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US Army Corps of Engineers

Toxic and Hazardous Materials Agency

Remedial Investigation Report

Cold Regions Research and Engineering Laboratory

Hanover, New Hampshire

October 1992
Contract No. DAAA15-90-D-0012
Delivery Order No. 0002
ELIN A009

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U.S. Army Toxic and
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Aberdeen Proving Ground, Maryland 21010-5401

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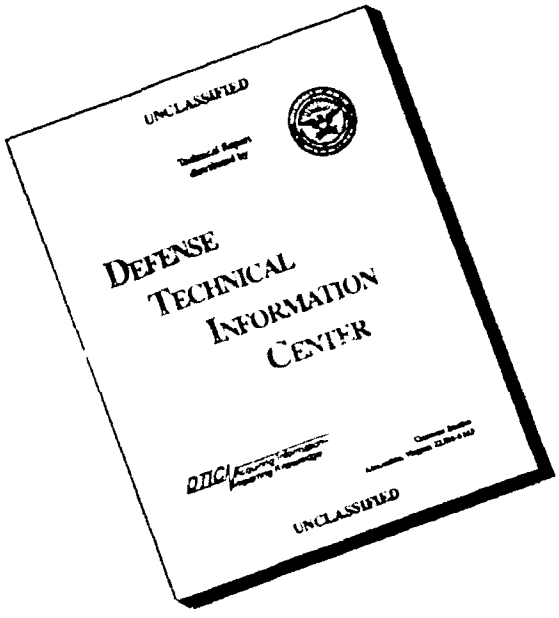

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FINAL
REMEDIAL INVESTIGATION REPORT FOR COLD REGIONS RESEARCH AND ENGINEERING LABORATORY

HANOVER, NEW HAMPSHIRE

Contract No. DAAA15-90-D-0012
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The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

PREFACE

On 1 August 1991, under contract DAAA15-90-D-0012, the United States Army Toxic and Hazardous Materials Agency (USATHAMA) assigned Delivery Order No. 0002 to Ecology and Environment, Inc., (E & E). This delivery order tasked E & E to plan for and conduct a Remedial Investigation (RI) at the Cold Regions Research and Engineering Laboratory (CRREL), located in Hanover, New Hampshire.

The purpose of the RI is to characterize the extent of contamination at 16 areas of potential concern at the CRREL site. To achieve this goal, E & E completed various field activities including a passive soil gas survey, soil borings, monitoring well installation, and the collection of soil, sediment, surface water, and ground water samples. The samples were then submitted for laboratory analysis to determine the type and amount of contamination.

To properly conduct and document the field and laboratory activities, E & E developed four work plans covering the various aspects of the technical work: the RI Work Plan, the RI Field Sampling Plan, the Quality Assurance Project Plan, and the Health and Safety Plan. Taken together, these plans formed the basis of E & E's operations for conducting the RI.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADL	Arthur D. Little, Inc.
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
AST	Above-ground Storage Tank
ASTM	American Society for Testing and Materials
BGS	Below Ground Surface
BNA	Bureau of National Affairs
BTX	Benzene, Toluene, Xylene
CENED	United States Army Corps of Engineers-New England Division
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chain of Custody
COR	Contracting Officer's Representative
CRL	Certified Reporting Limits
CRREL	Cold Regions Research and Engineering Laboratory
DCE	Dichloroethylene
DL	Detection limit
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
FERF	Frost Effects Research Facility
FSP	Field Sampling Plan
GC/MS	Gas Chromatography/Mass Spectrometry
GW	Ground Water
HNU	HNU, Inc. Model 101 Photoionization Detector
HSGC	Headspace Gas Chromatography
ID	Inside Diameter
IDW	Investigation-Derived Waste
IRDMIS	Installation Restoration Data Management Information System
K	Hydraulic Conductivity
MCL	Maximum Contaminant Level
MEK	Methylethyl Ketone

LIST OF ACRONYMS AND ABBREVIATIONS (Cont.)

