06D82	3380	249^{J}	0.05^{U}	4.6^{B}	1110	0.41^{U}	2.03^{UJ}	111^{B}	0.41^{U}	20.7	27.6^{J}	1.02^{U}
B06D83	4600	333^{J}	0.05^{U}	4.04^{U}	1230	0.4^{U}	2.02^{UJ}	171^{B}	0.4^{U}	27.7	35.9^{J}	1.01^{U}
B06D84	3959	324.5	0.02	19.1	1000	0.2^{U}	0.3^{U}	724^{J}	0.2^{UJ}	47	40.9	0.8^{UJ}
B06D85	5680	142^{J}	0.61	16.3	1820	4.97^{U}	2.49^{UJ}	228^{B}	1.2^{B}	32.1	515^{J}	1.24^{U}
B06D86	1940	144^{J}	0.6^{U}	4.81^{U}	367^{B}	0.48^{U}	2.4^{UJ}	82.6^{B}	0.48^{U}	15.8	28.7^{J}	1.2^{U}
B06D87	2180	173^{J}	0.08^{B}	7.3^{B}	350^{U}	0.52^{U}	2.62^{UJ}	80.4^{B}	0.52^{U}	17.9	49^{J}	1.31^{U}
B06D88	3070	157^{J}	0.06^{U}	7.6^{B}	668^{B}	0.5^{U}	2.51^{UJ}	91.9^{B}	0.5^{U}	20.9	30.3^{J}	1.26^{U}
B06D89	4110	125^{J}	0.27	8.6^{B}	1060^{B}	0.85^{U}	4.27^{UJ}	135^{B}	0.85^{U}	30.5	293^{J}	2.13^{U}
B06D91	30.8^{B}	1.5^{J}	0.05^{U}	4^{U}	268^{U}	0.4^{U}	2^{UJ}	30.2^{U}	0.4^{U}	1.6^{U}	2.2^{J}	1^{U}
Phase 1 Result Summary												
3A Pond	3760-6546	212.7-856.4	0.2^{U}	5.2-11.4	498.9-1637.1	NA	NA	200.0-464.6	NA	40.9-57.5	41.7-55.0	NA
3B Pond	4245-5206	290.6-342.5	NA	6.6-8.3	771.9-1071.7	NA	NA	198.5-249.2	NA	61.8-71.1	38.5-41.4	NA
3C Pond	2130-4787	101.4-305.8	NA	4.9-8.2	426.4-1038.6	NA	NA	129.5-282.5	NA	12.8-53.2	33.6-77.7	NA
Contingency pond	4284-6308	243.7-397.7	NA	5.4-13.9	899.9-1350.0	NA	NA	331.6-405.5	NA	53.3-73.5	33.1-44.0	NA

Table 6. Results of Phase 2 Inorganics Analyses. (sheet 3 of 3)

HEIS Number	Constituent											
	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	Cyanide
Phase 1 Result Summary (cont.)												
Background	4142-5193	306.7-345.8	ND	7.8-10.1	1404-1561	NA	NA	185.2-226.2	NA	48.6-56.3	37.5-41.3	NA
MTCA	NA	11200	1.0	1600	4000	400	400	NA	72	560	16000	1600

NOTES:

1. Phase 1 results added for comparison.
2. Concentrations in mg/L (water matrix) and mg/kg (soil matrix).
3. B qualifiers for inorganic analyses indicate the relation of the reported values to the Contract Required Detection Limit (CRDL); values noted with a B qualifier are less than the CRDL. A B qualifier does not represent a limitation on the use of the data.

[U]Material was analyzed for but not detected. Associated value is the detection/quantitation limit.

[UJ]Material was analyzed for but not detected. Associated detection/quantitation limit is an estimated value.

[J]Associated value is estimated.

[R]Data are not useable.

NA = not available.

4.1 DATA SUMMARY

Detectable analyte concentrations were not observed for most samples. The organic analytes detected were dismissed due to their low concentrations and status as common laboratory contaminants. Metal analytes found in levels detectable by the laboratory instrumentation were compared to the Hanford Site Background (DOE-RL 1993), to previously determined local background levels (from Phase 1 sampling), and to health-based standards. Of the analyses that showed levels above detection limits, none are considered to indicate contamination. Appendix D provides the MTCA cleanup levels for reference.

4.1.1 Organic Analytes

No volatile organic compounds were detected in any of the water samples. Of the compounds found in the soil samples, all the compounds found only in the trip blank were disregarded with respect to determining contamination. The remaining analytes detected, toluene, methylene chloride, and acetone, are considered to be common laboratory contaminants and, with the exception of two toluene hits, were found only in very low concentrations. The two toluene values of possible concern, greater than 100 µg/kg, were found in very dry surface soils samples of the 3B Pond. These values can be compared to the MTCA cleanup levels, WAC-173-340-740 (3) (Appendix D); all reported values are significantly below the cleanup levels.

No semivolatile organic compounds were detected in any of the soil samples. All semivolatile organic compounds found in the water samples were at very low levels. The methoxyethoxyethanol was found in two routine samples at concentrations less than or equal to that found in the trip blanks. Therefore, this compound was attributed to contamination after sampling. The methylcyclopentanol was found in a duplicate sample but was not reported in the original analyses.

No pesticides or polychlorinated biphenyls (PCBs) were detected in any samples.

Volatile and semivolatile organic compounds as well as PCBs and pesticides typically were not detected in the Hanford Site Background samples; therefore, sample result comparison to Hanford Site Background values is not possible.

4.1.2 Metal Analytes

Metal analyses reported above-laboratory instrument detection limits were first compared to Hanford Site Background values [(DOE-RL 1993) (Appendix B)]. In the calculation of threshold values, certain soil classes such as topsoil and volcanic ash were excluded. Results exceeding Hanford Site Background threshold values are summarized in Table 7. Only copper, lead, zinc, antimony, and cadmium were found in concentrations exceeding the Hanford Site Background threshold. These analytes then were compared to the local area background determined during the Phase 1 study, to common concentrations found in soils, and to MTCA Method B cleanup levels, except for lead, which was compared to the more stringent Method A cleanup level. MTCA Method A levels

Table 7. Sample Results Exceeding Hanford Site Background Threshold Values.

HEIS Number	Analyte of concern	Concentration[a] (mg/kg)	Background threshold value (mg/kg)
B06D79	Copper	59.6	30
	Lead	29.6	14.9
	Zinc	450	79
B06D85	Antimony	18.9	15.7/52.2[b]
	Cadmium	3.3	0.24/0.79[b]
	Copper	67.3	30
	Lead	32.3	14.9
	Zinc	515	79
B06D86	Cadmium	3.4	0.24/0.79[b]
B06D87	Cadmium	4.9	0.24/0.79[b]
B06D88	Cadmium	1.76	0.24/0.79[b]
B06D89	Zinc	293	79

[a]Data qualifiers listed in Table 6.
[b]Threshold values not calculated; numbers represent statistically calculated "Limit of Detection"/"Limit of Quantification."

were used for comparison to lead concentrations because data for the Method B cleanup level calculation were not available. It is concluded that none of these analytes are present in concentrations of concern. In addition, copper, lead, and zinc do not meet the designation criteria for dangerous waste according to WAC 173-303-9904.

4.1.2.1 Copper. Two analytical results for copper, 59.6 mg/kg and 67.3 mg/kg (Table 7), are above the Hanford Site Background threshold. Both of these values were found in the 3C Pond. The highest value found in topsoil during the Hanford Site Background study was 40.3 mg/kg. The highest value found in all types of soil analyzed during the Hanford Site Background study was 61 mg/kg. The highest value reported during the Phase 1 study for the 3C Pondwas 18.5 mg/kg. The threshold value calculated in Phase 1 was 15.96 mg/kg (WHC 1991). The common range for copper for soils throughout the world is 2 to 100 mg/kg (Dragun 1988). In addition, the MTCA Method B cleanup level is 3,200 mg/kg, which is far greater than the highest reported value in this study, 67.3 mg/kg.

4.1.2.2 Lead. Two analytical results for lead, 29.6 mg/kg and 32.3 mg/kg (Table 7), are above the Hanford Site Background threshold. Both values were derived for 3C Pond samples, which also contained elevated concentrations of copper. The highest reported value for lead during the Hanford Site Background study was 74.1 mg/kg, found in topsoil. Other exceedances of the Hanford Site Background threshold limit for lead in topsoil reported in the Hanford Site Background document ranged from 19.9 mg/kg to 74.1 mg/kg, with the majority being greater than 35 mg/kg. The threshold value calculated in

Phase 1 was 15.16 mg/kg (WHC 1991). The common range for lead for soils throughout the world is 2 to 200 mg/kg (Dragun 1988). In addition, the MTCA Method A cleanup level for lead is 250 mg/kg, which is far greater than the highest reported value in this study, 32.3 mg/kg. Because they are well below commonly found concentrations of lead or levels of concern, the reported values should not be considered an indication of contamination.

4.1.2.3 Zinc. Three values for zinc concentration, 450 mg/kg, 515 mg/kg, and 293 mg/kg (Table 7), are above the Hanford Site Background threshold. All of these samples were collected from the 3C Pond. The highest value reported for zinc in topsoil in the Hanford Site Background study was 366 mg/kg. The highest value reported during the Phase 1 study for the 3C Pond was 77.7 mg/kg. The threshold value calculated in Phase 1 was 41.3 mg/kg (WHC 1991). The common range for zinc for soils throughout the world is 10 to 300 mg/kg (Dragun 1988). The MTCA Method B cleanup level for zinc is 16,000 mg/kg, which is much higher than the highest concentration reported for the 3C Pond, 515 mg/kg.

4.1.2.4 Antimony. The concentration of antimony is 18.9 mg/kg, which is only slightly above the Hanford Site Background Limit of Detection (LOD) at 15.7 mg/kg. The associated Limit of Quantitation (LOQ) is 52.2 mg/kg. For analytical results reported between the LOD and LOQ, detection is considered reliable; however, the concentration value is in question. The maximum reported value for antimony collected from topsoil during the Hanford Site Background study was 29.1 mg/kg. The MTCA Method B cleanup level for antimony is 32 mg/kg, which is higher than the 18.9 mg/kg value found in this study. Because there is only one detected concentration reported for antimony and this value is only slightly above the LOD, it should not be considered an indication of contamination.

4.1.2.5 Cadmium. Values found for cadmium is this study ranged from 3.3 mg/kg to 7.9 mg/kg. The Hanford Site Background LOD value for cadmium is 0.24 mg/kg and the LOQ value is 0.79 mg/kg. The highest cadmium value reported for topsoil during the Hanford Site Background study was 3.1 mg/kg. The local backgrounds reported in the B Pond Phase 1 study were 8.23 mg/kg for the sagebrush site and 9.58 mg/kg for the contingency pond. The threshold value calculated in Phase 1 was 8.23 mg/kg (WHC 1991). Several local backgrounds described in the Hanford Site Background document showed values of cadmium above the values reported here. The 1324-N local background ranged from 6.1 to 7.9 mg/kg. The 183-H local background ranged from 4.7 to 5.9 mg/kg. The common range for cadmium for soils throughout the world is 0.01 to 7 mg/kg (Dragun 1988). The MTCA Method B cleanup level for cadmium is 80 mg/kg, which is again much higher than the concentrations found in this study.

4.1.3 Radionuclide Analyses

Radionuclide analyses were performed on several samples. A report describing the results of the radionuclide analysis will be prepared separately.

5.0 CONCLUSIONS

Most analytes were reported undetected in the sample results. The organic analytes detected were dismissed due to their low concentrations and status as common laboratory contaminants. Metals analytes detected by the laboratories were compared to the Hanford Site Background, to previously determined local background levels (from Phase 1 sampling), and to health-based standards. Of the analyses that showed levels above detection limits, none are considered to indicate contamination relative to local background levels.

All detected analytes were compared to the MTCA cleanup standards. Method B was used to calculate the appropriate soil cleanup levels (Appendix D). In cases where sufficient information for calculating cleanup levels was not available, MTCA Residential (Method A) standards were used instead. MTCA Residential standards may be considered inappropriate for the closure of the B Pond expansion ponds. The cleanup levels will depend on the eventual land use. This area may not be released for residential use. However, the MTCA Residential standards used here are meant to illustrate the relatively low levels of metals when compared to regulatory standards.

Beryllium results were reported at levels that exceeded the MTCA Method B cleanup standards but below the Hanford Site Background threshold value. In this case, beryllium concentration was compared to the soil cleanup level for carcinogens (0.2 mg/kg). Based on the regional background beryllium concentration and the limited number of sample data, there is insubstantial evidence to conclude that the B Pond expansion ponds contain regulated levels of beryllium.

Of all the organic compounds or inorganic constituents detected within the samples from the B Pond expansion ponds, none were found in levels regulated under the Washington Administrative Codes. The findings of Phase 2 are consistent with the findings of Phase 1 and Phase 3. No organic compounds or inorganic constituents were found in sufficient concentrations to cause the investigated soil to be regulated as dangerous waste.

6.0 REFERENCES

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APPENDIX A

METHOD-SPECIFIC ANALYTE LIST AND ASSOCIATED TYPICAL DETECTION LIMITS

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APPENDIX A

METHOD-SPECIFIC ANALYTE LIST AND ASSOCIATED TYPICAL DETECTION LIMITS

The following table lists detection/quantitation limits typically reported by each laboratory. Detection/quantitation limits listed for organic analytes are sample quantitation limits. Detection/quantitation limits listed for inorganic analytes are instrument detection limits. More specific information such as the effects of data qualifiers on detection/quantitation limits of a particular sample may be found in the source documentation along with the specific justification of such qualifiers.

Analytical Method	Analyte	Weston Detection/ Quantitation Limits	TMA Detection/ Quantitation Limits	Units
8240 Volatile Organics (water & soil matrices)	Chloromethane	10	10	µg/L or µg/kg
	Bromomethane	10	10	"
	Vinyl Chloride	10	10	"
	Chloroethane	10	10	"
	Methylene Chloride	10	5	"
	Acetone	10	100	"
	Carbon Disulfide	10	5	"
	1,1-Dichloroethene	10	5	"
	1,1-Dichloroethane	10	5	"
	1,2-Dichloroethene (total)	10	5	"
	Chloroform	10	5	"
	1,2-Dichloroethane	10	5	"
	2-Butanone	10	100	"
	1,1,1-Trichloroethane	10	5	"
	Carbon Tetrachloride	10	5	"
	Vinyl Acetate	NA[a]	50	"
	Bromodichloromethane	10	5	"
	1,2-Dichloropropane	10	5	"
	cis-1,3-Dichloropropene	10	5	"
	Trichloroethene	10	5	"
	Dibromochloromethane	10	5	"
	1,1,2-Trichloroethane	10	5	"
	Benzene	10	5	"
	trans-1,3,-Dichloropropene	10	5	"
	Bromoform	10	5	"
	2-Chloroethyl Vinyl Ether	NA	10	"
	4-Methyl-2-pentanone	10	50	"
	2-Hexanone	10	50	"
	Tetrachloroethene	10	5	"
	1,1,2,2-Tetrachloroethane	10	5	"
	Toluene	10	5	"
	Chlorobenzene	10	5	"
	Ethylbenzene	10	5	"
	Styrene	10	5	"
	Xylene (total)	10	5	"
8270 Semivolatile Organics (water matrix only)	Phenol	10	10	µg/L
	bis(2-Chloroether) Ether	10	10	"
	2-Chlorophenol	10	10	"
	1,3-Dichlorobenzene	10	10	"
	1,4-Dichlorobenzene	10	10	"
	Benzyl Alcohol	NA	20	"
	1,2-Dichlorobenzene	10	10	"
	2-Methylphenol	10	10	"
	bis(2-Chloroisopropyl) Ether	10	10	"

Analytical Method	Analyte	Weston Detection/ Quantitation Limits	TMA Detection/ Quantitation Limits	Units
	4-Methylphenol	10	10	µg/L
	N-Nitroso-Di-n-Propylamine	10	10	"
	Hexachloroethane	10	10	"
	Nitrobenzene	10	10	"
	Isophorone	10	10	"
	2-Nitrophenol	10	10	"
	2,4-Dimethylphenol	10	10	"
	Benzoic Acid	NA	50	"
	bis(2-Chloroethoxy)methane	10	10	"
	Napthalene	10	10	"
	4-Chloroaniline	10	20	"
	Hexachlorobutadiene	10	10	"
	4-Chloro-3-methylphenol	10	10	"
	2-Methylnapthalene	10	10	"
	Hexachlorocyclopentadiene	10	10	"
	2,4,6-Trichlorophenol	10	10	"
	2,4,5-Trichlorophenol	26	50	"
	2-Chloronaphthalene	10	10	"
	2-Nitroaniline	26	50	"
	Dimethylphthalate	10	10	"
	Acenaphthylene	10	10	"
	1,2,4-Trichlorobenzene	10	10	"
	3-Nitroaniline	26	50	"
	Acenaphthene	10	10	"
	2,4-Dinitrophenol	26	50	"
	4-Nitrophenol	26	50	"
	Dibenzofuran	10	10	"
	2,4-Dinitrotoluene	10	10	"
	2,6-Dinitrotoluene	10	10	"
	Diethylphthalate	10	10	"
	4-Chlorophenylphenylether	10	10	"
	Fluorene	10	10	"
	4-Nitroanaline	26	50	"
	4,6-Dinitro-2-methylphenol	26	50	"
	N-Nitrosodiphenylamine	10	10	"
	4-Bromophenyl-phenylether	10	10	"
	Hexachlorobenzene	10	10	"
	Pentachlorophenol	26	50	"
	Phenanthrene	10	10	"
	Anthracene	10	10	"
	Carbazole	10	NA	"
	Di-N-Butylphthalate	10	10	"
	Fluoranthene	10	10	"
	Pyrene	10	10	"
	Butylbenzylphthalate	10	10	"
	3,3'-Dichlorobenzidine	10	20	"
	Benzo(a)anthracene	10	10	"
	bis(2-Ethylhexyl)phthalate	10	10	"
	Chrysene	10	10	"
	Di-n-octyl Phthalate	10	10	"
	Benzo(b)fluoranthene	10	10	"
	Benzo(k)fluoranthene	10	10	"
	Benzo(a)pyrene	10	10	"
	Indeno(1,2,3-cd) Pyrene	10	10	"
	Dibenz(a,h) Anthracene	10	10	"
	Benzo(g,h,i)perylene	10	10	"

Analytical Method	Analyte	Weston Detection/ Quantitation Limits	TMA Detection/ Quantitation Limits	Units
8270	Phenol	330-1900[c]	330	µg/kg
Semivolatile	bis(2-Chloroether) Ether	330-1900	330	"
Organics	2-Chlorophenol	330-1900	330	"
(soil matrix only)	1,3-Dichlorobenzene	330-1900	330	"
	1,4-Dichlorobenzene	NA	330	"
	Benzyl Alcohol	330-1900	650	"
	1,2-Dichlorobenzene	330-1900	330	"
	2-Methylphenol	330-1900	330	"
	bis(2-Chloroisopropyl) Ether	330-1900	330	"
	4-Methylphenol	330-1900	330	"
	N-Nitroso-Di-n-Propylamine	330-1900	330	"
	Hexachloroethane	330-1900	330	"
	Nitrobenzene	330-1900	330	"
	Isophorene	330-1900	330	"
	2-Nitrophenol	330-1900	330	"
	2,4-Dimethylphenol	330-1900	330	"
	Benzoic Acid	NA	1600	"
	bis(2-Chloroethoxy)methane	330-1900	330	"
	Napthalene	330-1900	330	"
	4-Chloroaniline	330-1900	650	"
	Hexachlorobutadiene	330-1900	330	"
	4-Chloro-3-methylphenol	330-1900	650	"
	2-Methylnapthalene	330-1900	330	"
	Hexachlorocyclopentadiene	330-1900	330	"
	2,4,6-Trichlorophenol	330-1900	330	"
	2,4,5-Trichlorophenol	830-4600	1600	"
	2-Chloronaphthalene	330-1900	330	"
	2-Nitroaniline	830-4600	1600	"
	Dimethylphthalate	330-1900	330	"
	Acenaphthylene	330-1900	330	"
	1,2,4-Trichlorobenzene	330-1900	330	"
	3-Nitroaniline	830-4600	1600	"
	Acenaphthene	330-1900	330	"
	2,4-Dinitrophenol	830-4600	1600	"
	4-Nitrophenol	830-4600	1600	"
	Dibenzofuran	330-1900	330	"
	2,4-Dinitrotoluene	330-1900	330	"
	2,6-Dinitrotoluene	330-1900	330	"
	Diethylphthalate	330-1900	330	"
	4-Chlorophenylphenylether	330-1900	330	"
	Fluorene	330-1900	330	"
	4-Nitroanaline	830-4600	1600	"
	4,6-Dinitro-2-methylphenol	830-4600	1600	"
	N-Nitrosodiphenylamine[b]	330-1900	330	"
	4-Bromophenyl-phenylether	330-1900	330	"
	Hexachlorobenzene	330-1900	330	"
	Pentachlorophenol	830-4600	1600	"
	Phenanthrene	330-1900	330	"
	Anthracene	330-1900	330	"
	Carbozole	330-1900	NA	"
	Di-N-Butylphthalate	330-1900	330	"
	Fluoranthene	330-1900	330	"
	Pyrene	330-1900	330	"
	Butylbenzylphthalate	330-1900	330	"
	3,3'-Dichlorobenzidine	330-1900	1600	"
	Benzo(a)anthracene	330-1900	330	"
	bis(2-Ethylhexyl)phthalate	330-1900	330	"
	Chrysene	330-1900	330	"
	Di-n-octyl Phthalate	330-1900	330	"
	Benzo(b)fluoranthene	330-1900	330	"
	Benzo(k)fluoranthene	330-1900	330	"
	Benzo(a)pyrene	330-1900	330	"
	Indeno(1,2,3-cd) Pyrene	330-1900	330	"

Analytical Method	Analyte	Weston Detection/ Quantitation Limits	TMA Detection/ Quantitation Limits	Units
	Dibenz(a,h) Anthracene	330-1900	330	µg/kg
	Benzo(g,h,i)perylene	330-1900	330	"
8080 PCBs and Pesticides (water matrix only)	Alpha-BHC	0.05-0.10	0.05	µg/L
	Beta-BHC	0.05-0.10	0.05	"
	Delta-BHC	0.05-0.10	0.05	"
	Gamma-BHC (Lindane)	0.05-0.10	0.05	"
	Heptachlor	0.05-0.10	0.05	"
	Aldrin	0.05-0.10	0.05	"
	Heptachlor epoxide	0.05-0.10	0.05	"
	Endosulfan I	NA	0.05	"
	Dieldrin	0.10-0.20	0.10	"
	4,4'-DDE	0.10-0.20	0.10	"
	Endrin	0.10-0.20	0.10	"
	Endosulfan II	0.10-0.20	0.10	"
	4,4'-DDD	0.10-0.20	0.10	"
	Endosulfan Sulfate	NA	0.10	"
	4,4'-DDT	NA	0.10	"
	Methoxychlor	0.50-1.0	0.50	"
	Endrine Ketone	0.10-0.20	0.10	"
	Endrin Aldehyde	0.10-0.20	0.10	"
	Chlordane	NA	1.0	"
	alpha-Chlordane	0.05-0.10	NA	"
	gamma-Chlordane	0.05-0.10	NA	"
	Toxaphene	5.0-10.0	5.0	"
	Aroclor 1016	1.0-2.0	1.0	"
	Aroclor 1221	2.0-4.0	1.0	"
	Aroclor 1232	1.0-2.0	1.0	"
	Aroclor 1242	1.0-2.0	1.0	"
	Aroclor 1248	1.0-2.0	1.0	"
	Aroclor 1254	1.0-2.0	1.0	"
	Aroclor 1260	1.0-2.0	1.0	"
8080 PCBs and Pesticides (soil matrix only)	Alpha-BHC	1.7-9.6	1.7	µg/l
	Beta-BHC	1.7-9.6	1.7	"
	Delta-BHC	1.7-9.6	1.7	"
	Gamma-BHC (Lindane)	1.7-9.6	1.7	"
	Heptachlor	1.7-9.6	1.7	"
	Aldrin	1.7-9.6	1.7	"
	Heptachlor epoxide	1.7-9.6	1.7	"
	Endosulfan I	NA	1.7	"
	Dieldrin	3.4-19	3.3	"
	4,4'-DDE	3.4-19	3.3	"
	Endrin	3.4-19	3.3	"
	Endosulfan II	3.4-19	3.3	"
	4,4'-DDD	3.4-19	3.3	"
	Endosulfan Sulfate	NA	3.3	"
	4,4'-DDT	NA	3.3	"
	Methoxychlor	17-96	17.0	"
	Endrine Ketone	3.4-19	3.3	"
	Endrin Aldehyde	3.4-19	3.3	"
	Chlordane	NA	33.0	"
	alpha-Chlordane	1.7-9.6	NA	"
	gamma-Chlordane	1.7-9.6	NA	"
	Toxaphene	170-960	170	"
	Aroclor 1016	34-190	33.0	"
	Aroclor 1221	68-380	33.0	"
	Aroclor 1232	34-190	33.0	"
	Aroclor 1242	34-190	33.0	"
	Aroclor 1248	34-190	33.0	"
	Aroclor 1254	34-190	33.0	"
	Aroclor 1260	34-190	33.0	"

Analytical Method	Analyte	Weston Detection/ Quantitation Limits	TMA Detection/ Quantitation Limits	Units
Inorganics per	Aluminum	49.0	5	µg/L
CLP SOW 3/90	Antimony	60.0	18	"
(Weston) and	Arsenic	2.0	1	"
6010 (TMA)	Barium	14.0	1	"
(water matrix only)	Beryllium	1.0	1	"
	Boron	NA	52	"
	Cadmium	7.0	10	"
	Calcium	57.0	6	"
	Chromium	9.0	7	"
	Cobalt	9.0	7	"
	Copper	10.1	4	"
	Iron	15.0	4	"
	Lead	2.4	1	"
	Magnesium	68.0	53	"
	Manganese	4.0	2	"
	Mercury	0.10	0.2	"
	Molybdenum	NA	4	"
	Potassium	1340.0	1260	"
	Selenium	2.0	2	"
	Silver	10.0	3	"
	Sodium	151.0	53	"
	Thallium	2.0	2	"
	Vanadium	16.4	4	"
	Zinc	10.0	4	"
	Cyanide	10.0	2	"
Inorganics per	Aluminum	49.0	0.5	mg/kg
CLP SOW 3/90	Antimony	60.0	1.8	"
(Weston) and	Arsenic	2.0	0.1	"
6010 (TMA)	Barium	14.0	0.1	"
(soil matrix only)	Beryllium	1.0	0.1	"
	Boron	NA	5.2	"
	Cadmium	7.0	1	"
	Calcium	57.0	0.5	"
	Chromium	9.0	0.7	"
	Cobalt	9.0	0.7	"
	Copper	8.0	0.4	"
	Iron	15.0	0.4	"
	Lead	2.0	0.1	"
	Magnesium	68.0	5.3	"
	Manganese	4.0	0.2	"
	Mercury	0.10	0.005	"
	Molybdenum	NA	0.4	"
	Nickel	20.0	1.2	"
	Potassium	1340.0	126	"
	Selenium	2.0	0.2	"
	Silver	10.0	0.3	"
	Sodium	151.0	5.3	"
	Thallium	2.0	0.2	"
	Vandium	8.0	0.4	"
	Zinc	4.0	0.4	"
[9010 (TMA)]	Cyanide	20.0	0.08	"

[a] Not included in analysis.
[b] Cannot be separated from diphenylamine.
[c] Detection limits typically fell within this range.

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APPENDIX B

MAXIMA AND 95/95 REFERENCE THRESHOLD VALUES FOR HANFORD SITE SOIL BACKGROUND

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APPENDIX B

MAXIMA AND 95/95 REFERENCE THRESHOLDS FOR HANFORD SITE SOIL BACKGROUND[1]

The 95/95 thresholds values represent the upper 95% confidence interval of the 95th percentile of the distribution. Information on the statistics is provided in the source document.

Analyte	LOD	LOQ	95/95 Threshold (mg/kg)	Maximum concentration (mg/kg)	Sample with maximum concentration
Aluminum	21.8	66.1	15100	28800	TOPSOIL, PLAYA, E-7
Antimony	15.7	52.2	NC	31	VOLCANIC ASH*
Arsenic	N/A	N/A	9.0	27.7	TOPSOIL,JUNIPER, E-3
Barium	0.87	2.7	175	480	VOLCANIC ASH*
Beryllium	N/A	N/A	1.8	10	VOLCANIC ASH*
Cadmium	0.24	0.79	NC	11	VOLCANIC ASH*
Calcium	175	470	24600	105000	TOPSOIL, GREASEWOOD, E-2
Chromium	1.1	3.0	28	320	RINGOLD FM*
Cobalt	0.88	2.9	19	110	VOLCANIC ASH*
Copper	2.1	6.2	30	61	VOLCANIC ASH*
Iron	75.7	236	38200	68100	RINGOLD FM
Lead	N/A	N/A	14.9	74.1	TOPSOIL,JUNIPER, E-3
Magnesium	18.4	57.9	9160	32300	TOPSOIL, GREASEWOOD, E-2
Manganese	0.63	1.8	583	1110	TOPSOIL, PLAYA, E-7
Mercury	N/A	N/A	1.3	3.8	RANDOM SAMPLES, #15
Nickel	2.4	7.7	25	200	RINGOLD FM*
Potassium	135	451	3090	7900	TOPSOIL, PLAYA, E-7
Selenium	N/A	N/A	NC	6	RANDOM SAMPLES, #15
Silver	2.1	4.5	2.1	14.6	RANDOM SAMPLES, #6
Sodium	50.6	140	1390	5060	RANDOM SAMPLES, #12
Thallium	N/A	N/A	NC	3.7	LAB DETECTION LIMIT
Vanadium	1.8	5.9	107	140	VOLCANIC ASH*
Zinc	6.4	15.6	79	366	TOPSOIL, JUNIPER, E-3
Molybdenum	1.4	4.8	NC	6	RINGOLD FM
Lithium	N/A	N/A	37	38.2	RANDOM SAMPLES, #14*
Titanium	N/A	N/A	3307	3180	RANDOM SAMPLES, #6
Zirconium	N/A	N/A	53	84.8	RANDOM SAMPLES,#10
Ammonia	N/A	N/A	27.4	26.4	RANDOM SAMPLES, #14
Alkalinity	N/A	N/A	20100	150000	TOPSOIL, GREASEWOOD, E-2
Silicon	N/A	N/A	239	1202.9	TOPSOIL, PLAYA, E-7
Fluoride	N/A	N/A	13	73.3	RANDOM SAMPLES, #10
Chloride	N/A	N/A	783	1480	RANDOM SAMPLES, #11
Nitrite	N/A	N/A	NC	36.5	TOPSOIL, GREASEWOOD, E-2
Nitrate	N/A	N/A	208	906	HANFORD FM JUDGEMENT,
O-Phosphate	N/A	N/A	12.7	225	RANDOM SAMPLES, #10
Sulfate	N/A	N/A	931	12600	TOPSOIL, GREASEWOOD, E-2

[1]Adapted from DOE-RL, 1993, Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes, DOE/RL-92-24, Rev. 1.

N/A = Not available.
NC = Not calculated.
* = Offsite.

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APPENDIX C

TYPICAL RANGES FOR METALS IN SOILS

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APPENDIX C

TYPICAL RANGES FOR METALS IN SOILS

Element	Common Range in Soils (mg/kg)		
Aluminum	10,000	to	300,000
Antimony	0.2	to	10
Barium	100	to	3,000
Beryllium	0.1	to	40
Boron	2	to	100
Cadmium	0.01	to	7
Calcium	7,000	to	500,000
Chromium	1	to	1,000
Cobalt	1	to	40
Copper	2	to	100
Iron	7,000	to	550,000
Lead	2	to	200
Lithium	5	to	200
Magnesium	500	to	10,200
Manganese	20	to	3,000
Mercury	0.01	to	0.3
Molybdemum	0.2	to	5
Nickel	5	to	500
Potassium	400	to	30,000
Selenium	0.1	to	2
Silicon	230,000	to	350,000
Silver	0.01	to	5
Sodium	750	to	7,500
Strontium	50	to	1,000
Thallium	0.1	to	0.8
Titanium	1,000	to	10,000
Tin	2	to	200
Vanadium	20	to	500
Zinc	10	to	300
Zirconium	60	to	2,000

Adapted from Dragun, James, 1988, *The Soil Chemistry of Hazardous Materials*, The Hazardous Materials Research Institute, Silver Springs, Maryland.

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APPENDIX D

WASHINGTON ADMINISTRATIVE CODE
MODEL TOXICS CONTROL ACT
CLEANUP STANDARDS

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APPENDIX D
MODEL TOXICS CONTROL ACT CLEANUP STANDARDS* (sheet 1 of 2)

The following cleanup standards are derived from MTCA Method A and Method B. MTCA Method B was used to calculate the appropriate soil cleanup levels. In cases where sufficient information for calculating cleanup levels was not available, MTCA Method A standards were used.

Compound	RfD[a]	Cleanup level (mg/kg)	CPF[a]	Cleanup level (mg/kg)	Carcinogenic classification[a]
Acetone	0.1	8000.0		NA	D
Chlorobenzene	0.02	1600.0		NA	D
Chloroform	0.01	800.0	0.0061	163.9	B2
Methylene chloride	0.06	4800.0	0.0075	133.3	B2
Toluene	0.2	16000.0		NA	D
1,1,1-TCA[b]		20.0[c]		NA	D
Trichloroethene[b]		0.5[c]		NA	D
Xylenes	2	160000.0		NA	D
Aluminum[d]	Data Inadequate for Quantitative Risk Analysis				
Arsenic	0.0003	24.0		NA	A
Antimony[d]	0.0004[e]	32.0		NA	
Barium[g]	0.07	5600.0		NA	
Beryllium	0.005	400.0	4.3	0.2	B2
Cadmium	0.001	80.0		NA	B1
Calcium[d]		NA		NA	D
Chromium (III)	1	80000.0		NA	D
Chromium (VI)	0.005	400.0		NA	A
Cobalt[b,g]		NA		NA	
Copper[d,g]	0.04[f]	3200.0		NA	
Cyanide	0.02	1600.0		NA	D
Iron[d]	Data Inadequate for Quantitative Risk Analysis				
Lead[b]		250.0[c]		NA	
Magnesium[d]		NA		NA	
Manganese	0.14	11200.0		NA	D
Mercury		1.0[c]		NA	D
Nickel[g]	0.02[e]	1600.0		NA	
Potassium[d]	0.05[e]	4000.0		NA	
Selenium	0.005	400.0		NA	D
Silver	0.005	400.0		NA	D
Sodium[d]		NA		NA	
Thallium[d]	0.0009[e]	72.0		NA	
Vanadium[b,g]	0.007[e]	560.0		NA	
Zinc	0.2	16000.0		NA	D

*See footnotes on page D-4.
NA = not available.

MODEL TOXICS CONTROL ACT CLEANUP STANDARDS* (sheet 2 of 2)

FOOTNOTES:

[a]RfD = Reference Dose
CPF = Carcinogenic Potency Factor
A = Human carcinogen.
B = Probable human carcinogen:
B1 indicates limited human evidence;
B2 indicates sufficient evidence in animals and inadequate or no evidence in humans.
D = Not classifiable as to human carcinogenicity.

[b]Undergoing EPA RfD Work Group Review at the time of the IRIS Dbase check.

[c]Cleanup levels obtained from MTCA Method A Cleanup Standards for soil.

[d]IRIS did not contain entries.

[e]RfD values were taken from the Health Effect Summary Tables.

[f]Taken from the Superfund Technical Support Center.

[g]IRIS did not contain any carcinogenic data.

IRIS, Integrated Risk Information System, is part of the *Hazardous Substances Data Bank*, National Library of Medicine, Bethesda, Maryland.

MTCA Method B Soil Cleanup Level Calculations:

Soil Cleanup Level (mg/kg)
= (RfD * ABW * UCF * HQ)/(SIR * AB1 * FOC) = 80,000 * Rfd

Soil Cleanup Level for Carcinogens (mg/kg)
= (RISK * ABW * LIFE * UCF)/(CPF * SIR * AB1 * DUR * FOC) = 1/CPF

where:

RfD = Reference Dose (mg/kg/day)
ABW = Average Body Weight (16 kg)
UCF = Unit Conversion Factor (10e+6 mg/kg)
SIR = Soil Ingestion Rate (200 mg/day)
AB1 = Gastrointestinal Adsorption Rate (1.0)
FOC = Frequency of Contact (1.0)
HQ = Hazard Quotient (1)
RISK = Acceptable Cancer Risk (10e-6)
LIFE = Lifetime (75 years)
CPF = Carcinogenic Potency Factor (Slope Factor) (kg-day/mg)
DUR = Duration of Exposure (6 years).

WAC 173-340, 1992, "The Model Toxics Control Act Cleanup Regulations," *Washington Administrative Code*, as amended.

APPENDIX E

216-B-3 POND SYSTEM PHASE 3 VADOSE ZONE SAMPLING

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ENGINEERING DATA TRANSMITTAL

1. EDT 160280

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5. Proj./Prog./Dept./Div.: 81353	6. Cog. Engr.: C.D. Kramer	7. Purchase Order No.: N/A
8. Originator Remarks: Please sign indicating approval of WHC-SD-EN-AP-104, Rev. 0		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: N/A
11. Receiver Remarks:		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 10/05/92

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-EN-AP-104		0	Vadose Zone Investigation of 216-B-3A, 216-B-3B, and 216-B-3C Ponds	3Q	1		

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
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1	1	Cog. Mgr. R.C. Roos	R.C. Roos	10/5/92	H4-55	C.D. Delaney			H4-56	3	
1	1	QA J.R. McCallum	JR McCallum	10/5/92	A3-12	Central Files			L8-04	3	
		Safety				EDMC (2)			H4-22	3	
		Env.									
1	1	F.A. Ruck (5)	[illegible]	10/5/92	H4-57						
3		A.P. Prignano			H4-57						

18.	19.	20.	21. DOE APPROVAL (if required)
C.D. Kramer CD Kramer 10/1/92 Signature of EDT Originator / Date	Authorized Representative for Receiving Organization / Date	R.C. Roos R.C. Roos 10/5/92 Cognizant/Project Engineer's Manager / Date	Ltr. No. [] Approved [] Approved w/comments [] Disapproved w/comments

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SUPPORTING DOCUMENT

1. Total Pages 174

2. Title	3. Number	4. Rev No.
Vadose Zone Investigation of 216-B-3A, 216-B-3B, and 216-B-3C Ponds	WHC-SD-EN-AP-104	0

5. Key Words

Closure, Pond, Characterization, Soil sampling, 216-B-3 Pond, Wastewater

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6. Author

Name: C.D. Kramer

C D Kramer 9/30/92
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7. Abstract

The B-Pond system on the Hanford Site in south-central Washington State is undergoing a series of investigations designed to determine if hazardous or dangerous waste remains in the soils and/or sediments. The pond system has been classified as a Resource Conservation and Recovery Act of 1976 *unit, and is undergoing closure under the act. This report summarizes the findings from three temporary boreholes constructed to sample soil beneath the 216-B-3A, 216-B-3B, and 216-B-3C Ponds. These field activities comprise Phase 3 investigations as described in 216-B-3 Pond System Closure/Postclosure Plan (DOE 1990). Samples from each borehole were analyzed for a wide variety of organic and inorganic constituents. Representative constituent concentrations indicate vadose zone soils are not contaminated with* Resource Conservation and Recovery Act of 1976 *regulated hazardous and/or dangerous waste.*

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LIST OF TERMS

BNA	base/neutral/acid
CBEC	concentration-based exemption criteria
CDL	contractual detection limit
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	Code of Federal Regulations
CLP	contract laboratory program
CMS	corrective measures study
CRDL	contract-required detection limit
CRQL	contract-required quantitation limit
DOE	U.S. Department of Energy
DW	dangerous waste
Ecology	Washington State Department of Ecology
EHW	extremely hazardous waste
EII	Environmental Investigation Instruction
EPA	U.S. Environmental Protection Agency
FR	Federal Register
HSWA	*Hazardous and Solid Waste Amendments of 1984*
OSM	Office of Sample Management
PCB	polychlorinated biphenyls
PID	photoionization detector
PQL	practical quantitation limit
PUREX	Plutonium/Uranium Extraction (Plant)
QC	quality control
RCRA	*Resource Conservation and Recovery Act of 1976*
SOW	statement of work
SQL	sample quantitation limit
TIC	tentatively identified compound
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TSD	treatment, storage or disposal
VOA	volatile organic analysis
WAC	Washington Administrative Code
Westinghouse Hanford	Westinghouse Hanford Company

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1.0 INTRODUCTION

A number of waste management units located on the Hanford Site in south-central Washington State are being physically and/or procedurally closed in accordance with applicable laws, regulations, and agreements. One unit, the 216-B-3 Pond System (B-Pond), consists of one main pond area, three expansion ponds (often referred to as lobes) and the 216-B-3-3 Ditch. This series of ponds lies immediately east of the Hanford Site's 200 East Area (Figure 1-1). The B-Pond has been considered a *Resource Conservation and Recovery Act of 1976* (RCRA) treatment, storage, or disposal (TSD) unit (Ecology et al. 1989, p B-2) comprised of the following:

- Open section of the 216-B-3-3 Ditch, approximately 3,700 ft
- 216-B-3 Pond (main pond), approximately 35 acres
- 216-B-3A Pond (hereafter referred to as the 3A Pond), approximately 11 acres
- 216-B-3B Pond (hereafter referred to as the 3B Pond), approximately 11 acres
- 216-B-3C Pond (hereafter referred to as the 3C Pond), approximately 41 acres.

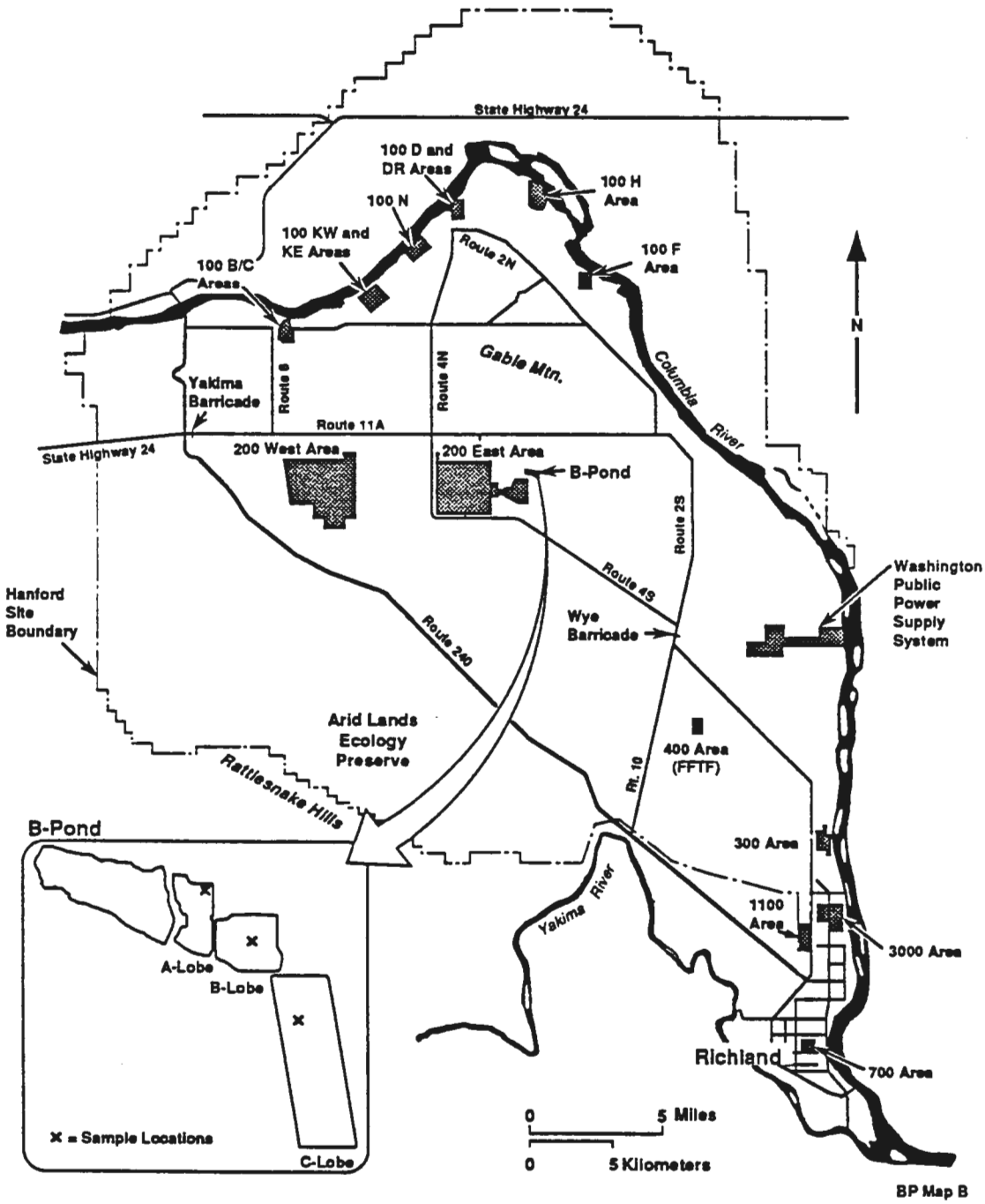
The B-Pond receives wastewater from a variety of sources in the 200 East Area. The system is fully described in the *216-B-3 Pond System Closure/Postclosure Plan* (closure plan) (DOE 1990). Wastewater enters the southwest side of the main pond via the 216-B-3-3 Ditch. The system is designed to handle in excess of 28,000,000 gal/day. The discharge primarily consists of atmospheric condensate, cooling water, potable water, and steam condensate (DOE 1990, p 3-1). In 1989, over 3,000,000,000 gallons of water were discharged to B-Pond (WHC 1990). Much of this is unfiltered, untreated water originating from the Columbia River. Current discharges to B-Pond are considered nonhazardous.

