START

003278

SUPPORTING DOCUMENT

1. Page 1 of 176

2. Title	3. Number	4. Rev. No.
INTERIM-STATUS GROUND-WATER MONITORING PLAN FOR THE 216-B-3 POND	WHC-SD-EN-AP-013	0

5. Key Words

Ground-water monitoring
216-B-3 pond
interim status

6. Author /

L.C. Swanson/S.P. Luttrell
Name (Type or Print)

DC Weekes for L.C. Swanson
Signature

80230 (WHC) (PNL)
Organization Code

7. Abstract

This document outlines a ground-water monitoring plan for the 216-B-3 Pond, located east of the 200 East Area on the Hanford Site in southeastern Washington State. It has been determined that hazardous materials were discharged to the pond. Installation of an interim-status ground-water monitoring system is required under the Resource Conservation and Recovery Act of 1976 to determine if hazardous chemicals are moving out of the pond.

This plan describes the location of new and existing wells in the monitoring system, who the wells are to be completed, which data are to be collected, and how those data can be used to determine the source and extent of ground-water contamination from the pond. Four downgradient wells were installed in 1988. Six new downgradient wells are planned to be installed in 1989. Two existing wells will be used to establish background ground-water chemistry.

8. **PURPOSE AND USE OF DOCUMENT** - This document was prepared for use within Westinghouse Hanford Company and is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. Distribution external to WHC requires the appropriate document clearance.

PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the U.S. Department of Energy, Patent Attorney, Richland Operations Office, Richland, WA.

SEP 1989
RECEIVED
EDMC

9. **ENGINEERING RELEASE STAMP**
(Does not authorize public dissemination)

OFFICIAL RELEASE
BY WHC
DATE 8/23/1989
Sta. 21

10. Impact Level

2

A-6400-073 (6/89)

9117205 7

SUPPORTING DOCUMENT COVER SHEET COMPLETION INSTRUCTIONS

1. **PAGE 1 OF _____** – Enter total page count.

2. **TITLE** – Enter the title of the Supporting Document to be released.

3. **NUMBER** – Enter the unique document identification number obtained from Engineering Document Control.

4. **REV. NO.** – Enter the current revision number of the Supporting Document to be released.

5. **KEY WORDS** – Enter specific words that are input to a database that will aid in future retrieval of the document, e.g., project, task, selected words from the title, etc.

6. **AUTHOR** – Enter the printed/typed name of the Supporting Document author, his signature, and the author's organization code.

7. **ABSTRACT** – Enter a brief summary of the document content.

8. **CAVEATS** – Reminders to the user(s) and those on distribution that the Supporting Document is not approved for public release until proper reviews/approvals have been obtained.

9. **ENGINEERING RELEASE STAMP** – The release stamp is affixed by Engineering Document Control to certify that the Supporting Document is approved for the intended use, and is accountable and retrievable. The release stamp is not an authorization for public release and does not signify that the document is approved for public dissemination.

10. **IMPACT LEVEL** – Enter the applicable Impact Level for the Supporting Document. Reference MRP 5.43 and EP-1.7.

INTERIM-STATUS GROUND-WATER MONITORING PLAN FOR THE 216-B-3 POND

S. P. Luttrell
M. A. Chamness
S. Dudziak

June 1989

Prepared for Westinghouse Hanford Company
by Pacific Northwest Laboratory
Richland, Washington 99352

9011172053 0

THIS PAGE INTENTIONALLY
LEFT BLANK

CONTENTS

1.0 INTRODUCTION 9

PURPOSE AND OBJECTIVES 9

2.0 BACKGROUND INFORMATION 12

FACILITY DESCRIPTION 12

Location and Physical Description 12

History of Operation 12

Waste Characteristics 18

GEOLOGY 20

Regional Geologic Setting 28

Geology of the Separations Areas 29

Site Geology 33

HYDROGEOLOGY 40

Regional Setting 40

Ground-Water Hydrology of the Separations Areas 41

Hydrogeology Beneath B Pond 46

3.0 PHASE I--GROUND-WATER MONITORING PROGRAM 49

OBJECTIVES 49

APPROACH 49

GROUND-WATER MONITORING SYSTEM 53

Uppermost Aquifer 53

Background Wells 54

Detection Wells 54

Use of Existing Wells 54

Installation of New Characterization/Monitoring Wells 56

Monitoring Parameters 62

HYDROGEOLOGIC CHARACTERIZATION 62

Geologic Characterization 64

Hydrogeologic Characterization 66

SAMPLING AND ANALYSIS 69

STATISTICAL ANALYSIS OF GROUND-WATER MONITORING DATA 70

Methods 70

Establishing Background 70

Evaluation of Data 71

Notification and Reports 71

4.0 PHASE II--INITIATION OF GROUND-WATER QUALITY ASSESSMENT PROGRAM 73

INITIATION CRITERIA 73

GROUND-WATER QUALITY ASSESSMENT PROGRAM 73

Nature and Extent of Contamination 74

Rate of Movement 76

Additional Well Installations 76

Additional Field and Laboratory Testing 76

Modeling 77

CONTINUED ANALYSIS AND EVALUATION 77

Review of Methods and Procedures 77

Review of Sampling Parameters and Frequency 78

Notification and Reports 78

5.0 REFERENCES 80

APPENDIX A - GEOLOGIC AND WELL CONSTRUCTION DIAGRAMS FOR EXISTING WELLS 85

APPENDIX B - WATER-CHEMISTRY DATA LISTINGS AND SUMMARIES 101

APPENDIX C - SAMPLING AND ANALYSIS 165

FIGURES

1.1 Map Showing the Locations of the Hanford Site and the Separations Areas 10

2.1 Map Showing the Location of the 216-B-3 Pond in Relation to the 200-East Area 13

2.2 Structural Geology of the Pasco Basin 30

2.3 Generalized Geologic Column for the Separations Areas 31

2.4 Map Showing the Locations of Wells and Geologic Cross Sections Near the 216-B-3 Pond 34

2.5 Cross Section A-A′ 35

2.6 Cross Section B-B′ 37

2.7 Water Table Map for the Separations Areas, December 1987 43

3.1 Map Showing the Locations of Existing and Planned Monitoring Wells at 216-B-3 Pond 51

3.2 Schematic Diagrams of a Monitoring Well 60

9 0 1 1 7 7 2 0 5 3 3

TABLES

2.1 Hazardous Discharged to B Pond Via the 216-A-29 Ditch 19

2.2 Volume of Water Discharged to Gable Mountain and B Ponds 20

2.3 Constituents in PUREX Chemical Sewage Discharged to B Pond . . . 21

2.4 Constituents in PUREX Cooling Water Discharged to B Pond 22

2.5 Constituents in B Plant Cooling Water Discharged to B Pond . . . 23

2.6 Constituents in 242-A Evaporator Steam Condensate Discharged to B Pond 24

2.7 Constituents in 242-A Evaporator Cooling Water Discharged to B Pond 25

2.8 Constituents in 244-AR Vault Cooling Water Discharged to B Pond 26

2.9 Constituents in 284-E Powerhouse Cooling Water Discharged to B Pond 27

2.10 Hydraulic Properties in the Separations Areas 46

2.11 Status of Existing Wells in the Vicinity of B Pond 48

3.1 Ground-Water Sampling Parameters, Maximum Level 63

3.2 Reports Required by 40 CFR 265, Subpart F, for Ground-Water Monitoring 72

4.1 Sample Ground-Water Quality Assessment Plan Outline 75

4.2 Reports and Notifications 79

1.0 INTRODUCTION

The 216-B-3 Pond (hereafter called B Pond), located at the Hanford Site in southeastern Washington State (see Figure 1.1), receives waste water from various operations in the 200-East Area. In the past, known and potential discharges of hazardous wastes have occurred. Since 1984, physical and administrative controls have been modified to avoid inadvertent discharge of chemicals to the waste-water stream. A Resource Conservation and Recovery Act (RCRA) Part A (interim status) permit application has been submitted for B Pond. The pond is not expected to receive additional hazardous substances; therefore, B Pond is proposed for closure under RCRA, although it will continue to receive non-RCRA-regulated waste water.

Under RCRA interim status, B Pond requires a ground-water monitoring program. This section presents the purpose, objectives, and scope of the plan for this program. This plan differs slightly from the draft closure plan (DOE 1987) because of the changing requirements for information.

PURPOSE AND OBJECTIVES

The purpose of this plan is to present a program that is capable of determining the impact of waste-water disposal to B Pond on the quality of the uppermost aquifer underlying the facility as required in 40 CFR 265.90(a). Specific objectives include

- presenting an initial ground-water monitoring system that is able to provide a preliminary indication if any hazardous constituents have migrated from the site to ground water
- presenting an initial hydrogeologic characterization plan.

This document presents an overview of B Pond, the waste characteristics of the discharges to the pond, the geology and hydrology of the area, the ground-water monitoring indicator evaluation program, and an outline of a ground-water quality assessment program.

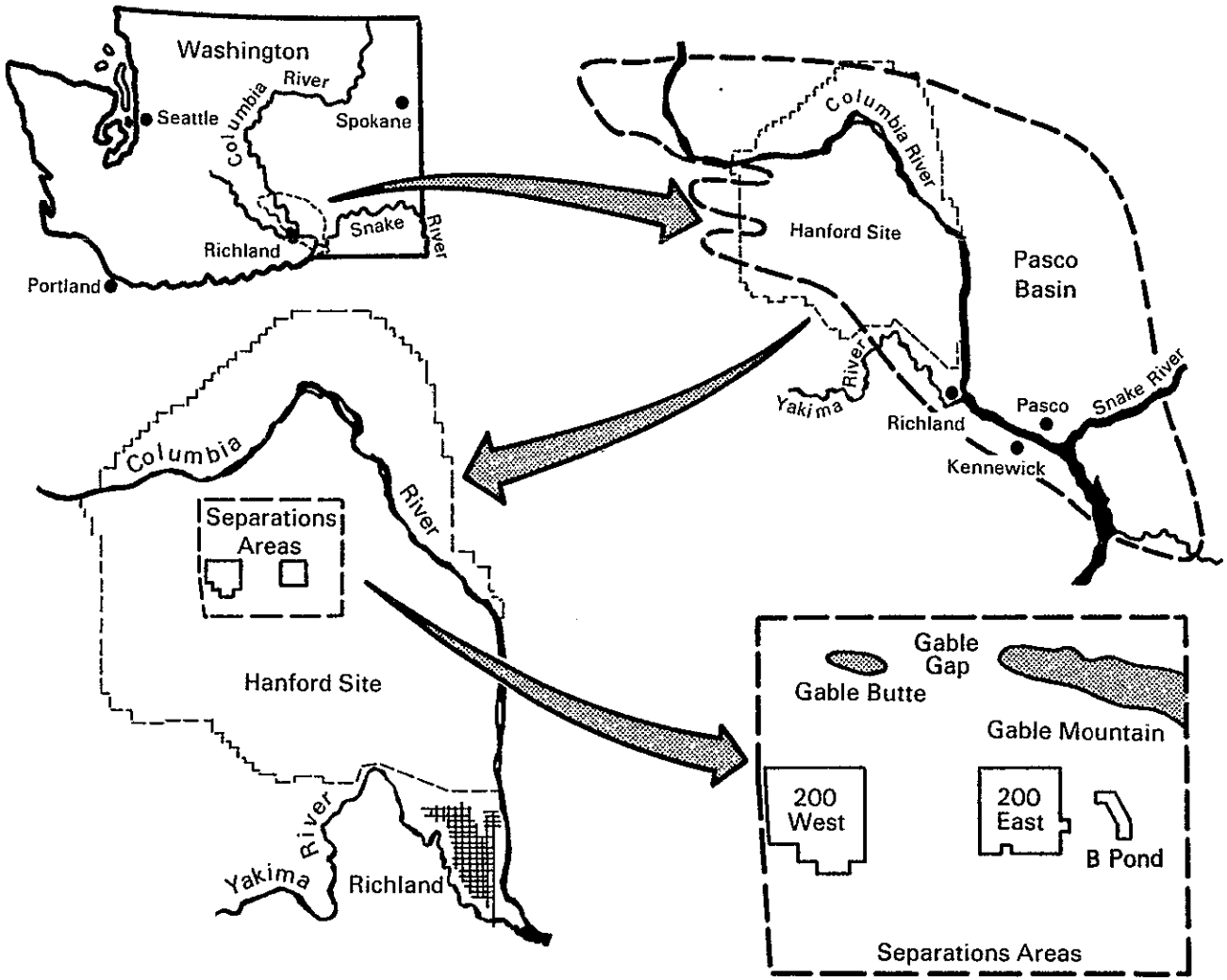


FIGURE 1.1. Map Showing the Locations of the Hanford Site and the Separations Areas

The plan for the monitoring program is based on ground-water monitoring requirements for RCRA interim-status facilities. The applicable monitoring requirements are described in 40 CFR 265, Subpart F and the State of Washington Department of Ecology (Ecology) Dangerous Waste Regulations, Washington Administrative Code (WAC) 173-303. (Ecology implements interim-status ground-water monitoring regulations by reference in WAC 173-303 to 40 CFR 265 Subpart F.)

The hydrogeologic characterization activities and ground-water monitoring system presented in this plan constitute an initial program. Hydrogeologic data and information and ground-water chemistry data will be interpreted and evaluated before initiating additional hydrogeologic characterization and well installation activities.

9 0 1 1 7 7 2 0 5 9 7

2.0 BACKGROUND INFORMATION

The U.S. Department of Energy's (DOE's) Hanford Site is located in southeastern Washington State (Figure 1.1). The Hanford Site is used for nuclear reactor operations, spent fuel reprocessing, and radioactive waste management. The fuel reprocessing and radioactive waste management facilities in the 200-East and 200-West Areas (Separations Areas) are operated by Westinghouse Hanford Company.

FACILITY DESCRIPTION

This section describes B Pond, its operational history, and past and present waste characteristics.

Location and Physical Description

B Pond is a series of interconnected surface-water ponds that lie east of the 200-East Area (Figure 2.1). The pond receives large volumes of waste water from the 200-East Area via the 216-A-29 and 216-B-3-3 Ditches. The original pond (216-B-3) is located in a topographic low and is diked on the eastern margin to provide containment. The pond is unlined and approximately 5 ft deep. In its original configuration, B Pond covered approximately 39 acres, with overflow capacity at its western end. This overflow area has been decommissioned. In 1984, B Pond was expanded to include two additional basins designated 216-B-3A and 216-B-3B; both are approximately 11 acres in size. In 1985, a 41-acre third basin, 216-B-3C, was added. B Pond now covers approximately 102 acres (Law and Schatz 1986; Law, Serkowski, and Schatz 1987).

History of Operation

B Pond has received large volumes of potentially low-level radioactive and nonradioactive waste water from various operations in the 200-East Area. In the past, discharges of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-reportable quantities of hazardous waste have also occurred. Various ditches have been used to transmit this waste water to B Pond over the years. In the past, the 216-B-3-1 and 216-B-3-2 Ditches led from the 200-East Area fenceline to B Pond (Figure 2.1). Limited

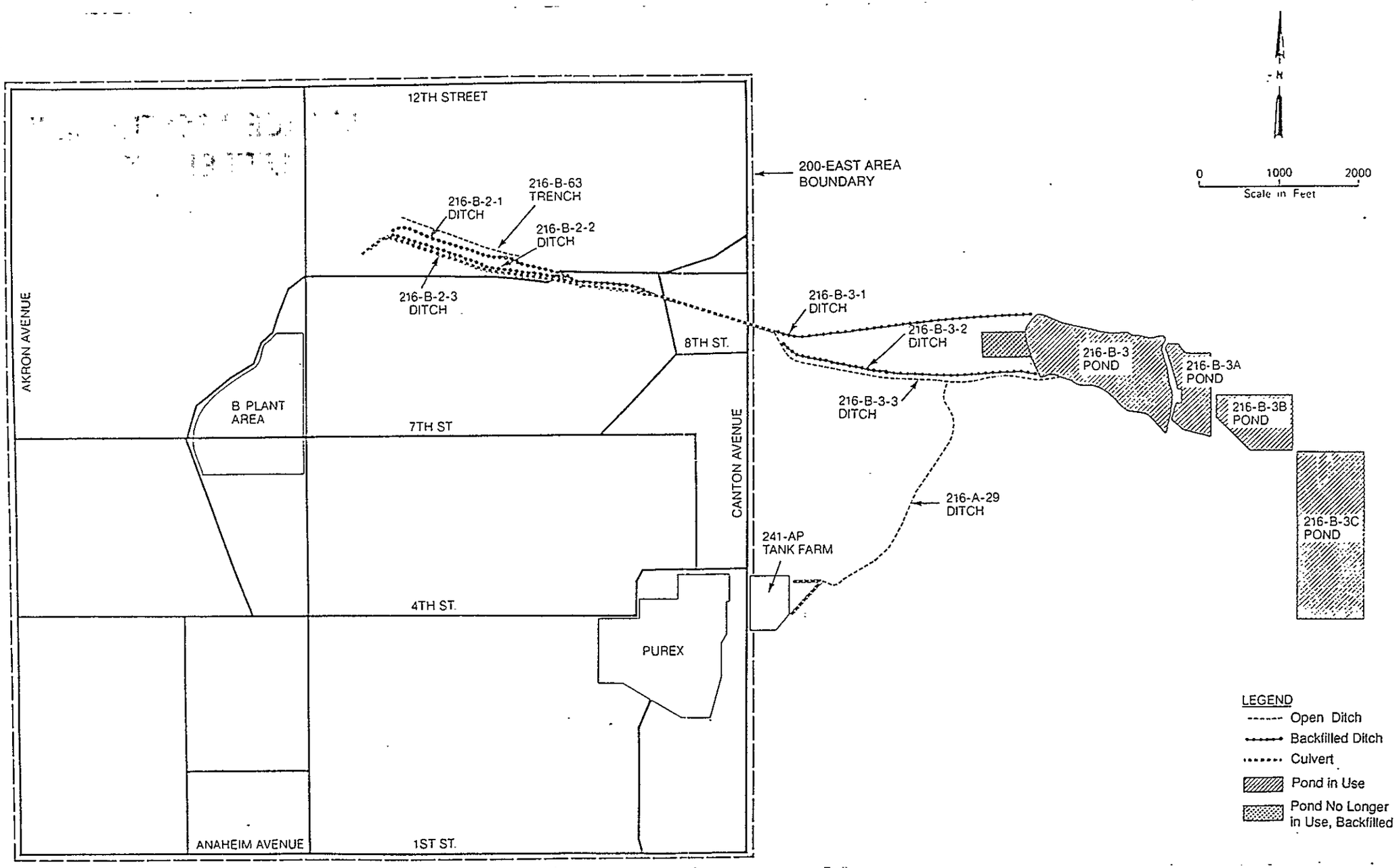


FIGURE 2.1. Map Showing the Location of the 216-B-3 Pond in Relation to the 200-East Area

THIS PAGE INTENTIONALLY
LEFT BLANK

information is available on the total quantities and the types of waste constituents that were disposed of to these ditches. The following information on operational discharges is available.

Previous Discharges to B Pond

Maxfield (1979) contains limited information on previous discharges to B Pond and the original locations of the ditches leading to B Pond. From 1945 to 1964, the 216-B-3-1 Ditch was used. This ditch was located about 450 ft north of 216-B-3-3 and widened into a "swamp" before discharging to B Pond. The 216-B-3-1 Ditch was removed from service and backfilled in 1964 after a release of about 10,000 Ci of mixed fission products to B Pond and Gable Mountain Pond. Discharges to this ditch included

- 221-B Plant steam condensate (April 1945 to July 1964)
- 221-B Plant process cooling water (April 1945 to July 1964)
- 221-B Plant chemical sewer waste (April 1945 to July 1964)
- 284-E powerhouse waste (April 1945 to July 1964)
- 241-CR vault cooling water (March 1952 to July 1964).

In November 1955, the 216-A-29 Ditch was joined to the 216-B-3-1 Ditch about 1000 ft west of B Pond. The wastes discharged to the 216-A-29 Ditch from 1955 to 1964 included

- 202-A Plutonium Uranium Extraction Plant (PUREX) process cooling water (November 1955 to December 1957, February 1958 to July 1964)
- 202-A acid fractionator condensate (February 1958 to July 1964)
- 202-A seal cooling water from air sampler vacuum pumps (December 1962 to December 1963).

After the 216-B-3-1 Ditch was retired in 1964, the 216-B-3-2 Ditch was activated. This ditch was used from 1964 to 1970 and was backfilled in 1970 after a substantial release of strontium-90 from 221-B Plant. This ditch was located about 80 ft north of the current 216-B-3-3 Ditch. Discharges to the 216-B-3-2 Ditch included

- 221-B Plant process cooling water (July 1964 to July 1970)
- 221-B Plant steam condensate (July 1964 to July 1970)
- 221-B Plant chemical sewer (July 1964 to July 1970)
- 241-CR vault cooling water (July 1964 to July 1970)
- 284-E powerhouse waste water (July 1964 to November 1967, February 1968 to July 1970)
- 241-BY tank farm in-tank solidification (ITS) unit 1 condenser cooling water (January 1965 to July 1970)
- 241-BY tank farm ITS unit 2 condenser cooling water (February 1968 to July 1970).

During this time (1964 to 1970), the 216-A-29 Ditch discharged to the 216-B-3-2 Ditch approximately 1000 ft west of B Pond. After the 216-B-3-2 Ditch was decommissioned, the 216-A-29 Ditch was routed to its present discharge point in the 216-B-3-3 Ditch. Discharges to the 216-A-29 Ditch during this time included

- 202-A PUREX chemical sewer (July 1964 to July 1970)
- 202-A PUREX fractionator condensate (July 1964 to July 1970)
- 202-A PUREX condenser cooling water (January 1966 to July 1970)
- 202-A PUREX air sampler vacuum pump seal cooling water (January 1966 to July 1970).

Other ditches inside the 200-East Area that transported wastes toward B Pond included the 216-B-2-1 and 216-B-2-2 Ditches, which paralleled the 216-B-2-3 Ditch (Figure 2.1). Most of the waste streams discharged to these ditches originated in the B Plant area.

The 216-B-2-1 Ditch operated from 1945 to 1963 and was backfilled in 1964. Discharges to the 216-B-2-1 Ditch included

- 221-B Plant steam condensate (April 1945 to November 1963)
- 221-B Plant process cooling water (April 1945 to November 1963)
- 221-B Plant chemical sewer (April 1945 to November 1963)
- 241-CR vault cooling water (March 1952 to November 1963).

The 216-B-2-2 Ditch operated from 1963 until it was retired and backfilled in 1970. Discharges to this ditch included

- 221-B Plant cooling water (November 1963 to April 1970)
- 221-B Plant steam condensate (November 1963 to April 1970)
- 221-B Plant chemical sewer waste (November 1963 to April 1970)
- 241-CR vault cooling water (November 1963 to April 1970)
- 241-BY tank farm ITS unit 1 cooling water (January 1965 to April 1970)
- 241-BY tank farm ITS unit 2 cooling water (February 1968 to April 1970)
- cleanup waste from 207-B Basin (April 1970 to May 1970).

The 216-B-2-3 Ditch has been in operation since 1970 and was replaced by polyvinyl chloride pipe early in 1987. Originally the ditch was about 20 ft wide, 6 to 8 ft deep, and about 4000 ft long. Discharges to the 216-B-2-3 ditch included

- 225-B Building (Waste Encapsulation and Storage Facility) cooling water from cooling coils in process tanks, vessels, and pool cell heat exchangers.
- 244-CR vault compressor cooling water.
- 221-B Plant (separations building) cooling water from coils of process tanks and vessels.

Current Discharges to B Pond

Currently, all discharge to B Pond is from the 216-B-3-3 Ditch, which is fed by the 216-B-2-3 Ditch and the 216-A-29 Ditch (see Figure 2.1). The 216-B-3-3 Ditch enters B Pond in its southwest corner. Influents to this ditch currently come from the following operations:

- PUREX facility cooling water and chemical sewer (via 216-A-29 Ditch)
- B Plant cooling water
- 244-AR vault cooling water
- 242-A evaporator cooling water and steam condensate

- 241-AY tank farm surface condenser
- 242-AZ tank farm surface condenser
- 283-E water treatment facility
- 284-E powerhouse cooling water.

The 216-A-29 Ditch discharges into the 216-B-3-3 Ditch approximately 1500 ft upstream of B Pond. The 216-A-29 Ditch has received waste water from PUREX cooling water and its chemical sewer, the latter containing the following waste streams:

- nonprocess steam condensates
- chemical storage and makeup tank overflows
- demineralizer recharge effluents
- acid fractionator condensates.

General categories of waste streams from the Hanford Site are discussed later.

Waste Characteristics

A number of documents exist on both radiological and nonradiological constituents discharged into the waste streams that feed into B Pond. These include annual reports of radioactive liquid wastes discharged to ground (e.g., Sliger 1983, Aldrich 1984, 1985, 1986, 1987) and a report evaluating the hazardous characteristics of liquid discharges to ground (Jungfleisch 1988). Metcalf (1986) sampled and analyzed several of the waste streams for nonradioactive constituents; however, the results were considered preliminary and are therefore not reported here. Waste-stream water chemistry data before 1985 were primarily limited to analyses for radionuclides and nitrate. Table 2.1 gives a listing of the hazardous discharges known to have been released to B Pond. These releases were all via the 216-A-29 Ditch. There is no documentation of hazardous waste releases or discharges to B Pond via the 216-B-3-3 Ditch.

The volume of waste water discharged to B Pond has varied in the past and increased with the decommissioning of Gable Mountain Pond in the fall of 1987 when all Gable Mountain Pond discharges were rerouted to B Pond. The recent annual volumes of waste water discharged to the two ponds are summarized in Table 2.2.

9011172059 3

TABLE 2.1. Hazardous Discharges to B Pond via the 216-A-29 Ditch[a]

Waste	Date	Description
Demineralizer regenerant	1955 to Feb. 1986	Characteristic (corrosive)
Aqueous makeup tank heels and off-specification batches	1955 to Oct. 1984	Characteristic [corrosive and EP[b] toxic]
N cell prestart testing (oxalic acid, nitric acid, hydrogen peroxide, calcium nitrate)	Apr. 11 to Dec. 7, 1983	Characteristic (corrosive)
Potassium permanganate, sodium carbonate solution	Oct. 19, 1983	CERCLA[c]-reportable release
Hydrazine HN solution	June 6, 1984 Sept. 13, 1984 Oct. 2, 1984	CERCLA-reportable release
Potassium hydroxide	Dec. 2, 1984	CERCLA-reportable release
Sodium nitrate	Feb. 8, 1985	CERCLA-reportable release
Nitric acid	Aug. 22, 1984 Jan. 18, 1985 May 27, 1985 June 25, 1985 Oct. 28, 1985	CERCLA-reportable release
Sodium hydroxide	Feb. 26, 1984 Nov. 19, 1984 Aug. 6, 1985	CERCLA-reportable release
Cadmium nitrate	May 16, 1984 Dec. 18, 1985	CERCLA-reportable release
Hydrazine	July 7, 1986	CERCLA-reportable release
Sodium nitrite	April 25, 1987	CERCLA-reportable release

(a) From DOE 1987.
(b) Extraction procedure.
(c) Comprehensive Environmental Response, Compensation, and Liability Act.

TABLE 2.2. Volume of Water Discharged to Gable Mountain and B Ponds

Year	Gable Mountain Pond	B Pond
1985	2.10E+9 gal (7.90E+9 L)	3.90E+9 gal (1.50E+10 L)[a]
1986	3.58E+8 gal (1.36E+9 L)	6.06E+9 gal (2.29E+10 L)[b]
1987	2.47E+8 gal (9.35E+8 L)	5.86E+9 gal (2.22E+10 L)[c]

(a) From Law and Schatz 1986.
(b) From Law et al. 1987.
(c) From Serkowski et al. 1988.

Waste streams in the following two categories were discharged to B Pond:

1. Steam condensate and cooling water - primarily river water with little potential for chemical or radioactive contamination. These liquid effluents made up a large portion of the water used in the 200-East Area. Accidental releases of radioactive and hazardous substances have occurred, but represent only a small fraction of the waste volume discharged to these sites.

2. Miscellaneous liquid wastes - include a wide variety of potentially hazardous wastes. These liquid effluents are not well characterized but could contain more highly concentrated, potentially hazardous substances. All liquid wastes in this category had relatively low volumes.

Starting in mid-1986 and continuing into mid-1987, quarterly samples were taken from most of the waste streams discharging to B Pond (Jungfleisch 1988). These samples were analyzed for a variety of constituents, and the results are given in Tables 2.3 through 2.9. These tables provide the reader with data on current waste characteristics. Jungfleisch (1988) evaluated these discharges according to the Dangerous Waste Regulations of the State of Washington (WAC 173-303). None of these discharges is a dangerous waste or an extremely hazardous waste based on these data.

GEOLOGY

This section provides background information on the geology of the Hanford Site and B Pond in support of the detection-level ground-water

TABLE 2.3. Constituents in PUREX Chemical Sewage Discharged to B Pond (Jungfleisch 1988)

Parameter[a]	Sample Date 6/6/86	12/19/86	3/18/87	4/6/87
Aluminum	2.0E+02	<1.53+02	<1.5E+02	<1.5E+02
Ammonium	<5.0E+01	1.2E+02	<5.0E+01	NIC[b]
Antimony	<1.0E+02	<1.0E+02	<1.0E+02	<1.0E+02
Barium	2.4E+01	3.1E+01	2.6E+01	2.4E+01
Beryllium	<2.0E+00	<2.0E+00	<2.0E+00	<2.0E+00
Cadmium	1.4E+04	2.0E+04	2.1E+04	2.0E+04
Calcium	1.4E+04	2.0E+04	2.1E+04	2.3E+04
Chromium	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Copper	<1.0E+01	2.8E+01	<1.0E+01	<1.0E+1
Iron	2.2E+02	5.0E+01	6.8E+01	6.0E+01
Lead	NR[c]	<5.0E+00	<5.0E+00	<5.0E+00
Magnesium	3.2E+03	4.7E+03	4.7E+03	4.2+03
Manganese	1.3E+01	<5.0E+00	5.03+00	<5.0E+00
Mercury	<1.0E-01	<1.0E-01	1.5E-01	<1.0E-01
Nickel	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Potassium	1.3E+03	8.2E+02	8.4E+02	7.4E+02
Silver	<1.0E+01	<1.0E+02	<2.0E+01	<2.0E+01
Sodium	2.6E+03	1.2E+04	3.2E+03	2.0E+03
Strontium	<3.0E+02	<3.0E+02	<3.0E+02	<3.0E+02
Uranium	4.1E-01	4.2E-01	4.2E-01	3.0E-01
Vanadium	<5.0E+00	<5.0E+00	<4.0E+00	<5.0E+00
Zinc	5.0E+00	1.0E+01	1.3E+01	7.0E+00
Chloride	<5.0E+02	1.0E+03	1.2E+03	1.2E+03
Cyanide	<1.0E+01	<2.0E+01	<2.0E+01	<1.0E+01
Fluoride	<5.0E+02	<5.0E+02	<5.0E+02	<5.0E+02
Nitrate	<5.0E+02	5.4E+02	5.8E+02	<5.0E+02
Phosphate	<1.0E+03	<1.0E+03	<1.0E+03	<1.0E+03
Sulfide	HTE[d]	HTE	HTE	NIC
Sulfate	8.0E-03	1.2E+04	1.3E+04	1.1E+04
Acetone	<1.0E+01	<1.0E+01	<1.0E+01	2.0E+02
Amount (L/month)	1.5E+08	9.2E+07	4.8E+07	7.5E+07
pH (dimensionless)	7.72	8.56	7.12	8.53
Temperature (celsius)	31.0	15.9	13.4	24.6
Alpha Activity (pCi/L)	4.0E+00	6.0E-01	<1.8E-01	<4.2E-01
Beta Activity (pCi/L)	2.3E+01	3.8E+00	4.9E+00	5.1E+00
Conductivity (μS/cm)	1.3E+01	1.7E+02	1.1E+02	1.5E+02
Total Organic Carbon	2.5E+03	1.3E+03	1.2E+03	1.3E+03
Total Organic Halide	1.7E+01	3.1E+01	2.8E+01	2.0E+01

(a) Unless otherwise noted, concentrations are in parts per billion.
(b) NIC - measurements made by methods that were not in control at the time of measurement.
(c) NR - data not reported.
(d) HTE - measurements made after the holding times were exceeded.

TABLE 2.4. Constituents in PUREX Cooling Water Discharged to B Pond (Jungfleisch 1988)

Parameter[a]	Sample Date 5/7/86	7/10/86	11/20/86	3/10/87
Aluminum	<1.5E+02	<1.5E+02	NIC[b]	2.2E+02
Ammonium	<5.0E+01	<5.0E+01	NIC	NIC
Antimony	<1.0E+02	<1.0E+02	<1.0E+02	<1.0E+02
Barium	3.3E+01	3.2E+01	3.1E+01	2.9E+01
Beryllium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Cadmium	<2.0E+00	<2.0E+00	<2.0E+00	<2.0E+00
Calcium	2.2E+04	NIC	2.0E+04	2.1E+04
Chromium	<1.0E+01	<1.0E+01	<2.0E+01	<1.0E+01
Copper	<1.0E+01	<1.0E+01	<1.0E+01	3.0E+01
Iron	NIC	1.8E+02	1.3E+02	NIC
Lead	NR[c]	NR	<5.0E+00	<5.0E+00
Magnesium	NR	4.3+03	4.5E+03	4.8E+03
Manganese	<6.0E+00	2.9E+01	1.1E+01	2.8E+01
Mercury	<1.0E-01	<1.0E-01	<1.0E-01	<1.0E-01
Nickel	<1.0E+01	<1.0E+01	<1.0E+02	<1.0E+01
Potassium	9.1E+02	8.5E+02	7.0E+02	8.2E+02
Silver	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Sodium	NIC	NIC	NIC	2.2E+03
Strontium	<3.0E+02	<3.0E+02	<3.0E+02	<3.0E+02
Uranium	5.4E-01	6.2E-01	5.7E-01	5.9E-01
Vanadium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Zinc	<5.0E+00	9.0E+00	1.2E+01	2.6E+01
Chloride	6.3E+02	1.1E+03	9.3E+02	1.2E+03
Cyanide	<1.0E+01	NIC	<1.0E+01	<1.0E+01
Fluoride	<5.0E+02	<5.0E+02	<5.9E+02	<5.0E+02
Nitrate	<5.0E+02	1.2E+03	5.9E+02	5.1E+02
Phosphate	<1.0E+03	<1.0E+03	<1.0E+03	<1.0E+03
Sulfide	HTE[d]	HTE	HTE	<1.0E+03
Sulfate	1.2E+04	8.9E+03	1.1E+04	1.3E+04
Amount (L/month)	1.2E+09	1.2E+09	2.2E+08	3.3E+08
pH (dimensionless)	8.15	6.18	5.40	5.28
Temperature (celsius)	19.90	31.40	14.00	10.00
Alpha Activity (pCi/L)	1.3E+00	1.3E+00	4.0E-01	7.3E-01
Beta Activity (pCi/L)	1.6E+01	3.3E+02	2.2+01	1.5E+01
Conductivity (μS/cm)	1.4E+01	1.4E+02	1.3E+02	1.1E+02
Total Organic Carbon	1.5E+03	1.8E+03	1.1E+03	1.0E+03
Total Organic Halide	8.3E+00	<2.1E+01	2.6E+01	<2.0E+01

(a) Unless otherwise noted, concentrations are in parts per billion.
(b) NIC - measurements made by methods that were not in control at the time of measurement.
(c) NR - data not reported.
(d) HTE - measurements made after the holding times were exceeded.

TABLE 2.5. Constituents in B Plant Cooling Water Discharged to B Pond (Jungfleisch 1988)

Parameter[a]	Sample Date 4/18/86	7/16/86	10/2/86	1/23/87
Aluminum	<1.5E+02	<1.5E+02	<1.5E+02	1.5E+02
Ammonium	NIC[b]	<5.0E+01	<5.0E+01	<5.0E+01
Antimony	<1.0E+02	<1.0E+02	<1.0E+02	<1.0E+02
Barium	2.5E+01	3.2E+01	2.6E+01	3.1E+01
Beryllium	<5.0E+00	<5.0E+00	2.6E+01	<5.0E+00
Cadmium	<2.0E+00	<2.0E+00	<2.9E+00	<2.0E+00
Calcium	1.7E+04	NIC	1.9E+04	2.2E+04
Chromium	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Copper	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Iron	6.5E+01	<5.0E+01	8.9E+01	<5.0E+01
Lead	NR[c]	NR	<5.03+00	<5.0E+00
Magnesium	4.4E+03	4.5E+03	4.2E+03	5.0E+03
Manganese	6.0E+00	1.0E+01	1.2E+01	<5.0E+00
Mercury	<1.0E-01	<1.0E-01	<1.0E-01	<1.0E-01
Nickel	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Potassium	6.4E+02	8.4E+02	8.3E+02	8.0E+02
Silver	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Sodium	2.3E+03	NIC	2.4E+03	NIC
Strontium	<3.0E+02	<3.0E+02	<3.0E+02	<3.0E+02
Uranium	7.7E-01	7.0E-01	6.4E-01	6.0E-01
Vanadium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Zinc	6.8E+01	7.0E+00	7.0E+00	1.1E+01
Chloride	8.3E+02	8.3E+02	3.1E+02	9.7E+02
Cyanide	<1.0E+01	NIC	<1.0E+01	NIC
Fluoride	<5.0E+02	<5.0E+02	<5.0E+02	<5.0E+02
Nitrate	<5.0E+02	5.23+02	<5.0E+02	<5.0E+02
Phosphate	<1.0E+03	<1.0E+03	<1.0E+03	<1.0E+03
Sulfide	HTE[d]	HTE	<1.0E+03	<1.0E+03
Sulfate	1.2E+04	1.2E+04	9.43+03	1.3E+04
Dichloromethane	<1.0E+01	<1.0E+01	1.1E+01	<1.0E+01
Amount (L/month)	3.1E+08	3.0E+08	2.7E+08	2.0E+08
pH (dimensionless)	8.16	6.29	5.80	5.20
Temperature (celsius)	14.3	19.6	18.6	4.8
Alpha Activity (pCi/L)	6.0E-01	2.9E+00	8.1E-01	<1.6E-01
Beta Activity (pCi/L)	3.2E+00	3.7E+00	2.6E+00	4.5E+00
Conductivity (μS/cm)	1.3E+01	1.2E+02	1.2E+02	1.3E+02
Total Organic (Carbon)	1.8E+03	1.9E+03	1.5E+03	1.2E+03
Total Organic Halide	6.6E+00	HTE	<1.0E+02	2.3E+01

(a) Unless otherwise noted, concentrations are in parts per billion.
(b) NIC - measurements made by methods that were not in control at the time of measurement.
(c) NR - data not reported.
(d) HTE - measurements made after the holding times were exceeded.

TABLE 2.6. Constituents in 242-A Evaporator Steam Condensate Discharged to B Pond (Jungfleisch 1988)

Parameter[a]	Sample Date 6/24/86	9/18/86	11/7/86	2/3/87
Aluminum	<1.5E+02	<1.5E+02	<1.5E+02	1.8E+02
Ammonium	<5.0E+01	<5.0E+01	7.0E+01	NIC[b]
Antimony	<1.0E+02	<1.0E+02	<1.0E+02	<1.0E+02
Barium	2.6E+01	2.7E+01	8.0E+00	1.0E+01
Beryllium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Cadmium	<2.0E+00	<2.0E+00	<2.0E+00	<2.0E+00
Calcium	1.6E+04	1.8E+04	6.0E+03	5.1E+03
Chromium	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Copper	<1.0E+01	1.8E+01	1.2E+01	8.8E+01
Iron	1.1E+-2	1.1E+02	2.0E+02	4.2E+04
Lead	NR[c]	1.0E+01	6.5E+00	4.9E+01
Magnesium	3.7E+03	4.1E+03	1.2E+03	1.6E+03
Manganese	1.3E+01	1.5E+01	<5.0E+00	5.6E+01
Mercury	<1.0E-01	<1.0E-01	<1.0E-01	<1.0E-01
Nickel	<1.0E+01	1.0E+01	<1.0E+01	<1.0E+01
Potassium	5.8+02	8.2E+02	2.6E+02	2.3E+02
Silver	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Sodium	2.2E+03	2.2E+03	7.3E+02	6.2E+02
Strontium	<3.0E+02	<3.0E+02	<3.0E+02	<3.0E+02
Uranium	9.0E-01	1.2E+00	3.0E-02	<4.3E-01
Vanadium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Zinc	3.5E+01	6.0E+01	3.6E+01	1.1E+02
Chloride	<5.0E+02	7.7E+02	<5.0E+02	<5.0E+02
Cyanide	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Fluoride	<5.0E+02	<5.0E+02	<5.0E+02	<5.0E+02
Nitrate	7.6E+02	6.7E+02	<5.0E+02	<5.0E+02
Phosphate	<1.0E+03	<2.0E+03	<1.0E+03	<1.0E+03
Sulfide	<1.0E+03	HTE[d]	HTE	HTE
Sulfate	9.4E+03	9.5E+03	3.3E+03	2.8E+03
Amount (L/month)	6.6E+06	1.9E+06	8.4E+06	4.9E+06
pH (dimensionless)	6.90	7.40	5.04	4.90
Temperature (celsius)	31.5	19.9	33.3	41.9
Alpha Activity (pCi/L)	<4.0E+00	6.7E-01	0.3E-02	9.4E-01
Beta Activity (pCi/L)	3.6E+00	5.9E+00	3.7E+00	3.8E+00
Conductivity (μS/cm)	1.2E+02	1.3E+03	5.9E+01	5.3E+01
Total Organic Carbon	2.6E+03	1.3E+03	<2.6E+02	<5.9E+02
Total Organic Halide	9.6E+00	<1.8E+01	<1.0E+02	<2.03+01

(a) Unless otherwise noted, concentrations are in parts per billion.
(b) NIC - measurements made by methods that were not in control at the time of measurement.
(c) NR - data not reported.
(d) HTE - measurements made after the holding times were exceeded.

TABLE 2.7. Constituents in 242-A Evaporator Cooling Water Discharged to B Pond (Jungfleisch 1988)

Parameter[a]	Sample Date 6/27/86	8/22/86	11/20/86	1/12/87
Aluminum	<1.5E+02	<1.5E+02	NIC[b]	<1.5E+02
Ammonium	<5.0E+01	<5.0E+01	NIC	<5.0E+01
Antimony	<1.0E+02	<1.0E+02	<1.0E+02	<1.0E+02
Barium	2.8E+01	2.9E+01	3.1E+01	3.2E+01
Beryllium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Cadmium	<2.0E+00	<2.0E+00	<2.0E+00	<2.0E+00
Calcium	1.7E+04	1.8E+04	2.0E+04	2.13+04
Chromium	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Copper	9.0E+01	4.7E+01	9.7E+01	7.0E+01
Iron	8.6E+01	6.9E+01	<5.0E+01	1.9E+02
Lead	NR[c]	NR	9.4E+00	NIC
Magnesium	4.0E+03	4.0E+03	4.5E+03	4.9E+03
Manganese	1.1E+01	1.4E+01	<5.0E+00	5.0E+00
Mercury	<1.0E-01	HTE[d]	<1.0E-01	<1.0E-01
Nickel	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Potassium	8.3E+02	7.8E+02	8.2E+02	7.3E+02
Silver	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Sodium	2.3E+03	2.3E+03	NIC	2.2E+03
Strontium	<3.0E+02	<3.0E+02	<3.0E+02	<3.0E+02
Uranium	5.0E-01	7.7E-01	6.3E-01	6.5E-01
Vanadium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Zinc	5.8E+01	4.1E+01	6.7E+01	2.3E+01
Chloride	<5.0E+02	7.0E+02	8.5E+02	8.0E+02
Cyanide	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Fluoride	<5.0E+02	<5.0E+02	<5.0E+02	<5.0E+02
Nitrate	<5.0E+02	<5.0E+02	8.2E+02	<5.0E+02
Phosphate	<1.0E+03	<1.0E+03	<1.9E+03	<1.0E+03
Sulfide	<1.0E+03	HTE	HTE	<1.0E+03
Sulfate	9.3E+03	1.0E+04	1.1E+04	1.2E+04
Amount (L/month)	2.8E+08	1.4E+08	4.8E+08	4.6E+08
pH (dimensionless)	6.40	5.50	5.50	5.47
Temperature (celsius)	34.2	23.1	24.2	10.4
Alpha Activity (pCi/L)	1.0E+00	4.3E-01	3.9E-01	1.6E+00
Beta Activity (pCi/L)	2.0E+00	3.5E+00	1.0E+01	3.0E+00
Conductivity (μS/cm)	1.5E+02	1.2E+02	1.6E+02	1.4E+02
Total Organic (Carbon)	2.1E+03	1.7E+03	1.1E+03	1.1E+03
Total Organic Halide	1.2E+01	<6.5E+00	<2.0E+01	NIC

(a) Unless otherwise noted, concentrations are in parts per billion.
(b) NIC - measurements made by methods that were not in control at the time of measurement.
(c) NR - data not reported.
(d) HTE - measurements made after the holding times were exceeded.

TABLE 2.8. Constituents in 244-AR Vault Cooling Water Discharged to B Pond (Jungfleisch 1988)

Parameter[a]	Sample Date 6/24/86	9/23/86	10/3/86	3/5/87
Aluminum	<1.5E+02	1.8E+02	<1.5E+02	<1.5E+02
Ammonium	<5.0E+01	5.4E+01	<5.0E+01	<5.0E+01
Antimony	<1.0E+02	<1.0E+02	<1.0E+02	<1.0E+02
Barium	2.6E+01	3.0E+01	2.8E+01	2.5E+01
Beryllium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Cadmium	<2.0E+00	<2.0E+00	<2.0E+00	<2.0E+00
Calcium	1.7E+04	1.9E+04	1.9E+04	1.9E+04
Chromium	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Copper	<1.0E+01	1.8E+01	4.6E+01	<1.0E+01
Iron	<5.0E+01	3.0E+02	3.1E+02	NIC[b]
Lead	NR[c]	6.8E+00	<5.0E+00	<5.0E+00
Magnesium	3.8E+03	4.3E+03	4.2E+03	4.4E+03
Manganese	<5.0E+00	4.6E+01	3.5E+01	<5.0E+00
Mercury	<1.0E-01	<1.0E-01	HTE[d]	<1.0E+01
Nickel	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Potassium	7.2E+02	9.4E+02	8.5E+02	7.3E+02
Silver	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Sodium	2.2E+03	2.6E+03	NIC	1.9E+03
Strontium	<3.0E+02	<3.0E+02	<3.0E+02	<3.0E+02
Uranium	3.1E-01	1.1E+00	5.2E-01	4.9E-01
Vanadium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Zinc	2.6E+01	2.7E+01	3.2E+01	1.7E+01
Chloride	<5.0E+02	8.4E+02	7.7E+02	1.1E+03
Cyanide	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Fluoride	<5.0E+02	<5.0E+02	<5.0E+02	<5.0E+02
Nitrate	<5.0E+02	<5.0E+02	5.4E+02	<5.0E+02
Phosphate	<1.0E+03	<1.0E+03	<1.0E+03	<1.0E+03
Sulfide	<1.0E+03	HTE	<1.0E+03	<1.0E+03
Sulfate	9.4E+03	9.4E+03	9.4E+03	1.2E+04
Amount (L/month)	7.6E+06	1.4E+07	1.4E+07	1.1E+07
pH (dimensionless)	6.20	7.80	7.47	5.58
Temperature (celsius)	NR	17.7	17.0	26.4
Alpha Activity (pCi/L)	<4.0E+00	1.3E+00	6.7E-01	4.3E-01
Beta Activity (pCi/L)	6.5E+00	7.1E+00	3.2E+00	1.34
Conductivity (μS/cm)	1.8E+02	1.3E+02	1.3E+02	1.4E+02
Total Organic Carbon	2.0E+03	1.8E+03	<1.0E+03	1.1E+03
Total Organic Halide	1.6E+01	<8.0E+00	<1.0E+02	<2.0E+01

(a) Unless otherwise noted, concentrations are in parts per billion.
(b) NIC - measurements made by methods that were not in control at the time of measurement.
(c) NR - data not reported.
(d) HTE - measurements made after the holding times were exceeded.

TABLE 2.9. Constituents in 284-E Powerhouse Cooling Water Discharged to B Pond (Jungfleisch 1988)

Parameter[a]	Sample Date 5/15/86	8/27/86	12/31/86	1/19/87
Aluminum	2.6E+02	3.5E+02	<1.5E+02	7.8E+02
Ammonium	<5.0E+01	<5.0E+01	9.9E+01	<5.0E+01
Antimony	<1.0E+02	<1.0E+02	<1.0E+02	<1.0E+02
Barium	3.7E+01	3.4E+01	2.7E+01	9.3E+01
Beryllium	<5.0E+00	<5.0E+00	<5.0E+00	<5.0E+00
Cadmium	<2.0E+00	<2.0E+99	<2.0E+00	<2.0E+00
Calcium	1.8E+04	1.8E+04	1.7E+04	1.9E+04
Chromium	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Copper	<1.0E+01	1.2E+02	<1.0E+01	9.9E+01
Iron	1.9E+02	2.2E+03	6.8E+01	6.1E+02
Lead	NR[b]	NR	<5.0E+00	<5.0E+00
Magnesium	4.0E+03	4.3E+03	3.9E+03	4.2E+03
Manganese	7.03+00	2.7E+01	<5.0E+00	1.1E+01
Mercury	<1.0E-01	HTE	<1.0E-01	<1.0E-01
Nickel	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Potassium	9.2E+02	8.0E+02	7.4E+02	9.4E+02
Silver	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Sodium	3.2E+04	5.6E+04	1.2E+04	NIC[c]
Strontium	<3.0E+02	<3.0E+02	<3.0E+02	<3.0E+02
Uranium	9.8E-01	8.1E-01	5.4E-01	2.3E+00
Vanadium	6.0E+00	<5.0E+00	<5.0E+00	1.4E+01
Zinc	1.0E+01	2.9E+01	6.0E+00	1.1E+01
Chloride	5.0E+03	6.0E+03	4.7E+03	3.7E+03
Cyanide	<1.0E+01	<1.0E+01	<1.0E+01	<1.0E+01
Fluoride	<5.0E+02	<5.0E+02	<5.0E+02	<5.0E+02
Nitrate	5.2E+02	<5.0E+02	1.0E+03	5.9E+02
Phosphate	<1.0E+03	<1.0E+03	<1.0E+03	7.8E+03
Sulfide	HTE[d]	1.2E+03	HTE	6.8E+03
Sulfate	2.8E+04	2.9E+04	1.6E+04	4.0E+04
Amount (L/month)	1.5E+07	1.5E+07	1.5E+07	1.5E+07
pH (dimensionless)	10.38	9.45	9.62	8.25
Temperature (celsius)	17.9	26.7	9.3	7.9
Alpha Activity (pCi/L)	3.0E+00	-9.6E-02	5.7E-01	<4.3E-01
Beta Activity (pCi/L)	6.5E-00	5.7E+00	5.9E+00	2.9E+00
Conductivity (μS/cm)	2.5E+01	1.7E+02	1.5E+092	1.9E+02
Total Organic Carbon	3.9E+03	2.5E+03	1.3E+03	2.4E+03
Total Organic Halide	3.5E-01	<4.3E+01	3.3E+01	<2.0E+01

(a) Unless otherwise noted, concentrations are in parts per billion.
(b) NR - data not reported.
(c) NIC - measurements made by methods that were not in control at the time of measurement.
(d) HTE - measurements made after the holding times were exceeded.

monitoring program presented in Chapter 3. The geology of the Columbia Plateau and particularly the Pasco Basin has been studied in detail for DOE as a part of the siting studies for a deep geologic repository for nuclear waste. The Consultation Draft, Site Characterization Plan (DOE 1988) summarizes much of the information known about the Hanford Site, especially near the 200-West Area, where the candidate repository site was located. Studies have also been done in support of nuclear power plant licensing efforts, including those for the Washington Public Power Supply System (Supply System 1981) and the Skagit/Hanford Project (PSPL 1982). More detailed information is available in the following reports:

- on the structural geology and tectonics - Caggiano and Duncan (1983); Reidel, Fecht, and Cross (1982); and Tolan (1986)
- on the basalt stratigraphy and chemistry - Swanson et al. (1979) and Reidel, Fecht, and Cross (1982)
- on the sedimentary units interfingered with and overlying the basalts - Bjornstad (1984, 1985); Fecht, Reidel, and Tallman (1985); Myers/Price et al. (1979); Myers and Price (1981); and Graham, Last, and Fecht (1984). Tallman et al. (1979) is the only in-depth study of the geology of the Separations Areas.

Regional Geologic Setting

The Hanford Site lies within the Columbia Plateau, which is generally characterized by a thick sequence of tholeiitic basalt flows called the Columbia River Basalt Group (Swanson et al. 1979). These flows have been folded and faulted, creating broad structural and topographic basins separated by asymmetric anticlinal ridges. The Hanford Site lies within one of these basins, the Pasco Basin (Figure 1.1).

Principal geologic layers within the Pasco Basin include, in ascending order, the Columbia River Basalt Group (Miocene), the Ringold Formation (Miocene-Pliocene), and the Hanford formation (Pleistocene). A regionally discontinuous veneer of recent alluvium, colluvium, and eolian sediments overlies the principal geologic units.

Geology of the Separations Areas

The surface topography in the vicinity of the Separations Areas is primarily the result of two geomorphic processes: 1) Pleistocene cataclysmic flooding, and 2) Holocene eolian activity. The last cataclysmic flood(s), which ended about 13,000 years ago (Mullineaux et al. 1978), covered the Separations Areas with a blanket of coarse-grained deposits, which become finer-grained to the south. An erosional channel runs east-southeast between Gable Mountain and Gable Butte (see Figure 1.1) and north of the 200-East Area. B Pond lies on the edge of this paleo flood channel. Since the end of the Pleistocene, winds have locally reworked the surface of the glaciofluvial sediments, depositing a thin veneer of eolian sand in places.

The Separations Areas lie within the Cold Creek syncline, which is bounded on the north by the Umtanum-Gable Mountain anticlinal structure and on the south by the Yakima Ridge anticlinal structure (Figure 2.2). In the Separations Areas, the top of the basalt generally dips gently (less than 5°) to the south-southwest, except in the southwest corner of the 200-West Area where the basalt is nearly horizontal along the axis of the Cold Creek syncline.

The generalized stratigraphy of the 200-West and 200-East Areas is shown in Figure 2.3. Overlying the Columbia River basalt is the fluvial-lacustrine Ringold Formation, consisting of variably mixed and interbedded layers of gravel, sand, silt, and clay. The thickness of the Ringold Formation ranges from 0 ft in the northern part of the 200-East Area to about 500 ft in the southwest portion of the 200-West Area (DOE 1988; Tallman et al. 1979) near the axis of the Cold Creek syncline.

The Ringold Formation is divided into four stratigraphic units: basal, lower, middle, and upper. The basal Ringold unit consists of silty sandy gravel overlain by fine-grained sand, silt, or clay. Overlying the basal Ringold is the lower Ringold unit consisting of silty coarse- to medium-grained sand, sandy silt, and clay (Tallman et al. 1979). Sediments of the lower Ringold unit are often indurated and have been recognized locally as a potential confining layer.