MSL	Mean Sea Level
NA	Not Analyzed
ND	Not Detected
NEPA	National Environmental Policy Act of 1969
NERI	Northeast Research Institute, Inc.
NHDES	New Hampshire Department of Environmental Services
NHWSPCC	New Hampshire Water Supply and Pollution Control Commission
No.	Number
NPDES	National Pollutant Discharge Elimination Systems
NPL	National Priorities List
PC	Permeability Constant
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethylene
PID	Photovac Microtip Photoionization Detector
PRI	Potomac Research, Inc.
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
QAPjP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act of 1986
SE	Sediment
SO	Soil
STP	State Planar Coordinates
SW	Surface Water
TBC	To Be Considered
TCE	Trichloroethylene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TIC	Tentatively Identified Compound
TPHC	Total Petroleum Hydrocarbons

LIST OF ACRONYMS AND ABBREVIATIONS (Cont.)

USACE	United States Army Corps of Engineers
USATHAMA	United States Army Toxic and Hazardous Materials Agency
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound
VTDEC	Vermont Department of Environmental Conservation
VTDOH	Vermont Department of Health

UNITS OF MEASURE

°C	degree(s) Celsius
cfs	cubic feet per second
cm	centimeter(s)
°F	degree(s) Fahrenheit
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
gal	gallon(s)
gpd	gallons per day
gpm	gallons per minute
in.	inch(es)
lb	pound(s)
m	meter(s)
mg	milligram(s)
mi	mile(s)
ppb	part(s) per billion
ppm	part(s) per million
wk	week(s)
yd^3	cubic yard(s)
yr	year(s)
µg	microgram(s)
µmho	micromho(s)

EXECUTIVE SUMMARY

On 1 August 1991, Ecology and Environment, Inc. (E & E) was assigned Delivery Order No. 0002 under the Army Total Environmental Program Support Contract No. DAAA15-90-D-0012 with the United States Army Toxic and Hazardous Materials Agency (USATHAMA). This delivery order tasked E & E to plan and conduct a Remedial Investigation (RI) at the Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, New Hampshire. CRREL was established on 1 February 1961, and performs basic and applied research in snow and ice, as well as practical engineering research to develop equipment and procedures for application in cold regions.

The CRREL site encompasses 30 acres, and has experienced soil and ground water contamination due to past disposal practices and leakage from former underground storage tanks. Sixteen Areas of Concern (AOCs) were identified as potential sources at the CRREL site based on knowledge of these past events. The overall purpose of the RI is to characterize the nature and extent of contamination at these AOCs.

The Technical Review Committee (TRC) was established in December 1991, and includes representatives from CRREL; the town of Hanover, New Hampshire; the town of Norwich, Vermont; Dartmouth College; Region I United States Environmental Protection Agency (EPA); the New Hampshire Department of Environmental Services; and the Vermont Department of Environmental Conservation. The primary function of the TRC is to act as an advisory committee, and to provide coordinated direction to all Installation Restoration Program actions at CRREL.

RI fieldwork was carried out between 26 August 1991 and 9 April 1992 in accordance with approved work plans. This fieldwork involved the collection and analysis of samples from various media for volatile organic compounds (VOCs) and petroleum hydrocarbons. To complete portions of the RI fieldwork, E & E utilized experienced subcontractors in drilling (WTD Environmental Drilling, Inc.); soil gas (Northeast Research Institute, Inc.); laboratory analysis (Arthur D. Little, Inc.); and surveying (Kenneth A. LeClair, Co. P.E.).

The RI field investigation activities provided information about the nature and occurrence of ground water, sediment, and bedrock at CRREL. There are five production wells that pump a combined average of one million gallons per day of ground water from highly permeable esker sediments, located in the subsurface beneath the western portion of the site. This water is used for the CRREL refrigeration and cooling systems. The spent refrigeration/cooling water is discharged to the Connecticut River via the CRREL storm drain system. No hydraulic barriers have been identified between ground water in the overburden (esker and lake sediments) and bedrock. Based on limited data, it appears that the majority of ground water beneath the site is captured

by the pumping production wells. Furthermore, ground water flow patterns indicate recharge of the aquifer from the Connecticut River is occurring during the pumping of these production wells.

With two exceptions, TCE was detected in all wells (including the upgradient well) sampled during the RI at levels exceeding Federal and State drinking water standards. The two exceptions were production well CECRL03 and the Hanover municipal well, for which no contamination was detected.