Some past discharges to B-Pond are suspected to have included waste that would currently be regulated under RCRA (DOE 1990, p 1-1). Some discharges have also included radioactive wastes.

Analysis of the pond soil and sediments is being conducted to assess the possible presence and extent of hazardous waste contamination (DOE 1990, p 7-1). Initial sampling efforts examined surface soil and sediment composition. (For more detail refer to WHC 1991.) Subsequent activities have involved drilling vadose zone boreholes.

This report summarizes the findings of three subsurface (vadose zone) temporary characterization boreholes: 699-43-41H, 699-42-41B, and 699-41-41. Areas investigated include the 3A Pond, the 3B Pond, and the 3C Pond (Figure 1-1). As proposed in the closure plan, one vadose zone borehole was drilled in each lobe (DOE 1990, p 7-16).

Figure 1-1. The Hanford Site and the Study Borehole Locations.



1.1 REGULATORY BACKGROUND

The U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (Ecology) jointly administer RCRA in the State of Washington. The EPA retains oversight authority while delegating to Ecology enforcement of a state program consistent with or more stringent than the corresponding federal program. The implementing regulations can be found in the Washington Administrative Code (WAC) 173-303, "Dangerous Waste Regulations", and Title 40, Code of Federal Regulations (CFR), Parts 260-270. Ecology's authorization includes administering TSD closures. However, the state is currently not authorized to enforce the federal *Hazardous and Solid Waste Amendments of 1984* (HSWA), which includes RCRA corrective-action provisions.

The U.S. Department of Energy (DOE), EPA, and Ecology have entered into an agreement called the *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989), commonly referred to as the Tri-Party Agreement. This agreement affects environmental regulation at the Hanford Site. One of purposes of this agreement was to ensure environmental impacts associated with past activities are investigated, and appropriate response actions taken as necessary to protect human health and the environment. The agreement seeks to promote this goal in part, by identifying TSD units, identifying which units will undergo closure and promote compliance with relevant RCRA permitting requirements. The agreement also establishes "operable units" for addressing potential environmental contamination from past practices.

The B-Pond is identified as a RCRA TSD unit that will be closed in accordance with applicable laws and regulations (Ecology et al. 1989, Appendix B). The B-Pond is considered an interim status, surface impoundment disposal unit (DOE 1990, p 1-1).

Although current liquid discharges to the pond are not considered hazardous or dangerous, RCRA closure has been necessitated by the concern that B-Pond soil and sediments may "contain" hazardous or dangerous waste from past activities. Environmental media such as water, soil, or sediments may be managed as a hazardous waste when they contain a *listed* waste (EPA Office of Solid Waste and Emergency Response memorandum, Cannon to Jorling, 1989, refer to Appendix C). Generally, regulated hazardous *characteristic* wastes, for instance wastes that are hazardous solely due to corrosivity, are no longer regulated hazardous wastes when they loose the characteristic that caused them to be managed as such (40 CFR 261.3 (a)(2)(i)). Dilution and neutralization for instance, can render a corrosive hazardous waste as nonhazardous.

Clean closure requires the demonstration that all dangerous and/or hazardous wastes or waste constituents posing any significant hazard to human health or the environment have been removed. The Tri-Party Agreement describes three types of closure: closure as a landfill, clean closure, and procedural closure (Ecology et al. 1989, Action Plan-Section 6.3). Clean closure is the planned option for the portion of B-Pond addressed by this report: the 3A, 3B, and 3C Ponds (DOE 1990, p 1-2). If a unit no longer contains significant hazardous waste or constituents, no physical closure action may be required.

According to the WAC 173-303, a specific scheme must be followed in determining whether or not a solid waste is a regulated hazardous waste. This

scheme requires knowledge of the process by which the waste was generated and the attributes of the waste. Current Washington State designation procedures (WAC 173-303-070), require generators to check their waste per specified criteria in a specific order.

Under the "Dangerous Waste Regulations," a dangerous waste means a solid waste designated via WAC 173-303-070 through 173-303-103 as either dangerous waste (DW) or extremely hazardous waste (EHW). Those regulations use the words "hazardous waste" to mean those solid wastes designated by 40 CFR 261, and regulated as hazardous by the EPA. This document will henceforth be consistent with existing state regulations by using the term "dangerous waste" to mean waste regulated by WAC 173-303, including DW, EHW, and EPA hazardous wastes.

Normally TSD units will have all hazardous *substances* addressed as part of the TSD closure. However, disposal units such as B-Pond being closed in conjunction with an operable unit may have hazardous substances (including radioactive constituents) addressed under the *Comprehensive Environmental Response, Compensation and Liability Act of 1980* (CERCLA) past-practice authority (Ecology et al. 1989, Action Plan p 6-4). "Hazardous substances" are defined in CERCLA Section 101(14). When investigation shows that a unit no longer contains substantial dangerous waste or constituents, any remaining CERCLA-only materials would be addressed as part of the past-practice process designated for that operable unit (Ecology et al. 1989, Action Plan p 6-4).

The B-Pond is part of the 200-BP-11 operable unit (Ecology et al. 1989, Appendix C).

1.2 PHYSICAL AND HISTORICAL SETTING

The B-Pond lies on an arid isolated tract of land near the center of the Hanford Site. Water is supplied to the pond system through a series of lines exiting the Site's 200 East Area. Water presently flows into the approximately 35-acre main pond through the 216-B-3-3 Ditch.

The vicinity of the main pond has received liquid effluent from activities in the 200 East Area since 1945. The level of the pond and the inflow have changed over time. Originally the pond was supplied through the 216-B-3-1 Ditch. In 1964 this ditch was replaced by the 216-B-3-2 Ditch. In 1970 the 216-B-3-2 Ditch was replaced by the 216-B-3-3 Ditch. The 216-B-3-3 Ditch is currently operative. Both the 216-B-3-1 and 216-B-3-2 Ditches were radioactively contaminated and were removed from service and filled with soil to reduce potential radioactive contaminant mobility.

The three expansion ponds, the 3A, 3B, and 3C Ponds, were placed in service much later than the main pond. Flow from the main pond is directed to the 3A Pond and then either to the 3B Pond or the 3C Pond. Flow is controlled. Use of the 3A Pond commenced in October 1983 (DOE 1990, p 2-19). The 3B Pond was in service from January 1984 until May 1985. The 3C Pond became operational in 1985.

The 3A Pond is a shallow pond approximately 11 acres and 12 ft deep. It was constructed using a cut-and-fill method. In January of 1984 the dike between the 3A and the 3B Ponds and adjacent to the connecting spillway failed

(DOE 1990, p 2-19). Overflow from the 3A Pond was contained in the previously unused 3B Pond. Flow to B-Pond was reduced, and the 3A and 3B Ponds were removed from service for repairs. A trench approximately 30 ft wide and 5 ft deep was excavated along part of the 3A Pond bottom to increase the pond's infiltration capacity. Discharge was resumed to 3A Pond at a temporarily reduced rate in the newly excavated area. A new spillway was constructed to connect 3B Pond. Debris from the dike failure was removed from 3B Pond. A system of infiltration trenches were excavated in 3B Pond. Both ponds were fully operational by June 1984.

The 3B Pond, which is currently dry, is also approximately 11 acres. It has not been used since being removed from service in May 1985 (DOE 1990, p 2-32). After being removed from service, the area was excavated to a depth below the bottom of the former trenches. According to the closure plan, up to 7 ft of material was excavated from the pond bottom (DOE 1990, p 2-32).

The 3C Pond, approximately 41 acres in total size, has a series of eight partially filled, parallel infiltration trenches into which water from 3A Pond is usually channelled. The water in 3C Pond has never risen above the tops of the trenches, which cover a much smaller total area than the pond itself. The trenchès are not usually wet along their entire length. The water level and, therefore, the area wetted longitudinally vary with time.

A contingency pond, 216-E-28, was constructed in 1987 to provide emergency overflow capability for B-Pond. This contingency pond lies north and slightly west of the main pond. The area is dry and has never been used. The contingency pond is mentioned in this report only because it was one of two sites used to generate background values for earlier comparisons (WHC 1991).

Sagebrush and native plants populate the undisturbed areas around B-Pond. Typical littoral vegetation is naturally developing along the edge of the 3A Pond and the trenches of the 3C Pond. Each of the three expansion ponds is circumscribed by graveled and/or unimproved roads. Some adjacent areas disturbed by spillway construction, etc. have been revegetated.

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2.0 DISCUSSION OF RECENT WASTE HISTORY

This section summarizes dangerous waste releases to B-Pond since October 1983 as described in the closure plan (DOE 1990). The general period of operation for the expansion ponds was as follows:

3A Pond: October 1983 -- present
3B Pond: January 1984 -- May 1985
3C Pond: May 1985 -- present.

B-Pond had two points of inflow during the period from 1983 through 1992. Water continuously flowed into the 216-B-3-3 Ditch via a pipe at the headend. In addition, midway to the main pond, flow was supplemented by effluent from the 216-A-29 Ditch. Wastewater discharged at the headend of the 216-B-3-3 Ditch since October 1983 has included raw water, sanitary (potable) water, cooling water, steam condensate, filter backwash from the water treatment plant, etc. (DOE 1990, p 3-2). No contributing source has been identified as a dangerous waste.

The unlined 216-A-29 Ditch is a separate TSD unit. It had been used as an open ditch conveying wastewater to B-Pond. In 1991 it was decommissioned and backfilled. Wastewater from the PUREX chemical sewer line had been routinely released to the 216-A-29 Ditch before entering B-Pond. The open 216-A-29 Ditch extended over 2,000 ft before discharging into the 216-B-3-3 Ditch of B-Pond.

The closure plan (Rev. 0) lists the Plutonium/Uranium Extraction (PUREX) Plant chemical sewer line as the most likely contributor of any dangerous waste to B-Pond while the expansion ponds were operable (DOE 1990, p 4-3). Documented releases were assessed (DOE 1990, p 4-6). The following chemicals were traceable components of the chemical sewer line wastewater: potassium hydroxide, sodium hydroxide, cadmium nitrate, hydrazine, nitric acid, and sulfuric acid (DOE 1990, Table 4-3). A single documented release to the PUREX chemical sewer of solution containing ammonium fluoride and ammonium nitrate occurred in July 1985 (DOE 1990, p 4-7).

The chemical sewer line wastewater was conservatively judged to be a regulated dangerous waste during some of those documented releases. Applicable designation codes are D002, WT02, U133, WT01 and D006. These constitute all dangerous waste numbers listed on Revision 3 of the *Part A, Form 3, Dangerous Waste Permit Application* submitted for B-Pond (DOE 1990, p 1-10). The last chemical sewer discharge suspected of being a dangerous waste occurred in 1986 (DOE 1990, Table 4-3).

Each of the above releases to the 216-A-29 Ditch was designated as a dangerous waste based on characteristics or criteria, except for those releases containing hydrazine, a "listed" discarded chemical product (U133) (DOE 1990, Table 4-3). Wastes designated D002 are deemed hazardous based on corrosivity; D006, WT01 and WT02 wastes are regulated because of their toxicity. These designations were not made on the average or representative flow, but were based on specific incidences when high concentrations of chemicals were documented to have been released from the chemical sewer line to the 216-A-29 ditch.

The chemical sewer line wastewater attributes were estimated based on process knowledge, and were not measured nor estimated at the point that the 216-A-29 Ditch empties into the 216-B-3-3 Ditch of B-Pond. The closure plan specifically states that these designations were "at the point the chemical sewer line enters the environment" (DOE 1990, p 4-6). Further attenuation would occur as the liquid waste stream flowed the full length of the 216-A-29 Ditch, mixed with the additional flow of the 216-B-3-3 Ditch, and dispersed in the main lobe before any flow to 3A, 3B, or 3C Ponds.

3.0 SAMPLING ACTIVITIES

A Westinghouse Hanford Company (Westinghouse Hanford) sampling plan, *216-B-3 Pond Characterization of the Hazardous Waste Inventory in the Near-Surface Soil and Sediments* (WHC 1989a), in conjunction with approved modifications and procedures, has been used in the B-Pond site characterization effort. The sampling plan sets forth a phased approach toward characterizing the soils and sediments of B-Pond.

Phase 1 was an initial sampling effort assessing near-surface soil contamination within the main pond, the 216-B-3-3 Ditch, and the three expansion ponds. Phase 1 included measuring constituents in two types of background areas in the vicinity of the site. Phase 1 activities are summarized in *Phase 1 Characterization of the 216-B-3 Pond System* (WHC 1991).

Phase 2 is planned as an extension of the Phase 1 characterization work using data and knowledge gathered from Phase 1 and Phase 3.

Phase 3, the subject of this report, examines the vertical distribution of potential contaminants beneath the surface soil. Field activities involved drilling one vadose zone borehole in each of the expansion ponds. Soil samples were collected and submitted for chemical analyses similar to those performed in Phase 1. Additionally, some nonchemical data were collected in conjunction with the drilling effort. Each hole was logged by a qualified geologist as drilling was performed. Some samples were submitted for physical analyses, such as grain size. Gross gamma logging was also performed on each borehole.

3.1 OBJECTIVE AND SCOPE

The objective of Phase 3 characterization sampling was to collect data addressing the issue of potential vadose zone chemical contamination with dangerous waste. Efforts focused on the subsurface of the three expansion ponds. The current closure plan has proposed to address potential subsurface contamination in the main pond with the remedial activities of the operable unit, 200-BP-11. This report summarizes Phase 3 activities and findings.

This investigation was limited to the vadose zone, the portion of the earth's crust above the water table. "Soil" is meant to be understood in the context of environmental cleanup regulations. This report does not address groundwater.

3.2 ANALYTES INVESTIGATED

Although B-Pond was declared a RCRA TSD unit, current discharge to the unit is nondangerous waste. Although releases from the PUREX chemical sewer line to the 216-A-29 Ditch TSD have been documented, existence of the regulated characteristics or criteria in the downstream TSD (B-Pond) have been postulated, but not demonstrated. Substances of concern are concentrations of a potential waste residual that could cause the water, soil/(sediment), or subsoil to be managed as a dangerous waste under Ecology's "Dangerous Waste Regulations," (WAC 173-303).

Constituents and/or attributes not regulated under the "Dangerous Waste Regulations" are reported as part of the site characterization. It should not be inferred that all analytes are pertinent to determining whether or not a RCRA dangerous waste is present. For instance, the characteristic of radioactivity is not a criterion for determining whether or not a waste is a RCRA dangerous waste; however this information may be applicable to later CERCLA work at the site. With regard to listed waste, generally detection in an environmental media such as soil or sediment is sufficient to be of regulatory concern. However, the EPA has allowed hazardous waste management to cease when the constituents are less than de minimis levels--most commonly those posing no health threat when directly ingested.

Inorganic parameters measured in Phase 3 include those listed in Table 3-1.

Table 3-1. Inorganic Parameters.

Analyte	EPA Method	Analyte	EPA Method
Aluminum	6010	Magnesium	6010
Ammonia	350.3	Manganese	6010
Antimony	6010	Mercury	7471
Arsenic	7060	Molybdenum	6010
Barium	6010	Nickel	6010
Beryllium	6010	Nitrate	300.0
Boron	6010	Potassium	6010
Cadmium	6010	Selenium	7740
Calcium	6010	Silicon	6010
Chloride	300.0	Silver	6010
Chromium	6010	Sodium	6010
Cobalt	6010	Sulfate	300.0
Copper	6010	Sulfide	376.1
Cyanide	9010	Thallium	7841
Fluoride	300.0	Vanadium	6010
Iron	6010	Zinc	6010
Lead	7421		

Split samples were analyzed and reported according to Contract Laboratory Program (CLP) protocol found in the March 1990 Statement of Work (SOW) for Inorganic Analysis. The following inorganic analytes were reported for split samples: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, cyanide, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

Organic compounds evaluated at the primary laboratory include those listed in Table 3-2.

Table 3-2. Organic Parameters.

Analytical Class	EPA/Other Method	Analytical Class	EPA/Other Method
Pesticides/Polychlorinated biphenyls (PCBs)	8080	Dioxins/Furans	8280
Herbicides	8150	Volatile Organic Compounds	ACD 2440[1]
Organophosphorous Pesticides	8140	Base/Neutral/Acid (BNA) Compounds	ACD 2470[2]

[1] Laboratory-specific, volatile organic analysis (VOA) method based on CLP protocol.
[2] Laboratory-specific, base/neutral/acid (BNA) analysis method based on CLP protocol.

The specific chemicals reported for each of the above categories can be found in Appendix A. These lists contain only those routinely reported compounds in each class. Additional volatile and semivolatile compounds could be reported as tentatively identified compounds (TICs).

Some split samples were also analyzed and reported according to CLP protocol for the following organic analytes:

Target Compound List Volatiles (CLP SOW 2/88--Rev. 5/89)
Target Compound List Semivolatiles (CLP SOW 2/88--Rev. 5/89)
Pesticide and PCB Target Compounds (CLP SOW)

One split, sample B00GW5, was analyzed for semivolatiles by EPA 8270.

Radioactivity measurements were also made on Phase 3 soil samples. Gross alpha, beta activity, ^{90}Sr, and gamma activity radiochemical analyses were conducted using EPA-900 series procedures.

A sample key showing sample identification numbers and associated field data can be found in Table 3-3.

Table 3-3. B-Pond Phase 3 Borehole Sample Key.
(3 sheets)

Sample	Type	Pond	Depth[a]	Collection Date	Interval[b]		Classification from Borehole Log
B00FK6	Reg	3A	6.5	2/7/91	4.95	7.55	Silty Sand
B00FK7	Reg	3A	8.5	2/7/91	6.9	10.2	"
B00FK8	Reg	3A	10.5	2/7/91	9.6	11.75	Sand
B00FK9	Reg	3A	13	2/7/91	11.8	14.0	Sandy Gravel
B00FL0	Reg	3A	14.5	2/7/91	13.5	15.7	"
B00FL1	Reg	3A	16	2/8/91	14.7	17.0	"
B00FL2	Phys	3A	21.5	2/11/91	20.4	23	"
B00FL3	Blank	3A	---	2/11/91	NA		(Silica Sand Control Sample)
B00FL4	Reg	3A	28	2/11/91	26.4	29.3	Sandy Gravel
B00GR9	Fdup	3A	28	2/11/91	26.4	29.3	"
B00GS0	Reg	3A	31.5	2/11/91	30.5	32.6	"
B00GS1	Reg	3A	36.5	2/12/91	35.55	37.71	Sandy Gravel/ Slightly Silty Sand/ Sand
B00GS2	Reg	3A	42	2/13/91	40.4	43.25	Sand
B00GS3	Reg	3A	46.5	2/13/91	45.45	48.0	"
B00GS6	Phys	3A	52[c]	2/14/91	51.13	54.10	Silty Sand
B00GS4	Reg	3A	52.5	2/14/91	51.13	54.10	Sandy Silt
B00GS5	Split	3A	52.5	2/14/91	51.13	54.10	"
B00GS7	Phys	3A	54.5	2/14/91	53.0	55.6	Sandy Silt/ Sand
B00GS8	Reg	3A	57	2/14/91	56	58.4	Sand
B00GS9	Reg	3A	66.5	2/15/91	65.35	67.65	Sandy Gravel
B00GT0	Phys	3A	68.5	2/15/91	67.5	69.65	Sand
B00GT1	Reg	3A	77	2/19/91	75.7	77.90	"
B00GT2	Phys	3A	77	2/19/91	75.7	77.90	"
B00GT3	Blank	3A	---	2/20/91	NA		(Silica Sand Control Sample)
B00GT4	Reg	3A	85.5	2/21/91	84.1	86.68	Sand
B00GT5	Fdup	3A	85.5	2/21/91	84.1	86.68	"
B00GT6	Split	3A	85.5	2/21/91	84.1	86.68	"
B00GT7	Reg	3A	97	2/21/91	95.7	98.3	Sandy Gravel
B00GT8	Reg	3A	102	2/22/91	101.6	102.2	Slightly Silty, Slightly Gravelly Sand
B00GT9	Phys	3A	102	2/22/91	101.6	102.2	"
B00GV0	Reg	3A	122	2/26/91	120.7	123.2	Sandy Gravel
B00GV1	Blank	3A	---	2/27/91	NA		(Silica Sand Control Sample)
B00GV2	Reg	3A	131	2/27/91	129.9	132.05	Sandy Gravel
B00GV3	Fdup	3A	131	2/27/91	129.9	132.05	"
B00GV4	Split	3A	131	2/27/91	129.9	132.05	"
B00GV5	Reg	3A	143.5	2/28/91	142.75	143.85	"
B00GV6	Reg	3B	1	3/4/91	0	2	Silty Sandy Gravel
B00GV7	Reg	3B	3.5	3/4/91	2.5	4.5	"
B00GV8	Reg	3B	5.5	3/4/91	4	6.55	"

Table 3-3. B-Pond Phase 3 Borehole Sample Key.
(3 sheets)

Sample	Type	Pond	Depth[a]	Collection Date	Interval[b]		Classification from Borehole Log
B00GV9	Blank	3B	---	3/5/91	NA		(Silica Sand Control Sample)
B00GW0	Reg	3B	7.5	3/5/91	6.2	8.4	Sand
B00GW1	Reg	3B	9.5	3/5/91	8.2	10.85	"
B00GW2	Phys	3B	9.5	3/5/91	8.2	10.85	"
B00GW3	Reg	3B	13	3/5/91	11.4	14.1	Sandy Gravel
B00GW4	Fdup	3B	13	3/5/91	11.4	14.1	"
B00GW5	Split	3B	13	3/5/91	11.4	14.1	"
B00GW6	Reg	3B	16	3/5/91	14.4	17.1	Silty Sandy Gravel
B00GW7	Phys	3B	16	3/5/91	14.4	17.1	"
B00GW8	Reg	3B	21	3/6/91	19.2	22.5	"
B00GW9	Reg	3B	28	3/6/91	25.9	29.6	"
B00GX0	Phys	3B	28	3/6/91	25.9	29.6	"
B00GX1	Phys	3B	28	3/6/91	25.9	29.6	"
B00GX2	Reg	3B	31	3/6/91	29.5	32.2	"
B00GX3	Reg	3B	35.5	3/7/91	34.0	36.8	"
B00GX4	Reg	3B	40	3/7/91	38.8	41.4	"
B00GX5	Reg	3B	52	3/8/91	50.8	52.95	Silty Sandy Gravel/ Silty Gravel
B00GX6	Reg	3B	61.5	3/8/91	60.0	62.6	Silty Sandy Gravel/ Sand
B00GX7	Phys	3B	61.5	3/8/91	60.0	62.6	"
B00GX8	Reg	3B	70.5	3/8/91	69.6	71.8	Silty Sandy Gravel
B00GX9	Phys	3B	73	3/11/91	72.25	74.15	"
B00GY0	Blank	3B	---	3/12/91	NA		(Silica Sand Control Sample)
B00GY1	Reg	3B	80.5	3/12/91	79.75	81.5	Gravelly Sand
B00GY2	Fdup	3B	80.5	3/12/91	79.75	81.5	"
B00GY9	Split	3B	80.5	3/12/91	79.75	81.5	"
B00GZ0	Phys	3B	84.5	3/12/91	83.0	85.9	Silty Sandy Gravel
B00GZ1	Phys	3B	84.5	3/12/91	83.0	85.9	"
B00GZ2	Reg	3B	90.5	3/12/91	89.	91.85	"
B00GZ3	Reg	3B	105	3/14/91	103.9	106.35	"
B00GZ4	Phys	3B	105	3/14/91	103.9	106.35	"
B00GZ5	Phys	3B	105	3/14/91	103.9	106.35	"
B00GZ6	Reg	3B	118.5	3/15/91	117.5	119.3	Silt
B00GZ7	Phys	3B	118.5	3/15/91	117.5	119.3	"
B00GZ8	Reg	3B	123.5	3/18/91	122.3	124.7	"
B00H00	Reg	3C	1	3/15/91	0	2	Sandy Gravel
B00H01	Reg	3C	3	3/15/91	1.5	4	"
B00H02	Reg	3C	5	3/15/91	3.87	5.8	"
B00H03	Reg	3C	7	3/18/91	5.93	7.95	"
B00H04	Reg	3C	9	3/18/91	7.93	9.73	"
B00H05	Fdup	3C	9	3/18/91	7.93	9.73	"

Table 3-3. B-Pond Phase 3 Borehole Sample Key.
(3 sheets)

Sample	Type	Pond	Depth[a]	Collection Date	Interval[b]		Classification from Borehole Log
B00H06	Reg	3C	11.5	3/18/91	10.6	11.93	Sandy Gravel/ Sand
B00H07	Split	3C	11.5	3/18/91	10.6	11.93	"
B00H08	Phys	3C	12.5	3/19/91	11.7	13.7	Sand
B00H09	Reg	3C	16	3/19/91	15.0	17.0	Gravelly Sand
B00H10	Blank	3C	---	3/20/91	NA		(Silica Sand Control Sample)
B00H11	Reg	3C	20.5	3/20/91	19.5	21.5	Sandy Gravel
B00H12	Phys	3C	26.5	3/20/91	25.6	27.8	Gravel
B00H13	Phys	3C	26.5	3/21/91	25.6	27.8	"
B00H14	Reg	3C	30	3/21/91	29	31	Slightly Gravelly Sand
B00H15	Reg	3C	36	3/25/91	34.8	37.6	Sandy Gravel
B00H16	Reg	3C	40.5	3/25/91	39	41.8	"
B00H17	Fdup	3C	40.5	3/25/91	39	41.8	"
B00H18	Reg	3C	50	3/25/91	48.8	50.8	"
B00H19	Reg	3C	60	3/26/91	59.3	61.1	"
B00H20	Reg	3C	70.5	3/27/91	69.3	71.5	"
B00H21	Blank	3C	---	3/27/91	NA		(Silica Sand Control Sample)
B00H22	Phys	3C	78	3/27/91	76.9	79.4	Sandy Gravel
B00H23	Reg	3C	80	3/27/91	79.4	80.9	"
B00H24	Split	3C	80	3/27/91	79.4	80.9	"

[a] Logbook interval midpoint rounded to the closest 1/2-ft.
[b] Source: Project Field Logbook.
[c] Sample collected from liners 51.6-52.1 ft below surface.

Type:
- Reg = Regular sample for chemical analysis
- Phys = Sample for physical analysis
- Blank = Field originated, equipment "blank" silica sand sample for chemical analysis
- Fdup = Field duplicate sample for chemical analysis
- Split = Split sample for independent chemical analysis

3.3 DESCRIPTION OF FIELD ACTIVITIES

3.3.1 The 3A Pond

Several months before drilling, clean fill was used to construct a pad extending over a small portion of 3A Pond. This pad was located along the north shore of the pond, approximately 25 yd from the east corner.

Field sampling was initiated at the 3A Pond. The borehole, BH 3A-1, (later designated 699-43-411) penetrated the former pond bottom. The first sample submitted for chemical analysis was collected February 7, 1991. Samples were planned at 2-ft intervals for the first 10 ft below the former pond bottom and at decreasing intervals thereafter until reaching groundwater. All depths were referenced to the ground surface. The pond bottom was encountered at approximately 6.5 ft.

A cable tool drilling rig was used to drill the borehole. Drill rigs are decontaminated before use. Samples were collected using a 5-in. outside diameter stainless steel split tube with stainless steel liners. A 10-in. outside diameter, schedule 40 casing was first used, followed by 8- then 6-in. The 10-in. casing string was set at 20.4 ft. The 8-in. casing was set at 77.7 ft. Samples were collected per procedures of the *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7 (WHC 1989b). Samples for chemical analysis were placed in supplier-cleaned glass bottles.

Samples were screened for radioactivity using hand-held instruments. A field photoionization detector (PID) was used to monitor for organic vapors. No evidence of radioactive or organic contamination was found. Aliquots submitted to an onsite laboratory also revealed no evidence of radioactive contamination. All aliquots were found to be below applicable administrative limits for release from all radiologic controls. Applicable limits during the project were detectable readings above background with field instruments or laboratory results exceeding either 60 ρCi/g alpha or 200 ρCi/g total activity, including beta/gamma.

Gross gamma logging was performed on three separate days:

DATE	LOG INTERVAL (FT)
February 8, 1991	5-19
February 20, 1991	4-79
March 1, 1991	45-142.

Larger cobbles and boulders made drilling difficult at approximately the 100-ft level. After samples B00GT8 and B00GT9 were collected (101.0-102.2 ft), hardtooling was first employed. This required the addition of some raw (Columbia River) water to the borehole. Drilling improved below 105 ft, and hardtooling was discontinued. A small amount (approximately 0.5 gal) of raw water was required at 112 ft to get recovery in the core barrel. The next sample interval was 120.7-123.2 ft, sample B00GV0.

The final sample from the 3A Pond borehole was collected February 28, 1991 from a recorded depth of 142.75-143.85 ft. Recovery in the split spoon

was estimated at only 50 percent. Observations in the field log note the sample as "very wet." The water level was measured at 142.75 ft from the surface. Later, the casing was removed, and the borehole was backfilled, abandoned, and marked according to standard procedures--*Plugging and Abandoning Characterization Boreholes* Environmental Investigation Instruction (EII) 6.5 (WHC 1989b).

3.3.2 The 3B Pond

A cleaned cable tool drilling rig was set up at 3B Pond in late February 1991. The borehole, BH 3B-1, (later designated 699-42-41B) was located in the center of the dry lobe. Drilling equipment was routinely cleaned per EII 5.4 (WHC 1989b) before delivery/use at the site. Likewise, direct contact sampling equipment (split tube assemblies, bowls, spoons, etc.) is specially cleaned before use per EII 5.5, *1706 KE Laboratory Decontamination of RCRA/CERCLA Sampling Equipment*, (WHC 1989b).

Sampling was initiated March 4, 1991. The first sample, B00GV6, was collected with a split tube over the 0 to 2-ft interval. Recovery of sample B00GV6 and the next two samples was estimated at 50 percent because of the coarse gravelly nature of the soil. Finer material was found below a depth of 7 ft.

Drilling method and sampling frequency were similar to the other two boreholes. Samples were planned at 2-ft intervals for the first 10 ft and at decreasing intervals thereafter until reaching groundwater. Samples were collected as previously described for the 3A Pond, except that there was no fill material overlying the area to be investigated. All depths were referenced to the ground surface. The 10-in. casing string was set at 21.1 ft. The 8-in. casing was set at 78.2 ft. Samples were screened with field instruments for radioactivity and/or hazardous organic vapors. No evidence of radioactivity or organic vapors was found.

Gross gamma logging of the 3B Pond borehole was also performed on the following three separate days:

DATE	LOG INTERVAL (FT)
March 6, 1991	5-21
March 11, 1991	4-79
March 19, 1991	45-122.

The borehole was advanced by drive barrel to approximately 74 ft before it was necessary to add any water. Only 1 gal of raw water was added to progress drilling. This was about 6 ft above the next sample interval, 79.8 - 81.5 ft. Two samples, B00GY1 and B00GY2, were taken for chemical analysis from the bottom two liners at this next interval.

A sample for physical analysis, B00GZ0, was collected from an interval beginning at 83.0 ft. Although recovery in the split tube was good (est. 75 percent), there was insufficient volume for a representative grain size analysis because of the amount of cobble. Sample B00GZ1 was subsequently

collected from the 5-in-diameter drive-barrel cleanout and submitted for grain size.

Hard-tool drilling was required at 95-103 ft and at 109-113 ft. Thirty gallons of raw water were used. Samples for chemical analysis potentially affected by added raw water are B00GZ3, B00GZ4, and B00GZ6. In each case, several feet of soil remained above the respective intervals when the last of the water was added.

The final sample, B00GZ8, a wet silt, was collected March 18, 1991. Final depth of the borehole was 124.7 ft. The casing was later pulled and the borehole abandoned per standard procedures (WHC 1989b, EII 6.5).

3.3.3 The 3C Pond

Sampling in 3C Pond began on March 15, 1991. The borehole, BH 3C-1, (later designated 699-41-4) was located on dry ground between trenches in the northwest quadrant of the lobe. The water surface in the adjacent trench was several feet below ground level at the borehole. The 3C Pond (a series of trenches) was in active use at the time of this investigation, similar to 3A Pond.

Drilling and sampling methods were identical to those previously described. As with boreholes drilled earlier, sampling was more frequent in the top portion of the borehole. Field monitoring of the samples showed no radioactivity or hazardous organic vapors. Five samples were collected in the first 10 ft. Samples for chemical analysis were collected using a 5-in. outside-diameter split tube sampler. The 10-in. casing string was set at 32.1 ft. An 8-in. casing was used for the remainder of the borehole.

Most of the borehole was wet. Early samples were damp, but moisture appeared to increase at about 18 ft. When drilling started at 19 ft, March 20, there was no standing water in the hole. However, some difficulty was experienced keeping material in the drive barrel. Moisture was a factor. Poor sample recovery limited planned analyses in the 20-25 ft range. On the morning of March 21, there was standing water in the hole. The starting depth was 27.8 ft. Moist conditions abated, but did not cease for the remainder of the borehole.

Gross gamma logging at the 3C Pond was performed on two days as follows:

DATE	LOG INTERVAL (FT)
March 22, 1991	5-32
March 28, 1991	0-77.

Soil below 74 ft was noticeably wetter. Intermittent saturated zones were experienced to 80 ft. It was decided to terminate the borehole at this level because of continuing high moisture conditions. Final depth of the borehole was 80.9 ft.

The casing was removed and the borehole filled and abandoned in accordance with standard procedures (WHC 1989b, EII 6.5). As with previous sites, a brass survey marker was placed at the location.

Sample B00GS5, originating from the borehole at the 3C Pond, was later reported by the laboratory as sample B00GS. Based on date of submittal, analyses requested, and review of documentation associated with the sample this was determined to be simply a typographical error on the part of the laboratory and will not affect interpretation of the results.

4.0 SUMMARY OF RESULTS

4.1 ORGANIC CHEMICAL RESULTS

Organic analyses were performed on a subset of project samples in accordance with project plans. All regular samples identified below were analyzed for pesticides/PCBs, herbicides, organophosphorous pesticides, volatile organic compounds, and BNA compounds.

3A Pond: B00FK6, B00FK7, B00FK8, B00FK9, B00FL0, B00FL1, B00FL4, B00GS4, B00GS9, B00GT7, B00GV5

3B Pond: B00GV6, B00GV7, B00GV8, B00GW0, B00GW1, B00GW3, B00GW8, B00GX6, B00GZ2, B00GZ6, B00GZ8

3C Pond: B00H00, B00H01, B00H02, B00H03, B00H04, B00H06, B00H14, B00H19, B00H23

A subset of the above were analyzed for dioxin and furan homologs. This included all samples except B00GX6, B00GZ2, B00GZ6, B00GZ8, B00H01, B00H04, B00H06, B00H14, B00H19, and B00H23. More analyses were performed than were requested by Westinghouse Hanford. One planned dioxin analysis (sample B00H01 from 1.5- to 4-ft level of 3C Pond) was inadvertently omitted by the laboratory. An examination of the Sample Analysis Request forms shows the primary laboratory did not correctly forward requests/samples to their subcontracted laboratory.

Results of silica sand samples (B00FL3, B00GV9, B00H10), field duplicates (B00GW4, B00H05, B00GR9) and split samples (B00H07, B00GW5, B00GS5) are discussed with each group summary appearing below.

Results of all regular samples analyzed for organic compounds are summarized in Table 4-1. Organic constituents of interest were generally undetected.

Nearly all results have been qualified as estimated, flagged with a "J" by Westinghouse Hanford's Office of Sample Management (OSM). The most common reason is the comparison of sample (soil) holding times before extraction to holding times applicable to water matrices. Compounds not on routine target lists may have been reported as TICs. All TICs were routinely qualified as estimated, "J", by the reporting laboratory.

Table 4-1. Summary of Phase 3 Organic Analyses.

Analytical Class	Protocol Used	Pond	Number of Reg. Samples	All Analytes < Detection Limit	Remarks
Pesticides/PCB	EPA 8080	3A	11	Yes	
		3B	11	Yes	
		3C	9	Yes	
Herbicides	EPA 8150	3A	11	Yes	
		3B	11	Yes	
		3C	9	Yes	
Organophosphorous Pesticides	EPA 8140	3A	11	Yes	List A (App. C)
		3B	11	Yes	List A, List B for 4 lowermost
		3C	9	Yes	List B (App. C)
Dioxins/Furans	Modified EPA 8280	3A	11	Yes	(More analyses than requested)
		3B	7	Yes	
		3C	3	Yes	
Volatile Organic Compounds	ACD 2440 (CLP VOA Protocol)	3A	11	No	Low level Acetone, Methylene Chloride, and 4-Methyl-2-pentanone
		3B	11	No	Low level 4-Methyl-2-pentanone
		3C	8	No	Low level Acetone
Base/Neutral/Acid Compounds (Semivolatiles)	ACD 2470 (CLP BNA Protocol)	3A	11	No	Multiple compounds reported
		3B	11	No	Multiple compounds reported
		3C	9	No	Multiple compounds reported

4.1.1 Pesticides/PCBs

Tables 4-2 and 4-3 summarize results of the pesticides/PCB analyses. Table 4-2 is based on the results of the 31 regular soil samples sent to the primary laboratory. Table 4-3 shows the numerical results of each of the three samples sent to the split laboratory. All regular, field duplicate, field split, and silica sand sample results are provided in Appendix A.

All pesticides and PCB results were reported as nondetectable by the laboratory, or were qualified as nondetected upon validation. Some laboratory reagent blanks at the primary laboratory contained traces of target analytes (Arochlor-1254, beta-BHC, and Lindane). Some immediately associated B-Pond soil samples also contained those analytes at very low levels--less than the valid sample quantitation limit (SQL). Consistent with established data validation protocol, OSM qualified some data as undetected at the SQL based upon results of laboratory reagent blanks. No other analytes were reported by the laboratory without an undetected ("U") laboratory qualification.

All samples, including silica sand and field duplicates, were extracted outside the 7-day criterion applicable to certain water analyses, and were thus qualified "J" by Westinghouse Hanford. All extracts were analyzed within the allotted 40 days following extraction. High surrogate recovery on sample B00H01 also contributed to Westinghouse Hanford's "J" qualification for all analytes of that sample, although no target compounds were found. Recovery was 193 percent, slightly outside the laboratory-reported quality control (QC) limits of 20-150 percent for a 105-μg/Kg nominal spike.

Results of each of the three silica sand and field duplicate samples were consistent with the above. All values were reported as undetected by the laboratory or were qualified as undetected at the SQL. All six samples were reported with sub-SQL concentrations of arochlor-1254, and were qualified as undetected at the SQL. Two silica sand field blanks (B00FL3 and B00H10) and one field duplicate (B00GR9) reported by the laboratory with less than SQL traces of lindane were subsequently qualified as undetected at the SQL based on laboratory reagent blank results. The field duplicate B00GR9 contained a trace of beta-BHC (0.77J μg/Kg) that was qualified as undetected at the SQL (13 μg/Kg). No trace of beta-BHC was found in the associated regular sample, B00FL3; laboratory reported value, 13 U μg/Kg.

Split samples were analyzed according to criteria set forth in the CLP for pesticide and PCB target compounds. Validated results are shown in Table 4-3. Results confirm those of the primary laboratory. Targeted compounds were undetectable in site samples. Compounds for which there were trace contamination problems at the primary laboratory were undetected in samples analyzed at the split laboratory. One split sample, B00GS5, was also associated with a high surrogate spike recovery. This was attributed to a co-eluting interference. Seven of 12 matrix spike recoveries were outside EPA QC limits. Although all analytes were undetected, results for B00GS5 were consequently qualified "J" by Westinghouse Hanford.

Table 4-2. Pesticides/PCB Sample Result Summary
-- 31 Regular Samples.

ANALYTE	CAS #	ALL RESULTS < DETECTION LIMIT ?	DETECTION LIMIT RANGE µg/Kg	MEDIAN µg/Kg
4,4'-DDE	72-55-9	Yes	25 UJ - 310 UJ	120 UJ
4,4'-DDD	72-54-8	Yes	25 UJ - 310 UJ	120 UJ
4,4'-DDT	50-29-3	Yes	25 UJ - 310 UJ	120 UJ
Aldrin	309-00-2	Yes	13 UJ - 160 UJ	62 UJ
alpha BHC	319-84-6	Yes	13 UJ - 160 UJ	62 UJ
beta BHC	319-85-7	Yes	13 UJ - 160 UJ	62 UJ
delta BHC	319-86-8	Yes	13 UJ - 160 UJ	62 UJ
gamma BHC (Lindane)	58-89-9	Yes	13 UJ - 160 UJ	62 UJ
alpha-Chlorodane	5103-71-9	Yes	130 UJ - 1600 UJ	620 UJ
gamma-Chlorodane	5103-74-2	Yes	130 UJ - 1600 UJ	620 UJ
Dieldrin	60-57-1	Yes	25 UJ - 310 UJ	120 UJ
Endosulfan I	959-98-8	Yes	13 UJ - 160 UJ	62 UJ
Endosulfan II	33213-65-9	Yes	25 UJ - 310 UJ	120 UJ
Endosulfan Sulfate	1031-07-8	Yes	25 UJ - 310 UJ	120 UJ
Endrin	72-20-8	Yes	25 UJ - 310 UJ	120 UJ
Endrin Ketone	53494-70-5	Yes	25 UJ - 310 UJ	120 UJ
Heptachlor	76-44-8	Yes	13 UJ - 160 UJ	62 UJ
Heptachlor Epoxide	1024-57-3	Yes	13 UJ - 160 UJ	62 UJ
Methoxychlor	72-43-5	Yes	130 UJ - 1600 UJ	620 UJ
Toxaphene	8001-35-2	Yes	250 UJ - 3100 UJ	1200 UJ
Arochlor 1016	12674-11-2	Yes	120 UJ - 180 UJ	130 UJ
Arochlor 1221	11104-28-2	Yes	120 UJ - 180 UJ	130 UJ
Arochlor 1232	11141-16-5	Yes	120 UJ - 180 UJ	130 UJ
Arochlor 1242	53469-21-9	Yes	120 UJ - 180 UJ	130 UJ
Arochlor 1248	12672-29-6	Yes	120 UJ - 180 UJ	130 UJ
Arochlor 1254	11097-69-1	Yes	240 UJ - 360 UJ	260 UJ
Arochlor 1260	11096-82-5	Yes	240 UJ - 360 UJ	260 UJ

U Compound was analyzed for but not detected at the stated limit.
J Indicates an estimated value.

Table 4-3. Split Sample Results for Pesticides/PCBs.

ANALYTE	CAS #	B00H07 µg/Kg	B00GW5 µg/Kg	B00GS5[a] µg/Kg	Median[b] Regular Sample µg/Kg
4,4'-DDE	72-55-9	17 U	16 UJ	19 UJ	120 UJ
4,4'-DDD	72-54-8	17 U	16 UJ	19 UJ	120 UJ
4,4'-DDT	50-29-3	17 U	16 UJ	19 UJ	120 UJ
Aldrin	309-00-2	8.3 UJ	8.0 UJ	9.7 UJ	62 UJ
alpha BHC	319-84-6	8.3 UJ	8.0 UJ	9.7 UJ	62 UJ
beta BHC	319-85-7	8.3 UJ	8.0 UJ	9.7 UJ	62 UJ
delta BHC	319-86-8	8.3 UJ	8.0 UJ	9.7 UJ	62 UJ
gamma BHC (Lindane)	58-89-9	8.3 U	8.0 UJ	9.7 UJ	62 UJ
alpha-Chlorodane	5103-71-9	83 UJ	80 UJ	97 UJ	620 UJ
gamma-Chlorodane	5103-74-2	83 UJ	80 UJ	97 UJ	620 UJ
Dieldrin	60-57-1	17 U	16 U	19 UJ	120 UJ
Endosulfan I	959-98-8	8.3 U	8.0 UJ	9.7 UJ	62 UJ
Endosulfan II	33213-65-9	17 U	16 U	19 UJ	120 UJ
Endosulfan Sulfate	1031-07-8	17 U	16 UJ	19 UJ	120 UJ
Endrin	72-20-8	17 UJ	16 U	19 UJ	120 UJ
Endrin Ketone	53494-70-5	17 U	16 U	19 UJ	120 UJ
Heptachlor	76-44-8	8.3 U	8.0 U	9.7 UJ	62 UJ
Heptachlor Epoxide	1024-57-3	8.3 U	8.0 U	9.7 UJ	62 UJ
Methoxychlor	72-43-5	83 U	80 U	97 UJ	620 UJ
Toxaphene	8001-35-2	170 U	160 U	190 UJ	1200 UJ
Arochlor 1016	12674-11-2	83 U	80 U	97 UJ	130 UJ
Arochlor 1221	11104-28-2	83 U	80 U	97 UJ	130 UJ
Arochlor 1232	11141-16-5	83 U	80 U	97 UJ	130 UJ
Arochlor 1242	53469-21-9	83 U	80 U	97 UJ	130 UJ
Arochlor 1248	12672-29-6	83 U	80 U	97 UJ	130 UJ
Arochlor 1254	11097-69-1	170 U	160 U	190 UJ	260 UJ
Arochlor 1260	11096-82-5	170 U	160 U	190 UJ	260 UJ

[a] Sample misidentified on Form 1 as "B00-GS".
[b] For comparison to split sample results.
U Compound was analyzed for but not detected at the stated limit.
J Indicates an estimated value.
B00H07 and B00GW5 qualified "UJ" for some analytes because of a minor calibration anomaly.
B00GS5 qualified "UJ" because of high surrogate and high matrix spike recoveries.