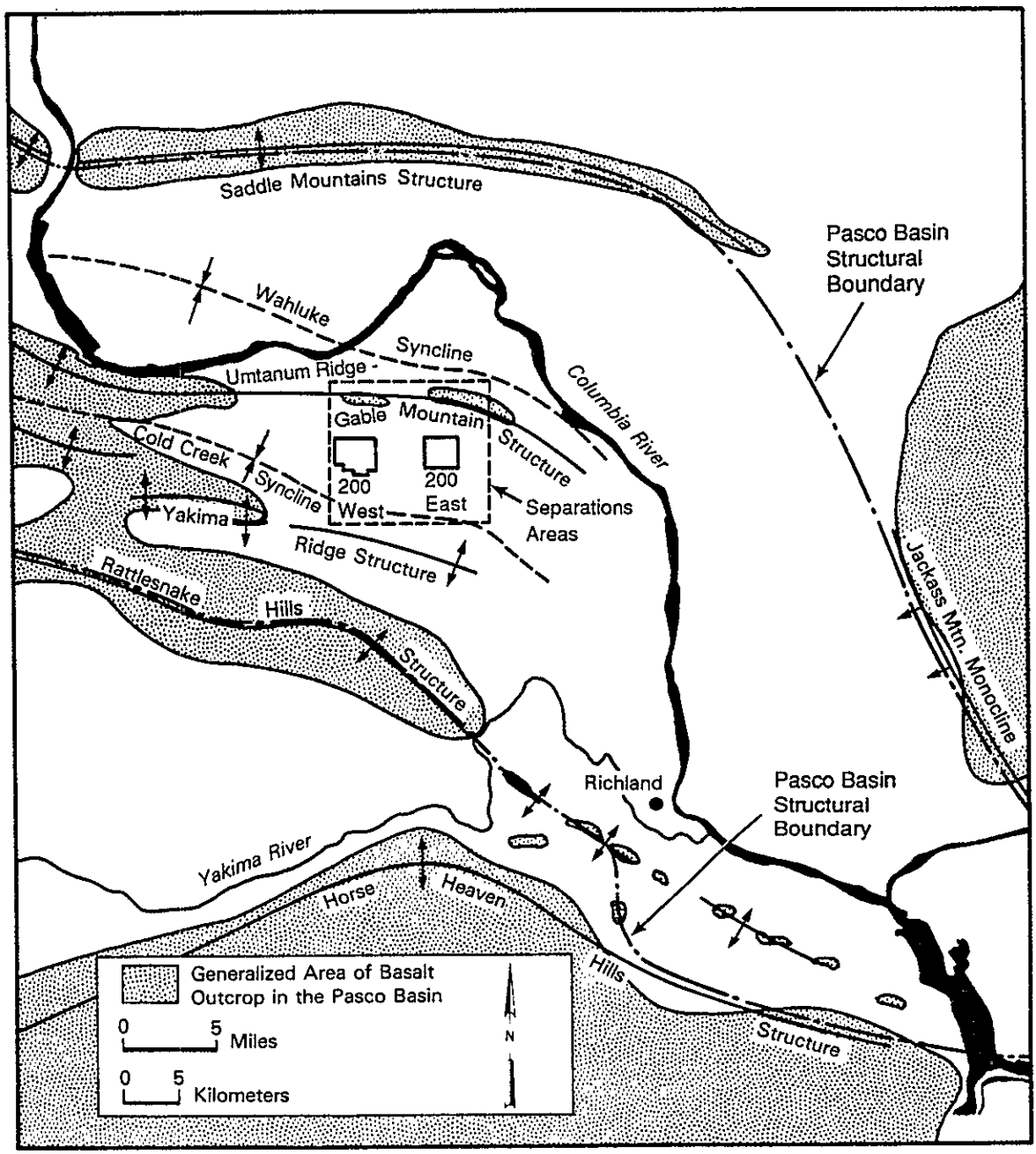


FIGURE 2.2. Structural Geology of the Pasco Basin

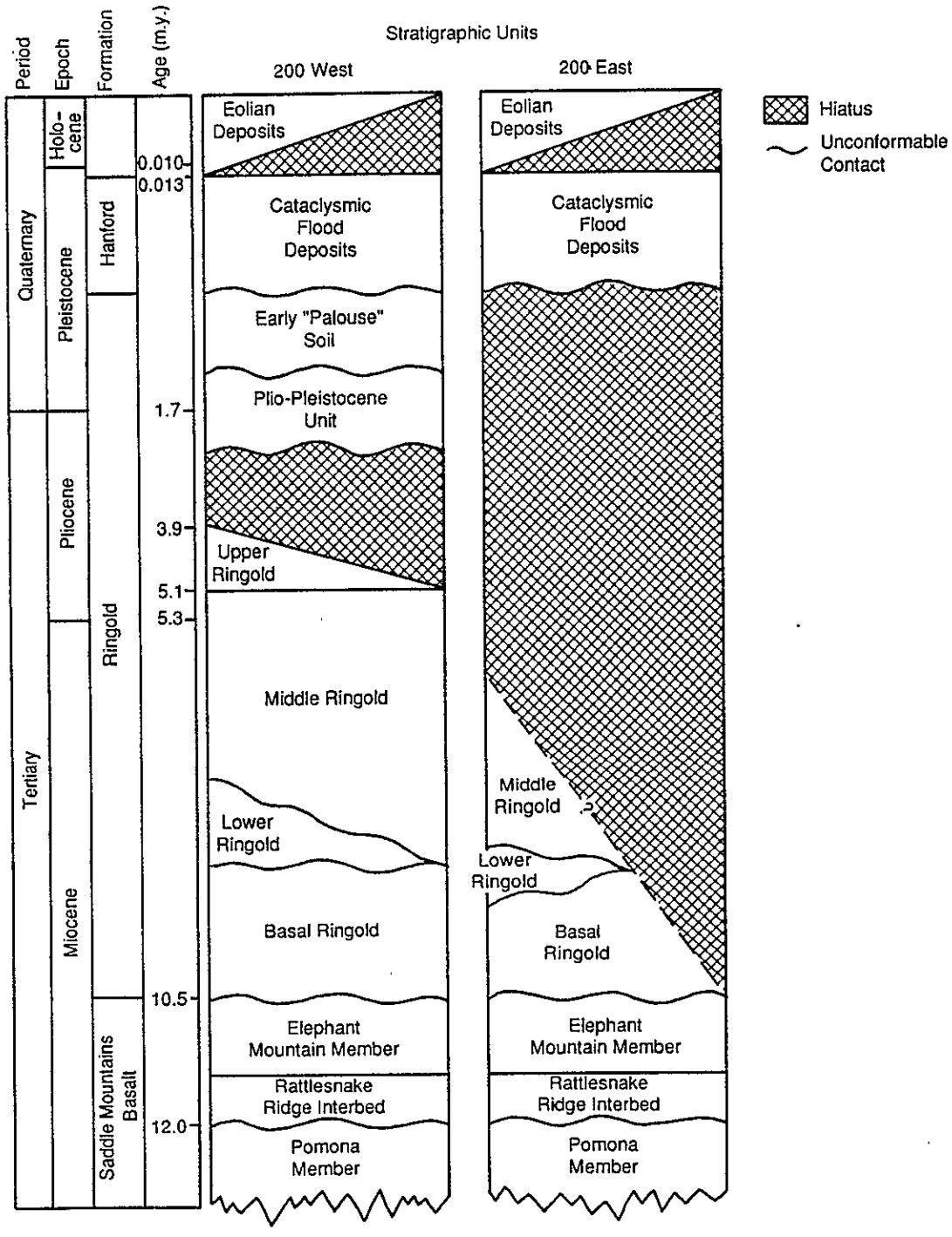


FIGURE 2.3. Generalized Geologic Column for the Separations Areas

The Ringold Formation is dominated by the middle unit throughout the Separations Areas. The predominant texture consists of well-rounded sandy gravel with some sand and silty sand lenses. The gravels typically range from pebble to cobble in size; however, boulders are locally common (Tallman et al. 1979). Because of their textures and the similarity of their gravel lithologies, the coarse-grained basal and middle Ringold units are difficult to distinguish unless separated by the fine-grained sediments of the upper basal Ringold or the lower Ringold unit. The uppermost unit, the upper Ringold, is another sequence of thinly bedded, well-sorted sands and/or silts, and silty clay (DOE 1988; Tallman et al. 1979).

Not all of the units of the Ringold Formation are present throughout the Separations Areas. Uplift along the trends of the anticlinal structural ridges and/or erosion by the ancestral Columbia River and later cataclysmic flooding during the Pleistocene Epoch have removed some or all of the Ringold Formation in areas (DOE 1988; Tallman et al. 1979). All four units are currently identified only in the western and southern portion of the 200-West Area, while little or no Ringold is present in the northeastern part of the 200-East Area (Tallman et al. 1979).

A well-developed calcrete belonging to the Plio-Pleistocene unit is found on the uppermost surface of the eroded Ringold sediments in the 200-West Area (Bjornstad 1984). In places, the Plio-Pleistocene unit is overlain by a few feet or less of early "Palouse" soil, an eolian deposit of fine-grained sand and silt. Both of these units are found only in the 200-West Area, having either been eroded or not deposited in the 200-East Area.

The cataclysmic flooding that helped erode the Ringold Formation also deposited a sequence of unconsolidated silts, sands, and gravels informally called the Hanford formation. At least four major flood events occurred in the Pasco Basin during the Pre-Wisconsin and Wisconsin cataclysmic flooding (Fecht, Reidel, and Tallman 1985). The fine-grained sands and silts, called the Touchet Beds, were deposited in protected areas, while the Pasco Gravels were deposited in and near the floodwater channels. Thickness of the formation ranges from approximately 70 ft in part of the 200-West Area to a

9 0 1 1 7 7 2 0 6 0 7

maximum of about 350 ft east of the 200-East Area (Tallman et al. 1979). Within much of the southern portion of the Separations Areas, the Hanford formation consists of predominantly sand.

The contact between the Hanford and Ringold formations is commonly a transition upward from more indurated deposits containing a variety of lithologies (Ringold Formation) to very weakly cemented or unconsolidated sediments with a high proportion of basaltic gravels (Hanford formation). The texture of the Pasco Gravels and the middle Ringold are similar, although the difference in gravel lithologies can sometimes be used to distinguish between the two. However, in some places, basalt-rich gravel layers have been found in the middle Ringold unit, and if the middle Ringold and Pasco Gravels are not separated by the upper Ringold or Plio-Pliestocene unit, they can be difficult to distinguish. This is particularly true where considerable reworking and incorporation of the Ringold sediments into the Hanford formation has occurred. Other methods (e.g., major and trace-element geochemistry and petrography) for defining the contact between the two formations are currently being evaluated. Further work, including this project, may also help determine the position of the contact more precisely.

Graham, Last, and Fecht (1984) indicate the possibility of complete erosion of the Elephant Mountain Member near the northeast corner of the 200-East Area, with partial erosion over a larger area. This may result in the Hanford formation directly overlying the Rattlesnake Ridge Interbed in the northeast part of the 200-East Area.

Site Geology

This section describes the site-specific stratigraphic characteristics beneath B Pond. Detailed information on the geology beneath B Pond is presented here, based on well log data collected by DOE contractors during previous drilling and well installations in the area. Drilling logs were reviewed for wells near B Pond (Figure 2.4 and Appendix A). The cross sections presented in Figures 2.5 and 2.6 illustrate the stratigraphy beneath the B Pond area.

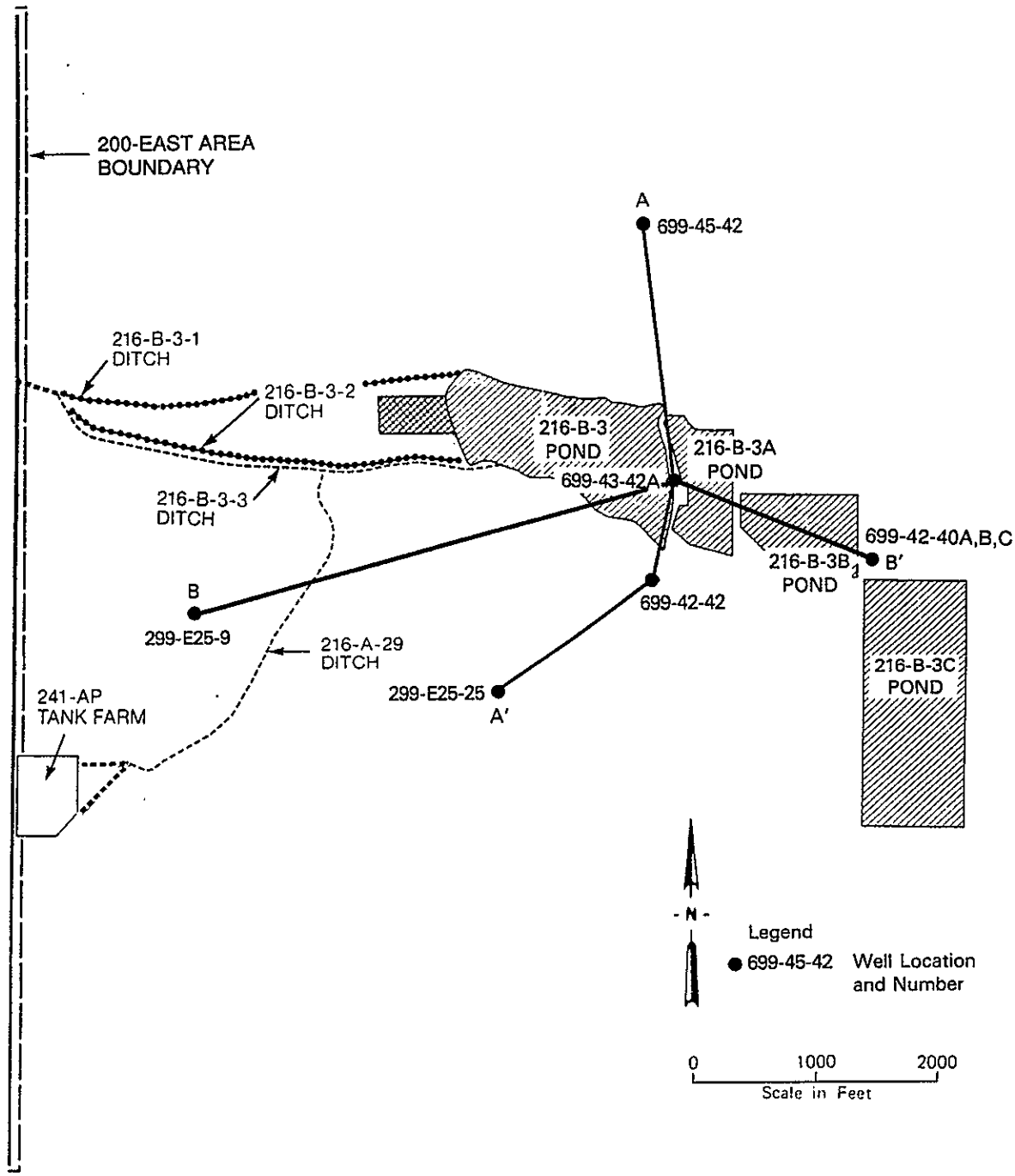


FIGURE 2.4. Map Showing the Location of Wells and Geologic Cross Sections Near the 216-B-3 Pond

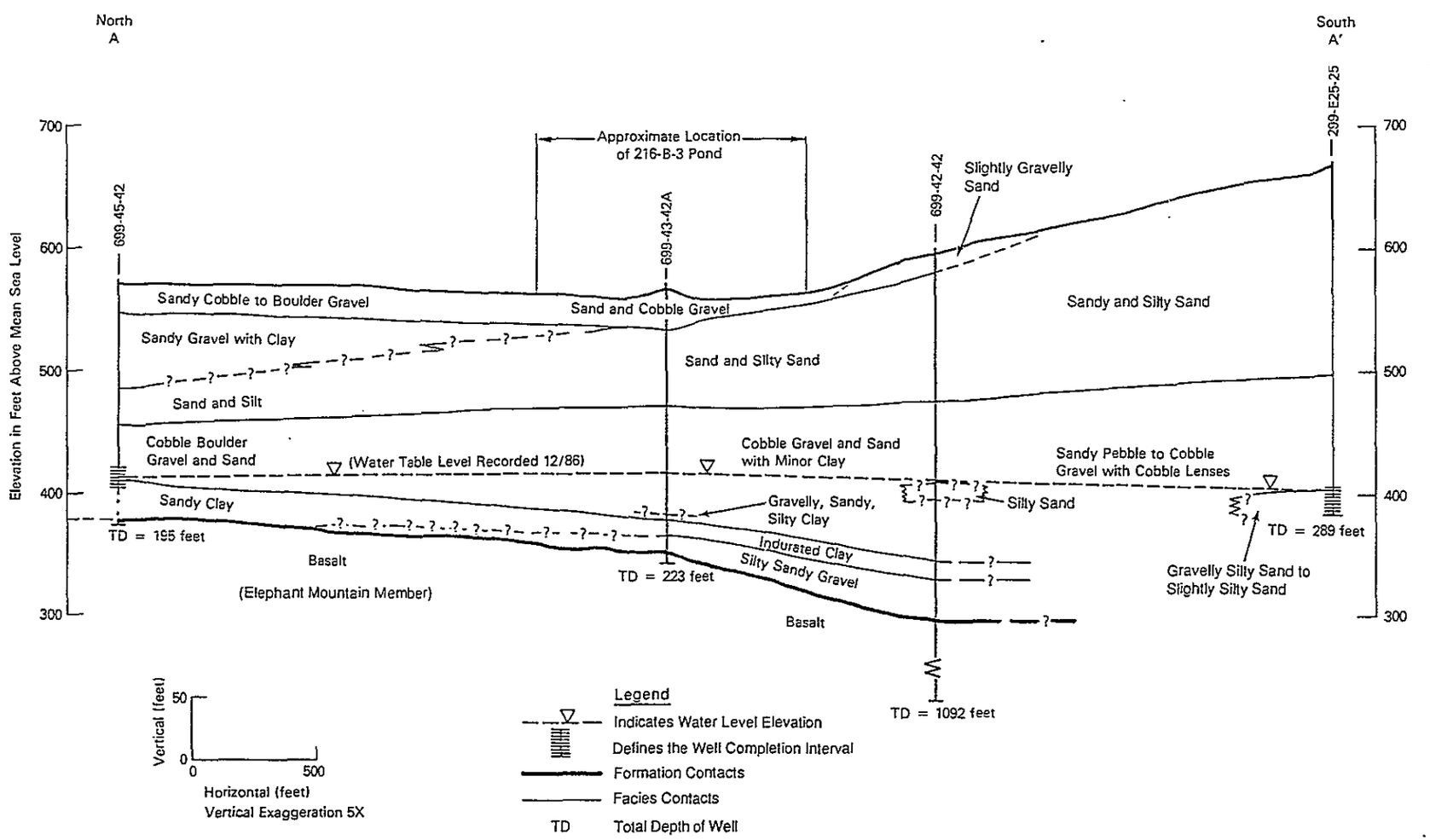


FIGURE 2.5. Cross Section A-A'

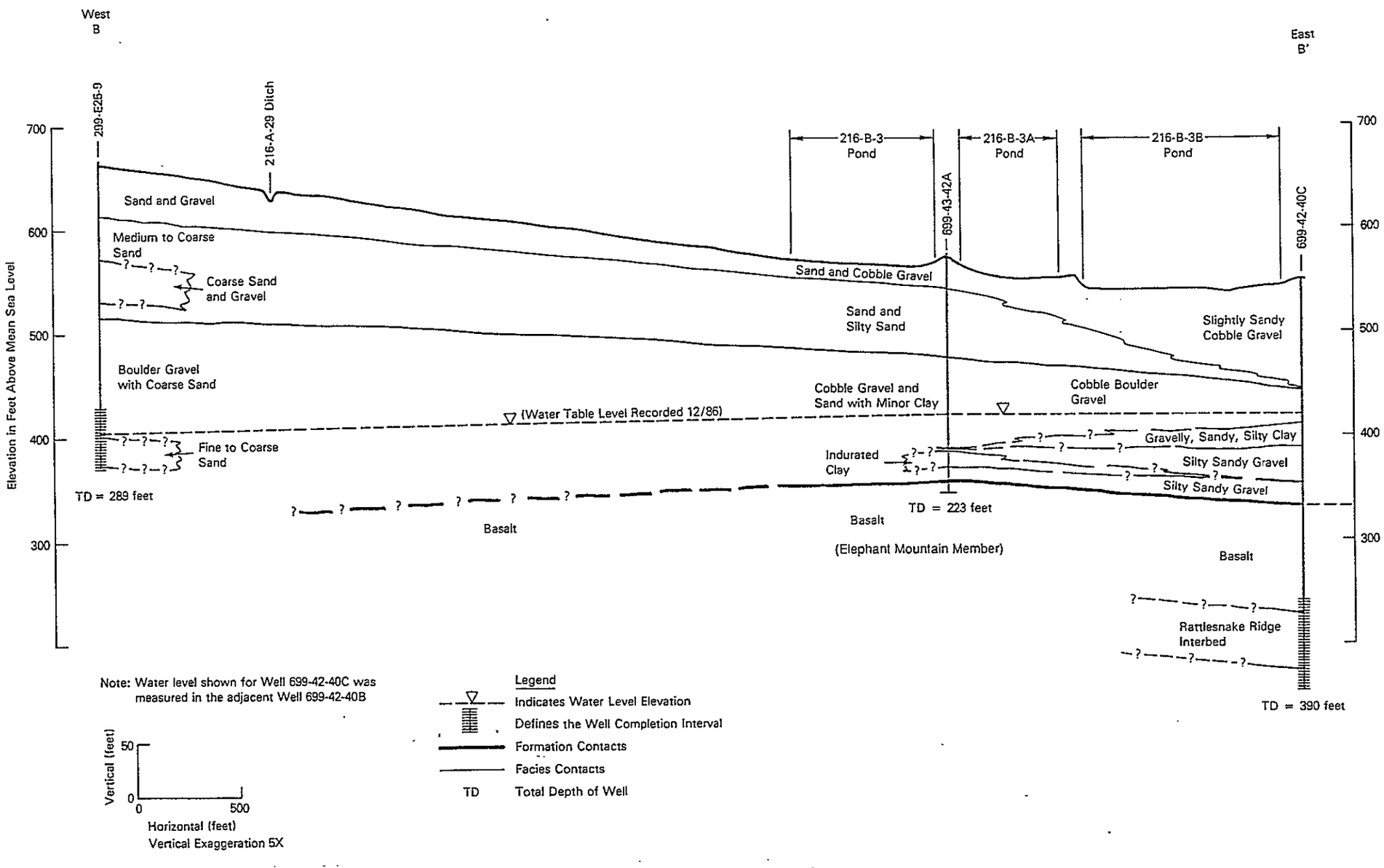


FIGURE 2.6. Cross Section B-B'

The depth to the Elephant Mountain Member basalt varies considerably in the vicinity of B Pond. The basalt generally dips to the south approximately 130 ft/mi based on Graham, Last, and Fecht (1984), but is probably modified by localized erosion caused by fluvial and cataclysmic flooding episodes. North of the pond in well 699-45-42, the basalt is 190 ft deep [elevation approximately 387 ft above mean sea level (MSL)], while immediately south of the pond in well 699-42-42, the basalt is approximately 295 ft deep (elevation approximately 308 ft above MSL) (Figures 2.5 and 2.6). In general, available well log information indicates that a basalt high or ridge flanks B Pond to the immediate north. The sediments overlying the basalt thin to the north in the direction of the basalt high. There is no evidence indicating that the Elephant Mountain Member has been removed by erosion beneath B Pond.

There is currently insufficient information available to determine the location of the contact between the Ringold and Hanford formations. Therefore, the following only discusses the general textural changes. In the area beneath B Pond, the surface of the Elephant Mountain Member basalt is covered with weathered basalt debris (e.g., in well 699-43-42, Appendix A) indicating exposure of the basalt surface before deposition of overlying sediments. Above the weathered basalt is a silty sandy gravel ranging in thickness from 10 to 30 ft beneath the pond and pinching out to the north (Figure 2.5). Overlying the silty sandy gravel is a silt- and/or clay-rich layer with varying amounts of sand and gravel. This layer may be laterally continuous beneath the pond, with thicknesses ranging from approximately 10 to 20 ft or more. Above the clay-rich layer is a sandy boulder-to-cobble gravel with relatively thin layers of sand or clay. This layer ranges in thickness from approximately 40 to 100 ft beneath the pond, and appears to thicken to the west and south (Figures 2.5 and 2.6).

Immediately above the cobble-to-boulder gravel is a sand to silty sand with a maximum thickness of approximately 70 ft beneath the pond. This layer thins to a thickness of approximately 5 ft or less to the east in well 699-42-40C. The overlying layer of sandy cobble gravel is though to be a channel-fill deposit associated with a cataclysmic flood channel in this area. The sandy cobble gravel thins to the north and west, and is not present southwest of the pond (Figures 2.5 and 2.6).

Near-surface sediments have generally been reworked by human activity or naturally eroded. Where undisturbed, the surficial sediments consist of eolian sands and silts in distinct contact with the underlying sediments.

HYDROGEOLOGY

This section provides background information on the hydrogeology of the Hanford Site. Detailed descriptions of the area's hydrogeology are available in reports by DOE (1988); Gephart et al. (1979); Graham, Fecht, and Brown (1981); Graham, Last, and Fecht (1984); and Law, Serkowski, and Schatz (1987), and in water-level data collected and reported semiannually (Schatz and Ammerman 1988).

Regional Setting

The Hanford Site has an arid climate and receives an average of 6.25 in. of precipitation per year. Some evapotranspiration measurements have been made at Hanford, but a detailed study has not been made near the Separations Areas. Wallace (1977) used Hanford Meteorology Station data to compute average potential evapotranspiration for the Hanford Site using three different methods: the Penman, Thornthwaite-Maither, and Morton methods. The potential evapotranspiration values calculated by Wallace were from five to nine times the mean annual precipitation. Calculations for monthly potential evapotranspiration compared with average monthly precipitation values from Stone (1983) indicate that precipitation may exceed evapotranspiration within the months of November through February.

Recharge rates range from near zero to more than 4 in./yr, depending on surface conditions (Gee 1987). Small recharge rates occur where fine-textured sediments and deep-rooted plants occur (e.g., much of the 200 Areas). The larger values are associated with areas having a coarse gravelly surface and no vegetative cover. The Hanford Site is drained by the Yakima and Columbia rivers (Figure 1.1).

Ground water beneath the Hanford Site occurs under both unconfined and confined conditions. The unconfined aquifer is contained primarily within the middle unit of the Ringold Formation and the Hanford formation. The base of the unconfined aquifer is the basalt surface of the Elephant Mountain

Member of the Columbia River Basalt Group, or, in some areas, the clay of the lower Ringold Formation (Figure 2.3). The confined aquifers beneath the Hanford Site include sedimentary interbeds and interflow zones that occur between dense basalt flows of the Columbia River Basalt Group.

The source of natural recharge to the unconfined aquifer and some of the confined aquifers is rainfall from areas of high relief west of the Hanford Site and ephemeral streams in the Cold Creek and Dry Creek valleys. Discharge from the unconfined aquifer is primarily to the Columbia River (Graham, Fecht, and Brown 1981).

Ground-Water Hydrology of the Separations Areas

As more characterization efforts are undertaken on the Hanford Site, the understanding of the geologic framework and its relation to the hydrogeologic system will continue to be developed and refined. This document does not attempt to integrate all that is known of the hydrogeologic system within the Separations Areas. Instead, this discussion is limited to the hydrologic properties of the uppermost portion of the unconfined aquifer contained in the Hanford and Ringold formations.

The unconfined aquifer receives artificial recharge from liquid waste disposal areas. This artificial recharge is estimated to be 10 times greater than natural recharge (Graham, Fecht, and Brown 1981). Graham et al. (1981) estimated natural recharge from the Cold Creek valley to the Separations Areas to be approximately 1.3×10^6 gal/d. The total volume of artificial recharge in the Separations Areas in 1987 was approximately 6.1×10^9 gal (Serkowski et al. 1988), or a rate of approximately 1.7×10^7 gal/d. The major sources of artificial recharge in the central Hanford Site have been three waste ponds designated U Pond, Gable Mountain Pond, and B Pond, all located near or in the Separations Areas. These areas of artificial recharge have had a major effect on the flow system of the unconfined aquifer. Both U Pond, which was located in the 200-West Area, and Gable Mountain Pond, which was located north of the 200-East Area, were deactivated within the past 4 years. B Pond is scheduled for decommissioning in the mid-1990s.

Ground-water elevation contours for December 1987 (Schatz and Ammerman 1988) for the unconfined aquifer in the Separations Areas are shown in

Figure 2.7. The regional flow direction in the Separations Areas is from west to east, but is affected by the two ground-water mounds that have resulted from discharges to U Pond and B Pond. Ground-water flow beneath the 200-West Area is generally toward the north and the east, away from the mound created by past discharges to U Pond. As this mound dissipates as a result of the discontinuance of discharges to U Pond, the hydraulic gradient will decrease and shift to the east. The hydraulic gradient in the 200-West Area is sufficiently high (a minimum of approximately 10^{-3} ft/ft) to determine flow directions with a large degree of certainty. Vertical hydraulic gradients are presumed to be present within the unconfined aquifer in portions of the 200-West Area as a result of the U Pond ground-water mound (Graham, Fecht, and Brown 1981).

Ground-water flow beneath the 200-East Area is complex because flow converges from the west and east and then diverges with a component flowing northward between Gable Butte and Gable Mountain and another component flowing southeast toward the Columbia River. In addition, the high transmissivity beneath most of the 200-East Area results in very small hydraulic gradients. In addition, flow directions may shift because of changing rates of waste water discharged into B Pond and other disposal sites. Therefore, it is often difficult to define flow directions at specific sites.

The principal geologic units (Figure 2.3) controlling the ground-water flow in the Separations Areas are, in ascending order, the Elephant Mountain Member, which acts as a confining layer in most areas; the Ringold Formation, which contains both confined and unconfined aquifer components; and the Hanford formation. Basalt of the Elephant Mountain Member is assumed to be the base of the unconfined or uppermost aquifer near the 200-East Area. However, two studies (Graham, Last, and Fecht 1984; Jensen 1987) present results indicating aquifer intercommunication between the unconfined aquifer and the Rattlesnake Ridge confined aquifer near the 200-East Area. The Elephant Mountain Member has possibly been eroded in or near the northeast corner of the 200-East Area, providing a means for aquifer intercommunication.

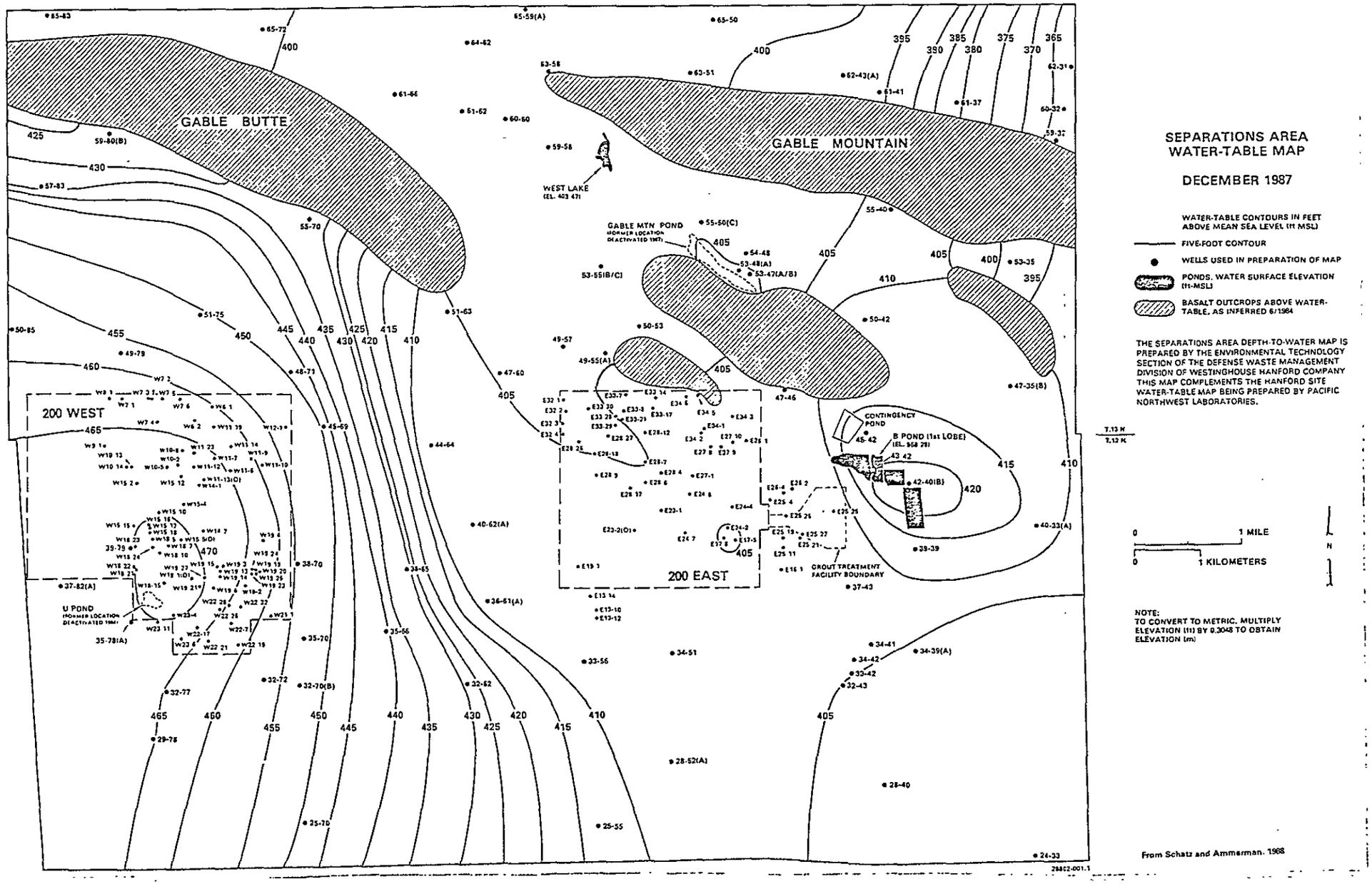


FIGURE 2.7. Water Table Map for the Separations Areas, December 1987

THIS PAGE INTENTIONALLY
LEFT BLANK

The depth to water of the unconfined aquifer within the Separations Areas ranges from approximately 19 ft beneath the former U Pond to approximately 340 ft west of the 200-East Area. The thickness of the unconfined aquifer ranges from zero feet at the north edge of the 200-East Area to more than 250 ft in the northwest part of the 200-West Area.

In general, the transmissivity tends to increase from west to east across the Separations Areas because a larger portion of the unconfined aquifer is contained within the more permeable Hanford formation.

The Ringold Formation exhibits a variety of hydrologic characteristics, including hydraulic conditions ranging from confined to unconfined. In some areas the lower Ringold unit is the base of the unconfined aquifer. In the southern portion of the 200-East Area and much of the 200-West Area, the basal Ringold unit is locally confined by the overlying lower Ringold unit (Graham, Last, and Fecht 1984). In other areas, the lower Ringold unit is missing, and the basal and middle Ringold units contain the unconfined aquifer. In the northeastern portion of the 200-East Area, the Ringold Formation is completely eroded. Here, the unconfined aquifer lies within the Hanford formation, which lies directly on top of basalt (Tallman et al. 1979). The lithologies in the unconfined aquifer exhibit widely varying hydrogeologic properties (Table 2.10). The values given in this table are generalizations; in some locations hydraulic properties lie outside the ranges given.

In the 200-West Area, the unconfined aquifer occurs within the middle Ringold unit, which is compacted and often partially cemented. Transmissivities range from 300 to 5400 ft^2/d. In the 200-East Area, the aquifer is in either the unconsolidated Hanford formation, the middle Ringold unit, or both, leading to a wide range of transmissivities from 5 to 135,000 ft^2/d (Graham, Fecht, and Brown 1981).

The measured storativity values for the unconfined aquifer range from 0.002 to 0.07 (Table 2.10); the lower values are associated with the lower Ringold Formation and the higher values with the Hanford formation (Graham, Fecht, and Brown 1981).

TABLE 2.10. Hydraulic Properties in the Separations Areas[a]

Interval Tested	Hydraulic Conductivity (ft/d)	Storativity	Porosity (%)
Hanford formation	2000-10,000	0.07	30
Middle Ringold Unit	9-230	NA[b]	NA
Lower Ringold Unit	1-12	0.002	10

(a) From Graham, Fecht, and Brown 1981.
(b) NA = not available.

The effective porosity of the sediments in the unconfined aquifer ranges from 10 to 30%. The lower value can be correlated with sediments of the lower Ringold unit, and the upper range approaches the total porosity of the sediments in the Hanford formation (Graham, Fecht, and Brown 1981). The water in the aquifer is principally of a calcium-bicarbonate type, but there is considerable variability in chemical composition among individual samples.

Discontinuous perched water tables occur in parts of the 200-West Area, often lying above a calcrete horizon in the Plio-Pleistocene unit or above markedly finer-grained sediments in the upper Ringold and Hanford formations. The lateral extent of these perched water tables has not been defined in detail, but is generally found only near sources of discharge of large quantities of water to the sediment column and where fine-grained sediments occur.

Hydrogeology Beneath B Pond

Information on the vadose zone and unconfined aquifer at the B Pond site is summarized below.

Vadose Zone Characteristics and Contamination

The geology of the site was discussed earlier. No information is available at this time on the presence or extent of contamination within the vadose zone at this site.

Unconfined (Uppermost) Aquifer

The unconfined aquifer contained within the sediments overlying the basalt is, for the purpose of planning for initial hydrogeologic characterization, considered to be the uppermost aquifer and is therefore of primary interest for ground-water monitoring. Data collected from existing wells near B Pond show that the upper portion of the unconfined aquifer beneath the pond is contained within an unconsolidated to slightly consolidated sandy gravel to silty sandy gravel (see Figures 2.5 and 2.6). The base of the aquifer may be the top of the clay-rich unit or possibly the top of basalt if the clay is not present throughout the area.

Based on existing well logs and water-level information, the water table in the immediate vicinity of B Pond is approximately 125 to 150 ft below ground surface. A ground-water mound exists under B Pond (see Figure 2.7). The thickness of the unconfined aquifer near B Pond ranges from approximately 30 ft to over 70 ft, based on logs of boreholes in the vicinity (see Figures 2.5 and 2.6).

The cross sections shown on Figures 2.5 and 2.6 indicate that the aquifer beneath B Pond is contained in sediments of the Ringold Formation; however, the Hanford formation may extend to below the depth of the water table. Therefore, the aquifer may include a wide range of values for the hydrogeologic properties beneath B Pond (see Table 2.10).

Historical ground-water quality data are available from three existing wells near B Pond (699-45-42, 699-42-40A, and 699-42-40B shown in Figure 2.4). Few historical ground-water quality data are available from a fourth well (699-43-42A). These wells were not specifically designed under RCRA requirements. Two other wells, 299-E32-4 and 299-E18-1, were constructed in 1987 and 1988, respectively, according to RCRA requirements. The locations of these wells are shown on Figure 3.1. The status of these wells is summarized in Table 2.11.

The ground water in wells 699-42-40A, 699-42-40B, and 699-45-42 has been sampled regularly for radionuclides. In addition, wells 699-42-40A and 699-45-42 have been sampled at least once for hazardous waste constituents.

TABLE 2.11. Status of Existing Wells in the Vicinity of B Pond (and Other Wells Planned for the Detection-Level Monitoring System)

Well Number (Date Completed)	Approximate Distance from Regulated Unit	Well Status
699-45-42 (6/48)	1650 ft north	Constructed of 8-in. carbon steel casing perforated from 158 to 180 ft below land surface
699-43-42A (2/66)	On berm between B-3 and B-3A Ponds	Constructed of 8-in. carbon steel casing. Open hole from 154 to 223 ft below land surface
699-42-40A (7/81)	80 to 100 ft east of B-3B Pond	Constructed of 8-in. carbon steel casing with 32 ft of stainless steel screen open from 139 to 171 ft below land surface
699-42-40B (9/81)	80 to 100 ft east of B-3B Pond	Constructed of 8-in. carbon steel casing with 20 ft of stainless steel screen open from 130 to 150 ft below land surface
299-E18-1 (7/88)	Approximately 2.25 mi west-southwest of B Pond	Constructed of 4-in. stainless steel casing with 20 ft of stainless steel screen open from 310 to 330 ft below land surface
299-E32-4 (9/87)	Approximately 2.75 mi west of B Pond	Constructed of 4-in. stainless steel casing with 20 ft of stainless steel screen open from 278 to 298 ft below land surface

Wells 299-E18-1 and 299-E32-4 have also been sampled at least once for several hazardous waste constituents and RCRA interim-status parameters. Results of the analyses for these samples are given in Appendix B. In addition to the wells in Table 2.11, water levels are measured in many other wells on a regular basis and provide a data base to estimate the depth to ground water and direction of ground-water flow on the Hanford Site (e.g., Schatz and Ammerman 1988).

3.0 PHASE I--GROUND-WATER MONITORING PROGRAM

This plan has been developed in accordance with RCRA as described in 40 CFR 265, Subpart F, to establish an interim-status ground-water monitoring program for B Pond, and, if necessary, to initiate a ground-water quality assessment program.

OBJECTIVES

The objectives of the drilling and ground-water monitoring program for B Pond are to:

- characterize the stratigraphy and the horizontal and vertical ground-water flow directions beneath B Pond. The focus will be on the uppermost unconfined aquifer.
- determine if any statistically significant amounts of hazardous waste constituents that originate from B Pond are detectable in the ground water.

APPROACH

Ten downgradient ground-water monitoring wells were initially planned for installation around the perimeter of B Pond (Figure 3.1). Four wells [BP-3 (699-44-42), BP-7 (699-43-42J), BP-8 (699-43-43), and BP-10 (699-42-42B)] were installed in 1988 (see Appendix A), and the six remaining wells will be installed in 1989. Wells BP-1 through BP-8 will be completed within the uppermost unconfined aquifer essentially at the water table, approximately 145 to 195 ft below ground surface. These wells will provide information on the stratigraphy and quality of ground water from the upper portion of the unconfined aquifer. At two locations (wells BP-9 and BP-10), deep wells will be installed at or near the presumed base of the unconfined aquifer. (Well BP-10 was drilled to approximately 250 ft and the screened interval was set between approximately 193 and 203 ft.) These wells will provide information to help characterize the hydrogeology at depth (including determining the base of the uppermost aquifer), assess the three-dimensional hydraulic head distribution, and determine the quality of ground water near

9 0 1 1 7 7 2 0 6 2 1

THIS PAGE INTENTIONALLY
LEFT BLANK

9 0 1 1 7 7 2 0 5 2 2

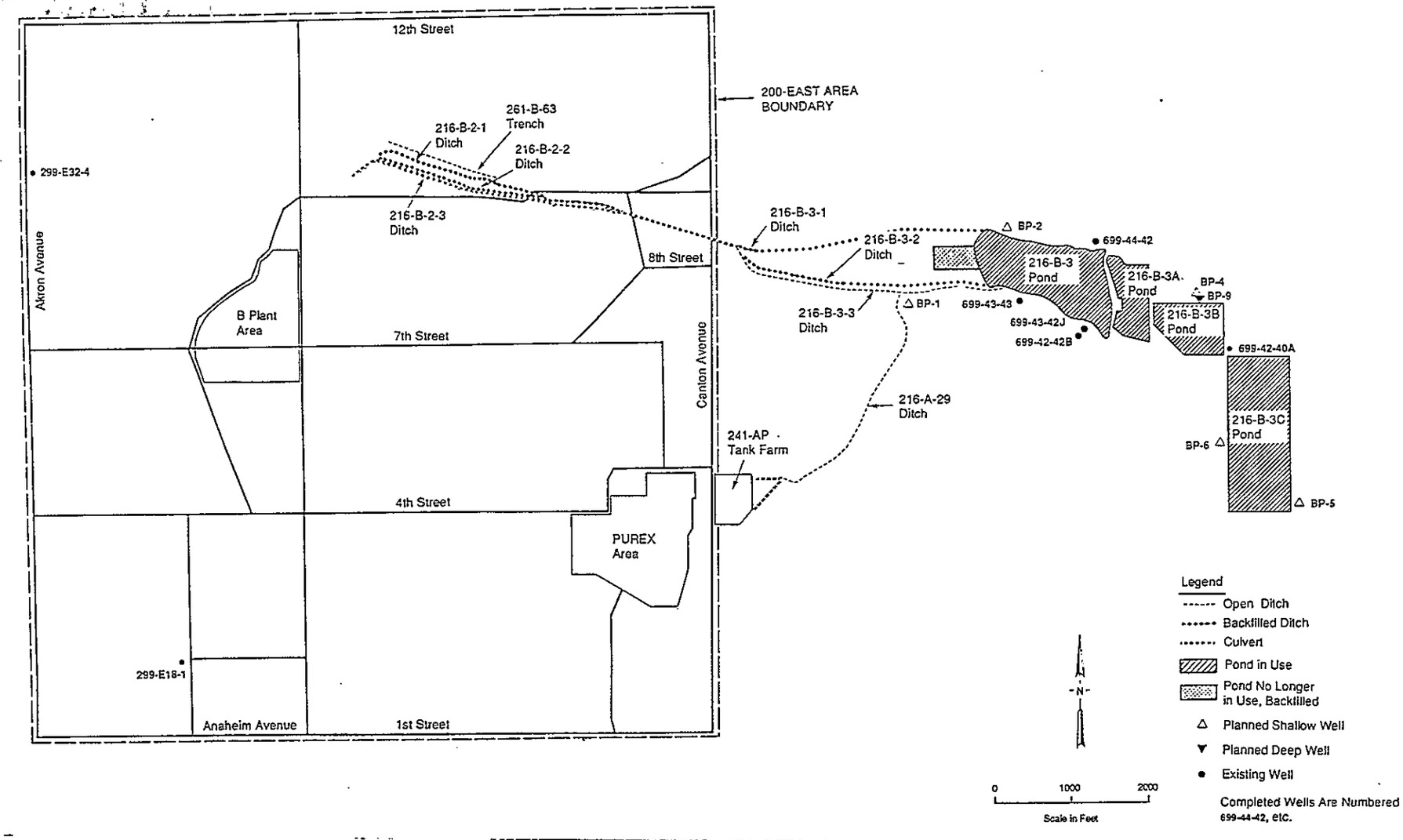


FIGURE 3.1. Map Showing the Locations of Existing and Planned Monitoring Wells at 216-B-3 Pond

THIS PAGE INTENTIONALLY
LEFT BLANK

the base of the unconfined aquifer. One existing well is also planned to be used as a downgradient monitoring point. Two existing wells are planned for use as background wells.

Subsurface soil samples will be obtained during drilling at each location. These samples will be classified in the field for later identification of stratigraphy, and selected samples will be submitted to the laboratory for analyses to determine various physical and chemical parameters. Ground-water samples will be collected on reaching the water table in accordance with the requirements of an Effluent Monitoring Plan. These samples will be analyzed for contamination indicator parameters (noted later in this section) before aquifer testing. If contamination is not detected above established guidelines, aquifer tests will be conducted to provide estimates of transmissivity and hydraulic conductivity of materials beneath the site.

Water samples will be collected and analyzed quarterly from all new and selected existing monitoring wells at B Pond. The first set of samples was collected following installation and development of the last well installed in 1988, allowing sufficient time for the wells to stabilize. Statistical evaluation of the first year of sample analyses (and thereafter) will provide an indication whether hazardous constituents from B Pond are significantly affecting the ground water.

GROUND-WATER MONITORING SYSTEM

This section defines the aquifer that will be monitored, the location and justification of the monitoring wells, how the new wells will be installed, the frequency of sampling and ground-water constituents to be analyzed.

Uppermost Aquifer

The uppermost aquifer beneath B Pond is presumed to be contained within the Ringold and/or Hanford formations. The uppermost aquifer extends from the water table to the top of basalt or to the top of the clay-rich unit. The uppermost aquifer is discussed in more detail in Section 2.0. Hydrogeologic characterization activities are designed and planned to obtain information on hydraulic and flow characteristics of the uppermost aquifer.

Existing water level data from wells completed in the unconfined aquifer indicate that a ground-water mound is present beneath B Pond (see Figure 2.7).

Background Wells

Two existing wells, 299-E18-1 and 299-E32-4, are planned to be used to determine the background water chemistry. Well 299-E18-1 is located approximately 2.25 miles west-southwest of B Pond (see Figure 3.1). Well 299-E32-4 is located approximately 2.75 miles west of B Pond (see Figure 3.1).

Detection (Downgradient) Wells

Ten new wells are planned at eight locations surrounding B Pond (Figure 3.1). Eight of these wells (BP-1 through BP-8) will monitor approximately the upper 15 to 18 ft of the uppermost aquifer and two of them (BP-9 and BP-10) will monitor a 10-ft interval at the base of the unconfined aquifer. The wells will be located approximately 100 to 200 ft from the edge of the pond. An existing well (699-42-40A) is also planned to be used (Figure 3.1).

Use of Existing Wells

One of the existing background wells, 299-E18-1, was constructed in 1988 to provide a ground-water monitoring well for the 2101-M Pond; it is constructed of 4-in. stainless steel screen and casing. Well 299-E18-1 is designed and constructed similar to the shallow wells planned to be installed around B Pond, as described in this plan. The other existing background well, 299-E32-4, was constructed in 1987 to provide a monitoring well for the Low Level Burial Grounds, Waste Management Area 1. This well is also constructed similar to the shallow wells planned to be installed at B Pond. The existing downgradient well 699-42-40A is constructed of 8-in. carbon steel casing with 20-slot stainless steel screen. Appendix A gives as-built diagrams for all these wells.

Justification

Because of the ground-water mound beneath B Pond, every location surrounding the facility is hydrologically "downgradient." According to 40 CFR 265.91(a), a well network designed for detection-level ground-water

monitoring must consist of at least one upgradient and at least three downgradient monitoring wells. In the case of B Pond, there is no upgradient location in the immediate vicinity; therefore, regionally upgradient locations must be chosen for background monitoring wells.

Certain hydrogeologic situations, such as ground-water mounds, require further site-specific examination to properly position background wells (EPA 1986). According to 40 CFR 265.91(a)(1), the background wells must be able to produce samples that are 1) representative of the background quality in the uppermost aquifer near the facility, and 2) not affected by the facility. On the basis of this guideline and analysis of the ground-water flow system, the two existing wells (299-E32-4 and 299-E18-1) were chosen to establish the background water chemistry for the 216-B-3 Pond.

A well or wells cannot be located in an area representative of true "background" ground-water chemistry that is minimally affected by Hanford waste management operations. Many different sources, and thus ground-water chemistry conditions, exist outside the influence of B Pond. Two wells were therefore selected to account for spatial variability in ground-water chemistry.

Wells 299-E18-1 and 299-E32-4 were chosen as upgradient wells for the following reasons. The wells are completed in the uppermost portion of the unconfined aquifer. They 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 ground-water mound beneath B Pond were not present. The wells are located as near B Pond as possible yet outside of the influence of the B Pond mound, as indicated by regional contaminant plume maps (Law, Serkowski, and Schatz 1987) and the Separations Areas water table map (see Figure 2.7). Further, they were recently constructed according to RCRA requirements and guidelines. Ground-water chemistry data for samples collected from wells 299-E18-1 and 299-E32-4 are given in Appendix B.

Well 699-42-40A is constructed with carbon steel casing and 20-slot stainless steel screen. The well may be suitable for monitoring B Pond. The well will be evaluated for its usefulness according to the criteria in

the section below. Ground-water chemistry data for samples collected from well 699-42-40A are given in Appendix B.

Well 699-43-42 has an open hole from approximately 10 ft below the water table into approximately the upper 15 ft of the basalt. This well will be remediated to provide a monitoring point at a selected interval, or it will be abandoned. The decision will be based on geologic and hydrochemical information obtained from the new wells that are planned and also will be based on the current borehole conditions.

Evaluation Plan

Well 699-42-40A will be evaluated for its use in three general ways, as listed below:

- geologic and drilling log evaluation - The log will be evaluated for construction details. If it is determined that there may be a problem with the construction (i.e., poor annular seal, severe problems during drilling or construction), the well will either be remediated (if possible) or will not be used.
- visual inspection - The well will be inspected at the surface for casing and concrete pad integrity. The well will also be inspected by downhole camera. If problems with incrustation or integrity are obvious, the well will either be remediated (if possible) or will not be used.
- evaluation of water-chemistry data - Water-chemistry data collected from the well will be evaluated on an ongoing basis. If the data indicate unusual trends or irregularities, the well will be re-evaluated for possible remediation or removal from use.

Installation of New Characterization/Monitoring Wells

Construction of six additional downgradient monitoring wells is planned at five locations surrounding B Pond. The wells will consist of both shallow and deep completion intervals at the locations shown in Figure 3.1. One shallow well will be installed at each location. The boreholes for the five shallow wells will generally extend to approximately 15 ft below the water table. The purpose of these wells is to 1) provide downgradient ground-water

9 0 1 1 7 7 2 0 6 2 7

quality information from the upper portion of the unconfined aquifer, 2) provide the means to evaluate the hydraulic properties of the aquifer, 3) provide information needed to define the subsurface stratigraphy beneath the site, and 4) provide samples to determine the moisture content of the unsaturated zone.

One borehole will be advanced to the top of the basalt bedrock or a confining layer and completed at the base of the unconfined aquifer. The purpose of this well is to 1) aid in determination of vertical hydraulic gradients, 2) provide ground-water quality information from the base of the unconfined aquifer, 3) evaluate hydraulic properties near the base of the unconfined aquifer, and 4) provide information to define the subsurface stratigraphy to determine the bottom of the unconfined aquifer.

Justification for Locations

Five of the shallow ground-water monitoring wells, which include the three installed in 1988, will be installed around the original 216-B-3 Pond and the 216-B-3-3 Ditch up to its confluence with the 216-A-29 Ditch because this area has a greater likelihood for contamination since all of the waste water passes through it (Figure 3.1). The wells will be installed at a distance of approximately 50 to 200 ft from the edge of the pond or the 216-B-3-3 Ditch. This distance was chosen 1) because potential contaminants are expected to spread laterally in the vadose zone before they reach the water table causing contaminants to bypass monitoring wells located very close to the pond, 2) to keep drilling activities outside of zoned decommissioned radiation areas adjacent to the pond, and 3) to lessen the potential of encountering perched water table conditions, which may inadvertently provide a mechanism, via the annulus, for the perched water to move down to the water table.

One shallow downgradient well will be installed on the north side of the B-3B section of the pond, and one shallow downgradient well will be installed on each the east and west sides of the B-3C section of the pond (Figure 3.1).

One deep downgradient well was installed on the southeast side of the 216-B-3 Pond. The one to be installed in 1989 will be installed north of the 216-B-3B Pond (Figure 3.1). These two wells will provide initial deep

ground-water monitoring points in the central area of the B Pond system, where vertical gradients are expected to be greatest and potential contaminants are most likely to be driven downward to the deeper part of the unconfined aquifer.

Drilling and Well Installation

Wells BP-3, BP-7, BP-8, and BP-10 were installed in 1988, using the cable-tool drilling method. These wells are all located around the 216-B-3 Pond, where there is presumed to be a greater likelihood of contamination. Installing these wells provided one deep monitoring well (BP-10) early on to help evaluate the vertical extent of potential contamination, determine the vertical head distribution, determine the stratigraphy vertically throughout the unconfined aquifer, and obtain hydrologic information deep in the unconfined aquifer. The remaining six wells will be installed in 1989.

Cable-tool drilling is desirable because 1) drill cuttings are easily contained (important in contaminated material), 2) representative geologic samples can be collected (from drive-barrel drilling), 3) moisture samples can be collected from above the water table with drive-barrel techniques, 4) disturbance to the borehole wall is minimized, and 5) a straight and plumb borehole is produced.