AOCs at CRREL have been prioritized based on data gathered during the RI, with 4 of the 16 AOCs (AOC 1, AOC 2, AOC 9, and AOC 13) being considered the primary sources of TCE contamination in ground water and soils. Due to the close proximity of these AOCs, and their alignment with respect to ground water flow patterns, these AOCs may create a single contamination plume beneath CRREL. Releases of petroleum-related contaminants have also occurred at several of the AOCs. However, it appears this contamination is limited primarily to soils.

1. INTRODUCTION

On 1 August 1991, Ecology and Environment, Inc. (E & E) was assigned Delivery Order No. 0002 under the Army Total Environmental Program Support Contract No. DAAA15-90-D-0012 with the United States Army Toxic and Hazardous Materials Agency (USATHAMA). This delivery order tasked E & E to plan and conduct a Remedial Investigation (RI) at the Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, New Hampshire.

Previous sampling investigations at CRREL indicated the presence of chlorinated solvent contamination in production wells, primarily trichloroethylene (TCE), which required further characterization. Sixteen areas of concern (AOCs) were identified at the CRREL site based on a review of historical procedures and events. The field activities were designed to compile the necessary data to assess the type and distribution of environmental contamination at these AOCs. Specific objectives of the RI were to:

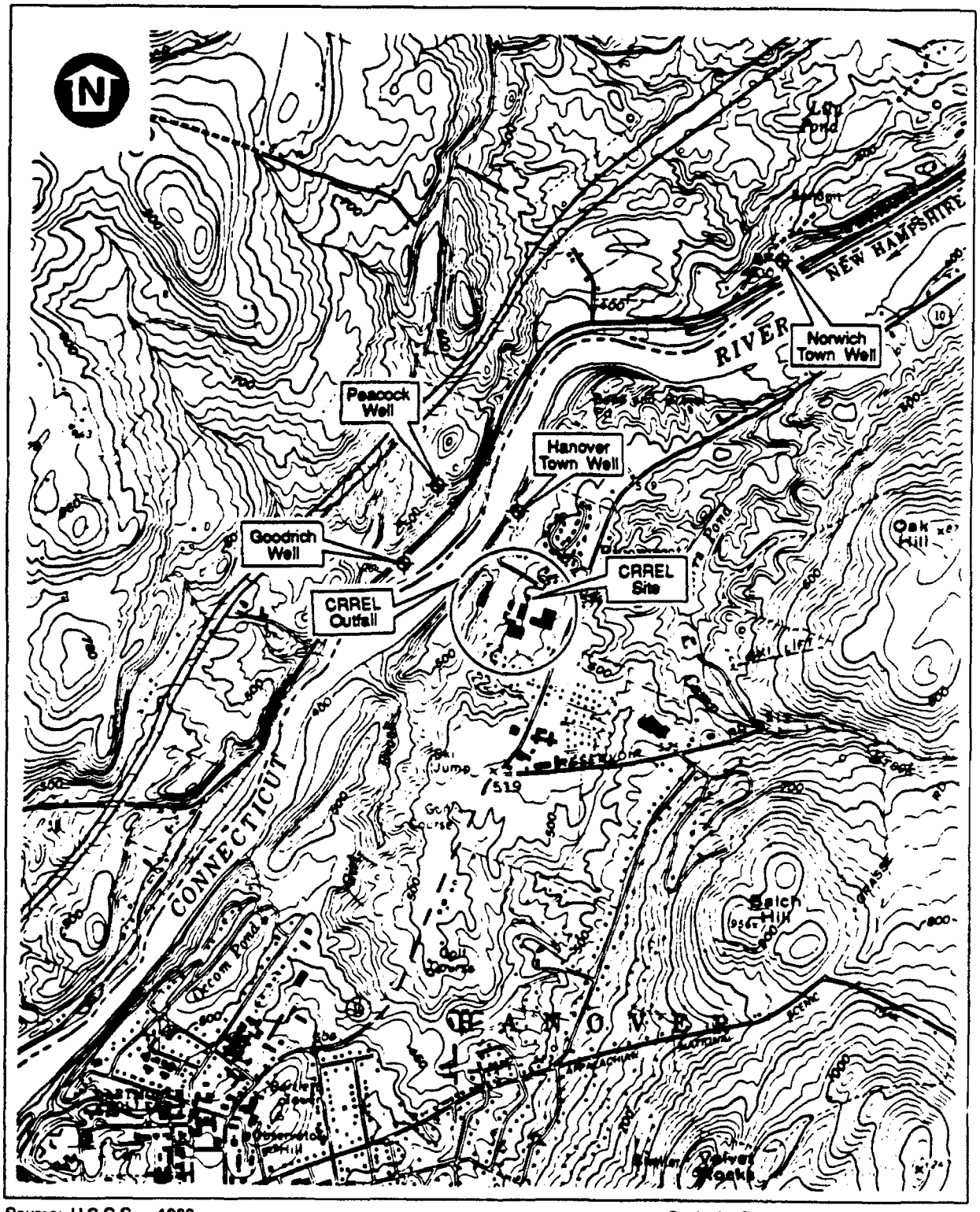
- Obtain information regarding overburden, bedrock, and ground water conditions at CRREL;
- Assess the nature and extent of contamination at the CRREL AOCs; and
- Prioritize the AOCs identified at CRREL.