4.1.2 Herbicides

Analytical results were reported for 2,4-D (CAS # 94-75-7) and 2,4,5-TP, also known as Silvex, (CAS # 93-72-1). Both herbicides were undetected in all regular site samples, field duplicates and field silica sand samples. Sample reporting limits ranged widely. Validated results ranged from 28 UJ - 4900 UJ μg/Kg for 2,4-D, and 3 UJ - 240 UJ μg/Kg for 2,4,5-TP. The median regular sample result for 2,4-D was 150 UJ μg/Kg. The median regular sample result for 2,4,5-TP was 15 UJ μg/Kg. All regular, field duplicate, field split and silica sand sample results are shown in Appendix A.

All values were qualified by Westinghouse Hanford as "J" because the pre-extraction holding time exceeded the 7 day criterion established for water samples. Once extracted, all samples were analyzed within the appropriate 40-day period. 2,4,5-TP was detected in one laboratory reagent blank, but no results were qualified because herbicides were undetected in all site samples.

Split samples were not analyzed for herbicides.

4.1.3 Organophosphorous Pesticides

Organophosphorous pesticides were undetected in all soil samples. All results were qualified by Westinghouse Hanford because extraction was outside the 7-day criterion applicable to certain water analyses. Once extracted, all samples were analyzed within the appropriate 40-day period.

Organopesticide analyses were subcontracted by the primary laboratory. One of the applicable contracts changed during the Phase 3 project. This resulted in an increase in the number of analytes reported for about 40 percent of the samples. All analytes were still undetected. Samples with the increased analyte list include the following:

- All samples from the borehole at the 3C Pond
- Samples B00GX6, B00GZ2, B00GZ6, and B00GZ8 from the 3B Pond
- Silica sand B00H10
- Field duplicate B00H05.

All regular, field duplicate and silica sand sample results are shown in Appendix A.

Tables 4-4a and 4-4b summarize the reporting limits for all regular field samples and analytes. Silica sand and field duplicates were reported to similar limits. No contaminants were reported in laboratory blanks.

Split samples were not analyzed for organophosphorous pesticides.

Table 4-4a. Organophosphorous Pesticide Reporting -- 18 Regular Samples (Short List).

ANALYTE	CAS #	ALL RESULTS < DETECTION LIMIT ?	DETECTION LIMIT RANGE mg/Kg	MEDIAN mg/Kg
Dimethoate	60-51-5	Yes	0.10 UJ - 0.13 UJ	0.11 UJ
Disulfoton	298-04-4	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Parathion ethyl	156-38-2	Yes	0.10 UJ - 0.13 UJ	0.11 UJ
Parathion methyl	298-00-0	Yes	0.10 UJ - 0.13 UJ	0.11 UJ
Phorate	298-02-2	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Sulfotepp	3689-24-5	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Famphur	52-85-7	Yes	0.16 UJ - 0.19 UJ	0.16 UJ
Thionazin	297-97-2	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
o,o,o-Triethyl phosphorothioate	126-68-1	Yes	0.03 UJ - 0.03 UJ	0.03 UJ

U Compound was analyzed for but not detected at the stated limit.
J Indicates an estimated value.

Table 4-4b. Organophosphorous Pesticide Reporting -- 13 Regular Samples (Long List).

ANALYTE	CAS #	ALL RESULTS < DETECTION LIMIT ?	DETECTION LIMIT RANGE mg/Kg	MEDIAN mg/Kg
Azinphos methly	86-50-0	Yes	0.21 UJ - 0.24 UJ	0.21 UJ
Chlorpyrifos	2981-88-2	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Chlorpyrifos methyl	5598-13-0	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Coumaphos	56-72-4	Yes	0.21 UJ - 0.26 UJ	0.21 UJ
Demeton	8065-48-3	Yes	0.1 UJ - 0.12 UJ	0.1 UJ
Diazanon	333-41-5	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
DDVP (Dichlorvos)	62-73-7	Yes	0.1 UJ - 0.12 UJ	0.1 UJ
Dimethoate	60-51-5	Yes	0.1 UJ - 0.12 UJ	0.1 UJ
Disulfoton	298-04-4	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
EPN	2104-64-5	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Ethion	563-12-2	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Ethoprop	13194-78-4	Yes	0.1 UJ - 0.12 UJ	0.1 UJ
Fensulfothion	115-90-2	Yes	0.1 UJ - 0.12 UJ	0.1 UJ
Fenthion	55-38-9	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Malathion	121-75-5	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Merphos	150-50-5	Yes	0.1 UJ - 0.12 UJ	0.1 UJ
Mevinphos	7786-34-7	Yes	0.1 UJ - 0.12 UJ	0.1 UJ
Monocrotophos	6923-22-4	Yes	0.21 UJ - 0.24 UJ	0.21 UJ
Naled	300-76-5	Yes	0.21 UJ - 0.24 UJ	0.21 UJ
Parathion, ethyl	56-38-2	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Parathion, methyl	298-00-0	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Phorate	298-02-2	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Ronnel	299-84-3	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Sulfotepp	3689-24-5	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
Sulprofos	35400-43-2	Yes	0.05 UJ - 0.06 UJ	0.05 UJ
TEPP	21646-99-1	Yes	0.21 UJ - 0.24 UJ	0.21 UJ
Tetrachlorvinphos	22248-79-9	Yes	0.26 UJ - 0.31 UJ	0.26 UJ
Trichloronate	327-98-0	Yes	0.05 UJ - 0.06 UJ	0.05 UJ

U Compound was analyzed for but not detected at the stated limit.
J Indicates an estimated value.

4.1.4 Dioxins and Furans

Some Phase 3 soil samples were submitted for the analysis of total tetra through octa dioxin and furan homologs. These highly specialized analyses were planned for the first few samples from each of the vadose zone boreholes. Evidence has shown that dioxins do not readily migrate through soil and dioxins are not suspected to have been disposed of at the site. Sampling and analysis was intended to demonstrate that the vadose zone was not contaminated with such compounds.

Samples were analyzed using a modified version of SW-846 Method 8280, (Rev. 0) (EPA 1986). Dioxin analyses, like organophosphorous pesticide analyses, were subcontracted by the primary laboratory. A 10-g aliquot of each sample and laboratory blank (sodium sulfate) were spiked at the analytical laboratory before extraction with an internal standard solution containing 50 ng each of ^{13}C-2,3,7,8-TCDD, ^{13}C-2,3,7,8-TCDF, ^{13}C-PeCDD, ^{13}C-PeCDF, ^{13}C-HxCDD, ^{13}C-HxCDF, ^{13}C-HpCDD, ^{13}C-HpCDF and ^{13}C-OCDD. A summary of the performance against these internal standards is shown in Table 4-5.

Table 4-5. Internal Standard Percent-Recovery Summary Dioxins and Furans (25 Samples).

	TCDD	PeCDD	HxCDD	HpCDD	OCDD	TCDF	PeCDF	HxCDF	HpCDF
AVERAGE	65.08	66.56	68.08	59.8	63.48	59.72	62.8	79.72	72.76
RANGE- Max	84	98	85	71	98	83	84	103	92
Min	37	36	44	43	44	26	49	61	55

Additional laboratory QC included blank, matrix spike, and duplicate analyses. Results were within established acceptance limits.

All soil aliquots were extracted outside the 7-day criterion applicable to certain water samples. Results shown in Appendix A were conservatively qualified "UJ" by Westinghouse Hanford because of the time between field sampling and extraction. Periods between sampling and extraction ranged from 3 weeks to 50 days. Once extracted, all samples were analyzed within the 40-day criterion established for extracts.

Detection limits were calculated and reported by the laboratory when target compounds were not found. The concentration corresponding to a signal-to-noise ratio of 2.5 was reported as the detection limit for each analyte. All results reflect these limits and are reported with "U" qualifiers in Appendix A.

The result for sample B00H01 (see Section 4.1) is missing; however, this should have minimal impact on the chemical characterization of 3C Pond vadose zone. Samples taken above and below B00H01 were not found to have any detectable dioxin or furan target compounds. (This is also consistent with samples from other areas of B-Pond.)

4.1.5 Volatile Organic Compounds

No volatile organic compounds of significance were found. However, three identifiable compounds were reported in the regular samples: methylene chloride, acetone, and 4-methyl-2-pentanone. Only methylene chloride is known to be a 40 CFR Part 261 Hazardous Constituent and WAC 173-303-9905 Dangerous Waste Constituent. All regular, field duplicate, field split, and silica sand sample results are shown in Appendix A.

Traces of three unidentified compounds were reported in sample B00GV5. This was the deepest 3A Pond borehole sample (~143.5 ft). It was from a saturated zone. (The sample was noted as "very wet" in the field logbook. A percent moisture on the VOA aliquot was not reported.)

Samples were spiked with surrogate compounds to monitor method performance. Recoveries are summarized in Table 4-6. Performance on matrix spike and matrix spike duplicates was also reviewed as part of data validation and found to be within accepted limits. Some VOA results were qualified during data validation based on holding times and laboratory reagent blanks.

Table 4-6. VOA Surrogate Percent-Recovery Summary
(37 Samples--50 μg/Kg Spikes)

SURROGATE	QC LIMITS (%)	MEAN (%)	MAXIMUM (%)	MINIMUM (%)
Toluene-d8	81-117	103.4	115.4	91.2
Bromofluorobenzene	74-121	101.1	109.2	91.0
1,2-Dichlorethane	70-121	102.0	110.7	86.9

Methylene chloride was reported in B00FK7 (4 J μg/Kg) and B00FK8 (3 J μg/Kg). These were the second and third samples, respectively, collected from the 3A Pond borehole. No other suspected traces of this analyte were identified in the 29 other regular site samples, 3 field duplicates, 3 silica sand samples, or 9 laboratory reagent blanks. Methylene chloride in each sample was reported at less than the minimum detection level reported for all other samples. Reporting limits on other samples ranged from 5 U - 8 U μg/Kg, with 5 U μg/Kg being the most common value.

Methylene chloride was reported by the laboratory (before Westinghouse Hanford validation) with a "J" qualifier flag. This indicates an estimated value. According to CLP protocol and given evidence of detection, some analytes may be reported by the laboratory at levels below the CLP contract detection limit and flagged as estimated. The EPA CLP Statement of Work for Organic Analysis has historically used 10 μg/Kg as a contract-required quantitation limit (CRQL) for methylene chloride in soil. This figure is based on wet weight, and must be adjusted upward based on the percent moisture for comparison to results reported on a dry-weight basis. The reporting methods used by the Phase 3 laboratories are based on this protocol. Results were reported on a dry-weight basis.

Although methylene chloride was not reported in blanks, it is a common laboratory contaminant. It can also diffuse through the septum of VOA sample containers in shipment or storage. Acetone, another common volatile solvent,

was also reported in each of the two samples reported with traces of methylene chloride. These samples contained the highest and second highest reported levels of acetone.

Acetone was reported in only 6 of the 37 validated VOA samples analyzed at the primary laboratory. Reported concentrations were 64, 55, 13, 17, 27, and 49 μg/Kg. Five of the incidences were associated with two sampling/shipment days (from 3A Pond) and two analytical batches. Sample numbers were B00FK7, B00FK8, B00FL0, B00FL3 (silica sand blank), and B00GR9 (field duplicate). The sixth occurrence was in sample B00H19 from 3C Pond. Not all samples collected and shipped in common were analyzed on the same day. Eight samples shared the characteristic of having been collected/shipped and analyzed in association with a sample where acetone was reported. None of the three immediately associated laboratory blanks showed traces of acetone, although another laboratory blank during the project was reported at 26 μg/Kg. One of the eight samples was a silica sand field blank. Acetone was reported in the silica sand blank at 17 μg/Kg. The other two silica blanks submitted during the project were not reported to contain acetone. Acetone was also not reported in B00FL4, the regular sample associated with the field duplicate, B00GR9.

All individual sample results for acetone are less than four times the amount reported in one of the three project silica sand blanks. All acetone results are also below the SW-846 (EPA 1986) practical quantitation limit (PQL) discussed below. Acetone is highly soluble in water. If acetone was at a quantifiable concentration and originated from percolating wastewater, there should be a positive correlation between sample moisture and acetone content. The evidence does not support correlation.

The compound 4-methyl-2-pentanone, also known as methyl isobutyl ketone, was reported by the laboratory at 3 J μg/Kg in sample B00GV5, B00GX6, and B00GZ2. (The "J" qualifiers have the same meaning as for methylene chloride.) The contract-required quantitation limit (CRQL) and nominal reporting limit of 4-methyl-2-pentanone is the same as methylene chloride, 10 μg/Kg. For all other 28 regular samples, 3 field duplicates, and 3 silica sand blanks, 4-methyl-2-pentanone was reported as undetected at the adjusted CRQL. Although not reported in either of the two immediately associated laboratory blanks, the compound was reported at precisely the same concentration in one of the nine laboratory VOA blanks reported for the project. This rate of occurrence (as well as concentration) is not significantly different from that found for site soil samples. A related compound, the aldol condensate 4-hydroxy-4-methyl-2-pentanone, was a chronic contaminant in semivolatile analyses at the primary laboratory. (All occurrences of that compound were qualified as undetected TICs caused by prolific laboratory contamination. Because of this they are not shown in Appendix A, but concentrations frequently exceeded 20,000 μg/Kg in many semivolatile analyses.)

The validation procedure used to produce the data listed in Appendix A qualifies data based only on laboratory blanks. Appendix A data have <u>not</u> been qualified based on results of project silica sand field samples. Consistent with EPA validation guidance, the procedure employed to evaluate laboratory blanks uses a 10X rule for evaluating common laboratory contaminants, including acetone. Results less than 10X the concentration in an associated blank are qualified as undetected at the reported concentration.

Frequently instrument capabilities alone are not the primary limitation of measuring low-level organic compounds. Other aspects of the procedure, such as sample preparation and handling, are important parts of the measurement system. For instance, a single VOA aliquot of sample B00H19 was collected and shipped for analysis. It was divided by the laboratory and analyzed in triplicate as a regular, matrix spike, and matrix spike duplicate sample. Acetone was measured at 49 and 47 μg/Kg respectively in two portions, yet undetectable (11 U μg/Kg) in the third.

In recognition of such factors, EPA has established practical quantitation limits (PQLs) for those methods used to determine whether a solid waste is a hazardous waste within the definition of Section 3001 of RCRA. Practical quantitation limits are estimates of the lowest concentrations that can be reliably measured by a given analytical procedure. Washington State "Dangerous Waste Regulations" (WAC 173-303) reference EPA's SW-846 (EPA 1986) manual in setting analytical protocol standards. The EPA has published 5 μg/Kg as a PQL for methylene chloride in soil measured by SW-846 method 8240. The corresponding PQLs for acetone and 4-methyl-2-pentanone are 100 and 50 μg/Kg (EPA 1986). EPA recognizes that PQLs are highly matrix dependent and may not always be achievable. Again, these figures are based on wet weight and must be adjusted when compared to results reported on a dry-weight basis.

Although not currently discussed in the "Dangerous Waste Regulations" (WAC 173-303), regulations under other authority such as Washington State's "Model Toxics Control Act" (WAC 173-340) reference EPA's PQLs in establishing de facto de minimis regulatory limits (see WAC 173-340-707 *Analytical Considerations*). Other factors, including toxicity, are also considered.

The EPA is not known to have issued any general rules on environmental media de minimis levels of 40 CFR Part 261 Appendix VIII hazardous constituents. It has historically been EPA's policy that such levels are determined on a site-specific basis (57 FR 958 et seq.). The EPA's proposed RCRA Corrective Action rules (55 FR 30798 et seq.) give an example of a soil methylene chloride concentration meeting the criteria for a media action level. This action level is a conservative health-based level based on ingestion of contaminated soil. The toxicity of methylene chloride is such that the proposed action level is 90 mg/Kg (equivalent to 90,000 μg/Kg). Likewise, conservative health-based concentration action levels for acetone and 4-methyl-2-pentanone are 8000 mg/Kg and 4000 mg/Kg, respectively.

4.1.6 Base/Neutral/Acid Compounds

Phase 3 soil samples showed no semivolatile target compounds at concentrations above their respective CRQL. Only two target compounds were reported in site samples, benzoic acid and diethylphthalate. Each occurrence was qualified as estimated, "J", by the laboratory because both had less than CRQL concentrations. Both were also reported in at least one laboratory blank, although not the one "associated" with those particular analyses according to the employed data validation procedure. All regular, field duplicate, field split, and silica sand sample results are shown in Appendix A.

Surrogate compounds were used to monitor method performance. All surrogate recoveries were within acceptable limits. A performance summary for

all regular, duplicate, and silica sand samples submitted to the primary laboratory is shown in Table 4-7. All matrix spike and duplicate recoveries met QC specifications.

Table 4-7. Semivolatile Surrogate Percent-Recovery Summary (37 Primary Laboratory Samples).

Surrogate	Nitrobenzene -d5	1,1'-Biphenyl, 2-Fluoro	Terphenyl-d14	Phenol-d6	2-Fluoro phenol	2,4,6-Tribromo phenol
Spike added (µg/Kg)	100	100	100	200	200	200
Mean percent-recovery	57.2	65.8	83.1	54.6	51.8	52.2
Standard deviation	17.2	20.4	14.8	16.1	13.3	17.4
QC limits %	23 - 120	30 - 115	18 - 137	24 - 113	25 - 121	19 - 122

While benzoic acid is not listed as a RCRA Appendix VIII- or WAC 173-303-9905 Dangerous Waste constituent, benzoic acid was reported in 9 of the 37 samples, (regular, field duplicate, and silica sand samples). In each case, it was reported at less-than-one-fifth of the nominal less-than reporting limit of 5000 µg/Kg. Seven occurrences were associated with samples extracted February 24, 1991. All of the samples were from the upper 28 ft of the 3A Pond borehole. The remaining two occurrences were associated with samples extracted March 7, 1991. These were the first two samples from the 3B borehole. Neither immediately associated batch blank was reported with traces of benzoic acid, nor were other site samples in the batches. However, one of seven laboratory blanks reported with Phase 3 samples did contain benzoic acid, estimated at 1500 J µg/Kg, which is below the CRQL. This concentration is greater than that estimated in the nine validated samples.

Diethylphthalate was reported in only three regular samples and one split sample. Diethylphthalate appears on both the RCRA Appendix VIII and WAC 173-303-9905 list. All occurrences of diethylphthalate were qualified as estimated, flagged with a "J", because of low concentration. All occurrences were less than half the less-than reporting limit of 1000 µg/Kg. Reported concentrations were 170 J, 210 J, and 370 J µg/Kg. One of the independently analyzed split samples was reported at 95 J µg/Kg. That sample was collected simultaneously to with the regular sample reported at 210 J µg/Kg by the primary laboratory. Sample numbers and location are as follows:

- B00FK7 (3A Pond-8.5 ft)
- B00GS4 (3A Pond-52.5 ft)
- B00GZ2 (3B Pond-90.5 ft)
- Split B00GS5 (3A Pond-52.5 ft).

No evidence of the phthalate compound was found in the associated laboratory blanks; however traces were suspected in two of the seven blanks at the primary laboratory, (a higher rate than the samples). The phthalate compound was reported at 670 J and 540 J µg/Kg in those laboratory reagent blanks. As a result, some samples were qualified undetected at the CRQL. None of the three split laboratory blanks or three silica sand samples showed traces of this particular phthalate, though both groups contained other

phthalates. Phthalates are commonly found at low levels as field or laboratory contaminants.

The EPA CLP SOW for organic analyses has traditionally defined an acceptable semivolatile analytical method blank as one containing a concentration less than or equal to the CLP CRQL, except for target compound phthalate esters. An acceptable blank may contain a concentration of less than or equal to 5X times the target compound phthalates. This reflects the widespread use of phthalate compounds and the difficulty of avoiding sample cross-contamination bias. The key issue of whether a particular single isolated sample is representative must be considered.

The fact that both the regular sample, B00GS4, and its associated split, B00GS5 were reported with traces of diethylphthalate suggests at least some of the occurrences may have had a field origin (true or artificial). Although the compound sinks in water, phthalate esters are readily sequestered by or adsorbed on organic residues and solid surfaces in environmental water systems. This should lead to accumulation in the near-surface sediments and subsequent long-term low-level release if wastewater disposal activities are the true source of diethylphthalate. Introduced spurious contamination from a common field source is also a possible source, which would cause such samples to actually be unrepresentative of site conditions.

The few and isolated nature of the occurrences, low concentration, and apparent lack of decreasing concentration with depth suggest that the occurrences are an artifact of the measurement system and not a reflection of site conditions. Although trends with depth are opposite of a pond sediment source, the values are too low to be considered reliable indicators of contamination. The overall measurement system is simply not capable of reliably characterizing the mean diethylphthalate concentration at such minute levels. From a single split spoon of soil, the sample standard deviation calculated using the two independently analyzed samples, B00GS4 and B00GS5, is 81.3 μg/Kg. A 90-percent one-sided small sample confidence interval for the true mean of the location encompasses zero. Based only on the demonstrated reproducibility at this one location for which two, supposedly positive, independent analyses were performed, one cannot reliably consider the concentration of diethylphthalate different from zero.

Semivolatile results, in contrast to the Phase 1 study results, showed frequent TICs, averaging approximately 13 per sample for the primary laboratory and slightly more than 3 per sample for the split laboratory. In addition, laboratory batch blanks averaged approximately 14 TICs per blank at the primary laboratory; no TICs were seen for blanks at the split laboratory. Most of the TICs were either unidentifiable or only generically identifiable compounds. The large number of TICs reported by the primary laboratory for both samples and blanks suggest that their occurrence must be interpreted with some skepticism.

The majority of TICs were rejected on validation because identical compounds occurred at similar concentrations in the immediately associated laboratory batch blanks. Nevertheless, some TICs remained after validation. A surprisingly similar number of TICs were present in the average validated sample results from the primary and split laboratories--slightly less than four and slightly greater than three, respectively, after validation. Silica sand field blanks were <u>not</u> considered in the employed validation procedure.

They were submitted only to the primary laboratory. On average, they contained four validated TICs per sample.

One compound identified as a validated TIC is listed on the RCRA Appendix VIII or WAC 173-303-9905 Dangerous Waste Constituents List. The identified compound is dimethylhydrazine (CAS # not reported by laboratory). Three occurrences, (B00FL1, B00GR9, and B00FK9), were associated with a single analytical batch; however, B00FK9 was flagged to indicate the analyte was found in an associated laboratory reagent blank. The laboratory did not specifically report this compound in the identified associated laboratory blank, (lab ID 910225-170). The laboratory has not been able to produce a definitive explanation for this apparent anomaly. Application of validation criteria to TICs resulted in rejection of this particular TIC in sample B00FK9, but not B00FL1 or B00GR9--even though all were supposedly in the same analytical batch. Reported concentrations and qualifiers were 600 JY- and 460 J-μg/Kg, respectively. No other Phase 3 samples contained this compound.

4.2 INORGANIC CHEMICAL RESULTS

All inorganic results with attached data qualifiers are listed in Appendix A. The results are summarized by two tables. Calculated statistics can be confirmed using values listed in Appendix A. Further comparisons of these results are made in Section 5.

All regular samples are summarized in Table 4-8. Values are summarized by showing the total number of samples analyzed, number of less-than-detection-limit values, median, mean, upper 90-percent limit of the mean, standard deviation, percent coefficient of variation, and range for each lobe. A standard deviation, upper confidence limit, and percent-coefficient of variation were not calculated for analytes that were rarely or never at detectable concentrations. For those analytes that were undetected in a minority of samples, analytes were assumed, for summary calculation purposes, to have values equal to their reported "less-than" values. Concentration qualification flags are shown for the minimum and maximum values of each lobe.

Table 4-8. Summary Statistics--Regular Samples (µg/g). (5 sheets)

Analyte	Pond	Number of Samples		Median	Mean	Upper 90% Limit	Standard Deviation	Percent Coefficient of Variation	Range	
		Total	< Detection Limit						Minimum	Maximum
Aluminum	3A	20	0	6100	6160	6584	1427	23	3800	9600
	3B	20	0	6000	6975	7866	3001	43	4500	17000
	3C	15	0	6000	5987	6333	998	17	4600	8300
Ammonia	3A	21	21	<0.001	<0.001	NC	NC	NC	0.001 U	0.001 U
	3B	17	17	<0.001	<0.001	NC	NC	NC	0.001 U	0.001 U
	3C	15	15	<0.001	<0.001	NC	NC	NC	0.001 U	0.001 U
Antimony	3A	20	16	<5.2	<5.8	NC	NC	NC	4.6 U	14
	3B	20	20	<5.1	<5.1	NC	NC	NC	4.9 U	5.8 U
	3C	15	15	<5.2	<5.2	NC	NC	NC	4.8 U	5.3 U
Arsenic	3A	21	0	1.5	1.74	1.97	0.805	46	0.79	4.2
	3B	20	1	<1.35	<2.25	2.90	2.171	96	0.59 U	7.2
	3C	11	0	1.7	1.46	1.76	0.713	49	0.65	2.5
Barium	3A	20	0	71.5	71.1	74.1	10.2	14	53	91
	3B	20	0	78	77.6	80.7	10.4	13	62	96
	3C	15	0	73	80.5	90.6	29.3	36	50	170
Beryllium	3A	20	0	0.35	0.36	0.38	0.073	20	0.23	0.53
	3B	20	0	0.35	0.38	0.42	0.130	34	0.29	0.88
	3C	15	0	0.30	0.31	0.33	0.058	19	0.21	0.41
Boron	3A	20	6	<4.6	<4.52	5.55	3.46	77	0.39 U	9.3
	3B	20	0	7.0	6.99	7.57	1.98	28	3.7	12
	3C	15	2	<7.7	<7.37	8.89	4.38	59	0.42 U	14

Table 4-8. Summary Statistics--Regular Samples (µg/g). (5 sheets)

Analyte	Pond	Number of Samples		Median	Mean	Upper 90% Limit	Standard Deviation	Percent Coefficient of Variation	Range	
		Total	< Detection Limit						Minimum	Maximum
Cadmium	3A	20	4	<0.66	<0.78	0.90	0.42	54	0.28 U	1.6
	3B	20	1	<0.98	<1.06	1.19	0.44	41	0.31 U	1.8
	3C	15	0	1.7	1.72	1.89	0.50	29	1.0	2.5
Calcium	3A	20	0	8000	8305	9055	2524	30	3400	14000
	3B	20	0	7250	7415	7994	1949	26	3000	13000
	3C	15	0	6800	7193	7686	1419	20	5300	11000
Chloride	3A	21	21	<20	<18.2	NC	NC	NC	1 U	20 U
	3B	20	20	<20	<20	NC	NC	NC	20 U	20 U
	3C	15	15	<20	<20	NC	NC	NC	20 U	20 U
Chromium	3A	20	0	7.55	8.17	9.35	3.98	49	3.1	16
	3B	20	0	10.35	12.0	13.6	5.39	45	5.1	25
	3C	15	0	7.30	9.23	11.2	5.64	61	4.1	27
Cobalt	3A	20	0	11	12.0	12.6	2.04	17	7.0	15
	3B	20	0	13	12.2	12.8	2.07	17	7.3	15
	3C	15	0	13	12.4	13.1	1.94	16	8.1	16
Copper	3A	20	0	16	18.3	20.5	7.31	40	10	45
	3B	20	0	19	19.4	20.7	4.44	23	13	33
	3C	15	0	17	17.4	18.6	3.40	20	13	26
Cyanide	3A	11	10	<1	<0.9	NC	NC	NC	0.12 J	1 UJ
	3B	11	11	<1	<0.7	NC	NC	NC	0.1 UJ	1 UJ
	3C	9	8	<0.1	<0.4	NC	NC	NC	0.1 UJ	1 UJ

Table 4-8. Summary Statistics--Regular Samples (µg/g). (5 sheets)

Analyte	Pond	Number of Samples		Median	Mean	Upper 90% Limit	Standard Deviation	Percent Coefficient of Variation	Range	
		Total	< Detection Limit						Minimum	Maximum
Fluoride	3A	21	9	<2	<1.5	NC	NC	NC	0.6	2.2
	3B	20	13	<2	<2.1	NC	NC	NC	2 U	3
	3C	15	12	<2	<2.0	NC	NC	NC	2 U	2.2
Iron	3A	20	0	26000	24700	2.58E+04	3813	15	16000 J	29000
	3B	20	0	26000	25500	2.65E+04	3269	13	17000	30000 J
	3C	15	0	25000	25200	2.64E+04	3590	14	17000	31000
Lead	3A	21	0	3.83	4.89	5.97	3.722	76	2.1	18
	3B	20	0	3.15	5.24	6.58	4.535	87	2.2	20
	3C	11	0	2.5	4.99	8.43	8.316	167	1.8	30
Magnesium	3A	20	0	4900	5035	5385	1178	23	3800	8700
	3B	20	0	4500	4785	5142	1201	25	3600	8400
	3C	15	0	4500	4513	4711	569	13	3700	5800
Manganese	3A	20	0	340	334	350	54.3	16	250 J	440
	3B	20	0	310	322	335	42.5	13	270	410 J
	3C	15	0	300	313	329	44.3	14	250	400
Mercury	3A	21	21	<1.0	<1.0	NC	NC	NC	1.0 U	1.0 U
	3B	20	20	<1.0	<1.0	NC	NC	NC	1.0 U	1.0 U
	3C	7	7	<1.0	<1.0	NC	NC	NC	1.0 U	1.0 U
Molybdenum	3A	20	15	<1.05	<1.18	NC	NC	NC	0.96 U	2.4
	3B	20	8	<1.2	<1.25	1.34	0.30	24	0.99 U	2.0
	3C	15	11	<1.0	<1.18	NC	NC	NC	0.97 U	2.2

Table 4-8. Summary Statistics--Regular Samples (µg/g). (5 sheets)

Analyte	Pond	Number of Samples		Median	Mean	Upper 90% Limit	Standard Deviation	Percent Coefficient of Variation	Range	
		Total	< Detection Limit						Minimum	Maximum
Nickel	3A	20	0	10	10.9	12.2	4.26	39	5.9	24
	3B	20	0	11	11.3	12.2	3.01	27	8.2	21
	3C	15	0	10	10.6	11.6	2.87	27	6.8	18
Nitrate	3A	21	21	<20	<18.2	NC	NC	NC	1 UJ	20 UJ
	3B	20	20	<20	<20	NC	NC	NC	20 UJ	20 UJ
	3C	15	15	<20	<20	NC	NC	NC	20 UJ	20 UJ
pH (Field)	3A	21	0	7.	7.0	7.2	0.42	6	6	7.6
	3B	20	0	7.5	7.3	7.4	0.30	4	7	8
	3C	15	0	7.5	7.5	7.6	0.40	5	7	8.1
Potassium	3A	20	0	820	905	1007	345	38	530	1800
	3B	20	0	780	1013	1181	566	56	660	3000
	3C	15	0	860	863	925	179	21	550	1100
Selenium	3A	12	12	<0.54	<0.70	NC	NC	NC	0.49 U	1.1 UD
	3B	11	11	<0.52	<0.53	NC	NC	NC	0.50 U	0.61 U
	3C	6	6	<0.52	<0.52	NC	NC	NC	0.51 U	0.52 U
Silicon	3A	20	0	445	437.0	478	137	31	270	860
	3B	20	0	300	326.5	347	70	21	240	450
	3C	15	0	300	326.7	349	66	20	250	460
Silver	3A	20	12	<0.64	<0.75	NC	NC	NC	0.56 U	1.5
	3B	20	20	<0.61	<0.62	NC	NC	NC	0.58 U	0.70 U
	3C	15	15	<0.62	<0.62	NC	NC	NC	0.58 U	0.64 U

Table 4-8. Summary Statistics--Regular Samples (µg/g). (5 sheets)

Analyte	Pond	Number of Samples		Median	Mean	Upper 90% Limit	Standard Deviation	Percent Coefficient of Variation	Range	
		Total	< Detection Limit						Minimum	Maximum
Sodium	3A	20	0	280	349	404	186	53	170	810
	3B	20	0	405	402	445	146	36	180	710
	3C	15	0	435	479	520	117	24	270	730
Sulfate	3A	21	2	<20	<18.4	NC	NC	NC	1 U	24
	3B	20	5	<20	<22.7	NC	NC	NC	20 U	39
	3C	15	1	<20	<20.4	NC	NC	NC	20 U	26
Sulfide	3A	11	11	<0.1	<0.1	NC	NC	NC	0.1 U	0.1 U
	3B	11	10	<0.1	<0.1	NC	NC	NC	0.1 U	0.1
	3C	9	9	<0.1	<0.1	NC	NC	NC	0.1 U	0.1 U
Thallium	3A	12	12	<1.0	<1.04	NC	NC	NC	0.97 U	1.1 U
	3B	11	11	<1.0	<1.04	NC	NC	NC	1.0 U	1.2 U
	3C	6	6	<1.0	<1.00	NC	NC	NC	1.0 U	1.0 U
Vanadium	3A	20	0	67.5	64.5	68.4	13.3	21	38	86
	3B	20	0	70.5	66.2	70.6	14.9	22	34	87
	3C	15	0	68	66.9	71.1	12.1	18	38	85
Zinc	3A	20	0	49.5	47.8	49.8	6.64	14	34	60
	3B	20	0	47	46.6	47.9	4.67	10	39	56
	3C	15	0	47	46.3	48.5	6.50	14	34	57

NC Not calculated, most or all values undetected. See Appendix A data.
D Dilution.
U Analyte was not detected at the stated limit.
J The associated value is an estimated quantity.

Field duplicates are summarized in Table 4-9. Field duplicate samples aid in evaluating short-term variability of the measurement system processes and of the inherent media variability itself. They provide a second estimate of the representative concentration associated with a particular interval, and thereby allow an estimate of variability within the given measurement system. For the purposes of the Table 4-9 summary, all statistics were calculated only where pairs of values were uncensored by a reporting limit. The following two methods of summarizing variability were used:

- The average sample variance between regular/field duplicate pairs. (The square root of the variance is the standard deviation.)

- The average percent coefficient of variation between regular/field duplicate pairs.

Variability above the detection limit is also graphically displayed in Appendix B for regular/field duplicate and regular/split sample pairs uncensored by a reporting limit. Most analytes show no definitive trend between variability and concentration for results from a single laboratory; however, this is not the case when split samples are considered. This suggests that the coefficient of variation may be the preferred parameter to consider when making interlaboratory comparisons. These comparisons incorporate sources of variability between measurement systems as well as within single-laboratory systems.

Split samples provide an independent analysis to corroborate results of the primary laboratory. Table 4-9 summarizes the average "bias" of the reportable primary laboratory results by assuming that the split laboratory provides the true value. The standard deviation of the bias and number of pairs considered in the calculations are listed. The statistical significance was evaluated by determining if a 95%, two-sided confidence interval around the average also encompassed zero. The interval was based upon the t-distribution, number of bias estimates and their variability. Analyte concentrations were generally lower at the split laboratory than the primary laboratory. Therefore, decisions based on projections from the primary laboratory values should be more conservative and thus be more protective of human health and the environment. If the site is considered sufficiently clean based on these higher values, overestimation of constituents is irrelevant. However, if values suggest that dangerous waste is be present, further evaluation may be in order.

A mean bias and comparison calculations were not made when all values were reported at an undetected censored limit by either laboratory. When values were not censored at a reporting limit, they were considered in the comparisons. Alternatively for arsenic, beryllium, chromium, potassium, sodium, and gross alpha, computations were also made considering all censored concentrations equivalent to the reporting limit, (example 1.0 U = 1). The alternate results are shown in brackets. In the case of sodium, one undetected split was reported at a much higher limit and therefore unduly affected this type of comparison. No comparisons are possible for analytes not measured at both the primary and split laboratories.

Table 4-9. Field Duplicate and Split Comparison Summary[a]

Analyte (µg/g)	Field Duplicate: Regular Sample Pairs				Regular Minus Associated Field Split Sample			
	Computed on x Sample Pairs	Average Variance (S^2)	Standard Deviation (S)	Average Percent Coefficient of Variation	Mean Bias µg/g	Standard Deviation of Bias	Computed on x Sample Pairs	Statistically Significant? (α=.05)
Aluminum	7	250714.3	500.71	6.50	4082.86	1163.50	7	Y
Ammonia	-	NC	NC	NC	NA	NA	-	-
Antimony	-	NC	NC	NC	NC	NC	-	-
Arsenic	6	1.503	1.226	19.9	1.426 [1.14]	2.37 [2.04]	5 [7]	N [N]
Barium	7	126.6	11.25	11.4	28.4429	13.33	7	Y
Beryllium	7	0.0	0.02	6.20	0.07 [-0.04]	0.11 [0.31]	4 [7]	N [N]
Boron	6	1.7	1.32	10.6	NA	NA	-	-
Cadmium	7	0.3	0.51	26.8	NC	NC	-	-
Calcium	7	1465714.3	1210.67	11.4	2761.43	978.48	7	Y
Chloride	-	NC	NC	NC	NA	NA	-	-
Chromium	7	12.4	3.52	27.3	14.17 [11.04]	6.17 [5.50]	3 [7]	N [Y]
Cobalt	7	0.2	0.48	3.09	5.25	2.74	6	Y
Copper	7	3.4	1.85	9.01	9.943	3.25	7	Y
Cyanide	-	NC	NC	NC	NC	NC	-	-
Field pH	7	0.0	0.0	0.0	NA	NA	-	-
Fluoride	-	NC	NC	NC	NA	NA	-	-
Iron	7	2214285.7	1488.05	4.34	14927.1	3962.73	7	Y
Lead	7	8.995	2.999	12.2	2.2	5.45	6	N
Magnesium	7	189285.7	435.07	8.85	2645.71	816.37	7	Y
Manganese	7	464.3	21.55	5.38	145.6	48.27	7	Y
Mercury	-	NC	NC	NC	NC	NC	-	-
Molybdenum	3	0.3	0.57	31.5	NA	NA	-	-
Nickel	7	26.9	5.18	20.3	5.62	2.43	6	Y
Nitrate	-	NC	NC	NC	NA	NA	-	-
Potassium	7	8114.3	90.08	8.76	389.75 [351.28]	74.59 [205.7]	4 [7]	Y [Y]
Selenium	-	NC	NC	NC	NC	NC	-	-
Silicon	7	3828.6	61.88	12.9	NA	NA	-	-

Table 4-9. Field Duplicate and Split Comparison Summary[a]

Analyte (µg/g)	Field Duplicate: Regular Sample Pairs				Regular Minus Associated Field Split Sample			
	Computed on x Sample Pairs	Average Variance (S^2)	Standard Deviation (S)	Average Percent Coefficient of Variation	Mean Bias µg/g	Standard Deviation of Bias	Computed on x Sample Pairs	Statistically Significant? (α=.05)
Silver	-	NC	NC	NC	NC	NC	-	-
Sodium	7	3785.7	61.53	11.6	272.14 [151.1]	177.58 [299.35]	5 [7]	Y [N]
Sulfate	2	18.5	4.30	13.3	NA	NA	-	-
Sulfide	-	NC	NC	NC	NA	NA	-	-
Thallium	-	NC	NC	NC	NC	NC	-	-
Vanadium	7	13.0	3.61	4.17	45.029	14.53	7	Y
Zinc	7	8.6	2.93	4.32	25.829	5.35	7	Y
RADIONUCLIDE DATA (pCi/g)								
Gross Alpha	7	1.21	1.100	NC	-2.7 [-1.4]	1.38 [1.7]	3 [6]	N [N]
Gross Beta	7	18.78	4.334	NC	-18.35	12.88	6	Y
Strontium-90	3	1.60	1.263	NC	NC	NC	-	-
Gamma: Cs-137	2	0.015	0.121	NC	NA	NA	-	-
Gamma: Pa-234m	2	1056.25	32.500	NC	NA	NA	-	-
Gamma: Th-234	2	1.49	1.220	NC	NA	NA	-	-

[a] "U" flagged, less-than values excluded <u>except</u> for bracketed alternate figures computed under the assumption undetected values are equal to the reporting limit, (See text).
NC Not calculated, most or all values undetected--see Appendix A data.
NA Not available.

4.3 RADIOANALYTICAL RESULTS

Radioanalytical work included field screening techniques and both onsite and offsite laboratory determinations. All samples were handled as nonradioactive based on field screening and onsite analyses. Offsite analyses included gross alpha, gross beta, gamma, and ^{90}Sr determinations. The primary laboratory reported EPA 900.0 was used for alpha, beta and gamma, and EPA 906 for ^{90}Srdeterminations. Several samples were submitted to the split laboratory for radiologic analyses. These particular analyses were subcontracted to another laboratory. Methods were identified only by the laboratory-specific procedure numbers PRO-032-15 for total alpha or beta determinations, PRO-042-5 for gamma scans, and PRO-032-25 for strontium-90 assays.

The above parameters are not believed to be regulated under current and applicable RCRA regulations. Unvalidated radiological data are presented in Appendix A for information only. Field duplicate and split summaries are presented at the end of Table 4-9. The results of the gamma spectra analyses were not comparable between the two project laboratories. Different radionuclides were reported by the two measurement systems.

Gross gamma borehole logging did not reveal any obvious anomalies. Without radionuclide-specific detection capabilities, it is not possible to judge whether any areas of slightly elevated gross counts are caused by radionuclide contamination or localized natural background differences.

4.4 GEOLOGY AT THE VADOSE BOREHOLES

The geology at the three boreholes consisted of mixed sands, sandy gravels, and gravelly sands typical of the Hanford formation in this area. Lithologic descriptions of the three boreholes were recorded in the project borehole logs. A general classification associated with each sample has been listed in the sample key, Table 3-4.

Soil from the 3A Pond borehole was somewhat sandier and had less gravels than soil from the other locations reflecting the fining westward character of the Hanford formation in the B-Pond area. The water table at the 3A Pond borehole was in a sandy gravel, probably still in the Hanford formation, while at the 3B Pond borehole, a saturated silt lens at 116.5 ft most likely marks the top of the Ringold formation. The 3C Pond borehole did not penetrate deep enough to pass through the Hanford formation into the Ringold, which also underlies this area.

Undisturbed surface soil surrounding the B-Pond system is predominately eolian-deposited material. It lacks the cobble and coarse gravels common to the flood-deposited Hanford formation. Earlier Phase 1 sampling collected one class of background samples from the upper foot of soil in sagebrush areas surrounding the B-Pond system. Other background samples collected, as part of the same study, were from the surface of an adjacent unused contingency pond excavation. These two groups of samples were treated separately in the Phase 1 analysis when it became evident that the values of the combined set differed significantly from a normal distribution.

4.5 SOIL PHYSICAL PROPERTIES

Characterization work at the three boreholes included a suite of physical properties testing. Samples collected for physical properties testing were not those analyzed for chemical constituents. Testing was performed at an onsite laboratory. Determinations included specific gravity, percent moisture content, grain size distribution by sieve analysis, hydraulic conductivity, and porosity. Deviation from basic theoretical relationships showed moisture retention curve results were not satisfactory.

Six samples were collected from the borehole at the 3A Pond; 11 at the 3B Pond; and 3 at the 3C Pond. Test requests were not the same for each sample, particularly where similar lithologies were present at several sample horizons. Table 4-10 shows physical properties data for the three boreholes. Some determinations were not performed because the samples were unsuitable. Table 4-11 shows sieve data results. A hydrometer analysis was performed for most samples on fractions passing through a number 200 sieve. This additional data was not included in Table 4-11.

Specific gravity of all samples was well within expected values, ranging from 2.69 to 2.82 g/cm^3. Sieve analysis data showed grain size distributions typical of the Hanford formation in this area. Most samples were classified as sandy gravels and were poorly sorted showing a fairly wide range in grain size. Porosity ranged from 20.50 to 37.71 percent. These values are relatively high, but well within the range for the sandy gravels of the Hanford formation, which are relatively uncompacted and uncemented.