Drill cuttings will be routinely monitored for radiation and hazardous material. Contaminated cuttings will be handled, transported, and disposed of according to Westinghouse Hanford Company procedures.

Temporary carbon steel casing will be driven to total depth as each borehole is advanced. On reaching the water table, ground-water samples will be collected and contamination indicator parameters will be analyzed for on a rapid turnaround (usually within 24 h). The constituents to be analyzed will be specified in an Effluent Monitoring Plan. In addition, manganese, chromium, nickel, and iron may be analyzed to determine baseline chemistry conditions for these constituents before beginning well-completion activities.

If concentrations of contamination indicator parameters exceed the limits stated in the Effluent Monitoring Plan, which will be written before

9 0 1 1 7 2 0 6 2 9

hydrologic testing or well development begins, these activities will not be conducted until proper treatment and/or disposal of pumped water is available. If concentrations of these constituents are below the limits stated in the Effluent Monitoring Plan, a telescoping well screen will be emplaced and aquifer testing will be conducted. At the completion of aquifer testing, the final well casing and screen will be installed and the temporary steel casing will be removed as the filter pack and annular seal materials are emplaced. The minimum nominal diameter of the temporary casing at the bottom of the well will be 8 in.

To help prevent introduction of contaminants into the borehole, the drill rigs and peripheral equipment (such as drill tools, cables, and temporary casing) will be steam-cleaned before arriving onsite and between wells. During drilling in the zone to be sampled, the addition of water to the borehole will be kept to a minimum or avoided to minimize subsequent development pumping required to meet hydrochemical development criteria.

Well Construction

A schematic diagram of completed shallow and deep wells is presented in Figure 3.2. Procedures concerning geologic sampling and inspection of well construction are given in Last and Liikala (1987). The design criteria and specifications for the wells are provided in well construction specifications prepared by Westinghouse Hanford Company. The WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," was also used for guidance for designing the wells.

Final wells will be constructed of 4-in.-inside-diameter, 304 stainless steel casing, and continuous-slot well screen. Final well screen lengths will be 20 ft for the shallow wells and 10 ft for the deep wells. In the shallow wells, the screened interval will generally extend from approximately 15 ft below the water table to 5 ft above it. This interval will allow for possible future fluctuations of the water table from variations in discharges to B Pond. It will also permit sampling of the upper portion of the aquifer and allow detection of any immiscible constituents that might be floating on the water table. In the deep wells, the bottom of the screened interval will be placed as near as possible to the contact between either the basalt

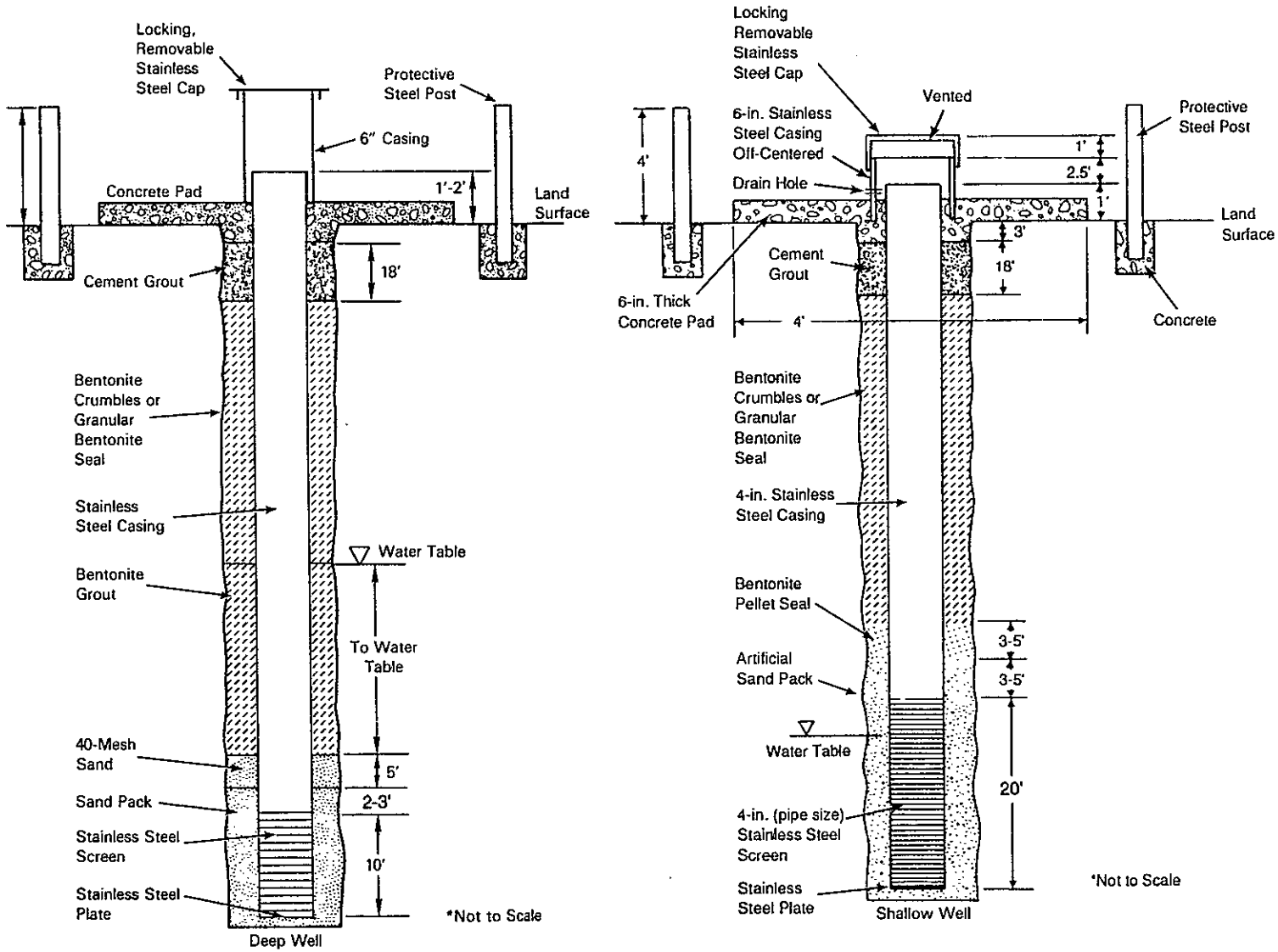


FIGURE 3.2. Schematic Diagrams of a Monitoring Well

bedrock or the confining clay unit in the unconfined aquifer. This will target detection of constituents near the bottom of the unconfined aquifer. The screen length will be limited to 10 ft to minimize excessive dilution of the samples.

Screen slot sizes are pre-selected to avoid delays that may be caused by determining correct slot sizes, ordering, and shipping the screens. (A 10-slot screen is anticipated for the wells at B Pond.) The onsite geologist will determine the filter pack size and screen slot size based on field sediment analyses and guidelines outlined in Last and Liikala (1987). Sand filter packs will be placed in the annulus between the 8-in. telescoping screen or the temporary (8-in.) casing and the permanent (4-in.) casing and screen as the temporary casing is withdrawn. If a telescoping screen is used during shallow well aquifer tests, it will be left in the hole. The sand filter pack will be placed from total well depth to 3 to 5 ft above the top of the screen.

A 2- to 3-ft-thick bentonite pellet seal will be placed on top of the sand pack for shallow wells. Five feet of 40-mesh sand will be placed on top of the sand pack for deep wells. In the shallow wells, the annulus between the bentonite pellet seal and 18 ft below ground surface will be filled with bentonite. In the deep wells, the annulus between the 40-mesh sand and the water table will be filled with bentonite grout or slurry. The annulus between the water table and 18 ft below ground surface will be filled with bentonite. Cement grout will then be installed to within 2 ft of the ground surface. The well casing will extend 1 to 2 ft above ground surface and will be protected by an outer steel casing and a locking cap. The casing will be set into the ground and cemented in place with a 4-ft by 4-ft concrete well pad. All protective casings will be permanently marked with well identification numbers.

Well Development

All wells will be developed following completion. Wells will be developed by the surge-and-bail technique, overpumping, or any other techniques deemed necessary until turbidity is less than 5 NTU and sediment content is less than 8 mg/L. If the water cannot be developed to a turbidity of less

than 5 NTU, an explanation will be documented by a qualified hydrogeologist. Other hydrochemical indicators, such as total iron and drilling fluid tracers, may be monitored to assess the adequacy of development pumping for trace constituent sampling. Water will be pumped from the well only after the requirements of the Effluent Monitoring Plan have been met.

Surveying

After monitoring well installation is completed, all wells will be surveyed for location and elevation by qualified surveyors. The elevation of the top of the stainless steel casing and a brass marker in the concrete pad will be determined within 0.04 ft. A mark will be placed on the casing to indicate the location that was surveyed. The areal location will be determined to the nearest 0.5 ft. All measurements will be referenced to a common datum (preferably a Hanford Site datum). The survey results will be reviewed by a licensed surveyor.

Monitoring Parameters

Ground-water samples will be analyzed for the parameters listed in Table 3.1, as required by 40 CFR 265.92, for volatile organic constituents by method #8240 (EPA 1986), for hydrazine, and for ammonia. These constituents will be analyzed quarterly for 1 year from the wells previously indicated. Samples will also be analyzed for tritium. Other radioactive constituents may be analyzed on an ad hoc basis.

HYDROGEOLOGIC CHARACTERIZATION

Hydrogeologic characterization will be conducted to describe the geologic and hydrogeologic conditions and properties that control contaminant flow paths. Data collection and interpretation will focus on geology, geochemistry, hydrogeology, hydrochemistry, ground-water monitoring, and ground-water modeling. Work performed by Pacific Northwest Laboratory will follow a Quality Assurance Project Plan meeting EPA requirements of QAMS 005/80 (Stanley and Verner 1983). The characterization effort will be performed during and after construction of the planned ground-water monitoring network. An outline of the work to be performed is included below. Information obtained from the existing wells and wells drilled at B Pond will also be

9 0 1 1 7 7 2 0 6 3 3

TABLE 3.1. Ground-Water Sampling Parameters,[a] Maximum Level

Interim Primary Drinking Water Standards	Maximum Level[b]
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Fluoride	1.4 to 2.4
Lead	0.05
Mercury	0.002
Nitrate (as NO_3^-)	45
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 (pCi/L)
Gross Alpha	15 (pCi/L)
Gross Beta	4 (mrem/yr)
Turbidity (surface water only)	1 (TU)
Coliform bacteria	1/100 (mL)
Ground-Water Quality Parameters	
Chloride	
Iron	
Manganese	
Phenols	
Sodium	
Sulfate	
Ground-Water Contamination Indicator Parameters	
pH	
Specific conductance	
Total organic carbon	
Total organic halogen	

(a) Regulatory requirements for sampling parameters are subject to change because of federal regulations.
(b) Unless otherwise noted, concentrations are in mg/L.

integrated into the characterization and interpretation effort. The characterization effort is an iterative discovery process, and data collection in these areas may expand or decrease depending on the information

obtained. Data collected from the four wells installed near B Pond in 1988 are currently being or will soon be processed and will be evaluated in the future.

Personnel conducting sampling, testing, and other activities at the site must meet Occupational Safety and Health Administration (OSHA) medical, monitoring, and training requirements in accordance with 29 CFR 1910.120.

Geologic Characterization

The following activities will be conducted in support of geologic characterization.

Geologic Sampling

Geologic samples will be collected at 5-ft intervals or at changes in lithology during drilling. Samples will be collected with a drive barrel in the unsaturated sediments whenever possible. If hard-tool drilling is necessary, a bailer will be used to collect the sediment samples. No drilling water or other material will be added to the borehole during drive-barrel drilling unless necessary and approved by the well-site geologist so that perched water zones can be detected, representative moisture samples can be taken, and water chemistry will not be affected. Samples will be collected for moisture content determinations in the unsaturated sediments at 5-ft intervals and at moist or wet zones.

The samples collected will be described as hand specimens in the field and documented on geologic field forms. Samples will be archived for possible future analyses. A guide to subsurface data collection and documentation during cable-tool drilling is presented in Last and Liikala (1987).

Sample Analyses

Laboratory analyses of sediment samples will include, but are not restricted to 1) sieve analysis, 2) moisture content, 3) calcium carbonate content, 4) saturated hydraulic conductivity, 5) water retention, 6) petrographic description and/or x-ray diffraction analysis of mineral content, 7) hydrometer analyses of silt/clay zones, and 8) chemical analyses of contamination indicator parameters. The first three analyses will be run on selected samples in the vadose zone, and sieve analysis may be run on some

of the samples from the saturated zone as well. At least one representative sample will be collected for the last three analyses from each major stratigraphic unit encountered during drilling. X-ray diffraction analysis may be run on samples to determine clay mineralogy. Sediment samples will be collected at approximately 20-ft intervals from every borehole for analyses of total organic carbon, anions (nitrate), alpha, and total beta. If perched water or zones suspected of containing contamination are encountered during drilling, sediment samples and, if possible, water samples will be taken for analysis of these constituents. These analyses will be performed by U.S. Testing Company, Inc. (UST).

Borehole Logging

Each well will be geophysically logged with natural gamma probes on reaching the final depth and before completion of the well. The data will be collected according to documented procedures approved by Westinghouse Hanford. These logs will be interpreted by personnel meeting qualification requirements stated in the procedures. On completion, each well will also be viewed with a downhole video camera to ensure that the well is clean and undamaged.

Data Interpretation and Presentation

All geologic and geophysical data will be interpreted by geologists to determine the stratigraphy beneath the site. These data will be presented in cross sections, fence diagrams, contour maps, and tables, as recommended by EPA (1986). Interpretations of the stratigraphy will be used in evaluating potential contaminant flow paths and in determining the hydrostratigraphic units beneath the pond, and aid in locating additional monitoring wells, if needed.

The data and interpretations will be presented in an interim site characterization report and in permitting documents. The documents will include specifically 1) descriptions of stratigraphic units, 2) results of analyses, 3) as-built diagrams of wells, and 4) recommendations for further characterization or additional monitoring wells, if necessary.

Hydrogeologic Characterization

Data will be collected during and after drilling of the monitoring wells that will be used in characterizing the hydrogeology of the area around B Pond. The types and methods of data collection are discussed below. Ground-water samples will be taken following the procedures discussed in Appendix C, or their revised, approved, and documented equivalents.

Aquifer Testing

The purpose of aquifer testing is to determine the hydraulic characteristics of in situ geologic materials in the uppermost aquifer underlying B Pond. A field testing design program is essential to optimize collection of hydrologic data. However, the primary purpose of installing the wells is to monitor the chemistry of the ground water and not for aquifer testing. Therefore, the results must be considered in this perspective.

Aquifer tests may include bailer, slug, step-development, constant discharge, and recovery. Constant-discharge tests will be conducted for up to 24 h in those cases where at least one observation well is available and drawdown is large enough (greater than approximately 0.2 ft) to allow a quantitative analysis of the data. If possible, data from the observation wells will be analyzed to yield estimates of storativity and the ratio of horizontal to vertical anisotropy. Single-well constant-discharge tests will be conducted for up to 10 h.

A step-development test will be conducted before the pumping test. The purpose of this test is to develop the well and to determine the optimum discharge rate and thus the pump size for that test. The pumping test will not be performed until water levels have fully recovered from the step-development test.

A pumping test is planned to be conducted at each well location. Tests will include single-well tests (at single-well locations) and multiple-well tests (at paired-well locations). A temporary 20-ft section of nominal 8-in.-dia telescoping, continuous-wound, stainless-steel screen will be set in each of the shallow wells before pumping. The screen will be open to the

aquifer formation and will extend from approximately the water table into the uppermost part of the aquifer.

At the site where two wells will be installed, two testing options are possible, depending on the construction schedule and drilling progress. The preferred option is to place a temporary short (less than 10 ft long) 8-in.-dia telescoping screen in the uppermost part of the aquifer in the deep well (before drilling to total depth) and a 20-ft telescoping screen in the shallow well, as indicated in the previous paragraph. The shallow well will be pumped while observing the response at the temporary depth in the deep well. The temporary telescoping screen will be removed from the deep well, and the well will be drilled to the total depth, where a 20-ft nominal 8-in.-dia telescoping screen will be set. The shallow well will concurrently be completed within the 20-ft telescoping screen. Another pumping test will be conducted by pumping from the deep well and observing the response in the completed shallow well.

An alternative is to conduct a single-well pumping test in the shallow well and then complete the shallow well. The deep well will then be drilled to total depth before placing a 20-ft nominal 8-in.-dia telescoping screen at the bottom. The deep well will be pumped while observing the response in the shallow well.

A submersible pump will be placed in the bottom portion of the screened interval. If the sediments in the test interval appear to have relatively high permeabilities such as those characteristic of the Hanford formation, a large discharge rate will be required. The largest pump size that will fit in a nominal 8-in.-dia telescoping screen (normally 40 hp) will be used in this case because it is expected that a maximum discharge from this size pump (200 to 250 gpm) will produce a small drawdown (no more than 2 ft).

If the sediments in the test interval have low permeabilities, such as those characteristic of the Ringold Formation, a much lower discharge rate will be required, and a smaller pump will be installed. In some locations, the sediments in a test interval may be of such low permeability that a pumping test would not be possible. In these situations, a slug test may be conducted.

If the interval is heterogeneous, containing materials with hydraulic conductivities ranging over several orders of magnitude, a slug test will not yield representative results. In this case, split-spoon samples will be collected, and laboratory tests to determine hydraulic conductivity will be conducted.

One or two days of continuous water-level monitoring will be conducted (if scheduling permits) before and/or after pump tests. The baseline data will be used to determine whether outside influences such as barometric effects will have a significant impact on the tests. If so, the data will be corrected for these effects.

A ground-water sample will be collected and analyzed before aquifer testing. If no contamination is detected above acceptable limits, the test will proceed. Aquifer testing will not occur if ground-water contamination is detected above acceptable limits until proper treatment and disposal of pumped water is available. An Effluent Monitoring Plan will outline the water-quality criteria that must be met to determine whether ground water can be discharged to the ground surface.

9 0 1 1 7 2 0 6 3 9

Determination of Ground-Water Flow Paths

Water levels will be measured in all new wells and in several nearby existing wells to determine the hydraulic head distribution used in determining ground-water flow paths. Measurements will also be made over time to evaluate temporal changes in flow paths. The data will be integrated to conceptualize three-dimensional flow paths.

Data Interpretation and Presentation

The hydrogeologic data interpretation was discussed in part above. The results of these data will be integrated to form a preliminary conceptual model of ground-water flow. Components of the model will include the current determination and description of hydrostratigraphic units, ground-water flow paths and estimates of ground-water velocity, unsaturated zone conditions as they relate to the ground-water monitoring system, and hydrochemical characterization.

The data will also be used to evaluate whether the characterization effort was adequate or whether the ground-water monitoring system is appropriately designed. Recommendations may be provided for additional characterization activities or additional ground-water monitoring wells, if necessary.

The data and interpretations will be presented in an interim characterization report and in permitting documents. The report will include specifically 1) descriptions of hydrostratigraphic units, 2) water-level data and water-table maps, 3) test data and results of analyses, 4) as-built diagrams of wells, 5) hydrochemistry data, and 6) recommendations for further characterization or additional monitoring wells, if necessary.

SAMPLING AND ANALYSIS

The wells will be sampled quarterly for 1 year and semiannually thereafter in accordance with 40 CFR 265.92. HydroStar®[a] sampling pumps will be installed in the new wells soon after construction and well development are complete. The depth to water will be measured before samples are collected. The wells will be purged and samples will be collected when at least three borehole volumes have been removed, when specific conductance and pH have stabilized, or, in the case of wells completed in very low permeability materials, after the well has recharged. Sampling, preservation, analytical methods, and chain-of-custody procedures as required by 40 CFR 265.92 are discussed in Appendix C. The quality assurance/control protocol, which are in addition to 40 CFR 265.92 requirements, are also given in Appendix C. The purpose of the quality control activities is to determine and document the quality of the analytical results being produced by the laboratory and to institute corrective actions as necessary.

Under the indicator evaluation monitoring program, ground-water surface elevation data will be evaluated at least annually to determine if the existing monitoring wells are appropriately located. If the evaluation indicates that existing wells are no longer adequately located, the

(a) HydroStar® is a registered tradename of Instrumentation Northwest, Incorporated, Redmond, Washington.

ground-water monitoring system will be modified to bring it into compliance with 40 CFR 265.91(a).

Personnel measuring water levels and collecting ground-water samples must meet OSHA medical, monitoring, and training requirements in accordance with 29 CFR 1910.120.

STATISTICAL ANALYSIS OF GROUND-WATER MONITORING DATA

The methods for establishing background and evaluating water-chemistry data, and the reporting requirements are discussed below.

Methods

Quarterly samples will be collected for 1 year from the ground-water monitoring wells for chemical analyses for the constituents listed in Table 3.1, as required by 40 CFR 265.92, volatile organic constituents, and hydrazine. This list may have additions based on an evaluation of the initial results. The samples will be analyzed by UST. The first set of samples will be collected after the wells have been completed, developed, and have had sampling pumps installed. Depths-to-water will be measured before the wells are purged.

After 1 year of quarterly monitoring, background levels for indicator parameters will be determined and compared with indicator parameters from downgradient wells semiannually in accordance with 40 CFR 265.93. The data will be analyzed to evaluate whether ground water is affected by B Pond.

Establishing Background

Background summary statistics (mean, variance, and coefficient of variation) will be calculated from five quarters of data from wells 299-E18-1 and 299-E32-4. The actual method that will be used for calculating summary statistics will depend on the distribution of the data and the presence of any data reported as less than the limit of detection. Replicate summary statistics will be calculated each quarter. Background comparison summary statistics will be calculated from the quarterly summary statistics.

Samples will continue to be collected and analyzed semiannually from the background wells. The data will be evaluated to determine if trends are

9 0 1 1 7 7 2 0 6 4 1

present, irregularities exist in the data, or ground water from the wells is affected by B Pond. If any of these conditions is present, the data will be evaluated in relation to the hydrologic system to determine if the background levels need to be re-calculated from a new set of quarterly sample data. The data will also be evaluated to determine whether the wells being used are suitable to that purpose or if different wells are required.

Evaluation of Data

Wells will be sampled at least twice each succeeding year after background concentrations have been established. A minimum of four replicate measurements will be obtained from each downgradient well for the indicator parameters, and the arithmetic mean and variance will be calculated for the indicator parameters for each sample.

The Student's t-test will be used to determine statistically significant changes in the concentration of indicator parameters of downgradient wells as compared to initial background concentrations or values. This comparison will consider individually each of the wells in the monitoring system. For three of the indicator parameters (specific conductance, total organic carbon, total organic halogen), a single-tailed Student's t-test will be used to test at the 0.01 level of significance for significant increases over background. The difference test for pH will be a two-tailed Student's t-test at the overall 0.01 level of significance.

Notification and Reports

A summary of the reports required by 40 CFR 265, Subpart F, is given in Table 3.2.

TABLE 3.2. Reports Required by 40 CFR 265, Subpart F, for Ground-Water Monitoring

Submittal	Submittal Period
First year of sampling: Concentrations of interim primary drinking water constituents, identifying those that exceed the limits listed in Table 3.1.	Quarterly reports according to the current schedule
Concentration and statistical analyses of ground-water contamination indicator parameters, noting significant differences in upgradient wells.	Annually, according to the current schedule
Results of ground-water surface elevation evaluation, and description of response if appropriate.	Annually, according to the current schedule

4.0 PHASE II--INITIATION OF GROUND-WATER QUALITY ASSESSMENT PROGRAM

This section discusses the development of criteria that would trigger notification of regulatory agencies and initiate a ground-water quality assessment program. The notifications required by 40 CFR 265, Subpart F, are presented, and the ground-water quality assessment program is outlined.

INITIATION CRITERIA

As indicated in Section 3.0, ground-water samples from all monitoring wells will be tested quarterly for interim primary drinking water constituents, ground-water quality parameters, ground-water contamination indicator parameters, and site-specific parameters for the first year (Table 3.1).

Significant changes in concentrations from both the upgradient (background) and downgradient wells must be reported. If significant changes are noted in the downgradient wells, those wells must be immediately resampled, and the samples split in two and analyzed by independent laboratories to determine if the results were caused by laboratory error. If this second sampling also shows a significant increase (or pH decrease), the U.S. Environmental Protection Agency (EPA) and Ecology must be notified in writing within 7 days that the 216-B-3 Pond might be affecting ground-water quality. If a significant increase (or pH decrease) is confirmed by the second sampling, a plan for a ground-water quality assessment program must be submitted to EPA and Ecology within 15 days of this written notification. The outline of the ground-water quality assessment program is presented in the following section as required by 40 CFR 265.93(a).

GROUND-WATER QUALITY ASSESSMENT PROGRAM

A ground-water quality assessment program will be implemented when a release of hazardous constituents is indicated in the indicator evaluation monitoring system. The decision to implement the ground-water quality assessment program will be based on criteria described in the previous

section. A ground-water quality assessment plan will be certified by a qualified hydrogeologist or geotechnical engineer. This plan will address the following:

1. ground-water monitoring wells that will be drilled, as necessary, to determine the nature and extent of contamination. The number, location, and depth of each well will be identified.
2. ground-water samples that will be collected and analyzed at a minimum for constituents outlined in Appendix IX of 40 CFR 264.
3. detailed procedures describing how the analytical results will be evaluated, including the analysis of any previously gathered ground-water quality information.
4. a schedule for implementation of the assessment-level ground-water monitoring program.

A sample outline of a ground-water quality assessment plan is shown in Table 4.1. The following paragraphs provide additional explanation for several items that will be addressed in the plan.

At sites where contaminants are known to have entered the ground water, the regulations specified in 40 CFR 265.93(d)(4) require that the rate and extent of contaminant movement be determined. The methods used to determine these will depend on the quantity and quality of the field data base. Methods will include additional monitoring well installations and field testing, continued chemical analyses of selected constituents in existing and new well installations, ground-water flow and contaminant transport modeling, and statistical evaluation of chemical analyses.

Nature and Extent of Contamination

Analytical data from new and existing wells will be evaluated to determine the specific hazardous and nonhazardous constituents and levels of these constituents found in ground water. In addition, the hazardous constituents will be statistically evaluated to determine which exceed background concentrations. The data will be further evaluated to determine if particular constituents have come from the 216-B-3 Pond or may originate from some other waste management facility.

TABLE 4.1. Sample Ground-Water Quality Assessment Plan Outline

- Introduction
- Background Information
  - Facility Description
  - Geology and Hydrology of 200-East Area
    - Geology
    - Hydrology
- Interim-Status Work Conducted to Date
  - Scope and Description
    - Well Network
    - Sample Collection
    - Water Level Measurements
    - Sample Analysis
    - Data Handling and Verification
    - Analytical Data Evaluation
    - Quality Assurance
    - Quality Control (QC)
  - Results
    - Sampling Schedule
    - Constituent Lists
    - Constituents Detected
    - Constituent Concentrations
    - Graphs of the Data
    - General Observations
    - QC Program Results
    - Factors Potentially Affecting the Data
- Planned Expansion of Ground-Water Monitoring Program
  - Planned Approach
    - Evaluation of Existing Data
    - Installation of New Monitoring Wells
    - Collection and Analysis of Geologic Data
    - Collection and Analysis of Water Quality Data
    - Hydrologic and Water Quality Interpretation
    - Method of Determining Rate and Extent of Contaminant Movement
  - Schedule of Implementation
  - Reports to Be Produced
- References
- Appendixes

The lateral extent of contamination will be estimated by contouring concentrations of various hazardous and nonhazardous constituents. The concentrations of hazardous constituents will be contoured to estimate the

actual contamination distributions; the concentrations of nonhazardous constituents will be contoured and evaluated as indicators of ground-water and contaminant movement. The rate and extent of contamination will be conceptually evaluated based on existing data and modeling results (discussed below).

Rate of Movement

The rate of contaminant movement will be estimated initially by using values of hydraulic conductivity estimated from aquifer testing, the hydraulic gradient determined from water-level measurements, and an estimated effective porosity based on the nature of the geologic material. This will provide a gross estimate for application in modeling studies and additional monitoring programs. The rate and extent of contamination will be conceptually evaluated based on existing data and modeling results (discussed below). The results of the evaluation will provide insight into the areas of greatest uncertainty and thus those areas where additional data are needed. Additional wells and field testing will most likely be necessary to quantify the rate and extent of contamination.

Additional Well Installations

Examination of the analytical results obtained under Phase I coupled with preliminary flow and transport modeling (discussed below) will provide the bases for locating additional monitoring wells. Data from these wells will be used to further define and quantify the rate and extent of contamination.

Additional Field and Laboratory Testing

Samples will be collected from new and existing wells and analyzed for known hazardous waste or hazardous waste constituents and other constituents that will be useful for evaluating rate and extent of contamination. Additional field testing (pumping tests, tracer tests) and laboratory testing may also be necessary. The primary focus of additional field or laboratory testing will be those parameters with the highest uncertainty and that most affect flow and transport. These factors will be evaluated by preliminary

modeling and sensitivity analyses. Additional field and/or laboratory testing may be conducted to obtain

- quantitative and representative values and distribution of hydraulic conductivity
- quantitative values of porosity
- more accurate spatial and temporal distributions of hydraulic head
- retardation characteristics
- quantitative values of dispersivity.

Modeling

Simple analytical models that include terms for dispersion, retardation, and radioactive decay will be used to simulate the extent and rate of contaminant plume movement based on assumed hydraulic and retardation parameters. Numerical models that can accommodate heterogeneities in the hydrogeologic system and more complex transport conditions can also be used to estimate the rate and direction of flow under various hydrologic conditions. As previously mentioned, the results of modeling will be used to locate additional wells and to identify data needs.

CONTINUED ANALYSIS AND EVALUATION

This section discusses the review and evaluation that will be conducted on initiation of the ground-water quality assessment program. It also discusses the required notifications and reports.

Review of Methods and Procedures

On verification of contamination in ground-water monitoring wells, the monitoring system, data evaluation methods, and sampling and analysis procedures will be reviewed. This review will evaluate if the ground-water monitoring system is adequate to determine if contamination may be originating from a source other than 216-B-3 Pond. The method of establishing background will be reviewed for its appropriateness within the hydrogeologic system. This review will consider the potential effects of other facilities that may result in trends in background water quality which have not been

addressed in establishing background. Finally, the review will evaluate the current sampling and analysis procedures, and if sample bias may result from inadequacies in the procedures.

Review of Sampling Parameters and Frequency

The sampling plan will be reviewed to evaluate if the appropriate parameters are being analyzed and if the frequency is adequate. The ground-water quality assessment program will require the addition of any hazardous constituents that have been detected. The sampling frequency will be returned to quarterly from semiannually until it is determined that no hazardous waste or hazardous waste constituents from the 216-B-3 Pond have entered the ground water or until final closure of the facility, as required by 40 CFR 265, Subpart F.

Notification and Reports

Table 4.2 lists the reports and notifications that must be submitted 1) whether or not the facility might be affecting ground water or 2) if the facility might be affecting ground water as determined by the method mentioned above (Student's t-test).

Records of the ground-water quality analyses, associated ground-water surface elevations, and the various data analyses (including the statistical analyses) will be kept throughout the active life of the 216-B-3 Pond and throughout the post-closure period as well [40 CFR 265.94(a)(1)].

9 0 1 1 7 7 2 0 6 4 9

TABLE 4.2. Reports and Notifications

Submittal	Submittal Period
Required whether or not the facility might be affecting ground water	
1. First year of sampling only: Concentrations of interim primary drinking water standards, identifying those that exceed the limits listed in Table 3.1	Within 15 days of completion of each quarterly analysis
Concentration and statistical analyses of ground-water contamination indicator parameters, noting significant differences in upgradient wells	Annually, by March 1 of following year
Results of ground-water surface elevation evaluation and description of response if appropriate	Annually, by March 1 of following year
Required if the facility might be affecting ground water	
2. Notification to EPA and Ecology that the facility might be affecting ground water	Within 7 days of confirmation of a significant increase (or pH decrease).
Submittal of ground-water assessment plan to EPA and Ecology	Within 15 days of the above notification
Submittal to EPA and Ecology of a written report on assessment of ground-water quality, including concentrations of hazardous waste constituents and their rate and extent of migration	Within 15 days of first determination (as soon as technically feasible)
Results of the ground-water quality assessment program	Annually, by March 1 of following year, until closure of the facility

5.0 REFERENCES

29 CFR 1910.120. 1986. Occupation Safety and Health Administration, "Hazardous Waste Operations and Emergency Response." U.S. Code of Federal Regulations.

40 CFR 265, Subpart F. 1987. U.S. Environmental Protection Agency, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities." U.S. Code of Federal Regulations.

Aldrich, R. C. 1984. Radioactive Liquid Wastes Discharged to Ground in the 200 Areas During 1983. RHO-HS-SR-83-3 4QL1Q P, Rockwell Hanford Operations, Richland, Washington.

Aldrich, R. C. 1985. Radioactive Liquid Wastes Discharged to Ground in the 200 Areas During 1984. RHO-HS-SR-84-3 4QL1Q P, Rockwell Hanford Operations, Richland, Washington.

Aldrich, R. C. 1986. Radioactive Liquid Wastes Discharged to Ground in the 200 Areas During 1985. RHO-HS-SR-85-3 4QL1Q P, Rockwell Hanford Operations, Richland, Washington.

Aldrich, R. C. 1987. Radioactive Liquid Wastes Discharged to Ground in the 200 Areas During 1986. RHO-HS-SR-86-3 4QL1Q P, Rockwell Hanford Operations, Richland, Washington.

Bjornstad, B. N. 1984. Suprabasalt Stratigraphy Within and Adjacent to the Reference Repository Location. SD-BWI-DP-039, Rockwell Hanford Operations, Richland, Washington.

Bjornstad, B. N. 1985. Late-Cenezoic Stratigraphy and Tectonic Evolution Within a Subsiding Basin, South-Central Washington. Geologic Society of America, Abstracts with Programs, 17(7):524.

Bjornstad, B. N., K. R. Fecht, and A. M. Tallman. 1987. Quaternary Stratigraphy of the Pasco Basin Area, South-Central Washington. RHO-BWI-SA-563A, Rockwell Hanford Operations, Richland, Washington.

Caggiano, J. A., and D. W. Duncan (eds.). 1983. Preliminary Interpretation of the Tectonic Stability of the Reference Repository Location, Cold Creek Syncline, Hanford Site. RHO-BWI-ST-19P, Rockwell Hanford Operations, Richland, Washington.

DOE. 1987. 216-B-3 Pond Preliminary Closure/Post Closure Plan. U.S. Department of Energy, Richland, Washington.

DOE. 1988. Consultation Draft, Site Characterization Plan. Volumes 1 and 2, DOE/RW-0164, U.S. Department of Energy, Richland, Washington.

EPA. 1986. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD). OSWER-9950.1, U.S. Environmental Protection Agency, Washington D.C.

Fecht, K. R., S. P. Reidel, and A. M. Tallman. 1985. Paleodrainage of the Columbia River System on the Columbia Plateau of Washington State: A Summary. RHO-BWI-SA-318P, Rockwell Hanford Operations, Richland, Washington.

Gee, G. W. 1987. Recharge at the Hanford Site: Status Report. PNL-6403, PacificNorthwest Laboratory, Richland, Washington.

Gephart, R. E., R. C. Arnett, R. G. Baca, L. S. Leonhart, and F. A. Spane, Jr. 1979. Hydrologic Studies Within the Columbia Plateau, Washington: An Integration of Current Knowledge. RHO-BWI-ST-5, Rockwell Hanford Operations, Richland, Washington.

Graham, M. J., K. R. Fecht, and W. R. Brown. 1981. Hydrology of the Separations Area. RHO-ST-42, Rockwell Hanford Operations, Richland, Washington.

Graham, M. J., G. V. Last, and K. R. Fecht. 1984. An Assessment of Aquifer Intercommunication Within B Pond-Gable Mountain Pond Area of the Hanford Site. RHO-RE-ST-12 P, Rockwell Hanford Operations, Richland, Washington.

Jensen, E. J. 1987. An Evaluation of Aquifer Intercommunication Between the Unconfined and Rattlesnake Ridge Aquifers on the Hanford Site. PNL-6313, Pacific Northwest Laboratory, Richland, Washington.

Jungfleisch, F. 1988. Preliminary Evaluation of Hanford Liquid Discharges to Ground. WHC-EP-0052, Westinghouse Hanford Company, Richland, Washington.

Last, G. V., and T. L. Liikala. 1987. A Field Guide for Well Site Geologists: Cable Tool Drilling. PNL-6392, Pacific Northwest Laboratory, Richland, Washington.

Law, A. G., and A. L. Schatz. 1986. Results of the Separations Area Ground-Water Monitoring Network for 1985. RHO-RE-SR-86-24 P, Rockwell Hanford Operations, Richland, Washington.

Law, A. G., J. A. Serkowski, and A. L. Schatz. 1987. Results of the Separations Area Ground-Water Monitoring Network for 1986. RHO-RE-SR-87-24 P, Rockwell Hanford Operations, Richland, Washington.

Liikala, T. L., D. S. Daly, and A. P. Toste. 1988. An Evaluation of the Effects of Well Construction Materials and Ground-Water Sampling Equipment on Concentrations of Volatile Organic Compounds. PNL-6585, Pacific Northwest Laboratory, Richland, Washington.

Maxfield, H. L. 1979. 200 Areas Waste Sites Handbook, Vol. 3. RHO-CD-673, Rockwell Hanford Operations, Richland, Washington.

Metcalf, S. G. 1986. Analysis of Hanford Liquid Effluents for Hazardous Waste Regulatory Compliance--Preliminary Data. RHO-RE-SA-133 P, Rockwell Hanford Operations, Richland, Washington.

Mullineaux, D. R., R. E. Wilson, W. F. Ebaugh, R. Fryxel, and M. Rubin. 1978. "Age of the Last Major Scabland Flood of the Columbia River Plateau in Eastern Washington." Quaternary Research 10:171-180.

Myers, C. W./S. M. Price, and J. A. Caggiano, M. P. Cochran, W. H. Czimer, N. J. Davidson, R. C. Edwards, K. R. Fecht, G. E. Holmes, M. G. Jones, T. H. Mitchell, E. H. Price, S. P. Reidel, and A. M. Tallman. 1979. Geologic Studies of the Columbia Plateau: A Status Report. RHO-BWI-ST-4, Rockwell Hanford Operations, Richland, Washington.

Myers, C. W., and S. M. Price (eds.) 1981. Subsurface Geology of the Cold Creek Syncline. RHO-BWI-ST-14, Rockwell Hanford Operations, Richland, Washington.

PSPL. 1982. Skagit Hanford Nuclear Project, Application for Site Certification/Environmental Report. Vol. 2, Chapters 4-8, Puget Sound Power and Light Company, Bellevue, Washington.

Reidel, S. P., K. R. Fecht, and R. W. Cross. 1982. "Constraints on Tectonic Models for the Columbia Plateau from the Age and Growth Rates of Yakima Folds." Proceedings, 33rd Alaska Science Conference, Vol. 12, Arctic Division, American Association for Advancement of Science.

Schatz, A. L., and J. J. Ammerman. 1988. Ground-Water Maps of the Hanford Site Separations Area December 1987. WHC-EP-0142, Westinghouse Hanford Company, Richland, Washington.

Serkowski, J. A., A. G. Law, J. J. Ammerman, and A. L. Schatz. 1988. Results of Ground-Water Monitoring for Radionuclides in the Separations Area - 1987. WHC-EP-0152, Westinghouse Hanford Company, Richland, Washington.

Sliger, G. J. 1983. Radioactive Liquid Wastes Discharged to Ground in the 200 Areas During 1982. RHO-HS-SR-82-3 4QLIQ P, Rockwell Hanford Operations, Richland, Washington.

Stanley, T. W., and S. S. Verner. 1983. Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans. EPA-600/4-83-004, U.S. Environmental Protection Agency, Washington, D.C.

Stone, W. A., J. M. Thorp, O. P. Gifford, and D. J. Hoitink. 1983. Climatological Summary for the Hanford Area. PNL-4622, Pacific Northwest Laboratory, Richland, Washington.

Supply System. 1981. Final Safety Analysis Report, WPPSS Nuclear Project No. 2. Amendment 18, Washington Public Power Supply System, Richland, Washington.

Swanson, D. A., T. L. Wright, P. R. Hooper, and R. D. Bentley. 1979. "Revisions in Stratigraphic Nomenclature of the Columbia River Basalt Group." Bulletin 1457-G, U.S. Geological Survey, Washington, D.C.

Tallman, A. M., K. R. Fecht, M. C. Marratt, and G. V. Last. 1979. Geology of the Separations Area, Hanford Site, South-Central Washington. RHO-T-23, Rockwell Hanford Operations, Richland, Washington.

Tolan, T. L. 1986. Tectonic Map of the Columbia Plateau and Adjacent Areas Scale 1:50,000. SD-BWI-TI-320, Rockwell Hanford Operations, Richland, Washington.

Wallace, R. W. 1977. A Comparison of Evapotranspiration Estimates Using ERDA Hanford Climatological Data. PNL-2698, Pacific Northwest Laboratory, Richland, Washington.

WAC 173-160. Washington State Department of Ecology, "Minimum Standards for Construction and Maintenance of Wells." Washington Administrative Code.

WAC 173-303. Washington State Department of Ecology, "Dangerous Waste Regulations." Washington Administrative Code.

THIS PAGE INTENTIONALLY
LEFT BLANK

THIS PAGE INTENTIONALLY
LEFT BLANK

9 0 1 1 7 7 2 0 6 5 5

APPENDIX A

GEOLOGIC AND WELL CONSTRUCTION DIAGRAMS FOR EXISTING WELLS

9 0 1 1 7 7 2 0 6 5 5

APPENDIX A

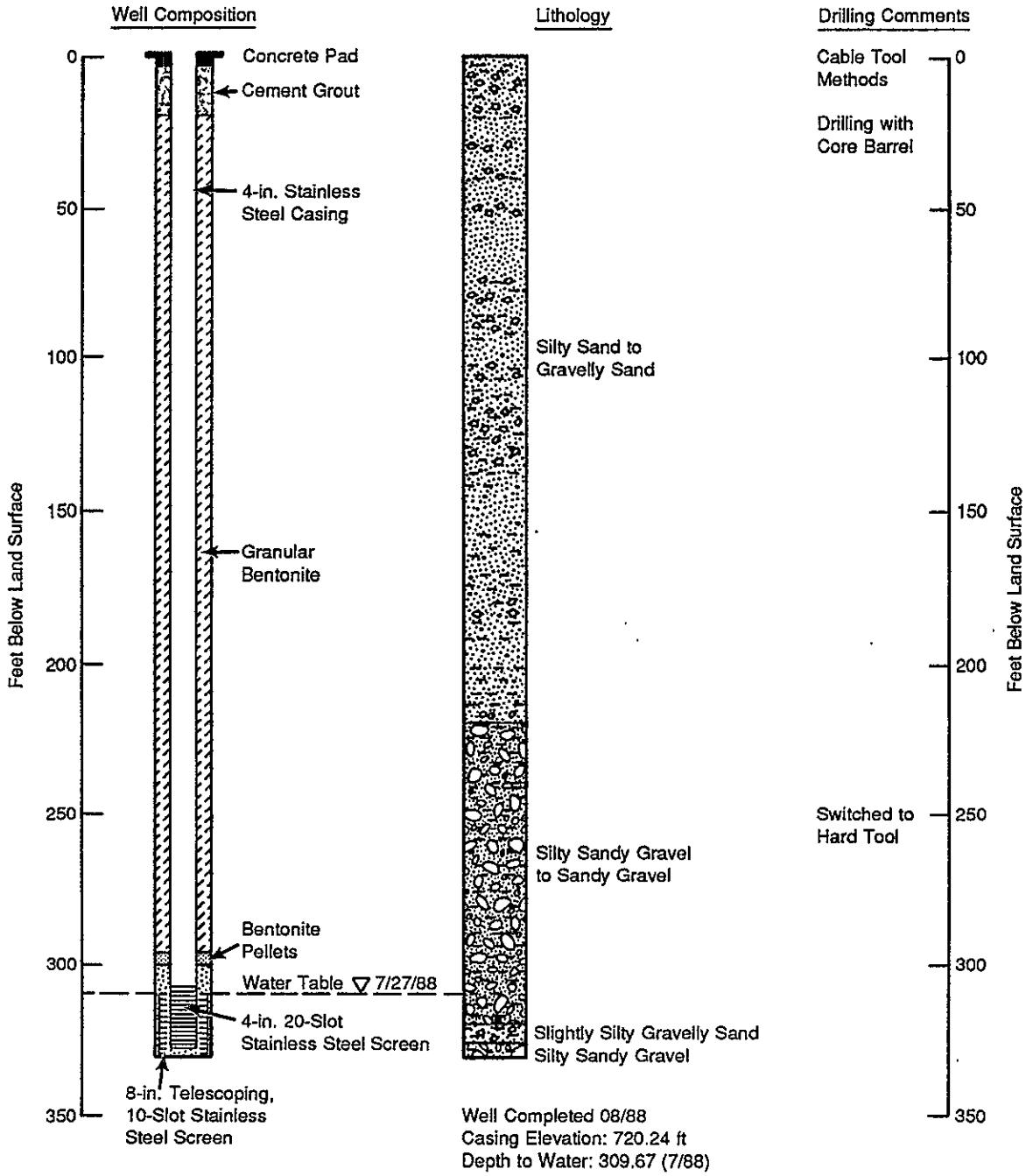
GEOLOGIC AND WELL CONSTRUCTION DIAGRAMS FOR EXISTING WELLS

Geologic and well construction diagrams from existing and newly constructed wells in the vicinity of B Pond and from the background wells are included on pages A.2 through A.15. These logs were compiled from data obtained from wells drilled by U.S. Department of Energy contractors. The lithologic and well construction information was obtained from driller's logs and, where available, geologist's logs. No borehole geophysics were used in developing these logs. The well log information was used, where possible, to substantiate site-specific geologic information and evaluate the construction of existing wells. The following well logs were reviewed and are included:

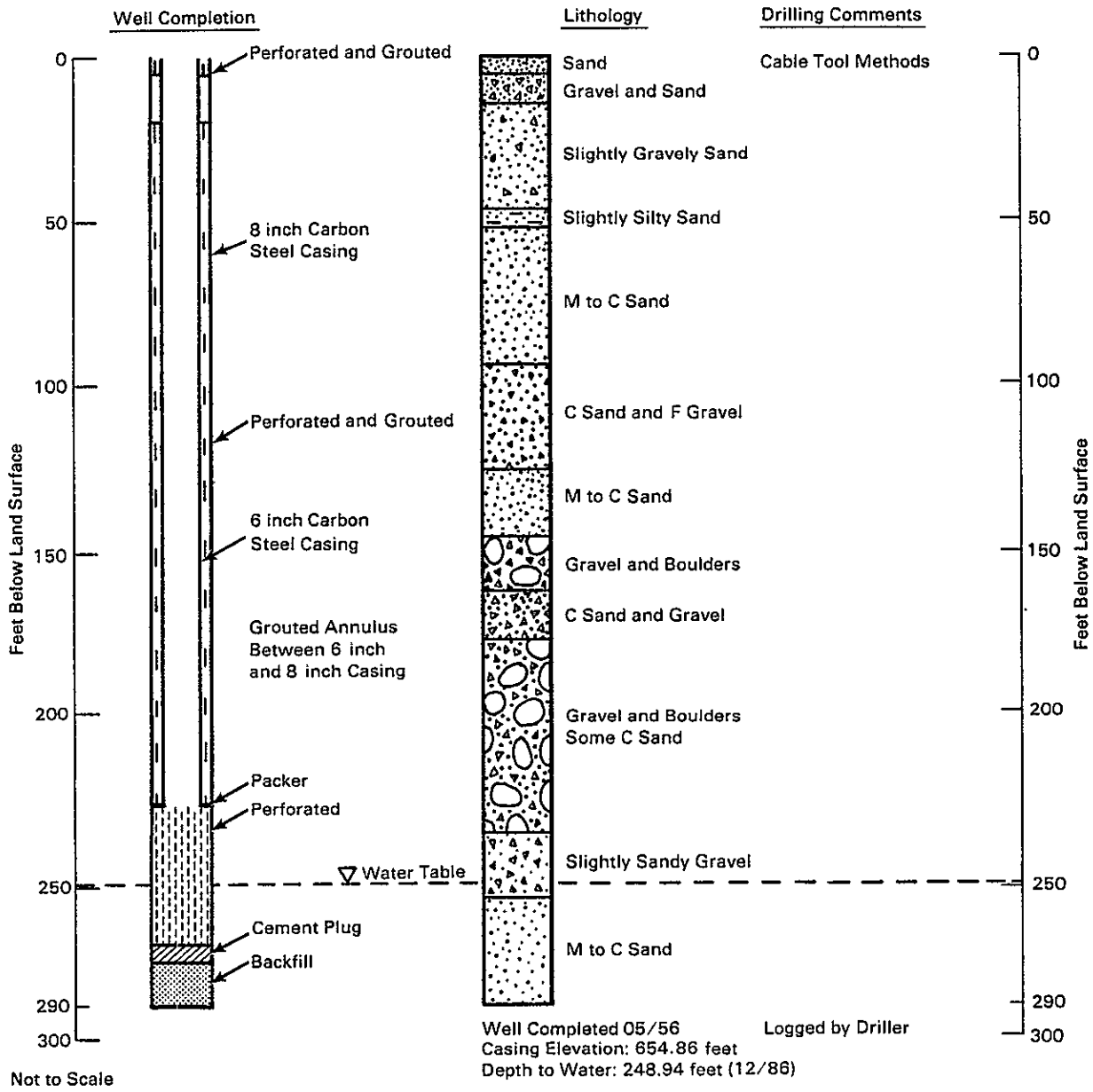
Well Number	Completion Date	Location Completed (Hanford Coordinates)	Page
299-E18-1	8/88	N38458/W54458	A.2
299-E25-9	5/56	N41779/W45860	A.3
299-E25-25	4/85	N41002/W43648	A.4
299-E32-4	9/87	N44985/W56713	A.5
699-42-40A	7/81	N42420/W40205	A.6
699-42-40B	9/81	N42400/W40200	A.7
699-42-40C	4/82	N42414/W40181	A.8
699-42-42A	8/56	N41994/W42063	A.9
699-42-42B (BP-10)	10/88	N42473/W42301	A.10
699-43-42	2/66	N43409/W41716	A.11
699-43-42J (BP-7)	9/88	N42532/W42274	A.12
699-43-43 (BP-8)	9/88	N42942/W43184	A.13
699-44-42 (BP-3)	9/88	N43783/W41965	A.14
699-45-42	6/48	N45274/W42099	A.15

9 0 1 1 7 7 2 0 6 5 7

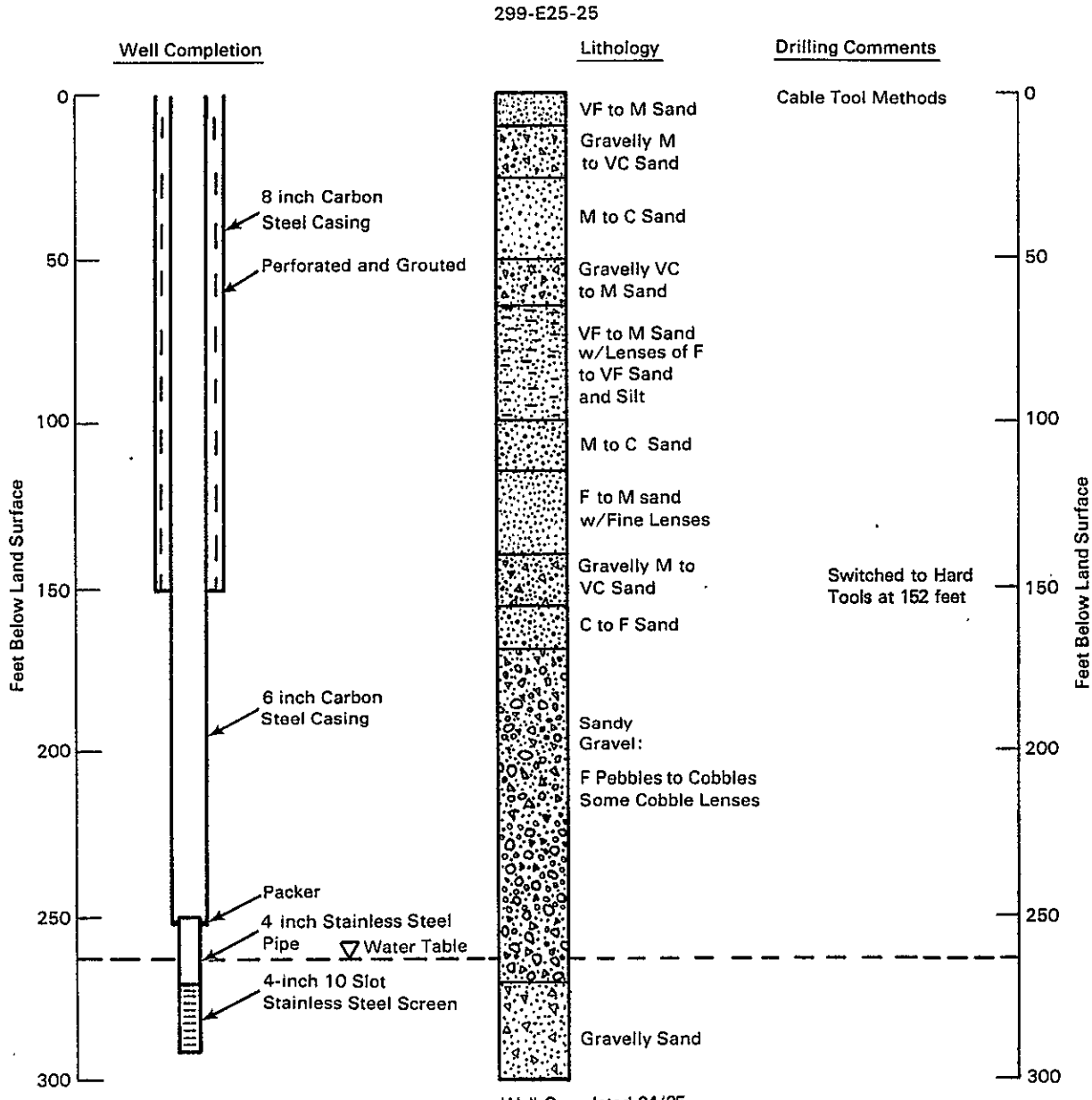
299-E18-1

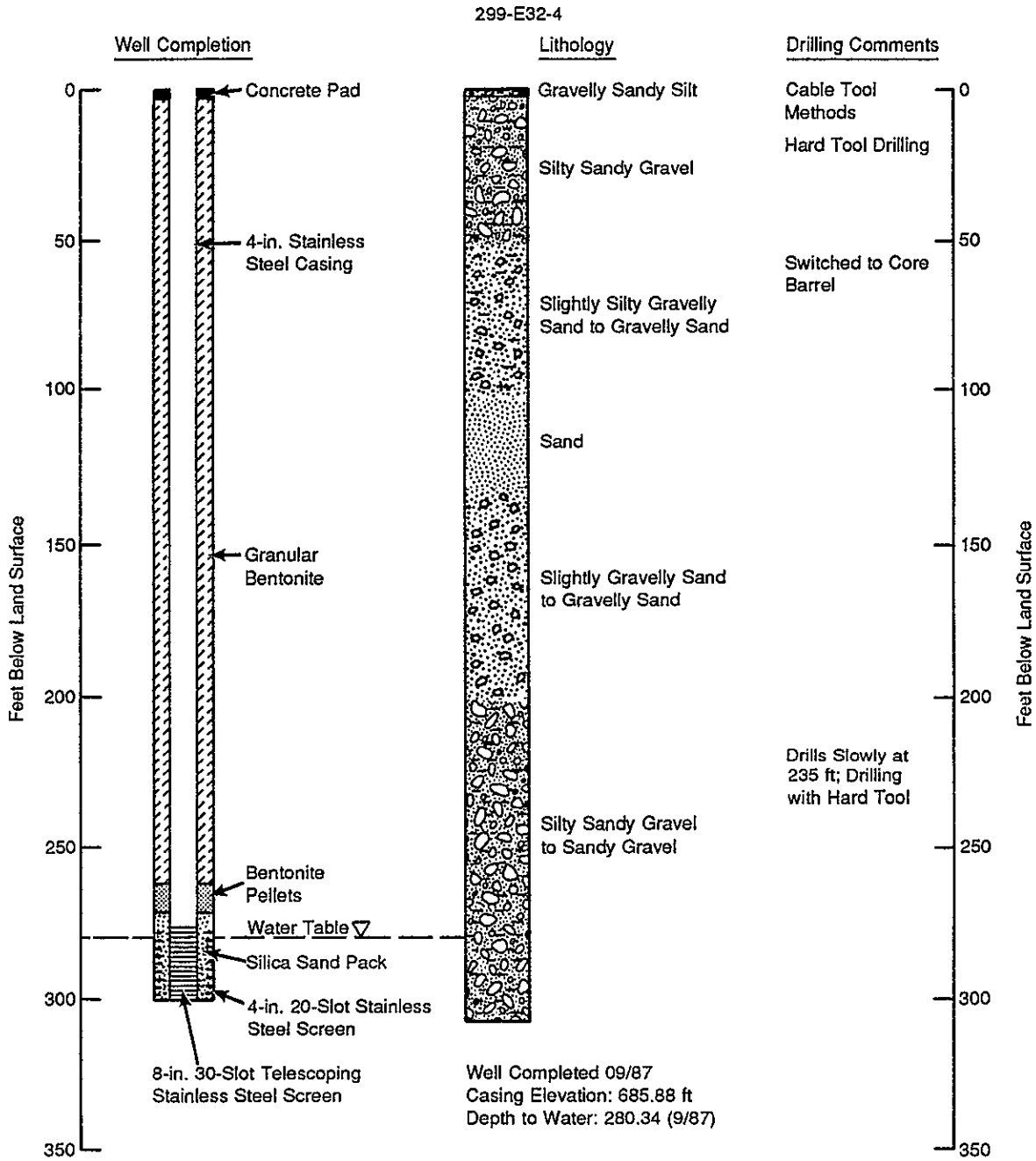

Well Composition
Lithology
Drilling Comments
Concrete Pad
Cement Grout
4-in. Stainless Steel Casing
Granular Bentonite
Bentonite Pellets
Water Table 7/27/88
4-in. 20-Slot Stainless Steel Screen
8-in. Telescoping, 10-Slot Stainless Steel Screen
Silty Sand to Gravelly Sand
Silty Sandy Gravel to Sandy Gravel
Slightly Silty Gravelly Sand
Silty Sandy Gravel
Cable Tool Methods
Drilling with Core Barrel
Switched to Hard Tool
Feet Below Land Surface
0
50
100
150
200
250
300
350
Well Completed 08/88
Casing Elevation: 720.24 ft
Depth to Water: 309.67 (7/88)