To achieve these objectives, the RI work involved the review of existing data, evaluation of current site conditions, and the design and completion of a field sampling and analysis program. The field program encompassed the completion of a passive soil gas survey and eight soil borings; the installation of six monitoring wells; and the sampling of soil, sediment, surface water, and ground water. Samples collected during the RI were analyzed for volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPHC), which were identified as the primary contaminants of concern prior to the initiation of the RI.

E & E considered the environmental effects of the field activities in accordance with National Environmental Policy Act (NEPA) guidelines, incorporating monitoring requirements to identify hazards to health and to segregate potentially contaminated investigation-derived waste (IDW). The IDW was handled in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) and in accordance with the Resource Conservation and Recovery Act (RCRA).

1.1 SITE LOCATION AND DESCRIPTION

CRREL is located on 30 acres of land, west of and adjacent to State Highway 10, 1.5 miles north of the town of Hanover in Grafton County, New Hampshire (Figure 1-1). The site is roughly rectangular in shape



Source: U.S.G.S. , 1988.

Figure 1-1 SITE LOCATION MAP

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and measures approximately 1,360 feet east to west, and 970 feet north to south at its maximum extent (CRREL 1990). The site consists of five major buildings plus various other smaller structures, including pump houses for five production wells that provide water for the CRREL refrigeration/cooling system (Figure 1-2). A small pond (100 x 200 feet) is located near the southwest corner of the site.

With the exception for the front lawn and front parking lot areas, the CRREL site is surrounded by a chain-link fence equipped with security gates. These gates remain open during normal working hours, but are secured at night, on weekends, and on holidays. The security gates utilize a card key system for operation. Student housing for Dartmouth College is located adjacent to the site on the north and south. Highway 10 forms the eastern boundary of the site, and the Connecticut River is located immediately west of the CRREL property.

Land use within 1/4-mile is primarily rural and residential, with zones of commercial/service, light industry, cropland/pasture, and deciduous and mixed forest (CRBCC 1970).

1.2 AREAS OF CONCERN

The following AOCs have been identified as possible sources of contamination at CRREL. Each of these areas is depicted in Figure 1-3. Figure 1-4 shows the location of underground storage tanks (USTs) at CRREL. Information concerning USTs is summarized in Table 1-1.

- AOC 1: Two above-ground storage tanks (ASTs) are currently located in this area; a 15,000 gallon tank installed in 1989 containing fuel oil, and a 10,000 gallon tank installed in 1970 containing glycol and water. This area also contained a 10,000 gallon TCE tank that exploded on 2 July 1970, resulting in the release of approximately 3,000 gallons of TCE.

- AOC 2: Location of former USTs. A 10,000 gallon tank containing TCE and a 12,000 gallon tank for fuel oil storage were installed in 1960. The TCE tank was removed in 1972 and replaced by a 10,000 gallon fuel oil tank. The 10,000 gallon and 12,000 gallon fuel oil tanks were removed in 1989. A TCE odor was noticed during both the 1972 and 1989 excavations.

- AOC 3: Location of the Facilities Engineering building former fuel oil tank, which was installed in 1968. In 1989, this UST failed two tightness tests and was removed. Upon removal, minor surface corrosion and a small hole was noted.