Moisture content varied widely between physical property samples and was not correlated with depth of the sample. Moisture contents of 15 to 18 percent in the 3A Pond borehole indicate saturated or nearly saturated sediments at intermediate depths. This borehole was drilled over a filled area on the edge of the 3A Pond. At the 3B Pond borehole, moisture contents were generally lower, between 2.44 and 7.16 percent above the water table and 20.88 percent in the sample taken at the water table. The 3B Pond has not been used for wastewater disposal since 1985. Moisture content in physical samples from the 3C Pond borehole ranged from 1.07 to 9.6 percent.

Hydraulic conductivity values determined in the laboratory reflect the generally coarsening grain size of the Hanford formation from northwest to southeast at the B-Pond area. The 3A Pond borehole, drilled in the northwest, has the finer grain sizes and the lower measured hydraulic conductivity values, around 3 to 5 cm/sec. Hydraulic conductivity measurements on samples from the 3B Pond borehole to the southeast are higher, around 1E-4 to 1E-3 cm/sec. One measurement of 3E-8 was obtained on the clay silt sample taken at the water table from 3B Pond. No measurements were made on the single 3C Pond sample submitted for this determination because the sample was unsuitable.

Table 4-10. Physical Properties B-Pond Phase 3 Soil Samples.

Sample	Pond	Interval	Specific Gravity g/cm^3	Moisture (percent)	Hydraulic Conductivity cm/sec	Porosity (percent)
B00FL2	3A	20.4 - 23	NR	7.19	NR	NR
B00GS6	3A	51.13 - 54.10	2.81	17.13	4.3 E-5	36.14
B00GS7	3A	53.0 - 55.6	2.81	15.4	1.1 E-5	33.46
B00GT0	3A	67.5 - 69.65	2.81	NR	4.8 E-5	30.32
B00GT2	3A	75.7 - 77.90	2.72	18.01	NR	NR
B00GT9	3A	101.6 - 102.2	NR	4.44	NR	NR
B00GW2	3B	8.2 - 10.85	2.82	7.16	9.8 E-4	32.13
B00GW7	3B	14.4 - 17.1	2.81	3.9	7.6 E-4	25.14
B00GX0	3B	25.9 - 29.6	2.82	2.99	2.36 E-4	23.56
B00GX1[a]	3B	25.9 - 29.6	NR	NR	NR	NR
B00GX7	3B	60 - 62.6	No test-sample uncompacted	5.35	No test-sample uncompacted	No test-sample uncompacted
B00GX9	3B	72.25 - 74.15	2.75	4.02	NR	20.50
B00GZ0	3B	83.0 - 85.9	2.76	3.03	5.4 E-3	29.87
B00GZ1	3B	83.0 - 85.9	2.74	NR	NR	NR
B00GZ4	3B	103.9 - 106.35	2.76	2.44	NR	22.64
B00GZ5	3B	103.9 - 106.35	2.75	3.92	NR	NR
B00GZ7	3B	117.5 - 119.3	2.69	20.88	3.0 E-8	35.76
B00H08	3C	11.7 - 13.7	No test-sample uncompacted	9.6	No test-sample uncompacted	No test-sample uncompacted
B00H12	3C	25.6 - 27.8	2.81	1.07	NR	37.71
B00H13[b]	3C	25.6 - 27.8	NR	NR	NR	NR
B00H22	3C	76.9 - 79.4	NR	5.24	NR	No test-sample uncompacted

[a] Sample only submitted for moisture-retention analysis.
[b] Sample only submitted for grain-size analysis.
NR Not requested

Table 4-11. Grain Size Analysis[a].

			Cumulative Percent Passed Sieve Size -- Opening in Inches or Number of Mesh per Inch												
Sample	Pond	Depth	2.5	2	1.5	1	3/4	1/2	3/8	#4	#10	#40	#60	#100	#200
B00FL2	3A	21.5	100	92.6	82.9	64.4	58	48.7	44.2	37.1	29.5	10.9	7.3	5.5	4.1
B00GS6	3A	52	100	100	100	100	100	100	100	100	99.1	62.7	23.5	11.6	7
B00GS7	3A	54.5	100	100	100	100	100	100	100	100	100	80.7	60.3	43.7	29.7
B00GT2	3A	77	100	100	100	100	100	100	100	100	99.8	91.9	79.3	59.4	31.4
B00GW2	3B	9.5	100	100	100	100	97	94.9	92.1	86.3	81.5	60.8	34.1	15.7	7.8
B00GW7	3B	16	100	100	100	100	100	100	93.1	83.1	68.1	31.1	16.1	9.9	6.6
B00GX7	3B	61.5	100	100	100	100	100	97.7	96.8	93.3	87.3	24.4	12.7	8.4	5.2
B00GX9	3B	73	100	100	100	92.1	85	76.4	70.4	60.9	51.7	28.4	22.3	18.3	14.3
B00GZ0	3B	84.5	100	100	100	100	98	88.2	81.3	66.8	52.3	29.3	23.3	18.9	14.2
B00GZ1	3B	84.5	100	100	96.3	89.6	85.7	80.9	77.9	71.5	61.5	29.4	21.4	16.4	11.7
B00GZ4[b]	3B	105	100	100	81.7	67.2	61.9	54.9	48.1	37.6	NR	NR	NR	NR	NR
B00GZ5	3B	105	100	97.6	94.1	83.7	77.5	69.8	65.5	56.8	46.9	28.4	23.1	19	14.5
B00GZ7	3B	118.5	100	100	100	100	100	100	100	100	100	98.9	98.1	93.3	74.9
B00H08	3C	12.5	100	100	92.8	86.6	81.5	76.4	73.5	68.8	63.1	13.9	8	5.8	4.2
B00H12	3C	26.5	100	57.1	52.3	39	29.3	19.5	15.2	9.8	6.6	2.7	1.9	1.4	1.1
B00H13	3C	26.5	100	88.5	83.6	---	62	---	43	32.2	22.8	12.3	9.7	7.9	5.8
B00H22	3C	78	100	100	92.9	75.4	67.3	57.2	49.2	38.2	28	12.8	9.8	7.6	5.7

[a]Washed fine grading also performed for most samples on material finer than No. 200 sieve.
[b]Sieve analysis not requested but performed to no. 4 for specific gravity determination.

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5.0 DISCUSSION AND COMPARISON TO DANGEROUS WASTE CRITERIA

The demonstration of clean closure requires that no 40 CFR Part 261 Appendix VIII constituents remain in the soils, vadose zone, or groundwater above regulatory agency recommended limits (EPA 1989). These limits include consideration of water quality standards and criteria, health-based limits based on published reference doses or carcinogenic potency factors, or site-specific agency-approved health advisories (52 FR 8706). The scope of analytical requirements may be reduced from all Appendix VIII constituents when it is reasonable to exclude some based on knowledge of past activities at the unit. In consideration of the potential effect of a waste on human health or the environment, EPA's proposed corrective action rules (55 FR 30798) expand the meaning of the term hazardous constituents to include those identified in 40 CFR Part 264 Appendix IX, commonly known as the Groundwater Monitoring List. Washington State's "Dangerous Waste Constituents List" (WAC 173-303-9905) includes additional constituents not found on the 40 CFR Part 261 Appendix VIII list. Clean closure will require that concentrations of such constituents pose no substantial threat to human health or the environment when left unmanaged.

For several years, two published statements have provided the fullest interpretation of EPA policy currently available concerning requirements applicable to units undergoing clean closure. Those two accounts are in the Federal Register (FR) starting at 52 FR 8704 and again starting at 53 FR 9944. The EPA has been working on issuance of a clean closure guidance document, however it is not known to be available at this time. It is anticipated that many aspects will reflect policy expressed in the proposed RCRA Corrective Action Rule issued July 27, 1990, (55 FR 30798). Recent legal rulings regarding the "mixture" and "derived-from" rule have led EPA to propose a concentration-based exemption criteria (CBEC) that would fundamentally change the application of RCRA Subtitle C (see 57 FR 21450). The proposal will also affect soil contaminated with listed waste, which is currently considered hazardous by the "contained-in" policy.

Surface impoundments containing unremoved regulated hazardous waste cannot remain open to receive nonhazardous waste (54 FR 33388). The 3A Pond, 3B Pond, and 3C Pond have been classified part of a RCRA TSD unit; however, no waters, sediments, or soils have demonstrated characteristics or criteria of a dangerous waste. A dangerous waste must meet one or more of the characteristics or criteria described in WAC 173-303.

Compounds listed on the Part A permit as being occasionally discharged into the B-Pond system include common acids and bases. Such chemicals are no longer hazardous when they lose the characteristic that caused them to be a hazard. In the case of corrosivity, a waste is regulated when the pH is less than or equal to 2 or greater than or equal to 12.5. In the case of solids, regulated status is determined on the solution derived by mixing with an equal weight of water. Both field pH data and pH reported in conjunction with BNA analyses at the split laboratory showed pH within criteria. Also, as evidenced by the aquatic life and vegetation at the unit, the soils would not be expected to exceed these criteria.

Cadmium nitrate was known to have been discharged at least twice since 1983 (during the operation of the B-Pond expansion ponds) to a TSD unit

feeding B-Pond (DOE 1990, Table 4-3). In sufficient concentration, this compound may cause a waste to be sufficiently toxic for regulation as a dangerous waste. Earlier Phase 1 studies did not indicate elevated total cadmium concentrations in surface sediments/soils of 3A, 3B, or 3C Ponds (WHC 1991). Phase 3 results found average concentrations at the 3A, 3B, and 3C Ponds boreholes to be <0.78, <1.06, and 1.72 μg/g, respectively. These figures are well below those found at sagebrush sites and contingency-pond Phase 1 backgrounds. Phase 1 background tolerance limits were established at 8.23 and 9.58 μg/g, respectively. No estimate of interlaboratory variability between the laboratories used for Phase 1 and Phase 3 analysis is available. A common cadmium range for soil is 0.1 - 7 μg/g (Shields 1988, p 101). Cadmium was undetected in all seven inorganic split samples. All values were reported $\leq$ 1.0 μg/g.

Several compounds designated in the closure plan as having been disposed of at B-Pond include elements such as sodium and potassium, the compound ammonium, or the common anions nitrate, fluoride, and sulfate. These constituents are not listed hazardous waste constituents. They may cause a waste to be regulated as a dangerous waste only when present in extreme (i.e. toxic or deleterious) concentrations or as indicators of specific listed wastes. Phase 3 data demonstrates this is not the case for vadose zone soils in the 3A, 3B, and 3C Ponds.

Table 5-1 lists Phase 3 inorganic analytes that are listed in Washington State's "Dangerous Waste Constituents List" (WAC 173-303-9905). Concentrations are compared, where available, to two criteria: Phase 1 thresholds and concentrations meeting criteria for action levels under EPA's proposed RCRA Subpart S (Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities--55 FR 30798). Each lobe is characterized by a mean concentration assumed to have a normal distribution of error. (Statistics are based on all regular samples; field and laboratory QC samples were not included in calculating averages or maximum values.) An upper 90 percent confidence limit is compared to Phase 1 threshold values. Thresholds were based on Phase 1 surface samples from areas of natural vegetation surrounding the TSD or an unused excavated dry contingency-pond area. For several constituents all Phase 1 samples for each background were undetected at concentrations greater than the contractual detection limit (CDL). In those cases the respective detection limits were given, as footnoted. Though the *representative* value is clearly defined by regulation and guidance as the *average* (40 CFR 260.10, or SW-846 Ch. 9, [EPA 1986]), a conservative comparison of the maximum reported regular sample value is also compared to EPA's example soil action levels.

Table 5-1. Evaluation of Inorganic Dangerous Waste Constituents in all Regular Samples.

Analyte	Pond	Frequency of Non-detects	Mean	Upper 90% Limit	Maximum Observation	Phase 1 Threshold Concentrations µg/g	Propose RCRA Corrective Action Level-Soil[d] mg/Kg	Typical Soil Range[a] (ppm)	Mean Upper Limit Above Both Phase 1 Thresholds?	Maximum Above EPA Example Soil Action Level?[d]
Antimony	3A	16/20	<5.8	NC	14	<10.0[b]	30	0.6 - 10	--	NO
	3B	20/20	<5.1	NC	5.8 U				--	NO
	3C	15/15	<5.2	NC	5.3 U				--	NO
Arsenic	3A	0/21	1.74	1.97	4.2	4.91 / 7.59	80	0.1 - 40	NO	NO
	3B	1/20	<2.25	2.90	7.2				NO	NO
	3C	0/11	1.46	1.76	2.5				NO	NO
Barium	3A	0/20	71.1	74.1	91	NC[c]	4000	100 - 3500	--	NO
	3B	0/20	77.6	80.7	96				--	NO
	3C	0/15	80.5	90.6	170				--	NO
Beryllium	3A	0/20	0.36	0.38	0.53	<0.5[b]	0.2	0.1 - 40	--	YES
	3B	0/20	0.38	0.42	0.88				--	YES
	3C	0/15	0.31	0.33	0.41				--	YES
Cadmium	3A	1/20	<0.78	0.90	1.6	8.23 / 9.58	40	0.01 - 7	NO	NO
	3B	1/20	<1.06	1.19	1.8				NO	NO
	3C	0/15	1.72	1.89	2.5				NO	NO
Chromium	3A	0/20	8.17	9.35	16	12.86 / 8.78	400 (as Cr VI)	5 - 3000	NO	NO
	3B	0/20	12.0	13.6	25				YES	NO
	3C	0/15	9.23	11.2	27				NO	NO
Cyanide	3A	10/11	<0.9	NC	1 UJ	<0.5[b]	2000	NA	--	NO
	3B	11/11	<0.7	NC	1 UJ				--	NO
	3C	8/9	<0.4	NC	1 UJ				--	NO
Lead	3A	0/21	4.89	5.97	18	15.16 / 7.13	NA	2 - 200	NO	--
	3B	0/20	5.24	6.58	20				NO	--
	3C	0/11	4.99	8.43	30				NO	--

Table 5-1. Evaluation of Inorganic Dangerous Waste Constituents in all Regular Samples.

Analyte	Pond	Frequency of Non-detects	Mean	Upper 90% Limit	Maximum Observation	Phase 1 Threshold Concentrations µg/g	Propose RCRA Corrective Action Level-Soil[d] mg/Kg	Typical Soil Range[a] (ppm)	Mean Upper Limit Above Both Phase 1 Thresholds?	Maximum Above EPA Example Soil Action Level?[d]
Mercury	3A	21/21	<1.0	NC	1.0 U	<0.2[b]	20	0.01 - 0.8	--	NO
	3B	20/20	<1.0	NC	1.0 U				--	NO
	3C	7/7	<1.0	NC	1.0 U				--	NO
Nickel	3A	0/20	10.9	12.2	24	12.3 / 22.0	2000	5 - 1000	NO	NO
	3B	0/20	11.3	12.2	21				NO	NO
	3C	0/15	10.6	11.6	18				NO	NO
Selenium	3A	12/12	<0.70	NC	1.1 UD	<1.0[b]	NA	0.1 - 2	--	--
	3B	11/11	<0.53	NC	0.61 U				--	--
	3C	6/6	<0.52	NC	0.52 U				--	--
Silver	3A	12/20	<0.75	NC	1.5	<1.0[b]	200	0.01 - 5	--	NO
	3B	20/20	<0.62	NC	0.70 U				--	NO
	3C	15/15	<0.62	NC	0.64 U				--	NO
Thallium	3A	12/12	<1.04	NC	1.1 U	<1.0[b]	NA	0.1 - 0.8	--	--
	3B	11/11	<1.04	NC	1.2 U				--	--
	3C	6/6	<1.00	NC	1.0 U				--	--

[a] Source: Shields 1988 except for thallium from WHC 1991.
[b] All Phase 1 samples less than the stated contract detection limit--no threshold calculated.
[c] Threshold not calculated for total barium. All Phase 1 background values <105 µg/g.
[d] 55 FR 30798
NA Not applicable.
NC Not calculated.

Action levels are established for hazardous constituents for which data are sufficient to establish protective health- or environmental-based limits. "The Agency believes that it will very rarely be necessary to set action levels at background," (55 FR 30820). Action levels for soil generally assume exposure through consumption of soil contaminated with the hazardous constituent. Exposure assumptions are given in the proposed rule, and are based on a residential use pattern, including long-term direct contact and soil ingestion by children.

Action levels serve as rebuttable conservative presumptions that further study is necessary. Concentrations would "typically be measured on the surface (generally the upper two feet of earth)," (55 FR 30819). The EPA intends to use these levels as a presumption that a corrective measures study (CMS) may be necessary for contaminated deep soils, too. The permittee may attempt to rebut this presumption by demonstrating that there is no threat to human health and the environment from such deep soil contamination, either through direct contact or migration to aquifers or surface water.

Concentrations below capabilities of approved measurement methods designed to determine whether or not a sample contains a given dangerous waste constituent are presumed to be adequately protective of human health and the environment, i.e. satisfy the intent of regulation. Mercury, selenium, thallium, and cyanide were below contractual quantitation limits for all Phase 3 samples. Antimony and silver concentrations in all regular samples from the boreholes of 3B and 3C Ponds were also undetected at the stated limits. Likewise, all Phase 1 background measurements for all these analytes were below their respective reporting limits.

Antimony was detected in 4 of the 20 regular Phase 3 samples. The median sample value was undetectable (typically < 6 ppm). For comparison, the March 1990 EPA CLP Statement of Work CRDL for antimony in soil and sediment is 12 ppm. The maximum antimony concentration found in any single Phase 3 sample (14 μg/g), an extreme of the data set, was only slightly above a referenced typical natural range (0.6 - 10 ppm) and less than half the level EPA has proposed as protective of human health and the environment (30 mg/Kg). (No Phase 1 TSD or background soil sample was found at or above the CDL of 10.0 μg/g.) All Phase 3 split and field duplicate samples were consistent with the associated regular samples; each reported antimony as undetected.

Several other elements of Table 5-1 deserve mention. Beryllium was not found in any Phase 1 site or background samples at or above 0.5 μg/g, the CDL. This Phase 3 sampling had lower reporting limits. All regular Phase 3 samples were reported as detects, but values were similar. The vast majority were less than 0.5 μg/g. Split sample results suggested no significant primary laboratory bias. The EPA example action level of 0.2 mg/Kg (55 FR 30798) is frequently exceeded. Concentrations found in the vadose zone samples are entirely within the range of natural concentrations expected in the area based upon ranges found in the *Characterization and Use of Soil and Groundwater Background for the Hanford Site* (WHC-MR-0246, Rev 1).

Chromium Phase 1 threshold concentrations were frequently exceeded in the vadose zone. The highest average was found beneath the least used pond, the 3B Pond. The pond area used longer, the 3C Pond, had an intermediate concentration, and the oldest and most used of the expansion ponds, the 3A Pond, had the lowest average chromium concentration. This casts doubt on the premise

that wastewater disposal deposited hazardous concentrations of chromium to the land. The highest reported concentration (27 μg/g) was in the lowest 3C Pond sample (~80 ft); the associated split (8.5 J μg/g) was also the highest of seven splits. The Phase 3 data imply a slight natural increase in concentration with depth at B-Pond, contrary to the pond and near-surface sediments being a hazardous waste. Naturally occurring typical soil ranges have been referenced at 5-3000 ppm (Shields 1988).

High chromium concentrations in a waste may cause it to be regulated because of toxicity. Chromium is considered more toxic when present as Cr(VI). This is why the action level of Table 5-1 is based on Cr(VI). Chromium is most stable as Cr(III). It is most commonly found in oxidation states 0, III, and VI.

Chromium was analyzed simultaneously with numerous other elements that showed a positive bias against the split laboratory results. A possible interelement correlation may exist because of common measurement system factors, (for example: digestion conditions). Comparisons between laboratories are confounded by left-censored data at the reporting limit. Using only samples that each laboratory found above their respective reporting limits (as if a random sample), insufficient information is available to contradict a null hypothesis of no significant bias; however, most samples at the split laboratory are undetected while corresponding primary laboratory samples are reported much higher. Under the assumption that the true nondetect split sample concentrations equal the reporting limit, the primary positive bias estimate would be minimized. The average bias in this case would be about 11 μg/g, which is substantial when compared to the average reported concentrations.

Although validation did not detect accuracy problems via review of laboratory blanks or matrix spike recoveries, the validation did not consider field silica sand samples. A review of the seven silica sand blanks shows two of the seven were reported positive for Cr; one at 1.3, the other at 7.2 μg/g. The remainder were <1 μg/g. Silica sand was not submitted to the split laboratory. However, all 11 Phase 1 values of similar silica sand were <1 μg/g.

The data suggest a potential positive bias in the concentrations reported by the primary laboratory. These factors should be considered in comparing Phase 1 to Phase 3 chromium concentrations. Nevertheless, the important point is not to promote more study but identify if there is a potential threat to human health or the environment. Acceptance of an inflated characteristic concentration will not change the conclusion of "no threat." The reported concentrations are more than an order of magnitude below limits the EPA has quoted as protective trigger levels for further investigation (upper 90 percent limit = 13.6 μg/g total Cr vs. 400 μg/g all Cr[VI]). Washington State has determined similar levels to be protective of human health and the environment. The state has promulgated environmental regulations setting "Method A" chromium cleanup levels for industrial soil at 500 μg/Kg (WAC 173-340-745). The most critical path is considered to be via inhalation. The level is based on exposure assumptions of breathing contaminated dust at the sites where hazardous chromium compounds were formerly released to the environment.

No designated, listed wastes are known to have been directly discharged to the B-Pond system while the expansion lobes were in service. Hydrazine is the sole designated, listed waste known to have been potentially discharged indirectly to the B-Pond system during operation of any of the B-Pond expansion ponds (DOE 1990). Five releases of this compound were documented to a TSD unit supplying B-Pond, the 216-A-29 Ditch--the latest in 1986 (DOE 1990). Hydrazine is a strong oxygen scavenger and will react with oxygen in water to form NH_4OH and nitrogen gas. It was not specifically addressed in Phase 3 because it was not expected to be present at the expansion ponds because of the extreme dilution and relatively age of the releases. Furthermore, no SW-846 (EPA 1986) method is specified to measure this constituent in soil. Air is the typical medium of concern for this compound. Several studies were found addressing the fate of hydrazine in aquatic environments. In one study, river and pond water were adjusted to the same dissolved oxygen level and temperature, and 5 mg/L of hydrazine was added. Hydrazine residues in river water containing substantial amounts of organic matter were 22.6 percent, 96 percent, and 100 percent degraded after approximately one hour, one day, and two days, respectively. In the pond water, residues were 20 percent, 74 percent, 80 percent, and 81.6 percent degraded after approximately one hr, one day, two days, and three days, respectively (Slonim and Gisclard 1976). Hydrazine has been used experimentally in vitro as medication for sickle cell disease (HSDB 1992[1]). It has been found to be a natural product of nitrogen fixation by azotobacter algae (HSDB 1992[1]). It has also been measured in cigarette smoke (HSDB 1992[1]).

Most Appendix VIII (40 CFR 261) and Dangerous Waste (WAC 173-303) constituents are organic compounds. All investigated organic analytes were undetectable at representative site soil concentrations.

There is no indication that any investigated pesticide, PCB, herbicide, organophosphorous pesticide, dioxin, or furan is present in the vadose zone soil at the borehole sites. Several volatile and semivolatile target compounds were occasionally reported at concentrations less than PQL and/or contract required detection limit (CRDL). Tentatively identified volatile and semivolatile compounds were also noted in site samples, but performance on field duplicates, split, and silica sand samples suggests such occurrences are not representative of site soils.

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6.0 CONCLUSION

The B-Pond Phase 3 vadose zone investigation does not indicate hazardous levels of waste constituents exist in the vadose zone of the 216-B-3A, 216-B-3B, or 216-B-3C Ponds. Furthermore, results do not suggest dangerous, listed wastes exist in detectable, but dilute concentrations in the vadose zone. Nondangerous waste by definition, does not meet the statutory criteria of a "dangerous" or "hazardous" waste. Based on characteristics (ignitability, corrosivity, reactivity, toxicity) or criteria (carcinogenic, persistent, toxic), no compounds, organic or inorganic, were found in sufficient representative concentrations to cause the investigated vadose soils to be reasonably regulated as a dangerous waste.

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APPENDIX A

B-POND PHASE 3 SOIL DATA

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LIST OF TERMS

AAS	atomic absorbtion spectroscopy
CLP	contract laboratory program
CRQL	contract-required detection limit
ICP	inductively coupled plasma
MS	matrix spike
MSD	matrix spike duplicate
PCB	polychlorinated biphenyl
TIC	tentatively identified compound
Westinghouse Hanford-OSM	Westinghouse Hanford Company-Office of Sample Management

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Introduction

Each table in Appendix A typically is several pages long. Samples will be listed along one axis and analytes along the other. Where analytes are listed along the left-hand margin, results from a single group of samples will be visible for several pages before the end of the analyte list is reached. An analyte list appears in the same order for another set of samples until all results are reported and the table ends. In other tables, each analyte is listed along the top of a table and all samples are listed along the left-hand margin for several pages until all are reported and the table ends.

Data appearing in this appendix have been validated by the Westinghouse Hanford Company Office of Sample Management (Westinghouse Hanford-OSM). The primary exceptions are radiological characterization data, which are presented as is for information only. Validation is a systematic review of laboratory performance and execution of protocol that may qualify data based on holding time, matrix spike (MS), matrix spike duplicate (MSD) analysis, surrogate recovery, analytical blank performance, calibration, or any other method-specific requirements. As a result of data validation, qualification flags placed by the reporting laboratory may be replaced, supplemented or deleted. Westinghouse Hanford validation procedures can be found in WHC-CM-5-3 (WHC 1990). Many sample results were qualified according to holding time criteria established for water samples. This represents a conservative approach to validation. It is questionable if these time periods, especially in the case of extraction for organics, for soil matrices affect quality.

Several common concentration flags appear in the following tables. These include:

"U" The analyte was undetected. (The associated number represents an upper bound estimate of an undetected analyte, usually a concentration corresponding to an established sample quantitation limit.)

"J" The associated value is an estimated quantity. (This may be caused by any of a wide number of factors. It should alert the user that the associated value may have a slightly wider than usual *potential* for error.)

The above two flags may be combined and/or appear in conjunction with other qualifiers. The meaning of other flags will be listed at the end of each multipage table, as necessary. Results of inorganic constituents from the primary laboratory were reported to Westinghouse Hanford as "< *x* μg/g" when undetected. For consistency in this report, these inorganic constituents reported by the primary laboratory are presented as the equivalent "*x* U μg/g". The CLP "Q" (quality) flags and "M" (method) flags reported on contract laboratory program (CLP) Form 1 are not shown for split samples because this information was not reported in the same format for those samples analyzed by SW-846 (EPA 1986) methods at the primary laboratory. Concentration or "C" flags are shown. One laboratory-reported concentration flag appearing ONLY with CLP inorganic split sample results is a "B" flag. This indicates when

the corresponding inorganic sample result is above an instrument detection limit but below the CLP contract-required detection limit (CRQL).

After each table, a brief summary of the reasons for Westinghouse Hanford data qualification will appear. Only concentration qualifiers added or altered by Westinghouse Hanford-OSM as a result of data validation will be addressed--not explanations for displayed standard laboratory-reported qualifiers. The explanation will first address samples analyzed at the primary laboratory--regular, field duplicate, and silica sand samples--then, if applicable, the split samples analyzed at an independent laboratory. Split samples were validated to criteria consistent with employed CLP procedure, except for radiological analyses, as already mentioned.

Most tables list some additional information about each reported field sample. Terms used to describe sample type include Regular (Reg), Field Duplicate (FDup), Field Split (Split), and clean Silica Sand (Blank) as described in the attached report. The terms 3A, 3B, and 3C Pond refer to the 216-B-3A Pond, 216-B-3B Pond, and 216-B-3C Pond, respectively. Sample depths are given as depth from the surface at the borehole to a midpoint of the sampled interval. ALL DEPTHS ARE LISTED IN FEET UNLESS SPECIFIED OTHERWISE.

Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
alpha BHC	319-84-6	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
beta BHC	319-85-7	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
delta BHC	319-86-8	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
gamma BHC (Lindane)	58-89-9	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
Heptachlor	76-44-8	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
Aldrin	309-00-2	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
Heptachlor Epoxide	1024-57-3	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
Endosulfan I	959-98-8	14 UJ	13 UJ	13 UJ	13 UJ	13 UJ	14 UJ	12 UJ	13 UJ	13 UJ	16 UJ
Dieldrin	60-57-1	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
4,4'-DDE	72-55-9	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
Endrin	72-20-8	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
Endosulfan II	33213-65-9	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
4,4'-DDD	72-54-8	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
Endosulfan Sulfate	1031-07-8	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
4,4'-DDT	50-29-3	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
Methoxychlor	72-43-5	140 UJ	130 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ
Endrin Ketone	53494-70-5	27 UJ	27 UJ	25 UJ	26 UJ	26 UJ	27 UJ	24 UJ	25 UJ	25 UJ	31 UJ
alpha-Chlorodane	5103-71-9	140 UJ	130 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ
gamma-Chlorodane	5103-74-2	140 UJ	130 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ

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Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
Toxaphene	8001-35-2	270 UJ	270 UJ	250 UJ	260 UJ	260 UJ	270 UJ	240 UJ	250 UJ	250 UJ	310 UJ
Arochlor 1016	12674-11-2	140 UJ	140 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ
Arochlor 1221	11104-28-2	140 UJ	140 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ
Arochlor 1232	11141-16-5	140 UJ	140 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ
Arochlor 1242	53469-21-9	140 UJ	140 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ
Arochlor 1248	12672-29-6	140 UJ	140 UJ	130 UJ	130 UJ	130 UJ	140 UJ	120 UJ	130 UJ	130 UJ	160 UJ
Arochlor 1254	11097-69-1	280 UJ	280 UJ	260 UJ	260 UJ	260 UJ	280 UJ	240 UJ	260 UJ	260 UJ	320 UJ
Arochlor 1260	11096-82-5	280 UJ	280 UJ	260 UJ	260 UJ	260 UJ	280 UJ	240 UJ	260 UJ	260 UJ	320 UJ

Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	53	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
alpha BHC	319-84-6	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
beta BHC	319-85-7	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
delta BHC	319-86-8	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
gamma BHC (Lindane)	58-89-9	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
Heptachlor	76-44-8	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
Aldrin	309-00-2	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
Heptachlor Epoxide	1024-57-3	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
Endosulfan I	959-98-8	9.7 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	13 UJ	60 UJ	60 UJ	62 UJ
Dieldrin	60-57-1	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
4,4'-DDE	72-55-9	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
Endrin	72-20-8	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
Endosulfan II	33213-65-9	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
4,4'-DDD	72-54-8	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
Endosulfan Sulfate	1031-07-8	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
4,4'-DDT	50-29-3	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
Methoxychlor	72-43-5	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	600 UJ	600 UJ	620 UJ
Endrin Ketone	53494-70-5	19 UJ	26 UJ	25 UJ	26 UJ	25 UJ	25 UJ	25 UJ	120 UJ	120 UJ	120 UJ
alpha-Chlorodane	5103-71-9	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	600 UJ	600 UJ	620 UJ
gamma-Chlorodane	5103-74-2	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	600 UJ	600 UJ	620 UJ

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Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	53	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
Toxaphene	8001-35-2	190 UJ	260 UJ	250 UJ	260 UJ	250 UJ	250 UJ	250 UJ	1200 UJ	1200 UJ	1200 UJ
Arochlor 1016	12674-11-2	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	120 UJ	120 UJ	120 UJ
Arochlor 1221	11104-28-2	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	120 UJ	120 UJ	120 UJ
Arochlor 1232	11141-16-5	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	120 UJ	120 UJ	120 UJ
Arochlor 1242	53469-21-9	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	120 UJ	120 UJ	120 UJ
Arochlor 1248	12672-29-6	97 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	130 UJ	120 UJ	120 UJ	120 UJ
Arochlor 1254	11097-69-1	190 UJ	260 UJ	260 UJ	260 UJ	260 UJ	260 UJ	260 UJ	240 UJ	260 UJ	240 UJ
Arochlor 1260	11096-82-5	190 UJ	260 UJ	260 UJ	260 UJ	260 UJ	260 UJ	260 UJ	240 UJ	260 UJ	240 UJ

Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
alpha BHC	319-84-6	62 UJ	62 UJ	8.0 UJ	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
beta BHC	319-85-7	62 UJ	62 UJ	8.0 UJ	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
delta BHC	319-86-8	62 UJ	62 UJ	8.0 UJ	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
gamma BHC (Lindane)	58-89-9	62 UJ	62 UJ	8.0 UJ	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
Heptachlor	76-44-8	62 UJ	62 UJ	8.0 U	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
Aldrin	309-00-2	62 UJ	62 UJ	8.0 UJ	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
Heptachlor Epoxide	1024-57-3	62 UJ	62 UJ	8.0 U	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
Endosulfan I	959-98-8	62 UJ	62 UJ	8.0 UJ	62 UJ	63 UJ	63 UJ	140 UJ	92 UJ	120 UJ	130 UJ
Dieldrin	60-57-1	120 UJ	120 UJ	16 U	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
4,4'-DDE	72-55-9	120 UJ	120 UJ	16 UJ	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
Endrin	72-20-8	120 UJ	120 UJ	16 U	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
Endosulfan II	33213-65-9	120 UJ	120 UJ	16 U	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
4,4'-DDD	72-54-8	120 UJ	120 UJ	16 UJ	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
Endosulfan Sulfate	1031-07-8	120 UJ	120 UJ	16 UJ	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
4,4'-DDT	50-29-3	120 UJ	120 UJ	16 UJ	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
Methoxychlor	72-43-5	620 UJ	620 UJ	80 U	620 UJ	630 UJ	630 UJ	1400 UJ	920 UJ	1200 UJ	1300 UJ
Endrin Ketone	53494-70-5	120 UJ	120 UJ	16 U	120 UJ	130 UJ	130 UJ	290 UJ	180 UJ	250 UJ	250 UJ
alpha-Chlorodane	5103-71-9	620 UJ	620 UJ	80 UJ	620 UJ	630 UJ	630 UJ	1400 UJ	920 UJ	1200 UJ	1300 UJ
gamma-Chlorodane	5103-74-2	620 UJ	620 UJ	80 UJ	620 UJ	630 UJ	630 UJ	1400 UJ	920 UJ	1200 UJ	1300 UJ

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Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
Toxaphene	8001-35-2	1200 UJ	1200 UJ	160 U	1200 UJ	1300 UJ	1300 UJ	2900 UJ	1800 UJ	2500 UJ	2500 UJ
Arochlor 1016	12674-11-2	120 UJ	120 UJ	80 U	120 UJ	130 UJ	130 UJ	140 UJ	180 UJ	130 UJ	130 UJ
Arochlor 1221	11104-28-2	120 UJ	120 UJ	80 U	120 UJ	130 UJ	130 UJ	140 UJ	180 UJ	130 UJ	130 UJ
Arochlor 1232	11141-16-5	120 UJ	120 UJ	80 U	120 UJ	130 UJ	130 UJ	140 UJ	180 UJ	130 UJ	130 UJ
Arochlor 1242	53469-21-9	120 UJ	120 UJ	80 U	120 UJ	130 UJ	130 UJ	140 UJ	180 UJ	130 UJ	130 UJ
Arochlor 1248	12672-29-6	120 UJ	120 UJ	80 U	120 UJ	130 UJ	130 UJ	140 UJ	180 UJ	130 UJ	130 UJ
Arochlor 1254	11097-69-1	240 UJ	240 UJ	160 U	240 UJ	260 UJ	260 UJ	280 UJ	360 UJ	260 UJ	260 UJ
Arochlor 1260	11096-82-5	240 UJ	240 UJ	160 U	240 UJ	260 UJ	260 UJ	280 UJ	360 UJ	260 UJ	260 UJ

Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
alpha BHC	319-84-6	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 UJ	130 UJ	60 UJ	130 UJ	77 UJ
beta BHC	319-85-7	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 UJ	130 UJ	60 UJ	130 UJ	77 UJ
delta BHC	319-86-8	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 UJ	130 UJ	60 UJ	130 UJ	77 UJ
gamma BHC (Lindane)	58-89-9	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 U	130 UJ	60 UJ	130 UJ	77 UJ
Heptachlor	76-44-8	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 U	130 UJ	60 UJ	130 UJ	77 UJ
Aldrin	309-00-2	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 UJ	130 UJ	60 UJ	130 UJ	77 UJ
Heptachlor Epoxide	1024-57-3	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 U	130 UJ	60 UJ	130 UJ	77 UJ
Endosulfan I	959-98-8	160 UJ	63 UJ	130 UJ	63 UJ	130 UJ	8.3 U	130 UJ	60 UJ	130 UJ	77 UJ
Dieldrin	60-57-1	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 U	260 UJ	120 UJ	260 UJ	150 UJ
4,4'-DDE	72-55-9	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 U	260 UJ	120 UJ	260 UJ	150 UJ
Endrin	72-20-8	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 UJ	260 UJ	120 UJ	260 UJ	150 UJ
Endosulfan II	33213-65-9	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 U	260 UJ	120 UJ	260 UJ	150 UJ
4,4'-DDD	72-54-8	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 U	260 UJ	120 UJ	260 UJ	150 UJ
Endosulfan Sulfate	1031-07-8	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 U	260 UJ	120 UJ	260 UJ	150 UJ
4,4'-DDT	50-29-3	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 U	260 UJ	120 UJ	260 UJ	150 UJ
Methoxychlor	72-43-5	1600 UJ	630 UJ	1300 UJ	630 UJ	1300 UJ	83 U	1300 UJ	600 UJ	1300 UJ	770 UJ
Endrin Ketone	53494-70-5	310 UJ	130 UJ	250 UJ	130 UJ	250 UJ	17 U	260 UJ	120 UJ	260 UJ	150 UJ
alpha-Chlorodane	5103-71-9	1600 UJ	630 UJ	1300 UJ	630 UJ	1300 UJ	83 UJ	1300 UJ	600 UJ	1300 UJ	770 UJ
gamma-Chlorodane	5103-74-2	1600 UJ	630 UJ	1300 UJ	630 UJ	1300 UJ	83 UJ	1300 UJ	600 UJ	1300 UJ	770 UJ

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Table A-1. B-Pond Phase 3 Pesticide/PCBs. (µg/Kg)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
Toxaphene	8001-35-2	3100 UJ	1300 UJ	2500 UJ	1300 UJ	2500 UJ	170 U	2600 UJ	1200 UJ	2600 UJ	1500 UJ
Arochlor 1016	12674-11-2	160 UJ	130 UJ	130 UJ	130 UJ	130 UJ	83 U	130 UJ	120 UJ	130 UJ	150 UJ
Arochlor 1221	11104-28-2	160 UJ	130 UJ	130 UJ	130 UJ	130 UJ	83 U	130 UJ	120 UJ	130 UJ	150 UJ
Arochlor 1232	11141-16-5	160 UJ	130 UJ	130 UJ	130 UJ	130 UJ	83 U	130 UJ	120 UJ	130 UJ	150 UJ
Arochlor 1242	53469-21-9	160 UJ	130 UJ	130 UJ	130 UJ	130 UJ	83 U	130 UJ	120 UJ	130 UJ	150 UJ
Arochlor 1248	12672-29-6	160 UJ	130 UJ	130 UJ	130 UJ	130 UJ	83 U	130 UJ	120 UJ	130 UJ	150 UJ
Arochlor 1254	11097-69-1	320 UJ	260 UJ	260 UJ	260 UJ	260 UJ	170 U	260 UJ	240 UJ	260 UJ	300 UJ
Arochlor 1260	11096-82-5	320 UJ	260 UJ	260 UJ	260 UJ	260 UJ	170 U	260 UJ	240 UJ	260 UJ	300 UJ

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.

Reasons for Westinghouse Hanford Qualification--Pesticides/Polychlorinated Biphenyls

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--All samples were flagged as estimated, "J". All samples extracted outside 7-day criteria established for water. (All samples were analyzed within 40 days of extraction.)

LABORATORY BLANK--Arochlor-1254, beta-BHC, and lindane were detected in laboratory blanks. This resulted in an undetected qualification, "U", of one or more of those analytes detected at similar concentrations in the following:

B00FK6	B00GS4	B00GW1	B00H02
B00FK7	B00GS9	B00GW3	B00H03
B00FK8	B00GT7	B00GW4	B00H04
B00FK9	B00GV5	B00GW8	B00H05
B00FL0	B00GV6	B00GX6	B00H06
B00FL1	B00GV7	B00GZ2	B00H10
B00FL3	B00GV8	B00GZ6	B00H14
B00FL4	B00GV9	B00GZ8	B00H19
B00GR9	B00GW0	B00H01	B00H23

SURROGATE RECOVERY--Recovery was high for sample B00H01. All pesticide/PCB constituents were undetected but qualified as "UJ" for B00H01.

Split Samples:

SURROGATE RECOVERY--Recovery was high for sample B00GS5. All pesticide/PCB constituents were undetected but qualified as "UJ" for B00GS5.

MS/MSD--Recovery was high for sample B00GS5. All pesticide/PCB constituents were undetected but qualified "UJ" per OSM guidelines.

Table A-2. B-Pond Phase 3 Herbicide Data. (µg/Kg)

SAMPLE	TYPE	POND	APPROXIMATE DEPTH (ft)	HERBICIDES			
				2,4-D		2,4,5-TP	
B00FK6	Reg	3A	6.5	100	UJ	10	UJ
B00FK7	Reg	3A	8.5	100	UJ	10	UJ
B00FK8	Reg	3A	10.5	100	UJ	10	UJ
B00FK9	Reg	3A	13	100	UJ	10	UJ
B00FL0	Reg	3A	14.5	100	UJ	10	UJ
B00FL1	Reg	3A	16	100	UJ	10	UJ
B00FL3	Blank	3A	---	500	UJ	50	UJ
B00FL4	Reg	3A	28	500	UJ	50	UJ
B00GR9	Fdup	3A	28	500	UJ	50	UJ
B00GS4	Reg	3A	52.5	500	UJ	50	UJ
B00GS9	Reg	3A	66.5	500	UJ	50	UJ
B00GT7	Reg	3A	97	100	UJ	10	UJ
B00GV5	Reg	3A	143.5	150	UJ	15	UJ
B00GV6	Reg	3B	1	150	UJ	15	UJ
B00GV7	Reg	3B	3.5	150	UJ	15	UJ
B00GV8	Reg	3B	5.5	151	UJ	15.1	UJ
B00GV9	Blank	3B	---	150	UJ	15	UJ
B00GW0	Reg	3B	7.5	28	UJ	3	UJ
B00GW1	Reg	3B	9.5	29	UJ	3	UJ
B00GW3	Reg	3B	13	150	UJ	15	UJ
B00GW4	Fdup	3B	13	148	UJ	14.8	UJ
B00GW8	Reg	3B	21	30	UJ	3	UJ
B00GX6	Reg	3B	61.5	152	UJ	15.2	UJ
B00GZ2	Reg	3B	90.5	154	UJ	15.4	UJ
B00GZ6	Reg	3B	118.5	100	UJ	10	UJ
B00GZ8	Reg	3B	123.5	4900	UJ	490	UJ
B00H00	Reg	3C	1	100	UJ	10	UJ
B00H01	Reg	3C	3	100	UJ	10	UJ
B00H02	Reg	3C	5	98	UJ	10	UJ
B00H03	Reg	3C	7	960	UJ	96	UJ
B00H04	Reg	3C	9	990	UJ	99	UJ
B00H05	Fdup	3C	9	960	UJ	96	UJ
B00H06	Reg	3C	11.5	980	UJ	98	UJ
B00H14	Reg	3C	30	2400	UJ	240	UJ
B00H10	Blank	3C	---	990	UJ	99	UJ
B00H19	Reg	3C	60	990	UJ	99	UJ
B00H23	Reg	3C	80	100	UJ	10	UJ

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.

Reasons for Westinghouse Hanford Company Qualification--Herbicides

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--All samples were flagged as estimated, "J". All samples extracted outside 7-day criteria established for water. (All samples were analyzed within 40 days of extraction.)

Split Samples:

None.

Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28
Azinphos-methly	86-50-0	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chlorpyrifos	2981-88-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chlorpyrifos methyl	5598-13-0	NT	NT	NT	NT	NT	NT	NT	NT	NT
Coumaphos	56-72-4	NT	NT	NT	NT	NT	NT	NT	NT	NT
Demeton	8065-48-3	NT	NT	NT	NT	NT	NT	NT	NT	NT
Diazanon	333-41-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
DDVP (Dichlorvos)	62-73-7	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dimethoate	60-51-5	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Disulfoton	298-04-4	0.06 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ
EPN	2104-64-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Ethion	563-12-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
Ethoprop	13194-78-4	NT	NT	NT	NT	NT	NT	NT	NT	NT
Famphur	52-85-7	0.17 UJ	0.17 UJ	0.16 UJ	0.16 UJ	0.16 UJ	0.17 UJ	0.15 UJ	0.16 UJ	0.16 UJ
Fensulfothion	115-90-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fenthion	55-38-9	NT	NT	NT	NT	NT	NT	NT	NT	NT
Malathion	121-75-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Merphos	150-50-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Mevinphos	7786-34-7	NT	NT	NT	NT	NT	NT	NT	NT	NT
Monocrotophos	6923-22-4	NT	NT	NT	NT	NT	NT	NT	NT	NT

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Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28
Naled	300-76-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Parathion ethyl	156-38-2	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Parathion methyl	298-00-0	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.10 UJ	0.10 UJ	0.10 UJ
Phorate	298-02-2	0.06 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Ronnel	299-84-3	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sulfotepp	3689-24-5	0.06 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Sulprofos	35400-43-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
TEPP	21646-99-1	NT	NT	NT	NT	NT	NT	NT	NT	NT
Tetrachlorvinphos	22248-79-9	NT	NT	NT	NT	NT	NT	NT	NT	NT
Thionazin	297-97-2	0.06 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Trichloronate	327-98-0	NT	NT	NT	NT	NT	NT	NT	NT	NT
o,o,o-Triethylphos phorothioate	126-68-1	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.025 UJ	0.03 UJ	0.03 UJ

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Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00GS4	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B
	DEPTH	53	66.5	97	143.5	1	3.5	5.5	---	7.5
Azinphos methly	86-50-0	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chlorpyrifos	2981-88-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chlorpyrifos methyl	5598-13-0	NT	NT	NT	NT	NT	NT	NT	NT	NT
Coumaphos	56-72-4	NT	NT	NT	NT	NT	NT	NT	NT	NT
Demeton	8065-48-3	NT	NT	NT	NT	NT	NT	NT	NT	NT
Diazanon	333-41-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
DDVP (Dichlorvos)	62-73-7	NT	NT	NT	NT	NT	NT	NT	NT	NT
Dimethoate	60-51-5	0.13 UJ	0.11 UJ	0.10 UJ	0.11 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.11 UJ
Disulfoton	298-04-4	0.06 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ
EPN	2104-64-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Ethion	563-12-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
Ethoprop	13194-78-4	NT	NT	NT	NT	NT	NT	NT	NT	NT
Famphur	52-85-7	0.19 UJ	0.16 UJ	0.16 UJ	0.17 UJ	0.16 UJ	0.16 UJ	0.16 UJ	0.15 UJ	0.16 UJ
Fensulfothion	115-90-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fenthion	55-38-9	NT	NT	NT	NT	NT	NT	NT	NT	NT
Malathion	121-75-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Merphos	150-50-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Mevinphos	7786-34-7	NT	NT	NT	NT	NT	NT	NT	NT	NT
Monocrotophos	6923-22-4	NT	NT	NT	NT	NT	NT	NT	NT	NT

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Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00GS4	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B
	DEPTH	53	66.5	97	143.5	1	3.5	5.5	---	7.5
Naled	300-76-5	NT	NT	NT	NT	NT	NT	NT	NT	NT
Parathion ethyl	156-38-2	0.13 UJ	0.11 UJ	0.10 UJ	0.11 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.11 UJ
Parathion methyl	298-00-0	0.13 UJ	0.11 UJ	0.10 UJ	0.11 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.11 UJ
Phorate	298-02-2	0.06 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ
Ronnel	299-84-3	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sulfotepp	3689-24-5	0.06 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ
Sulprofos	35400-43-2	NT	NT	NT	NT	NT	NT	NT	NT	NT
TEPP	21646-99-1	NT	NT	NT	NT	NT	NT	NT	NT	NT
Tetrachlorvinphos	22248-79-9	NT	NT	NT	NT	NT	NT	NT	NT	NT
Thionazin	297-97-2	0.06 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ
Trichloronate	327-98-0	NT	NT	NT	NT	NT	NT	NT	NT	NT
o,o,o-Triethylphos phorothioate	126-68-1	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.025 UJ	0.03 UJ

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Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00GW1	B00GW3	B00GW4	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00
	TYPE	Reg	Reg	Fdup	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C
	DEPTH	9.5	13	13	21	61.5	90.5	118.5	123.5	1
Azinphos methly	86-50-0	NT	NT	NT	NT	0.21 UJ	0.21 UJ	0.24 UJ	0.24 UJ	0.21 UJ
Chlorpyrifos	2981-88-2	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Chlorpyrifos methyl	5598-13-0	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Coumaphos	56-72-4	NT	NT	NT	NT	0.21 UJ	0.21 UJ	0.26 UJ	0.24 UJ	0.21 UJ
Demeton	8065-48-3	NT	NT	NT	NT	0.1 UJ	0.1 UJ	0.12 UJ	0.12 UJ	0.1 UJ
Diazanon	333-41-5	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
DDVP (Dichlorvos)	62-73-7	NT	NT	NT	NT	0.1 UJ	0.1 UJ	0.12 UJ	0.12 UJ	0.1 UJ
Dimethoate	60-51-5	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.1 UJ	0.1 UJ	0.12 UJ	0.12 UJ	0.1 UJ
Disulfoton	298-04-4	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
EPN	2104-64-5	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Ethion	563-12-2	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Ethoprop	13194-78-4	NT	NT	NT	NT	0.1 UJ	0.1 UJ	0.12 UJ	0.12 UJ	0.1 UJ
Famphur	52-85-7	0.16 UJ	0.16 UJ	0.16 UJ	0.16 UJ	NT	NT	NT	NT	NT
Fensulfothion	115-90-2	NT	NT	NT	NT	0.1 UJ	0.1 UJ	0.12 UJ	0.12 UJ	0.1 UJ
Fenthion	55-38-9	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Malathion	121-75-5	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Merphos	150-50-5	NT	NT	NT	NT	0.1 UJ	0.1 UJ	0.12 UJ	0.12 UJ	0.1 UJ
Mevinphos	7786-34-7	NT	NT	NT	NT	0.1 UJ	0.1 UJ	0.12 UJ	0.12 UJ	0.1 UJ
Monocrotophos	6923-22-4	NT	NT	NT	NT	0.21 UJ	0.21 UJ	0.24 UJ	0.24 UJ	0.21 UJ

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Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00GW1	B00GW3	B00GW4	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00
	TYPE	Reg	Reg	Fdup	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C
	DEPTH	9.5	13	13	21	61.5	90.5	118.5	123.5	1
Naled	300-76-5	NT	NT	NT	NT	0.21 UJ	0.21 UJ	0.24 UJ	0.24 UJ	0.21 UJ
Parathion ethyl	156-38-2	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Parathion methyl	298-00-0	0.10 UJ	0.10 UJ	0.10 UJ	0.10 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Phorate	298-02-2	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Ronnel	299-84-3	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Sulfotepp	3689-24-5	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
Sulprofos	35400-43-2	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
TEPP	21646-99-1	NT	NT	NT	NT	0.21 UJ	0.21 UJ	0.24 UJ	0.24 UJ	0.21 UJ
Tetrachlorvinphos	22248-79-9	NT	NT	NT	NT	0.26 UJ	0.26 UJ	0.30 UJ	0.31 UJ	0.26 UJ
Thionazin	297-97-2	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	NT	NT	NT	NT	NT
Trichloronate	327-98-0	NT	NT	NT	NT	0.05 UJ	0.05 UJ	0.06 UJ	0.06 UJ	0.05 UJ
o,o,o-Triethylphos phorothioate	126-68-1	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	NT	NT	NT	NT	NT

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Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00H01	B00H02	B00H03	B00H04	B00H05	B00H06	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Reg	Fdup	Reg	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	3	5	7	9	9	11.5	30	---	60	80
Azinphos methly	86-50-0	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.22 UJ	0.21 UJ	0.20 UJ	0.21 UJ	0.21 UJ
Chlorpyrifos	2981-88-2	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Chlorpyrifos methyl	5598-13-0	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Coumaphos	56-72-4	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.22 UJ	0.21 UJ	0.20 UJ	0.21 UJ	0.21 UJ
Demeton	8065-48-3	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.11 UJ	0.11 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Diazanon	333-41-5	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
DDVP (Dichlorvos)	62-73-7	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.11 UJ	0.11 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Dimethoate	60-51-5	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.11 UJ	0.11 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Disulfoton	298-04-4	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
EPN	2104-64-5	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Ethion	563-12-2	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Ethoprop	13194-78-4	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.11 UJ	0.11 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Famphur	52-85-7	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Fensulfothion	115-90-2	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.11 UJ	0.11 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Fenthion	55-38-9	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Malathion	121-75-5	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Merphos	150-50-5	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.11 UJ	0.11 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Mevinphos	7786-34-7	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.11 UJ	0.11 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Monocrotophos	6923-22-4	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.22 UJ	0.21 UJ	0.20 UJ	0.21 UJ	0.21 UJ

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Table A-3. B-Pond Phase 3 Organophosphorous Pesticides. (mg/Kg)

ANALYTE	CAS#	B00H01	B00H02	B00H03	B00H04	B00H05	B00H06	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Reg	Fdup	Reg	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	3	5	7	9	9	11.5	30	---	60	80
Naled	300-76-5	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.22 UJ	0.21 UJ	0.20 UJ	0.21 UJ	0.21 UJ
Parathion ethyl	156-38-2	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Parathion methyl	298-00-0	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Phorate	298-02-2	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Ronnel	299-84-3	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Sulfotepp	3689-24-5	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
Sulprofos	35400-43-2	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
TEPP	21646-99-1	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.21 UJ	0.22 UJ	0.21 UJ	0.20 UJ	0.21 UJ	0.21 UJ
Tetrachlorvinphos	22248-79-9	0.26 UJ	0.26 UJ	0.26 UJ	0.26 UJ	0.26 UJ	0.28 UJ	0.26 UJ	0.25 UJ	0.26 UJ	0.27 UJ
Thionazin	297-97-2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Trichloronate	327-98-0	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ
o,o,o-Triethylphos phorothioate	126-68-1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

NT Not a target analyte for this sample, see text.
U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.

Reasons for Westinghouse Hanford Company Qualification--Organophosphorous Pesticides

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--All samples were flagged as estimated, "J". All samples extracted outside 7-day criteria established for water. (All samples were analyzed within 40 days of extraction.)

Split Samples:

None.

Table A-4. B-Pond Phase 3 Dioxins & Furans. (ng/g)

ANALYTE SAMPLE ID	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9
TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup
POND	3A	3A	3A	3A	3A	3A	3A	3A	3A
DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28
Total tetrachlorinated dibenzo-p-dioxins (TCDD)	0.062 UJ	0.060 UJ	0.056 UJ	0.11 UJ	0.071 UJ	0.068 UJ	0.042 UJ	0.056 UJ	0.051 UJ
Total pentachlorinated dibenzo-p-dioxins (PeCDD)	0.13 UJ	0.17 UJ	0.13 UJ	0.10 UJ	0.16 UJ	0.22 UJ	0.15 UJ	0.16 UJ	0.084 UJ
Total hexachlorinated dibenzo-p-dioxins (HxCDD)	0.12 UJ	0.18 UJ	0.13 UJ	0.40 UJ	0.17 UJ	0.15 UJ	0.11 UJ	0.15 UJ	0.18 UJ
Total heptachlorinated dibenzo-p-dioxins (HpCDD)	0.15 UJ	0.21 UJ	0.19 UJ	0.19 UJ	0.16 UJ	0.23 UJ	0.17 UJ	0.15 UJ	0.27 UJ
Total octachlorinated dibenzo-p-dioxins (OCDD)	0.13 UJ	0.21 UJ	0.13 UJ	0.11 UJ	0.16 UJ	0.17 UJ	0.15 UJ	0.15 UJ	0.21 UJ
Total tetrachlorinated dibenzo-furans (TCDF)	0.11 UJ	0.077 UJ	0.058 UJ	0.085 UJ	0.071 UJ	0.079 UJ	0.061 UJ	0.055 UJ	0.047 UJ
Total pentachlorinated dibenzo-furans (PeCDF)	0.039 UJ	0.053 UJ	0.046 UJ	0.058 UJ	0.047 UJ	0.050 UJ	0.036 UJ	0.049 UJ	0.058 UJ
Total hexachlorinated dibenzo-furans (HxCDF)	0.11 UJ	0.11 UJ	0.085 UJ	0.14 UJ	0.11 UJ	0.11 UJ	0.072 UJ	0.13 UJ	0.10 UJ
Total heptachlorinated dibenzo-furans (HpCDF)	0.13 UJ	0.17 UJ	0.11 UJ	0.13 UJ	0.13 UJ	0.19 UJ	0.13 UJ	0.23 UJ	0.14 UJ
Total octachlorinated dibenzo-furans (OCDF)	0.069 UJ	0.19 UJ	0.077 UJ	0.096 UJ	0.12 UJ	0.14 UJ	0.059 UJ	0.11 UJ	0.20 UJ

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Table A-4. B-Pond Phase 3 Dioxins & Furans. (ng/g)

ANALYTE SAMPLE ID	B00GS4	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0
TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg
POND	3A	3A	3A	3A	3B	3B	3B	3B	3B
DEPTH	52.5	66.5	97	143.5	1	3.5	5.5	---	7.5
Total tetrachlorinated dibenzo-p-dioxins (TCDD)	0.17 UJ	0.12 UJ	0.063 UJ	0.086 UJ	0.070 UJ	0.044 UJ	0.036 UJ	0.048 UJ	0.032 UJ
Total pentachlorinated dibenzo-p-dioxins (PeCDD)	0.30 UJ	0.35 UJ	0.21 UJ	0.20 UJ	0.16 UJ	0.12 UJ	0.087 UJ	0.11 UJ	0.057 UJ
Total hexachlorinated dibenzo-p-dioxins (HxCDD)	0.29 UJ	0.25 UJ	0.14 UJ	0.28 UJ	0.19 UJ	0.15 UJ	0.15 UJ	0.14 UJ	0.098 UJ
Total heptachlorinated dibenzo-p-dioxins (HpCDD)	0.24 UJ	0.27 UJ	0.13 UJ	0.14 UJ	0.19 UJ	0.12 UJ	0.11 UJ	0.13 UJ	0.11 UJ
Total octachlorinated dibenzo-p-dioxins (OCDD)	0.23 UJ	0.27 UJ	0.12 UJ	0.090 UJ	0.25 UJ	0.15 UJ	0.12 UJ	0.067 UJ	0.13 UJ
Total tetrachlorinated dibenzo-furans (TCDF)	0.14 UJ	0.14 UJ	0.058 UJ	0.084 UJ	0.051 UJ	0.038 UJ	0.033 UJ	0.038 UJ	0.033 UJ
Total pentachlorinated dibenzo-furans (PeCDF)	0.069 UJ	0.067 UJ	0.057 UJ	0.052 UJ	0.082 UJ	0.035 UJ	0.036 UJ	0.051 UJ	0.046 UJ
Total hexachlorinated dibenzo-furans (HxCDF)	0.084 UJ	0.15 UJ	0.086 UJ	0.072 UJ	0.10 UJ	0.094 UJ	0.093 UJ	0.095 UJ	0.073 UJ
Total heptachlorinated dibenzo-furans (HpCDF)	0.15 UJ	0.14 UJ	0.23 UJ	0.12 UJ	0.14 UJ	0.097 UJ	0.093 UJ	0.14 UJ	0.084 UJ
Total octachlorinated dibenzo-furans (OCDF)	0.030 UJ	0.19 UJ	0.12 UJ	0.13 UJ	0.21 UJ	0.10 UJ	0.13 UJ	0.13 UJ	0.066 UJ

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Table A-4. B-Pond Phase 3 Dioxins & Furans. (ng/g)

ANALYTE SAMPLE ID	B00GW1	B00GW3	B00GW4	B00GW8	B00H00	B00H02	B00H03
TYPE	Reg	Reg	Fdup	Reg	Reg	Reg	Reg
POND	3B	3B	3B	3B	3C	3C	3C
DEPTH	9.5	13	13	21	1	5	7
Total tetrachlorinated dibenzo-p-dioxins (TCDD)	0.041 UJ	0.047 UJ	0.031 UJ	0.044 UJ	0.10 UJ	0.16 UJ	0.12 UJ
Total pentachlorinated dibenzo-p-dioxins (PeCDD)	0.080 UJ	0.12 UJ	0.090 UJ	0.13 UJ	0.15 UJ	0.12 UJ	0.38 UJ
Total hexachlorinated dibenzo-p-dioxins (HxCDD)	0.11 UJ	0.12 UJ	0.087 UJ	0.16 UJ	0.20 UJ	0.22 UJ	0.17 UJ
Total heptachlorinated dibenzo-p-dioxins (HpCDD)	0.15 UJ	0.14 UJ	0.11 UJ	0.13 UJ	0.24 UJ	0.27 UJ	0.17 UJ
Total octachlorinated dibenzo-p-dioxins (OCDD)	0.15 UJ	0.096 UJ	0.14 UJ	0.11 UJ	0.23 UJ	0.32 UJ	0.15 UJ
Total tetrachlorinated dibenzo-furans (TCDF)	0.035 UJ	0.039 UJ	0.050 UJ	0.052 UJ	0.062 UJ	0.077 UJ	0.067 UJ
Total pentachlorinated dibenzo-furans (PeCDF)	0.047 UJ	0.038 UJ	0.045 UJ	0.035 UJ	0.19 UJ	0.10 UJ	0.11 UJ
Total hexachlorinated dibenzo-furans (HxCDF)	0.11 UJ	0.088 UJ	0.066 UJ	0.11 UJ	0.23 UJ	0.15 UJ	0.18 UJ
Total heptachlorinated dibenzo-furans (HpCDF)	0.10 UJ	0.10 UJ	0.079 UJ	0.082 UJ	0.53 UJ	0.19 UJ	0.32 UJ
Total octachlorinated dibenzo-furans (OCDF)	0.094 UJ	0.16 UJ	0.11 UJ	0.13 UJ	0.14 UJ	0.23 UJ	0.12 UJ

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.

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Reasons for Westinghouse Hanford Company Qualification--Dioxins and Furans

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--All samples were flagged as estimated, "J". All samples extracted outside 7-day criteria established for water. (All samples were analyzed within 40 days of extraction.)

Split Samples:

None.

Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
	ANALYSIS DATE	2/20/91	2/20/91	2/20/91	2/22/91	2/22/91	2/20/91	2/22/91	2/28/91	2/22/91	2/20/91
	MOISTURE (%)	12	10.9	5.3	6.7	6.8	11.2	0.0	4.9	5.3	23.2
Chloromethane	74-87-3	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
Bromomethane	74-83-9	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
Vinyl Chloride	75-01-4	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
Chloroethane	75-00-3	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
Methylene Chloride	75-09-2	6 U	4 J	3 J	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Acetone	67-64-1	11 U	64	55	11 U	13	11 U	17	11 UJ	27	13 U
Carbon Disulfide	75-15-0	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
1,1-Dichloroethene	75-35-4	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
1,1-Dichloroethane	75-34-3	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
1,2-Dichloroethene (total)	540-59-0	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Chloroform	67-66-3	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
1,2-Dichloroethane	107-06-2	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
2-Butanone	78-93-3	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
1,1,1-Trichloroethane	71-55-6	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Carbon Tetrachloride	56-23-5	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Vinyl Acetate	108-05-4	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
Bromodichloromethane	75-27-4	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U

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Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
	ANALYSIS DATE	2/20/91	2/20/91	2/20/91	2/22/91	2/22/91	2/20/91	2/22/91	2/28/91	2/22/91	2/20/91
	MOISTURE (%)	12	10.9	5.3	6.7	6.8	11.2	0.0	4.9	5.3	23.2
1,2-Dichloropropane	78-87-5	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
cis-1,3-Dichloropropene	10061-01-5	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Trichloroethene	79-01-6	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Dibromochloromethane	124-48-1	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
1,1,2-Trichloroethane	79-00-5	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Benzene	71-43-2	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
trans-1,3-Dichloropropene	10061-02-6	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Bromoform	75-25-2	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
4-Methyl-2-pentanone	108-10-1	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
2-Hexanone	591-78-6	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 UJ	11 U	13 U
Tetrachloroethene	127-18-4	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
1,1,2,2-Tetrachloroethane	79-34-5	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Toluene	108-88-3	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Chlorobenzene	108-90-7	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Ethylbenzene	100-41-4	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Styrene	100-42-5	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U
Xylene (total)	1330-20-7	6 U	6 U	5 U	5 U	5 U	6 U	5 U	5 UJ	5 U	7 U

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Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	52.5	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
	ANALYSIS DATE	2/26/91	2/28/91	2/28/91	3/4/91	3/11/91	3/11/91	3/11/91	3/11/91	3/11/91	3/11/91
	MOISTURE (%)	19	7.3	4.0	NA	5.0	4.0	5.0	0.0	0.0	3.1
Chloromethane	74-87-3	12 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
Bromomethane	74-83-9	12 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
Vinyl Chloride	75-01-4	12 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
Chloroethane	75-00-3	12 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
Methylene Chloride	75-09-2	30 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	67-64-1	18 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
Carbon Disulfide	75-15-0	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	75-35-4	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	75-34-3	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	540-59-0	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	67-66-3	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	107-06-2	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	78-93-3	12 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
1,1,1-Trichloroethane	71-55-6	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	56-23-5	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	108-05-4	12 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
Bromodichloromethane	75-27-4	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

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Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	52.5	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
	ANALYSIS DATE	2/26/91	2/28/91	2/28/91	3/4/91	3/11/91	3/11/91	3/11/91	3/11/91	3/11/91	3/11/91
	MOISTURE (%)	19	7.3	4.0	NA	5.0	4.0	5.0	0.0	0.0	3.1
1,2-Dichloropropane	78-87-5	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	10061-01-5	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	79-01-6	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	124-48-1	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	79-00-5	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	71-43-2	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	10061-02-6	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	75-25-2	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	108-10-1	12 U	11 U	10 U	3 J	11 U	10 U	11 U	10 U	10 U	10 U
2-Hexanone	591-78-6	12 U	11 U	10 U	10 U	11 U	10 U	11 U	10 U	10 U	10 U
Tetrachloroethene	127-18-4	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	79-34-5	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	108-88-3	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	108-90-7	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	100-41-4	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	100-42-5	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	1330-20-7	6 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

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Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
	ANALYSIS DATE	3/11/91	3/11/91	3/12/91	3/11/91	3/21/91	3/21/91	3/21/91	3/22/91	3/21/91	3/21/91
	MOISTURE (%)	3.0	3.0	3	3.1	5.4	5.0	16.7	34.5	3.9	4.8
Chloromethane	74-87-3	10 U	10 U	10 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
Bromomethane	74-83-9	10 U	10 U	10 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
Vinyl Chloride	75-01-4	10 U	10 U	10 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
Chloroethane	75-00-3	10 U	10 U	10 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
Methylene Chloride	75-09-2	5 U	5 U	44 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Acetone	67-64-1	10 U	10 U	19 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
Carbon Disulfide	75-15-0	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
1,1-Dichloroethene	75-35-4	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
1,1-Dichloroethane	75-34-3	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
1,2-Dichloroethene (total)	540-59-0	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Chloroform	67-66-3	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
1,2-Dichloroethane	107-06-2	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
2-Butanone	78-93-3	10 U	10 U	10 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
1,1,1-Trichloroethane	71-55-6	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Carbon Tetrachloride	56-23-5	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Vinyl Acetate	108-05-4	10 U	10 U	10 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
Bromodichloromethane	75-27-4	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U

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Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
	ANALYSIS DATE	3/11/91	3/11/91	3/12/91	3/11/91	3/21/91	3/21/91	3/21/91	3/22/91	3/21/91	3/21/91
	MOISTURE (%)	3.0	3.0	3	3.1	5.4	5.0	16.7	34.5	3.9	4.8
cis-1,3-Dichloropropene	10061-01-5	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Trichloroethene	79-01-6	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Dibromochloromethane	124-48-1	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
1,1,2-Trichloroethane	79-00-5	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Benzene	71-43-2	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
trans-1,3-Dichloropropene	10061-02-6	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Bromoform	75-25-2	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
4-Methyl-2-pentanone	108-10-1	10 U	10 U	10 U	10 U	3 J	3 J	13 U	15 U	10 U	11 U
2-Hexanone	591-78-6	10 U	10 U	10 U	10 U	11 U	11 U	13 U	15 U	10 U	11 U
Tetrachloroethene	127-18-4	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
1,1,2,2-Tetrachloroethane	79-34-5	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Toluene	108-88-3	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Chlorobenzene	108-90-7	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Ethylbenzene	100-41-4	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Styrene	100-42-5	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U
Xylene (total)	1330-20-7	5 U	5 U	5 U	5 U	5 U	5 U	6 U	8 U	5 U	5 U

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Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
	ANALYSIS DATE	3/21/91	3/28/91	3/22/91	3/22/91	3/22/91	3/26/91	4/2/91	3/28/91	4/2/91	4/2/91
	MOISTURE (%)	4.8	NA	5.0	4.3	5.6	6	8.7	NA	6.1	22.3
Chloromethane	74-87-3	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
Bromomethane	74-83-9	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
Vinyl Chloride	75-01-4	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
Chloroethane	75-00-3	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
Methylene Chloride	75-09-2	5 U	5 U	5 U	5 U	5 U	31 U	5 U	5 U	5 U	6 U
Acetone	67-64-1	15 U	10 U	11 U	10 U	11 U	20 U	11 U	10 U	49	13 U
Carbon Disulfide	75-15-0	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
1,1-Dichloroethene	75-35-4	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
1,1-Dichloroethane	75-34-3	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
1,2-Dichloroethene (total)	540-59-0	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Chloroform	67-66-3	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
1,2-Dichloroethane	107-06-2	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
2-Butanone	78-93-3	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
1,1,1-Trichloroethane	71-55-6	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Carbon Tetrachloride	56-23-5	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Vinyl Acetate	108-05-4	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
Bromodichloromethane	75-27-4	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
1,2-Dichloropropane	78-87-5	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U

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Table A-5. Volatile Organic Compounds. (µg/Kg)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
	ANALYSIS DATE	3/21/91	3/28/91	3/22/91	3/22/91	3/22/91	3/26/91	4/2/91	3/28/91	4/2/91	4/2/91
	MOISTURE (%)	4.8	NA	5.0	4.3	5.6	6	8.7	NA	6.1	22.3
cis-1,3-Dichloropropene	10061-01-5	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Trichloroethene	79-01-6	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Dibromochloromethane	124-48-1	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
1,1,2-Trichloroethane	79-00-5	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Benzene	71-43-2	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
trans-1,3-Dichloropropene	10061-02-6	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Bromoform	75-25-2	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
4-Methyl-2-pentanone	108-10-1	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
2-Hexanone	591-78-6	11 U	10 U	11 U	10 U	11 U	11 U	11 U	10 U	11 U	13 U
Tetrachloroethene	127-18-4	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
1,1,2,2-Tetrachloroethane	79-34-5	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Toluene	108-88-3	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Chlorobenzene	108-90-7	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Ethylbenzene	100-41-4	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Styrene	100-42-5	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U
Xylene (total)	1330-20-7	5 U	5 U	5 U	5 U	5 U	6 U	5 U	5 U	5 U	6 U

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.

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Reasons for Westinghouse Hanford Company Qualification--Volatile Organics

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--B00FL4 was qualified as estimated, "J". Fourteen day holding time criteria established for water missed on sample B00FL4 by 7 days.

LABORATORY BLANK--Acetone was qualified as undetected at 15 μg/Kg in B00H02 because acetone was also reported in the associated laboratory blank (#910321-027). A summary of VOA Reagent Blanks at Primary Lab:

Nine laboratory blanks total:
6 with no reported contaminants
1 with Acetone at 26 μg/Kg (3/21/91)
1 with 4-methyl-2-pentanone at 3 J μg/Kg (2/28/91)
1 with an unknown tentatively identified compound (TIC) at 7 J μg/Kg (3/22/91)

Split Samples:

LABORATORY BLANK--Methylene chloride and acetone were found in laboratory blanks, and were qualified as undetected, "U", in samples B00H07, B00GW5, and B00GS5.

CALIBRATION--Two samples had analytes qualified because of separate exceedances of Westinghouse Hanford-OSM's calibration criteria. All analytes were undetected. Sample B00H07 was qualified "UJ" for the following analytes:

alpha BHC	aldrin	chlordane
beta BHC	endrin	gamma chlordane
delta BHC	alpha	

Sample B00GW5 was qualified "UJ" for the following analytes:

alpha BHC	aldrin	endosulfan sulfate
beta BHC	endosulfan I	4,4'-DDT
delta BHC	4,4'-DDE	alpha chlordane
gamma BHC (lindane)	4,4'-DDD	gamma chlordane

Additional Note to Volatile Organic Compound Data, Table A-5.

Three "unknown" compounds were reported as VOA TICs: 19 J, 22 J, 11 J μg/Kg in the regular sample B00GV5. No similar compounds were found in the associated laboratory blank.

Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
	EXTRACTION DATE	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91
	ANALYSIS DATE	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	3/1/91
Phenol	108-95-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
bis(2-chloroethyl)ether	111-44-4	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2-Chlorophenol	95-57-8	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
1,3-Dichlorobenzene	541-73-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
1,4-Dichlorobenzene	106-46-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Benzyl Alcohol	100-51-6	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
1,2-Dichlorobenzene	95-50-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2-Methylphenol	95-48-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
bis(2-Chloroisopropyl) ether	108-60-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
4-Methylphenol	106-44-5	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
N-Nitrosodipropylamine	621-64-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Hexachloroethane	67-72-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Nitrobenzene	98-95-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Isophorone	78-59-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2-Nitrophenol	88-75-5	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2,4-Dimethylphenol	105-67-9	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Benzoic acid	65-85-0	5400 UJ	590 J	520 J	5100 UJ	360 J	470 J	4800 UJ	370 J	390 J	6300 UJ
bis(2-chloroethoxy)methane	111-91-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
	EXTRACTION DATE	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91
	ANALYSIS DATE	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	3/1/91
2,4-Dichlorophenol	120-83-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
1,2,4-Trichlorobenzene	120-82-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Naphthalene	91-20-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
4-Chloroaniline	106-47-8	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Hexachlorobutadiene	87-68-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
4-Chloro-3-methylphenol	59-50-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2-Methylnaphthalene	91-57-6	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Hexachlorocyclopentadiene	77-47-4	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2,4,6-Trichlorophenol	88-06-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2,4,5-Trichlorophenol	95-95-4	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ
2-Chloronaphthalene	91-58-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2-Nitroaniline	88-74-4	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ
Dimethylphthalate	131-11-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Acenaphthylene	208-96-8	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
3-Nitroaniline	99-09-2	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ
Acenaphthene	83-32-9	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2,4-Dinitrophenol	51-28-5	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ
4-Nitrophenol	100-02-7	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
	EXTRACTION DATE	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91
	ANALYSIS DATE	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	3/1/91
Dibenzofuran	132-64-9	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2,4-Dinitrotoluene	121-14-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
2,6-Dinitrotoluene	606-20-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Diethylphthalate	84-66-2	1100 UJ	170 J	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	210 J
4-Chlorophenyl-phenylether	7005-72-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Fluorene	86-73-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
4-Nitroaniline	100-01-6	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ
4,6-Dinitro-2-methylphenol	534-52-1	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ
N-Nitrosodiphenylamine	86-30-6	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
4-Bromophenyl-phenylether	101-55-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Hexachlorobenzene	118-74-1	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Pentachlorophenol	87-86-5	5400 UJ	5400 UJ	5100 UJ	5100 UJ	5200 UJ	5400 UJ	4800 UJ	5000 UJ	5100 UJ	6300 UJ
Phenanthrene	85-01-8	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Anthracene	120-12-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Di-n-Butylphthalate	84-74-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Fluoranthene	206-44-0	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Pyrene	129-00-0	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Butylbenzylphthalate	85-68-7	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00FK6	B00FK7	B00FK8	B00FK9	B00FL0	B00FL1	B00FL3	B00FL4	B00GR9	B00GS4
	TYPE	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Fdup	Reg
	POND	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A
	DEPTH	6.5	8.5	10.5	13	14.5	16	---	28	28	52.5
	EXTRACTION DATE	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91	2/24/91
	ANALYSIS DATE	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	2/28/91	3/1/91
3,3'-Dichlorobenzidine	91-94-1	2200 UJ	2200 UJ	2100 UJ	2100 UJ	2100 UJ	2200 UJ	2000 UJ	2100 UJ	2100 UJ	1300 UJ
Benzo(a)anthracene	56-55-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
bis(2-ethylhexyl)phthalate	117-81-7	1100 UJ	1100 UJ	1100 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1400 UJ
Chrysene	218-01-9	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Di-n-octylphthalate	117-84-0	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Benzo(b)fluoranthene	205-99-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Benzo(k)fluoranthene	207-08-9	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Benzo(a)pyrene	50-32-8	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Indeno(1,2,3-cd)pyrene	193-39-5	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Dibenz(a,h)anthracene	53-70-3	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
Benzo(g,h,i)perylene	191-24-2	1100 UJ	1100 UJ	1000 UJ	1100 UJ	1100 UJ	1100 UJ	990 UJ	1000 UJ	1000 UJ	1300 UJ
OTHER WAC-173-303-9905 DANGEROUS WASTE CONSTITUENTS?		No	No	No	No	No	?	No	No	?	No
Total TICs		7	7	8	6	8	8	2	7	9	8
TICs without laboratory "B" flags		3	3	4	2	5	5	0	4	6	4

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	52.5	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
	EXTRACTION DATE	2/24/91	2/24/91	2/27/91	3/7/91	3/7/91	3/7/91	3/7/91	3/12/91	3/12/91	3/12/91
	ANALYSIS DATE	3/1/91	3/1/91	3/5/91	3/12/91	3/12/91	3/12/91	3/12/91	3/14/91	3/14/91	4/2/91
Phenol	108-95-2	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
bis(2-chloroethyl)ether	111-44-4	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2-Chlorophenol	95-57-8	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
1,3-Dichlorobenzene	541-73-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
1,4-Dichlorobenzene	106-46-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Benzyl Alcohol	100-51-6	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
1,2-Dichlorobenzene	95-50-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2-Methylphenol	95-48-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
bis(2-Chloroisopropyl) ether	108-60-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
4-Methylphenol	106-44-5	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
N-Nitrosodipropylamine	621-64-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Hexachloroethane	67-72-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Nitrobenzene	98-95-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Isophorone	78-59-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2-Nitrophenol	88-75-5	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2,4-Dimethylphenol	105-67-9	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Benzoic acid	65-85-0	2200 U	830 J	5000 UJ	4800 UJ	290 J	240 J	5100 U	4800 U	4800 U	5000 UJ
bis(2-chloroethoxy)methane	111-91-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	52.5	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
	EXTRACTION DATE	2/24/91	2/24/91	2/27/91	3/7/91	3/7/91	3/7/91	3/7/91	3/12/91	3/12/91	3/12/91
	ANALYSIS DATE	3/1/91	3/1/91	3/5/91	3/12/91	3/12/91	3/12/91	3/12/91	3/14/91	3/14/91	4/2/91
2,4-Dichlorophenol	120-83-2	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
1,2,4-Trichlorobenzene	120-82-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Naphthalene	91-20-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
4-Chloroaniline	106-47-8	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Hexachlorobutadiene	87-68-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
4-Chloro-3-methylphenol	59-50-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2-Methylnaphthalene.	91-57-6	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Hexachlorocyclopentadiene	77-47-4	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2,4,6-Trichlorophenol	88-06-2	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2,4,5-Trichlorophenol	95-95-4	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ
2-Chloronaphthalene	91-58-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2-Nitroaniline	88-74-4	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ
Dimethylphthalate	131-11-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Acenaphthylene	208-96-8	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
3-Nitroaniline	99-09-2	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ
Acenaphthene	83-32-9	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2,4-Dinitrophenol	51-28-5	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ
4-Nitrophenol	100-02-7	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	52.5	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
	EXTRACTION DATE	2/24/91	2/24/91	2/27/91	3/7/91	3/7/91	3/7/91	3/7/91	3/12/91	3/12/91	3/12/91
	ANALYSIS DATE	3/1/91	3/1/91	3/5/91	3/12/91	3/12/91	3/12/91	3/12/91	3/14/91	3/14/91	4/2/91
Dibenzofuran	132-64-9	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2,4-Dinitrotoluene	121-14-2	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
2,6-Dinitrotoluene	606-20-2	NA	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Diethylphthalate	84-66-2	95 J	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U*	1000UJ*
4-Chlorophenyl-phenylether	7005-72-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Fluorene	86-73-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
4-Nitroaniline	100-01-6	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ
4,6-Dinitro-2-methylphenol	534-52-1	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ
N-Nitrosodiphenylamine	86-30-6	450 U[1]	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
4-Bromophenyl-phenylether	101-55-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Hexachlorobenzene	118-74-1	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Pentachlorophenol	87-86-5	2200 U	5200 UJ	5000 UJ	4800 UJ	4800 U	4800 U	5100 U	4800 U	4800 U	5000 UJ
Phenanthrene	85-01-8	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Anthracene	120-12-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Di-n-Butylphthalate	84-74-2	450 U*	1100 UJ	1000 UJ	990 UJ	2500 U	990 U	1000 U	1900 U	990 U	1800 UJ
Fluoranthene	206-44-0	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Pyrene	129-00-0	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Butylbenzylphthalate	85-68-7	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GS5	B00GS9	B00GT7	B00GV5	B00GV6	B00GV7	B00GV8	B00GV9	B00GW0	B00GW1
	TYPE	Split	Reg	Reg	Reg	Reg	Reg	Reg	Blank	Reg	Reg
	POND	3A	3A	3A	3A	3B	3B	3B	3B	3B	3B
	DEPTH	52.5	66.5	97	143.5	1	3.5	5.5	---	7.5	9.5
	EXTRACTION DATE	2/24/91	2/24/91	2/27/91	3/7/91	3/7/91	3/7/91	3/7/91	3/12/91	3/12/91	3/12/91
	ANALYSIS DATE	3/1/91	3/1/91	3/5/91	3/12/91	3/12/91	3/12/91	3/12/91	3/14/91	3/14/91	4/2/91
3,3'-Dichlorobenzidine	91-94-1	900 U	2200 UJ	2100 UJ	2000 UJ	2000 U	2000 U	2100 U	2000 U	2000 U	2000 UJ
Benzo(a)anthracene	56-55-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
bis(2-ethylhexyl)phthalate	117-81-7	450 U*	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Chrysene	218-01-9	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Di-n-octylphthalate	117-84-0	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Benzo(b)fluoranthene	205-99-2	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Benzo(k)fluoranthene	207-08-9	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Benzo(a)pyrene	50-32-8	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Indeno(1,2,3-cd)pyrene	193-39-5	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Dibenz(a,h)anthracene	53-70-3	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
Benzo(g,h,i)perylene	191-24-2	450 U	1100 UJ	1000 UJ	990 UJ	990 U	990 U	1000 U	990 U	990 U	1000 UJ
OTHER WAC-173-303-9905 DANGEROUS WASTE CONSTITUENTS?		No	No	No	No	No	No	No	No	No	No
Total TICs		0	8	13	7	17	9	7	16	11	9
TICs without laboratory "B" flags		0	4	11	4	9	2	2	8	4	2

Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
	EXTRACTION DATE	3/12/91	3/12/91	3/13/91	3/12/91	3/17/91	3/17/91	3/21/91	4/2/91	3/21/91	3/21/91
	ANALYSIS DATE	4/2/91	3/14/91	4/8/91	4/2/91	4/4/91	4/4/91	4/1/91	4/5/91	4/1/91	4/1/91
Phenol	108-95-2	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
bis(2-chloroethyl)ether	111-44-4	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2-Chlorophenol	95-57-8	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
1,3-Dichlorobenzene	541-73-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
1,4-Dichlorobenzene	106-46-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Benzyl Alcohol	100-51-6	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
1,2-Dichlorobenzene	95-50-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2-Methylphenol	95-48-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
bis(2-Chloroisopropyl) ether	108-60-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
4-Methylphenol	106-44-5	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
N-Nitrosodipropylamine	621-64-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Hexachloroethane	67-72-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Nitrobenzene	98-95-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Isophorone	78-59-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2-Nitrophenol	88-75-5	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2,4-Dimethylphenol	105-67-9	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Benzoic acid	65-85-0	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300UJ*	5000 UJ	5000 UJ
bis(2-chloroethoxy)methane	111-91-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg.	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
	EXTRACTION DATE	3/12/91	3/12/91	3/13/91	3/12/91	3/17/91	3/17/91	3/21/91	4/2/91	3/21/91	3/21/91
	ANALYSIS DATE	4/2/91	3/14/91	4/8/91	4/2/91	4/4/91	4/4/91	4/1/91	4/5/91	4/1/91	4/1/91
2,4-Dichlorophenol	120-83-2	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
1,2,4-Trichlorobenzene	120-82-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Naphthalene	91-20-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
4-Chloroaniline	106-47-8	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Hexachlorobutadiene	87-68-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
4-Chloro-3-methylphenol	59-50-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2-Methylnaphthalene	91-57-6	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Hexachlorocyclopentadiene	77-47-4	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2,4,6-Trichlorophenol	88-06-2	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2,4,5-Trichlorophenol	95-95-4	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ
2-Chloronaphthalene	91-58-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2-Nitroaniline	88-74-4	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ
Dimethylphthalate	131-11-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Acenaphthylene	208-96-8	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
3-Nitroaniline	99-09-2	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ
Acenaphthene	83-32-9	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2,4-Dinitrophenol	51-28-5	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ
4-Nitrophenol	100-02-7	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
	EXTRACTION DATE	3/12/91	3/12/91	3/13/91	3/12/91	3/17/91	3/17/91	3/21/91	4/2/91	3/21/91	3/21/91
	ANALYSIS DATE	4/2/91	3/14/91	4/8/91	4/2/91	4/4/91	4/4/91	4/1/91	4/5/91	4/1/91	4/1/91
Dibenzofuran	132-64-9	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2,4-Dinitrotoluene	121-14-2	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
2,6-Dinitrotoluene	606-20-2	1000 UJ	1000 U	NA	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Diethylphthalate	84-66-2	1000UJ*	1000 U*	370 U	1000 UJ	1000 UJ	370 J	1200 UJ	1500UJ*	1000 UJ	1000 UJ
4-Chlorophenyl-phenylether	7005-72-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Fluorene	86-73-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
4-Nitroaniline	100-01-6	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ
4,6-Dinitro-2-methylphenol	534-52-1	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ
N-Nitrosodiphenylamine	86-30-6	1000 UJ	1000 U	90 J[1]	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
4-Bromophenyl-phenylether	101-55-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Hexachlorobenzene	118-74-1	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Pentachlorophenol	87-86-5	4900 UJ	4900 U	1900 U	5000 UJ	5100 UJ	5000 UJ	5800 UJ	7300 UJ	5000 UJ	5000 UJ
Phenanthrene	85-01-8	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Anthracene	120-12-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Di-n-Butylphthalate	84-74-2	1000 UJ	1000 U	45 J	1500 UJ	1000 UJ	1400 UJ	1200 UJ	4500 UJ	1000 UJ	1000 UJ
Fluoranthene	206-44-0	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Pyrene	129-00-0	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Butylbenzylphthalate	85-68-7	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00GW3	B00GW4	B00GW5	B00GW8	B00GX6	B00GZ2	B00GZ6	B00GZ8	B00H00	B00H01
	TYPE	Reg	Fdup	Split	Reg	Reg	Reg	Reg	Reg	Reg	Reg
	POND	3B	3B	3B	3B	3B	3B	3B	3B	3C	3C
	DEPTH	13	13	13	21	61.5	90.5	118.5	123.5	1	3
	EXTRACTION DATE	3/12/91	3/12/91	3/13/91	3/12/91	3/17/91	3/17/91	3/21/91	4/2/91	3/21/91	3/21/91
	ANALYSIS DATE	4/2/91	3/14/91	4/8/91	4/2/91	4/4/91	4/4/91	4/1/91	4/5/91	4/1/91	4/1/91
3,3'-Dichlorobenzidine	91-94-1	2000 UJ	2000 U	740 U	2000 UJ	2100 UJ	2100 UJ	2400 UJ	3000 UJ	2100 UJ	2100 UJ
Benzo(a)anthracene	56-55-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
bis(2-ethylhexyl)phthalate	117-81-7	1000 UJ	1000 U	54 J	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1200 UJ	1600 UJ
Chrysene	218-01-9	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Di-n-octylphthalate	117-84-0	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Benzo(b)fluoranthene	205-99-2	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Benzo(k)fluoranthene	207-08-9	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Benzo(a)pyrene	50-32-8	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Indeno(1,2,3-cd)pyrene	193-39-5	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Dibenz(a,h)anthracene	53-70-3	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
Benzo(g,h,i)perylene	191-24-2	1000 UJ	1000 U	370 U	1000 UJ	1000 UJ	1000 UJ	1200 UJ	1500 UJ	1000 UJ	1000 UJ
OTHER WAC-173-303-9905 DANGEROUS WASTE CONSTITUENTS?		No	No	No	No	No	No	No	No	No	No
Total TICs		6	11	5	13	14	17	11	20	16	17
TICs without laboratory "B" flags		0	4	5	7	5	9	1	1	5	0

Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
	EXTRACTION DATE	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91
	ANALYSIS DATE	4/1/91	4/5/91	4/5/91	4/5/91	4/5/91	4/26/91	4/5/91	4/5/91	4/5/91	4/5/91
Phenol	108-95-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
bis(2-chloroethyl)ether	111-44-4	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2-Chlorophenol	95-57-8	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
1,3-Dichlorobenzene	541-73-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
1,4-Dichlorobenzene	106-46-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Benzyl Alcohol	100-51-6	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
1,2-Dichlorobenzene	95-50-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2-Methylphenol	95-48-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
bis(2-Chloroisopropyl) ether	108-60-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
4-Methylphenol	106-44-5	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
N-Nitrosodipropylamine	621-64-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Hexachloroethane	67-72-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Nitrobenzene	98-95-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Isophorone	78-59-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2-Nitrophenol	88-75-5	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2,4-Dimethylphenol	105-67-9	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Benzoic acid	65-85-0	6300 UJ	5000UJ*	5100UJ*	5000UJ*	5100UJ*	1700 U	5300UJ*	4800UJ*	5100UJ*	6200 U*
bis(2-chloroethoxy)methane	111-91-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
	EXTRACTION DATE	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91
	ANALYSIS DATE	4/1/91	4/5/91	4/5/91	4/5/91	4/5/91	4/26/91	4/5/91	4/5/91	4/5/91	4/5/91
2,4-Dichlorophenol	120-83-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
1,2,4-Trichlorobenzene	120-82-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Naphthalene	91-20-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
4-Chloroaniline	106-47-8	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Hexachlorobutadiene	87-68-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
4-Chloro-3-methylphenol	59-50-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2-Methylnaphthalene	91-57-6	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Hexachlorocyclopentadiene	77-47-4	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2,4,6-Trichlorophenol	88-06-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2,4,5-Trichlorophenol	95-95-4	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U
2-Chloronaphthalene	91-58-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2-Nitroaniline	88-74-4	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U
Dimethylphthalate	131-11-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Acenaphthylene	208-96-8	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
3-Nitroaniline	99-09-2	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U
Acenaphthene	83-32-9	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2,4-Dinitrophenol	51-28-5	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U
4-Nitrophenol	100-02-7	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
	EXTRACTION DATE	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91
	ANALYSIS DATE	4/1/91	4/5/91	4/5/91	4/5/91	4/5/91	4/26/91	4/5/91	4/5/91	4/5/91	4/5/91
Dibenzofuran	132-64-9	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2,4-Dinitrotoluene	121-14-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
2,6-Dinitrotoluene	606-20-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	NA	1100 UJ	990 UJ	1100 UJ	1300 U
Diethylphthalate	84-66-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000UJ*	340 U	1100UJ*	990 UJ	1100 UJ	1300 U*
4-Chlorophenyl-phenylether	7005-72-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Fluorene	86-73-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
4-Nitroaniline	100-01-6	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U
4,6-Dinitro-2-methylphenol	534-52-1	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U
N-Nitrosodiphenylamine	86-30-6	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U[1]	1100 UJ	990 UJ	1100 UJ	1300 U
4-Bromophenyl-phenylether	101-55-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Hexachlorobenzene	118-74-1	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Pentachlorophenol	87-86-5	6300 UJ	5000 UJ	5100 UJ	5000 UJ	5100 UJ	1700 U	5300 UJ	4800 UJ	5100 UJ	6200 U
Phenanthrene	85-01-8	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Anthracene	120-12-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Di-n-Butylphthalate	84-74-2	2000 UJ	1500 UJ	2500 UJ	2100 UJ	3100 UJ	340 U	2500 UJ	1100 UJ	2200 UJ	3700 U
Fluoranthene	206-44-0	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Pyrene	129-00-0	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Butylbenzylphthalate	85-68-7	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U

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Table A-6. B-Pond Phase 3 Semivolatiles. (µg/Kg)
(Base/Neutral/Acid Compounds)

ANALYTE	CAS#	B00H02	B00H03	B00H04	B00H05	B00H06	B00H07	B00H14	B00H10	B00H19	B00H23
	TYPE	Reg	Reg	Reg	Fdup	Reg	Split	Reg	Blank	Reg	Reg
	POND	3C	3C	3C	3C	3C	3C	3C	3C	3C	3C
	DEPTH	5	7	9	9	11.5	11.5	30	---	60	80
	EXTRACTION DATE	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91	3/21/91	4/2/91	4/2/91	4/2/91	4/2/91
	ANALYSIS DATE	4/1/91	4/5/91	4/5/91	4/5/91	4/5/91	4/26/91	4/5/91	4/5/91	4/5/91	4/5/91
3,3'-Dichlorobenzidine	91-94-1	2600 UJ	2100 UJ	2100 UJ	2100 UJ	2100 UJ	690 U	2200 UJ	2000 UJ	2100 UJ	2500 U
Benzo(a)anthracene	56-55-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
bis(2-ethylhexyl)phthalate	117-81-7	1400 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Chrysene	218-01-9	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Di-n-octylphthalate	117-84-0	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Benzo(b)fluoranthene	205-99-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Benzo(k)fluoranthene	207-08-9	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Benzo(a)pyrene	50-32-8	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Indeno(1,2,3-cd)pyrene	193-39-5	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Dibenz(a,h)anthracene	53-70-3	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
Benzo(g,h,i)perylene	191-24-2	1300 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	340 U	1100 UJ	990 UJ	1100 UJ	1300 U
OTHER WAC-173-303-9905 DANGEROUS WASTE CONSTITUENTS?		No	No	No	No	No	No	No	No	No	No
Total TICs		18	21	21	20	21	5	21	21	19	20
TICs without laboratory "B" flags		1	4	3	2	2	5	4	4	2	4

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.
* NOTE: Analyte was qualified as non-detected at the adjusted CRQL due to traces in immediate laboratory blank and sample however, other samples analyzed at that laboratory are reported in this table at sub-CRQL concentrations.
1 Cannot be separated from Diphenylamine.