299-E25-9

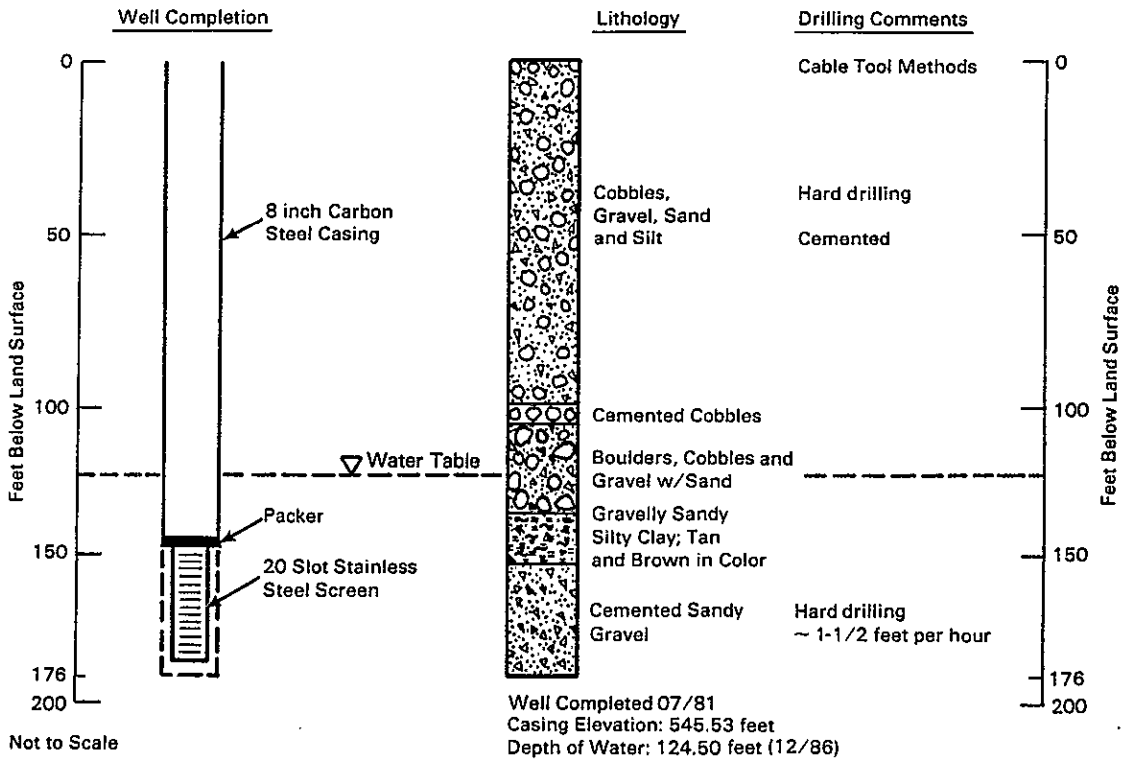


Well Completed 05/56
Casing Elevation: 654.86 feet
Depth to Water: 248.94 feet (12/86)

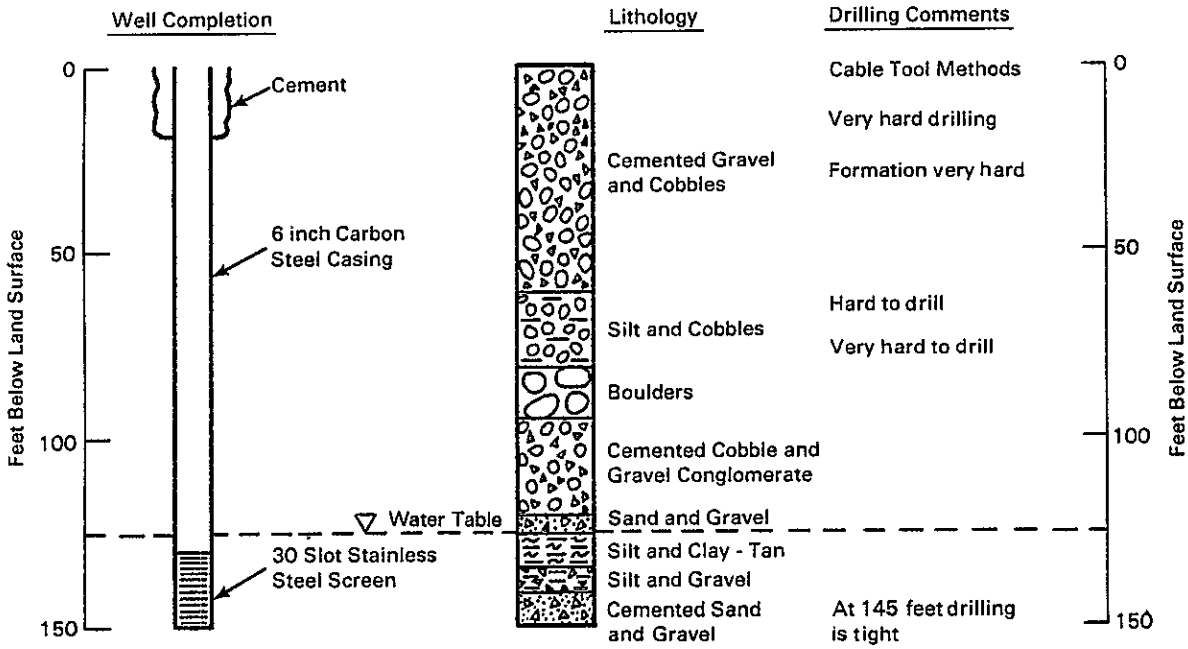

299-E25-25
Well Completion
Lithology
Drilling Comments
Cable Tool Methods
8 inch Carbon Steel Casing
Perforated and Grouted
6 inch Carbon Steel Casing
Packer
4 inch Stainless Steel Pipe
Water Table
4-inch 10 Slot Stainless Steel Screen
VF to M Sand
Gravelly M to VC Sand
M to C Sand
Gravelly VC to M Sand
VF to M Sand w/Lenses of F to VF Sand and Silt
M to C Sand
F to M sand w/Fine Lenses
Gravelly M to VC Sand
C to F Sand
Sandy Gravel:
F Pebbles to Cobbles Some Cobble Lenses
Gravelly Sand
Switched to Hard Tools at 152 feet
Feet Below Land Surface
0
50
100
150
200
250
300
Not to Scale
Well Completed 04/85
Casing Elevation: 669.42 feet
Depth to Water 262.84 feet (12/86)


299-E32-4
Well Completion
Lithology
Drilling Comments
Concrete Pad
4-in. Stainless Steel Casing
Granular Bentonite
Bentonite Pellets
Water Table
Silica Sand Pack
4-in. 20-Slot Stainless Steel Screen
8-in. 30-Slot Telescoping Stainless Steel Screen
Gravelly Sandy Silt
Silty Sandy Gravel
Slightly Silty Gravelly Sand to Gravelly Sand
Sand
Slightly Gravelly Sand to Gravelly Sand
Silty Sandy Gravel to Sandy Gravel
Cable Tool Methods
Hard Tool Drilling
Switched to Core Barrel
Drills Slowly at 235 ft; Drilling with Hard Tool
Well Completed 09/87
Casing Elevation: 685.88 ft
Depth to Water: 280.34 (9/87)
Feet Below Land Surface
0
50
100
150
200
250
300
350

699-42-40A


Well Completion
Lithology
Drilling Comments
0
50
100
150
176
200
Feet Below Land Surface
8 inch Carbon Steel Casing
Water Table
Packer
20 Slot Stainless Steel Screen
Cobbles, Gravel, Sand and Silt
Cemented Cobbles
Boulders, Cobbles and Gravel w/Sand
Gravelly Sandy Silty Clay; Tan and Brown in Color
Cemented Sandy Gravel
Cable Tool Methods
Hard drilling
Cemented
Hard drilling
~ 1-1/2 feet per hour
Not to Scale
Well Completed 07/81
Casing Elevation: 545.53 feet
Depth of Water: 124.50 feet (12/86)

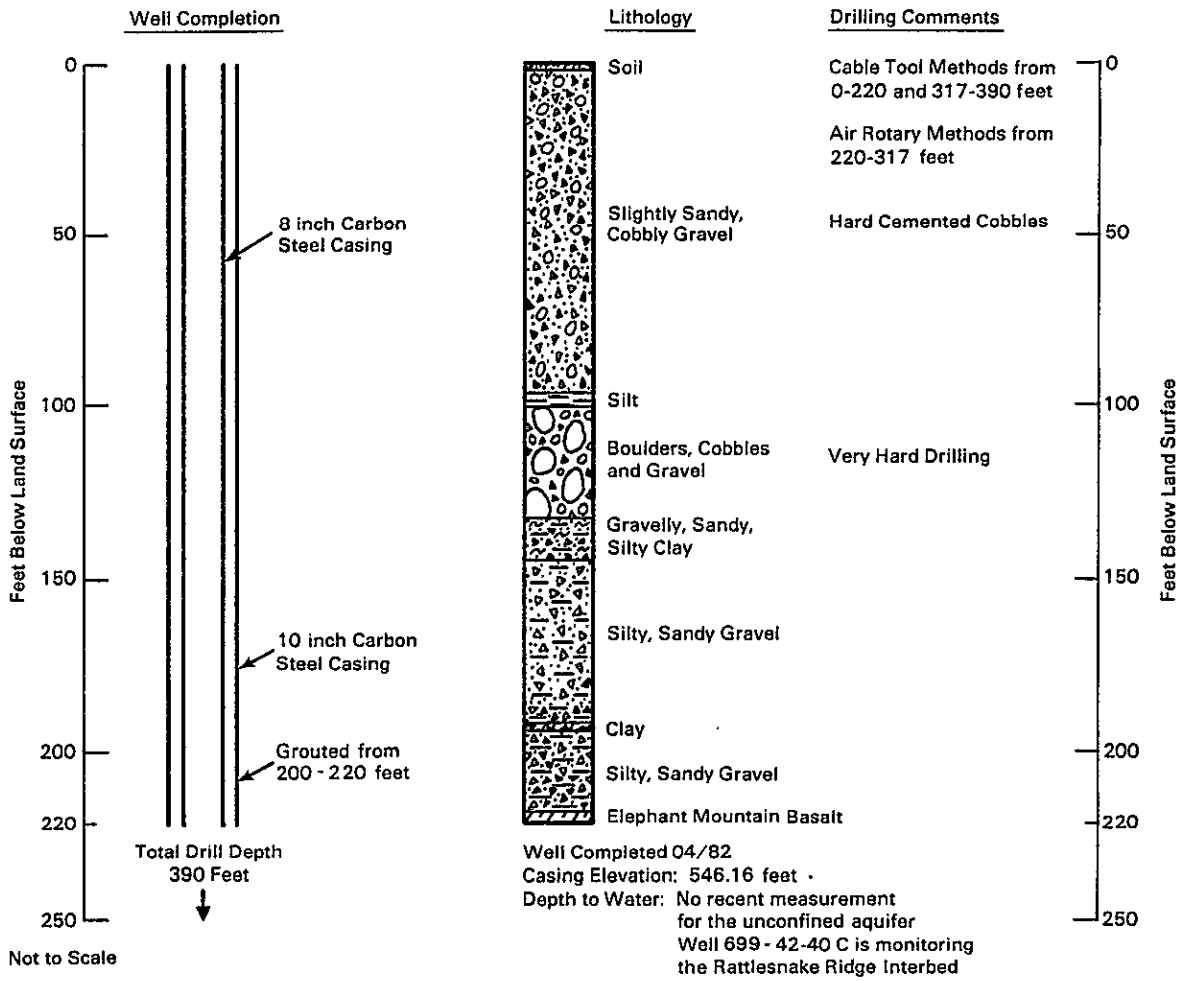
699-42-40B



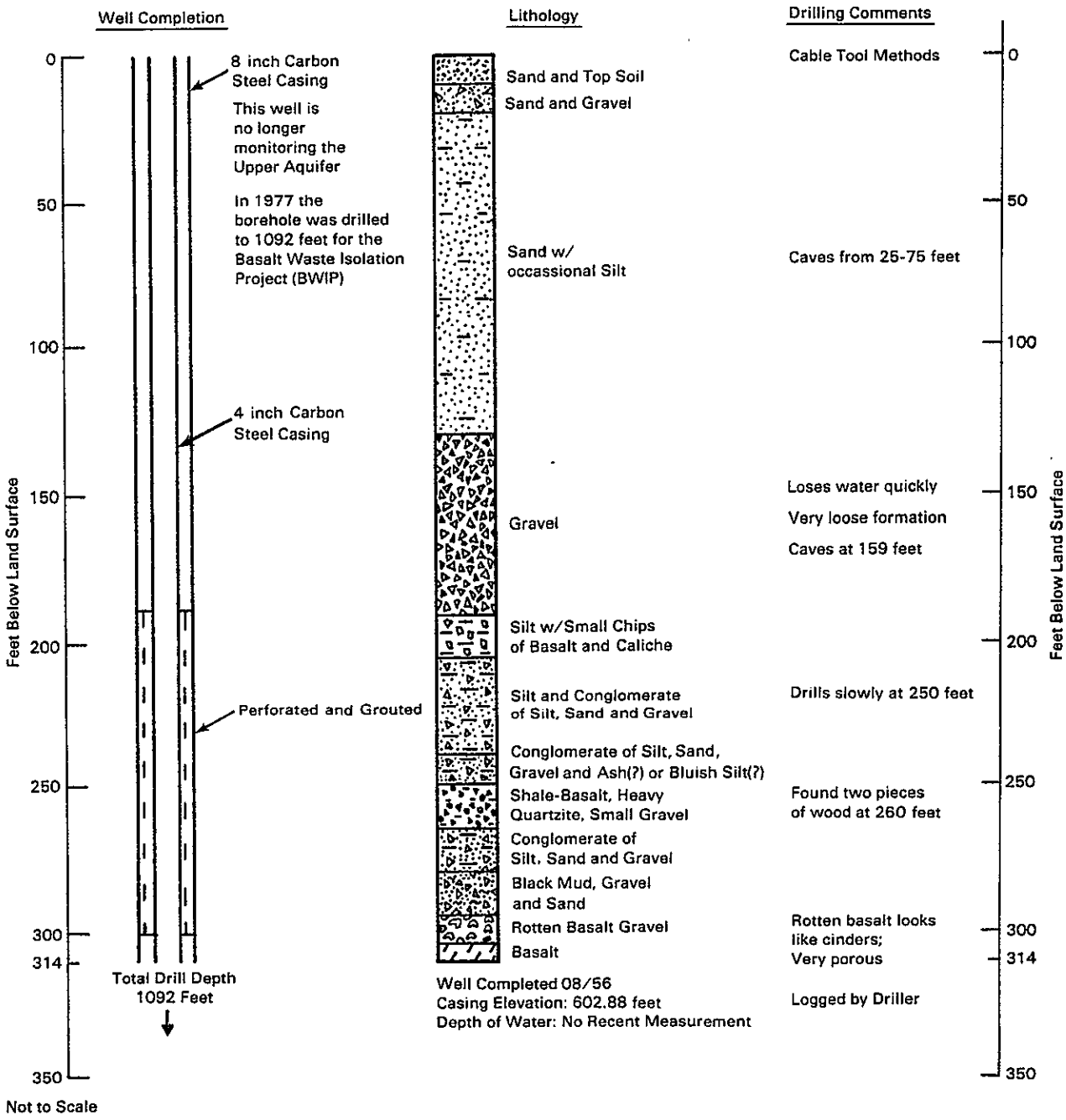
Not to Scale

Well Completed 09/81
Casing Elevation: 546.46 feet
Depth to Water: 124.48 feet (12/86)

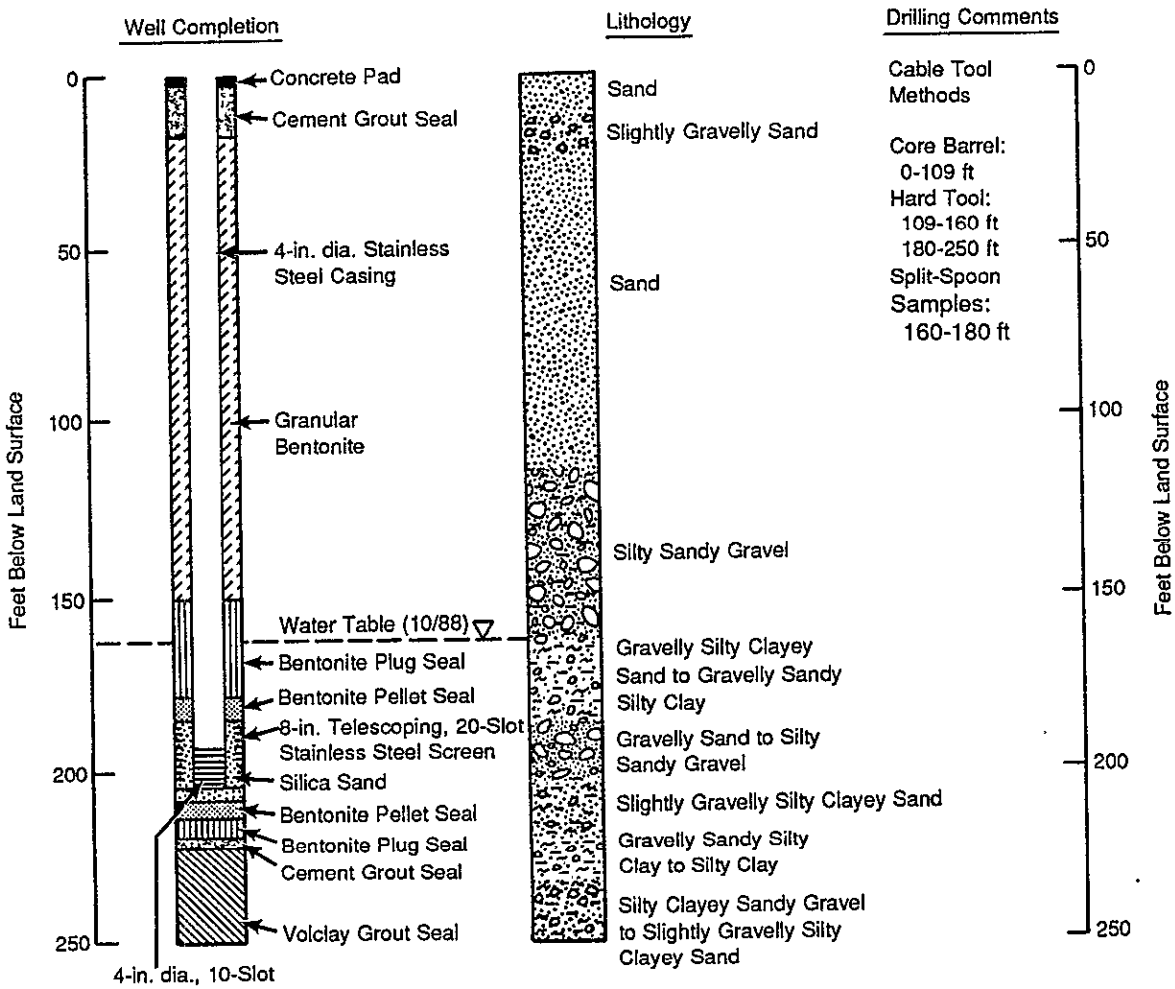
699-42-40C


Well Completion
Lithology
Drilling Comments
0
50
100
150
200
220
250
Feet Below Land Surface
8 inch Carbon Steel Casing
10 inch Carbon Steel Casing
Grouted from 200 - 220 feet
Total Drill Depth 390 Feet
Not to Scale
Soil
Slightly Sandy, Cobbly Gravel
Silt
Boulders, Cobbles and Gravel
Gravelly, Sandy, Silty Clay
Silty, Sandy Gravel
Clay
Silty, Sandy Gravel
Elephant Mountain Basalt
Cable Tool Methods from 0-220 and 317-390 feet
Air Rotary Methods from 220-317 feet
Hard Cemented Cobbles
Very Hard Drilling
Well Completed 04/82
Casing Elevation: 546.16 feet
Depth to Water: No recent measurement for the unconfined aquifer
Well 699 - 42-40 C is monitoring the Rattlesnake Ridge Interbed

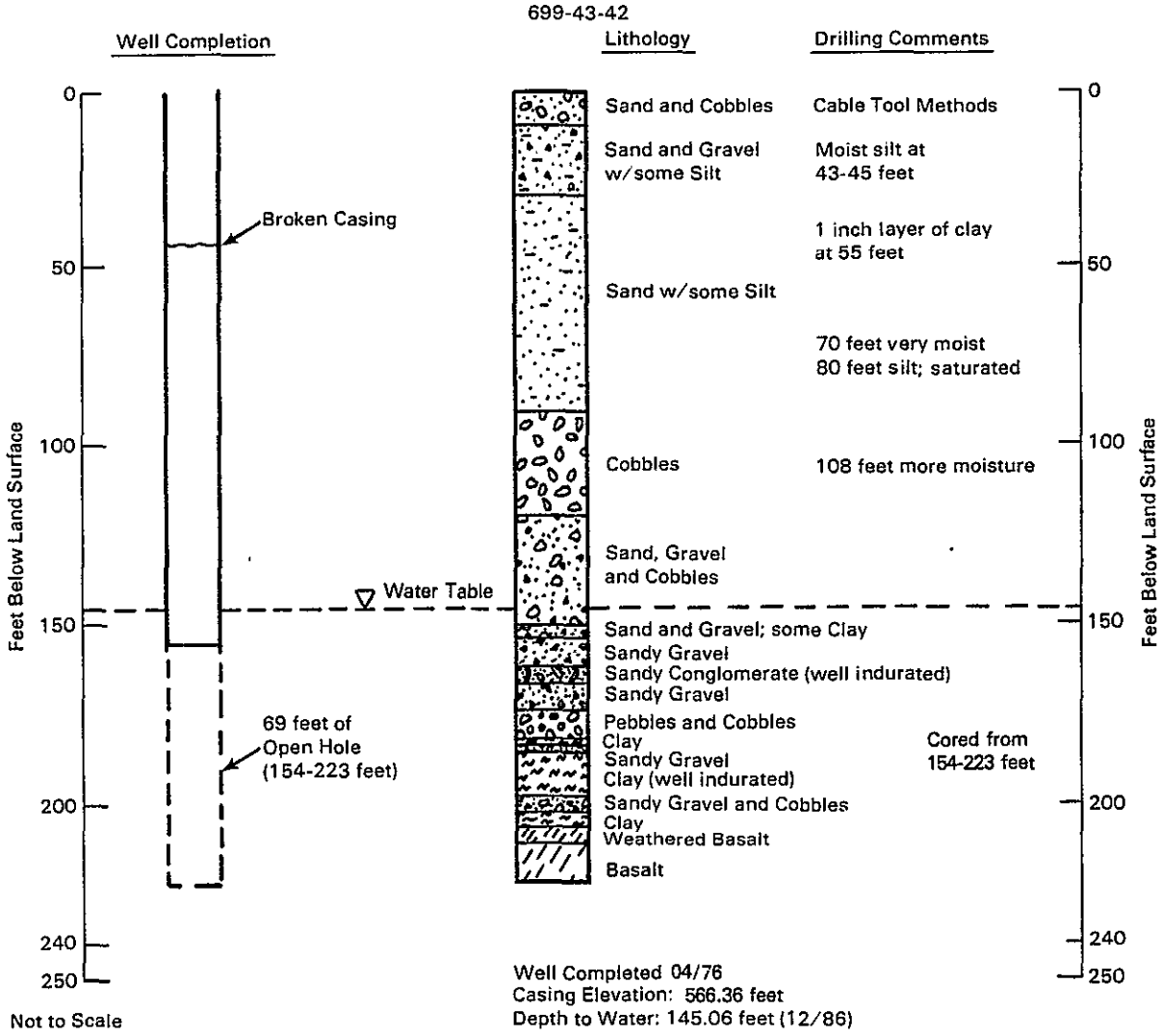
699-42-42


Well Completion
Lithology
Drilling Comments
8 inch Carbon Steel Casing
This well is no longer monitoring the Upper Aquifer
In 1977 the borehole was drilled to 1092 feet for the Basalt Waste Isolation Project (BWIP)
4 inch Carbon Steel Casing
Perforated and Grouted
Total Drill Depth 1092 Feet
Feet Below Land Surface
0
50
100
150
200
250
300
314
350
Sand and Top Soil
Sand and Gravel
Sand w/ occassional Silt
Gravel
Silt w/Small Chips of Basalt and Caliche
Silt and Conglomerate of Silt, Sand and Gravel
Conglomerate of Silt, Sand, Gravel and Ash(?) or Bluish Silt(?)
Shale-Basalt, Heavy Quartzite, Small Gravel
Conglomerate of Silt, Sand and Gravel
Black Mud, Gravel and Sand
Rotten Basalt Gravel
Basalt
Cable Tool Methods
Caves from 25-75 feet
Loses water quickly
Very loose formation
Caves at 159 feet
Drills slowly at 250 feet
Found two pieces of wood at 260 feet
Rotten basalt looks like cinders;
Very porous
Logged by Driller
Well Completed 08/56
Casing Elevation: 602.88 feet
Depth of Water: No Recent Measurement
Not to Scale

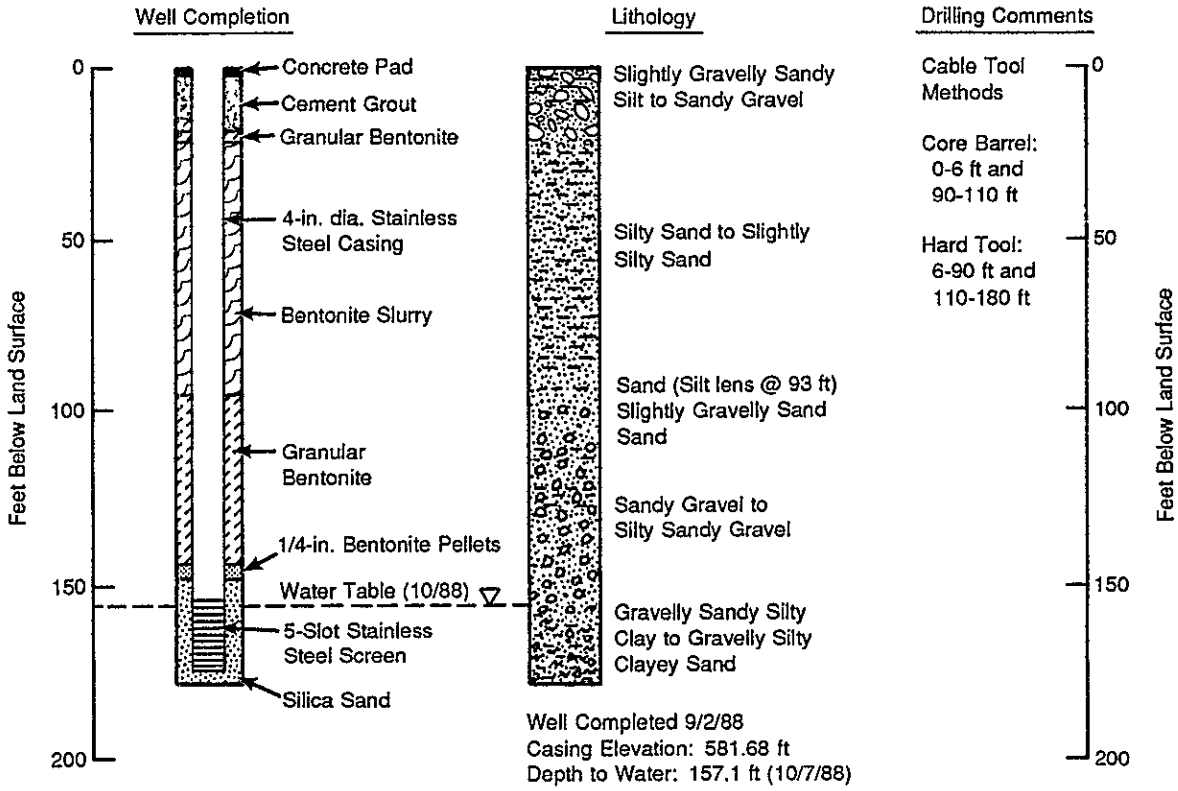
699-42-42B (BP-10)



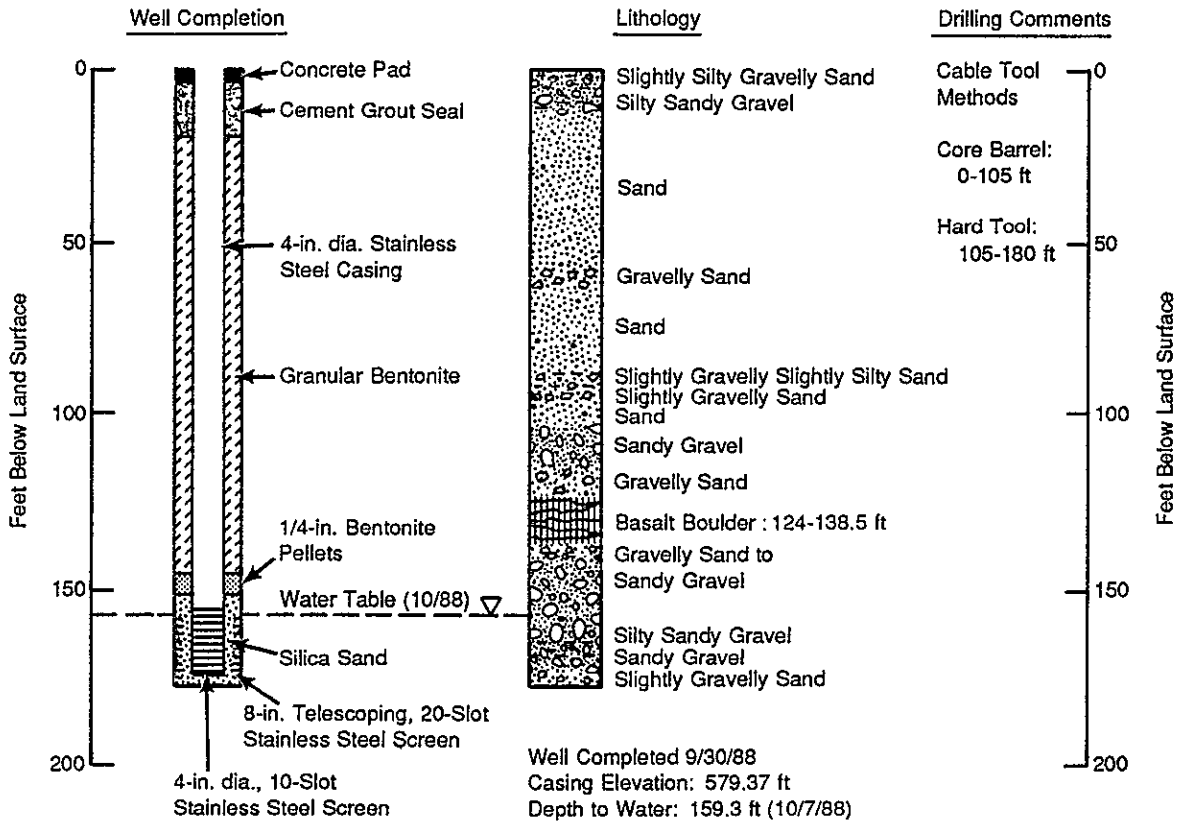
Well Completed 10/5/88
Casing Elevation: 583.23 ft
Depth to Water: 160.85 ft (10/7/88)


699-43-42
Well Completion
Lithology
Drilling Comments
Broken Casing
Water Table
69 feet of
Open Hole
(154-223 feet)
Feet Below Land Surface
0
50
100
150
200
240
250
Sand and Cobbles
Sand and Gravel
w/some Silt
Sand w/some Silt
Cobbles
Sand, Gravel
and Cobbles
Sand and Gravel; some Clay
Sandy Gravel
Sandy Conglomerate (well indurated)
Sandy Gravel
Pebbles and Cobbles
Clay
Sandy Gravel
Clay (well indurated)
Sandy Gravel and Cobbles
Clay
Weathered Basalt
Basalt
Cable Tool Methods
Moist silt at
43-45 feet
1 inch layer of clay
at 55 feet
70 feet very moist
80 feet silt; saturated
108 feet more moisture
Cored from
154-223 feet
Well Completed 04/76
Casing Elevation: 566.36 feet
Depth to Water: 145.06 feet (12/86)
Not to Scale

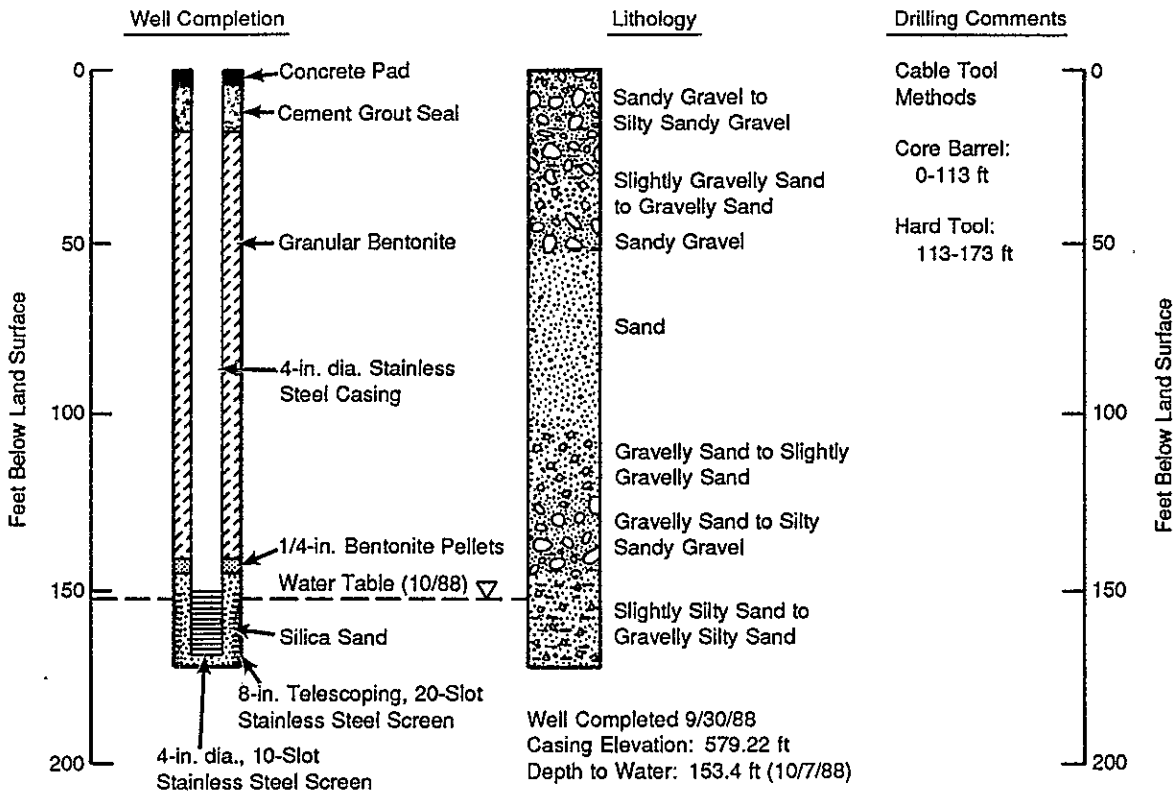
699-43-42J (BP-7)



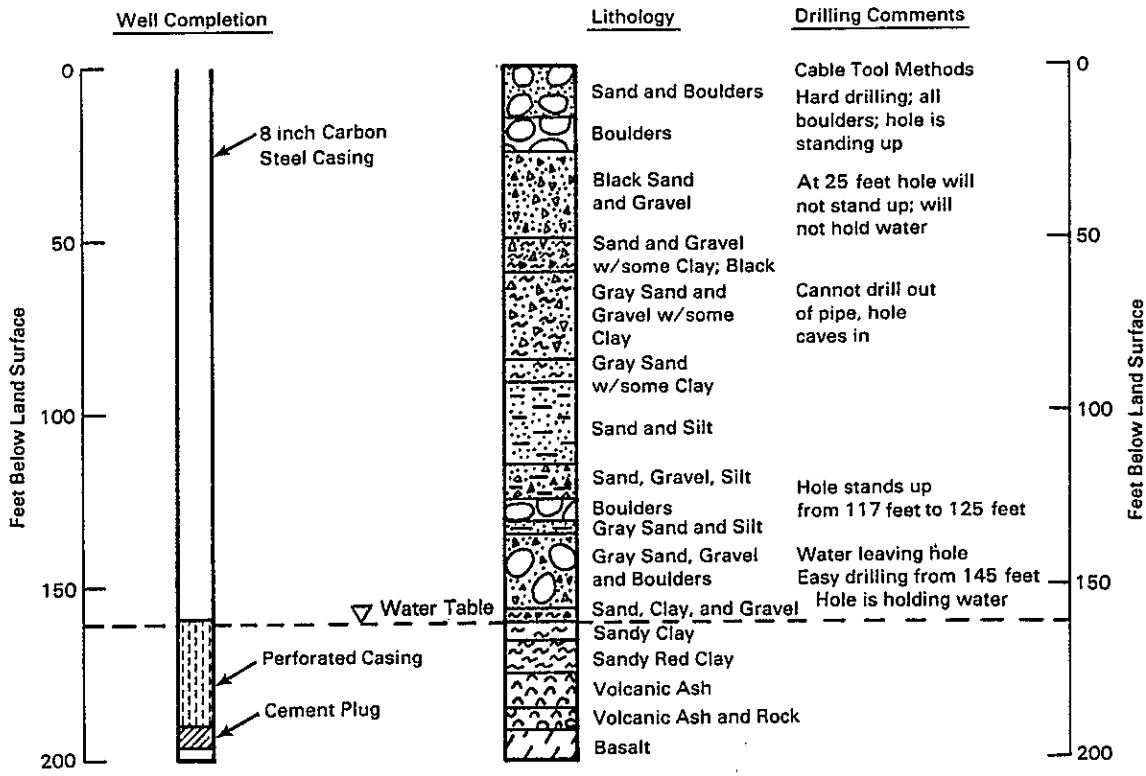
699-43-43 (BP-8)


Well Completion
Lithology
Drilling Comments
Concrete Pad
Cement Grout Seal
4-in. dia. Stainless Steel Casing
Granular Bentonite
1/4-in. Bentonite Pellets
Water Table (10/88)
Silica Sand
8-in. Telescoping, 20-Slot Stainless Steel Screen
4-in. dia., 10-Slot Stainless Steel Screen
Feet Below Land Surface
0
50
100
150
200
Slightly Silty Gravelly Sand
Silty Sandy Gravel
Sand
Gravelly Sand
Sand
Slightly Gravelly Slightly Silty Sand
Slightly Gravelly Sand
Sand
Sandy Gravel
Gravelly Sand
Basalt Boulder : 124-138.5 ft
Gravelly Sand to Sandy Gravel
Silty Sandy Gravel
Sandy Gravel
Slightly Gravelly Sand
Cable Tool Methods
Core Barrel: 0-105 ft
Hard Tool: 105-180 ft
Well Completed 9/30/88
Casing Elevation: 579.37 ft
Depth to Water: 159.3 ft (10/7/88)

699-44-42 (BP-3)


Well Completion
Lithology
Drilling Comments
Concrete Pad
Cement Grout Seal
Granular Bentonite
4-in. dia. Stainless Steel Casing
1/4-in. Bentonite Pellets
Water Table (10/88)
Silica Sand
8-in. Telescoping, 20-Slot Stainless Steel Screen
4-in. dia., 10-Slot Stainless Steel Screen
Feet Below Land Surface
0
50
100
150
200
Sandy Gravel to Silty Sandy Gravel
Slightly Gravelly Sand to Gravelly Sand
Sandy Gravel
Sand
Gravelly Sand to Slightly Gravelly Sand
Gravelly Sand to Silty Sandy Gravel
Slightly Silty Sand to Gravelly Silty Sand
Well Completed 9/30/88
Casing Elevation: 579.22 ft
Depth to Water: 153.4 ft (10/7/88)
Cable Tool Methods
Core Barrel: 0-113 ft
Hard Tool: 113-173 ft

699-45-42


Well Completion
Lithology
Drilling Comments
0
50
100
150
200
Feet Below Land Surface
8 inch Carbon Steel Casing
Water Table
Perforated Casing
Cement Plug
Sand and Boulders
Boulders
Black Sand and Gravel
Sand and Gravel w/some Clay; Black
Gray Sand and Gravel w/some Clay
Gray Sand w/some Clay
Sand and Silt
Sand, Gravel, Silt
Boulders
Gray Sand and Silt
Gray Sand, Gravel and Boulders
Sand, Clay, and Gravel
Sandy Clay
Sandy Red Clay
Volcanic Ash
Volcanic Ash and Rock
Basalt
Cable Tool Methods
Hard drilling; all boulders; hole is standing up
At 25 feet hole will not stand up; will not hold water
Cannot drill out of pipe, hole caves in
Hole stands up from 117 feet to 125 feet
Water leaving hole
Easy drilling from 145 feet
Hole is holding water
Not to Scale
Well Completed 06/48
Casing Elevation: 577.33 feet
Depth to Water: 159.32 feet (12/86)

APPENDIX B

WATER-CHEMISTRY DATA LISTINGS AND SUMMARIES

9 0 1 1 7 7 2 0 6 7 2

APPENDIX B

WATER-CHEMISTRY DATA LISTINGS AND SUMMARIES

This appendix presents an excerpt of existing water-chemistry data available for wells in the vicinity of B Pond. The results of the analyses for wells near B Pond are listed in Table B.1. Less than flags indicate levels below detection limits. Table B.2 presents the full name of the constituents analyzed for.

9011172067 3

TABLE B.1. Water-Chemistry Data

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	8/16/88	088	CONDLAB		5.2100E+02	UMHO/CM
2-E18-1	8/16/88	088	CONDLAB		5.2900E+02	UMHO/CM
2-E18-1	8/16/88	088	CONDLAB		5.3100E+02	UMHO/CM
2-E18-1	8/16/88	088	CONDLAB		5.3400E+02	UMHO/CM
2-E18-1	8/16/88	109	COLIFRM	<	2.2000E+00	MPN
2-E18-1	8/16/88	111	BETA		3.8900E+00	PCI/L
2-E18-1	8/16/88	181	RADIUM		2.1500E+00	PCI/L
2-E18-1	8/16/88	191	CONDFLD		8.0900E+02	UMHO/CM
2-E18-1	8/16/88	191	CONDFLD		8.1100E+02	UMHO/CM
2-E18-1	8/16/88	191	CONDFLD		8.1200E+02	UMHO/CM
2-E18-1	8/16/88	199	PHFIELD		7.8000E+00	
2-E18-1	8/16/88	199	PHFIELD		7.9000E+00	
2-E18-1	8/16/88	207	PH-LAB		7.9000E+00	
2-E18-1	8/16/88	212	ALPHA		2.2100E+00	PCI/L
2-E18-1	8/16/88	A01	BERYLUM	<	5.0000E+00	PPB
2-E18-1	8/16/88	A03	STRONUM		2.4900E+02	PPB
2-E18-1	8/16/88	A04	ZINC		1.8100E+02	PPB
2-E18-1	8/16/88	A05	CALCIUM		5.7300E+04	PPB
2-E18-1	8/16/88	A06	BARIUM		4.1000E+01	PPB
2-E18-1	8/16/88	A07	CADMIUM	<	2.0000E+00	PPB
2-E18-1	8/16/88	A08	CHROMUM		3.0000E+01	PPB
2-E18-1	8/16/88	A10	SILVER	<	1.0000E+01	PPB
2-E18-1	8/16/88	A11	SODIUM		2.8700E+04	PPB
2-E18-1	8/16/88	A12	NICKEL		1.5000E+01	PPB
2-E18-1	8/16/88	A13	COPPER	<	1.0000E+01	PPB
2-E18-1	8/16/88	A14	VANADUM	<	5.0000E+00	PPB
2-E18-1	8/16/88	A15	ANTIONY	<	1.0000E+02	PPB
2-E18-1	8/16/88	A16	ALUMNUM		3.5100E+02	PPB
2-E18-1	8/16/88	A17	MANGESE		7.0000E+01	PPB
2-E18-1	8/16/88	A18	POTASUM		6.3500E+03	PPB
2-E18-1	8/16/88	A19	IRON		1.2500E+03	PPB
2-E18-1	8/16/88	A20	ARSENIC	<	5.0000E+00	PPB
2-E18-1	8/16/88	A21	MERCURY	<	1.0000E-01	PPB
2-E18-1	8/16/88	A22	SELENUM		1.4900E+01	PPB
2-E18-1	8/16/88	A33	ENDRIN	<	1.0000E-01	PPB
2-E18-1	8/16/88	A34	METHLOR	<	3.0000E+00	PPB
2-E18-1	8/16/88	A35	TOXAENE	<	1.0000E+00	PPB
2-E18-1	8/16/88	A36	a-BHC	<	1.0000E-01	PPB
2-E18-1	8/16/88	A37	b-BHC	<	1.0000E-01	PPB
2-E18-1	8/16/88	A38	g-BHC	<	1.0000E-01	PPB
2-E18-1	8/16/88	A39	d-BHC	<	1.0000E-01	PPB
2-E18-1	8/16/88	A50	MAGNES		1.5300E+04	PPB
2-E18-1	8/16/88	A51	LEADGF	<	5.0000E+00	PPB
2-E18-1	8/16/88	C69	TOC	<	3.8200E+02	PPB
2-E18-1	8/16/88	C69	TOC	<	3.9700E+02	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	8/16/88	C69	TOC	<	5.3200E+02	PPB
2-E18-1	8/16/88	C69	TOC	<	8.9000E+02	PPB
2-E18-1	8/16/88	C72	NITRATE		1.0100E+04	PPB
2-E18-1	8/16/88	C73	SULFATE		1.6800E+05	PPB
2-E18-1	8/16/88	C74	FLUORID	<	5.0000E+02	PPB
2-E18-1	8/16/88	C75	CHLORID		6.5500E+03	PPB
2-E18-1	8/16/88	C76	PHOSPHA	<	1.0000E+03	PPB
2-E18-1	8/16/88	H13	2,4-D	<	2.0000E+00	PPB
2-E18-1	8/16/88	H14	2,4,5TP	<	2.0000E+00	PPB
2-E18-1	8/16/88	H18	FZINC		1.4500E+02	PPB
2-E18-1	8/16/88	H19	FCALCIU		7.0800E+04	PPB
2-E18-1	8/16/88	H20	FBARIUM		4.1000E+01	PPB
2-E18-1	8/16/88	H21	FCADMIU	<	2.0000E+00	PPB
2-E18-1	8/16/88	H22	FCHROMI	<	1.0000E+01	PPB
2-E18-1	8/16/88	H23	FSILVER	<	1.0000E+01	PPB
2-E18-1	8/16/88	H24	FSODIUM		3.1500E+04	PPB
2-E18-1	8/16/88	H25	FNICKEL	<	1.0000E+01	PPB
2-E18-1	8/16/88	H26	FCOPPER	<	1.0000E+01	PPB
2-E18-1	8/16/88	H27	FVANADI	<	5.0000E+00	PPB
2-E18-1	8/16/88	H28	FALUMIN	<	1.5000E+02	PPB
2-E18-1	8/16/88	H29	FMANGAN		5.1000E+01	PPB
2-E18-1	8/16/88	H30	FPOTASS		6.9800E+03	PPB
2-E18-1	8/16/88	H31	FIRON		3.3000E+01	PPB
2-E18-1	8/16/88	H32	FMAGNES		1.7100E+04	PPB
2-E18-1	8/16/88	H33	FBERYLL	<	5.0000E+00	PPB
2-E18-1	8/16/88	H35	FSTRONT		2.7700E+02	PPB
2-E18-1	8/16/88	H36	FANTIMO	<	1.0000E+02	PPB
2-E18-1	8/16/88	H37	FARSENI	<	5.0000E+00	PPB
2-E18-1	8/16/88	H38	FMERCUR	<	1.0000E-01	PPB
2-E18-1	8/16/88	H39	FSELENI		1.0700E+01	PPB
2-E18-1	8/16/88	H41	FLEAD	<	5.0000E+00	PPB
2-E18-1	8/16/88	H42	TOXLDL	<	-4.8000E+00	PPB
2-E18-1	8/16/88	H42	TOXLDL	<	1.3000E+00	PPB
2-E18-1	8/16/88	H42	TOXLDL	<	1.1400E+01	PPB
2-E18-1	8/16/88	H42	TOXLDL	<	1.1500E+01	PPB
2-E18-1	8/16/88	H57	LPHENOL	<	1.0000E+01	PPB
2-E18-1	9/22/88	A04	ZINC		7.3000E+01	PPB
2-E18-1	9/22/88	A05	CALCIUM		7.2800E+04	PPB
2-E18-1	9/22/88	A06	BARIUM		5.4000E+01	PPB
2-E18-1	9/22/88	A07	CADMIUM	<	2.0000E+00	PPB
2-E18-1	9/22/88	A08	CHROMUM		1.0400E+02	PPB
2-E18-1	9/22/88	A10	SILVER	<	1.0000E+01	PPB
2-E18-1	9/22/88	A11	SODIUM		2.8800E+04	PPB
2-E18-1	9/22/88	A12	NICKEL		4.8000E+01	PPB
2-E18-1	9/22/88	A13	COPPER	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	9/22/88	A14	VANADUM		5.0000E+00	PPB
2-E18-1	9/22/88	A16	ALUMNUM		6.0900E+02	PPB
2-E18-1	9/22/88	A17	MANGESE		4.6000E+01	PPB
2-E18-1	9/22/88	A18	POTASUM		7.2000E+03	PPB
2-E18-1	9/22/88	A19	IRON		1.8100E+03	PPB
2-E18-1	9/22/88	A20	ARSENIC	<	5.0000E+00	PPB
2-E18-1	9/22/88	A22	SELENUM		1.0000E+01	PPB
2-E18-1	9/22/88	A50	MAGNES		1.7000E+04	PPB
2-E18-1	9/22/88	H18	FZINC		4.6000E+01	PPB
2-E18-1	9/22/88	H19	FCALCIU		7.3700E+04	PPB
2-E18-1	9/22/88	H20	FBARIUM		4.8000E+01	PPB
2-E18-1	9/22/88	H21	FCADMIU	<	2.0000E+00	PPB
2-E18-1	9/22/88	H22	FCHROMI	<	1.0000E+01	PPB
2-E18-1	9/22/88	H23	FSILVER	<	1.0000E+01	PPB
2-E18-1	9/22/88	H24	FSODIUM		2.7400E+04	PPB
2-E18-1	9/22/88	H25	FNICKEL	<	1.0000E+01	PPB
2-E18-1	9/22/88	H26	FCOPPER	<	1.0000E+01	PPB
2-E18-1	9/22/88	H27	FVANADI	<	5.0000E+00	PPB
2-E18-1	9/22/88	H28	FALUMIN	<	1.5000E+02	PPB
2-E18-1	9/22/88	H29	FMANGAN		1.9000E+01	PPB
2-E18-1	9/22/88	H30	FPOTASS		6.8700E+03	PPB
2-E18-1	9/22/88	H31	FIRON	<	3.0000E+01	PPB
2-E18-1	9/22/88	H32	FMAGNES		1.6500E+04	PPB
2-E18-1	9/22/88	H37	FARSENI	<	5.0000E+00	PPB
2-E18-1	9/22/88	H39	FSELENI		8.6000E+00	PPB
2-E18-1	11/10/88	088	CONDLAB		5.7100E+02	UMHO/CM
2-E18-1	11/10/88	088	CONDLAB		5.8300E+02	UMHO/CM
2-E18-1	11/10/88	088	CONDLAB		5.8600E+02	UMHO/CM
2-E18-1	11/10/88	088	CONDLAB		5.8800E+02	UMHO/CM
2-E18-1	11/10/88	108	TRITIUM	<	-2.8700E+02	PCI/L
2-E18-1	11/10/88	109	COLIFRM	<	2.2000E+00	MPN
2-E18-1	11/10/88	111	BETA		8.4500E+00	PCI/L
2-E18-1	11/10/88	111	BETA		1.0700E+01	PCI/L
2-E18-1	11/10/88	181	RADIUM		2.0700E-01	PCI/L
2-E18-1	11/10/88	181	RADIUM		2.7200E-01	PCI/L
2-E18-1	11/10/88	191	CONDFLD		5.9300E+02	UMHO/CM
2-E18-1	11/10/88	191	CONDFLD		5.9400E+02	UMHO/CM
2-E18-1	11/10/88	191	CONDFLD		5.9500E+02	UMHO/CM
2-E18-1	11/10/88	199	PHFIELD		8.5000E+00	
2-E18-1	11/10/88	199	PHFIELD		8.6000E+00	
2-E18-1	11/10/88	207	PH-LAB		7.9000E+00	
2-E18-1	11/10/88	207	PH-LAB		8.0000E+00	
2-E18-1	11/10/88	212	ALPHA		3.8300E+00	PCI/L
2-E18-1	11/10/88	212	ALPHA		3.9000E+00	PCI/L
2-E18-1	11/10/88	A01	BERYLUM	<	5.0000E+00	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/10/88	A03	STRONUM		2.4100E+02	PPB
2-E18-1	11/10/88	A03	STRONUM		2.4900E+02	PPB
2-E18-1	11/10/88	A04	ZINC		5.3000E+01	PPB
2-E18-1	11/10/88	A04	ZINC		7.9000E+01	PPB
2-E18-1	11/10/88	A05	CALCIUM		5.7700E+04	PPB
2-E18-1	11/10/88	A05	CALCIUM		6.7400E+04	PPB
2-E18-1	11/10/88	A06	BARIUM		3.8000E+01	PPB
2-E18-1	11/10/88	A06	BARIUM		4.2000E+01	PPB
2-E18-1	11/10/88	A07	CADMIUM	<	2.0000E+00	PPB
2-E18-1	11/10/88	A08	CHROMUM		2.0000E+01	PPB
2-E18-1	11/10/88	A08	CHROMUM		3.0000E+01	PPB
2-E18-1	11/10/88	A10	SILVER	<	1.0000E+01	PPB
2-E18-1	11/10/88	A11	SODIUM		2.5900E+04	PPB
2-E18-1	11/10/88	A11	SODIUM		2.7000E+04	PPB
2-E18-1	11/10/88	A12	NICKEL		1.9000E+01	PPB
2-E18-1	11/10/88	A12	NICKEL		2.5000E+01	PPB
2-E18-1	11/10/88	A13	COPPER		1.2000E+01	PPB
2-E18-1	11/10/88	A13	COPPER	<	1.0000E+01	PPB
2-E18-1	11/10/88	A14	VANADUM		6.0000E+00	PPB
2-E18-1	11/10/88	A14	VANADUM	<	5.0000E+00	PPB
2-E18-1	11/10/88	A15	ANTIONY	<	1.0000E+02	PPB
2-E18-1	11/10/88	A16	ALUMNUM	<	1.5000E+02	PPB
2-E18-1	11/10/88	A17	MANGESE		1.2000E+01	PPB
2-E18-1	11/10/88	A18	POTASUM		6.3300E+03	PPB
2-E18-1	11/10/88	A18	POTASUM		6.4100E+03	PPB
2-E18-1	11/10/88	A19	IRON		2.6500E+02	PPB
2-E18-1	11/10/88	A19	IRON		3.5500E+02	PPB
2-E18-1	11/10/88	A20	ARSENIC	<	5.0000E+00	PPB
2-E18-1	11/10/88	A21	MERCURY	<	1.0000E-01	PPB
2-E18-1	11/10/88	A22	SELENUM		7.0000E+00	PPB
2-E18-1	11/10/88	A23	THALIUM	<	5.0000E+00	PPB
2-E18-1	11/10/88	A50	MAGNES		1.4700E+04	PPB
2-E18-1	11/10/88	A50	MAGNES		1.5200E+04	PPB
2-E18-1	11/10/88	A51	LEADGF	<	5.0000E+00	PPB
2-E18-1	11/10/88	A54	AR1016	<	1.0000E+00	PPB
2-E18-1	11/10/88	A55	AR1221	<	1.0000E+00	PPB
2-E18-1	11/10/88	A56	AR1232	<	1.0000E+00	PPB
2-E18-1	11/10/88	A57	AR1242	<	1.0000E+00	PPB
2-E18-1	11/10/88	A58	AR1248	<	1.0000E+00	PPB
2-E18-1	11/10/88	A59	AR1254	<	1.0000E+00	PPB
2-E18-1	11/10/88	A60	AR1260	<	1.0000E+00	PPB
2-E18-1	11/10/88	A61	TETRANE	<	5.0000E+00	PPB
2-E18-1	11/10/88	A62	BENZENE	<	5.0000E+00	PPB
2-E18-1	11/10/88	A63	DIOXANE	<	5.0000E+02	PPB
2-E18-1	11/10/88	A64	METHONE	<	1.0000E+01	PPB