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Reasons for Westinghouse Hanford Company Qualification--Semivolatile Organic (Base/Neutral/Acid) Compounds

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--All samples were flagged as estimated, "J". The following samples were qualified "J" based on extraction outside 7-day criteria established for water. (All samples were analyzed within 40 days of extraction.)

B00FK6	B00GR9	B00GX6	B00H04
B00FK7	B00GS4	B00GZ2	B00H05
B00FK8	B00GS9	B00GZ6	B00H06
B00FK9	B00GT7	B00GZ8	B00H10
B00FL0	B00GV5	B00H00	B00H14
B00FL1	B00GW1	B00H01	B00H19
B00FL3	B00GW3	B00H02	
B00FL4	B00GW8	B00H03	

LABORATORY BLANK--The target compounds diethyl phthalate bis(2-ethylhexyl) phthalate, di-n-butyl phthalate and benzoic acid were detected in laboratory blanks. This resulted in an undetected qualification, "U", of one or more of those analytes detected at similar concentrations in the following:

B00FK6	B00GS9	B00GW4	B00H04
B00FK7	B00GT7	B00GW8	B00H05
B00FK8	B00GV5	B00GX6	B00H06
B00FK9	B00GV6	B00GZ2	B00H10
B00FL0	B00GV7	B00GZ6	B00H14
B00FL1	B00GV8	B00GZ8	B00H19
B00FL3	B00GV9	B00H00	B00H23
B00FL4	B00GW0	B00H01	
B00GR9	B00GW1	B00H02	
B00GS4	B00GW3	B00H03	

Blank qualification criteria were also applied to compounds reported as TICs. The TICs were not reported when present in similar concentrations in the immediately associated laboratory blank.

Split Samples:

LABORATORY BLANKS--The compounds di-n-butylpthalate, fluoranthene, pyrene, butylbenzylphthalate, and bis(2-ethylhexyl)phthalate were detected at sub-CRQL levels in the laboratory blank associated with B00GS5. Similar levels in sample B00GS5 were qualified "U" at the quantitation limit.

Additional notes :

The split samples B00GS5, B00GW5, and B00H07 had a pH reported in conjunction with the semivolatile analysis. Reported values were 7.1, 7.2, and 6.3, respectively.

A listing of semivolatile TICs follows in Table A-7.

Table A-7. B-Pond Phase 3 Semivolatile Tentatively Identified Compounds. Laboratory Reported Compounds Not in the Associated Lab Blank (6 sheets)

SAMPLE	REPORTED COMPOUND	CAS#	CONCENTRATION
B00FK6	Dioctyl Adipate	123-79-5	630 J
	Unknown		1400 J
	Unknown		960 J
B00FK7	Benzaldehyde, 5-hydroxy-3-metho	121-33-5	550 J
	2-Pyrrolidinone, 1-methyl-	872-50-4	610 J
	Unknown		900 J
B00FK8	Unknown Hydrocarbons		5400 J
	Unknown Hydrocarbons		1100 J
	Unknown		1500 J
	Unknown		500 J
B00FK9	Octanoic Acid	124-07-2	460 J
	Unknown		1400 J
B00FL0	Unknown Hydrocarbon		2800 J
	Unknown Hydrocarbon		810 J
	Unknown		520 J
	Unknown		1500 J
	Unknown		490 J
B00FL1	Dimethyl Hydrazine		600 JY
	Unknown Hydrocarbon		530 J
	Unknown		1500 J
	Unknown		1700 J
	Unknown		620 J
B00FL3	None		
B00FL4	Benzaldehyde, 5-hydroxy-3-metho	121-33-5	480 J
	Phosphoric acid, Dioctadecyl e		470 J
	Unknown		1200 J
	Unknown		1600 J

Table A-7. B-Pond Phase 3 Semivolatile Tentatively Identified Compounds. Laboratory Reported Compounds Not in the Associated Lab Blank (6 sheets)

SAMPLE	REPORTED COMPOUND	CAS#	CONCENTRATION
B00GR9	Benzaldehyde, 5-hydroxy-3-metho	121-33-5	450 J
	Dimethyl Hydrazine		460 J
	Unknown		630 J
	Unknown		440 J
	Unknown		790 J
	Unknown		640 J
B00GS4	Phosphoric acid, Dioctadecyl e		1200 J
	Unknown Hydrocarbon		1700 J
	Unknown		1300 J
	Unknown		650 J
B00GS5	None		
B00GS9	Butyl Cellosolve	111-76-2	690 J
	Unknown		470 J
	Unknown		1400 J
	Unknown		490 J
B00GT7	Unknown Hydrocarbon		3000 J
	Unknown Phthalate ester		470 J
	Unknown		780 J
	Unknown		2000 J
	Unknown		820 J
	Unknown		2300 J
	Unknown		550 J
	Unknown		1600 J
	Unknown		1400 J
	Unknown		1400 J
	Unknown		2000 J
B00GV5	Unknown		780 J
	Unknown		1400 J
	Unknown		640 J
	Unknown		790 J

Table A-7. B-Pond Phase 3 Semivolatile Tentatively Identified Compounds. Laboratory Reported Compounds Not in the Associated Lab Blank (6 sheets)

SAMPLE	REPORTED COMPOUND	CAS#	CONCENTRATION
B00GV6	2-Pyrrolidinone, 1-methyl-	872-50-4	620 J
	Isoheptdecanol		1800 J
	Sat'd. Hydrocarbon		1200 J
	Sat'd. Hydrocarbon		1100 J
	Sat'd. Hydrocarbon		570 J
	Sat'd. Hydrocarbon		670 J
	Sat'd. Hydrocarbon		1300 J
	Unknown		1200 J
	Unknown		920 J
B00GV7	Hexadecanoic acid	57-10-3	1500 J
	Tetradecanoic acid, tetradecyl	3234-85-3	520 J
B00GV8	Pentadecanoic acid	1002-84-2	820 J
	Unknown		640 J
B00GV9	Unknown Alkoxy Cpd		1800 J
	Unknown Alkyl Hydrocarbon		1800 J
	Unknown Alkyl Hydrocarbon		440 J
	Unknown Phthalate ester		890 J
	Unknown		400 J
	Unknown		4800 J
	Unknown		490 J
	Unknown		850 J
B00GW0	Unknown Alkyl Hydrocarbon		470 J
	Unknown Alkyl Hydrocarbon		1200 J
	Unknown Alkyl/Alkoxy Cpd		990 J
	Unknown Alkyl/Alkoxy Cpd		2300 J
B00GW1	Unknown Alkoxy Cpd		860 J
	Unknown Alkyl Hydrocarbon		1500 J
B00GW3	None		

Table A-7. B-Pond Phase 3 Semivolatile Tentatively Identified Compounds. Laboratory Reported Compounds Not in the Associated Lab Blank (6 sheets)

SAMPLE	REPORTED COMPOUND	CAS#	CONCENTRATION
B00GW4	Unknown Alkyl/Alkoxy Cpd		1000 J
	Unknown Alkyl/Alkoxy Cpd		2300 J
	Unknown Phthalate ester		460 J
	Unknown		440 J
B00GW5	Adipate		10000 J
	Aldol condensate		200 JA
	Aldol condensate		600 JA
	Unknown		200 J
	Unknown		1000 J
B00GW8	Unknown Alkoxy Cpd		670 J
	Unknown Alkyl Hydrocarbon		1000 J
	Unknown Alkyl Hydrocarbon		450 J
	Unknown Phthalate ester		610 J
	Unknown		3600 J
	Unknown		450 J
	Unknown		470 J
B00GX6	1-Dotriacontanol		3100 J
	Sat'd. Hydrocarbon		740 J
	Unknown Alkyl Hydrocarbon		3600 J
	Unknown Alkyl Hydrocarbon		1300 J
	Unknown		830 J
B00GZ2	3-Eicosene, (e)-		7900 J
	7 Hexadecane, (2)-		500 J
	1-Propanol, 2-ethoxy-		850 J
	Unknown Alkyl Hydrocarbon		3300 J
	Unknown Alkyl Hydrocarbon		1400 J
	Unknown Hydrocarbon		500 J
	Unknown Hydrocarbon		520 J
	Unknown Hydrocarbon		4600 J
	Unknown		980 J

Table A-7. B-Pond Phase 3 Semivolatile Tentatively Identified Compounds. Laboratory Reported Compounds Not in the Associated Lab Blank (6 sheets)

SAMPLE	REPORTED COMPOUND	CAS#	CONCENTRATION
B00GZ6	Unknown		1400 J
B00GZ8	Unknown Alkyl Hydrocarbon		2600 J
B00H00	Unknown Hydrocarbon		1200 J
	Unknown Hydrocarbon		3800 J
	Unknown Hydrocarbon		1600 J
	Unknown Hydrocarbon		910 J
	Unknown		590 J
B00H01	None		
B00H02	Unknown		790 J
B00H03	bis(2-Methoxyethyl)ester	117-82-8	860 J
	Propanoic acid, 2-methyl-, 1-(1	74381-40-1	2600 J
	Unknown Alkyl Hydrocarbon		900 J
	Unknown Hydrocarbon		1200 J
B00H04	Propanoic acid, 2-methyl-, 1-(1	74381-40-1	4100 J
	Unknown Hydrocarbon		960 J
	Unknown		1100 J
B00H05	bis(2-Methoxyethyl)ester	117-82-8	790 J
	Propanoic acid, 2-methyl-, 1-(1	74381-40-1	2300 J
B00H06	Unknown Alkyl Hydrocarbon		1000 J
	Unknown Hydrocarbon		940 J
B00H07	Adipate		6000 J
	Aldol condensate		200 JA
	Phthalate		100 J
	Unknown Hydrocarbon		200 J
	Unknown		200 J

Table A-7. B-Pond Phase 3 Semivolatile Tentatively Identified Compounds. Laboratory Reported Compounds Not in the Associated Lab Blank (6 sheets)

SAMPLE	REPORTED COMPOUND	CAS#	CONCENTRATION
B00H14	Propanoic acid, 2-methyl-, 2,2-D		1200 J
	Unknown Hydrocarbon		780 J
	Unknown		800 J
	Unknown		890 J
B00H10	Propanoic acid, 2-methyl-, 1-(1	74381-40-1	1100 J
	Unknown Alkyl Hydrocarbon		550 J
	Unknown		550 J
	Unknown		2100 J
B00H19	bis(2-Methoxyethyl)ester	117-82-8	880 J
	Propanoic acid, 2-methyl-, 1-(1	74381-40-1	3300 J
B00H23	bis(2-Methoxyethyl)ester	117-82-8	1200 J
	Unknown Hydrocarbon		1100 J
	Unknown Hydrocarbon		1100 J
	Unknown		1100 J

J The associated value is an estimated quantity.

Table A-8a. Analytes by Inductively Coupled Plasma, Aluminum-Calcium. (µg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Al	Sb		Ba	Be		B	Cd		Ca
BOOFK6	Reg	3A	6.5	6600	5.6	U	72	0.36		4.5	0.98		3400
BOOFK7	Reg	3A	8.5	6900	5.4	U	81	0.43		8.6	1.2		5300
BOOFK8	Reg	3A	10.5	3800	5.1	U	61	0.36		3.2	1.6		8100
BOOFK9	Reg	3A	13	4500	4.8	U	55	0.31		4.8	0.85		8400
BOOFL0	Reg	3A	14.5	5200	5.1	U	69	0.53		3.5	1.2		9200
BOOFL1	Reg	3A	16	5600	5.4	U	75	0.40		7.4	1.3		12000
BOOFL3	Blank	3A	---	130	5.0	U	1.6	0.03	U	3.7	0.30	U	36
BOOFL4	Reg	3A	28	4700	5.1	U	67	0.38		4.7	0.54		9300
BOOGR9	Fdup	3A	28	3900	5.1	U	54	0.34		5.3	0.72		6900
BOOGS0	Reg	3A	31.5	NA	NA		NA	NA		NA	NA		NA
BOOGS1	Reg	3A	36.5	6100	5.2	U	71	0.41		0.42	1.6	U	12000
BOOGS2	Reg	3A	42	5200	6.5		65	0.35		0.39	0.99	U	7700
BOOGS3	Reg	3A	46.5	5300	5.2	U	72	0.35		0.42	0.69	U	9300
BOOGS4	Reg	3A	52.5	8700	5.5	U	91	0.50		1.3	0.33	U	14000
BOOGS5	Split	3A	52.5	4020	4.0	UJ	75	0.34	B	NA	0.762	U	11600
BOOGS8	Reg	3A	57	4800	4.9	U	66	0.31		0.39	0.34	U	6700
BOOGS9	Reg	3A	66.5	5500	5.9		75	0.35		0.41	0.31	U	8000
BOOGT1	Reg	3A	77	9600	5.7	U	83	0.37		0.46	0.34	U	11000
BOOGT3	Blank	3A	---	230	4.8	U	4.6	0.029	U	0.38	0.29	U	64
BOOGT4	Reg	3A	85.5	6500	5.2	U	56	0.23		8.2	0.49		7400
BOOGT5	Fdup	3A	85.5	6300	5.2	U	52	0.25		8.3	0.58		8300
BOOGT6	Split	3A	85.5	2450	4.0	U	36.3	0.21	U	NA	0.83	U	5280
BOOGT7	Reg	3A	97	6600	4.8	U	75	0.28		8.2	0.58		6300

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Table A-8a. Analytes by Inductively Coupled Plasma, Aluminum-Calcium. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Al	Sb		Ba	Be		B	Cd		Ca
BOOFK6	Reg	3A	6.5	6600	5.6	U	72	0.36		4.5	0.98		3400
BOOGT8	Reg	3A	102	7600	14		87	0.35		8.0	0.76		7800
BOOGV0	Reg	3A	122	6500	4.6	U	71	0.29		8.8	0.28	U	5800
BOOGV1	Blank	3A	---	300	4.6	U	6.4	0.12		5.9	0.27	U	60
BOOGV2	Reg	3A	131	7400	4.6	U	77	0.30		7.4	0.60		8000
BOOGV3	Fdup	3A	131	7100	5.2	U	110	0.30		9.1	0.64		7600
BOOGV4	Split	3A	131	2590	3.76	U	43.7	0.28	B	NA	0.79	U	3450
BOOGV5	Reg	3A	143.5	6100	8.0		53	0.28		9.3	0.62		6400
BOOGV6	Reg	3B	1	4500	5.0	U	62	0.32		8.7	0.67		6900
BOOGV7	Reg	3B	3.5	5200	4.9	U	70	0.33		7.6	0.50		7700
BOOGV8	Reg	3B	5.5	5300	5.1	U	87	0.35		8.9	0.31	U	7700
BOOGV9	Blank	3B	---	150	5.0	U	2.0	0.03		7.5	0.30	U	37
BOOGW0	Reg	3B	7.5	7200	5.3	U	80	0.40		6.1	0.80		13000
BOOGW1	Reg	3B	9.5	5000	5.1	U	64	0.35		6.6	0.80		8700
BOOGW3	Reg	3B	13	4600	5.0	U	80	0.35		5.8	1.7		7100
BOOGW4	Fdup	3B	13	4900	4.8	U	78	0.35		5.8	0.84		7600
BOOGW5	Split	3B	13	2210	3.89	U	58.3	0.20	U	NA	0.82	U	5220
BOOGW6	Reg	3B	16	7000	5.3	U	75	0.42		8.0	0.90		10000
BOOGW8	Reg	3B	21	6000	5.1	U	76	0.35		7.2	0.80		7600
BOOGW9	Reg	3B	28	6500	5.2	U	96	0.38		8.1	0.60		7300
BOOGX2	Reg	3B	31	5500	5.1	U	65	0.37		6.8	0.96		7200
BOOGX3	Reg	3B	35.5	5700	5.0	U	63	0.33		5.2	1.6		6500
BOOGX4	Reg	3B	40	5600	5.1	U	75	0.37		4.7	1.7		6800

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Table A-8a. Analytes by Inductively Coupled Plasma, Aluminum-Calcium. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Al	Sb		Ba	Be		B	Cd		Ca
B00FK6	Reg	3A	6.5	6600	5.6	U	72	0.36		4.5	0.98		3400
B00GX5	Reg	3B	52	6000	5.1	U	95	0.36		7.1	1.2		6600
B00GX6	Reg	3B	61.5	5400	5.1	U	75	0.34		4.2	1.5		7700
B00GX8	Reg	3B	70.5	7400	5.2	U	84	0.32		3.7	1.3		8000
B00GY0	Blank	3B	---	200	4.9	U	3.6	0.05		6.0	0.29	U	49
B00GY1	Reg	3B	80.5	8400	5.2	U	80	0.29		12	0.66		8700
B00GY2	Fdup	3B	80.5	7200	5.2	U	63	0.29		8.7	0.82		8000
*B00GY9	Split	3B	80.5	2930	12.5	U	43.7	1.0	U	NA	1.0	U	5160
B00GZ2	Reg	3B	90.5	7300	5.1	U	84	0.31		6.9	1.0		7000
B00GZ3	Reg	3B	105	6900	5.1	U	66	0.30		5.0	1.1		5800
B00GZ6	Reg	3B	118.5	17000	5.8	U	88	0.88		7.6	1.3		5000
B00GZ8	Reg	3B	123.5	13000	4.9	U	87	0.56		9.5	1.8		3000
B00H00	Reg	3C	1	6000	5.2	U	53	0.41		8.3	2.0		11000
B00H01	Reg	3C	3	6200	5.0	U	50	0.36		5.8	1.0		5900
B00H02	Reg	3C	5	6500	5.2	U	60	0.39		7.7	1.2		6900
B00H03	Reg	3C	7	5400	5.0	U	88	0.29		11	2.5		6800
B00H04	Reg	3C	9	6000	5.0	U	92	0.21		12	2.3		7300
B00H05	Fdup	3C	9	7100	4.9	U	79	0.26		9.4	2.1		7600
B00H06	Reg	3C	11.5	4900	5.3	U	76	0.30		12	2.3		6800
B00H07	Split	3C	11.5	2300	4.0	U	57.1	0.36	B	NA	0.8	UJ	4820
B00H09	Reg	3C	16	4600	5.2	U	170	0.23		14	1.7		5300
B00H10	Blank	3C	---	260	4.9	U	3.0	0.066		3.4	0.29	U	75
B00H11	Reg	3C	20.5	4700	5.2	U	69	0.30		0.42	1.0	U	6200

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Table A-8a. Analytes by Inductively Coupled Plasma, Aluminum-Calcium. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Al	Sb	Ba	Be	B	Cd	Ca
B00FK6	Reg	3A	6.5	6600	5.6 U	72	0.36	4.5	0.98	3400
B00H14	Reg	3C	30	5600	4.8 U	73	0.35	4.9	1.7	6800
B00H15	Reg	3C	36	6000	5.2 U	56	0.27	10	1.9	6200
B00H16	Reg	3C	40.5	5500	5.3 U	84	0.26	12	2.3	9400
B00H17	Fdup	3C	40.5	5500	5.1 U	78	0.32	0.41 U	0.62	5800
B00H18	Reg	3C	50	5800	5.3 U	69	0.35	0.42 U	1.7	7800
B00H19	Reg	3C	60	7000	5.3 U	97	0.29	4.5	1.2	6500
B00H20	Reg	3C	70.5	7300	5.2 U	70	0.33	4.0	1.7	7400
B00H21	Blank	3C	---	150	5.0 U	2.4	0.04	3.9	0.30 U	92
B00H23	Reg	3C	80	8300	5.2 U	100	0.37	3.5	1.3	7600
B00H24	Split	3C	80	3720 J	3.59 UJ	46.8 J	0.21 B	NA	0.756 U	4740 J

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.
B The reported value is less than the CLP required detection limit, but greater than the instrument detection limit. This concentration flag was only reported with split samples.
* As reported by laboratory--unvalidated by WHC Office of Sample Management. "J" or additional qualification flags may be added.
NA Analysis not requested.

Table A-8b. Analytes by Inductively Coupled Plasma, Chromium-Molybdenum. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Cr	Co	Cu	Fe	Mg	Mn	Mo
B00FK6	Reg	3A	6.5	7.4	9.4	10	19000	3900	330 J	1.1 U
B00FK7	Reg	3A	8.5	6.6	13	15	26000	5300	390 J	1.1 U
B00FK8	Reg	3A	10.5	3.3	15	17	29000	5200	400 J	1.0 U
B00FK9	Reg	3A	13	5.9	12	16	24000	4300	300 J	0.96 U
B00FL0	Reg	3A	14.5	7.4	14	16	29000	4500	360 J	1.0 U
B00FL1	Reg	3A	16	5.9	14	21	28000	5100	370 J	1.1 U
B00FL3	Blank	3A	---	0.99 U	0.50 U	0.40 U	190	19	4.5 J	0.99 U
B00FL4	Reg	3A	28	3.5	13	17	28000	4000	360 J	1.0 U
B00GR9	Fdup	3A	28	4.9	13	14	25000	3600	300 J	1.0 U
B00GS0	Reg	3A	31.5	NA	NA	NA	NA	NA	NA	NA
B00GS1	Reg	3A	36.5	9.6	13	16	27000	6600	410	1.0 U
B00GS2	Reg	3A	42	7.7	11	16	26000	5300	300	0.97 U
B00GS3	Reg	3A	46.5	3.9	12	17	26000	5100	350	1.0 U
B00GS4	Reg	3A	52.5	8.1	12	20	27000	8700	440	1.1 U
B00GS5	Split	3A	52.5	0.572 U	10.4	13.8	15700	4670	354 J	NA
B00GS8	Reg	3A	57	3.5	12	15	24000	4300	300	0.99 U
B00GS9	Reg	3A	66.5	3.1	12	18	27000	4600	340	1.0 U
B00GT1	Reg	3A	77	13	8.4	13	19000	6600	360	1.1 U
B00GT3	Blank	3A	---	0.96 U	0.48 U	0.57	890	38	7.5	0.96 U
B00GT4	Reg	3A	85.5	11	7.0	12	16000 J	4700	250 J	1.0 U
B00GT5	Fdup	3A	85.5	9.4	7.4	13	16000 J	4000	260 J	1.0 U
B00GT6	Split	3A	85.5	0.63 U	3.6 B	4.9 B	5450	1700	140 J	NA
B00GT7	Reg	3A	97	12	10	16	20000 J	4300	260 J	1.3

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Table A-8b. Analytes by Inductively Coupled Plasma, Chromium-Molybdenum. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Cr	Co	Cu	Fe	Mg	Mn	Mo
BOOFK6	Reg	3A	6.5	7.4	9.4	10	19000	3900	330 J	1.1 U
BOOGT8	Reg	3A	102	16	14	27	29000 J	5500	340 J	1.9
BOOGV0	Reg	3A	122	9.5	12	16	21000 J	3800	250 J	1.1
BOOGV1	Blank	3A	---	0.91 U	0.72	1.4	1300 J	42	13 J	0.91 U
BOOGV2	Reg	3A	131	10	13	23	24000 J	3800	290 J	1.5
BOOGV3	Fdup	3A	131	14	14	22	24000 J	4300	290 J	1.9
BOOGV4	Split	3A	131	2.9	6.3 B	10.1	9140	2210	151	NA
BOOGV5	Reg	3A	143.5	16	14	45	25000 J	5100	280 J	2.4
BOOGV6	Reg	3B	1	8.7	12	16	24000 J	3600	280 J	1.2
BOOGV7	Reg	3B	3.5	8.6	14	17	25000 J	3800	340 J	1.4
BOOGV8	Reg	3B	5.5	14	13	19	26000 J	4000	350 J	1.5
BOOGV9	Blank	3B	---	1.3	0.50 U	5.7	270 J	22	5.4 J	1.00 U
BOOGW0	Reg	3B	7.5	9.7	11	19	23000 J	7000	410 J	1.3
BOOGW1	Reg	3B	9.5	5.1	14	25	28000 J	5000	360 J	1.4
BOOGW3	Reg	3B	13	14	13	19	27000	4900	300	1.0 U
BOOGW4	Fdup	3B	13	7.2	13	18	25000 J	4200	340 J	0.95 U
BOOGW5	Split	3B	13	0.61 U	6.1 B	8.6	9620	1990 J	152	NA
BOOGW6	Reg	3B	16	8.1	14	17	30000 J	5800	400 J	1.1 U
BOOGW8	Reg	3B	21	6.8	14	18	29000 J	4600	360 J	1.0 U
BOOGW9	Reg	3B	28	9.4	15	21	29000 J	4200	340 J	1.0
BOOGX2	Reg	3B	31	7.6	14	17	27000 J	3800	320 J	1.0
BOOGX3	Reg	3B	35.5	9.6	13	18	24000	3800	270	1.0 U
BOOGX4	Reg	3B	40	5.9	14	19	27000	4600	310	1.0 U

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Table A-8b. Analytes by Inductively Coupled Plasma, Chromium-Molybdenum. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Cr	Co	Cu	Fe	Mg	Mn	Mo
BOOFK6	Reg	3A	6.5	7.4	9.4	10	19000	3900	330 J	1.1 U
BOOGX5	Reg	3B	52	11	13	21	27000	4200	300	1.5
BOOGX6	Reg	3B	61.5	11	12	17	25000	4400	310	1.2
BOOGX8	Reg	3B	70.5	11	9.5	14	21000	4800	300	1.0 U
BOOGY0	Blank	3B	---	0.98 U	0.49 U	1.5	970 J	32	18 J	0.98 U
BOOGY1	Reg	3B	80.5	19	9.1	26	30000 J	4300	370 J	2.0
BOOGY2	Fdup	3B	80.5	17	8.9	22	29000 J	4400	350 J	1.4
*BOOGY9	Split	3B	80.5	2.1	10.4 U	10.9	9600	2530	183	NA
BOOGZ2	Reg	3B	90.5	18	12	33	26000 J	3900	300 J	1.9
BOOGZ3	Reg	3B	105	20	11	19	22000	4600	280	1.4
BOOGZ6	Reg	3B	118.5	25	9.5	19	23000	8400	270	1.2 U
BOOGZ8	Reg	3B	123.5	18	7.3	13	17000	6000	270	0.99 U
BOOH00	Reg	3C	1	6.0	13	17	28000	5000	370	1.0 U
BOOH01	Reg	3C	3	11	11	19	23000	4600	290	1.0 U
BOOH02	Reg	3C	5	13	14	26	29000	5000	350	1.8
BOOH03	Reg	3C	7	7.6	13	16	25000	4500	300	1.0 U
BOOH04	Reg	3C	9	11	13	18	26000	4500	320	2.2
BOOH05	Fdup	3C	9	20	12	16	22000	5500	300	1.0
BOOH06	Reg	3C	11.5	4.1	15	17	30000	5000	400	1.1 U
BOOH07	Split	3C	11.5	0.634 U	6 B	9.4	11400	2350	172	NA
BOOH09	Reg	3C	16	4.6	10	13	21000	3700	250	1.0 U
BOOH10	Blank	3C	---	0.98 U	0.49 U	0.39 U	650	44	12	0.98 U
BOOH11	Reg	3C	20.5	5.7	13	14	25000	3900	300	1.0 U

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Table A-8b. Analytes by Inductively Coupled Plasma, Chromium-Molybdenum. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Cr	Co	Cu	Fe	Mg	Mn	Mo
B00FK6	Reg	3A	6.5	7.4	9.4	10	19000	3900	330 J	1.1 U
B00H14	Reg	3C	30	5.7	12	17	26000	4100	290	0.97 U
B00H15	Reg	3C	36	7.1	12	15	23000	3700	280	1.0 U
B00H16	Reg	3C	40.5	6.3	13	15	26000	4300	290	1.1 U
B00H17	Fdup	3C	40.5	11	14	19	25000	4800	310	1.0 U
B00H18	Reg	3C	50	7.3	16	17	31000	4900	390	1.2
B00H19	Reg	3C	60	11	8.1	15	17000	4200	270	1.3
B00H20	Reg	3C	70.5	11	11	19	23000	4500	290	1.0 U
B00H21	Blank	3C	---	7.2	0.50 U	0.40 U	270	45	6.9	0.99 U
B00H23	Reg	3C	80	27	12	23	25000	5800	310	1.0 U
B00H24	Split	3C	80	8.5 J	8.1 B	12.7	13600 J	3230 J	189 J	NA

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.
B The reported value is less than the CLP required detection limit, but greater than the instrument detection limit. This concentration flag was only reported with split samples.
* As reported by laboratory--unvalidated by WHC Office of Sample Management. "J" or additional qualification flags may be added.
NA Analysis not requested.

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Table A-8c. Analytes by Inductively Coupled Plasma, Nickel-Zinc. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ni	K	Si	Ag	Na	V	Zn
B00FK6	Reg	3A	6.5	8.5	1400	860	0.67 U	170	45	42
B00FK7	Reg	3A	8.5	10	1200	540	0.64 U	240	67	51
B00FK8	Reg	3A	10.5	5.9	590	550	0.61 U	230	81	51
B00FK9	Reg	3A	13	7.7	560	320	0.58 U	230	59	45
B00FL0	Reg	3A	14.5	10	600	500	0.62 U	290	86	54
B00FL1	Reg	3A	16	7.5	840	510	0.64 U	320	81	55
B00FL3	Blank	3A	---	0.99 U	59 U	58	0.59 U	20	0.50 U	2.1
B00FL4	Reg	3A	28	6.4	530	370	0.62	220	78	48
B00GR9	Fdup	3A	28	6.4	530	370	0.61 U	240	78	47
B00GS0	Reg	3A	31.5	NA	NA	NA	NA	NA	NA	NA
B00GS1	Reg	3A	36.5	15	900	400	1.5	280	68	56
B00GS2	Reg	3A	42	13	750	330	1.0	270	68	52
B00GS3	Reg	3A	46.5	12	800	280	1.1	280	68	51
B00GS4	Reg	3A	52.5	12	1500	480	1.1	250	58	60
B00GS5	Split	3A	52.5	6.6 B	1110 U	NA	0.952 U	131 B	18.2	32.4
B00GS8	Reg	3A	57	7.1	670	310	0.66	330	62	45
B00GS9	Reg	3A	66.5	7.0	710	270	0.77	310	74	52
B00GT1	Reg	3A	77	16	1800	450	0.83	180	41	42
B00GT3	Blank	3A	---	0.96 U	57 U	87	0.57 U	16	0.48 U	0.6
B00GT4	Reg	3A	85.5	11	1000	440	0.63 U	200	38	34
B00GT5	Fdup	3A	85.5	10	830	550	0.62 U	160	40	33
B00GT6	Split	3A	85.5	3.6 B	420 U	NA	0.83 U	90.3 B	7.6 B	12.4
B00GT7	Reg	3A	97	10	800	470	0.58 U	540	52	37

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Table A-8c. Analytes by Inductively Coupled Plasma, Nickel-Zinc. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ni	K	Si	Ag	Na	V	Zn
B00FK6	Reg	3A	6.5	8.5	1400	860	0.67 U	170	45	42
B00GT8	Reg	3A	102	15	1100	560	0.61 U	740	73	51
B00GV0	Reg	3A	122	11	930	450	0.56 U	490	56	42
B00GV1	Blank	3A	---	0.91 U	83	82	0.55 U	58	3.1	7.4
B00GV2	Reg	3A	131	9.8	870	330	0.56 U	810	65	43
B00GV3	Fdup	3A	131	16	860	510	0.62 U	770	61	43
B00GV4	Split	3A	131	6.1 B	390 B	NA	0.79 U	341	15.4	15.6
B00GV5	Reg	3A	143.5	24	550	320	0.65 U	600	69	45
B00GV6	Reg	3B	1	8.2	680	340	0.60 U	320	64	48
B00GV7	Reg	3B	3.5	8.9	660	330	0.58 U	360	72	50
B00GV8	Reg	3B	5.5	13	670	360	0.62 U	340	70	52
B00GV9	Blank	3B	---	1.4	60 U	110	0.60 U	34	0.50 U	4.1
B00GW0	Reg	3B	7.5	11	1300	260	0.64 U	210	52	48
B00GW1	Reg	3B	9.5	8.2	780	280	0.61 U	230	78	50
B00GW3	Reg	3B	13	11	850	300	0.60 U	340	71	46
B00GW4	Fdup	3B	13	8.8	670	220	0.57 U	280	76	45
B00GW5	Split	3B	13	4.3 B	491 B	NA	0.82 U	132 B	11.3	17.7
B00GW6	Reg	3B	16	10	870	300	0.63 U	260	82	51
B00GW8	Reg	3B	21	8.3	740	240	0.61 U	450	76	50
B00GW9	Reg	3B	28	11	730	240	0.62 U	560	87	50
B00GX2	Reg	3B	31	8.9	660	250	0.62 U	390	82	49
B00GX3	Reg	3B	35.5	9.2	710	290	0.60 U	520	77	44
B00GX4	Reg	3B	40	10	780	410	0.61 U	420	76	46

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Table A-8c. Analytes by Inductively Coupled Plasma, Nickel-Zinc. (µg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ni	K	Si	Ag	Na	V	Zn
B00FK6	Reg	3A	6.5	8.5	1400	860	0.67 U	170	45	42
B00GX5	Reg	3B	52	9.7	910	390	0.62 U	550	72	46
B00GX6	Reg	3B	61.5	12	770	450	0.61 U	420	68	43
B00GX8	Reg	3B	70.5	12	1200	400	0.62 U	450	54	40
B00GY0	Blank	3B	---	0.99	65	100	0.59 U	51	0.59	3.3
B00GY1	Reg	3B	80.5	12	970	290	0.62 U	610	45	40
B00GY2	Fdup	3B	80.5	14	1100	260	0.65	410	45	36
*B00GY9	Split	3B	80.5	8.3 U	1040 U	NA	2.1 U	1040 U	15.0	17.3
B00GZ2	Reg	3B	90.5	13	780	250	0.61 U	710	67	40
B00GZ3	Reg	3B	105	15	1200	430	0.61 U	500	58	39
B00GZ6	Reg	3B	118.5	21	3000	430	0.70 U	210	38	56
B00GZ8	Reg	3B	123.5	14	2000	290	0.59 U	180	34	43
B00H00	Reg	3C	1	9.4	1100	350	0.62 U	560	77	51
B00H01	Reg	3C	3	11	830	460	0.60 U	470	62	41
B00H02	Reg	3C	5	13	970	300	0.62 U	620	78	57
B00H03	Reg	3C	7	10	940	410	0.60 U	450	62	49
B00H04	Reg	3C	9	11	960	290	0.60 U	510	69	49
B00H05	Fdup	3C	9	29	790	260	0.59 U	540	58	39
B00H06	Reg	3C	11.5	7.0	670	290	0.63 U	390	85	54
B00H07	Split	3C	11.5	5.0 B	256 B	NA	0.85 U	263 U	17.3	19.3
B00H09	Reg	3C	16	6.8	550	290	0.62 U	310	55	38
B00H10	Blank	3C	---	0.98 U	59 U	100	0.59 U	31	0.53	5.5
B00H11	Reg	3C	20.5	14	630	270	0.62 U	270	68	47

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Table A-8c. Analytes by Inductively Coupled Plasma, Nickel-Zinc. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ni	K	Si	Ag	Na	V	Zn
BOOFK6	Reg	3A	6.5	8.5	1400	860	0.67 U	170	45	42
BOOH14	Reg	3C	30	9.6	860	260	0.58 U	440	69	49
BOOH15	Reg	3C	36	7.9	720	250	0.62 U	520	60	42
BOOH16	Reg	3C	40.5	12	750	270	0.64 U	510	72	46
BOOH17	Fdup	3C	40.5	14	670	300	0.61 U	440	68	45
BOOH18	Reg	3C	50	8.9	770	370	0.64 U	430	85	54
BOOH19	Reg	3C	60	11	1100	430	0.63 U	410	38	34
BOOH20	Reg	3C	70.5	10	1100	310	0.62 U	570	63	41
BOOH21	Blank	3C	---	4.1	60 U	76	0.60 U	56	0.50 U	2.2
BOOH23	Reg	3C	80	18	1000	350	0.63 U	730	61	42
BOOH24	Split	3C	80	9.5	694 B	NA	1.1 B	275 B	23	23.5

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.
B The reported value is less than the CLP required detection limit, but greater than the instrument detection limit. This concentration flag was only reported with split samples.
* As reported by laboratory--unvalidated by WHC Office of Sample Management. "J" or additional qualification flags may be added.
NA Analysis not requested.

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Reasons for Westinghouse Hanford Company Qualification--
Analytes by Inductively Coupled Plasma (Aluminum-Zinc)

Regular, Field Duplicate, and Silica Sand Samples:

MATRIX SPIKE--The spike recovery for **Mg** and **Fe** was high for several batches. This resulted in an estimated, "J", qualification for samples in those batches. Affected samples are:

B00FK6	B00GT4	B00GV6	B00GY0
B00FK7	B00GT5	B00GV7	B00GY1
B00FK8	B00GT7	B00GV8	B00GY2
B00FK9	B00GT8	B00GV9	B00GZ2
B00FL0	B00GV0	B00GW0	B00GW9
B00FL1	B00GV1	B00GW1	B00GX2
B00FL3	B00GV2	B00GW4	
B00FL4	B00GV3	B00GW6	
B00GR9	B00GV5	B00GW8	

Split Samples:

LABORATORY BLANKS--B00GS5, B00GT6 and B00GW5 were qualified as undetected, "U", for **K** based on traces in the associated blanks. Sample B00H07 was likewise qualified for **Na** because contamination was present in the associated blank. (Blank concentrations were less than the CLP CRQL.)

INDUCTIVELY COUPLED PLASMA (ICP) INTERFERENCE CHECK SAMPLE--B00GS5, B00H07, B00H24, B00GT6 and B00GW5 **Mn** results were qualified as estimated, "J", because of the possibility of false positive results. A "UJ" qualified **Sb** results for B00H24 and B00GS5 because of the potential for false negative results from interference. **Sodium** results for B00GV4 were qualified "J", because of the possibility of false positive results.

MATRIX SPIKE--The **Cd** and **Mn** results for B00H07 were qualified "UJ" and "J", respectively because of associated low matrix spike recoveries. The **Sb** results for B00H24 and B00GS5 were qualified "UJ" because of low spike recoveries (<75%).

DUPLICATE ANALYSIS--**Barium** and **Cr** results of sample B00H24 were qualified because of variability among duplicate analyses.

SERIAL DILUTION--Several major soil elements (**Al**, **Fe**, **Mn**, **Ca**, and **Mg**) were qualified as estimated, "J", for B00H24 because of serial dilution results differed from initial sample results by >10%.

Table A-9. Analytes by Atomic Absorption Spectroscopy. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Arsenic		Lead		Mercury		Sellenium		Thallium	
BOOFK6	Reg	3A	6.5	2.6		5.1		1.0	UJ	0.54	U	1.1	U
BOOFK7	Reg	3A	8.5	2.86		5.1		1.0	UJ	0.54	U	1.1	U
BOOFK8	Reg	3A	10.5	1.8		3.12		1.0	UJ	0.50	U	0.99	U
BOOFK9	Reg	3A	13	2.0		3.83		1.0	UJ	0.52	U	1.0	U
BOOFL0	Reg	3A	14.5	1.7		3.18		1.0	UJ	0.52	U	1.0	U
BOOFL1	Reg	3A	16	2.6		4.0		1.0	U	0.50	U	0.99	U
BOOFL3	Blank	3A	---	0.49	U	0.39	U	1.0	U	0.49	U	1.0	U
BOOFL4	Reg	3A	28	1.3		2.6		1.0	U	1.0	U	1.0	U
BOOGR9	Fdup	3A	28	1.1		2.6		1.0	U	0.46	U	0.92	U
BOOGS0	Reg	3A	31.5	0.97		3.0		1.0	U	NA		NA	
BOOGS1	Reg	3A	36.5	2.1		4.2		1.0	U	NA		NA	
BOOGS2	Reg	3A	42	1.5		2.6		1.0	U	NA		NA	
BOOGS3	Reg	3A	46.5	1.9		3.1		1.0	U	NA		NA	
BOOGS4	Reg	3A	52.5	4.2		11		1.0	U	1.1	UD	1.1	U
BOOGS5	Split	3A	52.5	4.4		8.7	J	0.12	U	0.348	UJ	0.696	UJ
BOOGS8	Reg	3A	57	1.5		2.5		1.0	U	NA		NA	
BOOGS9	Reg	3A	66.5	1.3		2.8		1.0	U	0.99	UD	0.99	U
BOOGT1	Reg	3A	77	1.2		5.1		1.0	U	1.1	UD	1.1	U
BOOGT3	Blank	3A	---	0.44	U	0.45		1.0	U	NA		NA	
BOOGT4	Reg	3A	85.5	1.6		2.1		1.0	U	NA		NA	
BOOGT5	Fdup	3A	85.5	1.7		2.5		1.0	U	NA		NA	
BOOGT6	Split	3A	85.5	0.42	UJ	2.5		0.11	UJ	NA		NA	
BOOGT7	Reg	3A	97	1.2		4.3		1.0	U	0.49	U	0.97	U

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Table A-9. Analytes by Atomic Absorption Spectroscopy. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Arsenic		Lead		Mercury		Selenium		Thallium	
B00GT8	Reg	3A	102	1.5		9.3		1.0	U	NA		NA	
B00GV0	Reg	3A	122	0.94		2.8		1.0	U	NA		NA	
B00GV1	Blank	3A	---	0.5	U	0.52		1.0	U	0.50	U	NA	
B00GV2	Reg	3A	131	0.79		5.0		1.0	U	NA		NA	
B00GV3	Fdup	3A	131	0.82		4.6		1.0	U	NA		NA	
B00GV4	Split	3A	131	0.6	B	7.3		0.1	U	NA		NA	
B00GV5	Reg	3A	143.5	0.94		18		1.0	U	0.54	U	1.1	U
B00GV6	Reg	3B	1	1.0		2.6		1.0	U	0.50	U	1.0	U
B00GV7	Reg	3B	3.5	2.0		3.4		1.0	U	0.52	U	1.0	U
B00GV8	Reg	3B	5.5	1.6		3.5		1.0	U	0.52	U	1.1	U
B00GV9	Blank	3B	---	0.5	U	0.50		1.0	UJ	0.05	U	1.0	U
B00GW0	Reg	3B	7.5	7.1		13		1.0	UJ	0.53	U	1.1	U
B00GW1	Reg	3B	9.5	3.7		4.1		1.0	UJ	0.50	U	1.0	U
B00GW3	Reg	3B	13	6.6		3.2		1.0	UJ	0.51	U	1.0	U
B00GW4	Fdup	3B	13	2.4		3.6		1.0	UJ	0.51	U	1.0	U
B00GW5	Split	3B	13	1.0	J	0.36	U	0.1	UJ	0.32	U	0.89	U
B00GW6	Reg	3B	16	2.6		4.7		1.0	UJ	NA		NA	
B00GW8	Reg	3B	21	2.2		3.0		1.0	UJ	0.52	U	1.0	U
B00GW9	Reg	3B	28	1.2		2.9		1.0	UJ	NA		NA	
B00GX2	Reg	3B	31	0.93		3.0		1.0	UJ	NA		NA	
B00GX3	Reg	3B	35.5	0.68		2.3		1.0	U	NA		NA	
B00GX4	Reg	3B	40	0.82		2.5		1.0	U	NA		NA	
B00GX5	Reg	3B	52	0.90		2.7		1.0	U	NA		NA	

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Table A-9. Analytes by Atomic Absorption Spectroscopy. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Arsenic		Lead	Mercury		Sellenium		Thallium	
B00GX6	Reg	3B	61.5	0.61		2.2	1.0	U	0.52	U	1.0	U
B00GX8	Reg	3B	70.5	1.5		3.1	1.0	U	NA		NA	
B00GY0	Blank	3B	---	0.5	U	0.43	1.0	U	NA		NA	
B00GY1	Reg	3B	80.5	1.6		20	1.0	U	NA		NA	
B00GY2	Fdup	3B	80.5	1.9		8.8	1.0	U	NA		NA	
*B00GY9	Split	3B	80.5	1.9	U	7.1	0.56		NA		NA	
B00GZ2	Reg	3B	90.5	1.2		9.9	1.0	U	0.51	U	1.0	U
B00GZ3	Reg	3B	105	0.98		2.9	1.0	U	NA		NA	
B00GZ6	Reg	3B	118.5	0.59	U	8.5	1.0	U	0.54	U	1.0	U
B00GZ8	Reg	3B	123.5	7.2		7.2	1.0	U	0.61	U	1.2	U
B00H00	Reg	3C	1	2.5		3.9	1.0	U	0.51	U	1.0	U
B00H01	Reg	3C	3	1.9		3.1	1.0	U	0.51	U	1.0	U
B00H02	Reg	3C	5	2.3		30	1.0	U	0.52	U	1.0	U
B00H03	Reg	3C	7	2.1		2.5	1.0	U	0.52	U	1.0	U
B00H04	Reg	3C	9	1.8		2.6	1.0	U	0.52	U	1.0	U
B00H05	Fdup	3C	9	1.3		2.6	1.0	U	0.51	U	1.0	U
B00H06	Reg	3C	11.5	1.7		2.5	1.0	U	0.52	U	1.0	U
B00H07	Split	3C	11.5	0.9	B	2.2	0.1	U	0.16	U	8.0	U
B00H09	Reg	3C	16	0.80		1.9	1.0	U	NA		NA	
B00H10	Blank	3C	---	0.5	U	0.51	0.1	UJ	0.50	U	1.0	U
B00H11	Reg	3C	20.5	0.82		2.5	0.1	UJ	NA		NA	
B00H14	Reg	3C	30	0.92		2.4	0.1	UJ	0.52	U	1.0	U
B00H15	Reg	3C	36	0.65		1.8	0.1	UJ	NA		NA	

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Table A-9. Analytes by Atomic Absorption Spectroscopy. (µg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Arsenic		Lead		Mercury		Sellenium		Thallium	
B00H16	Reg	3C	40.5	0.76		2.0		0.1	UJ	NA		NA	
B00H17	Fdup	3C	40.5	0.50	U	1.9		0.1	UJ	NA		NA	
B00H18	Reg	3C	50	0.73		2.1		0.1	UJ	NA		NA	
B00H19	Reg	3C	60	1.4		2.8		0.1	UJ	0.53	U	1.0	U
B00H20	Reg	3C	70.5	0.88		2.22		0.1	UJ	NA		NA	
B00H21	Blank	3C	---	0.5	U	0.4	U	0.1	UJ	0.50	U	1.0	U
B00H23	Reg	3C	80	1.4		2.5		0.1	UJ	0.52	U	1.0	U
B00H24	Split	3C	80	0.66	J	2.1		0.107	UR	NA		NA	

U The analyte was undetected at the stated limit.
J The associated value is an estimated quantity.
NA Analysis not requested.
D Sample quantitation may be affected by dilution.
B The reported value is less than the CLP required detection limit, but greater than the instrument detection limit. This concentration flag was only reported with split samples.
* As reported by laboratory--unvalidated by WHC Office of Sample Management. "J" or additional qualification flags may be added.
R Qualified by WHC Office of Sample Management as unusable.

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Reasons for Westinghouse Hanford Company Qualification--Analytes by Atomic Absorption Spectroscopy

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--All holding time criteria were met except for some mercury samples. Those samples were qualified "UJ". All samples were flagged as estimated, "J". The 28 day criteria established for water was exceeded for the following Phase 3 soil samples:

B00FK6	B00GW1	B00GX2	B00H17
B00FK7	B00GW3	B00H10	B00H18
B00FK8	B00GW4	B00H11	B00H19
B00FK9	B00GW6	B00H14	B00H20
B00FL0	B00GW8	B00H15	B00H21
B00GV9	B00GW9	B00H16	B00H23
B00GW0			

Split Samples:

LABORATORY BLANKS--**Selenium** results for B00GW5 were qualified as "U" because similar levels were found in the immediately associated laboratory blank.

HOLDING TIME--**Mercury** sample results for B00GW5 and B00GT6 were qualified Because of holding times greater than 28 days. Mercury was not detected in either sample; both were qualified "UJ".

SPIKE RECOVERY--Low percent recovery of spike led Westinghouse Hanford-OSM to qualify **As** result as estimated, "J" or "UJ" on B00GW5 and B00GT6, respectively. The **Pb**, **Se**, and **Tl** results for B00GS5 were also qualified "J", "UJ", and "UJ", respectively, for spike recoveries outside limits. The **Hg** results for B00H24 were qualified unusable, "R", because there was no spike recovery.

Table A-10. Miscellaneous Analytes. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ammonia		Chloride		Cyanide		Fluoride		Nitrate		Sulfate		Sulfide	
B00FK6	Reg	3A	6.5	0.001	U	20	U	1.0	UJ	2		20	UJ	20	U	0.1	UJ
B00FK7	Reg	3A	8.5	0.001	U	20	U	0.12	J	1.4		20	UJ	20	U	0.1	UJ
B00FK8	Reg	3A	10.5	0.001	U	20	U	1.0	U	0.8		20	UJ	20	U	0.1	UJ
B00FK9	Reg	3A	13	0.001	U	20	U	1.0	UJ	0.6		20	UJ	20	U	0.1	UJ
B00FL0	Reg	3A	14.5	0.001	U	20	U	1.0	UJ	0.6		20	UJ	24		0.1	UJ
B00FL1	Reg	3A	16	0.001	U	20	U	1.0	UJ	0.8		20	UJ	20	U	0.1	UJ
B00FL3	Blank	3A	---	0.001	U	20	U	1.0	UJ	0.4		20	UJ	20	U	0.1	UJ
B00FL4	Reg	3A	28	0.001	U	20	U	1.0	UJ	0.6		20	UJ	20	U	0.1	UJ
B00GR9	Fdup	3A	28	0.001	U	20	U	1.0	UJ	0.6		20	UJ	20	U	0.1	UJ
B00GS0	Reg	3A	30.5	0.001	U	20	U	NA		1.2		20	UJ	20	U	NA	
B00GS1	Reg	3A	36.5	0.001	U	20	U	NA		2.2		20	UJ	20	U	NA	
B00GS2	Reg	3A	42	0.001	U	20	U	NA		1.0		20	UJ	20	U	NA	
B00GS3	Reg	3A	46.5	0.001	U	20	U	NA		1.0		20	UJ	20	U	NA	
B00GS4	Reg	3A	52.5	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GS5	Split	3A	52.5	NA		NA		0.6	UI	NA		NA		NA		NA	
B00GS8	Reg	3A	57	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GS9	Reg	3A	66.5	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GT1	Reg	3A	77	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GT3	Blank	3A	---	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GT4	Reg	3A	85.5	0.001	U	1	U	NA		2	U	1	UJ	1	U	NA	
B00GT5	Fdup	3A	85.5	0.001	U	1	U	NA		2	U	1	UJ	1	U	NA	
B00GT6	Split	3A	85.5	NA		NA		NA		NA		NA		NA		NA	
B00GT7	Reg	3A	97	0.001	U	1	U	1.0	UJ	2	U	1	UJ	1	U	0.1	U

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Table A-10. Miscellaneous Analytes. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ammonia		Chloride		Cyanide		Fluoride		Nitrate		Sulfate		Sulfide	
B00GT8	Reg	3A	102	0.001	U	20	U	NA		2		20	UJ	21		NA	
B00GV0	Reg	3A	122	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GV1	Blank	3A	---	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GV2	Reg	3A	131	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GV3	Fdup	3A	131	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GV4	Split	3A	131	NA		NA		NA		NA		NA		NA		NA	
B00GV5	Reg	3A	143.5	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GV6	Reg	3B	1	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GV7	Reg	3B	3.5	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	U
B00GV8	Reg	3B	5.5	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	U
B00GV9	Blank	3B	---	0.001		20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GW0	Reg	3B	7.5	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GW1	Reg	3B	9.5	0.001	U	20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GW3	Reg	3B	13	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GW4	Fdup	3B	13	0.001	U	20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GW5	Split	3B	13	NA		NA		0.5	U	NA		NA		NA		NA	
B00GW6	Reg	3B	16	NA		20	U	NA		2	U	20	UJ	20	U	NA	
B00GW8	Reg	3B	21	0.001	U	20	U	1.0	UJ	2	U	20	UJ	20	U	0.1	UJ
B00GW9	Reg	3B	28	NA		20	U	NA		2		20	UJ	20	U	NA	
B00GX2	Reg	3B	31	NA		20	U	NA		2	U	20	UJ	20	U	NA	
B00GX3	Reg	3B	35.5	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GX4	Reg	3B	40	0.001	U	20	U	NA		2.6		20	UJ	20	U	NA	
B00GX5	Reg	3B	52	0.001	U	20	U	NA		2.4		20	UJ	20	U	NA	

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Table A-10. Miscellaneous Analytes. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ammonia		Chloride		Cyanide		Fluoride		Nitrate		Sulfate		Sulfide	
B00GX6	Reg	3B	61.5	0.001	U	20	U	0.1	UJ	2.0		20	UJ	20	U	0.1	UJ
B00GX8	Reg	3B	70.5	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GY0	Blank	3B	---	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00GY1	Reg	3B	80.5	0.001	U	20	U	NA		2	U	20	UJ	39		NA	
B00GY2	Fdup	3B	80.5	0.001	U	20	U	NA		2.0		20	UJ	46		NA	
B00GY9	Split	3B	80.5	NA		NA		NA		NA		NA		NA		NA	
B00GZ2	Reg	3B	90.5	0.001	U	20	U	0.1	UJ	2.2		20	UJ	36		0.1	UJ
B00GZ3	Reg	3B	105	0.001	U	20	U	NA		2.0		20	UJ	25		NA	
B00GZ6	Reg	3B	118.5	0.001	U	20	U	1.0	UJ	3.0		20	UJ	28		0.1	UJ
B00GZ8	Reg	3B	123.5	0.001	U	20	U	0.1	UJ	2	U	20	UJ	26		0.1	UJ
B00H00	Reg	3C	1	0.001	U	20	U	1.0	UJ	2.0		20	UJ	20	U	0.1	UJ
B00H01	Reg	3C	3	0.001	U	20	U	1.0	UJ	2.2		20	UJ	20	U	0.1	UJ
B00H02	Reg	3C	5	0.001	U	20	U	1.0	UJ	2.2		20	UJ	20	U	0.1	UJ
B00H03	Reg	3C	7	0.001	U	20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00H04	Reg	3C	9	0.001	U	20	U	0.1	UJ	2	U	20	UJ	26		0.1	UJ
B00H05	Fdup	3C	9	0.001	U	20	U	0.1	UJ	2	U	20	UJ	21		0.1	UJ
B00H06	Reg	3C	11.5	0.001	U	20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00H07	Split	3C	11.5	NA		NA		0.5	UJ	NA		NA		NA		NA	
B00H09	Reg	3C	16	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	
B00H10	Blank	3C	---	0.001	UJ	20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00H11	Reg	3C	20.5	0.001	UJ	20	U	NA		2	U	20	UJ	20	U	NA	
B00H14	Reg	3C	30	0.001	U	20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00H15	Reg	3C	36	0.001	U	20	U	NA		2	U	20	UJ	20	U	NA	

(Page 3 of 4)

Table A-10. Miscellaneous Analytes. (μg/g)

SAMPLE	TYPE	POND	APPROX. DEPTH	Ammonia		Chloride		Cyanide		Fluoride		Nitrate		Sulfate		Sulfide	
B00H16	Reg	3C	40.5	0.001	UJ	20	U	NA		2	U	20	UJ	20	U	NA	
B00H17	Fdup	3C	40.5	0.001	UJ	20	U	NA		2	U	20	UJ	20	U	NA	
B00H18	Reg	3C	50	0.001	UJ	20	U	NA		2	U	20	UJ	20	U	NA	
B00H19	Reg	3C	60	0.001	UJ	20	U	0.17	UJ	2	U	20	UJ	20	U	0.1	UJ
B00H20	Reg	3C	70.5	0.001	UJ	20	U	NA		2	U	20	UJ	20	U	NA	
B00H21	Blank	3C	---	0.001	UJ	20	U	NA		2	U	20	UJ	20	U	NA	
B00H23	Reg	3C	80	0.001	UJ	20	U	0.1	UJ	2	U	20	UJ	20	U	0.1	UJ
B00H24	Split	3C	80	NA		NA		NA		NA		NA		NA		NA	

U The analyte was undetected at the stated concentration.
J The associated value is an estimated quantity.
NA Analysis not requested.
I Information only, see validation explanations.

Reasons for Westinghouse Hanford Company Qualification--Miscellaneous Analytes

Regular, Field Duplicate, and Silica Sand Samples:

HOLDING TIME--Nitrate holding time of 48 hrs exceeded for all samples. All samples qualified as estimated, "J", for nitrate. Only B00GT7, B00GV7, and B00GV8 were analyzed within 28 days for sulfide. All other samples were qualified as estimated, "J", for sulfide. All samples were qualified as estimated, "J", for cyanide because of holding times in excess of 14 days. A 28 day holding time for ammonia analyses was exceeded for the following samples:

B00H10	B00H17	B00H19	B00H21
B00H11	B00H18	B00H20	B00H23
B00H16			

Split Samples:

MATRIX SPIKE/DUPLICATE--No matrix spike or duplicate results were provided for cyanide in sample B00GS5 or B00H07. The undetected value for B00GS5 was qualified as "UI", or information only while a similar undetected result for B00H07 was qualified as estimated, "UJ".

Table A-11. List of Radioactivity Data (ρCi/g)--Unvalidated.

Sample	Type	Pond	Approx. Depth	Alpha	Alpha Counting Error	Beta	Beta Counting Error	^{90}Sr	^{90}Sr Counting Error	GEA[1]
B00FK6	Reg	3A	-6.5	5.34	2.9	-0.221	4.8	12.7	0.84	NA
B00FK7	Reg	3A	-8.5	4.5	2.9	5.0	5.0	3.47	0.51	NA
B00FK8	Reg	3A	-10.5	3.21	2.8	-0.863	4.8	3.65	0.51	NA
B00FK9	Reg	3A	-13	2.4	2.7	-2.61	4.8	3.86	0.52	NA
B00FL0	Reg	3A	-14.5	-2.42	2.3	-9.51	4.5	1.43	4.0	NA
B00FL1	Reg	3A	-16	2.37	2.7	-1.43	4.8	0.00	0.41	NA
B00FL3	Blank	3A	---	-0.77	2.4	-10.5	4.4	-0.0686	0.29	NA
B00FL4	Reg	3A	-28	-1.08	2.4	1.16	4.4	0.226	0.074	NA
B00GR9	Fdup	3A	-28	-2.44	2.3	-12.6	4.4	3.27	0.50	NA
B00GS0	Reg	3A	-31.5	-0.309	2.5	-11.3	4.4	NA	NA	NA
B00GS1	Reg	3A	-36.5	-2.39	2.3	-11.2	4.4	NA	NA	NA
B00GS2	Reg	3A	-42	-0.337	1.9	2.33	4.7	NA	NA	NA
B00GS3	Reg	3A	-46.5	1.05	2.1	6.72	4.9	NA	NA	NA
B00GS4	Reg	3A	-52.5	2.28	2.3	4.82	4.8	0.13	0.46	NA
B00GS5	Split	3A	-52.5	3.4	1.3	33	2	< 0.04	---	Done
B00GS8	Reg	3A	-57	0.711	2	3.32	4.7	NA	NA	NA
B00GS9	Reg	3A	-66.5	1.48	0.48	2.26	0.87	379	330	NA
B00GT1	Reg	3A	-77	1.67	0.51	3.35	0.93	NA	NA	NA
B00GT3	Blank	3A	---	0.76	0.11	0.67	0.13	NA	NA	NA
B00GT4	Reg	3A	-85.5	2.46	2.3	8.24	5.0	NA	NA	NA
B00GT5	Fdup	3A	-85.5	1.84	2.2	5.49	4.8	NA	NA	NA
B00GT6	Split	3A	-85.5	< 3	---	19	2	NA	NA	NA
B00GT7	Reg	3A	-97	1.81	2.2	0.815	4.6	36.1	1.7	Done
B00GT8	Reg	3A	-102	42.59	5.5	4.94	5.2	NA	NA	NA
B00GV0	Reg	3A	-122	1.74	1.9	-2.12	4.8	NA	NA	NA
B00GV1	Blank	3A	---	1.45	1.9	-0.26	4.9	NA	NA	NA
B00GV2	Reg	3A	-131	1.93	1.9	-0.22	4.9	NA	NA	NA
B00GV3	Fdup	3A	-131	2.16	2	5.84	5.2	NA	NA	NA
B00GV4	Split	3A	-131	< 2	---	26	3	NA	NA	NA
B00GV5	Reg	3A	-143.5	3.52	2.2	7.43	5.3	1.00	0.433	Done
B00GV6	Reg	3B	-1	2.21	1.7	1.65	4.7	-0.182	0.44	Done
B00GV7	Reg	3B	-3.5	4.82	2.2	5.78	5.0	1.25	0.55	Done
B00GV8	Reg	3B	-5.5	1.83	1.7	5.93	5.0	1.14	0.54	Done
B00GV9	Blank	3B	---	2.95	1.9	-0.72	4.6	-0.016	0.45	Done
B00GW0	Reg	3B	-7.5	3.27	1.9	8.75	5.1	36.5	1.7	Done

Table A-11. List of Radioactivity Data (ρCi/g)--Unvalidated.

Sample	Type	Pond	Approx. Depth	Alpha	Alpha Counting Error	Beta	Beta Counting Error	^{90}Sr	^{90}Sr Counting Error	GEA[1]
BOOGW1	Reg	3B	-9.5	2.43	1.8	3.28	4.8	0.222	0.47	Done
BOOGW3	Reg	3B	-13	1.22	1.6	2.91	3.8	1.55	0.40	Done
BOOGW4	Fdup	3B	-13	4.02	2.1	3.42	4.8	1.06	0.53	Done
BOOGW5	Split	3B	-13	< 1	---	19	2	< 0.04	---	Done
BOOGW6	Reg	3B	-16	3.89	2	6.84	5.0	NA	NA	NA
BOOGW8	Reg	3B	-21	1.43	1.6	0.48	4.7	1.47	0.56	Done
BOOGW9	Reg	3B	-28	1.82	1.7	1.36	4.7	NA	NA	NA
BOOGX2	Reg	3B	-31	4.28	2.1	3.59	4.8	NA	NA	NA
BOOGX3	Reg	3B	-35.5	3.45	2	2.06	3.8	NA	NA	NA
BOOGX4	Reg	3B	-40	2.38	1.8	3.86	3.9	NA	NA	NA
BOOGX5	Reg	3B	-52	3.01	1.9	4.57	3.9	NA	NA	NA
BOOGX6	Reg	3B	-61.5	7.29	2.4	3.74	3.9	1.22	0.38	Done
BOOGX8	Reg	3B	-70.5	2.54	1.8	5.88	4.0	NA	NA	NA
BOOGY0	Blank	3B	---	-0.47	2.3	-0.59	4.1	NA	NA	NA
BOOGY1	Reg	3B	-80.5	-0.94	2.3	4.1	-0.41	NA	NA	NA
BOOGY2	Fdup	3B	-80.5	1.14	2.5	4.57	4.4	NA	NA	NA
BOOGY9	Split	3B	-80.5	2.7	1.2	31	2	NA	NA	NA
BOOGZ2	Reg	3B	-90.5	-2.59	2	3.02	4.3	0.806	0.34	Done
BOOGZ3	Reg	3B	-105	-1.77	2.2	1.37	4.2	NA	NA	NA
BOOGZ6	Reg	3B	-118.5	-0.46	2.3	1.49	4.2	9.17	0.78	Done
BOOGZ8	Reg	3B	-123.5	-2.7	2.3	4.34	4.3	2.43	0.46	Done
BOOH00	Reg	3C	-1	-1.45	2.2	-0.30	4.1	1.31	0.38	Done
BOOH01	Reg	3C	-3	-0.65	2.3	-0.78	4.1	1.37	0.39	Done
BOOH02	Reg	3C	-5	-2.25	2.1	0.30	4.1	2.86	0.049	Done
BOOH03	Reg	3C	-7	-1.71	2.5	2.32	4.2	2.58	0.47	Done
BOOH04	Reg	3C	-9	-1.87	2.4	-1.37	4.0	1.86	0.42	Done
BOOH05	Fdup	3C	-9	-3.21	2.3	0.64	4.1	1.60	0.41	Done
BOOH06	Reg	3C	-11.5	-1.44	2.5	4.56	4.3	1.13	0.37	Done
BOOH07	Split	3C	-11.5	1.9	1	2	25	< 0.04	---	Done
BOOH09	Reg	3C	-16	2.0	1.6	6.94	4.2	NA	NA	NA
BOOH10	Blank	3C	---	0.94	1.4	2.13	4.0	0.101	0.37	Done
BOOH11	Reg	3C	-20.5	3.29	1.8	3.61	4.0	NA	NA	NA
BOOH14	Reg	3C	-30	2.98	1.8	6.59	4.2	0.608	0.41	Done
BOOH15	Reg	3C	-36	-1.11	1	-3.12	3.6	NA	NA	NA
BOOH16	Reg	3C	-40.5	3.02	1.8	4.11	4.1	NA	NA	NA

Table A-11. List of Radioactivity Data (ρCi/g)--Unvalidated.

Sample	Type	Pond	Approx. Depth	Alpha	Alpha Counting Error	Beta	Beta Counting Error	^{90}Sr	^{90}Sr Counting Error	GEA[1]
B00H17	Fdup	3C	-40.5	3.85	1.9	3.51	4.0	NA	NA	NA
B00H18	Reg	3C	-50	1.86	1.6	3.51	4.0	NA	NA	NA
B00H19	Reg	3C	-60	0.68	1.4	-1.39	3.7	0.479	0.40	Done
B00H20	Reg	3C	-70.5	2.66	2	6.38	5.1	NA	NA	NA
B00H21	Blank	3C	---	2.53	2	-1.47	4.7	NA	NA	NA
B00H23	Reg	3C	-80	2.46	2	3.29	4.9	2.29	0.52	Done
B00H24	Split	3C	-80	M	M	M	M	NA	NA	NA

NA Analysis not requested.
M Missing result, figure not available for this report.
--- Result only reported as a "less-than" value--counting error not specified by laboratory.
1. GEA = Gamma Energy Analysis, see Table A-12.

Table A-12. Gamma Energy Analysis Unvalidated, Raw Data. (µCi/g)

Radionuclide w/ estimated counting error (Err)

Primary Laboratory Sample	^{137}Cs	--Err	^{234m}Pa	--Err	^{234}Th	--Err	^{235}U	--Err
B00GS4	0.602	0.31	26.03	52.7	3.84	6	NR	
B00GS9	0.34	0.2	7.1	33.7	0.94	3.8	NR	
B00GT7	0.0193	0.23	22.73	37.4	0.0945	4.1	NR	
B00GV5	0.136	0.3	55.35	43.2	1.78	5.9	NR	
B00GV6	0.262	0.23	-12	49.7	-1.69	5.9	NR	
B00GV7	0.0374	0.23	-6.03	37.9	-1.95	4.1	NR	
B00GV8	0.446	0.27	21.38	47.3	0.0968	6	NR	
B00GV9	0.31	0.31	-22.05	51	-2.43	5.9	NR	
B00GW1	0.0635	0.24	11.1	40.7	0.702	4.1	NR	
B00GW0	0.0238	0.22	21.3	39.2	-1.13	4.1	NR	
B00GW3	0.259	0.22	29.28	30.8	-0.224	0.37	NR	
B00GW4	0.495	0.27	-24.68	45.6	-0.194	5.9	NR	
B00GW8	-0.0818	0.23	27.83	40	-1.03	4.1	NR	
B00GX6	0.112	0.20	5.83	34.1	7.56	1.8	NR	
B00GZ6	0.32	0.2	25.62	29.4	1.27	3.7	NR	
B00GZ8	0.0241	0.17	15.48	31.1	NR		NR	
B00H00	0.0268	0.18	1.04	31.1	-3.83	2.4	0.308	0.21
B00H01	-0.0589	0.2	10.02	36.5	0.858	3.3	NR	
B00H02	0.0708	0.19	1.04	32.4	-0.149	3.7	NR	
B00H03	-0.113	0.18	-5.18	31.7	NR		NR	
B00H04	0.0924	0.17	44.28	34.6	5.84	2	NR	
B00H05	0.0429	0.20	8.04	36.2	8.28	1.8	NR	
B00H06	0.0193	0.18	54.12	29.9	-1.63	3.8	NR	
B00H10	0.103	1.6	33.9	30.7	6.54	1.6	NR	
B00H14	0.175	0.20	-31.38	33.0	0.373	3.7	NR	
B00H19	0.0433	0.18	6.48	31.8	-0.451	3.8	NR	
B00H23	0.0618	0.19	9.3	32.2	-1.93	2.4	NR	

NR Not Reported.

Table A-12. Gamma Energy Analysis Unvalidated, Raw Data. (μCi/g)

Radionuclide w/ estimated counting error (Err)

Alternate (Split) Laboratory

Sample	^{40}K	--Err	^{226}Ra	--Err	^{228}Th	--Err
B00GS5	14	1.4	1.9	0.48	0.864	0.086
B00GW5	9.76	0.98	0.853	0.359	0.42	0.042
B00H07	10.1	1	0.513	0.297	0.557	0.056

Undetected radionuclides reported for the above split samples as "less-than" the following (ρCi/g-dry):

	^{7}Be	^{54}Mn	^{58}Co	^{59}Fe	^{60}Co	^{65}Zn
B00GS5	<1	<0.04	<0.08	<0.4	<0.03	<0.1
B00GW5	<0.8	<0.03	<0.06	<0.3	<0.03	<0.08
B00H07	<0.6	<0.03	<0.05	<0.2	<0.02	<0.08

	^{95}Zr	^{103}Ru	^{106}Ru	^{131}I	^{134}Cs	^{137}Cs
B00GS5	<0.1	<0.3	<0.03	<2000	<0.04	<0.03
B00GW5	<0.08	<0.2	<0.2	<300	<0.03	<0.02
B00H07	<0.07	<0.1	<0.2	<100	<0.03	<0.02

	^{140}Ba	^{141}Ce	^{144}Ce
B00GS5	<30	<0.6	<0.3
B00GW5	<10	<0.4	<0.2
B00H07	<5	<0.2	<0.1

References

WHC, 1990, WHC-CM-5-3, Westinghouse Hanford Company, Richland, Washington.

EPA, 1986, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, U.S. Environmental Protection Agency, Washington, D.C.

APPENDIX B

ANALYTE VARIABILITY GRAPHS

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Introduction

Appendix B contains graphs of selected validated duplicate data. The graphs show how variability does/does not trend over the observed concentration range of the duplicate pairs. The ONLY points appearing on the graphs are those where each validated member of a data pair were reported at detectable levels. These are based on some of the data appearing in the Appendix A.

Each point on the graphs shows a standard deviation based on only two sample results. The reader is cautioned about making grand inferences from any particular point. Though inferences about a population variability based on only two samples are minimally precise, multiple estimates impart more confidence.

Most graphs display two sets of validated data--field duplicate/regular or split/regular sample pairs. The first is based on the results of field duplicates and their associated regular samples. These were collected concurrently and submitted to the primary laboratory without notification that they were duplicate samples. The first set demonstrates uncertainty in the media and a single laboratory measurement system.

The second set appearing on most graphs is based on the results of split samples and their associated regular samples. Split samples were submitted by Westinghouse Hanford to an alternate laboratory; associated regular samples were submitted to the primary laboratory. This set shows the wider validated data uncertainty associated the media and an independent laboratory estimate of the true average concentration at a particular location.

Figure B-1. Selected Duplicates: Gross Alpha.

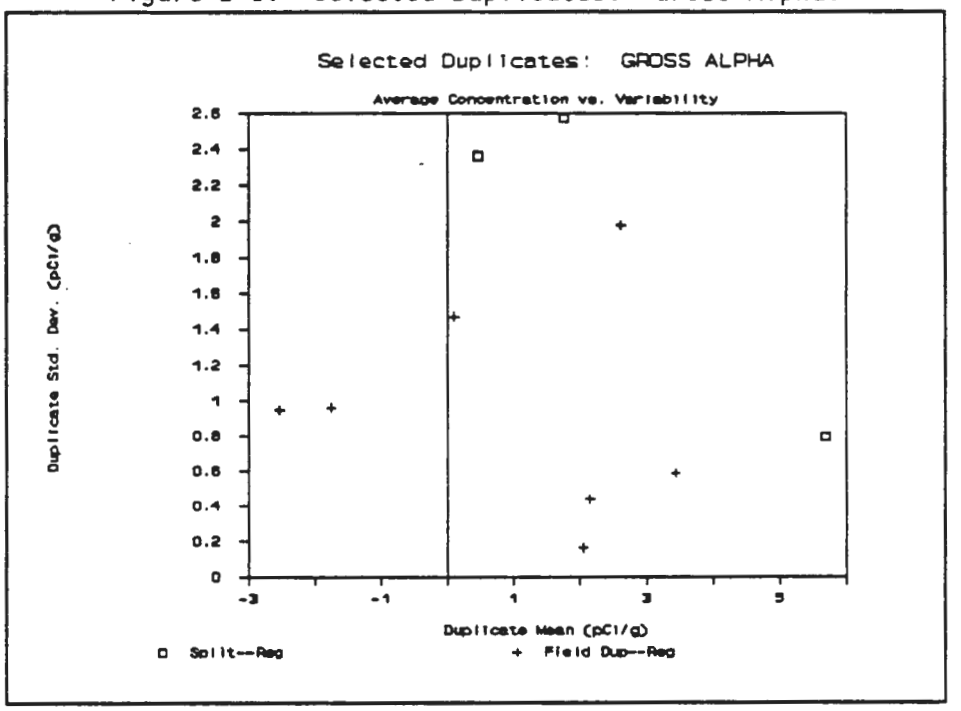


Figure B-2. Selected Duplicates: Aluminum.

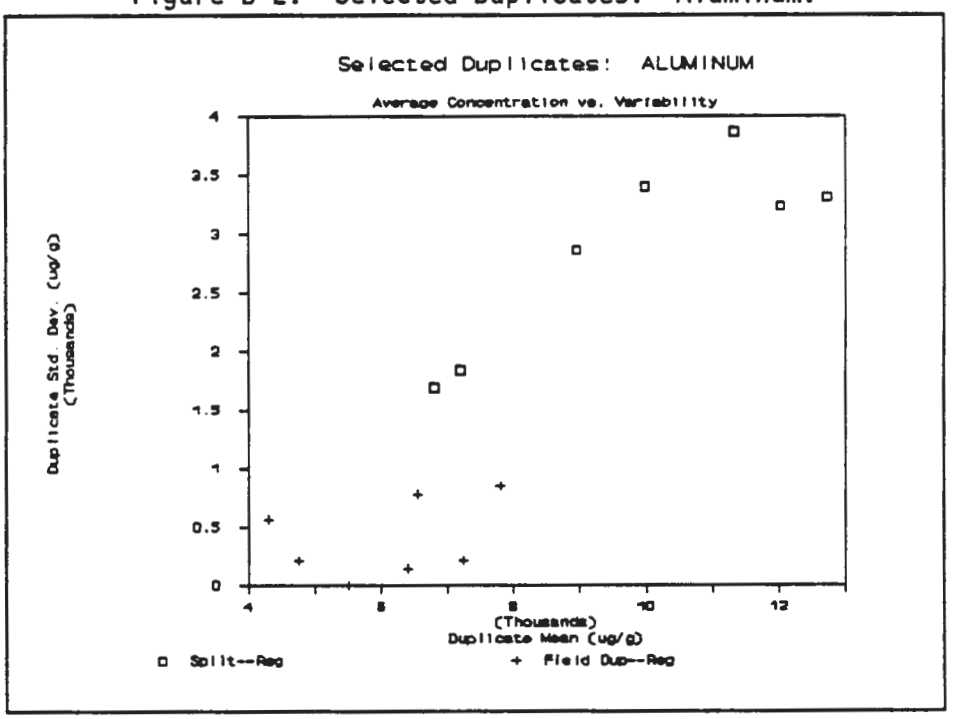


Figure B-3. Selected Duplicates: Arsenic.

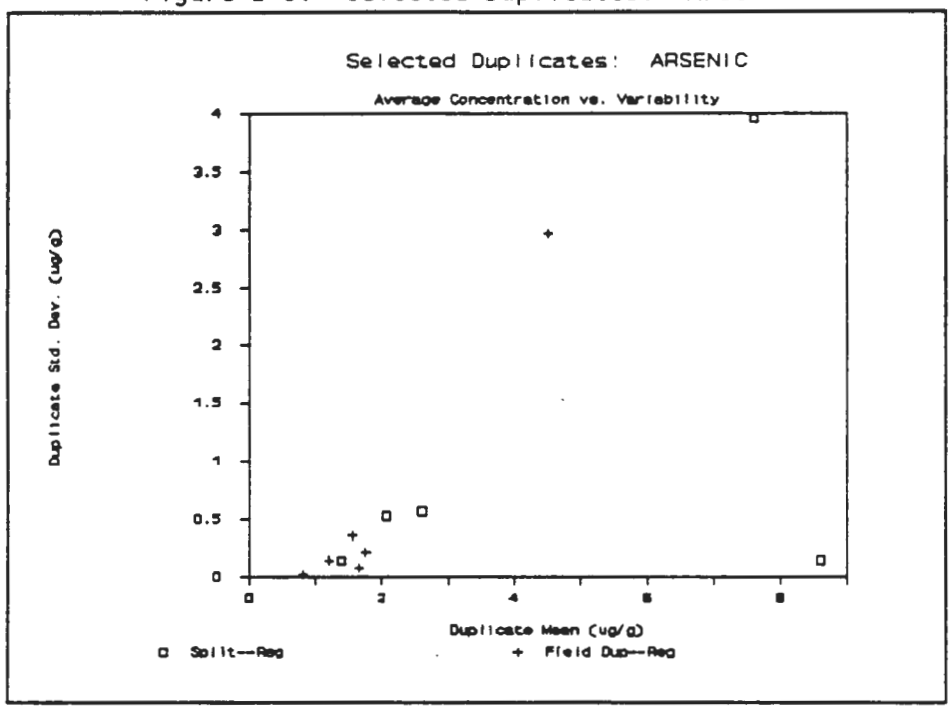


Figure B-4. Selected Duplicates: Barium.

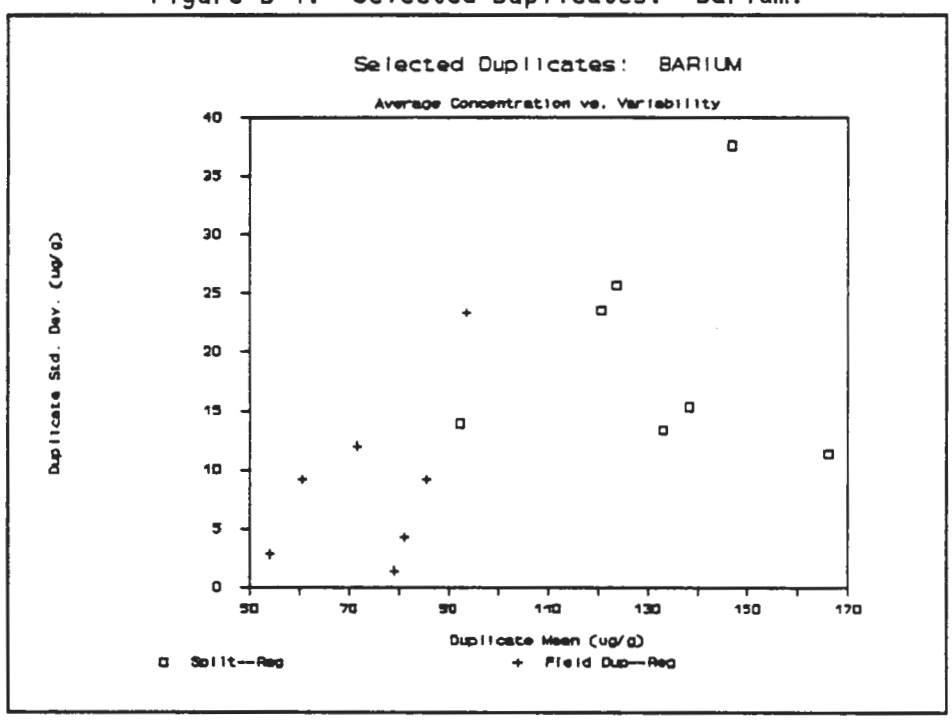


Figure B-5. Selected Duplicates: Beryllium.

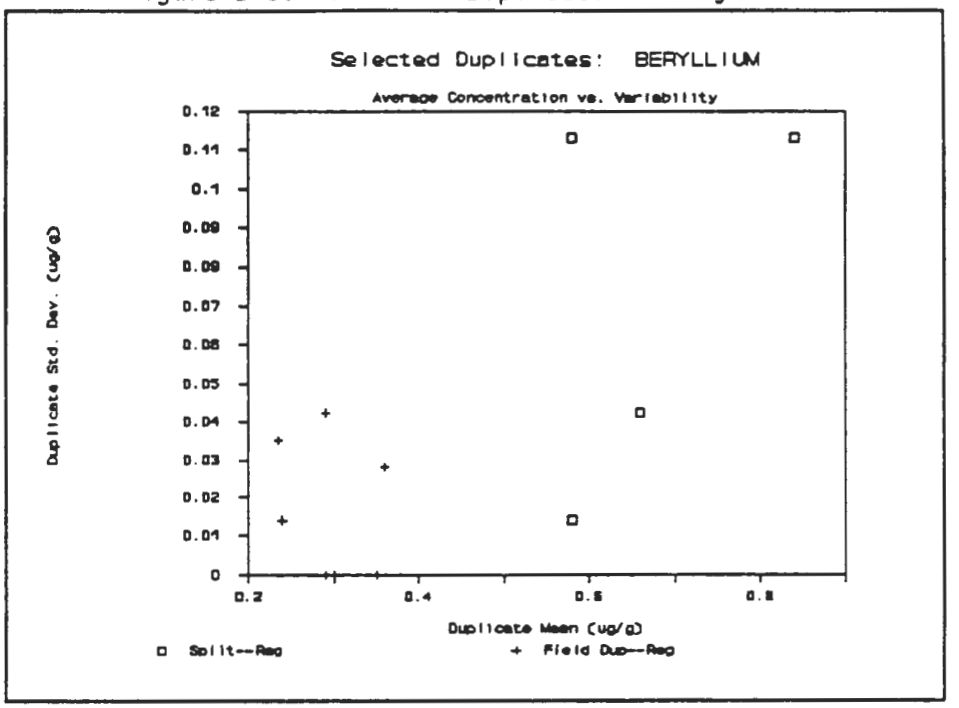


Figure B-6. Selected Duplicates: Gross Beta.

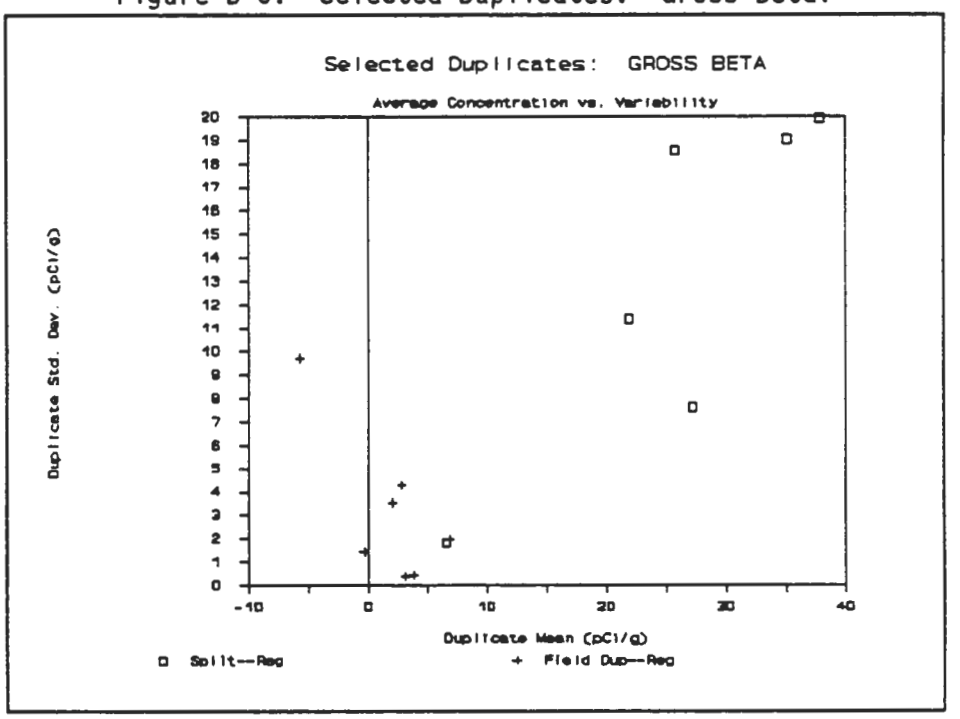


Figure B-7. Selected Duplicates: Boron.