9 0 1 1 7 7 2 0 6 7 7

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/10/88	A65	PYRIDIN	<	5.0000E+02	PPB
2-E18-1	11/10/88	A66	TOLUENE	<	5.0000E+00	PPB
2-E18-1	11/10/88	A67	1,1,1-T	<	5.0000E+00	PPB
2-E18-1	11/10/88	A68	1,1,2-T	<	5.0000E+00	PPB
2-E18-1	11/10/88	A69	TRICENE	<	5.0000E+00	PPB
2-E18-1	11/10/88	A70	PERCENE	<	5.0000E+00	PPB
2-E18-1	11/10/88	A71	OPXYLE	<	5.0000E+00	PPB
2-E18-1	11/10/88	A72	ACROLIN	<	1.0000E+01	PPB
2-E18-1	11/10/88	A73	ACRYILE	<	1.0000E+01	PPB
2-E18-1	11/10/88	A74	BISTHER	<	1.0000E+01	PPB
2-E18-1	11/10/88	A75	BROMONE	<	1.0000E+01	PPB
2-E18-1	11/10/88	A76	METHBRO	<	1.0000E+01	PPB
2-E18-1	11/10/88	A77	CARBIDE	<	1.0000E+01	PPB
2-E18-1	11/10/88	A78	CHLBENZ	<	1.0000E+01	PPB
2-E18-1	11/10/88	A79	CHLTHER	<	1.0000E+01	PPB
2-E18-1	11/10/88	A80	CHLFORM	<	5.0000E+00	PPB
2-E18-1	11/10/88	A81	METHCHL	<	1.0000E+01	PPB
2-E18-1	11/10/88	A82	CHMTHER	<	1.0000E+01	PPB
2-E18-1	11/10/88	A83	CROTONA	<	1.0000E+01	PPB
2-E18-1	11/10/88	A84	DIBRCHL	<	1.0000E+01	PPB
2-E18-1	11/10/88	A85	DIBRETH	<	1.0000E+01	PPB
2-E18-1	11/10/88	A86	DIBRMET	<	1.0000E+01	PPB
2-E18-1	11/10/88	A87	DIBUTEN	<	1.0000E+01	PPB
2-E18-1	11/10/88	A88	DICDIFM	<	1.0000E+01	PPB
2-E18-1	11/10/88	A89	1,1-DIC	<	1.0000E+01	PPB
2-E18-1	11/10/88	A90	1,2-DIC	<	1.0000E+01	PPB
2-E18-1	11/10/88	A91	TRANDCE	<	1.0000E+01	PPB
2-E18-1	11/10/88	A92	DICETHY	<	1.0000E+01	PPB
2-E18-1	11/10/88	A93	METHYCH	<	1.0000E+01	PPB
2-E18-1	11/10/88	A94	DICPANE	<	1.0000E+01	PPB
2-E18-1	11/10/88	A95	DICPENE	<	1.0000E+01	PPB
2-E18-1	11/10/88	A96	NNDIEHY	<	1.0000E+01	PPB
2-E18-1	11/10/88	A99	HYDRSUL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B01	IODOMET	<	1.0000E+01	PPB
2-E18-1	11/10/88	B02	METHACR	<	1.0000E+01	PPB
2-E18-1	11/10/88	B03	METHTHI	<	1.0000E+01	PPB
2-E18-1	11/10/88	B04	PENTACH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B05	1112-tc	<	1.0000E+01	PPB
2-E18-1	11/10/88	B06	1122-tc	<	1.0000E+01	PPB
2-E18-1	11/10/88	B08	BROMORM	<	1.0000E+01	PPB
2-E18-1	11/10/88	B09	TRCMEOL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B10	TRCMFLM	<	1.0000E+01	PPB
2-E18-1	11/10/88	B11	TRCPANE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B12	123-trp	<	1.0000E+01	PPB
2-E18-1	11/10/88	B13	VINYIDE	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/10/88	B14	M-XYLE	<	5.0000E+00	PPB
2-E18-1	11/10/88	B15	DIETHY	<	1.0000E+01	PPB
2-E18-1	11/10/88	B19	ACETILE	<	3.0000E+03	PPB
2-E18-1	11/10/88	B20	ACETOPH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B21	WARFRIN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B22	ACEFENE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B23	AMINOYL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B24	AMIISOX	<	1.0000E+01	PPB
2-E18-1	11/10/88	B25	AMITROL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B26	ANILINE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B27	ARAMITE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B28	AURAMIN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B29	BENZCAC	<	1.0000E+01	PPB
2-E18-1	11/10/88	B30	BENZAAN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B31	BENDICM	<	1.0000E+01	PPB
2-E18-1	11/10/88	B32	BENTHOL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B33	BENDINE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B34	BENZBFL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B35	BENZJFL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B36	PBENZQU	<	1.0000E+01	PPB
2-E18-1	11/10/88	B37	BENZCHL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B38	BIS2CHM	<	1.0000E+01	PPB
2-E18-1	11/10/88	B39	BIS2CHE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B40	BIS2EPH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B41	BROPHEN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B42	BUTBENP	<	1.0000E+01	PPB
2-E18-1	11/10/88	B43	BUTDINP	<	1.0000E+01	PPB
2-E18-1	11/10/88	B44	CHALETH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B45	CHLANIL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B46	CHLCRES	<	1.0000E+01	PPB
2-E18-1	11/10/88	B47	CHLEPOX	<	1.0000E+01	PPB
2-E18-1	11/10/88	B48	CHLNAPH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B49	CHLPHEN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B50	CHRYSEN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B51	CRESOLS	<	1.0000E+01	PPB
2-E18-1	11/10/88	B52	CYCHDIN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B53	DIBAHAC	<	1.0000E+01	PPB
2-E18-1	11/10/88	B54	DIBAJAC	<	1.0000E+01	PPB
2-E18-1	11/10/88	B55	DIBAHAN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B56	DIBCGCA	<	1.0000E+01	PPB
2-E18-1	11/10/88	B57	DIBAEPY	<	1.0000E+01	PPB
2-E18-1	11/10/88	B58	DIBAHPY	<	1.0000E+01	PPB
2-E18-1	11/10/88	B59	DIBAIPY	<	1.0000E+01	PPB
2-E18-1	11/10/88	B60	DIBPHTH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B61	12-dben	<	1.0000E+01	PPB

9 0 1 1 7 7 2 0 6 7 9

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/10/88	B62	13-dben	<	1.0000E+01	PPB
2-E18-1	11/10/88	B63	14-dben	<	1.0000E+01	PPB
2-E18-1	11/10/88	B64	DICHBEN	<	2.0000E+01	PPB
2-E18-1	11/10/88	B65	24-dchp	<	1.0000E+01	PPB
2-E18-1	11/10/88	B66	26-dchp	<	1.0000E+01	PPB
2-E18-1	11/10/88	B67	DIEPHTH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B68	DIHYSAF	<	1.0000E+01	PPB
2-E18-1	11/10/88	B69	DIMETHB	<	1.0000E+01	PPB
2-E18-1	11/10/88	B70	DIMEAMB	<	1.0000E+01	PPB
2-E18-1	11/10/88	B71	DIMBENZ	<	1.0000E+01	PPB
2-E18-1	11/10/88	B72	DIMEYLB	<	1.0000E+01	PPB
2-E18-1	11/10/88	B73	THIONOX	<	1.0000E+01	PPB
2-E18-1	11/10/88	B74	DIMPHAM	<	1.0000E+01	PPB
2-E18-1	11/10/88	B75	DIMPHEN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B76	DIMPHTH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B77	DINBENZ	<	1.0000E+01	PPB
2-E18-1	11/10/88	B78	DINCRES	<	1.0000E+01	PPB
2-E18-1	11/10/88	B79	DINPHEN	<	5.0000E+01	PPB
2-E18-1	11/10/88	B80	24-dint	<	1.0000E+01	PPB
2-E18-1	11/10/88	B81	26-dint	<	1.0000E+01	PPB
2-E18-1	11/10/88	B82	DIOPHTH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B83	DIPHAMI	<	1.0000E+01	PPB
2-E18-1	11/10/88	B84	DIPHHYD	<	1.0000E+01	PPB
2-E18-1	11/10/88	B85	DIPRNIT	<	1.0000E+01	PPB
2-E18-1	11/10/88	B86	ETHMINE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B87	ETHMETS	<	1.0000E+01	PPB
2-E18-1	11/10/88	B88	FLUORAN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B89	HEXCBEN	<	1.0000E+01	PPB
2-E18-1	11/10/88	B90	HEXCBUT	<	1.0000E+01	PPB
2-E18-1	11/10/88	B91	HEXCCYC	<	1.0000E+01	PPB
2-E18-1	11/10/88	B92	HEXCETH	<	1.0000E+01	PPB
2-E18-1	11/10/88	B93	INDENOP	<	1.0000E+01	PPB
2-E18-1	11/10/88	B94	ISOSOLE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B95	MALOILE	<	1.0000E+01	PPB
2-E18-1	11/10/88	B96	MELPHAL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B97	METHAPY	<	1.0000E+01	PPB
2-E18-1	11/10/88	B98	METHNYL	<	1.0000E+01	PPB
2-E18-1	11/10/88	B99	METAZIR	<	1.0000E+01	PPB
2-E18-1	11/10/88	C01	METCHAN	<	1.0000E+01	PPB
2-E18-1	11/10/88	C02	METBISC	<	1.0000E+01	PPB
2-E18-1	11/10/88	C03	METACTO	<	1.0000E+01	PPB
2-E18-1	11/10/88	C04	METACRY	<	1.0000E+01	PPB
2-E18-1	11/10/88	C05	METMSUL	<	1.0000E+01	PPB
2-E18-1	11/10/88	C06	METPROP	<	1.0000E+01	PPB
2-E18-1	11/10/88	C07	METHIOU	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/10/88	C08	NAPHQUI	<	1.0000E+01	PPB
2-E18-1	11/10/88	C09	1-napha	<	1.0000E+01	PPB
2-E18-1	11/10/88	C10	2-napha	<	1.0000E+01	PPB
2-E18-1	11/10/88	C11	NITRANI	<	5.0000E+01	PPB
2-E18-1	11/10/88	C12	NITBENZ	<	1.0000E+01	PPB
2-E18-1	11/10/88	C13	NITPHEN	<	5.0000E+01	PPB
2-E18-1	11/10/88	C14	NNIBUTY	<	1.0000E+01	PPB
2-E18-1	11/10/88	C15	NNIDIEA	<	1.0000E+01	PPB
2-E18-1	11/10/88	C16	NNIDIEY	<	1.0000E+01	PPB
2-E18-1	11/10/88	C17	NNIDIME	<	1.0000E+01	PPB
2-E18-1	11/10/88	C18	NNIMETH	<	1.0000E+01	PPB
2-E18-1	11/10/88	C19	NNIURET	<	1.0000E+01	PPB
2-E18-1	11/10/88	C20	NNIVINY	<	1.0000E+01	PPB
2-E18-1	11/10/88	C21	NNIMORP	<	1.0000E+01	PPB
2-E18-1	11/10/88	C22	NNINICO	<	1.0000E+01	PPB
2-E18-1	11/10/88	C23	NNIPIPE	<	1.0000E+01	PPB
2-E18-1	11/10/88	C24	NITRPYR	<	1.0000E+01	PPB
2-E18-1	11/10/88	C25	NITRTOL	<	1.0000E+01	PPB
2-E18-1	11/10/88	C26	PENTCHB	<	1.0000E+01	PPB
2-E18-1	11/10/88	C27	PENTCHN	<	1.0000E+01	PPB
2-E18-1	11/10/88	C28	PENTCHP	<	5.0000E+01	PPB
2-E18-1	11/10/88	C29	PHENTIN	<	1.0000E+01	PPB
2-E18-1	11/10/88	C30	PHENINE	<	1.0000E+01	PPB
2-E18-1	11/10/88	C31	PHTHEST	<	1.0000E+01	PPB
2-E18-1	11/10/88	C32	PICOLIN	<	1.0000E+01	PPB
2-E18-1	11/10/88	C33	PRONIDE	<	1.0000E+01	PPB
2-E18-1	11/10/88	C34	RESERPI	<	1.0000E+01	PPB
2-E18-1	11/10/88	C35	RESORCI	<	1.0000E+01	PPB
2-E18-1	11/10/88	C36	SAFROL	<	1.0000E+01	PPB
2-E18-1	11/10/88	C37	TETRCHB	<	1.0000E+01	PPB
2-E18-1	11/10/88	C39	TETRCHP	<	1.0000E+01	PPB
2-E18-1	11/10/88	C40	THIURAM	<	1.0000E+01	PPB
2-E18-1	11/10/88	C41	TOLUDIA	<	1.0000E+01	PPB
2-E18-1	11/10/88	C42	OTOLHYD	<	1.0000E+01	PPB
2-E18-1	11/10/88	C43	TRICHLB	<	1.0000E+01	PPB
2-E18-1	11/10/88	C44	245-trp	<	5.0000E+01	PPB
2-E18-1	11/10/88	C45	246-trp	<	1.0000E+01	PPB
2-E18-1	11/10/88	C46	TRIPHOS	<	1.0000E+01	PPB
2-E18-1	11/10/88	C47	SYMTRIN	<	1.0000E+01	PPB
2-E18-1	11/10/88	C48	TRISPHO	<	1.0000E+01	PPB
2-E18-1	11/10/88	C49	BENZOPY	<	1.0000E+01	PPB
2-E18-1	11/10/88	C50	CHLNAPZ	<	1.0000E+01	PPB
2-E18-1	11/10/88	C51	BIS2ETH	<	1.0000E+01	PPB
2-E18-1	11/10/88	C52	HEXAENE	<	1.0000E+01	PPB
2-E18-1	11/10/88	C53	HYDRAZI	<	3.0000E+03	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/10/88	C54	HEXACHL	<	1.0000E+01	PPB
2-E18-1	11/10/88	C55	NAPHTHA	<	1.0000E+01	PPB
2-E18-1	11/10/88	C56	123TRI	<	1.0000E+01	PPB
2-E18-1	11/10/88	C57	PHENOL	<	1.0000E+01	PPB
2-E18-1	11/10/88	C58	135TRI	<	1.0000E+01	PPB
2-E18-1	11/10/88	C59	1234TE	<	1.0000E+01	PPB
2-E18-1	11/10/88	C60	1235TE	<	1.0000E+01	PPB
2-E18-1	11/10/88	C69	TOC	<	3.0000E+02	PPB
2-E18-1	11/10/88	C69	TOC	<	4.0000E+02	PPB
2-E18-1	11/10/88	C70	CYANIDE	<	1.0000E+01	PPB
2-E18-1	11/10/88	C71	FORMALN	<	5.0000E+02	PPB
2-E18-1	11/10/88	C72	NITRATE		8.4000E+03	PPB
2-E18-1	11/10/88	C73	SULFATE		1.6900E+05	PPB
2-E18-1	11/10/88	C73	SULFATE		1.7200E+05	PPB
2-E18-1	11/10/88	C74	FLUORID	<	5.0000E+02	PPB
2-E18-1	11/10/88	C75	CHLORID		6.2000E+03	PPB
2-E18-1	11/10/88	C75	CHLORID		6.8000E+03	PPB
2-E18-1	11/10/88	C76	PHOSPHA	<	1.0000E+03	PPB
2-E18-1	11/10/88	C77	PERCHLO	<	1.0000E+03	PPB
2-E18-1	11/10/88	C78	SULFIDE	<	1.0000E+03	PPB
2-E18-1	11/10/88	C79	KEROSEN	<	1.0000E+04	PPB
2-E18-1	11/10/88	C80	AMMONIU	<	5.0000E+01	PPB
2-E18-1	11/10/88	C86	DIOXIN	<	1.0000E-01	PPB
2-E18-1	11/10/88	C87	CITRUSR	<	1.0000E+03	PPB
2-E18-1	11/10/88	C90	PARALDE	<	2.0000E+03	PPB
2-E18-1	11/10/88	C91	STRYCHN	<	5.0000E+01	PPB
2-E18-1	11/10/88	C92	MALHYDR	<	5.0000E+02	PPB
2-E18-1	11/10/88	C93	NICOTIN	<	1.0000E+02	PPB
2-E18-1	11/10/88	C94	ACRYIDE	<	1.0000E+04	PPB
2-E18-1	11/10/88	C95	ALLYLAL	<	2.5000E+03	PPB
2-E18-1	11/10/88	C97	CHLACET	<	1.6000E+04	PPB
2-E18-1	11/10/88	C98	CHLPROP	<	4.0000E+03	PPB
2-E18-1	11/10/88	H03	ETHCARB	<	5.0000E+03	PPB
2-E18-1	11/10/88	H04	ETHCYAN	<	2.0000E+03	PPB
2-E18-1	11/10/88	H05	ETHOXID	<	3.0000E+03	PPB
2-E18-1	11/10/88	H06	ETHMETH	<	1.0000E+01	PPB
2-E18-1	11/10/88	H09	ISOBUTY	<	1.0000E+03	PPB
2-E18-1	11/10/88	H11	PROPYLA	<	1.0000E+04	PPB
2-E18-1	11/10/88	H12	PROPYNO	<	8.0000E+03	PPB
2-E18-1	11/10/88	H13	2,4-D	<	2.0000E+00	PPB
2-E18-1	11/10/88	H14	2,4,5TP	<	2.0000E+00	PPB
2-E18-1	11/10/88	H15	2,4,5-T	<	2.0000E+00	PPB
2-E18-1	11/10/88	H16	TC		2.1500E+04	PPB
2-E18-1	11/10/88	H18	FZINC		2.6000E+01	PPB
2-E18-1	11/10/88	H18	FZINC		4.1000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/10/88	H19	FCALCIU		5.8400E+04	PPB
2-E18-1	11/10/88	H19	FCALCIU		6.3200E+04	PPB
2-E18-1	11/10/88	H20	FBARIUM		3.8000E+01	PPB
2-E18-1	11/10/88	H20	FBARIUM		4.3000E+01	PPB
2-E18-1	11/10/88	H21	FCADMIU	<	2.0000E+00	PPB
2-E18-1	11/10/88	H22	FCHROMI	<	1.0000E+01	PPB
2-E18-1	11/10/88	H23	FSILVER	<	1.0000E+01	PPB
2-E18-1	11/10/88	H24	FSODIUM		2.6700E+04	PPB
2-E18-1	11/10/88	H24	FSODIUM		2.8100E+04	PPB
2-E18-1	11/10/88	H25	FNICKEL		1.5000E+01	PPB
2-E18-1	11/10/88	H25	FNICKEL		1.6000E+01	PPB
2-E18-1	11/10/88	H26	FCOPPER	<	1.0000E+01	PPB
2-E18-1	11/10/88	H27	FVANADI	<	5.0000E+00	PPB
2-E18-1	11/10/88	H28	FALUMIN	<	1.5000E+02	PPB
2-E18-1	11/10/88	H29	FMANGAN	<	5.0000E+00	PPB
2-E18-1	11/10/88	H30	FPOTASS		6.3800E+03	PPB
2-E18-1	11/10/88	H30	FPOTASS		6.5400E+03	PPB
2-E18-1	11/10/88	H31	FIRON	<	3.0000E+01	PPB
2-E18-1	11/10/88	H32	FMAGNES		1.4700E+04	PPB
2-E18-1	11/10/88	H32	FMAGNES		1.5300E+04	PPB
2-E18-1	11/10/88	H33	FBERYLL	<	5.0000E+00	PPB
2-E18-1	11/10/88	H35	FSTRONT		2.4100E+02	PPB
2-E18-1	11/10/88	H35	FSTRONT		2.5500E+02	PPB
2-E18-1	11/10/88	H36	FANTIMO	<	1.0000E+02	PPB
2-E18-1	11/10/88	H37	FARSENI	<	5.0000E+00	PPB
2-E18-1	11/10/88	H38	FMERCUR	<	1.0000E-01	PPB
2-E18-1	11/10/88	H39	FSELENI		6.0000E+00	PPB
2-E18-1	11/10/88	H39	FSELENI		7.0000E+00	PPB
2-E18-1	11/10/88	H40	FTHALLI	<	5.0000E+00	PPB
2-E18-1	11/10/88	H41	FLEAD	<	5.0000E+00	PPB
2-E18-1	11/10/88	H66	BROMIDE	<	1.0000E+03	PPB
2-E18-1	11/10/88	H67	NITRITE	<	1.0000E+03	PPB
2-E18-1	11/10/88	H68	HEXONE	<	1.0000E+01	PPB
2-E18-1	11/10/88	I01	ACETONE	<	1.0000E+00	PPB
2-E18-1	11/10/88	I01	ACETONE	<	2.0000E+00	PPB
2-E18-1	11/10/88	I01	ACETONE	<	3.0000E+00	PPB
2-E18-1	11/10/88	I09	BUTANOL	<	5.0000E+03	PPB
2-E18-1	11/10/88	I10	PROPANO	<	5.0000E+03	PPB
2-E18-1	11/10/88	I21	TRIBUPH	<	1.0000E+01	PPB
2-E18-1	11/10/88	I28	TAF	<	1.0000E+01	PPB
2-E18-1	11/10/88	I67	ETHANOL	<	5.0000E+03	PPB
2-E18-1	11/10/88	L20	MBP	<	5.0000E+03	PPB
2-E18-1	11/10/88	L21	DBP	<	5.0000E+03	PPB
2-E18-1	11/23/88	191	CONDFLD		6.3300E+02	UMHO/CM
2-E18-1	11/23/88	199	PHFIELD		8.5000E+00	

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/23/88	A61	TETRANE	<	5.0000E+00	PPB
2-E18-1	11/23/88	A62	BENZENE	<	5.0000E+00	PPB
2-E18-1	11/23/88	A63	DIOXANE	<	5.0000E+02	PPB
2-E18-1	11/23/88	A64	METHONE	<	1.0000E+01	PPB
2-E18-1	11/23/88	A65	PYRIDIN	<	5.0000E+02	PPB
2-E18-1	11/23/88	A66	TOLUENE	<	5.0000E+00	PPB
2-E18-1	11/23/88	A67	1,1,1-T	<	5.0000E+00	PPB
2-E18-1	11/23/88	A68	1,1,2-T	<	5.0000E+00	PPB
2-E18-1	11/23/88	A69	TRICENE	<	5.0000E+00	PPB
2-E18-1	11/23/88	A70	PERCENE	<	5.0000E+00	PPB
2-E18-1	11/23/88	A71	OPXYLE	<	5.0000E+00	PPB
2-E18-1	11/23/88	A72	ACROLIN	<	1.0000E+01	PPB
2-E18-1	11/23/88	A73	ACRYILE	<	1.0000E+01	PPB
2-E18-1	11/23/88	A74	BISTHER	<	1.0000E+01	PPB
2-E18-1	11/23/88	A75	BROMONE	<	1.0000E+01	PPB
2-E18-1	11/23/88	A76	METHBRO	<	1.0000E+01	PPB
2-E18-1	11/23/88	A77	CARBIDE	<	1.0000E+01	PPB
2-E18-1	11/23/88	A78	CHLBENZ	<	1.0000E+01	PPB
2-E18-1	11/23/88	A79	CHLTHER	<	1.0000E+01	PPB
2-E18-1	11/23/88	A80	CHLFORM	<	5.0000E+00	PPB
2-E18-1	11/23/88	A81	METHCHL	<	1.0000E+01	PPB
2-E18-1	11/23/88	A82	CHMTHER	<	1.0000E+01	PPB
2-E18-1	11/23/88	A83	CROTONA	<	1.0000E+01	PPB
2-E18-1	11/23/88	A84	DIBRCHL	<	1.0000E+01	PPB
2-E18-1	11/23/88	A85	DIBRETH	<	1.0000E+01	PPB
2-E18-1	11/23/88	A86	DIBRMET	<	1.0000E+01	PPB
2-E18-1	11/23/88	A87	DIBUTEN	<	1.0000E+01	PPB
2-E18-1	11/23/88	A88	DICDIFM	<	1.0000E+01	PPB
2-E18-1	11/23/88	A89	1,1-DIC	<	1.0000E+01	PPB
2-E18-1	11/23/88	A90	1,2-DIC	<	1.0000E+01	PPB
2-E18-1	11/23/88	A91	TRANDCE	<	1.0000E+01	PPB
2-E18-1	11/23/88	A92	DICETHY	<	1.0000E+01	PPB
2-E18-1	11/23/88	A93	METHYCH	<	1.0000E+01	PPB
2-E18-1	11/23/88	A94	DICPANE	<	1.0000E+01	PPB
2-E18-1	11/23/88	A95	DICPENE	<	1.0000E+01	PPB
2-E18-1	11/23/88	A96	NNDIEHY	<	1.0000E+01	PPB
2-E18-1	11/23/88	A99	HYDRSUL	<	1.0000E+01	PPB
2-E18-1	11/23/88	B01	IODOMET	<	1.0000E+01	PPB
2-E18-1	11/23/88	B02	METHACR	<	1.0000E+01	PPB
2-E18-1	11/23/88	B03	METHTHI	<	1.0000E+01	PPB
2-E18-1	11/23/88	B04	PENTACH	<	1.0000E+01	PPB
2-E18-1	11/23/88	B05	1112-tc	<	1.0000E+01	PPB
2-E18-1	11/23/88	B06	1122-tc	<	1.0000E+01	PPB
2-E18-1	11/23/88	B08	BROMORM	<	1.0000E+01	PPB
2-E18-1	11/23/88	B09	TRCMEOL	<	1.0000E+01	PPB

9 0 1 1 7 7 2 0 6 3 4

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E18-1	11/23/88	B10	TRCMFLM	<	1.0000E+01	PPB
2-E18-1	11/23/88	B11	TRCPANE	<	1.0000E+01	PPB
2-E18-1	11/23/88	B12	123-trp	<	1.0000E+01	PPB
2-E18-1	11/23/88	B13	VINYIDE	<	1.0000E+01	PPB
2-E18-1	11/23/88	B14	M-XYLE	<	5.0000E+00	PPB
2-E18-1	11/23/88	B15	DIETHY	<	1.0000E+01	PPB
2-E18-1	11/23/88	B19	ACETILE	<	3.0000E+03	PPB
2-E18-1	11/23/88	C04	METACRY	<	1.0000E+01	PPB
2-E18-1	11/23/88	C71	FORMALN	<	5.0000E+02	PPB
2-E18-1	11/23/88	H05	ETHOXID	<	3.0000E+03	PPB
2-E18-1	11/23/88	H06	ETHMETH	<	1.0000E+01	PPB
2-E18-1	11/23/88	H68	HEXONE	<	1.0000E+01	PPB
2-E18-1	11/23/88	I01	ACETONE	<	1.0000E+01	PPB
2-E18-1	11/23/88	I28	TAF	<	1.0000E+01	PPB
2-E32-4	9/27/88	010	CO-60	<	-7.9300E+00	PCI/L
2-E32-4	9/27/88	024	CS-137		6.5900E+00	PCI/L
2-E32-4	9/27/88	034	RU-106	<	0.0000E+00	PCI/L
2-E32-4	9/27/88	088	CONDLAB		4.1000E+02	UMHO/CM
2-E32-4	9/27/88	088	CONDLAB		4.1100E+02	UMHO/CM
2-E32-4	9/27/88	088	CONDLAB		4.1200E+02	UMHO/CM
2-E32-4	9/27/88	088	CONDLAB		4.1500E+02	UMHO/CM
2-E32-4	9/27/88	108	TRITIUM		1.8500E+03	PCI/L
2-E32-4	9/27/88	109	COLIFRM	<	2.2000E+00	MPN
2-E32-4	9/27/88	111	BETA		9.2200E+00	PCI/L
2-E32-4	9/27/88	121	SR 90	<	3.7000E-01	PCI/L
2-E32-4	9/27/88	124	U-CHEM		7.7300E+00	UG/L
2-E32-4	9/27/88	181	RADIUM	<	1.5100E-02	PCI/L
2-E32-4	9/27/88	191	CONDFLD		4.1000E+02	UMHO/CM
2-E32-4	9/27/88	197	TC-99	<	-4.3700E-01	PCI/L
2-E32-4	9/27/88	199	PHFIELD		7.9000E+00	
2-E32-4	9/27/88	199	PHFIELD		8.0000E+00	
2-E32-4	9/27/88	199	PHFIELD		8.1000E+00	
2-E32-4	9/27/88	207	PH-LAB		7.7000E+00	
2-E32-4	9/27/88	207	PH-LAB		7.8000E+00	
2-E32-4	9/27/88	212	ALPHA		4.5900E+00	PCI/L
2-E32-4	9/27/88	A01	BERYLUM	<	5.0000E+00	PPB
2-E32-4	9/27/88	A03	STRONUM		2.3400E+02	PPB
2-E32-4	9/27/88	A04	ZINC		6.0000E+00	PPB
2-E32-4	9/27/88	A05	CALCIUM		4.4900E+04	PPB
2-E32-4	9/27/88	A06	BARIUM		8.2000E+01	PPB
2-E32-4	9/27/88	A07	CADMIUM	<	2.0000E+00	PPB
2-E32-4	9/27/88	A08	CHROMUM		2.5000E+01	PPB
2-E32-4	9/27/88	A10	SILVER	<	1.0000E+01	PPB
2-E32-4	9/27/88	A11	SODIUM		3.0600E+04	PPB
2-E32-4	9/27/88	A12	NICKEL	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E32-4	9/27/88	A13	COPPER	<	1.0000E+01	PPB
2-E32-4	9/27/88	A14	VANADUM		1.9000E+01	PPB
2-E32-4	9/27/88	A15	ANTIONY	<	1.0000E+02	PPB
2-E32-4	9/27/88	A16	ALUMNUM	<	1.5000E+02	PPB
2-E32-4	9/27/88	A17	MANGESE	<	5.0000E+00	PPB
2-E32-4	9/27/88	A18	POTASUM		6.7900E+03	PPB
2-E32-4	9/27/88	A19	IRON		1.2300E+02	PPB
2-E32-4	9/27/88	A20	ARSENIC	<	5.0000E+00	PPB
2-E32-4	9/27/88	A21	MERCURY	<	1.0000E-01	PPB
2-E32-4	9/27/88	A22	SELENUM		7.0000E+00	PPB
2-E32-4	9/27/88	A23	THALIUM	<	5.0000E+00	PPB
2-E32-4	9/27/88	A24	THIOURA	<	2.0000E+02	PPB
2-E32-4	9/27/88	A25	ACETREA	<	2.0000E+02	PPB
2-E32-4	9/27/88	A26	CHLOREA	<	2.0000E+02	PPB
2-E32-4	9/27/88	A27	DIETROL	<	2.0000E+02	PPB
2-E32-4	9/27/88	A28	ETHYREA	<	2.0000E+02	PPB
2-E32-4	9/27/88	A29	NAPHREA	<	2.0000E+02	PPB
2-E32-4	9/27/88	A32	PHENREA	<	5.0000E+02	PPB
2-E32-4	9/27/88	A33	ENDRIN	<	1.0000E-01	PPB
2-E32-4	9/27/88	A34	METHLOR	<	3.0000E+00	PPB
2-E32-4	9/27/88	A35	TOXAENE	<	1.0000E+00	PPB
2-E32-4	9/27/88	A36	a-BHC	<	1.0000E-01	PPB
2-E32-4	9/27/88	A37	b-BHC	<	1.0000E-01	PPB
2-E32-4	9/27/88	A38	g-BHC	<	1.0000E-01	PPB
2-E32-4	9/27/88	A39	d-BHC	<	1.0000E-01	PPB
2-E32-4	9/27/88	A40	DDD	<	1.0000E-01	PPB
2-E32-4	9/27/88	A41	DDE	<	1.0000E-01	PPB
2-E32-4	9/27/88	A42	DDT	<	1.0000E-01	PPB
2-E32-4	9/27/88	A43	HEPTLOR	<	1.0000E-01	PPB
2-E32-4	9/27/88	A44	HEPTIDE	<	1.0000E-01	PPB
2-E32-4	9/27/88	A46	DIELRIN	<	1.0000E-01	PPB
2-E32-4	9/27/88	A47	ALDRIN	<	1.0000E-01	PPB
2-E32-4	9/27/88	A48	CHLOANE	<	1.0000E+00	PPB
2-E32-4	9/27/88	A49	ENDO1	<	1.0000E-01	PPB
2-E32-4	9/27/88	A50	MAGNES		1.4300E+04	PPB
2-E32-4	9/27/88	A51	LEADGF	<	5.0000E+00	PPB
2-E32-4	9/27/88	A52	ENDO2	<	1.0000E-01	PPB
2-E32-4	9/27/88	A54	AR1016	<	1.0000E+00	PPB
2-E32-4	9/27/88	A55	AR1221	<	1.0000E+00	PPB
2-E32-4	9/27/88	A56	AR1232	<	1.0000E+00	PPB
2-E32-4	9/27/88	A57	AR1242	<	1.0000E+00	PPB
2-E32-4	9/27/88	A58	AR1248	<	1.0000E+00	PPB
2-E32-4	9/27/88	A59	AR1254	<	1.0000E+00	PPB
2-E32-4	9/27/88	A60	AR1260	<	1.0000E+00	PPB
2-E32-4	9/27/88	A61	TETRANE	<	5.0000E+00	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E32-4	9/27/88	A62	BENZENE	<	5.0000E+00	PPB
2-E32-4	9/27/88	A63	DIOXANE	<	5.0000E+02	PPB
2-E32-4	9/27/88	A64	METHONE	<	1.0000E+01	PPB
2-E32-4	9/27/88	A65	PYRIDIN	<	5.0000E+02	PPB
2-E32-4	9/27/88	A66	TOLUENE	<	5.0000E+00	PPB
2-E32-4	9/27/88	A67	1,1,1-T	<	5.0000E+00	PPB
2-E32-4	9/27/88	A68	1,1,2-T	<	5.0000E+00	PPB
2-E32-4	9/27/88	A69	TRICENE	<	5.0000E+00	PPB
2-E32-4	9/27/88	A70	PERCENE	<	5.0000E+00	PPB
2-E32-4	9/27/88	A71	OPXYLE	<	5.0000E+00	PPB
2-E32-4	9/27/88	A72	ACROLIN	<	1.0000E+01	PPB
2-E32-4	9/27/88	A73	ACRYILE	<	1.0000E+01	PPB
2-E32-4	9/27/88	A74	BISTHER	<	1.0000E+01	PPB
2-E32-4	9/27/88	A75	BROMONE	<	1.0000E+01	PPB
2-E32-4	9/27/88	A76	METHBRO	<	1.0000E+01	PPB
2-E32-4	9/27/88	A77	CARBIDE	<	1.0000E+01	PPB
2-E32-4	9/27/88	A78	CHLBENZ	<	1.0000E+01	PPB
2-E32-4	9/27/88	A79	CHLTHER	<	1.0000E+01	PPB
2-E32-4	9/27/88	A80	CHLFORM	<	5.0000E+00	PPB
2-E32-4	9/27/88	A81	METHCHL	<	1.0000E+01	PPB
2-E32-4	9/27/88	A82	CHMTHER	<	1.0000E+01	PPB
2-E32-4	9/27/88	A83	CROTONA	<	1.0000E+01	PPB
2-E32-4	9/27/88	A84	DIBRCHL	<	1.0000E+01	PPB
2-E32-4	9/27/88	A85	DIBRETH	<	1.0000E+01	PPB
2-E32-4	9/27/88	A86	DIBRMET	<	1.0000E+01	PPB
2-E32-4	9/27/88	A87	DIBUTEN	<	1.0000E+01	PPB
2-E32-4	9/27/88	A88	DICDIFM	<	1.0000E+01	PPB
2-E32-4	9/27/88	A89	1,1-DIC	<	1.0000E+01	PPB
2-E32-4	9/27/88	A90	1,2-DIC	<	1.0000E+01	PPB
2-E32-4	9/27/88	A91	TRANDCE	<	1.0000E+01	PPB
2-E32-4	9/27/88	A92	DICETHY	<	1.0000E+01	PPB
2-E32-4	9/27/88	A93	METHYCH	<	1.0000E+01	PPB
2-E32-4	9/27/88	A94	DICPANE	<	1.0000E+01	PPB
2-E32-4	9/27/88	A95	DICPENE	<	1.0000E+01	PPB
2-E32-4	9/27/88	A96	NNDIEHY	<	1.0000E+01	PPB
2-E32-4	9/27/88	A99	HYDRSUL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B01	IODOMET	<	1.0000E+01	PPB
2-E32-4	9/27/88	B02	METHACR	<	1.0000E+01	PPB
2-E32-4	9/27/88	B03	METHTHI	<	1.0000E+01	PPB
2-E32-4	9/27/88	B04	PENTACH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B05	1112-tc	<	1.0000E+01	PPB
2-E32-4	9/27/88	B06	1122-tc	<	1.0000E+01	PPB
2-E32-4	9/27/88	B08	BROMORM	<	1.0000E+01	PPB
2-E32-4	9/27/88	B09	TRCMEOL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B10	TRCMFLM	<	1.0000E+01	PPB

9 0 1 1 7 7 2 0 6 9 7

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E32-4	9/27/88	B11	TRCPANE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B12	123-trp	<	1.0000E+01	PPB
2-E32-4	9/27/88	B13	VINYIDE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B14	M-XYLE	<	5.0000E+00	PPB
2-E32-4	9/27/88	B15	DIETHY	<	1.0000E+01	PPB
2-E32-4	9/27/88	B19	ACETILE	<	3.0000E+03	PPB
2-E32-4	9/27/88	B20	ACETOPH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B21	WARFRIN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B22	ACEFENE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B23	AMINOYL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B24	AMIISOX	<	1.0000E+01	PPB
2-E32-4	9/27/88	B25	AMITROL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B26	ANILINE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B27	ARAMITE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B28	AURAMIN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B29	BENZCAC	<	1.0000E+01	PPB
2-E32-4	9/27/88	B30	BENZAAN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B31	BENDICM	<	1.0000E+01	PPB
2-E32-4	9/27/88	B32	BENTHOL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B33	BENDINE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B34	BENZBFL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B35	BENZJFL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B36	PBENZQU	<	1.0000E+01	PPB
2-E32-4	9/27/88	B37	BENZCHL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B38	BIS2CHM	<	1.0000E+01	PPB
2-E32-4	9/27/88	B39	BIS2CHE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B40	BIS2EPH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B41	BROPHEN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B42	BUTBENP	<	1.0000E+01	PPB
2-E32-4	9/27/88	B43	BUTDINP	<	1.0000E+01	PPB
2-E32-4	9/27/88	B44	CHALETH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B45	CHLANIL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B46	CHLCRES	<	1.0000E+01	PPB
2-E32-4	9/27/88	B47	CHLEPOX	<	1.0000E+01	PPB
2-E32-4	9/27/88	B48	CHLNAPH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B49	CHLPHEN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B50	CHRYSEN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B51	CRESOLS	<	1.0000E+01	PPB
2-E32-4	9/27/88	B52	CYCHDIN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B53	DIBAHAC	<	1.0000E+01	PPB
2-E32-4	9/27/88	B54	DIBAJAC	<	1.0000E+01	PPB
2-E32-4	9/27/88	B55	DIBAHAN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B56	DIBCGCA	<	1.0000E+01	PPB
2-E32-4	9/27/88	B57	DIBAEPY	<	1.0000E+01	PPB
2-E32-4	9/27/88	B58	DIBAHPY	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E32-4	9/27/88	B59	DIBAIPY	<	1.0000E+01	PPB
2-E32-4	9/27/88	B60	DIBPHTH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B61	12-dben	<	1.0000E+01	PPB
2-E32-4	9/27/88	B62	13-dben	<	1.0000E+01	PPB
2-E32-4	9/27/88	B63	14-dben	<	1.0000E+01	PPB
2-E32-4	9/27/88	B64	DICHBEN	<	2.0000E+01	PPB
2-E32-4	9/27/88	B65	24-dchp	<	1.0000E+01	PPB
2-E32-4	9/27/88	B66	26-dchp	<	1.0000E+01	PPB
2-E32-4	9/27/88	B67	DIEPHTH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B68	DIHYSAF	<	1.0000E+01	PPB
2-E32-4	9/27/88	B69	DIMETHB	<	1.0000E+01	PPB
2-E32-4	9/27/88	B70	DIMEAMB	<	1.0000E+01	PPB
2-E32-4	9/27/88	B71	DIMBENZ	<	1.0000E+01	PPB
2-E32-4	9/27/88	B72	DIMEYLB	<	1.0000E+01	PPB
2-E32-4	9/27/88	B73	THIONOX	<	1.0000E+01	PPB
2-E32-4	9/27/88	B74	DIMPHAM	<	1.0000E+01	PPB
2-E32-4	9/27/88	B75	DIMPHEN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B76	DIMPHTH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B77	DINBENZ	<	1.0000E+01	PPB
2-E32-4	9/27/88	B78	DINCRES	<	1.0000E+01	PPB
2-E32-4	9/27/88	B79	DINPHEN	<	5.0000E+01	PPB
2-E32-4	9/27/88	B80	24-dint	<	1.0000E+01	PPB
2-E32-4	9/27/88	B81	26-dint	<	1.0000E+01	PPB
2-E32-4	9/27/88	B82	DIOPHTH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B83	DIPHAMI	<	1.0000E+01	PPB
2-E32-4	9/27/88	B84	DIPHHYD	<	1.0000E+01	PPB
2-E32-4	9/27/88	B85	DIPRNIT	<	1.0000E+01	PPB
2-E32-4	9/27/88	B86	ETHMINE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B87	ETHMETS	<	1.0000E+01	PPB
2-E32-4	9/27/88	B88	FLUORAN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B89	HEXCBEN	<	1.0000E+01	PPB
2-E32-4	9/27/88	B90	HEXCBUT	<	1.0000E+01	PPB
2-E32-4	9/27/88	B91	HEXCCYC	<	1.0000E+01	PPB
2-E32-4	9/27/88	B92	HEXCETH	<	1.0000E+01	PPB
2-E32-4	9/27/88	B93	INDENOP	<	1.0000E+01	PPB
2-E32-4	9/27/88	B94	ISOSOLE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B95	MALOILE	<	1.0000E+01	PPB
2-E32-4	9/27/88	B96	MELPHAL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B97	METHAPY	<	1.0000E+01	PPB
2-E32-4	9/27/88	B98	METHNYL	<	1.0000E+01	PPB
2-E32-4	9/27/88	B99	METAZIR	<	1.0000E+01	PPB
2-E32-4	9/27/88	C01	METCHAN	<	1.0000E+01	PPB
2-E32-4	9/27/88	C02	METBISC	<	1.0000E+01	PPB
2-E32-4	9/27/88	C03	METACTO	<	1.0000E+01	PPB
2-E32-4	9/27/88	C04	METACRY	<	1.0000E+01	PPB