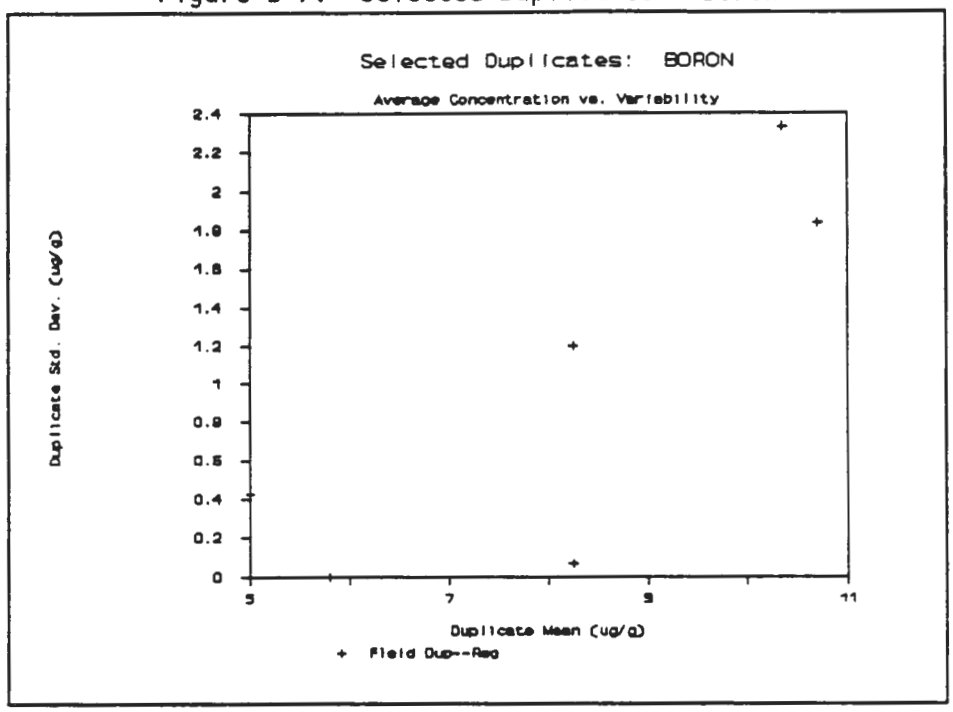


Figure B-8. Selected Duplicates: Cadmium.

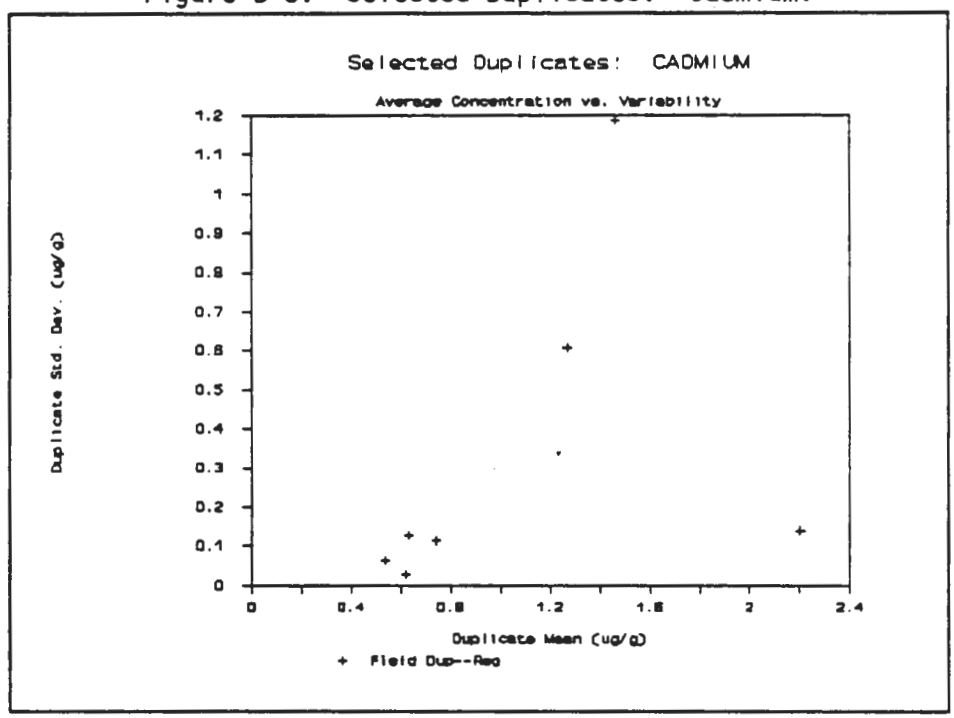


Figure B-9. Selected Duplicates: Calcium.

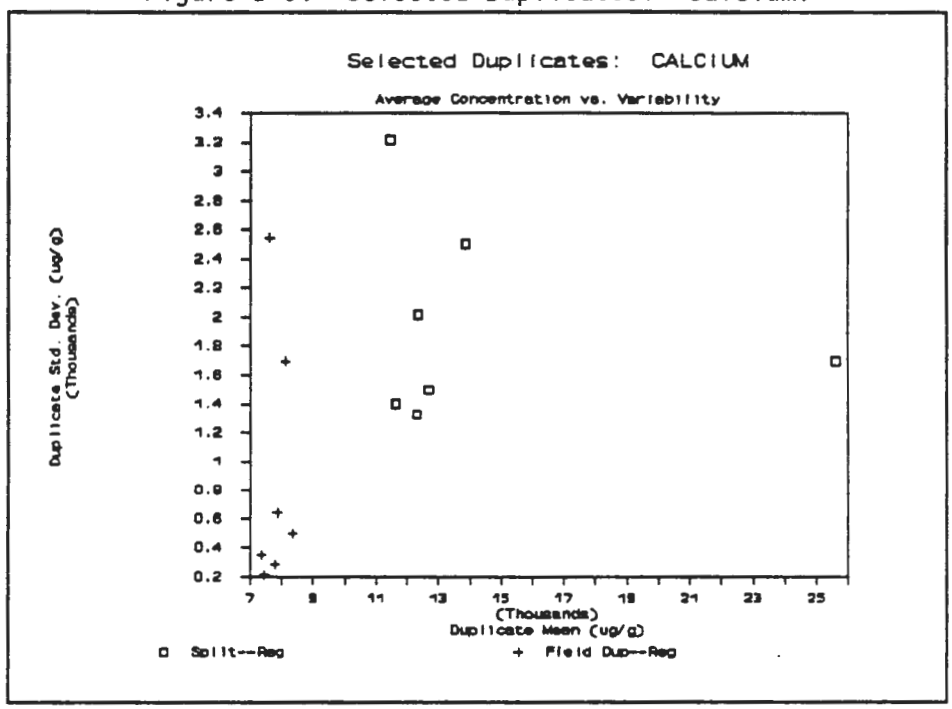


Figure B-10. Selected Duplicates: Chromium.

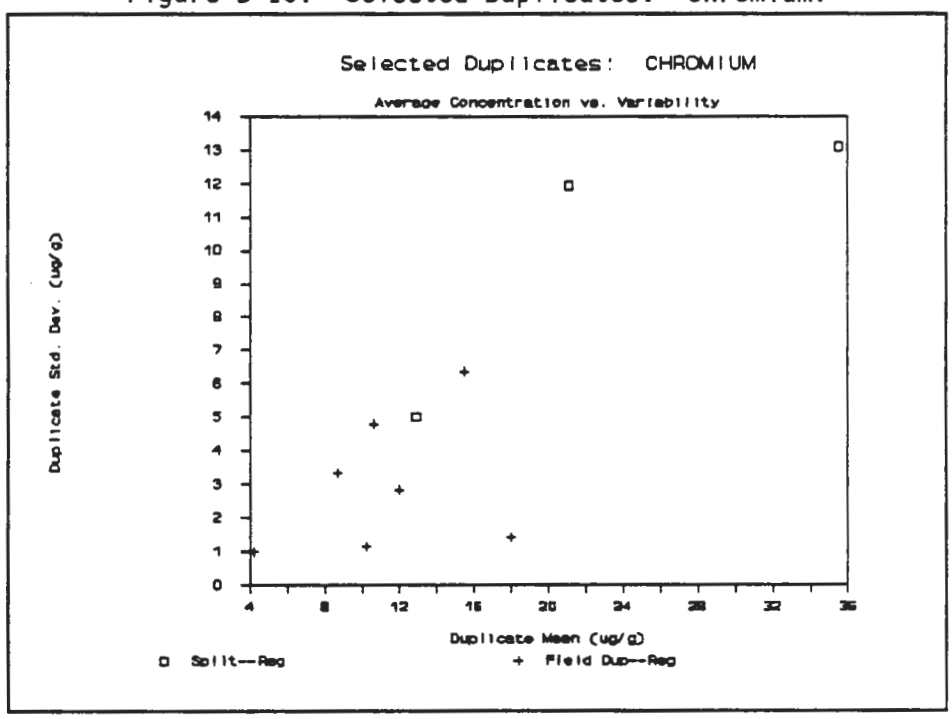


Figure B-11. Selected Duplicates: Cobalt.

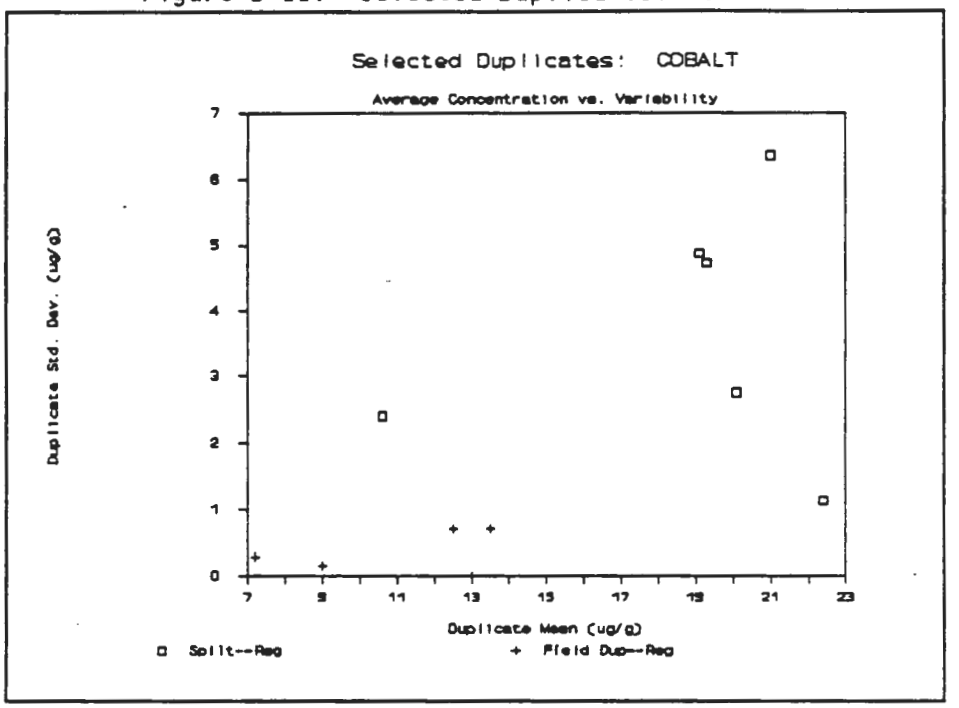


Figure B-12. Selected Duplicates: Copper.

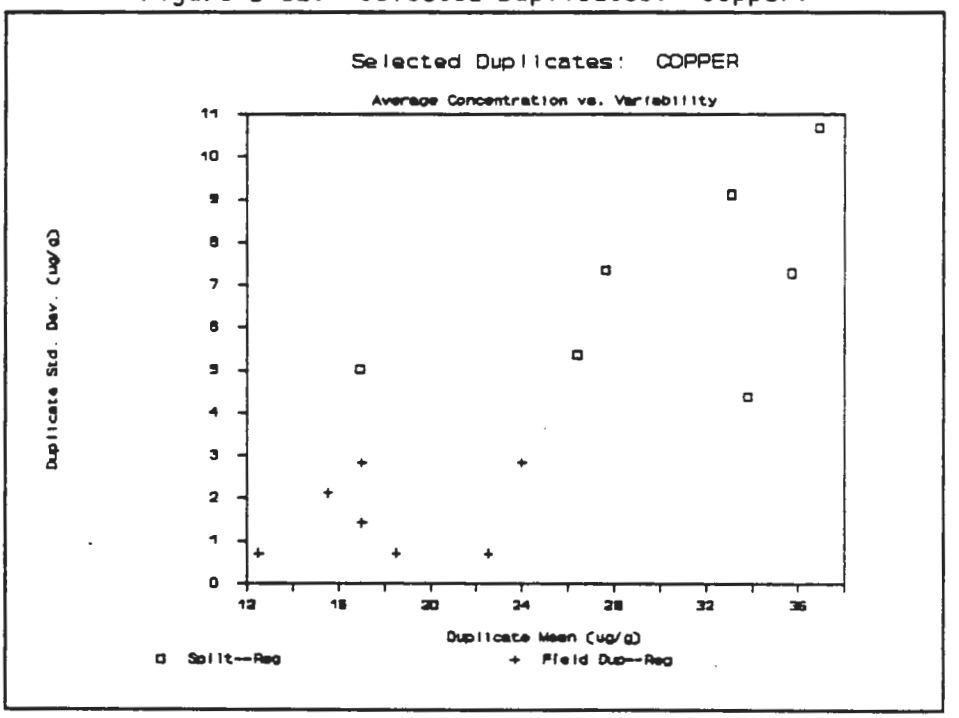


Figure B-13. Selected Duplicates: Lead.

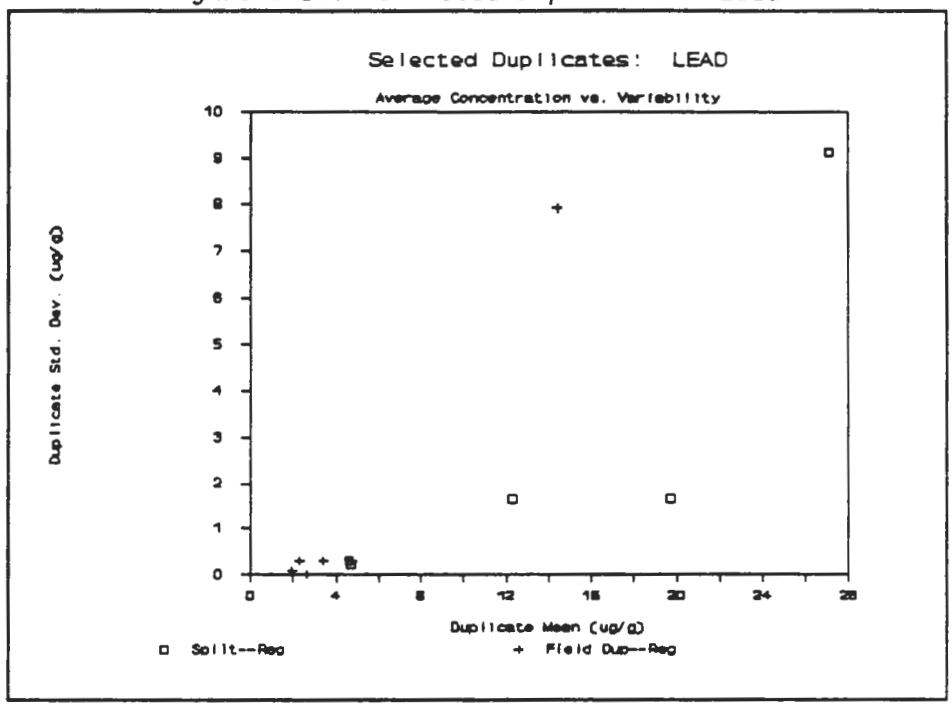


Figure B-14. Selected Duplicates: Magnesium.

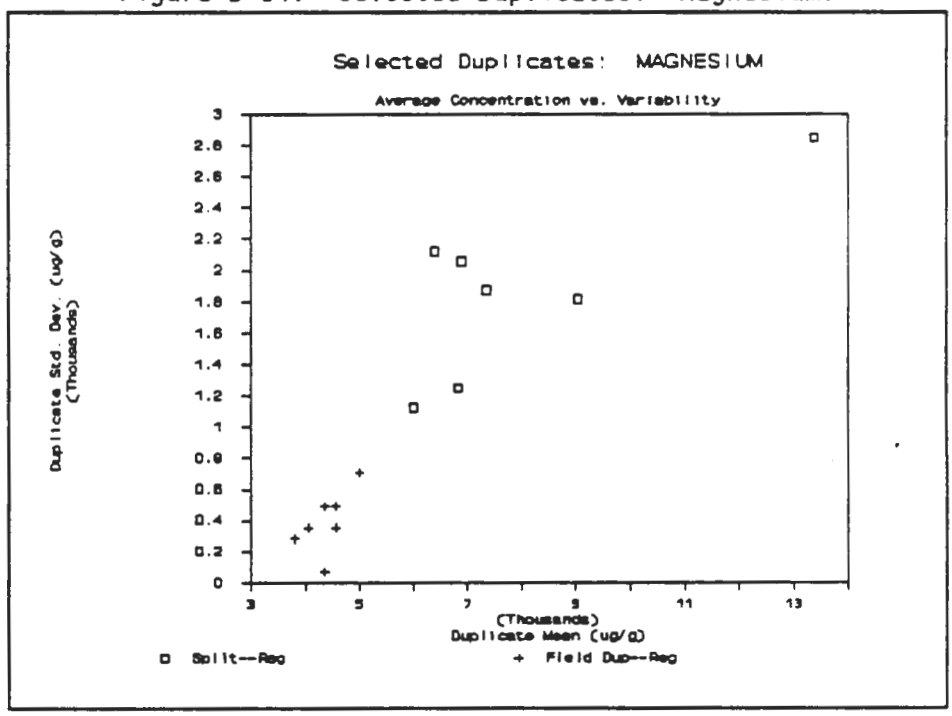


Figure B-15. Selected Duplicates: Manganese.

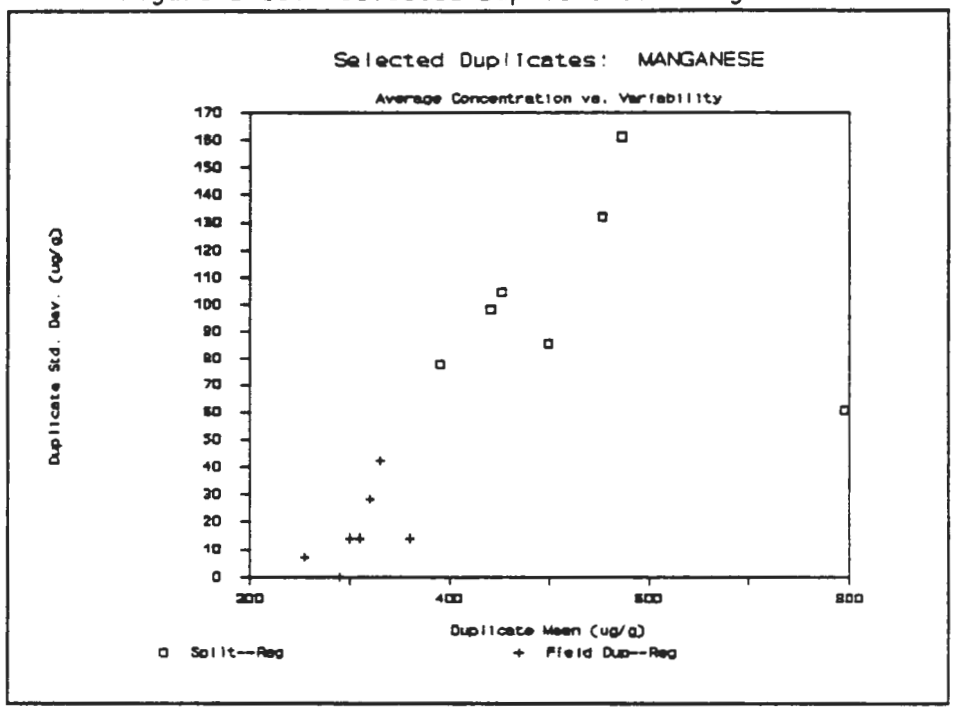


Figure B-16. Selected Duplicates: Molybdenum.

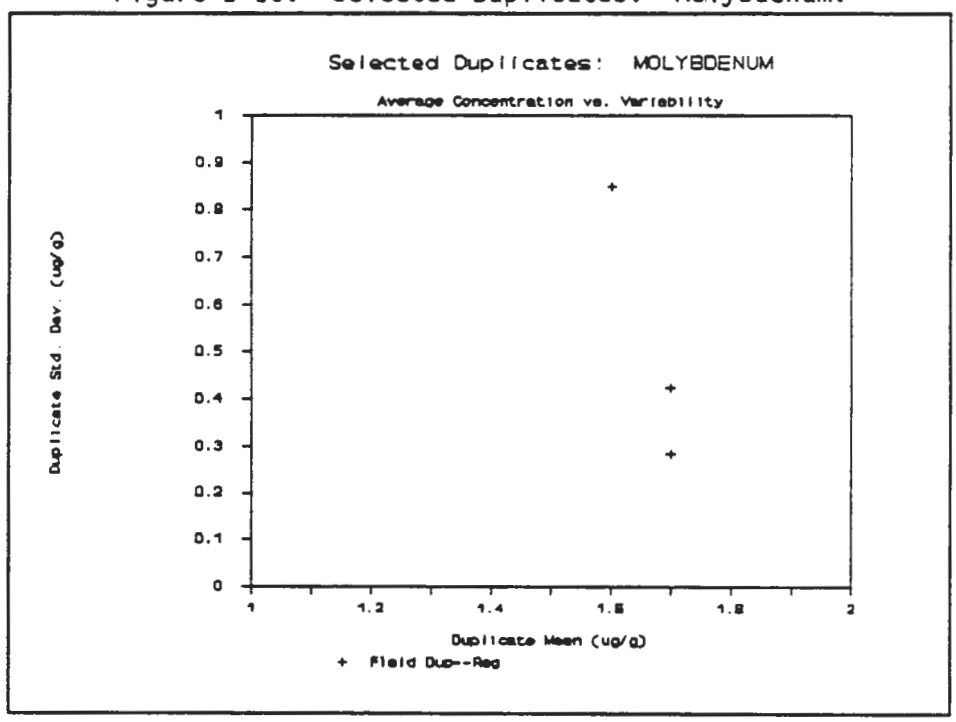


Figure B-17. Selected Duplicates: Nickel.

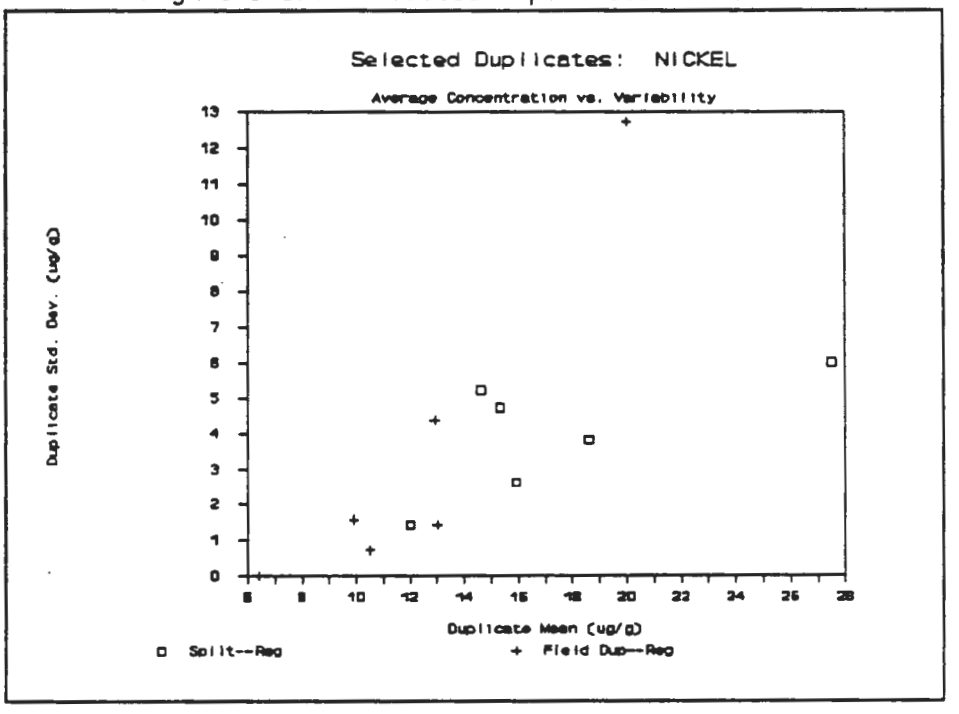


Figure B-18. Selected Duplicates: Potassium.

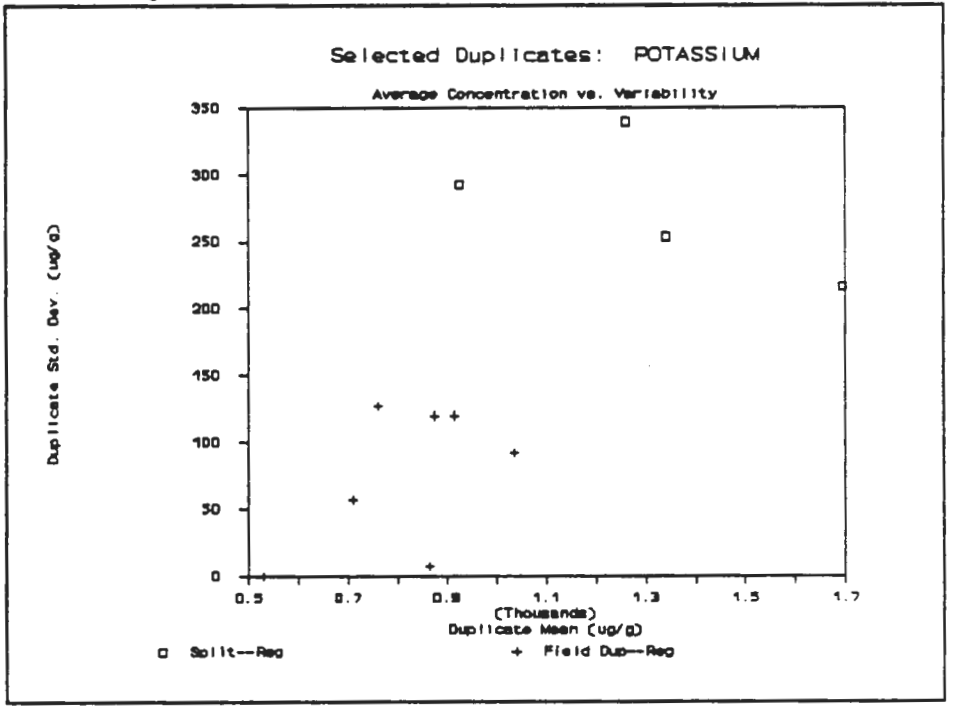


Figure B-19. Selected Duplicates: Silicon.

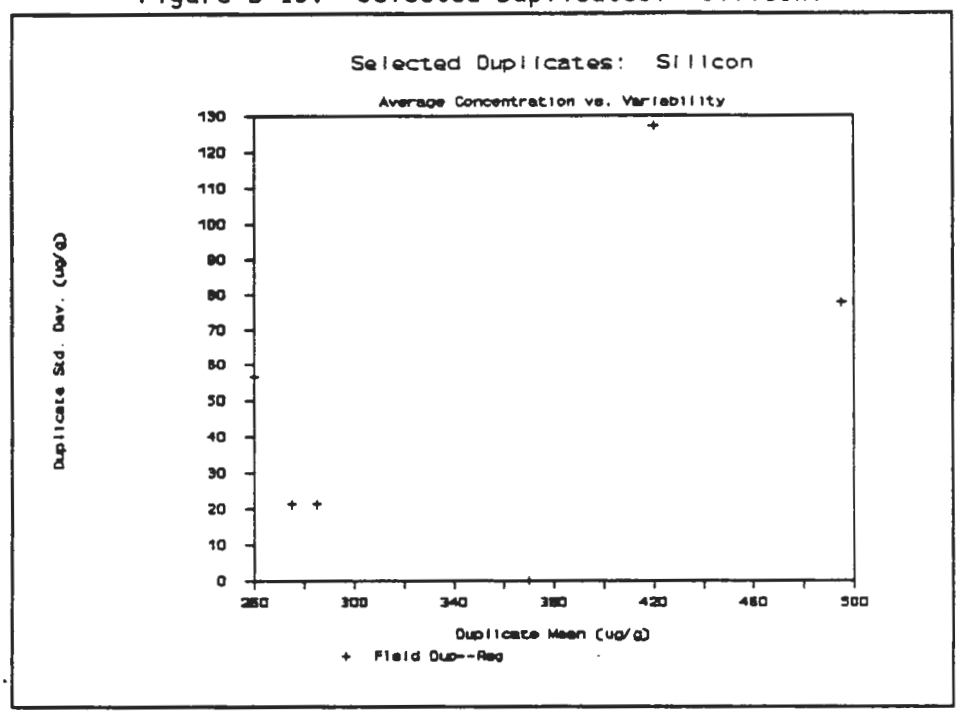


Figure B-20. Selected Duplicates: Sodium.

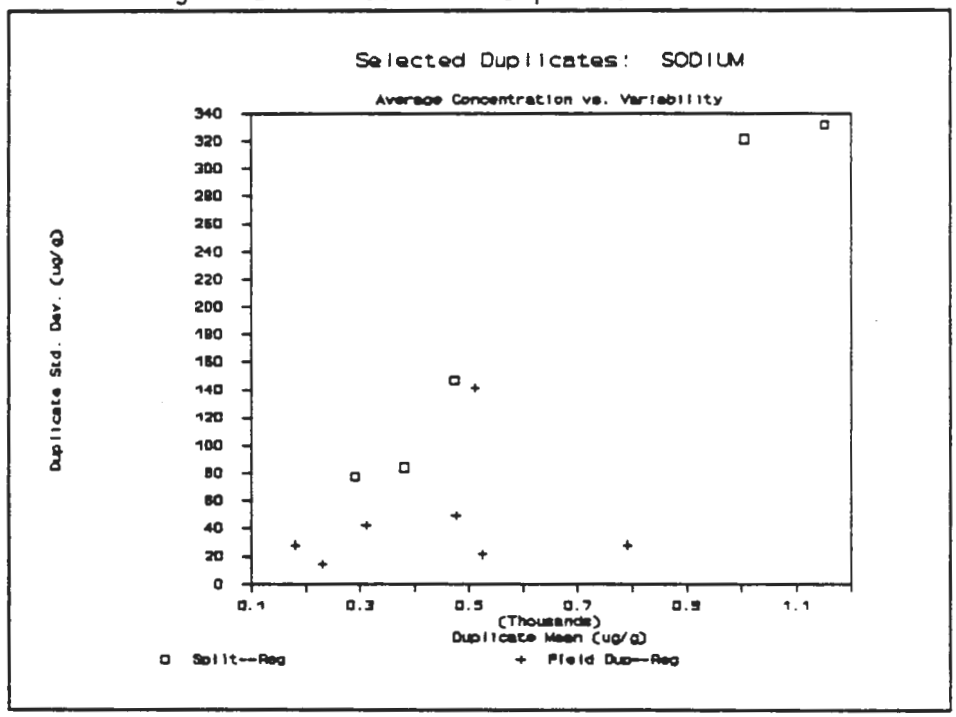


Figure B-21. Selected Duplicates: ^{90}Sr.

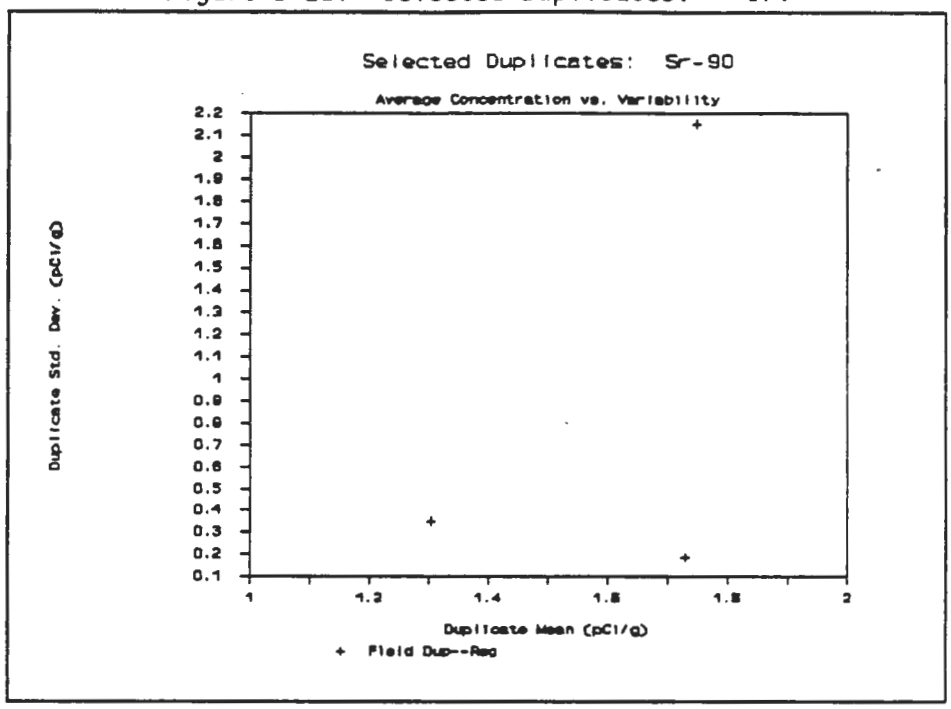


Figure B-22. Selected Duplicates: Sulfate.

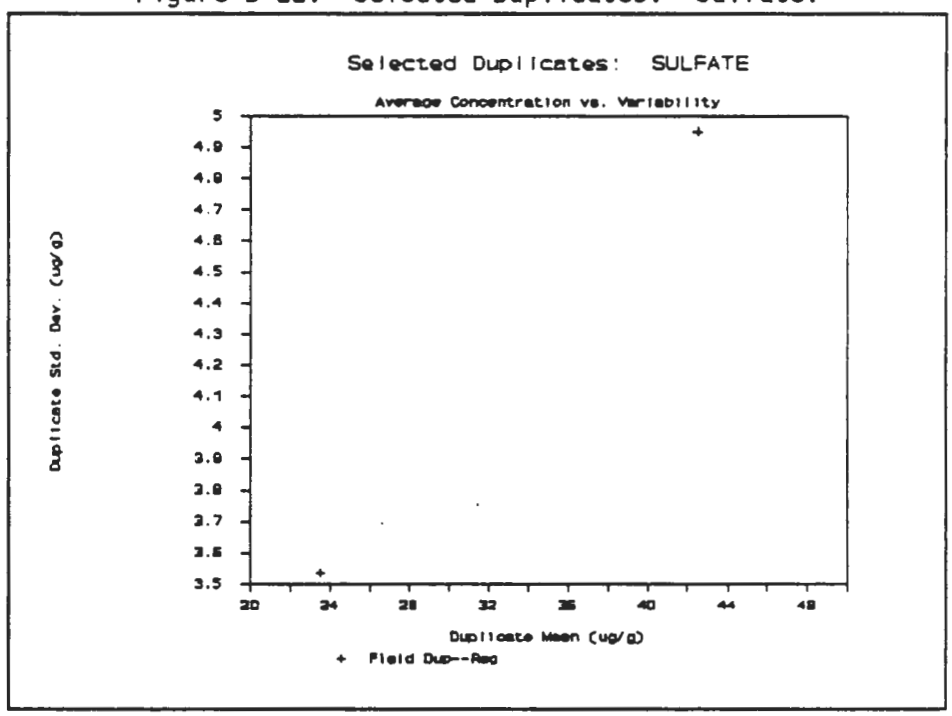


Figure B-23. Selected Duplicates: Vanadium.

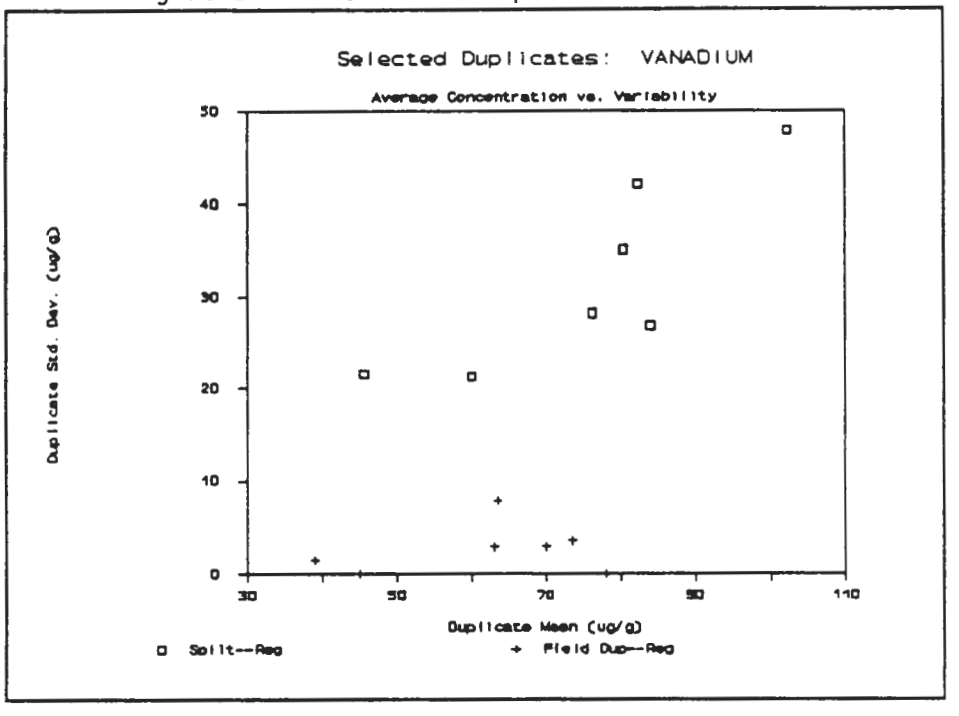
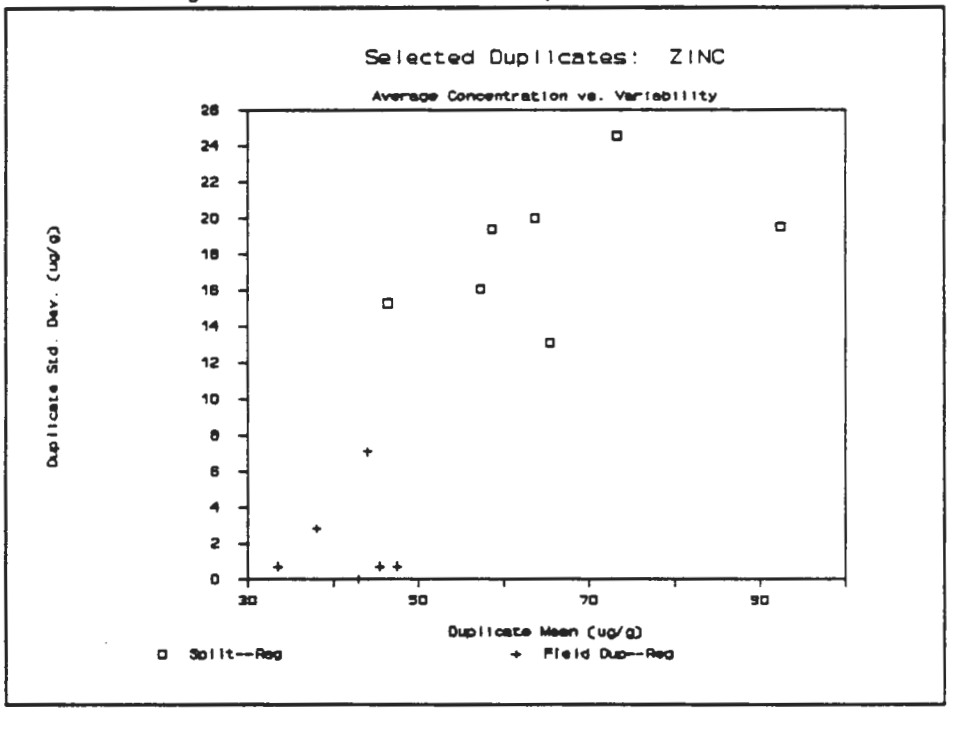


Figure B-24. Selected Duplicates: Zinc.



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APPENDIX C

ENVIRONMENTAL PROTECTION AGENCY OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE MEMORANDUM

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 19 1989

SOLID WASTE AND EMERGENCY RESPONSE

Mr. Thomas C. Jorling
Commissioner
Department of Environmental Conservation
State of New York
Albany, New York 12233-1010

Dear Mr. Jorling:

I am writing in response to your letter of May 5, 1989, in which you ask numerous questions concerning the regulatory status, under the Resource Conservation and Recovery Act (RCRA), of environmental media (ground water, soil, and sediment) contaminated with RCRA-listed hazardous waste.

As you point out in your letter, it is correct that the Agency's "contained-in" interpretation is that contaminated environmental media must be managed as if they were hazardous wastes until they no longer contain the listed waste, or are delisted. This leads to the critical question of when an environmental medium contaminated by listed hazardous waste ceases to be a listed hazardous waste. In your letter, you discuss three possible answers (based on previous EPA positions and documents) which you believe address this question, and request the Agency to clarify its interpretation. Each of these is discussed below.

The first possible answer you cite would be that the contaminated media would be a hazardous waste unless and until it is delisted, based on the "mixture" and "derived-from" rules. As you correctly state in your letter, a waste that meets a listing description due to the application of either of these rules remains a listed hazardous waste until it is delisted. However, these two rules do not pertain to contaminated environmental media. Under our regulations, contaminated media are not considered solid wastes in the sense of being abandoned, recycled, or inherently waste-like as those terms are defined in the regulations. Therefore, contaminated environmental media cannot be considered a hazardous waste via the "mixture" rule (i.e., to have a hazardous waste mixture, a hazardous waste must be mixed with a solid waste per 40 CFR 261.3(a)(2)(iv)). Similarly, the "derived-from" rule does not apply to contaminated media. Our basis for stating that contaminated environmental media must be managed as hazardous wastes is that they "contain"

listed hazardous waste. These environmental media must be managed as hazardous waste because, and only as long as, they "contain" a listed hazardous waste, (i.e., until decontaminated).

The second possibility you mention is that environmental media contaminated with a RCRA listed waste no longer have to be managed as a hazardous waste if the hazardous constituents are completely removed by treatment. This is consistent with the Agency's "contained-in" interpretation and represents the Agency's current policy.

The third possibility you discuss comes from Sylvia Lowrance's January 24, 1989, memorandum that you cited in your letter. This memorandum indicates that OSW has not issued any definitive guidance as to when, or at what levels, environmental media contaminated with listed hazardous waste are no longer considered to contain that hazardous waste. It also states that until such definitive guidance is issued, the Regions may determine these levels on a case-specific basis. Where this determination involves an authorized State, such as New York, our policy is that the State may also make such a determination.

Related to such a determination, you ask whether a risk assessment approach that addressed the public health and environmental impacts of hazardous constituents remaining in treatment residuals would be acceptable. This approach would be acceptable for contaminated media provided you assumed a direct exposure scenario, but would not be acceptable for "derived-from" wastes under our current rules. Additionally, consistent with the statute, you could substitute more stringent standards or criteria for contaminated environmental media than those recommended by the Federal EPA if you determined it to be appropriate.

The Agency is currently involved in a rulemaking effort directed at setting de minimis levels for hazardous constituents below which eligible listed wastes, treatment residuals from those wastes, and environmental media contaminated with those listed wastes would no longer have to be managed as hazardous wastes. The approach being contemplated in the De Minimis program would be similar to that used in the proposed RCRA Clean Closure Guidance in terms of the exposure scenario (direct ingestion), the management scenario (not in a waste management unit), and the levels (primarily health-based).

Your final question related to whether the "remove and decontaminate" procedure set forth in the March 19, 1987 Federal Register preamble to the conforming regulations on closing surface impoundments applies when making complete removal determinations for soil. These procedures do apply when one

chooses to clean close a hazardous waste surface impoundment by removing the waste. The preamble language states that the Agency interprets the term "remove" and "decontaminate" to mean removal of all wastes, liners, and/or leachate (including ground water) that pose a substantial present or potential threat to human health or the environment (52 FR 8706). Further discussion of these requirements is provided in a clarification notice published on March 28, 1988, (53 FR 1144) and in OSWER Policy Directive # 9476.00-18 on demonstrating equivalence of Part 265 clean closure with Part 264 requirements (copy enclosed).

I hope that this response will be helpful to you in establishing and implementing New York's hazardous waste policies on related issues. Should you have additional questions, please contact Bob Dellinger, Chief of the Waste Characterization Branch at (202) 475-8551.

Sincerely yours,

Robert H. Lagey

for Jonathan Z. Cannon
Acting Assistant Administrator

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