9 0 1 1 7 7 2 0 6 8 9

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E32-4	9/27/88	C05	METMSUL	<	1.0000E+01	PPB
2-E32-4	9/27/88	C06	METPROP	<	1.0000E+01	PPB
2-E32-4	9/27/88	C07	METHIOU	<	1.0000E+01	PPB
2-E32-4	9/27/88	C08	NAPHQUI	<	1.0000E+01	PPB
2-E32-4	9/27/88	C09	1-napha	<	1.0000E+01	PPB
2-E32-4	9/27/88	C10	2-napha	<	1.0000E+01	PPB
2-E32-4	9/27/88	C11	NITRANI	<	5.0000E+01	PPB
2-E32-4	9/27/88	C12	NITBENZ	<	1.0000E+01	PPB
2-E32-4	9/27/88	C13	NITPHEN	<	5.0000E+01	PPB
2-E32-4	9/27/88	C14	NNIBUTY	<	1.0000E+01	PPB
2-E32-4	9/27/88	C15	NNIDIEA	<	1.0000E+01	PPB
2-E32-4	9/27/88	C16	NNIDIEY	<	1.0000E+01	PPB
2-E32-4	9/27/88	C17	NNIDIME	<	1.0000E+01	PPB
2-E32-4	9/27/88	C18	NNIMETH	<	1.0000E+01	PPB
2-E32-4	9/27/88	C19	NNIURET	<	1.0000E+01	PPB
2-E32-4	9/27/88	C20	NNIVINY	<	1.0000E+01	PPB
2-E32-4	9/27/88	C21	NNIMORP	<	1.0000E+01	PPB
2-E32-4	9/27/88	C22	NNINICO	<	1.0000E+01	PPB
2-E32-4	9/27/88	C23	NNIPIPE	<	1.0000E+01	PPB
2-E32-4	9/27/88	C24	NITRPYR	<	1.0000E+01	PPB
2-E32-4	9/27/88	C25	NITRTOL	<	1.0000E+01	PPB
2-E32-4	9/27/88	C26	PENTCHB	<	1.0000E+01	PPB
2-E32-4	9/27/88	C27	PENTCHN	<	1.0000E+01	PPB
2-E32-4	9/27/88	C28	PENTCHP	<	5.0000E+01	PPB
2-E32-4	9/27/88	C29	PHENTIN	<	1.0000E+01	PPB
2-E32-4	9/27/88	C30	PHENINE	<	1.0000E+01	PPB
2-E32-4	9/27/88	C31	PHTHEST	<	1.0000E+01	PPB
2-E32-4	9/27/88	C32	PICOLIN	<	1.0000E+01	PPB
2-E32-4	9/27/88	C33	PRONIDE	<	1.0000E+01	PPB
2-E32-4	9/27/88	C34	RESERPI	<	1.0000E+01	PPB
2-E32-4	9/27/88	C35	RESORCI	<	1.0000E+01	PPB
2-E32-4	9/27/88	C36	SAFROL	<	1.0000E+01	PPB
2-E32-4	9/27/88	C37	TETRCHB	<	1.0000E+01	PPB
2-E32-4	9/27/88	C39	TETRCHP	<	1.0000E+01	PPB
2-E32-4	9/27/88	C40	THIURAM	<	1.0000E+01	PPB
2-E32-4	9/27/88	C41	TOLUDIA	<	1.0000E+01	PPB
2-E32-4	9/27/88	C42	OTOLHYD	<	1.0000E+01	PPB
2-E32-4	9/27/88	C43	TRICHLB	<	1.0000E+01	PPB
2-E32-4	9/27/88	C44	245-trp	<	5.0000E+01	PPB
2-E32-4	9/27/88	C45	246-trp	<	1.0000E+01	PPB
2-E32-4	9/27/88	C46	TRIPHOS	<	1.0000E+01	PPB
2-E32-4	9/27/88	C47	SYMTRIN	<	1.0000E+01	PPB
2-E32-4	9/27/88	C48	TRISPHO	<	1.0000E+01	PPB
2-E32-4	9/27/88	C49	BENZOPY	<	1.0000E+01	PPB
2-E32-4	9/27/88	C50	CHLNAPZ	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E32-4	9/27/88	C51	BIS2ETH	<	1.0000E+01	PPB
2-E32-4	9/27/88	C52	HEXAENE	<	1.0000E+01	PPB
2-E32-4	9/27/88	C53	HYDRAZI	<	3.0000E+03	PPB
2-E32-4	9/27/88	C54	HEXACHL	<	1.0000E+01	PPB
2-E32-4	9/27/88	C55	NAPHTHA	<	1.0000E+01	PPB
2-E32-4	9/27/88	C56	123TRI	<	1.0000E+01	PPB
2-E32-4	9/27/88	C57	PHENOL	<	1.0000E+01	PPB
2-E32-4	9/27/88	C58	135TRI	<	1.0000E+01	PPB
2-E32-4	9/27/88	C59	1234TE	<	1.0000E+01	PPB
2-E32-4	9/27/88	C60	1235TE	<	1.0000E+01	PPB
2-E32-4	9/27/88	C61	TETEPYR	<	2.0000E+00	PPB
2-E32-4	9/27/88	C62	CHLLATE	<	3.0000E+01	PPB
2-E32-4	9/27/88	C63	CARBPHT	<	2.0000E+00	PPB
2-E32-4	9/27/88	C64	DISULFO	<	2.0000E+00	PPB
2-E32-4	9/27/88	C65	DIMETHO	<	2.0000E+00	PPB
2-E32-4	9/27/88	C66	METHPAR	<	2.0000E+00	PPB
2-E32-4	9/27/88	C67	PARATHI	<	2.0000E+00	PPB
2-E32-4	9/27/88	C69	TOC	<	2.0000E+02	PPB
2-E32-4	9/27/88	C69	TOC	<	3.0000E+02	PPB
2-E32-4	9/27/88	C69	TOC	<	4.0000E+02	PPB
2-E32-4	9/27/88	C70	CYANIDE	<	1.0000E+01	PPB
2-E32-4	9/27/88	C71	FORMALN	<	5.0000E+02	PPB
2-E32-4	9/27/88	C72	NITRATE		2.5000E+04	PPB
2-E32-4	9/27/88	C73	SULFATE		5.9700E+04	PPB
2-E32-4	9/27/88	C74	FLUORID	<	5.0000E+02	PPB
2-E32-4	9/27/88	C75	CHLORID		8.4700E+03	PPB
2-E32-4	9/27/88	C76	PHOSPHA	<	1.0000E+03	PPB
2-E32-4	9/27/88	C77	PERCHLO	<	1.0000E+03	PPB
2-E32-4	9/27/88	C78	SULFIDE	<	1.0000E+03	PPB
2-E32-4	9/27/88	C79	KEROSEN	<	1.0000E+04	PPB
2-E32-4	9/27/88	C80	AMMONIU	<	5.0000E+01	PPB
2-E32-4	9/27/88	C81	ETHYGLY	<	1.0000E+04	PPB
2-E32-4	9/27/88	C86	DIOXIN	<	1.0000E-01	PPB
2-E32-4	9/27/88	C87	CITRUSR	<	1.0000E+03	PPB
2-E32-4	9/27/88	C90	PARALDE	<	2.0000E+03	PPB
2-E32-4	9/27/88	C91	STRYCHN	<	5.0000E+01	PPB
2-E32-4	9/27/88	C92	MALHYDR	<	5.0000E+02	PPB
2-E32-4	9/27/88	C93	NICOTIN	<	1.0000E+02	PPB
2-E32-4	9/27/88	C94	ACRYIDE	<	1.0000E+04	PPB
2-E32-4	9/27/88	C95	ALLYLAL	<	2.5000E+03	PPB
2-E32-4	9/27/88	C97	CHLACET	<	1.6000E+04	PPB
2-E32-4	9/27/88	C98	CHLPROP	<	4.0000E+03	PPB
2-E32-4	9/27/88	H03	ETHCARB	<	5.0000E+03	PPB
2-E32-4	9/27/88	H04	ETHCYAN	<	2.0000E+03	PPB
2-E32-4	9/27/88	H05	ETHOXID	<	3.0000E+03	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
2-E32-4	9/27/88	H06	ETHMETH	<	1.0000E+01	PPB
2-E32-4	9/27/88	H09	ISOBUTY	<	1.0000E+03	PPB
2-E32-4	9/27/88	H11	PROPYLA	<	1.0000E+04	PPB
2-E32-4	9/27/88	H12	PROPYNO	<	8.0000E+03	PPB
2-E32-4	9/27/88	H13	2,4-D	<	2.0000E+00	PPB
2-E32-4	9/27/88	H14	2,4,5TP	<	2.0000E+00	PPB
2-E32-4	9/27/88	H15	2,4,5-T	<	2.0000E+00	PPB
2-E32-4	9/27/88	H16	TC		2.6600E+04	PPB
2-E32-4	9/27/88	H18	FZINC	<	5.0000E+00	PPB
2-E32-4	9/27/88	H19	FCALCIU		4.0000E+04	PPB
2-E32-4	9/27/88	H20	FBARIUM		7.3000E+01	PPB
2-E32-4	9/27/88	H21	FCADMIU	<	2.0000E+00	PPB
2-E32-4	9/27/88	H22	FCHROMI	<	1.0000E+01	PPB
2-E32-4	9/27/88	H23	FSILVER	<	1.0000E+01	PPB
2-E32-4	9/27/88	H24	FSODIUM		2.7300E+04	PPB
2-E32-4	9/27/88	H25	FNICKEL	<	1.0000E+01	PPB
2-E32-4	9/27/88	H26	FCOPPER	<	1.0000E+01	PPB
2-E32-4	9/27/88	H27	FVANADI		1.6000E+01	PPB
2-E32-4	9/27/88	H28	FALUMIN	<	1.5000E+02	PPB
2-E32-4	9/27/88	H29	FMANGAN	<	5.0000E+00	PPB
2-E32-4	9/27/88	H30	FPOTASS		6.0600E+03	PPB
2-E32-4	9/27/88	H31	FIRON		3.4000E+01	PPB
2-E32-4	9/27/88	H32	FMAGNES		1.2900E+04	PPB
2-E32-4	9/27/88	H33	FBERYLL	<	5.0000E+00	PPB
2-E32-4	9/27/88	H35	FSTRONT		2.1400E+02	PPB
2-E32-4	9/27/88	H36	FANTIMO	<	1.0000E+02	PPB
2-E32-4	9/27/88	H37	FARSENI	<	5.0000E+00	PPB
2-E32-4	9/27/88	H38	FMERCUR	<	1.0000E-01	PPB
2-E32-4	9/27/88	H39	FSELENI		7.0000E+00	PPB
2-E32-4	9/27/88	H40	FTHALLI	<	5.0000E+00	PPB
2-E32-4	9/27/88	H41	FLEAD	<	5.0000E+00	PPB
2-E32-4	9/27/88	H42	TOXLDL		3.2000E+01	PPB
2-E32-4	9/27/88	H42	TOXLDL		3.5000E+01	PPB
2-E32-4	9/27/88	H42	TOXLDL		7.4000E+01	PPB
2-E32-4	9/27/88	H42	TOXLDL	<	2.0000E+00	PPB
2-E32-4	9/27/88	H68	HEXONE	<	1.0000E+01	PPB
2-E32-4	9/27/88	I21	TRIBUPH	<	1.0000E+01	PPB
6-42-40A	1/15/87	010	CO-60		7.4800E+00	PCI/L
6-42-40A	1/15/87	024	CS-137	<	4.0000E+00	PCI/L
6-42-40A	1/15/87	034	RU-106	<	5.6000E+00	PCI/L
6-42-40A	1/15/87	108	TRITIUM		5.9000E+02	PCI/L
6-42-40A	1/15/87	111	BETA		3.6600E+00	PCI/L
6-42-40A	1/15/87	121	SR 90	<	8.2600E-01	PCI/L
6-42-40A	1/15/87	124	U-CHEM		9.9600E-01	UG/L
6-42-40A	1/15/87	212	ALPHA		1.2300E+00	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	1/15/87	C72	NITRATE		2.3100E+04	PPB
6-42-40A	2/13/87	010	CO-60	<	1.8200E+00	PCI/L
6-42-40A	2/13/87	024	CS-137	<	-4.5300E+00	PCI/L
6-42-40A	2/13/87	034	RU-106	<	-3.7600E+01	PCI/L
6-42-40A	2/13/87	108	TRITIUM	<	2.3900E+02	PCI/L
6-42-40A	2/13/87	111	BETA		5.1000E+00	PCI/L
6-42-40A	2/13/87	212	ALPHA		1.6700E+00	PCI/L
6-42-40A	3/07/87	010	CO-60		6.0800E+00	PCI/L
6-42-40A	3/07/87	024	CS-137	<	1.5100E+00	PCI/L
6-42-40A	3/07/87	034	RU-106		6.3300E+01	PCI/L
6-42-40A	3/07/87	108	TRITIUM		3.8900E+02	PCI/L
6-42-40A	3/07/87	111	BETA		3.8500E+00	PCI/L
6-42-40A	3/07/87	212	ALPHA		8.0400E-01	PCI/L
6-42-40A	4/06/87	010	CO-60	<	-5.0900E+00	PCI/L
6-42-40A	4/06/87	024	CS-137		4.1300E+00	PCI/L
6-42-40A	4/06/87	034	RU-106		5.2900E+01	PCI/L
6-42-40A	4/06/87	108	TRITIUM	<	2.4000E+02	PCI/L
6-42-40A	4/06/87	111	BETA		3.3200E+00	PCI/L
6-42-40A	4/06/87	121	SR 90	<	5.3300E-03	PCI/L
6-42-40A	4/06/87	124	U-CHEM		9.6600E-01	UG/L
6-42-40A	4/06/87	212	ALPHA		9.3200E-01	PCI/L
6-42-40A	4/06/87	C72	NITRATE		2.5500E+04	PPB
6-42-40A	5/08/87	010	CO-60	<	3.3800E+00	PCI/L
6-42-40A	5/08/87	024	CS-137	<	-1.3800E+00	PCI/L
6-42-40A	5/08/87	034	RU-106	<	-6.3400E+01	PCI/L
6-42-40A	5/08/87	108	TRITIUM		3.0600E+02	PCI/L
6-42-40A	5/08/87	111	BETA		3.7900E+00	PCI/L
6-42-40A	5/08/87	212	ALPHA		4.7200E-01	PCI/L
6-42-40A	6/04/87	010	CO-60		7.4900E+00	PCI/L
6-42-40A	6/04/87	024	CS-137		6.3300E+00	PCI/L
6-42-40A	6/04/87	034	RU-106	<	1.4100E+01	PCI/L
6-42-40A	6/04/87	108	TRITIUM	<	1.8500E+02	PCI/L
6-42-40A	6/04/87	111	BETA		4.2100E+00	PCI/L
6-42-40A	6/04/87	212	ALPHA		7.8900E-01	PCI/L
6-42-40A	7/09/87	010	CO-60	<	4.5300E+00	PCI/L
6-42-40A	7/09/87	024	CS-137	<	2.4100E+00	PCI/L
6-42-40A	7/09/87	034	RU-106	<	1.7700E+01	PCI/L
6-42-40A	7/09/87	108	TRITIUM		4.6600E+02	PCI/L
6-42-40A	7/09/87	111	BETA		4.5200E+00	PCI/L
6-42-40A	7/09/87	121	SR 90	<	2.6600E-01	PCI/L
6-42-40A	7/09/87	124	U-CHEM		3.8700E-01	UG/L
6-42-40A	7/09/87	212	ALPHA	<	2.6600E-02	PCI/L
6-42-40A	7/09/87	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40A	8/11/87	010	CO-60	<	-2.0300E+00	PCI/L
6-42-40A	8/11/87	024	CS-137		4.4800E+00	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	8/11/87	034	RU-106	<	-5.6500E+01	PCI/L
6-42-40A	8/11/87	108	TRITIUM		5.4400E+02	PCI/L
6-42-40A	8/11/87	111	BETA		4.9700E+00	PCI/L
6-42-40A	8/11/87	212	ALPHA	<	2.6600E-01	PCI/L
6-42-40A	9/09/87	010	CO-60	<	4.5300E+00	PCI/L
6-42-40A	9/09/87	024	CS-137	<	3.7900E+00	PCI/L
6-42-40A	9/09/87	034	RU-106	<	-3.2500E+01	PCI/L
6-42-40A	9/09/87	108	TRITIUM		7.0000E+02	PCI/L
6-42-40A	9/09/87	111	BETA		4.8600E+00	PCI/L
6-42-40A	9/09/87	212	ALPHA	<	1.8300E-01	PCI/L
6-42-40A	10/06/87	010	CO-60	<	2.0300E+00	PCI/L
6-42-40A	10/06/87	024	CS-137	<	9.5900E-01	PCI/L
6-42-40A	10/06/87	034	RU-106	<	1.3600E+01	PCI/L
6-42-40A	10/06/87	108	TRITIUM	<	3.3700E+00	PCI/L
6-42-40A	10/06/87	111	BETA		3.5200E+00	PCI/L
6-42-40A	10/06/87	121	SR 90	<	-2.5600E-01	PCI/L
6-42-40A	10/06/87	124	U-CHEM		4.5300E-01	UG/L
6-42-40A	10/06/87	212	ALPHA		7.2000E-01	PCI/L
6-42-40A	10/06/87	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40A	11/04/87	010	CO-60	<	-7.9100E+00	PCI/L
6-42-40A	11/04/87	024	CS-137	<	1.3700E+00	PCI/L
6-42-40A	11/04/87	034	RU-106	<	8.8000E+00	PCI/L
6-42-40A	11/04/87	108	TRITIUM	<	2.0400E+01	PCI/L
6-42-40A	11/04/87	111	BETA		3.8600E+00	PCI/L
6-42-40A	11/04/87	212	ALPHA		7.8100E-01	PCI/L
6-42-40A	12/01/87	010	CO-60		6.0700E+00	PCI/L
6-42-40A	12/01/87	024	CS-137		7.1400E+00	PCI/L
6-42-40A	12/01/87	034	RU-106	<	5.0500E+01	PCI/L
6-42-40A	12/01/87	108	TRITIUM	<	1.4700E+02	PCI/L
6-42-40A	12/01/87	111	BETA		3.4600E+00	PCI/L
6-42-40A	12/01/87	212	ALPHA		8.0700E-01	PCI/L
6-42-40A	1/08/88	010	CO-60	<	1.4200E+00	PCI/L
6-42-40A	1/08/88	024	CS-137	<	4.3000E+00	PCI/L
6-42-40A	1/08/88	034	RU-106	<	2.7900E+00	PCI/L
6-42-40A	1/08/88	100	PU39-40	<	-4.0400E-03	PCI/L
6-42-40A	1/08/88	102	PU-238	<	1.9500E-03	PCI/L
6-42-40A	1/08/88	108	TRITIUM	<	2.1600E+02	PCI/L
6-42-40A	1/08/88	111	BETA		2.1200E+00	PCI/L
6-42-40A	1/08/88	121	SR 90	<	1.8000E-01	PCI/L
6-42-40A	1/08/88	124	U-CHEM		8.1000E-01	UG/L
6-42-40A	1/08/88	181	RADIUM	<	-2.7000E-02	PCI/L
6-42-40A	1/08/88	183	U 234		4.7500E-01	PCI/L
6-42-40A	1/08/88	184	U 235		6.4300E-02	PCI/L
6-42-40A	1/08/88	185	U 238		4.4500E-01	PCI/L
6-42-40A	1/08/88	191	CONDFLD		1.1700E+02	UMHO/CM

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	1/08/88	199	PHFIELD		7.9000E+00	
6-42-40A	1/08/88	207	PH-LAB		7.6800E+00	
6-42-40A	1/08/88	212	ALPHA		3.9300E-01	PCI/L
6-42-40A	1/08/88	A04	ZINC	<	5.0000E+00	PPB
6-42-40A	1/08/88	A05	CALCIUM		2.0200E+04	PPB
6-42-40A	1/08/88	A06	BARIUM	<	6.0000E+00	PPB
6-42-40A	1/08/88	A07	CADMIUM	<	2.0000E+00	PPB
6-42-40A	1/08/88	A08	CHROMUM	<	1.0000E+01	PPB
6-42-40A	1/08/88	A10	SILVER	<	1.0000E+01	PPB
6-42-40A	1/08/88	A11	SODIUM		4.1400E+03	PPB
6-42-40A	1/08/88	A12	NICKEL	<	1.0000E+01	PPB
6-42-40A	1/08/88	A13	COPPER	<	1.0000E+01	PPB
6-42-40A	1/08/88	A14	VANADUM	<	5.0000E+00	PPB
6-42-40A	1/08/88	A16	ALUMNUM	<	1.5000E+02	PPB
6-42-40A	1/08/88	A17	MANGESE	<	5.0000E+00	PPB
6-42-40A	1/08/88	A18	POTASUM		2.8500E+03	PPB
6-42-40A	1/08/88	A19	IRON		1.5500E+02	PPB
6-42-40A	1/08/88	A20	ARSENIC	<	5.0000E+00	PPB
6-42-40A	1/08/88	A21	MERCURY	<	1.0000E-01	PPB
6-42-40A	1/08/88	A22	SELENUM	<	5.0000E+00	PPB
6-42-40A	1/08/88	A50	MAGNES		5.5900E+03	PPB
6-42-40A	1/08/88	A51	LEADGF	<	5.0000E+00	PPB
6-42-40A	1/08/88	A61	TETRANE	<	5.0000E+00	PPB
6-42-40A	1/08/88	A62	BENZENE	<	5.0000E+00	PPB
6-42-40A	1/08/88	A63	DIOXANE	<	5.0000E+02	PPB
6-42-40A	1/08/88	A64	METHONE	<	1.0000E+01	PPB
6-42-40A	1/08/88	A65	PYRIDIN	<	5.0000E+02	PPB
6-42-40A	1/08/88	A66	TOLUENE	<	5.0000E+00	PPB
6-42-40A	1/08/88	A67	1,1,1-T	<	5.0000E+00	PPB
6-42-40A	1/08/88	A68	1,1,2-T	<	5.0000E+00	PPB
6-42-40A	1/08/88	A69	TRICENE	<	5.0000E+00	PPB
6-42-40A	1/08/88	A70	PERCENE	<	5.0000E+00	PPB
6-42-40A	1/08/88	A71	OPXYLE	<	5.0000E+00	PPB
6-42-40A	1/08/88	A72	ACROLIN	<	1.0000E+01	PPB
6-42-40A	1/08/88	A73	ACRYILE	<	1.0000E+01	PPB
6-42-40A	1/08/88	A74	BISTHER	<	1.0000E+01	PPB
6-42-40A	1/08/88	A75	BROMONE	<	1.0000E+01	PPB
6-42-40A	1/08/88	A76	METHBRO	<	1.0000E+01	PPB
6-42-40A	1/08/88	A77	CARBIDE	<	1.0000E+01	PPB
6-42-40A	1/08/88	A78	CHLBENZ	<	1.0000E+01	PPB
6-42-40A	1/08/88	A79	CHLTHER	<	1.0000E+01	PPB
6-42-40A	1/08/88	A80	CHLFORM	<	5.0000E+00	PPB
6-42-40A	1/08/88	A81	METHCHL	<	1.0000E+01	PPB
6-42-40A	1/08/88	A82	CHMTHER	<	1.0000E+01	PPB
6-42-40A	1/08/88	A83	CROTONA	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	1/08/88	A84	DIBRCHL	<	1.0000E+01	PPB
6-42-40A	1/08/88	A85	DIBRETH	<	1.0000E+01	PPB
6-42-40A	1/08/88	A86	DIBRMET	<	1.0000E+01	PPB
6-42-40A	1/08/88	A87	DIBUTEN	<	1.0000E+01	PPB
6-42-40A	1/08/88	A88	DICDIFM	<	1.0000E+01	PPB
6-42-40A	1/08/88	A89	1,1-DIC	<	1.0000E+01	PPB
6-42-40A	1/08/88	A90	1,2-DIC	<	1.0000E+01	PPB
6-42-40A	1/08/88	A91	TRANDCE	<	1.0000E+01	PPB
6-42-40A	1/08/88	A92	DICETHY	<	1.0000E+01	PPB
6-42-40A	1/08/88	A93	METHYCH	<	1.0000E+01	PPB
6-42-40A	1/08/88	A94	DICPANE	<	1.0000E+01	PPB
6-42-40A	1/08/88	A95	DICPENE	<	1.0000E+01	PPB
6-42-40A	1/08/88	A96	NNDIEHY	<	1.0000E+01	PPB
6-42-40A	1/08/88	A99	HYDRSUL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B01	IODOMET	<	1.0000E+01	PPB
6-42-40A	1/08/88	B02	METHACR	<	1.0000E+01	PPB
6-42-40A	1/08/88	B03	METHTHI	<	1.0000E+01	PPB
6-42-40A	1/08/88	B04	PENTACH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B05	1112-tc	<	1.0000E+01	PPB
6-42-40A	1/08/88	B06	1122-tc	<	1.0000E+01	PPB
6-42-40A	1/08/88	B08	BROMORM	<	1.0000E+01	PPB
6-42-40A	1/08/88	B09	TRCMEOL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B10	TRCMFLM	<	1.0000E+01	PPB
6-42-40A	1/08/88	B11	TRCPANE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B12	123-trp	<	1.0000E+01	PPB
6-42-40A	1/08/88	B13	VINYIDE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B14	M-XYLE	<	5.0000E+00	PPB
6-42-40A	1/08/88	B15	DIETHY	<	1.0000E+01	PPB
6-42-40A	1/08/88	B19	ACETILE	<	3.0000E+03	PPB
6-42-40A	1/08/88	B20	ACETOPH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B21	WARFRIN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B22	ACEFENE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B23	AMINOYL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B24	AMIISOX	<	1.0000E+01	PPB
6-42-40A	1/08/88	B25	AMITROL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B26	ANILINE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B27	ARAMITE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B28	AURAMIN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B29	BENZCAC	<	1.0000E+01	PPB
6-42-40A	1/08/88	B30	BENZAAN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B31	BENDICM	<	1.0000E+01	PPB
6-42-40A	1/08/88	B32	BENTHOL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B33	BENDINE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B34	BENZBFL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B35	BENZJFL	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	1/08/88	B36	PBENZQU	<	1.0000E+01	PPB
6-42-40A	1/08/88	B37	BENZCHL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B38	BIS2CHM	<	1.0000E+01	PPB
6-42-40A	1/08/88	B39	BIS2CHE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B40	BIS2EPH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B41	BROPHEN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B42	BUTBENP	<	1.0000E+01	PPB
6-42-40A	1/08/88	B43	BUTDINP	<	1.0000E+01	PPB
6-42-40A	1/08/88	B44	CHALETH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B45	CHLANIL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B46	CHLCRES	<	1.0000E+01	PPB
6-42-40A	1/08/88	B47	CHLEPOX	<	1.0000E+01	PPB
6-42-40A	1/08/88	B48	CHLNAPH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B49	CHLPHEN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B50	CHRYSEN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B51	CRESOLS	<	1.0000E+01	PPB
6-42-40A	1/08/88	B52	CYCHDIN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B53	DIBAHAC	<	1.0000E+01	PPB
6-42-40A	1/08/88	B54	DIBAJAC	<	1.0000E+01	PPB
6-42-40A	1/08/88	B55	DIBAHAN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B56	DIBCGCA	<	1.0000E+01	PPB
6-42-40A	1/08/88	B57	DIBAEPY	<	1.0000E+01	PPB
6-42-40A	1/08/88	B58	DIBAHPY	<	1.0000E+01	PPB
6-42-40A	1/08/88	B59	DIBAIPY	<	1.0000E+01	PPB
6-42-40A	1/08/88	B60	DIBPHTH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B61	12-dben	<	1.0000E+01	PPB
6-42-40A	1/08/88	B62	13-dben	<	1.0000E+01	PPB
6-42-40A	1/08/88	B63	14-dben	<	1.0000E+01	PPB
6-42-40A	1/08/88	B64	DICHBEN	<	2.0000E+01	PPB
6-42-40A	1/08/88	B65	24-dchp	<	1.0000E+01	PPB
6-42-40A	1/08/88	B66	26-dchp	<	1.0000E+01	PPB
6-42-40A	1/08/88	B67	DIEPHTH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B68	DIHYSAF	<	1.0000E+01	PPB
6-42-40A	1/08/88	B69	DIMETHB	<	1.0000E+01	PPB
6-42-40A	1/08/88	B70	DIMEAMB	<	1.0000E+01	PPB
6-42-40A	1/08/88	B71	DIMBENZ	<	1.0000E+01	PPB
6-42-40A	1/08/88	B72	DIMEYLB	<	1.0000E+01	PPB
6-42-40A	1/08/88	B73	THIONOX	<	1.0000E+01	PPB
6-42-40A	1/08/88	B74	DIMPHAM	<	1.0000E+01	PPB
6-42-40A	1/08/88	B75	DIMPHEN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B76	DIMPHTH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B77	DINBENZ	<	1.0000E+01	PPB
6-42-40A	1/08/88	B78	DINCRES	<	1.0000E+01	PPB
6-42-40A	1/08/88	B79	DINPHEN	<	5.0000E+01	PPB
6-42-40A	1/08/88	B80	24-dint	<	1.0000E+01	PPB

9011772069 7

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	1/08/88	B81	26-dint	<	1.0000E+01	PPB
6-42-40A	1/08/88	B82	DIOPHTH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B83	DIPHAMI	<	1.0000E+01	PPB
6-42-40A	1/08/88	B84	DIPHHYD	<	1.0000E+01	PPB
6-42-40A	1/08/88	B85	DIPRNIT	<	1.0000E+01	PPB
6-42-40A	1/08/88	B86	ETHMINE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B87	ETHMETS	<	1.0000E+01	PPB
6-42-40A	1/08/88	B88	FLUORAN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B89	HEXCBEN	<	1.0000E+01	PPB
6-42-40A	1/08/88	B90	HEXCBUT	<	1.0000E+01	PPB
6-42-40A	1/08/88	B91	HEXCCYC	<	1.0000E+01	PPB
6-42-40A	1/08/88	B92	HEXCETH	<	1.0000E+01	PPB
6-42-40A	1/08/88	B93	INDENOP	<	1.0000E+01	PPB
6-42-40A	1/08/88	B94	ISOSOLE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B95	MALOILE	<	1.0000E+01	PPB
6-42-40A	1/08/88	B96	MELPHAL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B97	METHAPY	<	1.0000E+01	PPB
6-42-40A	1/08/88	B98	METHNYL	<	1.0000E+01	PPB
6-42-40A	1/08/88	B99	METAZIR	<	1.0000E+01	PPB
6-42-40A	1/08/88	C01	METCHAN	<	1.0000E+01	PPB
6-42-40A	1/08/88	C02	METBISC	<	1.0000E+01	PPB
6-42-40A	1/08/88	C03	METACTO	<	1.0000E+01	PPB
6-42-40A	1/08/88	C04	METACRY	<	1.0000E+01	PPB
6-42-40A	1/08/88	C05	METMSUL	<	1.0000E+01	PPB
6-42-40A	1/08/88	C06	METPROP	<	1.0000E+01	PPB
6-42-40A	1/08/88	C07	METHIOU	<	1.0000E+01	PPB
6-42-40A	1/08/88	C08	NAPHQUI	<	1.0000E+01	PPB
6-42-40A	1/08/88	C09	1-napha	<	1.0000E+01	PPB
6-42-40A	1/08/88	C10	2-napha	<	1.0000E+01	PPB
6-42-40A	1/08/88	C11	NITRANI	<	5.0000E+01	PPB
6-42-40A	1/08/88	C12	NITBENZ	<	1.0000E+01	PPB
6-42-40A	1/08/88	C13	NITPHEN	<	5.0000E+01	PPB
6-42-40A	1/08/88	C14	NNIBUTY	<	1.0000E+01	PPB
6-42-40A	1/08/88	C15	NNIDIEA	<	1.0000E+01	PPB
6-42-40A	1/08/88	C16	NNIDIEY	<	1.0000E+01	PPB
6-42-40A	1/08/88	C17	NNIDIME	<	1.0000E+01	PPB
6-42-40A	1/08/88	C18	NNIMETH	<	1.0000E+01	PPB
6-42-40A	1/08/88	C19	NNIURET	<	1.0000E+01	PPB
6-42-40A	1/08/88	C20	NNIVINY	<	1.0000E+01	PPB
6-42-40A	1/08/88	C21	NNIMORP	<	1.0000E+01	PPB
6-42-40A	1/08/88	C22	NNINICO	<	1.0000E+01	PPB
6-42-40A	1/08/88	C23	NNIPIPE	<	1.0000E+01	PPB
6-42-40A	1/08/88	C24	NITRPYR	<	1.0000E+01	PPB
6-42-40A	1/08/88	C25	NITRTOL	<	1.0000E+01	PPB
6-42-40A	1/08/88	C26	PENTCHB	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	1/08/88	C27	PENTCHN	<	1.0000E+01	PPB
6-42-40A	1/08/88	C28	PENTCHP	<	5.0000E+01	PPB
6-42-40A	1/08/88	C29	PHENTIN	<	1.0000E+01	PPB
6-42-40A	1/08/88	C30	PHENINE	<	1.0000E+01	PPB
6-42-40A	1/08/88	C31	PHTHEST	<	1.0000E+01	PPB
6-42-40A	1/08/88	C32	PICOLIN	<	1.0000E+01	PPB
6-42-40A	1/08/88	C33	PRONIDE	<	1.0000E+01	PPB
6-42-40A	1/08/88	C34	RESERPI	<	1.0000E+01	PPB
6-42-40A	1/08/88	C35	RESORCI	<	1.0000E+01	PPB
6-42-40A	1/08/88	C36	SAFROL	<	1.0000E+01	PPB
6-42-40A	1/08/88	C37	TETRCHB	<	1.0000E+01	PPB
6-42-40A	1/08/88	C39	TETRCHP	<	1.0000E+01	PPB
6-42-40A	1/08/88	C40	THIURAM	<	1.0000E+01	PPB
6-42-40A	1/08/88	C41	TOLUDIA	<	1.0000E+01	PPB
6-42-40A	1/08/88	C42	OTOLHYD	<	1.0000E+01	PPB
6-42-40A	1/08/88	C43	TRICHLB	<	1.0000E+01	PPB
6-42-40A	1/08/88	C44	245-trp	<	5.0000E+01	PPB
6-42-40A	1/08/88	C45	246-trp	<	1.0000E+01	PPB
6-42-40A	1/08/88	C46	TRIPHOS	<	1.0000E+01	PPB
6-42-40A	1/08/88	C47	SYMTRIN	<	1.0000E+01	PPB
6-42-40A	1/08/88	C48	TRISPHO	<	1.0000E+01	PPB
6-42-40A	1/08/88	C49	BENZOPY	<	1.0000E+01	PPB
6-42-40A	1/08/88	C50	CHLNAPZ	<	1.0000E+01	PPB
6-42-40A	1/08/88	C51	BIS2ETH	<	1.0000E+01	PPB
6-42-40A	1/08/88	C52	HEXAENE	<	1.0000E+01	PPB
6-42-40A	1/08/88	C54	HEXACHL	<	1.0000E+01	PPB
6-42-40A	1/08/88	C55	NAPHTHA	<	1.0000E+01	PPB
6-42-40A	1/08/88	C56	123TRI	<	1.0000E+01	PPB
6-42-40A	1/08/88	C57	PHENOL	<	1.0000E+01	PPB
6-42-40A	1/08/88	C58	135TRI	<	1.0000E+01	PPB
6-42-40A	1/08/88	C59	1234TE	<	1.0000E+01	PPB
6-42-40A	1/08/88	C60	1235TE	<	1.0000E+01	PPB
6-42-40A	1/08/88	C69	TOC	<	8.4400E+02	PPB
6-42-40A	1/08/88	C70	CYANIDE	<	1.0000E+01	PPB
6-42-40A	1/08/88	C71	FORMALN	<	5.0000E+02	PPB
6-42-40A	1/08/88	C72	NITRATE	<	5.0000E+02	PPB
6-42-40A	1/08/88	C73	SULFATE		1.1500E+04	PPB
6-42-40A	1/08/88	C74	FLUORID	<	5.0000E+02	PPB
6-42-40A	1/08/88	C75	CHLORID		2.3400E+03	PPB
6-42-40A	1/08/88	C76	PHOSPHA	<	1.0000E+03	PPB
6-42-40A	1/08/88	C79	KEROSEN	<	1.0000E+04	PPB
6-42-40A	1/08/88	C80	AMMONIU	<	5.0000E+01	PPB
6-42-40A	1/08/88	C91	STRYCHN	<	5.0000E+01	PPB
6-42-40A	1/08/88	C92	MALHYDR	<	5.0000E+02	PPB
6-42-40A	1/08/88	C93	NICOTIN	<	1.0000E+02	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	1/08/88	H05	ETHOXID	<	3.0000E+03	PPB
6-42-40A	1/08/88	H06	ETHMETH	<	1.0000E+01	PPB
6-42-40A	1/08/88	H16	TC		1.6400E+04	PPB
6-42-40A	1/08/88	H18	FZINC	<	5.0000E+00	PPB
6-42-40A	1/08/88	H19	FCALCIU		2.1300E+04	PPB
6-42-40A	1/08/88	H20	FBARIUM	<	6.0000E+00	PPB
6-42-40A	1/08/88	H21	FCADMIU	<	2.0000E+00	PPB
6-42-40A	1/08/88	H22	FCHROMI	<	1.0000E+01	PPB
6-42-40A	1/08/88	H23	FSILVER	<	1.0000E+01	PPB
6-42-40A	1/08/88	H24	FSODIUM		4.4600E+03	PPB
6-42-40A	1/08/88	H25	FNICKEL	<	1.0000E+01	PPB
6-42-40A	1/08/88	H26	FCOPPER	<	1.0000E+01	PPB
6-42-40A	1/08/88	H27	FVANADI		5.0000E+00	PPB
6-42-40A	1/08/88	H28	FALUMIN	<	1.5000E+02	PPB
6-42-40A	1/08/88	H29	FMANGAN		1.1000E+01	PPB
6-42-40A	1/08/88	H30	FPOTASS		2.8000E+03	PPB
6-42-40A	1/08/88	H31	FIRON		1.7100E+02	PPB
6-42-40A	1/08/88	H32	FMAGNES		5.6300E+03	PPB
6-42-40A	1/08/88	H33	FBERYLL	<	5.0000E+00	PPB
6-42-40A	1/08/88	H35	FSTRONT		1.0400E+02	PPB
6-42-40A	1/08/88	H36	FANTIMO	<	1.0000E+02	PPB
6-42-40A	1/08/88	H37	FARSENI	<	5.0000E+00	PPB
6-42-40A	1/08/88	H38	FMERCUR	<	1.0000E-01	PPB
6-42-40A	1/08/88	H39	FSELENI	<	5.0000E+00	PPB
6-42-40A	1/08/88	H41	FLEAD	<	5.0000E+00	PPB
6-42-40A	1/08/88	H42	TOXLDL		5.4100E+01	PPB
6-42-40A	1/08/88	H58	ALKALIN		7.5200E+04	
6-42-40A	1/08/88	H65	HNITRAT		3.6500E+03	PPB
6-42-40A	1/08/88	H68	HEXONE	<	1.0000E+01	PPB
6-42-40A	1/08/88	I21	TRIBUPH	<	1.0000E+01	PPB
6-42-40A	5/23/88	010	CO-60		0.0000E+00	PCI/L
6-42-40A	5/23/88	024	CS-137	<	-2.2600E+00	PCI/L
6-42-40A	5/23/88	034	RU-106	<	-1.8900E+01	PCI/L
6-42-40A	5/23/88	100	PU39-40	<	-2.9600E-03	PCI/L
6-42-40A	5/23/88	102	PU-238	<	-1.4400E-03	PCI/L
6-42-40A	5/23/88	108	TRITIUM		4.2600E+02	PCI/L
6-42-40A	5/23/88	111	BETA		4.0900E+00	PCI/L
6-42-40A	5/23/88	121	SR 90	<	2.9100E-01	PCI/L
6-42-40A	5/23/88	124	U-CHEM		8.3400E-01	UG/L
6-42-40A	5/23/88	183	U 234		4.6800E-01	PCI/L
6-42-40A	5/23/88	184	U 235	<	1.3700E-02	PCI/L
6-42-40A	5/23/88	185	U 238		3.3300E-01	PCI/L
6-42-40A	5/23/88	212	ALPHA		7.3900E-01	PCI/L
6-42-40A	5/23/88	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40A	7/19/88	010	CO-60	<	-3.8500E+00	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	7/19/88	024	CS-137	<	-4.5100E+00	PCI/L
6-42-40A	7/19/88	034	RU-106	<	-5.0800E+01	PCI/L
6-42-40A	7/19/88	100	PU39-40	<	-1.6500E-04	PCI/L
6-42-40A	7/19/88	102	PU-238	<	-1.4400E-03	PCI/L
6-42-40A	7/19/88	108	TRITIUM	<	1.1000E+02	PCI/L
6-42-40A	7/19/88	111	BETA		3.6100E+00	PCI/L
6-42-40A	7/19/88	121	SR 90	<	3.1100E-01	PCI/L
6-42-40A	7/19/88	124	U-CHEM		4.8900E-01	UG/L
6-42-40A	7/19/88	183	U 234		2.1200E-01	PCI/L
6-42-40A	7/19/88	184	U 235		3.7300E-02	PCI/L
6-42-40A	7/19/88	185	U 238		1.7700E-01	PCI/L
6-42-40A	7/19/88	212	ALPHA	<	2.9100E-01	PCI/L
6-42-40A	7/19/88	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40A	11/15/88	010	CO-60	<	-4.0800E+00	PCI/L
6-42-40A	11/15/88	024	CS-137	<	-6.2900E-01	PCI/L
6-42-40A	11/15/88	034	RU-106	<	-7.3100E+00	PCI/L
6-42-40A	11/15/88	100	PU39-40	<	-1.6500E-04	PCI/L
6-42-40A	11/15/88	102	PU-238	<	-1.4400E-03	PCI/L
6-42-40A	11/15/88	108	TRITIUM	<	-2.0900E+02	PCI/L
6-42-40A	11/15/88	111	BETA		4.7800E+00	PCI/L
6-42-40A	11/15/88	121	SR 90	<	-1.8000E-01	PCI/L
6-42-40A	11/15/88	124	U-CHEM		8.2800E-01	UG/L
6-42-40A	11/15/88	183	U 234		2.7800E-01	PCI/L
6-42-40A	11/15/88	184	U 235	<	8.1600E-03	PCI/L
6-42-40A	11/15/88	185	U 238		2.5000E-01	PCI/L
6-42-40A	11/15/88	212	ALPHA	<	3.1800E-01	PCI/L
6-42-40A	11/15/88	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40A	11/22/88	108	TRITIUM	<	-3.7100E+02	PCI/L
6-42-40A	11/22/88	109	COLIFRM		-1.6543E+37	MPN
6-42-40A	11/22/88	111	BETA		4.0800E+00	PCI/L
6-42-40A	11/22/88	181	RADIUM	<	9.9600E-02	PCI/L
6-42-40A	11/22/88	191	CONDFLD		1.6900E+02	UMHO/CM
6-42-40A	11/22/88	191	CONDFLD		1.7000E+02	UMHO/CM
6-42-40A	11/22/88	199	PHFIELD		8.3000E+00	
6-42-40A	11/22/88	212	ALPHA	<	1.6000E-01	PCI/L
6-42-40A	11/22/88	A01	BERYLUM	<	5.0000E+00	PPB
6-42-40A	11/22/88	A03	STRONUM		8.9000E+01	PPB
6-42-40A	11/22/88	A04	ZINC		5.0000E+00	PPB
6-42-40A	11/22/88	A05	CALCIUM		1.8100E+04	PPB
6-42-40A	11/22/88	A06	BARIUM		6.0000E+00	PPB
6-42-40A	11/22/88	A07	CADMIUM	<	2.0000E+00	PPB
6-42-40A	11/22/88	A08	CHROMUM	<	1.0000E+01	PPB
6-42-40A	11/22/88	A10	SILVER	<	1.0000E+01	PPB
6-42-40A	11/22/88	A11	SODIUM		3.9200E+03	PPB
6-42-40A	11/22/88	A12	NICKEL	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	11/22/88	A13	COPPER	<	1.0000E+01	PPB
6-42-40A	11/22/88	A14	VANADUM	<	5.0000E+00	PPB
6-42-40A	11/22/88	A15	ANTIONY	<	1.0000E+02	PPB
6-42-40A	11/22/88	A16	ALUMNUM	<	1.5000E+02	PPB
6-42-40A	11/22/88	A17	MANGESE		1.2000E+01	PPB
6-42-40A	11/22/88	A18	POTASUM		2.9100E+03	PPB
6-42-40A	11/22/88	A19	IRON		3.0900E+02	PPB
6-42-40A	11/22/88	A20	ARSENIC	<	5.0000E+00	PPB
6-42-40A	11/22/88	A21	MERCURY	<	1.0000E-01	PPB
6-42-40A	11/22/88	A22	SELENUM	<	5.0000E+00	PPB
6-42-40A	11/22/88	A50	MAGNES		4.7000E+03	PPB
6-42-40A	11/22/88	A51	LEADGF	<	5.0000E+00	PPB
6-42-40A	11/22/88	A61	TETRANE	<	5.0000E+00	PPB
6-42-40A	11/22/88	A64	METHONE	<	1.0000E+01	PPB
6-42-40A	11/22/88	A67	1,1,1-T	<	5.0000E+00	PPB
6-42-40A	11/22/88	A68	1,1,2-T	<	5.0000E+00	PPB
6-42-40A	11/22/88	A69	TRICENE	<	5.0000E+00	PPB
6-42-40A	11/22/88	A70	PERCENE	<	5.0000E+00	PPB
6-42-40A	11/22/88	A71	OPXYLE	<	5.0000E+00	PPB
6-42-40A	11/22/88	A80	CHLFORM	<	5.0000E+00	PPB
6-42-40A	11/22/88	A93	METHYCH	<	1.0000E+01	PPB
6-42-40A	11/22/88	B14	M-XYLE	<	5.0000E+00	PPB
6-42-40A	11/22/88	C72	NITRATE		7.0000E+02	PPB
6-42-40A	11/22/88	C73	SULFATE		1.2200E+04	PPB
6-42-40A	11/22/88	C74	FLUORID	<	5.0000E+02	PPB
6-42-40A	11/22/88	C75	CHLORID		2.5000E+03	PPB
6-42-40A	11/22/88	C76	PHOSPHA	<	1.0000E+03	PPB
6-42-40A	11/22/88	H13	2,4-D	<	2.0000E+00	PPB
6-42-40A	11/22/88	H14	2,4,5TP	<	2.0000E+00	PPB
6-42-40A	11/22/88	H18	FZINC	<	5.0000E+00	PPB
6-42-40A	11/22/88	H19	FCALCIU		1.7000E+04	PPB
6-42-40A	11/22/88	H20	FBARIUM	<	6.0000E+00	PPB
6-42-40A	11/22/88	H21	FCADMIU	<	2.0000E+00	PPB
6-42-40A	11/22/88	H22	FCHROMI	<	1.0000E+01	PPB
6-42-40A	11/22/88	H23	FSILVER	<	1.0000E+01	PPB
6-42-40A	11/22/88	H24	FSODIUM		3.7700E+03	PPB
6-42-40A	11/22/88	H25	FNICKEL	<	1.0000E+01	PPB
6-42-40A	11/22/88	H26	FCOPPER	<	1.0000E+01	PPB
6-42-40A	11/22/88	H27	FVANADI	<	5.0000E+00	PPB
6-42-40A	11/22/88	H28	FALUMIN	<	1.5000E+02	PPB
6-42-40A	11/22/88	H29	FMANGAN	<	5.0000E+00	PPB
6-42-40A	11/22/88	H30	FPOTASS		2.7700E+03	PPB
6-42-40A	11/22/88	H31	FIRON		5.7000E+01	PPB
6-42-40A	11/22/88	H32	FMAGNES		4.4300E+03	PPB
6-42-40A	11/22/88	H33	FBERYLL	<	5.0000E+00	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40A	11/22/88	H35	FSTRONT		8.4000E+01	PPB
6-42-40A	11/22/88	H36	FANTIMO	<	1.0000E+02	PPB
6-42-40A	11/22/88	H37	FARSENI	<	5.0000E+00	PPB
6-42-40A	11/22/88	H38	FMERCUR	<	1.0000E-01	PPB
6-42-40A	11/22/88	H39	FSELENI	<	5.0000E+00	PPB
6-42-40A	11/22/88	H41	FLEAD	<	5.0000E+00	PPB
6-42-40A	11/22/88	H60	TURBID		4.0000E-01	NTU
6-42-40A	11/22/88	H66	BROMIDE	<	1.0000E+03	PPB
6-42-40A	11/22/88	H67	NITRITE	<	1.0000E+03	PPB
6-42-40A	11/22/88	H68	HEXONE	<	1.0000E+01	PPB
6-42-40B	1/15/87	010	CO-60	<	-9.7300E+00	PCI/L
6-42-40B	1/15/87	024	CS-137	<	-3.7800E-01	PCI/L
6-42-40B	1/15/87	034	RU-106	<	-3.1700E+01	PCI/L
6-42-40B	1/15/87	108	TRITIUM	<	-9.5200E+01	PCI/L
6-42-40B	1/15/87	111	BETA		3.8400E+00	PCI/L
6-42-40B	1/15/87	121	SR 90	<	4.4200E-01	PCI/L
6-42-40B	1/15/87	C72	NITRATE		5.3100E+02	PPB
6-42-40B	2/13/87	010	CO-60		6.0700E+00	PCI/L
6-42-40B	2/13/87	024	CS-137	<	1.8900E+00	PCI/L
6-42-40B	2/13/87	034	RU-106	<	2.8200E+01	PCI/L
6-42-40B	2/13/87	108	TRITIUM		1.5000E+04	PCI/L
6-42-40B	2/13/87	111	BETA		2.7600E+00	PCI/L
6-42-40B	3/07/87	010	CO-60	<	4.2000E+00	PCI/L
6-42-40B	3/07/87	024	CS-137	<	0.0000E+00	PCI/L
6-42-40B	3/07/87	034	RU-106		6.8300E+01	PCI/L
6-42-40B	3/07/87	108	TRITIUM		4.2200E+02	PCI/L
6-42-40B	3/07/87	111	BETA		2.1500E+00	PCI/L
6-42-40B	4/12/87	010	CO-60		5.3600E+00	PCI/L
6-42-40B	4/12/87	024	CS-137		7.3300E+00	PCI/L
6-42-40B	4/12/87	034	RU-106	<	4.2500E+01	PCI/L
6-42-40B	4/12/87	108	TRITIUM		1.1200E+03	PCI/L
6-42-40B	4/12/87	111	BETA		2.9700E+00	PCI/L
6-42-40B	4/12/87	121	SR 90	<	6.1300E-02	PCI/L
6-42-40B	4/12/87	C72	NITRATE	<	5.0000E+02	PPB
6-42-40B	5/08/87	010	CO-60	<	1.0100E+00	PCI/L
6-42-40B	5/08/87	024	CS-137	<	-4.7900E+00	PCI/L
6-42-40B	5/08/87	034	RU-106	<	-3.9700E+01	PCI/L
6-42-40B	5/08/87	108	TRITIUM		8.6000E+02	PCI/L
6-42-40B	5/08/87	111	BETA		4.2500E+00	PCI/L
6-42-40B	6/04/87	010	CO-60	<	3.0400E+00	PCI/L
6-42-40B	6/04/87	024	CS-137	<	2.2400E+00	PCI/L
6-42-40B	6/04/87	034	RU-106	<	1.8800E+01	PCI/L
6-42-40B	6/04/87	108	TRITIUM	<	1.9800E+02	PCI/L
6-42-40B	6/04/87	111	BETA		3.9800E+00	PCI/L
6-42-40B	7/09/87	010	CO-60	<	4.0600E+00	PCI/L

9 0 1 1 7 1 2 0 7 0 3

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40B	7/09/87	024	CS-137	<	-3.2000E+00	PCI/L
6-42-40B	7/09/87	034	RU-106		4.3500E+01	PCI/L
6-42-40B	7/09/87	108	TRITIUM	<	2.5800E+01	PCI/L
6-42-40B	7/09/87	111	BETA		3.4600E+00	PCI/L
6-42-40B	7/09/87	121	SR 90	<	-2.6400E-02	PCI/L
6-42-40B	7/09/87	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40B	8/11/87	010	CO-60		5.6500E+00	PCI/L
6-42-40B	8/11/87	024	CS-137	<	2.0700E+00	PCI/L
6-42-40B	8/11/87	034	RU-106	<	2.9300E+00	PCI/L
6-42-40B	8/11/87	108	TRITIUM	<	-3.5500E+01	PCI/L
6-42-40B	8/11/87	111	BETA		4.4600E+00	PCI/L
6-42-40B	9/09/87	010	CO-60	<	2.0300E+00	PCI/L
6-42-40B	9/09/87	024	CS-137	<	-1.6000E+00	PCI/L
6-42-40B	9/09/87	034	RU-106		2.7200E+01	PCI/L
6-42-40B	9/09/87	108	TRITIUM	<	-1.0800E+01	PCI/L
6-42-40B	9/09/87	111	BETA		5.8900E+00	PCI/L
6-42-40B	10/06/87	010	CO-60	<	6.2700E+00	PCI/L
6-42-40B	10/06/87	024	CS-137	<	-4.2700E+00	PCI/L
6-42-40B	10/06/87	034	RU-106	<	-2.1400E+01	PCI/L
6-42-40B	10/06/87	108	TRITIUM		2.7700E+03	PCI/L
6-42-40B	10/06/87	111	BETA		3.7700E+00	PCI/L
6-42-40B	10/06/87	121	SR 90	<	1.5500E-01	PCI/L
6-42-40B	10/06/87	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40B	11/04/87	010	CO-60	<	-1.5200E+00	PCI/L
6-42-40B	11/04/87	024	CS-137	<	-4.1300E+00	PCI/L
6-42-40B	11/04/87	034	RU-106	<	-2.9700E+01	PCI/L
6-42-40B	11/04/87	108	TRITIUM		4.1900E+02	PCI/L
6-42-40B	11/04/87	111	BETA		6.9000E+00	PCI/L
6-42-40B	12/07/87	010	CO-60	<	-4.5400E+00	PCI/L
6-42-40B	12/07/87	024	CS-137	<	0.0000E+00	PCI/L
6-42-40B	12/07/87	034	RU-106	<	3.4400E+01	PCI/L
6-42-40B	12/07/87	108	TRITIUM	<	1.0500E+02	PCI/L
6-42-40B	12/07/87	111	BETA		4.0400E+00	PCI/L
6-42-40B	1/08/88	010	CO-60		5.6400E+00	PCI/L
6-42-40B	1/08/88	024	CS-137	<	-2.6200E+00	PCI/L
6-42-40B	1/08/88	034	RU-106	<	9.6700E+00	PCI/L
6-42-40B	1/08/88	108	TRITIUM		3.9000E+02	PCI/L
6-42-40B	1/08/88	111	BETA		2.9700E+00	PCI/L
6-42-40B	1/08/88	121	SR 90	<	5.9100E-02	PCI/L
6-42-40B	1/08/88	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40B	3/06/88	010	CO-60	<	-1.3500E+00	PCI/L
6-42-40B	3/06/88	024	CS-137	<	-3.2900E+00	PCI/L
6-42-40B	3/06/88	034	RU-106	<	1.2600E+01	PCI/L
6-42-40B	3/06/88	108	TRITIUM	<	1.2300E+02	PCI/L
6-42-40B	3/06/88	111	BETA		4.4300E+00	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40B	3/17/88	010	CO-60	<	1.6800E+00	PCI/L
6-42-40B	3/17/88	024	CS-137	<	-1.0600E+00	PCI/L
6-42-40B	3/17/88	034	RU-106	<	3.5400E+00	PCI/L
6-42-40B	3/17/88	108	TRITIUM	<	-3.8700E+01	PCI/L
6-42-40B	3/17/88	111	BETA		3.7800E+00	PCI/L
6-42-40B	4/07/88	010	CO-60	<	-6.2400E+00	PCI/L
6-42-40B	4/07/88	024	CS-137	<	4.3000E+00	PCI/L
6-42-40B	4/07/88	034	RU-106	<	1.4000E+01	PCI/L
6-42-40B	4/07/88	108	TRITIUM	<	6.1300E+01	PCI/L
6-42-40B	4/07/88	111	BETA		2.9400E+00	PCI/L
6-42-40B	4/07/88	121	SR 90		9.2900E-01	PCI/L
6-42-40B	4/07/88	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40B	6/03/88	010	CO-60	<	2.6300E+00	PCI/L
6-42-40B	6/03/88	024	CS-137	<	7.5200E-01	PCI/L
6-42-40B	6/03/88	034	RU-106	<	-5.3900E+01	PCI/L
6-42-40B	6/03/88	108	TRITIUM		6.2200E+02	PCI/L
6-42-40B	6/03/88	111	BETA		7.3200E+00	PCI/L
6-42-40B	6/06/88	010	CO-60	<	-1.6600E+00	PCI/L
6-42-40B	6/06/88	024	CS-137	<	-3.3500E+00	PCI/L
6-42-40B	6/06/88	034	RU-106	<	9.4200E+00	PCI/L
6-42-40B	6/06/88	108	TRITIUM	<	-2.6900E+01	PCI/L
6-42-40B	6/06/88	111	BETA		2.8900E+00	PCI/L
6-42-40B	7/20/88	010	CO-60	<	-7.1200E-01	PCI/L
6-42-40B	7/20/88	024	CS-137	<	2.6500E+00	PCI/L
6-42-40B	7/20/88	034	RU-106	<	2.5200E+01	PCI/L
6-42-40B	7/20/88	108	TRITIUM	<	1.1600E+02	PCI/L
6-42-40B	7/20/88	111	BETA		3.3200E+00	PCI/L
6-42-40B	7/20/88	121	SR 90	<	-3.0500E-01	PCI/L
6-42-40B	7/20/88	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40B	8/12/88	010	CO-60	<	3.7900E-01	PCI/L
6-42-40B	8/12/88	024	CS-137	<	7.7800E+00	PCI/L
6-42-40B	8/12/88	034	RU-106	<	1.9900E+00	PCI/L
6-42-40B	8/12/88	108	TRITIUM		2.0700E+03	PCI/L
6-42-40B	8/12/88	111	BETA		4.4800E+00	PCI/L
6-42-40B	9/09/88	010	CO-60	<	3.2000E+00	PCI/L
6-42-40B	9/09/88	024	CS-137	<	-7.9900E-01	PCI/L
6-42-40B	9/09/88	034	RU-106	<	2.1300E+01	PCI/L
6-42-40B	9/09/88	108	TRITIUM	<	5.9900E+01	PCI/L
6-42-40B	9/09/88	111	BETA		3.7800E+00	PCI/L
6-42-40B	10/13/88	010	CO-60	<	2.4800E+00	PCI/L
6-42-40B	10/13/88	024	CS-137	<	-3.7300E-01	PCI/L
6-42-40B	10/13/88	034	RU-106	<	1.5700E+01	PCI/L
6-42-40B	10/13/88	108	TRITIUM		6.4900E+02	PCI/L
6-42-40B	10/13/88	111	BETA		4.4300E+00	PCI/L
6-42-40B	10/13/88	121	SR 90	<	7.0200E-01	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40B	10/31/88	010	CO-60	<	2.6800E+00	PCI/L
6-42-40B	10/31/88	024	CS-137		1.3300E+01	PCI/L
6-42-40B	10/31/88	034	RU-106	<	2.7900E+01	PCI/L
6-42-40B	10/31/88	108	TRITIUM	<	-1.4500E+01	PCI/L
6-42-40B	10/31/88	111	BETA		1.2700E+02	PCI/L
6-42-40B	11/15/88	H65	HNITRAT	<	2.5000E+03	PPB
6-42-40B	11/22/88	108	TRITIUM	<	9.3100E+01	PCI/L
6-42-40B	11/22/88	109	COLIFRM		-1.6543E+37	MPN
6-42-40B	11/22/88	111	BETA		4.3100E+00	PCI/L
6-42-40B	11/22/88	181	RADIUM	<	8.0000E-02	PCI/L
6-42-40B	11/22/88	191	CONDFLD		1.2200E+02	UMHO/CM
6-42-40B	11/22/88	199	PHFIELD		8.4000E+00	
6-42-40B	11/22/88	212	ALPHA	<	-4.4600E-01	PCI/L
6-42-40B	11/22/88	A01	BERYLUM	<	5.0000E+00	PPB
6-42-40B	11/22/88	A03	STRONUM		9.2000E+01	PPB
6-42-40B	11/22/88	A04	ZINC		1.9000E+01	PPB
6-42-40B	11/22/88	A05	CALCIUM		1.3200E+04	PPB
6-42-40B	11/22/88	A06	BARIUM		1.2000E+01	PPB
6-42-40B	11/22/88	A07	CADMIUM		3.0000E+00	PPB
6-42-40B	11/22/88	A08	CHROMUM	<	1.0000E+01	PPB
6-42-40B	11/22/88	A10	SILVER	<	1.0000E+01	PPB
6-42-40B	11/22/88	A11	SODIUM		4.4600E+03	PPB
6-42-40B	11/22/88	A12	NICKEL	<	1.0000E+01	PPB
6-42-40B	11/22/88	A13	COPPER	<	1.0000E+01	PPB
6-42-40B	11/22/88	A14	VANADUM		1.0000E+01	PPB
6-42-40B	11/22/88	A15	ANTIONY	<	1.0000E+02	PPB
6-42-40B	11/22/88	A16	ALUMNUM		2.2800E+02	PPB
6-42-40B	11/22/88	A17	MANGESE		1.7400E+02	PPB
6-42-40B	11/22/88	A18	POTASUM		3.2000E+03	PPB
6-42-40B	11/22/88	A19	IRON		1.3200E+04	PPB
6-42-40B	11/22/88	A20	ARSENIC	<	5.0000E+00	PPB
6-42-40B	11/22/88	A21	MERCURY	<	1.0000E-01	PPB
6-42-40B	11/22/88	A22	SELENUM	<	5.0000E+00	PPB
6-42-40B	11/22/88	A50	MAGNES		4.3400E+03	PPB
6-42-40B	11/22/88	A51	LEADGF	<	5.0000E+00	PPB
6-42-40B	11/22/88	A61	TETRANE	<	5.0000E+00	PPB
6-42-40B	11/22/88	A64	METHONE	<	1.0000E+01	PPB
6-42-40B	11/22/88	A67	1,1,1-T	<	5.0000E+00	PPB
6-42-40B	11/22/88	A68	1,1,2-T	<	5.0000E+00	PPB
6-42-40B	11/22/88	A69	TRICENE	<	5.0000E+00	PPB
6-42-40B	11/22/88	A70	PERCENE	<	5.0000E+00	PPB
6-42-40B	11/22/88	A71	OPXYLE	<	5.0000E+00	PPB
6-42-40B	11/22/88	A80	CHLFORM	<	5.0000E+00	PPB
6-42-40B	11/22/88	A93	METHYCH	<	1.0000E+01	PPB
6-42-40B	11/22/88	B14	M-XYLE	<	5.0000E+00	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-42-40B	11/22/88	C72	NITRATE	<	5.0000E+02	PPB
6-42-40B	11/22/88	C73	SULFATE		7.2000E+03	PPB
6-42-40B	11/22/88	C74	FLUORID	<	5.0000E+02	PPB
6-42-40B	11/22/88	C75	CHLORID		2.9000E+03	PPB
6-42-40B	11/22/88	C76	PHOSPHA	<	1.0000E+03	PPB
6-42-40B	11/22/88	H13	2,4-D	<	2.0000E+00	PPB
6-42-40B	11/22/88	H14	2,4,5TP	<	2.0000E+00	PPB
6-42-40B	11/22/88	H60	TURBID		2.0000E+02	NTU
6-42-40B	11/22/88	H66	BROMIDE	<	1.0000E+03	PPB
6-42-40B	11/22/88	H67	NITRITE	<	1.0000E+03	PPB
6-42-40B	11/22/88	H68	HEXONE	<	1.0000E+01	PPB
6-45-42	2/28/87	010	CO-60	<	-2.1000E+00	PCI/L
6-45-42	2/28/87	024	CS-137	<	3.8500E+00	PCI/L
6-45-42	2/28/87	034	RU-106		7.2000E+01	PCI/L
6-45-42	2/28/87	108	TRITIUM		5.1800E+04	PCI/L
6-45-42	2/28/87	C72	NITRATE		7.9700E+03	PPB
6-45-42	6/11/87	010	CO-60		0.0000E+00	PCI/L
6-45-42	6/11/87	024	CS-137	<	1.1300E+00	PCI/L
6-45-42	6/11/87	034	RU-106		6.3400E+01	PCI/L
6-45-42	6/11/87	108	TRITIUM		5.3000E+04	PCI/L
6-45-42	6/11/87	C72	NITRATE		7.3500E+03	PPB
6-45-42	8/04/87	010	CO-60	<	-1.7000E+00	PCI/L
6-45-42	8/04/87	024	CS-137	<	3.7900E+00	PCI/L
6-45-42	8/04/87	034	RU-106	<	-3.0100E+00	PCI/L
6-45-42	8/04/87	108	TRITIUM		5.4100E+04	PCI/L
6-45-42	8/04/87	H65	HNITRAT		6.5100E+03	PPB
6-45-42	9/15/87	010	CO-60	<	-2.1000E+00	PCI/L
6-45-42	9/15/87	024	CS-137	<	-9.8300E+00	PCI/L
6-45-42	9/15/87	034	RU-106	<	-7.2300E+01	PCI/L
6-45-42	9/15/87	100	PU39-40	<	6.1900E-03	PCI/L
6-45-42	9/15/87	102	PU-238		2.0100E-02	PCI/L
6-45-42	9/15/87	108	TRITIUM		5.2600E+04	PCI/L
6-45-42	9/15/87	111	BETA		4.0100E+00	PCI/L
6-45-42	9/15/87	121	SR 90	<	9.8800E-02	PCI/L
6-45-42	9/15/87	124	U-CHEM		1.8500E+00	UG/L
6-45-42	9/15/87	183	U 234		1.1400E+00	PCI/L
6-45-42	9/15/87	184	U 235		3.5200E-02	PCI/L
6-45-42	9/15/87	185	U 238		8.6000E-01	PCI/L
6-45-42	9/15/87	212	ALPHA		1.7100E+00	PCI/L
6-45-42	10/14/87	010	CO-60	<	4.0500E+00	PCI/L
6-45-42	10/14/87	024	CS-137	<	-2.5600E+00	PCI/L
6-45-42	10/14/87	034	RU-106	<	-5.3700E+00	PCI/L
6-45-42	10/14/87	100	PU39-40	<	-1.3700E-03	PCI/L
6-45-42	10/14/87	102	PU-238	<	-7.1700E-04	PCI/L
6-45-42	10/14/87	108	TRITIUM		5.2900E+04	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	10/14/87	111	BETA		4.7500E+00	PCI/L
6-45-42	10/14/87	121	SR 90	<	-2.7400E-01	PCI/L
6-45-42	10/14/87	124	U-CHEM		2.5400E+00	UG/L
6-45-42	10/14/87	183	U 234		1.0700E+00	PCI/L
6-45-42	10/14/87	184	U 235		2.8200E-02	PCI/L
6-45-42	10/14/87	185	U 238		8.8100E-01	PCI/L
6-45-42	10/14/87	212	ALPHA		1.8100E+00	PCI/L
6-45-42	11/15/87	010	CO-60	<	-2.0300E+01	PCI/L
6-45-42	11/15/87	024	CS-137		7.2800E+00	PCI/L
6-45-42	11/15/87	034	RU-106	<	-1.9400E+01	PCI/L
6-45-42	11/15/87	100	PU39-40	<	-3.6100E-03	PCI/L
6-45-42	11/15/87	102	PU-238	<	-7.1600E-04	PCI/L
6-45-42	11/15/87	108	TRITIUM		5.1100E+04	PCI/L
6-45-42	11/15/87	111	BETA		2.9500E+00	PCI/L
6-45-42	11/15/87	111	BETA		8.0700E+00	PCI/L
6-45-42	11/15/87	121	SR 90	<	1.9300E-01	PCI/L
6-45-42	11/15/87	124	U-CHEM		1.9800E+00	UG/L
6-45-42	11/15/87	181	RADIUM	<	-1.9600E-02	PCI/L
6-45-42	11/15/87	183	U 234		1.2400E+00	PCI/L
6-45-42	11/15/87	184	U 235		3.3000E-02	PCI/L
6-45-42	11/15/87	185	U 238		9.9400E-01	PCI/L
6-45-42	11/15/87	191	CONDFLD		2.2900E+02	UMHO/CM
6-45-42	11/15/87	199	PHFIELD		7.6000E+00	
6-45-42	11/15/87	207	PH-LAB		8.0000E+00	
6-45-42	11/15/87	212	ALPHA		1.8900E+00	PCI/L
6-45-42	11/15/87	212	ALPHA		2.0900E+00	PCI/L
6-45-42	11/15/87	A04	ZINC		8.0000E+00	PPB
6-45-42	11/15/87	A05	CALCIUM		2.5200E+04	PPB
6-45-42	11/15/87	A06	BARIUM		3.8000E+01	PPB
6-45-42	11/15/87	A07	CADMIUM	<	2.0000E+00	PPB
6-45-42	11/15/87	A08	CHROMUM	<	1.0000E+01	PPB
6-45-42	11/15/87	A10	SILVER	<	1.0000E+01	PPB
6-45-42	11/15/87	A11	SODIUM		1.9300E+04	PPB
6-45-42	11/15/87	A12	NICKEL	<	1.0000E+01	PPB
6-45-42	11/15/87	A13	COPPER	<	1.0000E+01	PPB
6-45-42	11/15/87	A14	VANADUM		3.1000E+01	PPB
6-45-42	11/15/87	A16	ALUMNUM	<	1.5000E+02	PPB
6-45-42	11/15/87	A17	MANGESE		1.2000E+01	PPB
6-45-42	11/15/87	A18	POTASUM		4.5900E+03	PPB
6-45-42	11/15/87	A19	IRON		8.8600E+02	PPB
6-45-42	11/15/87	A20	ARSENIC	<	5.0000E+00	PPB
6-45-42	11/15/87	A21	MERCURY	<	1.0000E-01	PPB
6-45-42	11/15/87	A22	SELENUM	<	5.0000E+00	PPB
6-45-42	11/15/87	A50	MAGNES		1.0400E+04	PPB
6-45-42	11/15/87	A51	LEADGF	<	5.0000E+00	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	11/15/87	A61	TETRANE	<	5.0000E+00	PPB
6-45-42	11/15/87	A62	BENZENE	<	5.0000E+00	PPB
6-45-42	11/15/87	A63	DIOXANE	<	5.0000E+02	PPB
6-45-42	11/15/87	A64	METHONE	<	1.0000E+01	PPB
6-45-42	11/15/87	A65	PYRIDIN	<	5.0000E+02	PPB
6-45-42	11/15/87	A66	TOLUENE	<	5.0000E+00	PPB
6-45-42	11/15/87	A67	1,1,1-T	<	5.0000E+00	PPB
6-45-42	11/15/87	A68	1,1,2-T	<	5.0000E+00	PPB
6-45-42	11/15/87	A69	TRICENE	<	5.0000E+00	PPB
6-45-42	11/15/87	A70	PERCENE	<	5.0000E+00	PPB
6-45-42	11/15/87	A71	OPXYLE	<	5.0000E+00	PPB
6-45-42	11/15/87	A72	ACROLIN	<	1.0000E+01	PPB
6-45-42	11/15/87	A73	ACRYILE	<	1.0000E+01	PPB
6-45-42	11/15/87	A74	BISTHER	<	1.0000E+01	PPB
6-45-42	11/15/87	A75	BROMONE	<	1.0000E+01	PPB
6-45-42	11/15/87	A76	METHBRO	<	1.0000E+01	PPB
6-45-42	11/15/87	A77	CARBIDE	<	1.0000E+01	PPB
6-45-42	11/15/87	A78	CHLBENZ	<	1.0000E+01	PPB
6-45-42	11/15/87	A79	CHLTHER	<	1.0000E+01	PPB
6-45-42	11/15/87	A80	CHLFORM	<	5.0000E+00	PPB
6-45-42	11/15/87	A81	METHCHL	<	1.0000E+01	PPB
6-45-42	11/15/87	A82	CHMTHER	<	1.0000E+01	PPB
6-45-42	11/15/87	A83	CROTONA	<	1.0000E+01	PPB
6-45-42	11/15/87	A84	DIBRCHL	<	1.0000E+01	PPB
6-45-42	11/15/87	A85	DIBRETH	<	1.0000E+01	PPB
6-45-42	11/15/87	A86	DIBRMET	<	1.0000E+01	PPB
6-45-42	11/15/87	A87	DIBUTEN	<	1.0000E+01	PPB
6-45-42	11/15/87	A88	DICDIFM	<	1.0000E+01	PPB
6-45-42	11/15/87	A89	1,1-DIC	<	1.0000E+01	PPB
6-45-42	11/15/87	A90	1,2-DIC	<	1.0000E+01	PPB
6-45-42	11/15/87	A91	TRANDCE	<	1.0000E+01	PPB
6-45-42	11/15/87	A92	DICETHY	<	1.0000E+01	PPB
6-45-42	11/15/87	A93	METHYCH	<	1.0000E+01	PPB
6-45-42	11/15/87	A94	DICPANE	<	1.0000E+01	PPB
6-45-42	11/15/87	A95	DICPENE	<	1.0000E+01	PPB
6-45-42	11/15/87	A96	NNDIEHY	<	1.0000E+01	PPB
6-45-42	11/15/87	A99	HYDRSUL	<	1.0000E+01	PPB
6-45-42	11/15/87	B01	IODOMET	<	1.0000E+01	PPB
6-45-42	11/15/87	B02	METHACR	<	1.0000E+01	PPB
6-45-42	11/15/87	B03	METHTHI	<	1.0000E+01	PPB
6-45-42	11/15/87	B04	PENTACH	<	1.0000E+01	PPB
6-45-42	11/15/87	B05	1112-tc	<	1.0000E+01	PPB
6-45-42	11/15/87	B06	1122-tc	<	1.0000E+01	PPB
6-45-42	11/15/87	B08	BROMORM	<	1.0000E+01	PPB
6-45-42	11/15/87	B09	TRCMEOL	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	11/15/87	B10	TRCMFLM	<	1.0000E+01	PPB
6-45-42	11/15/87	B11	TRCPANE	<	1.0000E+01	PPB
6-45-42	11/15/87	B12	123-trp	<	1.0000E+01	PPB
6-45-42	11/15/87	B13	VINYIDE	<	1.0000E+01	PPB
6-45-42	11/15/87	B14	M-XYLE	<	5.0000E+00	PPB
6-45-42	11/15/87	B15	DIETHY	<	1.0000E+01	PPB
6-45-42	11/15/87	B19	ACETILE	<	3.0000E+03	PPB
6-45-42	11/15/87	B20	ACETOPH	<	1.0000E+01	PPB
6-45-42	11/15/87	B21	WARFRIN	<	1.0000E+01	PPB
6-45-42	11/15/87	B22	ACEFENE	<	1.0000E+01	PPB
6-45-42	11/15/87	B23	AMINOYL	<	1.0000E+01	PPB
6-45-42	11/15/87	B24	AMIISOX	<	1.0000E+01	PPB
6-45-42	11/15/87	B25	AMITROL	<	1.0000E+01	PPB
6-45-42	11/15/87	B26	ANILINE	<	1.0000E+01	PPB
6-45-42	11/15/87	B27	ARAMITE	<	1.0000E+01	PPB
6-45-42	11/15/87	B28	AURAMIN	<	1.0000E+01	PPB
6-45-42	11/15/87	B29	BENZCAC	<	1.0000E+01	PPB
6-45-42	11/15/87	B30	BENZAAN	<	1.0000E+01	PPB
6-45-42	11/15/87	B31	BENDICM	<	1.0000E+01	PPB
6-45-42	11/15/87	B32	BENTHOL	<	1.0000E+01	PPB
6-45-42	11/15/87	B33	BENDINE	<	1.0000E+01	PPB
6-45-42	11/15/87	B34	BENZBFL	<	1.0000E+01	PPB
6-45-42	11/15/87	B35	BENZJFL	<	1.0000E+01	PPB
6-45-42	11/15/87	B36	PBENZQU	<	1.0000E+01	PPB
6-45-42	11/15/87	B37	BENZCHL	<	1.0000E+01	PPB
6-45-42	11/15/87	B38	BIS2CHM	<	1.0000E+01	PPB
6-45-42	11/15/87	B39	BIS2CHE	<	1.0000E+01	PPB
6-45-42	11/15/87	B40	BIS2EPH	<	1.0000E+01	PPB
6-45-42	11/15/87	B41	BROPHEN	<	1.0000E+01	PPB
6-45-42	11/15/87	B42	BUTBENP	<	1.0000E+01	PPB
6-45-42	11/15/87	B43	BUTDINP	<	1.0000E+01	PPB
6-45-42	11/15/87	B44	CHALETH	<	1.0000E+01	PPB
6-45-42	11/15/87	B45	CHLANIL	<	1.0000E+01	PPB
6-45-42	11/15/87	B46	CHLCRES	<	1.0000E+01	PPB
6-45-42	11/15/87	B47	CHLEPOX	<	1.0000E+01	PPB
6-45-42	11/15/87	B48	CHLNAPH	<	1.0000E+01	PPB
6-45-42	11/15/87	B49	CHLPHEN	<	1.0000E+01	PPB
6-45-42	11/15/87	B50	CHRYSEN	<	1.0000E+01	PPB
6-45-42	11/15/87	B51	CRESOLS	<	1.0000E+01	PPB
6-45-42	11/15/87	B52	CYCHDIN	<	1.0000E+01	PPB
6-45-42	11/15/87	B53	DIBAHAC	<	1.0000E+01	PPB
6-45-42	11/15/87	B54	DIBAJAC	<	1.0000E+01	PPB
6-45-42	11/15/87	B55	DIBAHAN	<	1.0000E+01	PPB
6-45-42	11/15/87	B56	DIBCGCA	<	1.0000E+01	PPB
6-45-42	11/15/87	B57	DIBAEPY	<	1.0000E+01	PPB

9 0 1 1 7 7 2 0 7 1 0

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	11/15/87	B58	DIBAHPY	<	1.0000E+01	PPB
6-45-42	11/15/87	B59	DIBAIPY	<	1.0000E+01	PPB
6-45-42	11/15/87	B60	DIBPHTH	<	1.0000E+01	PPB
6-45-42	11/15/87	B61	12-dben	<	1.0000E+01	PPB
6-45-42	11/15/87	B62	13-dben	<	1.0000E+01	PPB
6-45-42	11/15/87	B63	14-dben	<	1.0000E+01	PPB
6-45-42	11/15/87	B64	DICHBEN	<	2.0000E+01	PPB
6-45-42	11/15/87	B65	24-dchp	<	1.0000E+01	PPB
6-45-42	11/15/87	B66	26-dchp	<	1.0000E+01	PPB
6-45-42	11/15/87	B67	DIEPHTH	<	1.0000E+01	PPB
6-45-42	11/15/87	B68	DIHYSAF	<	1.0000E+01	PPB
6-45-42	11/15/87	B69	DIMETHB	<	1.0000E+01	PPB
6-45-42	11/15/87	B70	DIMEAMB	<	1.0000E+01	PPB
6-45-42	11/15/87	B71	DIMBENZ	<	1.0000E+01	PPB
6-45-42	11/15/87	B72	DIMEYLB	<	1.0000E+01	PPB
6-45-42	11/15/87	B73	THIONOX	<	1.0000E+01	PPB
6-45-42	11/15/87	B74	DIMPHAM	<	1.0000E+01	PPB
6-45-42	11/15/87	B75	DIMPHEN	<	1.0000E+01	PPB
6-45-42	11/15/87	B76	DIMPHTH	<	1.0000E+01	PPB
6-45-42	11/15/87	B77	DINBENZ	<	1.0000E+01	PPB
6-45-42	11/15/87	B78	DINCRES	<	1.0000E+01	PPB
6-45-42	11/15/87	B79	DINPHEN	<	5.0000E+01	PPB
6-45-42	11/15/87	B80	24-dint	<	1.0000E+01	PPB
6-45-42	11/15/87	B81	26-dint	<	1.0000E+01	PPB
6-45-42	11/15/87	B82	DIOPHTH	<	1.0000E+01	PPB
6-45-42	11/15/87	B83	DIPHAMI	<	1.0000E+01	PPB
6-45-42	11/15/87	B84	DIPHHYD	<	1.0000E+01	PPB
6-45-42	11/15/87	B85	DIPRNIT	<	1.0000E+01	PPB
6-45-42	11/15/87	B86	ETHMINE	<	1.0000E+01	PPB
6-45-42	11/15/87	B87	ETHMETS	<	1.0000E+01	PPB
6-45-42	11/15/87	B88	FLUORAN	<	1.0000E+01	PPB
6-45-42	11/15/87	B89	HEXCBEN	<	1.0000E+01	PPB
6-45-42	11/15/87	B90	HEXCBUT	<	1.0000E+01	PPB
6-45-42	11/15/87	B91	HEXCCYC	<	1.0000E+01	PPB
6-45-42	11/15/87	B92	HEXCETH	<	1.0000E+01	PPB
6-45-42	11/15/87	B93	INDENOP	<	1.0000E+01	PPB
6-45-42	11/15/87	B94	ISOSOLE	<	1.0000E+01	PPB
6-45-42	11/15/87	B95	MALOILE	<	1.0000E+01	PPB
6-45-42	11/15/87	B96	MELPHAL	<	1.0000E+01	PPB
6-45-42	11/15/87	B97	METHAPY	<	1.0000E+01	PPB
6-45-42	11/15/87	B98	METHNYL	<	1.0000E+01	PPB
6-45-42	11/15/87	B99	METAZIR	<	1.0000E+01	PPB
6-45-42	11/15/87	C01	METCHAN	<	1.0000E+01	PPB
6-45-42	11/15/87	C02	METBISC	<	1.0000E+01	PPB
6-45-42	11/15/87	C03	METACTO	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	11/15/87	C04	METACRY	<	1.0000E+01	PPB
6-45-42	11/15/87	C05	METMSUL	<	1.0000E+01	PPB
6-45-42	11/15/87	C06	METPROP	<	1.0000E+01	PPB
6-45-42	11/15/87	C07	METHIOU	<	1.0000E+01	PPB
6-45-42	11/15/87	C08	NAPHQUI	<	1.0000E+01	PPB
6-45-42	11/15/87	C09	1-napha	<	1.0000E+01	PPB
6-45-42	11/15/87	C10	2-napha	<	1.0000E+01	PPB
6-45-42	11/15/87	C11	NITRANI	<	5.0000E+01	PPB
6-45-42	11/15/87	C12	NITBENZ	<	1.0000E+01	PPB
6-45-42	11/15/87	C13	NITPHEN	<	5.0000E+01	PPB
6-45-42	11/15/87	C14	NNIBUTY	<	1.0000E+01	PPB
6-45-42	11/15/87	C15	NNIDIEA	<	1.0000E+01	PPB
6-45-42	11/15/87	C16	NNIDIEY	<	1.0000E+01	PPB
6-45-42	11/15/87	C17	NNIDIME	<	1.0000E+01	PPB
6-45-42	11/15/87	C18	NNIMETH	<	1.0000E+01	PPB
6-45-42	11/15/87	C19	NNIURET	<	1.0000E+01	PPB
6-45-42	11/15/87	C20	NNIVINY	<	1.0000E+01	PPB
6-45-42	11/15/87	C21	NNIMORP	<	1.0000E+01	PPB
6-45-42	11/15/87	C22	NNINICO	<	1.0000E+01	PPB
6-45-42	11/15/87	C23	NNIPIPE	<	1.0000E+01	PPB
6-45-42	11/15/87	C24	NITRPYR	<	1.0000E+01	PPB
6-45-42	11/15/87	C25	NITRTOL	<	1.0000E+01	PPB
6-45-42	11/15/87	C26	PENTCHB	<	1.0000E+01	PPB
6-45-42	11/15/87	C27	PENTCHN	<	1.0000E+01	PPB
6-45-42	11/15/87	C28	PENTCHP	<	5.0000E+01	PPB
6-45-42	11/15/87	C29	PHENTIN	<	1.0000E+01	PPB
6-45-42	11/15/87	C30	PHENINE	<	1.0000E+01	PPB
6-45-42	11/15/87	C31	PHTHEST	<	1.0000E+01	PPB
6-45-42	11/15/87	C32	PICOLIN	<	1.0000E+01	PPB
6-45-42	11/15/87	C33	PRONIDE	<	1.0000E+01	PPB
6-45-42	11/15/87	C34	RESERPI	<	1.0000E+01	PPB
6-45-42	11/15/87	C35	RESORCI	<	1.0000E+01	PPB
6-45-42	11/15/87	C36	SAFROL	<	1.0000E+01	PPB
6-45-42	11/15/87	C37	TETRCHB	<	1.0000E+01	PPB
6-45-42	11/15/87	C39	TETRCHP	<	1.0000E+01	PPB
6-45-42	11/15/87	C40	THIURAM	<	1.0000E+01	PPB
6-45-42	11/15/87	C41	TOLUDIA	<	1.0000E+01	PPB
6-45-42	11/15/87	C42	OTOLHYD	<	1.0000E+01	PPB
6-45-42	11/15/87	C43	TRICHLB	<	1.0000E+01	PPB
6-45-42	11/15/87	C44	245-trp	<	5.0000E+01	PPB
6-45-42	11/15/87	C45	246-trp	<	1.0000E+01	PPB
6-45-42	11/15/87	C46	TRIPHOS	<	1.0000E+01	PPB
6-45-42	11/15/87	C47	SYMTRIN	<	1.0000E+01	PPB
6-45-42	11/15/87	C48	TRISPHO	<	1.0000E+01	PPB
6-45-42	11/15/87	C49	BENZOPY	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	11/15/87	C50	CHLNAPZ	<	1.0000E+01	PPB
6-45-42	11/15/87	C51	BIS2ETH	<	1.0000E+01	PPB
6-45-42	11/15/87	C52	HEXAENE	<	1.0000E+01	PPB
6-45-42	11/15/87	C54	HEXACHL	<	1.0000E+01	PPB
6-45-42	11/15/87	C55	NAPHTHA	<	1.0000E+01	PPB
6-45-42	11/15/87	C56	123TRI	<	1.0000E+01	PPB
6-45-42	11/15/87	C57	PHENOL	<	1.0000E+01	PPB
6-45-42	11/15/87	C58	135TRI	<	1.0000E+01	PPB
6-45-42	11/15/87	C59	1234TE	<	1.0000E+01	PPB
6-45-42	11/15/87	C60	1235TE	<	1.0000E+01	PPB
6-45-42	11/15/87	C69	TOC	<	3.5500E+02	PPB
6-45-42	11/15/87	C70	CYANIDE	<	1.0000E+01	PPB
6-45-42	11/15/87	C71	FORMALN	<	5.0000E+02	PPB
6-45-42	11/15/87	C72	NITRATE		7.4700E+03	PPB
6-45-42	11/15/87	C73	SULFATE		3.4800E+04	PPB
6-45-42	11/15/87	C74	FLUORID		6.3400E+02	PPB
6-45-42	11/15/87	C75	CHLORID		5.9600E+03	PPB
6-45-42	11/15/87	C76	PHOSPHA	<	1.0000E+03	PPB
6-45-42	11/15/87	C79	KEROSEN	<	1.0000E+04	PPB
6-45-42	11/15/87	C80	AMMONIU	<	5.0000E+01	PPB
6-45-42	11/15/87	C91	STRYCHN	<	5.0000E+01	PPB
6-45-42	11/15/87	C92	MALHYDR	<	5.0000E+02	PPB
6-45-42	11/15/87	C93	NICOTIN	<	1.0000E+02	PPB
6-45-42	11/15/87	H05	ETHOXID	<	3.0000E+03	PPB
6-45-42	11/15/87	H06	ETHMETH	<	1.0000E+01	PPB
6-45-42	11/15/87	H16	TC		2.1800E+04	PPB
6-45-42	11/15/87	H18	FZINC		7.0000E+00	PPB
6-45-42	11/15/87	H19	FCALCIU		2.0600E+04	PPB
6-45-42	11/15/87	H20	FBARIUM		3.8000E+01	PPB
6-45-42	11/15/87	H21	FCADMIU	<	2.0000E+00	PPB
6-45-42	11/15/87	H22	FCHROMI	<	1.0000E+01	PPB
6-45-42	11/15/87	H23	FSILVER	<	1.0000E+01	PPB
6-45-42	11/15/87	H24	FSODIUM		1.8500E+04	PPB
6-45-42	11/15/87	H25	FNICKEL	<	1.0000E+01	PPB
6-45-42	11/15/87	H26	FCOPPER	<	1.0000E+01	PPB
6-45-42	11/15/87	H27	FVANADI		3.2000E+01	PPB
6-45-42	11/15/87	H28	FALUMIN	<	1.5000E+02	PPB
6-45-42	11/15/87	H29	FMANGAN		6.0000E+00	PPB
6-45-42	11/15/87	H30	FPOTASS		4.3900E+03	PPB
6-45-42	11/15/87	H31	FIRON	<	3.0000E+01	PPB
6-45-42	11/15/87	H32	FMAGNES		1.0200E+04	PPB
6-45-42	11/15/87	H33	FBERYLL	<	5.0000E+00	PPB
6-45-42	11/15/87	H35	FSTRONT		1.9300E+02	PPB
6-45-42	11/15/87	H36	FANTIMO	<	1.0000E+02	PPB
6-45-42	11/15/87	H37	FARSENI	<	5.0000E+00	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	11/15/87	H38	FMERCUR	<	1.0000E-01	PPB
6-45-42	11/15/87	H39	FSELENI	<	5.0000E+00	PPB
6-45-42	11/15/87	H41	FLEAD	<	5.0000E+00	PPB
6-45-42	11/15/87	H42	TOXLDL	<	6.1000E+00	PPB
6-45-42	11/15/87	H58	ALKALIN		1.0300E+05	
6-45-42	11/15/87	H63	LFLUORD		5.9500E+02	PPB
6-45-42	11/15/87	H68	HEXONE	<	1.0000E+01	PPB
6-45-42	11/15/87	I21	TRIBUPH	<	1.0000E+01	PPB
6-45-42	12/03/87	010	CO-60		0.0000E+00	PCI/L
6-45-42	12/03/87	024	CS-137	<	5.6400E+00	PCI/L
6-45-42	12/03/87	034	RU-106	<	6.2900E+01	PCI/L
6-45-42	12/03/87	100	PU39-40	<	-1.3700E-03	PCI/L
6-45-42	12/03/87	102	PU-238	<	-7.1700E-04	PCI/L
6-45-42	12/03/87	108	TRITIUM		5.1200E+04	PCI/L
6-45-42	12/03/87	111	BETA		4.0700E+00	PCI/L
6-45-42	12/03/87	121	SR 90	<	2.2100E-01	PCI/L
6-45-42	12/03/87	124	U-CHEM		2.4800E+00	UG/L
6-45-42	12/03/87	183	U 234		1.0200E+00	PCI/L
6-45-42	12/03/87	184	U 235		3.0000E-02	PCI/L
6-45-42	12/03/87	185	U 238		8.0200E-01	PCI/L
6-45-42	12/03/87	212	ALPHA		1.6700E+00	PCI/L
6-45-42	1/08/88	010	CO-60	<	4.3400E+00	PCI/L
6-45-42	1/08/88	024	CS-137	<	-5.2200E+00	PCI/L
6-45-42	1/08/88	034	RU-106	<	-5.6600E+01	PCI/L
6-45-42	1/08/88	100	PU39-40	<	-1.3700E-03	PCI/L
6-45-42	1/08/88	102	PU-238	<	-7.1700E-04	PCI/L
6-45-42	1/08/88	108	TRITIUM		5.2300E+04	PCI/L
6-45-42	1/08/88	111	BETA		3.1900E+00	PCI/L
6-45-42	1/08/88	121	SR 90	<	1.7300E-02	PCI/L
6-45-42	1/08/88	124	U-CHEM		2.1700E+00	UG/L
6-45-42	1/08/88	181	RADIUM	<	4.1000E-02	PCI/L
6-45-42	1/08/88	183	U 234		1.1100E+00	PCI/L
6-45-42	1/08/88	184	U 235		4.1800E-02	PCI/L
6-45-42	1/08/88	185	U 238		8.5600E-01	PCI/L
6-45-42	1/08/88	191	CONDFLD		2.1900E+02	UMHO/CM
6-45-42	1/08/88	199	PHFIELD		7.5000E+00	
6-45-42	1/08/88	207	PH-LAB		7.7400E+00	
6-45-42	1/08/88	212	ALPHA		1.8500E+00	PCI/L
6-45-42	1/08/88	A04	ZINC	<	5.0000E+00	PPB
6-45-42	1/08/88	A05	CALCIUM		2.4200E+04	PPB
6-45-42	1/08/88	A06	BARIUM		3.2000E+01	PPB
6-45-42	1/08/88	A07	CADMIUM	<	2.0000E+00	PPB
6-45-42	1/08/88	A08	CHROMUM	<	1.0000E+01	PPB
6-45-42	1/08/88	A10	SILVER	<	1.0000E+01	PPB
6-45-42	1/08/88	A11	SODIUM		1.8800E+04	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	1/08/88	A12	NICKEL	<	1.0000E+01	PPB
6-45-42	1/08/88	A13	COPPER	<	1.0000E+01	PPB
6-45-42	1/08/88	A14	VANADUM		2.8000E+01	PPB
6-45-42	1/08/88	A16	ALUMNUM	<	1.5000E+02	PPB
6-45-42	1/08/88	A17	MANGESE	<	5.0000E+00	PPB
6-45-42	1/08/88	A18	POTASUM		4.4200E+03	PPB
6-45-42	1/08/88	A19	IRON		4.2800E+02	PPB
6-45-42	1/08/88	A20	ARSENIC	<	5.0000E+00	PPB
6-45-42	1/08/88	A21	MERCURY	<	1.0000E-01	PPB
6-45-42	1/08/88	A22	SELENUM	<	5.0000E+00	PPB
6-45-42	1/08/88	A50	MAGNES		1.0100E+04	PPB
6-45-42	1/08/88	A51	LEADGF	<	5.0000E+00	PPB
6-45-42	1/08/88	A61	TETRANE	<	5.0000E+00	PPB
6-45-42	1/08/88	A62	BENZENE	<	5.0000E+00	PPB
6-45-42	1/08/88	A63	DIOXANE	<	5.0000E+02	PPB
6-45-42	1/08/88	A64	METHONE	<	1.0000E+01	PPB
6-45-42	1/08/88	A65	PYRIDIN	<	5.0000E+02	PPB
6-45-42	1/08/88	A66	TOLUENE	<	5.0000E+00	PPB
6-45-42	1/08/88	A67	1,1,1-T	<	5.0000E+00	PPB
6-45-42	1/08/88	A68	1,1,2-T	<	5.0000E+00	PPB
6-45-42	1/08/88	A69	TRICENE	<	5.0000E+00	PPB
6-45-42	1/08/88	A70	PERCENE	<	5.0000E+00	PPB
6-45-42	1/08/88	A71	OPXYLE	<	5.0000E+00	PPB
6-45-42	1/08/88	A72	ACROLIN	<	1.0000E+01	PPB
6-45-42	1/08/88	A73	ACRYILE	<	1.0000E+01	PPB
6-45-42	1/08/88	A74	BISTHER	<	1.0000E+01	PPB
6-45-42	1/08/88	A75	BROMONE	<	1.0000E+01	PPB
6-45-42	1/08/88	A76	METHBRO	<	1.0000E+01	PPB
6-45-42	1/08/88	A77	CARBIDE	<	1.0000E+01	PPB
6-45-42	1/08/88	A78	CHLBENZ	<	1.0000E+01	PPB
6-45-42	1/08/88	A79	CHLTHER	<	1.0000E+01	PPB
6-45-42	1/08/88	A80	CHLFORM	<	5.0000E+00	PPB
6-45-42	1/08/88	A81	METHCHL	<	1.0000E+01	PPB
6-45-42	1/08/88	A82	CHMTHER	<	1.0000E+01	PPB
6-45-42	1/08/88	A83	CROTONA	<	1.0000E+01	PPB
6-45-42	1/08/88	A84	DIBRCHL	<	1.0000E+01	PPB
6-45-42	1/08/88	A85	DIBRETH	<	1.0000E+01	PPB
6-45-42	1/08/88	A86	DIBRMET	<	1.0000E+01	PPB
6-45-42	1/08/88	A87	DIBUTEN	<	1.0000E+01	PPB
6-45-42	1/08/88	A88	DICDIFM	<	1.0000E+01	PPB
6-45-42	1/08/88	A89	1,1-DIC	<	1.0000E+01	PPB
6-45-42	1/08/88	A90	1,2-DIC	<	1.0000E+01	PPB
6-45-42	1/08/88	A91	TRANDCE	<	1.0000E+01	PPB
6-45-42	1/08/88	A92	DICETHY	<	1.0000E+01	PPB
6-45-42	1/08/88	A93	METHYCH	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	1/08/88	A94	DICPANE	<	1.0000E+01	PPB
6-45-42	1/08/88	A95	DICPENE	<	1.0000E+01	PPB
6-45-42	1/08/88	A96	NNDIEHY	<	1.0000E+01	PPB
6-45-42	1/08/88	A99	HYDRSUL	<	1.0000E+01	PPB
6-45-42	1/08/88	B01	IODOMET	<	1.0000E+01	PPB
6-45-42	1/08/88	B02	METHACR	<	1.0000E+01	PPB
6-45-42	1/08/88	B03	METHTHI	<	1.0000E+01	PPB
6-45-42	1/08/88	B04	PENTACH	<	1.0000E+01	PPB
6-45-42	1/08/88	B05	1112-tc	<	1.0000E+01	PPB
6-45-42	1/08/88	B06	1122-tc	<	1.0000E+01	PPB
6-45-42	1/08/88	B08	BROMORM	<	1.0000E+01	PPB
6-45-42	1/08/88	B09	TRCMEOL	<	1.0000E+01	PPB
6-45-42	1/08/88	B10	TRCMFLM	<	1.0000E+01	PPB
6-45-42	1/08/88	B11	TRCPANE	<	1.0000E+01	PPB
6-45-42	1/08/88	B12	123-trp	<	1.0000E+01	PPB
6-45-42	1/08/88	B13	VINYIDE	<	1.0000E+01	PPB
6-45-42	1/08/88	B14	M-XYLE	<	5.0000E+00	PPB
6-45-42	1/08/88	B15	DIETHY	<	1.0000E+01	PPB
6-45-42	1/08/88	B19	ACETILE	<	3.0000E+03	PPB
6-45-42	1/08/88	B20	ACETOPH	<	1.0000E+01	PPB
6-45-42	1/08/88	B21	WARFRIN	<	1.0000E+01	PPB
6-45-42	1/08/88	B22	ACEFENE	<	1.0000E+01	PPB
6-45-42	1/08/88	B23	AMINOYL	<	1.0000E+01	PPB
6-45-42	1/08/88	B24	AMIISOX	<	1.0000E+01	PPB
6-45-42	1/08/88	B25	AMITROL	<	1.0000E+01	PPB
6-45-42	1/08/88	B26	ANILINE	<	1.0000E+01	PPB
6-45-42	1/08/88	B27	ARAMITE	<	1.0000E+01	PPB
6-45-42	1/08/88	B28	AURAMIN	<	1.0000E+01	PPB
6-45-42	1/08/88	B29	BENZCAC	<	1.0000E+01	PPB
6-45-42	1/08/88	B30	BENZAAN	<	1.0000E+01	PPB
6-45-42	1/08/88	B31	BENDICM	<	1.0000E+01	PPB
6-45-42	1/08/88	B32	BENTHOL	<	1.0000E+01	PPB
6-45-42	1/08/88	B33	BENDINE	<	1.0000E+01	PPB
6-45-42	1/08/88	B34	BENZBFL	<	1.0000E+01	PPB
6-45-42	1/08/88	B35	BENZJFL	<	1.0000E+01	PPB
6-45-42	1/08/88	B36	PBENZQU	<	1.0000E+01	PPB
6-45-42	1/08/88	B37	BENZCHL	<	1.0000E+01	PPB
6-45-42	1/08/88	B38	BIS2CHM	<	1.0000E+01	PPB
6-45-42	1/08/88	B39	BIS2CHE	<	1.0000E+01	PPB
6-45-42	1/08/88	B40	BIS2EPH	<	1.0000E+01	PPB
6-45-42	1/08/88	B41	BROPHEN	<	1.0000E+01	PPB
6-45-42	1/08/88	B42	BUTBENP	<	1.0000E+01	PPB
6-45-42	1/08/88	B43	BUTDINP	<	1.0000E+01	PPB
6-45-42	1/08/88	B44	CHALETH	<	1.0000E+01	PPB
6-45-42	1/08/88	B45	CHLANIL	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	1/08/88	B46	CHLCRES	<	1.0000E+01	PPB
6-45-42	1/08/88	B47	CHLEPOX	<	1.0000E+01	PPB
6-45-42	1/08/88	B48	CHLNAPH	<	1.0000E+01	PPB
6-45-42	1/08/88	B49	CHLPHEN	<	1.0000E+01	PPB
6-45-42	1/08/88	B50	CHRYSEN	<	1.0000E+01	PPB
6-45-42	1/08/88	B51	CRESOLS	<	1.0000E+01	PPB
6-45-42	1/08/88	B52	CYCHDIN	<	1.0000E+01	PPB
6-45-42	1/08/88	B53	DIBAHAC	<	1.0000E+01	PPB
6-45-42	1/08/88	B54	DIBAJAC	<	1.0000E+01	PPB
6-45-42	1/08/88	B55	DIBAHAN	<	1.0000E+01	PPB
6-45-42	1/08/88	B56	DIBCGCA	<	1.0000E+01	PPB
6-45-42	1/08/88	B57	DIBAEPY	<	1.0000E+01	PPB
6-45-42	1/08/88	B58	DIBAHPY	<	1.0000E+01	PPB
6-45-42	1/08/88	B59	DIBAIPY	<	1.0000E+01	PPB
6-45-42	1/08/88	B60	DIBPHTH	<	1.0000E+01	PPB
6-45-42	1/08/88	B61	12-dben	<	1.0000E+01	PPB
6-45-42	1/08/88	B62	13-dben	<	1.0000E+01	PPB
6-45-42	1/08/88	B63	14-dben	<	1.0000E+01	PPB
6-45-42	1/08/88	B64	DICHBEN	<	2.0000E+01	PPB
6-45-42	1/08/88	B65	24-dchp	<	1.0000E+01	PPB
6-45-42	1/08/88	B66	26-dchp	<	1.0000E+01	PPB
6-45-42	1/08/88	B67	DIEPHTH	<	1.0000E+01	PPB
6-45-42	1/08/88	B68	DIHYSAF	<	1.0000E+01	PPB
6-45-42	1/08/88	B69	DIMETHB	<	1.0000E+01	PPB
6-45-42	1/08/88	B70	DIMEAMB	<	1.0000E+01	PPB
6-45-42	1/08/88	B71	DIMBENZ	<	1.0000E+01	PPB
6-45-42	1/08/88	B72	DIMEYLB	<	1.0000E+01	PPB
6-45-42	1/08/88	B73	THIONOX	<	1.0000E+01	PPB
6-45-42	1/08/88	B74	DIMPHAM	<	1.0000E+01	PPB
6-45-42	1/08/88	B75	DIMPHEN	<	1.0000E+01	PPB
6-45-42	1/08/88	B76	DIMPHTH	<	1.0000E+01	PPB
6-45-42	1/08/88	B77	DINBENZ	<	1.0000E+01	PPB
6-45-42	1/08/88	B78	DINCRES	<	1.0000E+01	PPB
6-45-42	1/08/88	B79	DINPHEN	<	5.0000E+01	PPB
6-45-42	1/08/88	B80	24-dint	<	1.0000E+01	PPB
6-45-42	1/08/88	B81	26-dint	<	1.0000E+01	PPB
6-45-42	1/08/88	B82	DIOPHTH	<	1.0000E+01	PPB
6-45-42	1/08/88	B83	DIPHAMI	<	1.0000E+01	PPB
6-45-42	1/08/88	B84	DIPHHYD	<	1.0000E+01	PPB
6-45-42	1/08/88	B85	DIPRNIT	<	1.0000E+01	PPB
6-45-42	1/08/88	B86	ETHMINE	<	1.0000E+01	PPB
6-45-42	1/08/88	B87	ETHMETS	<	1.0000E+01	PPB
6-45-42	1/08/88	B88	FLUORAN	<	1.0000E+01	PPB
6-45-42	1/08/88	B89	HEXCBEN	<	1.0000E+01	PPB
6-45-42	1/08/88	B90	HEXCBUT	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	1/08/88	B91	HEXCCYC	<	1.0000E+01	PPB
6-45-42	1/08/88	B92	HEXCETH	<	1.0000E+01	PPB
6-45-42	1/08/88	B93	INDENOP	<	1.0000E+01	PPB
6-45-42	1/08/88	B94	ISOSOLE	<	1.0000E+01	PPB
6-45-42	1/08/88	B95	MALOILE	<	1.0000E+01	PPB
6-45-42	1/08/88	B96	MELPHAL	<	1.0000E+01	PPB
6-45-42	1/08/88	B97	METHAPY	<	1.0000E+01	PPB
6-45-42	1/08/88	B98	METHNYL	<	1.0000E+01	PPB
6-45-42	1/08/88	B99	METAZIR	<	1.0000E+01	PPB
6-45-42	1/08/88	C01	METCHAN	<	1.0000E+01	PPB
6-45-42	1/08/88	C02	METBISC	<	1.0000E+01	PPB
6-45-42	1/08/88	C03	METACTO	<	1.0000E+01	PPB
6-45-42	1/08/88	C04	METACRY	<	1.0000E+01	PPB
6-45-42	1/08/88	C05	METMSUL	<	1.0000E+01	PPB
6-45-42	1/08/88	C06	METPROP	<	1.0000E+01	PPB
6-45-42	1/08/88	C07	METHIOU	<	1.0000E+01	PPB
6-45-42	1/08/88	C08	NAPHQUI	<	1.0000E+01	PPB
6-45-42	1/08/88	C09	1-napha	<	1.0000E+01	PPB
6-45-42	1/08/88	C10	2-napha	<	1.0000E+01	PPB
6-45-42	1/08/88	C11	NITRANI	<	5.0000E+01	PPB
6-45-42	1/08/88	C12	NITBENZ	<	1.0000E+01	PPB
6-45-42	1/08/88	C13	NITPHEN	<	5.0000E+01	PPB
6-45-42	1/08/88	C14	NNIBUTY	<	1.0000E+01	PPB
6-45-42	1/08/88	C15	NNIDIEA	<	1.0000E+01	PPB
6-45-42	1/08/88	C16	NNIDIEY	<	1.0000E+01	PPB
6-45-42	1/08/88	C17	NNIDIME	<	1.0000E+01	PPB
6-45-42	1/08/88	C18	NNIMETH	<	1.0000E+01	PPB
6-45-42	1/08/88	C19	NNIURET	<	1.0000E+01	PPB
6-45-42	1/08/88	C20	NNIVINY	<	1.0000E+01	PPB
6-45-42	1/08/88	C21	NNIMORP	<	1.0000E+01	PPB
6-45-42	1/08/88	C22	NNINICO	<	1.0000E+01	PPB
6-45-42	1/08/88	C23	NNIPIPE	<	1.0000E+01	PPB
6-45-42	1/08/88	C24	NITRPYR	<	1.0000E+01	PPB
6-45-42	1/08/88	C25	NITRTOL	<	1.0000E+01	PPB
6-45-42	1/08/88	C26	PENTCHB	<	1.0000E+01	PPB
6-45-42	1/08/88	C27	PENTCHN	<	1.0000E+01	PPB
6-45-42	1/08/88	C28	PENTCHP	<	5.0000E+01	PPB
6-45-42	1/08/88	C29	PHENTIN	<	1.0000E+01	PPB
6-45-42	1/08/88	C30	PHENINE	<	1.0000E+01	PPB
6-45-42	1/08/88	C31	PHTHEST	<	1.0000E+01	PPB
6-45-42	1/08/88	C32	PICOLIN	<	1.0000E+01	PPB
6-45-42	1/08/88	C33	PRONIDE	<	1.0000E+01	PPB
6-45-42	1/08/88	C34	RESERPI	<	1.0000E+01	PPB
6-45-42	1/08/88	C35	RESORCI	<	1.0000E+01	PPB
6-45-42	1/08/88	C36	SAFROL	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	1/08/88	C37	TETRCHB	<	1.0000E+01	PPB
6-45-42	1/08/88	C39	TETRCHP	<	1.0000E+01	PPB
6-45-42	1/08/88	C40	THIURAM	<	1.0000E+01	PPB
6-45-42	1/08/88	C41	TOLUDIA	<	1.0000E+01	PPB
6-45-42	1/08/88	C42	OTOLHYD	<	1.0000E+01	PPB
6-45-42	1/08/88	C43	TRICHLB	<	1.0000E+01	PPB
6-45-42	1/08/88	C44	245-trp	<	5.0000E+01	PPB
6-45-42	1/08/88	C45	246-trp	<	1.0000E+01	PPB
6-45-42	1/08/88	C46	TRIPHOS	<	1.0000E+01	PPB
6-45-42	1/08/88	C47	SYMTRIN	<	1.0000E+01	PPB
6-45-42	1/08/88	C48	TRISPHO	<	1.0000E+01	PPB
6-45-42	1/08/88	C49	BENZOPY	<	1.0000E+01	PPB
6-45-42	1/08/88	C50	CHLNAPZ	<	1.0000E+01	PPB
6-45-42	1/08/88	C51	BIS2ETH	<	1.0000E+01	PPB
6-45-42	1/08/88	C52	HEXAENE	<	1.0000E+01	PPB
6-45-42	1/08/88	C54	HEXACHL	<	1.0000E+01	PPB
6-45-42	1/08/88	C55	NAPHTHA	<	1.0000E+01	PPB
6-45-42	1/08/88	C56	123TRI	<	1.0000E+01	PPB
6-45-42	1/08/88	C57	PHENOL	<	1.0000E+01	PPB
6-45-42	1/08/88	C58	135TRI	<	1.0000E+01	PPB
6-45-42	1/08/88	C59	1234TE	<	1.0000E+01	PPB
6-45-42	1/08/88	C60	1235TE	<	1.0000E+01	PPB
6-45-42	1/08/88	C69	TOC	<	3.6800E+02	PPB
6-45-42	1/08/88	C70	CYANIDE	<	1.0000E+01	PPB
6-45-42	1/08/88	C71	FORMALN	<	5.0000E+02	PPB
6-45-42	1/08/88	C72	NITRATE		8.8600E+03	PPB
6-45-42	1/08/88	C73	SULFATE		3.5200E+04	PPB
6-45-42	1/08/88	C74	FLUORID		6.6700E+02	PPB
6-45-42	1/08/88	C75	CHLORID		5.6700E+03	PPB
6-45-42	1/08/88	C76	PHOSPHA	<	1.0000E+03	PPB
6-45-42	1/08/88	C79	KEROSEN	<	1.0000E+04	PPB
6-45-42	1/08/88	C80	AMMONIU	<	5.0000E+01	PPB
6-45-42	1/08/88	C91	STRYCHN	<	5.0000E+01	PPB
6-45-42	1/08/88	C92	MALHYDR	<	5.0000E+02	PPB
6-45-42	1/08/88	C93	NICOTIN	<	1.0000E+02	PPB
6-45-42	1/08/88	H05	ETHOXID	<	3.0000E+03	PPB
6-45-42	1/08/88	H06	ETHMETH	<	1.0000E+01	PPB
6-45-42	1/08/88	H16	TC		2.2600E+04	PPB
6-45-42	1/08/88	H18	FZINC	<	5.0000E+00	PPB
6-45-42	1/08/88	H19	FCALCIU		2.6300E+04	PPB
6-45-42	1/08/88	H20	FBARIUM		3.4000E+01	PPB
6-45-42	1/08/88	H21	FCADMIU	<	2.0000E+00	PPB
6-45-42	1/08/88	H22	FCHROMI	<	1.0000E+01	PPB
6-45-42	1/08/88	H23	FSILVER	<	1.0000E+01	PPB
6-45-42	1/08/88	H24	FSODIUM		1.8400E+04	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	1/08/88	H25	FNICKEL	<	1.0000E+01	PPB
6-45-42	1/08/88	H26	FCOPPER	<	1.0000E+01	PPB
6-45-42	1/08/88	H27	FVANADI		3.0000E+01	PPB
6-45-42	1/08/88	H28	FALUMIN	<	1.5000E+02	PPB
6-45-42	1/08/88	H29	FMANGAN		1.0000E+01	PPB
6-45-42	1/08/88	H30	FPOTASS		4.3200E+03	PPB
6-45-42	1/08/88	H31	FIRON		6.0000E+01	PPB
6-45-42	1/08/88	H32	FMAGNES		1.0500E+04	PPB
6-45-42	1/08/88	H33	FBERYLL	<	5.0000E+00	PPB
6-45-42	1/08/88	H35	FSTRONT		1.9200E+02	PPB
6-45-42	1/08/88	H36	FANTIMO	<	1.0000E+02	PPB
6-45-42	1/08/88	H37	FARSENI		5.0000E+00	PPB
6-45-42	1/08/88	H38	FMERCUR	<	1.0000E-01	PPB
6-45-42	1/08/88	H39	FSELENI	<	5.0000E+00	PPB
6-45-42	1/08/88	H41	FLEAD	<	5.0000E+00	PPB
6-45-42	1/08/88	H42	TOXLDL	<	1.1000E+00	PPB
6-45-42	1/08/88	H58	ALKALIN		1.0100E+05	
6-45-42	1/08/88	H65	HNITRAT		6.9100E+03	PPB
6-45-42	1/08/88	H68	HEXONE	<	1.0000E+01	PPB
6-45-42	1/08/88	I21	TRIBUPH	<	1.0000E+01	PPB
6-45-42	2/04/88	010	CO-60	<	3.6000E+00	PCI/L
6-45-42	2/04/88	024	CS-137	<	3.1800E+00	PCI/L
6-45-42	2/04/88	034	RU-106	<	2.7100E+01	PCI/L
6-45-42	2/04/88	100	PU39-40	<	-1.3700E-03	PCI/L
6-45-42	2/04/88	102	PU-238	<	-7.1700E-04	PCI/L
6-45-42	2/04/88	108	TRITIUM		5.0100E+04	PCI/L
6-45-42	2/04/88	111	BETA		4.2200E+00	PCI/L
6-45-42	2/04/88	121	SR 90	<	1.3700E-01	PCI/L
6-45-42	2/04/88	124	U-CHEM		2.3200E+00	UG/L
6-45-42	2/04/88	183	U 234		1.1600E+00	PCI/L
6-45-42	2/04/88	184	U 235		2.2200E-02	PCI/L
6-45-42	2/04/88	185	U 238		8.7300E-01	PCI/L
6-45-42	2/04/88	212	ALPHA		1.5500E+00	PCI/L
6-45-42	2/04/88	H65	HNITRAT		6.1400E+03	PPB
6-45-42	3/17/88	010	CO-60	<	2.0200E+00	PCI/L
6-45-42	3/17/88	024	CS-137	<	-1.3800E+00	PCI/L
6-45-42	3/17/88	034	RU-106	<	1.3300E+01	PCI/L
6-45-42	3/17/88	100	PU39-40	<	-1.6500E-04	PCI/L
6-45-42	3/17/88	102	PU-238	<	2.5400E-03	PCI/L
6-45-42	3/17/88	108	TRITIUM		4.9700E+04	PCI/L
6-45-42	3/17/88	111	BETA		4.7800E+00	PCI/L
6-45-42	3/17/88	121	SR 90	<	-1.7100E-01	PCI/L
6-45-42	3/17/88	124	U-CHEM		1.9200E+00	UG/L
6-45-42	3/17/88	183	U 234		8.7000E-01	PCI/L
6-45-42	3/17/88	184	U 235	<	1.4800E-02	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	3/17/88	185	U 238		5.6800E-01	PCI/L
6-45-42	3/17/88	212	ALPHA		1.8700E+00	PCI/L
6-45-42	3/17/88	H65	HNITRAT		5.2100E+03	PPB
6-45-42	4/07/88	010	CO-60	<	-5.6400E-01	PCI/L
6-45-42	4/07/88	024	CS-137	<	2.0500E+00	PCI/L
6-45-42	4/07/88	034	RU-106	<	2.9200E+01	PCI/L
6-45-42	4/07/88	100	PU39-40	<	2.0400E-03	PCI/L
6-45-42	4/07/88	102	PU-238	<	-8.0400E-03	PCI/L
6-45-42	4/07/88	108	TRITIUM		5.0200E+04	PCI/L
6-45-42	4/07/88	111	BETA		5.7800E+00	PCI/L
6-45-42	4/07/88	121	SR 90	<	-2.6900E-01	PCI/L
6-45-42	4/07/88	124	U-CHEM		1.8800E+00	UG/L
6-45-42	4/07/88	183	U 234		9.4300E-01	PCI/L
6-45-42	4/07/88	184	U 235		2.0900E-02	PCI/L
6-45-42	4/07/88	185	U 238		7.8600E-01	PCI/L
6-45-42	4/07/88	212	ALPHA		2.6200E+00	PCI/L
6-45-42	4/07/88	H65	HNITRAT		5.9600E+03	PPB
6-45-42	5/04/88	010	CO-60	<	-6.9200E+00	PCI/L
6-45-42	5/04/88	024	CS-137	<	2.7600E+00	PCI/L
6-45-42	5/04/88	034	RU-106	<	-2.1600E+01	PCI/L
6-45-42	5/04/88	100	PU39-40	<	3.6700E-03	PCI/L
6-45-42	5/04/88	102	PU-238	<	-1.4400E-03	PCI/L
6-45-42	5/04/88	108	TRITIUM		4.9400E+04	PCI/L
6-45-42	5/04/88	111	BETA		4.0400E+00	PCI/L
6-45-42	5/04/88	121	SR 90	<	-5.8500E-02	PCI/L
6-45-42	5/04/88	124	U-CHEM		2.0700E+00	UG/L
6-45-42	5/04/88	183	U 234		1.0800E+00	PCI/L
6-45-42	5/04/88	184	U 235		2.8100E-02	PCI/L
6-45-42	5/04/88	185	U 238		8.2300E-01	PCI/L
6-45-42	5/04/88	212	ALPHA		1.4800E+00	PCI/L
6-45-42	5/04/88	H65	HNITRAT		6.6100E+03	PPB
6-45-42	6/06/88	010	CO-60	<	4.2700E+00	PCI/L
6-45-42	6/06/88	024	CS-137	<	-2.3200E+00	PCI/L
6-45-42	6/06/88	034	RU-106	<	2.7900E+00	PCI/L
6-45-42	6/06/88	100	PU39-40	<	3.1400E-03	PCI/L
6-45-42	6/06/88	102	PU-238	<	-1.4400E-03	PCI/L
6-45-42	6/06/88	108	TRITIUM		5.0200E+04	PCI/L
6-45-42	6/06/88	111	BETA		6.2900E+00	PCI/L
6-45-42	6/06/88	121	SR 90	<	4.0700E-01	PCI/L
6-45-42	6/06/88	124	U-CHEM		2.0300E+00	UG/L
6-45-42	6/06/88	183	U 234		1.0800E+00	PCI/L
6-45-42	6/06/88	184	U 235		6.3300E-02	PCI/L
6-45-42	6/06/88	185	U 238		8.9000E-01	PCI/L
6-45-42	6/06/88	212	ALPHA		2.2300E+00	PCI/L
6-45-42	6/06/88	H65	HNITRAT		7.7300E+03	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	6/15/88	111	BETA		7.2500E+00	PCI/L
6-45-42	6/15/88	207	PH-LAB		7.9000E+00	
6-45-42	6/15/88	212	ALPHA		1.7700E+00	PCI/L
6-45-42	6/15/88	A61	TETRANE	<	5.0000E+00	PPB
6-45-42	6/15/88	A62	BENZENE	<	5.0000E+00	PPB
6-45-42	6/15/88	A63	DIOXANE	<	5.0000E+02	PPB
6-45-42	6/15/88	A64	METHONE	<	1.0000E+01	PPB
6-45-42	6/15/88	A65	PYRIDIN	<	5.0000E+02	PPB
6-45-42	6/15/88	A66	TOLUENE	<	5.0000E+00	PPB
6-45-42	6/15/88	A67	1,1,1-T	<	5.0000E+00	PPB
6-45-42	6/15/88	A68	1,1,2-T	<	5.0000E+00	PPB
6-45-42	6/15/88	A69	TRICENE	<	5.0000E+00	PPB
6-45-42	6/15/88	A70	PERCENE	<	5.0000E+00	PPB
6-45-42	6/15/88	A71	OPXYLE	<	5.0000E+00	PPB
6-45-42	6/15/88	A72	ACROLIN	<	1.0000E+01	PPB
6-45-42	6/15/88	A73	ACRYILE	<	1.0000E+01	PPB
6-45-42	6/15/88	A74	BISTHER	<	1.0000E+01	PPB
6-45-42	6/15/88	A75	BROMONE	<	1.0000E+01	PPB
6-45-42	6/15/88	A76	METHBRO	<	1.0000E+01	PPB
6-45-42	6/15/88	A77	CARBIDE	<	1.0000E+01	PPB
6-45-42	6/15/88	A78	CHLBENZ	<	1.0000E+01	PPB
6-45-42	6/15/88	A79	CHLTHER	<	1.0000E+01	PPB
6-45-42	6/15/88	A80	CHLFORM	<	5.0000E+00	PPB
6-45-42	6/15/88	A81	METHCHL	<	1.0000E+01	PPB
6-45-42	6/15/88	A82	CHMTHER	<	1.0000E+01	PPB
6-45-42	6/15/88	A83	CROTONA	<	1.0000E+01	PPB
6-45-42	6/15/88	A84	DIBRCHL	<	1.0000E+01	PPB
6-45-42	6/15/88	A85	DIBRETH	<	1.0000E+01	PPB
6-45-42	6/15/88	A86	DIBRMET	<	1.0000E+01	PPB
6-45-42	6/15/88	A87	DIBUTEN	<	1.0000E+01	PPB
6-45-42	6/15/88	A88	DICDIFM	<	1.0000E+01	PPB
6-45-42	6/15/88	A89	1,1-DIC	<	1.0000E+01	PPB
6-45-42	6/15/88	A90	1,2-DIC	<	1.0000E+01	PPB
6-45-42	6/15/88	A91	TRANDCE	<	1.0000E+01	PPB
6-45-42	6/15/88	A92	DICETHY	<	1.0000E+01	PPB
6-45-42	6/15/88	A93	METHYCH	<	1.0000E+01	PPB
6-45-42	6/15/88	A94	DICPANE	<	1.0000E+01	PPB
6-45-42	6/15/88	A95	DICPENE	<	1.0000E+01	PPB
6-45-42	6/15/88	A96	NNDIEHY	<	1.0000E+01	PPB
6-45-42	6/15/88	A99	HYDRSUL	<	1.0000E+01	PPB
6-45-42	6/15/88	B01	IODOMET	<	1.0000E+01	PPB
6-45-42	6/15/88	B02	METHACR	<	1.0000E+01	PPB
6-45-42	6/15/88	B03	METHTHI	<	1.0000E+01	PPB
6-45-42	6/15/88	B04	PENTACH	<	1.0000E+01	PPB
6-45-42	6/15/88	B05	1112-tc	<	1.0000E+01	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	6/15/88	B06	1122-tc	<	1.0000E+01	PPB
6-45-42	6/15/88	B08	BROMORM	<	1.0000E+01	PPB
6-45-42	6/15/88	B09	TRCMEOL	<	1.0000E+01	PPB
6-45-42	6/15/88	B10	TRCMFLM	<	1.0000E+01	PPB
6-45-42	6/15/88	B11	TRCPANE	<	1.0000E+01	PPB
6-45-42	6/15/88	B12	123-trp	<	1.0000E+01	PPB
6-45-42	6/15/88	B13	VINYIDE	<	1.0000E+01	PPB
6-45-42	6/15/88	B14	M-XYLE	<	5.0000E+00	PPB
6-45-42	6/15/88	B15	DIETHY	<	1.0000E+01	PPB
6-45-42	6/15/88	B19	ACETILE	<	3.0000E+03	PPB
6-45-42	6/15/88	B61	12-dben	<	1.0000E+01	PPB
6-45-42	6/15/88	B62	13-dben	<	1.0000E+01	PPB
6-45-42	6/15/88	B63	14-dben	<	1.0000E+01	PPB
6-45-42	6/15/88	B89	HEXCBEN	<	1.0000E+01	PPB
6-45-42	6/15/88	C04	METACRY	<	1.0000E+01	PPB
6-45-42	6/15/88	C26	PENTCHB	<	1.0000E+01	PPB
6-45-42	6/15/88	C37	TETRCHB	<	1.0000E+01	PPB
6-45-42	6/15/88	C43	TRICHLB	<	1.0000E+01	PPB
6-45-42	6/15/88	C54	HEXACHL	<	1.0000E+01	PPB
6-45-42	6/15/88	C55	NAPHTHA	<	1.0000E+01	PPB
6-45-42	6/15/88	C56	123TRI	<	1.0000E+01	PPB
6-45-42	6/15/88	C57	PHENOL	<	1.0000E+01	PPB
6-45-42	6/15/88	C58	135TRI	<	1.0000E+01	PPB
6-45-42	6/15/88	C59	1234TE	<	1.0000E+01	PPB
6-45-42	6/15/88	C60	1235TE	<	1.0000E+01	PPB
6-45-42	6/15/88	C69	TOC	<	6.2200E+02	PPB
6-45-42	6/15/88	C70	CYANIDE		1.5100E+02	PPB
6-45-42	6/15/88	C71	FORMALN	<	5.0000E+02	PPB
6-45-42	6/15/88	C72	NITRATE		7.2700E+03	PPB
6-45-42	6/15/88	C73	SULFATE		3.4200E+04	PPB
6-45-42	6/15/88	C74	FLUORID		1.2000E+03	PPB
6-45-42	6/15/88	C75	CHLORID		5.6500E+03	PPB
6-45-42	6/15/88	C76	PHOSPHA	<	1.0000E+03	PPB
6-45-42	6/15/88	C79	KEROSEN	<	1.0000E+04	PPB
6-45-42	6/15/88	C80	AMMONIU	<	5.0000E+01	PPB
6-45-42	6/15/88	H05	ETHOXID	<	3.0000E+03	PPB
6-45-42	6/15/88	H06	ETHMETH	<	1.0000E+01	PPB
6-45-42	6/15/88	H16	TC		2.3300E+04	PPB
6-45-42	6/15/88	H18	FZINC	<	5.0000E+00	PPB
6-45-42	6/15/88	H19	FCALCIU		2.6900E+04	PPB
6-45-42	6/15/88	H20	FBARIUM		3.5000E+01	PPB
6-45-42	6/15/88	H21	FCADMIU	<	2.0000E+00	PPB
6-45-42	6/15/88	H22	FCHROMI	<	1.0000E+01	PPB
6-45-42	6/15/88	H23	FSILVER	<	1.0000E+01	PPB
6-45-42	6/15/88	H24	FSODIUM		1.7300E+04	PPB

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	6/15/88	H25	FNICKEL	<	1.0000E+01	PPB
6-45-42	6/15/88	H26	FCOPPER	<	1.0000E+01	PPB
6-45-42	6/15/88	H27	FVANADI		3.4000E+01	PPB
6-45-42	6/15/88	H28	FALUMIN	<	1.5000E+02	PPB
6-45-42	6/15/88	H29	FMANGAN		7.0000E+00	PPB
6-45-42	6/15/88	H30	FPOTASS		3.9200E+03	PPB
6-45-42	6/15/88	H31	FIRON		5.3000E+01	PPB
6-45-42	6/15/88	H32	FMAGNES		1.0800E+04	PPB
6-45-42	6/15/88	H33	FBERYLL	<	5.0000E+00	PPB
6-45-42	6/15/88	H35	FSTRONT		1.9600E+02	PPB
6-45-42	6/15/88	H36	FANTIMO	<	1.0000E+02	PPB
6-45-42	6/15/88	H37	FARSENI		6.0000E+00	PPB
6-45-42	6/15/88	H38	FMERCUR	<	1.0000E-01	PPB
6-45-42	6/15/88	H39	FSELENI	<	5.0000E+00	PPB
6-45-42	6/15/88	H41	FLEAD	<	5.0000E+00	PPB
6-45-42	6/15/88	H42	TOXLDL	<	-5.5500E+00	PPB
6-45-42	6/15/88	H58	ALKALIN		1.0300E+05	
6-45-42	6/15/88	H63	LFLUORD		4.8800E+02	PPB
6-45-42	6/15/88	H68	HEXONE	<	1.0000E+01	PPB
6-45-42	6/15/88	I21	TRIBUPH	<	1.0000E+01	PPB
6-45-42	8/12/88	010	CO-60	<	-1.6900E-01	PCI/L
6-45-42	8/12/88	024	CS-137	<	6.1400E+00	PCI/L
6-45-42	8/12/88	034	RU-106	<	-1.0700E+01	PCI/L
6-45-42	8/12/88	100	PU39-40	<	-2.1600E-03	PCI/L
6-45-42	8/12/88	102	PU-238	<	5.5400E-04	PCI/L
6-45-42	8/12/88	108	TRITIUM		4.6000E+04	PCI/L
6-45-42	8/12/88	111	BETA		4.5000E+00	PCI/L
6-45-42	8/12/88	121	SR 90	<	1.6600E-01	PCI/L
6-45-42	8/12/88	124	U-CHEM		2.1000E+00	UG/L
6-45-42	8/12/88	183	U 234		1.0200E+00	PCI/L
6-45-42	8/12/88	184	U 235		3.9300E-02	PCI/L
6-45-42	8/12/88	185	U 238		8.2200E-01	PCI/L
6-45-42	8/12/88	212	ALPHA		1.8900E+00	PCI/L
6-45-42	8/12/88	H65	HNITRAT		5.1700E+03	PPB
6-45-42	8/15/88	010	CO-60	<	-3.7600E+00	PCI/L
6-45-42	8/15/88	024	CS-137	<	-1.1400E-01	PCI/L
6-45-42	8/15/88	034	RU-106	<	-1.2600E+01	PCI/L
6-45-42	8/15/88	100	PU39-40	<	-1.6500E-04	PCI/L
6-45-42	8/15/88	102	PU-238	<	-1.4400E-03	PCI/L
6-45-42	8/15/88	108	TRITIUM		4.5600E+04	PCI/L
6-45-42	8/15/88	111	BETA		5.8100E+00	PCI/L
6-45-42	8/15/88	121	SR 90	<	2.2400E-01	PCI/L
6-45-42	8/15/88	124	U-CHEM		2.8200E+00	UG/L
6-45-42	8/15/88	183	U 234		1.0100E+00	PCI/L
6-45-42	8/15/88	184	U 235		5.6400E-02	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	8/15/88	185	U 238		7.3000E-01	PCI/L
6-45-42	8/15/88	191	CONDFLD		2.6200E+02	UMHO/CM
6-45-42	8/15/88	199	PHFIELD		7.8000E+00	
6-45-42	8/15/88	207	PH-LAB		7.9000E+00	
6-45-42	8/15/88	212	ALPHA		4.3300E-01	PCI/L
6-45-42	8/15/88	C69	TOC	<	4.8000E+02	PPB
6-45-42	8/15/88	C70	CYANIDE	<	1.0000E+01	PPB
6-45-42	8/15/88	C72	NITRATE		6.6500E+03	PPB
6-45-42	8/15/88	C73	SULFATE		3.0900E+04	PPB
6-45-42	8/15/88	C74	FLUORID	<	5.0000E+02	PPB
6-45-42	8/15/88	C75	CHLORID		4.8300E+03	PPB
6-45-42	8/15/88	C76	PHOSPHA	<	1.0000E+03	PPB
6-45-42	8/15/88	H16	TC		2.3900E+04	PPB
6-45-42	8/15/88	H18	FZINC		8.2000E+01	PPB
6-45-42	8/15/88	H19	FCALCIU		2.9700E+04	PPB
6-45-42	8/15/88	H20	FBARIUM		1.6000E+01	PPB
6-45-42	8/15/88	H21	FCADMIU	<	2.0000E+00	PPB
6-45-42	8/15/88	H22	FCHROMI	<	1.0000E+01	PPB
6-45-42	8/15/88	H23	FSILVER	<	1.0000E+01	PPB
6-45-42	8/15/88	H24	FSODIUM		1.8000E+04	PPB
6-45-42	8/15/88	H25	FNICKEL	<	1.0000E+01	PPB
6-45-42	8/15/88	H26	FCOPPER	<	1.0000E+01	PPB
6-45-42	8/15/88	H27	FVANADI		2.0000E+01	PPB
6-45-42	8/15/88	H28	FALUMIN	<	1.5000E+02	PPB
6-45-42	8/15/88	H29	FMANGAN	<	5.0000E+00	PPB
6-45-42	8/15/88	H30	FPOTASS		4.4600E+03	PPB
6-45-42	8/15/88	H31	FIRON	<	3.0000E+01	PPB
6-45-42	8/15/88	H32	FMAGNES		1.0400E+04	PPB
6-45-42	8/15/88	H33	FBERYLL	<	5.0000E+00	PPB
6-45-42	8/15/88	H35	FSTRONT		1.8300E+02	PPB
6-45-42	8/15/88	H36	FANTIMO	<	1.0000E+02	PPB
6-45-42	8/15/88	H58	ALKALIN		1.0100E+05	
6-45-42	8/15/88	H63	LFLUORD		5.5000E+02	PPB
6-45-42	8/15/88	H65	HNITRAT		6.8700E+03	PPB
6-45-42	9/09/88	010	CO-60	<	-1.3200E+00	PCI/L
6-45-42	9/09/88	024	CS-137	<	1.8300E+00	PCI/L
6-45-42	9/09/88	034	RU-106	<	-2.8100E+01	PCI/L
6-45-42	9/09/88	100	PU39-40	<	-1.6500E-04	PCI/L
6-45-42	9/09/88	102	PU-238	<	-1.4400E-03	PCI/L
6-45-42	9/09/88	108	TRITIUM		4.7100E+04	PCI/L
6-45-42	9/09/88	111	BETA		4.3800E+00	PCI/L
6-45-42	9/09/88	121	SR 90	<	-3.7400E-01	PCI/L
6-45-42	9/09/88	124	U-CHEM		2.1300E+00	UG/L
6-45-42	9/09/88	183	U 234		1.0200E+00	PCI/L
6-45-42	9/09/88	184	U 235		1.7800E-02	PCI/L

TABLE B.1. (contd)

WELL NAME	COLLECTION DATE	CONSTITUENT CODE	CONSTITUENT NAME	LESS THAN FLAG	ANALYSIS VALUE	ANALYSIS UNITS
6-45-42	9/09/88	185	U 238		6.9600E-01	PCI/L
6-45-42	9/09/88	212	ALPHA		1.0700E+00	PCI/L
6-45-42	9/09/88	H65	HNITRAT		6.7000E+03	PPB
6-45-42	10/06/88	010	CO-60	<	-3.9200E-01	PCI/L
6-45-42	10/06/88	024	CS-137	<	-1.5600E+00	PCI/L
6-45-42	10/06/88	034	RU-106	<	-1.4100E+01	PCI/L
6-45-42	10/06/88	100	PU39-40	<	-4.1500E-03	PCI/L
6-45-42	10/06/88	102	PU-238	<	-1.4400E-03	PCI/L
6-45-42	10/06/88	108	TRITIUM		4.9500E+04	PCI/L
6-45-42	10/06/88	111	BETA		4.1700E+00	PCI/L
6-45-42	10/06/88	121	SR 90	<	6.2100E-02	PCI/L
6-45-42	10/06/88	124	U-CHEM		2.2800E+00	UG/L
6-45-42	10/06/88	183	U 234		1.0000E+00	PCI/L
6-45-42	10/06/88	184	U 235		6.5200E-02	PCI/L
6-45-42	10/06/88	185	U 238		7.9400E-01	PCI/L
6-45-42	10/06/88	212	ALPHA		1.6100E+00	PCI/L
6-45-42	10/06/88	H65	HNITRAT		6.5600E+03	PPB
6-45-42	10/31/88	010	CO-60	<	-4.2600E+00	PCI/L
6-45-42	10/31/88	024	CS-137	<	-6.0700E+00	PCI/L
6-45-42	10/31/88	034	RU-106	<	-2.0200E+01	PCI/L
6-45-42	10/31/88	100	PU39-40	<	2.1900E-03	PCI/L
6-45-42	10/31/88	102	PU-238	<	-1.4400E-03	PCI/L
6-45-42	10/31/88	108	TRITIUM		4.6300E+04	PCI/L
6-45-42	10/31/88	111	BETA		3.1800E+00	PCI/L
6-45-42	10/31/88	121	SR 90	<	-2.9800E-01	PCI/L
6-45-42	10/31/88	124	U-CHEM		2.1600E+00	UG/L
6-45-42	10/31/88	183	U 234		8.4900E-01	PCI/L
6-45-42	10/31/88	184	U 235		1.7200E-02	PCI/L
6-45-42	10/31/88	185	U 238		5.3300E-01	PCI/L
6-45-42	10/31/88	212	ALPHA		1.6600E+00	PCI/L
6-45-42	10/31/88	H65	HNITRAT		6.4000E+03	PPB
6-45-42	12/13/88	010	CO-60	<	-1.3700E+00	PCI/L
6-45-42	12/13/88	024	CS-137	<	-5.6500E+00	PCI/L
6-45-42	12/13/88	034	RU-106	<	-6.0300E+00	PCI/L
6-45-42	12/13/88	H65	HNITRAT		7.1000E+03	PPB

TABLE B.2. Monitoring Parameters

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
B05	1112-tc	1,1,1,2-tetrachlorethane	PPB
A67	1,1,1-T	1,1,1-trichloroethane	PPB
B06	1122-tc	1,1,2,2-tetrachlorethane	PPB
A68	1,1,2-T	1,1,2-trichloroethane	PPB
A89	1,1-DIC	1,1-dichloroethane	PPB
A92	DICETHY	1,1-dichloroethylene	PPB
C59	1234TE	1,2,3,4-tetrachlorobenzene	PPB
C60	1235TE	1,2,3,5-tetrachlorobenzene	PPB
C56	123TRI	1,2,3-trichlorobenzene	PPB
B12	123-trp	1,2,3-trichloropropane	PPB
C37	TETRCHB	1,2,4,5-tetrachlorobenzene	PPB
C43	TRICHLB	1,2,4-trichlorobenzene	PPB
A84	DIBRCHL	1,2-dibromo-3-chloropropane	PPB
A85	DIBRETH	1,2-dibromoethane	PPB
B61	12-dben	1,2-dichlorobenzene	PPB
A90	1,2-DIC	1,2-dichloroethane	PPB
A94	DICPANE	1,2-dichloropropane	PPB
B84	DIPHHYD	1,2-diphenylhydrazine	PPB
C58	135TRI	1,3,5-trichlorobenzene	PPB
B62	13-dben	1,3-dichlorobenzene	PPB
A95	DICPENE	1,3-dichloropropene	PPB
A87	DIBUTEN	1,4-dichloro-2-butene	PPB
B63	14-dben	1,4-dichlorobenzene	PPB
C08	NAPHQUI	1,4-naphthoquinone	PPB
A26	CHLOREA	1-(o-chlorophenyl) thiourea	PPB
I09	BUTANOL	1-Butanol	PPB
A25	ACETREA	1-acetyl-2-thiourea	PPB
B47	CHLEPOX	1-chloro-2,3-epoxypropane	PPB
A29	NAPHREA	1-naphthyl-2-thiourea	PPB
C09	1-napha	1-naphthylamine	PPB
C39	TETRCHP	2,3,4,6-tetrachlorophenol	PPB
H15	2,4,5-T	2,4,5-T	PPB
H14	2,4,5TP	2,4,5-TP silvex	PPB
C44	245-trp	2,4,5-trichlorophenol	PPB
C45	246-trp	2,4,6-trichlorophenol	PPB
H13	2,4-D	2,4-D	PPB
B65	24-dchp	2,4-dichlorophenol	PPB
B75	DIMPHEN	2,4-dimethylphenol	PPB
B79	DINPHEN	2,4-dinitrophenol	PPB
B80	24-dint	2,4-dinitrotoluene	PPB
B66	26-dchp	2,6-dichlorophenol	PPB
B81	26-dint	2,6-dinitrotoluene	PPB
I10	PROPANO	2-Propanol	PPB
B22	ACEFENE	2-acetylaminofluorene	PPB
A79	CHLTHER	2-chloroethyl vinyl ether	PPB

9 0 1 1 7 7 2 0 7 2 7

TABLE B.2. (contd)

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
B48	CHLNAPH	2-chloronaphthalene	PPB
B49	CHLPHEN	2-chlorophenol	PPB
B52	CYCHDIN	2-cyclohexyl-4,6-dinitrophenol	PPB
C06	METPROP	2-methyl-2-(methylthio) propionaldehyde-	PPB
B99	METAZIR	2-methylaziridine	PPB
C03	METACTO	2-methyllactonitrile	PPB
C10	2-napha	2-naphthylamine	PPB
C32	PICOLIN	2-picoline	PPB
H12	PROPYNO	2-propyn-1-ol	PPB
B43	BUTDINP	2-sec-butyl-4,6-dinitrophenol	PPB
B64	DICHBEN	3,3'-dichlorobenzidine	PPB
B69	DIMETHB	3,3'-dimethoxybenzidine	PPB
B72	DIMEYLB	3,3'-dimethylbenzidine	PPB
C98	CHLPROP	3-chloropropionitrile	PPB
C01	METCHAN	3-methylcholanthrene	PPB
C02	METBISC	4,4'-methylenebis(2-chloroaniline)	PPB
B78	DINCRES	4,6-dinitro-o-cresol and salts	PPB
B23	AMINOYL	4-aminobyphenyl	PPB
B41	BROPHEN	4-bromophenyl phenyl ether	PPB
C13	NITPHEN	4-nitrophenol	PPB
B24	AMIISOX	5-(aminomethyl)-3-isoxazolol	PPB
C25	NITRTOL	5-nitro-o-toluidine	PPB
B71	DIMBENZ	7,12-dimethylbenz[a]anthracene	PPB
B56	DIBCGCA	7H-dibenzo[c,g]carbazole	PPB
I01	ACETONE	Acetone	PPB
B19	ACETILE	Acetonitrile	PPB
B20	ACETOPH	Acetophenone	PPB
A72	ACROLIN	Acrolein	PPB
C94	ACRYIDE	Acrylamide	PPB
A73	ACRYILE	Acrylonitrile	PPB
A47	ALDRIN	Aldrin	PPB
H58	ALKALIN	Alkalinity	
C95	ALLYLAL	Allyl alcohol	PPB
B74	DIMPHAM	Alpha,alpha-dimethylphenethylamine	PPB
A36	a-BHC	Alpha-BHC	PPB
A16	ALUMNUM	Aluminum	PPB
H28	FALUMIN	Aluminum, filtered	PPB
B25	AMITROL	Amitrole	PPB
C80	AMMONIU	Ammonium ion	PPB
B26	ANILINE	Aniline	PPB
A15	ANTIONY	Antimony	PPB
H36	FANTIMO	Antimony, filtered	PPB
B27	ARAMITE	Aramite	PPB
A54	AR1016	Arochlor 1016	PPB
A55	AR1221	Arochlor 1221	PPB

TABLE B.2. (contd)

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
A56	AR1232	Arochlor 1232	PPB
A57	AR1242	Arochlor 1242	PPB
A58	AR1248	Arochlor 1248	PPB
A59	AR1254	Arochlor 1254	PPB
A60	AR1260	Arochlor 1260	PPB
A20	ARSENIC	Arsenic	PPB
H37	FARSENI	Arsenic, filtered	PPB
B28	AURAMIN	Auramine	PPB
A06	BARIUM	Barium	PPB
H20	FBARIUM	Barium, filtered	PPB
B30	BENZAAN	Benz[a]anthracene	PPB
B29	BENZCAC	Benz[c]acridine	PPB
A62	BENZENE	Benzene	PPB
B31	BENDICM	Benzene, dichloromethyl	PPB
B32	BENTHOL	Benzenethoil	PPB
B33	BENDINE	Benzidine	PPB
C49	BENZOPY	Benzo[a]pyrene	PPB
B34	BENZBFL	Benzo[b]fluoranthene	PPB
B35	BENZJFL	Benzo[j]fluoranthene	PPB
B37	BENZCHL	Benzyl chloride	PPB
A01	BERYLUM	Berylliam	PPB
H33	FBERYLL	Beryllium, filtered	PPB
A37	b-BHC	Beta-BHC	PPB
B38	BIS2CHM	Bis(2-chloroethoxy) methane	PPB
B39	BIS2CHE	Bis(2-chloroethyl) ether	PPB
C51	BIS2ETH	Bis(2-chloroisopropyl)ether	PPB
B40	BIS2EPH	Bis(2-ethylhexyl) phthalate	PPB
A74	BISTHER	Bis(chloromethyl) ether	PPB
H66	BROMIDE	Bromide	PPB
A75	BROMONE	Bromoacetone	PPB
B08	BROMORM	Bromoform	PPB
B42	BUTBENP	Butyl benzyl phthalate	PPB
A07	CADMIUM	Cadmium	PPB
H21	FCADMIU	Cadmium, filtered	PPB
A05	CALCIUM	Calcium	PPB
H19	FCALCIU	Calcium, filtered	PPB
A77	CARBIDE	Carbon disulfide	PPB
C63	CARBPHT	Carbophenothion	PPB
024	CS-137	Cesium-137	PCI/L
A48	CHLOANE	Chlordane	PPB
C75	CHLORID	Chloride	PPB
C50	CHLNAPZ	Chlornaphazine	PPB
C97	CHLACET	Chloroacetaldehyde	PPB
B44	CHALETH	Chloroalkyl ethers	PPB
A78	CHLBENZ	Chlorobenzene	PPB

TABLE B.2. (contd)

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
C62	CHLLATE	Chlorobenzilate	PPB
A80	CHLFORM	Chloroform	PPB
A82	CHMTHER	Chloromethyl methyl ether	PPB
A08	CHROMUM	Chromium	PPB
H22	FCHROMI	Chromium, filtered	PPB
B50	CHRYSEN	Chrysene	PPB
C87	CITRUSR	Citrus red	PPB
010	CO-60	Cobalt-60	PCI/L
109	COLIFRM	Coliform bacteria	MPN
088	CONDLAB	Conductivity, Laboratory	UMHO/CM
A13	COPPER	Copper	PPB
H26	FCOPPER	Copper, filtered	PPB
B51	CRESOLS	Cresols	PPB
A83	CROTONA	Crotonaldehyde	PPB
C70	CYANIDE	Cyanide	PPB
A40	DDD	DDD	PPB
A41	DDE	DDE	PPB
A42	DDT	DDT	PPB
A39	d-BHC	Delta-BHC	PPB
B60	DIBPHTH	Di-n-butyl phthalate	PPB
B82	DIOPHTH	Di-n-octyl phthalate	PPB
B85	DIPRNIT	Di-n-propylnitrosamine	PPB
B53	DIBAHAC	Dibenz[a,h]acridine	PPB
B55	DIBAHAN	Dibenz[a,h]anthracene	PPB
B54	DIBAJAC	Dibenz[a,j]acridine	PPB
B57	DIBAEPY	Dibenzo[a,e]pyrene	PPB
B58	DIBAHPY	Dibenzo[a,h]pyrene	PPB
B59	DIBAIPY	Dibenzo[a,i]pyrene	PPB
A86	DIBRMET	Dibromomethane	PPB
L21	DBP	Dibutylphosphate	PPB
A88	DICDIFM	Dichlorodifluoromethane	PPB
A46	DIELRIN	Dieldrin	PPB
B67	DIEPHTH	Diethyl phthalate	PPB
B15	DIETHY	Diethylarsine	PPB
A27	DIETROL	Diethylstilbesterol	PPB
B68	DIHYSAF	Dihydrosafrole	PPB
C65	DIMETHO	Dimethoate	PPB
B76	DIMPHTH	Dimethyl phthalate	PPB
B77	DINBENZ	Dinitrobenzene	PPB
A63	DIOXANE	Dioxane	PPB
C86	DIOXIN	Dioxin	PPB
B83	DIPHAMI	Diphenylamine	PPB
C64	DISULFO	Disulfoton	PPB
A49	ENDO1	Endosulfan I	PPB
A52	ENDO2	Endosulfan II	PPB

TABLE B.2. (contd)

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
A33	ENDRIN	Endrin	PPB
I67	ETHANOL	Ethanol	PPB
H03	ETHCARB	Ethyl carbamate	PPB
H04	ETHCYAN	Ethyl cyanide	PPB
H06	ETHMETH	Ethyl methacrylate	PPB
B87	ETHMETS	Ethyl methanesulfonate	PPB
C81	ETHYGLY	Ethylene glycol	PPB
H05	ETHOXID	Ethylene oxide	PPB
B86	ETHMINE	Ethyleneimine	PPB
A28	ETHYREA	Ethylenethiourea	PPB
B88	FLUORAN	Fluoranthene	PPB
C74	FLUORID	Fluoride	PPB
H63	LFLUORD	Fluoride, Low Detection Level	PPB
C71	FORMALN	Formalin	PPB
A38	g-BHC	Gamma-BHC	PPB
212	ALPHA	Gross alpha	PCI/L
111	BETA	Gross beta	PCI/L
A43	HEPTLOR	Heptachlor	PPB
A44	HEPTIDE	Heptchlor epoxide	PPB
B89	HEXCBEN	Hexachlorobenzene	PPB
B90	HEXCBUT	Hexachlorobutadiene	PPB
B91	HEXCCYC	Hexachlorocyclopentadiene	PPB
B92	HEXCETH	Hexachloroethane	PPB
C54	HEXACHL	Hexachlorophene	PPB
C52	HEXAENE	Hexachloropropene	PPB
H68	HEXONE	Hexone	PPB
C53	HYDRAZI	Hydrazine	PPB
A99	HYDRSUL	Hydrogen sulfide	PPB
B93	INDENOP	Indeno(1,2,3-cd)pyrene	PPB
B01	IODOMET	Iodomethane	PPB
A19	IRON	Iron	PPB
H31	FIRON	Iron, filtered	PPB
H09	ISOBUTY	Isobutyl alcohol	PPB
B94	ISOSOLE	Isosafrole	PPB
C79	KEROSEN	Kerosene	PPB
A51	LEADGF	Lead (graphite furnace)	PPB
H41	FLEAD	Lead, filtered	PPB
A50	MAGNES	Magnesium	PPB
H32	FMAGNES	Magnesium, filtered	PPB
C92	MALHYDR	Maleic hydrizide	PPB
B95	MALOILE	Malononitrile	PPB
A17	MANGESE	Manganese	PPB
H29	FMANGAN	Manganese, filtered	PPB
B96	MELPHAL	Melphalan	PPB
A21	MERCURY	Mercury	PPB

TABLE B.2. (contd)

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
H38	FMERCUR	Mercury, filtered	PPB
B02	METHACR	Methacrylonitrile	PPB
B03	METHTHI	Methanethiol	PPB
B97	METHAPY	Methapyrilene	PPB
B98	METHNYL	Metholonyl	PPB
A34	METHLOR	Methoxychlor	PPB
A76	METHBRO	Methyl bromide	PPB
A81	METHCHL	Methyl chloride	PPB
A64	METHONE	Methyl ethyl ketone	PPB
C04	METACRY	Methyl methacrylate	PPB
C05	METMSUL	Methyl methanesulfonate	PPB
C66	METHPAR	Methyl parathion	PPB
A93	METHYCH	Methylene chloride	PPB
C07	METHIOU	Methylthiouracil	PPB
L20	MBP	Monobutylphosphate	PPB
A96	NNDIEHY	N,N-diethylhydrazine	PPB
C19	NNIURET	N-nitroso-N-methylurethane	PPB
C14	NNIBUTY	N-nitrosodi-n-butylamine	PPB
C15	NNIDIEA	N-nitrosodiethanolamine	PPB
C16	NNIDIEY	N-nitrosodiethylamine	PPB
C17	NNIDIME	N-nitrosodimethylamine	PPB
C18	NNIMETH	N-nitrosomethylethylamine	PPB
C20	NNIVINY	N-nitrosomethylvinylamine	PPB
C21	NNIMORP	N-nitrosomorpholine	PPB
C22	NNINICO	N-nitrosonornicotine	PPB
C23	NNIPIPE	N-nitrosopiperidine	PPB
A32	PHENREA	N-phenylthiourea	PPB
H11	PROPYLA	N-propylamine	PPB
C55	NAPHTHA	Naphthalene	PPB
124	U-CHEM	Natural uranium	UG/L
A12	NICKEL	Nickel	PPB
H25	FNICKEL	Nickel, filtered	PPB
C93	NICOTIN	Nicotinic acid	PPB
C72	NITRATE	Nitrate	PPB
H65	HNITRAT	Nitrate, High Detection Level	PPB
H67	NITRITE	Nitrite	PPB
C12	NITBENZ	Nitrobenzine	PPB
C24	NITRPYR	Nitrosopyrrolidine	PPB
C46	TRIPHOS	O,O,O-triethyl phosphorothioate	PPB
C42	OTOLHYD	O-toluidine hydrochloride	PPB
B36	PBENZQU	P benzoquinone	PPB
B46	CHLCRES	P-chloro-m-cresol	PPB
B45	CHLANIL	P-chloroaniline	PPB
B70	DIMEAMB	P-dimethylaminoazobenzene	PPB
C11	NITRANI	P-nitroaniline	PPB

9 0 1 1 7 7 2 0 7 3 3

TABLE B.2. (contd)

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
C90	PARALDE	Paraldegyde	PPB
C67	PARATHI	Parathion	PPB
C26	PENTCHB	Pentachlorobenzene	PPB
B04	PENTACH	Pentachloroethane	PPB
C27	PENTCHN	Pentachloronitrobenzene	PPB
C28	PENTCHP	Pentachlorophenol	PPB
C77	PERCHLO	Perchlorate	PPB
A70	PERCENE	Perchloroethylene	PPB
199	PHFIELD	pH, Field Measurement	
207	PH-LAB	pH, Laboratory Measurement	
C29	PHENTIN	Phenacetin	PPB
C57	PHENOL	Phenol	PPB
H57	LPHENOL	Phenol, low DL	PPB
C30	PHENINE	Phenylenediamine	PPB
C76	PHOSPHA	Phosphate	PPB
C31	PHTHEST	Phthalic acid esters	PPB
102	PU-238	Plutonium-238	PCI/L
100	PU39-40	Plutonium-239/40	PCI/L
A18	POTASUM	Potassium	PPB
H30	FPOTASS	Potassium, filtered	PPB
C33	PRONIDE	Pronamide	PPB
A65	PYRIDIN	Pyridine	PPB
181	RADIUM	Radium	PCI/L
C34	RESERPI	Reserpine	PPB
C35	RESORCI	Resorcinol	PPB
034	RU-106	Ruthenium-106	PCI/L
C36	SAFROL	Safrol	PPB
A22	SELENUM	Selenium	PPB
H39	FSELENI	Selenium, filtered	PPB
A10	SILVER	Silver	PPB
H23	FSILVER	Silver, filtered	PPB
A11	SODIUM	Sodium	PPB
H24	FSODIUM	Sodium, filtered	PPB
191	CONDFLD	Specific conductance	UMHO/CM
A03	STRONUM	Strontium	PPB
H35	FSTRONT	Strontium, filtered	PPB
121	SR 90	Strontium-90	PCI/L
C91	STRYCHN	Strychnine	PPB
C73	SULFATE	Sulfate	PPB
C78	SULFIDE	Sulfide	PPB
C47	SYMTRIN	Sym-trinitrobenzene	PPB
197	TC-99	Technetium-99	PCI/L
A61	TETRANE	Tetrachloromethane	PPB
C61	TETEPYR	Tetraethylpyrophosphate	PPB
I28	TAF	Tetrahydorfuran	PPB

TABLE B.2. (contd)

CONSTITUENT CODE	CONSTITUENT NAME	CONSTITUENT LONG NAME	ANALYSIS UNITS
A23	THALIUM	Thallium	PPB
H40	FTHALLI	Thallium, filtered	PPB
B73	THIONOX	Thiofanox	PPB
A24	THIOURA	Thiourea	PPB
C40	THIURAM	Thiuram	PPB
A66	TOLUENE	Toluene	PPB
C41	TOLUDIA	Toluenediamine	PPB
H42	TOXLDL	Total Organic Halogen, Low Det. Level	PPB
H16	TC	Total carbon	PPB
C69	TOC	Total organic carbon	PPB
A35	TOXAENE	Toxaphene	PPB
A91	TRANDCE	Trans-1,2-dichloroethene	PPB
I21	TRIBUPH	Tributylphosphoric Acid	PPB
A69	TRICENE	Trichloroethylene	PPB
B09	TRCMEOL	Trichloromethanethiol	PPB
B10	TRCMFLM	Trichloromonofluoromethane	PPB
B11	TRCPANE	Trichloropropane	PPB
C48	TRISPHO	Tris(2,3-dibromopropyl) phosphate	PPB
108	TRITIUM	Tritium	PCI/L
H60	TURBID	Turbidity	NTU
183	U 234	Uranium-234	PCI/L
184	U 235	Uranium-235	PCI/L
185	U 238	Uranium-238	PCI/L
A14	VANADUM	Vanadium	PPB
H27	FVANADI	Vanadium, filtered	PPB
B13	VINYIDE	Vinyl chloride	PPB
B21	WARFRIN	Warfarin	PPB
B14	M-XYLE	Xylene-m	PPB
A71	OPXYLE	Xylene-o,p	PPB
A04	ZINC	Zinc	PPB
H18	FZINC	Zinc, filtered	PPB

9011172973 4

THIS PAGE INTENTIONALLY
LEFT BLANK

9 0 1 1 7 7 2 0 7 3 5

APPENDIX C

SAMPLING AND ANALYSIS PLAN

9011172073

APPENDIX C

SAMPLING AND ANALYSIS PLAN

This appendix introduces the procedures that will be used for sample collection (including well evacuation and sample withdrawal methods); chain of custody; analytical methods, including samples preservation and shipment and chemical analysis; and quality assurance/quality control.

All sampling activities are performed under contract by Pacific Northwest Laboratory (PNL). United States Testing Company, Incorporated, (UST) currently conducts sample analyses for most constituents.

SAMPLE COLLECTION PROCEDURES

The procedures for ground-water sample collection, water-level measurement, and field measurements are contained in Procedures for Ground-Water Investigations (PNL 1989). Specific applicable procedures are:

- GC-1 - Ground-Water Sample Collection Procedure
- GC-2 - In-Line Sample Filtration Procedure
- GC-3 - Disposal of Purge Water from Monitoring Wells
- 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
- WL-1 - Water-Level Measurement Procedure
- WL-2 - Procedure for Standardizing Steel Tapes.

CHAIN-OF-CUSTODY PROCEDURES

Chain-of-custody procedures are contained in Procedures for Ground-Water Investigations (PNL 1989). The specific applicable procedure is AD-2, Ground-Water Sample Chain-of-Custody Procedure. This history of the custody of each sample will be documented according to this procedure.

ANALYTICAL METHODS

Tables C.1 and C.2 discuss details of the methods used to analyze samples.

Table C.1. Preservation Techniques, Analytical Methods Used, and the Current Detection Levels for Listed Constituents as of January 1, 1989. (page 1 of 3)

CONSTITUENT	COLLECTION AND PRESERVATION[a,b]	ANALYSIS METHODS[c]	DETECTION LIMIT, PPB[d]
Metals Analyzed by the Inductively Coupled Plasma Method--Unfiltered/Filtered			
beryllium			3
strontium			10
zinc			5
calcium			50
barium			6
cadmium			5
chromium			10
silver			10
sodium			200
nickel			10
copper			10
vanadium			5
antimony	P, HNO_3 to pH<2	SW-846, #6010	100
aluminum			150
manganese			5
potassium			100
iron			30
magnesium			50
boron			10
cobalt			20
lithium			10
molybdenum			40
silicon			50
tin			30
titanium			60
zirconium			50
arsenic	P, HNO_3 to pH<2	SW-846, #7060	5
mercury	G, HNO_3 to pH<2	SW-846, #7470	0.1
selenium	P, HNO_3 to pH<2	SW-846, #7740	5
lead	P, HNO_3 to pH<2	SW-846, #7421	5
Anions by Ion Chromatography			
nitrate			500
sulfate			500
fluoride			500
chloride	P, none	(e)	500
phosphate			1000
bromide			1000
nitrite			1000

Table C.1. Preservation Techniques, Analytical Methods Used, and the Current Detection Levels for Listed Constituents as of January 1, 1989. (page 2 of 3)

CONSTITUENT	COLLECTION AND PRESERVATION[a,b]	ANALYSIS METHODS[c]	DETECTION LIMIT, PPB[d]
Pesticides			
endrin	G, none	SW-846, #8080	0.1
methoxychlor			3
toxaphene			1
lindane (four isomers)			0.1
Herbicides			
2, 4-D	G, none	SW-846, #8150	2
2, 4-5-TP silvex			2
2, 4, 5-T			2
Volatile Organic Analyses (VOA)			
carbon tetrachloride	G, no headspace	SW-846, #8240	5
benzene			5
methyl ethyl ketone			10
toluene			5
1,1,1-trichloroethane			5
1,1,2-trichloroethane			5
trichloroethylene			5
tetrachloroethylene			5
xylene (O, P)			5
chloroform			5
1,1 dichloroethane			5
1,2 dichloroethane			5
trans-1,2 dichloroethylene			5
methylene chloride			5
vinyl chloride			10
xylene (M)			5
p-dichlorobenzene			5
methyl isobutyl ketone			10
acetone			10
tetrahydrofuran			10
Radiological			
radium	P, HNO_3 to pH<2	SW-846, #9315[f]	1 pCi/L
gross alpha	P, HNO_3 to pH<2	SW-846, #9310	4 pCi/L
gross beta	P, HNO_3 to pH<2	SW-846, #9310	8 pCi/L
tritium	P, none	ASTM, D2476-81	500 pCi/L
uranium	P, HNO_3 to pH<2	(g)	
uranium	P, HNO_3 to pH<2	(h)	
gamma scan	P, HNO_3 to pH<2	(i)	

Table C.1. Preservation Techniques, Analytical Methods Used, and the Current Detection Levels for Listed Constituents as of January 1, 1989. (page 3 of 3)

CONSTITUENT	COLLECTION AND PRESERVATION[a,b]	ANALYSIS METHODS[c]	DETECTION LIMIT, PPB[d]
Other			
coliform bacteria	P, none	SW-846, #9131	2.2[j]
temperature	field measurement	(k)	
specific conductance	field measurement	(k)	
pH	field measurement	(k)	
total organic halogen, low detection level	G, H_2SO_4 to pH<2 No headspace	SW-846, #9020	10
total organic carbon	G, H_3PO_4 to pH<2	SW-846, #9060	2000
total carbon	G, none	SW-846, #9060	2000
ammonium ion	P, H_2SO_4 to pH<2	ASTM D1426-D[l]	50
phenol	G, none	SW-846, #8040	10
cyanide	P, NaOH to pH<2	SW-846, #9010	10
hydrazine	G, HCl	ASTM D1385	30
total dissolved solids	P, none	Std Methods 209B[m]	--

(a) P, plastic; G, glass.
(b) All samples will be cooled to 4°C upon collection.
(c) Constituents grouped together are analyzed by the same method.
(d) Detection limit units except where indicated.
(e) Analytical method adapted from Method 300.0, EPA (1984).
(f) The method also references ASTM (1988) and Krieger and Whittaker (1980).
(g) Adopted from Techniques of Water Resources Investigations of the U.S. Geological Survey, as amended, U.S. Government Printing Office, Washington, D.C.
(h) Adopted from NCRP (1985).
(i) From Krieger and Whittaker (1980) and Volchok and dePlanque (1983).
(j) most probable number.
(k) PNL (1989).
(l) By ion selective electrode.
(m) APHA (1985).

Table C.2. Preservation Techniques, Analytical Methods Used, and the Current Detection Levels for Additional Constituents on the 9905 and Appendix IX Lists[a]. (page 1 of 4)

CONSTITUENT	COLLECTION AND PRESERVATION[b,c]	ANALYSIS METHODS[d]	DETECTION LIMIT, PPB[e]
Metals Analyzed by the Inductively Coupled Plasma Method--Enhanced Additions			
thallium	P, HNO_3 to pH<2	SW-846, #7840	5
Thiourea Group--Enhanced Additions			
thiourea	G, none	SW-846, #8330 (modified)	200
1-acetyl-2-thiourea			200
1-(o-chlorophenyl) thiourea			200
diethylstilbesterol			200
ethylenethiourea			200
1-naphthyl-2-thiourea			200
N-phenylthiourea			500
Pesticides--Enhanced Additions			
aldrin	G, none	SW-846, #8080	0.1
chlordane			1
4,4'DDD			0.1
4,4'DDE			0.1
4,4'DDT			0.1
endosulfan I			0.1
endosulfan II			0.1
endosulfan sulfate			0.5
heptachlor			0.1
heptachlor epoxide			0.1
kepone			1
dieldrin			0.1
chlorobenzilate			300
Phosphorous Pesticides			
carbophenothion	G, none	SW-846, #8140	2
tetraethylpyrophosphate			2
disulfoton			2
dimethoate			2
methyl parathion			2
parathion			2
phorate			2

Table C.2. Preservation Techniques, Analytical Methods Used, and the Current Detection Levels for Additional Constituents on the 9905 and Appendix IX Lists[a]. (page 2 of 4)

CONSTITUENT	COLLECTION AND PRESERVATION[b,c]	ANALYSIS METHODS[d]	DETECTION LIMIT, PPB[e]
Direct Aqueous Injection			
acrylamide	G, none	SW-846, #8240[f]	10,000
allyl alcohol			2,500
chloroacetaldehyde			16,000
3-chloropropionitrile			4,000
ethyl carbamate			5,000
ethyl cyanide			2,000
ethylene glycol			10,000
isobutyl alcohol			1,000
paraldehyde			2,000
N-propylamine			10,000
2-propyn-1-ol			8,000
Dioxins			
PCDDs	G, none	SW-846, #8280	0.01
PCDFs			0.01
2,3,7,8 TCDD			0.01
Volatile Organic Analyses--Enhanced Additions			
1,4-dioxane	G, no headspace	SW-846, #8240	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
methyl chloride			10
chloromethyl methyl ether			5
crotonaldehyde			10
1,2-dibromo-3 chloropropane			10
1,2-dibromoethane			10
dibromomethane			10
1,4-dichloro-2-butene			10
dichlorodifluoro-methane			10
1,2-dichloropropane			5
N-N-diethylhydrazine			10

Table C.2. Preservation Techniques, Analytical Methods Used, and the Current Detection Levels for Additional Constituents on the 9905 and Appendix IX Lists[a]. (page 3 of 4)

CONSTITUENT	COLLECTION AND PRESERVATION[b,c]	ANALYSIS METHODS[d]	DETECTION LIMIT, PPB[e]
1,1-dimethylhydrazine			10
1,2-dimethylhydrazine			10
iodomethane			10
methacrylonitrile			10
methanethiol			10
pentachloroethane			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
ethylmethacrylate	G, no headspace	SW-846, #8240	10
ethyl benzene			5
styrene			5
bromodichloromethane			5
dibromochloromethane			5
2-hexanone			50
1,3-dichloropropene			5
allyl chloride			100
chloroethane			10
propionitrile			5
vinyl acetate			5
additional targeted compounds[g]			
additional VOAs[h]			
Semivolatile Organic Analysis (Acid/Base/Neutral)			
chlorobenzene			10
cresols			10
1,2-dichlorobenzene			10
1,3-dichlorobenzene			10
p-dichlorobenzene			10
hexachlorobenzene			10
pentachlorobenzene			10
pentachlorophenol	G, none	SW-846, #8270	50
1,2,4,5-tetrachlorobenzene			10
1,2,4-trichlorobenzene			10
hexachlorophene			10
naphthalene			10

Table C.2. Preservation Techniques, Analytical Methods Used, and the Current Detection Levels for Additional Constituents on the 9905 and Appendix IX Lists[a]. (page 4 of 4)

CONSTITUENT	COLLECTION AND PRESERVATION[b,c]	ANALYSIS METHODS[d]	DETECTION LIMIT, PPB[e]
1,2,3-trichlorobenzene			10
phenol			10
1,3,5-trichlorobenzene			10
1,2,3,4-tetrachlorobenzene			10
1,2,3,5-tetrachlorobenzene			10
kerosene			10
strychnine	G, none	SW-846, #8270	50
maleic hydrazide			500
nicotinic acid			100
tributylphosphate			10
additional semivolatiles[i]			
Other			
polychlorinated biphenyls	G, none	SW-846, #8080	1
perchlorate	P, none	70-IC[j]	500
sulfide	P, NaOH/zinc acetate	SW-846, #9030	1,000
citrus red no. 2	G, none	AOAC #34.015B[k]	1,000

(a) WAC 173-303-9905, "Dangerous Waste Constituent List;" and 40 CFR 264, Appendix IX, "Ground-Water Monitoring List."
(b) P, plastic; G, glass.
(c) All samples will be cooled to 4°C upon collection.
(d) Constituents grouped together are analyzed by the same method.
(e) Detection limit units except where indicated.
(f) Direct aqueous injection.
(g) Additional list of targeted compounds. Constituents on the "Dangerous Waste Constituent List" (WAC 173-303-9905).
(h) Tentatively identified compounds are listed when detected, but there are no established detection limits for these.
(i) There are more than 100 additional semivolatile compounds on the "long list" that are not listed here. Most of these analyses have a detection level of 10 ppb.
(j) Analytical method adapted from Method 300.0, EPA (1984).
(k) Association of Official Analytical Chemists (1980).

QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance

Quality assurance(QA) will be conducted in accordance wit the PNL quality assurance manual. A QA plan describing the manner in which specific QA requirements are to be met has been prepared in accordance with that manual.

Quality Control

The purpose of quality control (QC) is to determine and document the quality of the analytical results being produced by the laboratory and to bring potential problems with analyses to the attention of UST for corrective actions if needed. The QC effort has two main components: 1) routine internal checks performed by UST, and 2) external checks conducted by PNL to independently evaluate UST performance. The scope of these efforts is described in the following sections.

United States Testing Company, Incorporated, Internal Quality Control

Internal quality control at UST includes general practices applicable to a wide range of analyses, as well as specific procedures stipulated for particular analyses. The quality control and quality assurance programs at UST are documented in a quality control manual and a quality assurance manual. United States Testing Company, Incorporated, produces a quarterly quality control report to PNL, which includes blank, matrix, spike, and surrogate data.

United States Testing Company, Incorporated, External Quality Control

Pacific Northwest Laboratory will use interlaboratory comparisons, replicate, blank, and blind samples to evaluate the accuracy of results from UST. The purpose and scope of each of these is as follows.

Interlaboratory comparisons using field samples are conducted to determine if the results obtained by the primary laboratory, UST, are comparable to those obtained from other laboratories. Comparisons are currently being conducted for anions, selected volatile organic constituents, metals, cyanide, gross alpha, gross beta, and tritium. Each month, replicate samples from selected wells are delivered to four different PNL laboratories. The results from these PNL laboratories are then compared

with the results from UST. Samples sent to PNL laboratories are from the same sampling set as those to be analyzed in duplicate by UST.

Replicate analyses of field samples are conducted to establish how much variability might be expected in the laboratory measurements performed on nearly identical samples and as a check on gross errors. Blanks for a wide range of analyses are submitted to UST monthly to check for container or laboratory contamination.

Trip (transport) blanks and transfer blanks are submitted to UST to determine whether environmental conditions encountered during collection and transportation of samples have affected the results obtained by analysis. One set of trip blanks and transfer blanks are submitted each sample period per sample area at the rate of at least one for 1 to 20 wells. These blanks are analyzed for volatile organic constituents.

Blind samples are submitted to UST to estimate the bias of analytical laboratory procedures and to determine when this bias exceeds control limits. Blind standard samples prepared by PNL containing metals, anions, herbicides, pesticides, and volatile organic compounds have been submitted quarterly since January 1986. Most blind samples are now prepared with materials supplied by the U.S. Environmental Protection Agency (EPA), including the previous list of analytes plus ammonium ion, cyanide, semivolatile compounds, PCBs, and an expanded number of pesticides and volatile organic compounds. Samples containing constituents not available in EPA performance samples are prepared from high-quality chemicals. These include constituents from the enhanced thiourea and phosphorous pesticides, group analyses, plus ethylene glycol, sulfide, perchlorate, hydrazine dioxin (TCDD).

United States Testing Company, Incorporated, has also participated in the EPA-sponsored Water Pollution Laboratory Performance Evaluation Studies and the Water Supply Laboratory Performance Evaluation Studies since 1986.

REFERENCES

AOAC. 1980. "Methods for Color Additives," Official Methods of AOAC. 13th ed. Association of Official Analytical Chemists, Arlington, Virginia.

APHA. 1985. Standard Methods for the Examination of Water and Wastewater. 16th ed. Published jointly by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation.

ASTM. 1988. "Standard Test Method for the Radionuclides of Radium in Water," Annual Book of ASTM Standards. ASTM D2460, American Society of Testing and Materials, Philadelphia, Pennsylvania.

EPA. 1984. Test Method for Determination of Inorganic Anions in Water by Ion Chromatography. EPA-600/4-84-017, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio.

EPA. 1986. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. 3rd ed. EPA SW-846, U.S. Environmental Protection Agency, Washington, D.C.

Krieger, H. L., and E. L. Whittaker, eds. 1980. Prescribed Procedures for Measurement of Radioactivity in Drinking Water. EPA-600/4-80-032, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio.

NCRP. 1985. A Handbook of Radioactivity Measurement and Procedures. NCRP Report 58, National Council on Radiation Protection and Measurements, Washington, D.C.

PNL. 1989. Procedures for Ground-Water Investigations. PNL-6894, Pacific Northwest Laboratory, Richland, Washington.

USGS. Techniques of Water Resources Investigations of the U.S. Geological Survey, as amended, U.S. Government Printing Office, Washington, D.C.

Volchok, H. L., and G. dePlanque. 1983. HASL-300, 26th ed. U.S. Environmental Protection Agency, Environmental Monitoring Laboratory, Washington, D.C.