- AOC 4: Location of the Facilities Engineering building fuel oil tank. This 6,000 gallon UST was installed in 1989 and is still in use. There is no known release from this tank. A 3,000 gallon fuel oil tank installed in 1975 and removed in 1989 was also located at this AOC. There were no known releases from this tank.

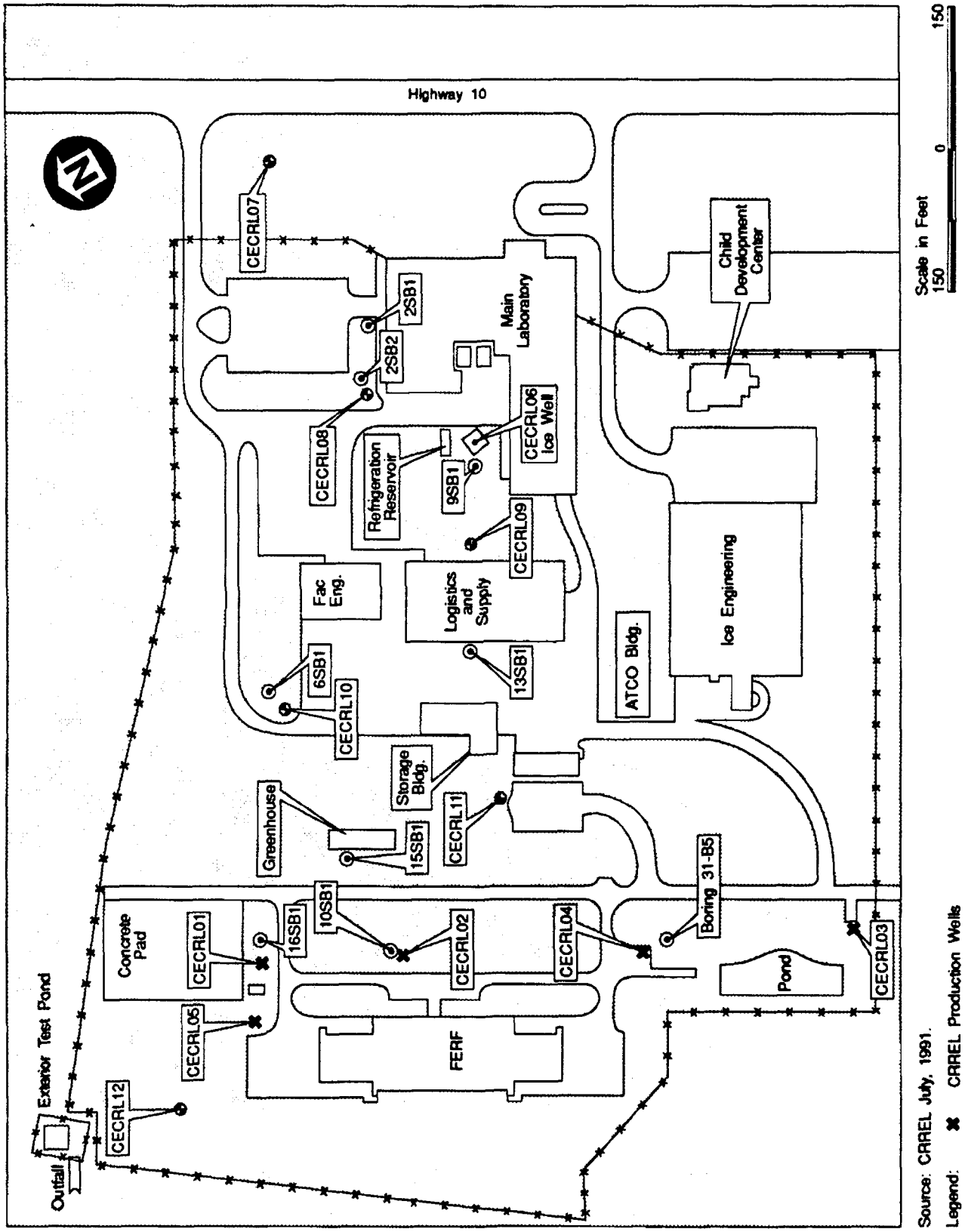

Figure 1-2 SITE MAP

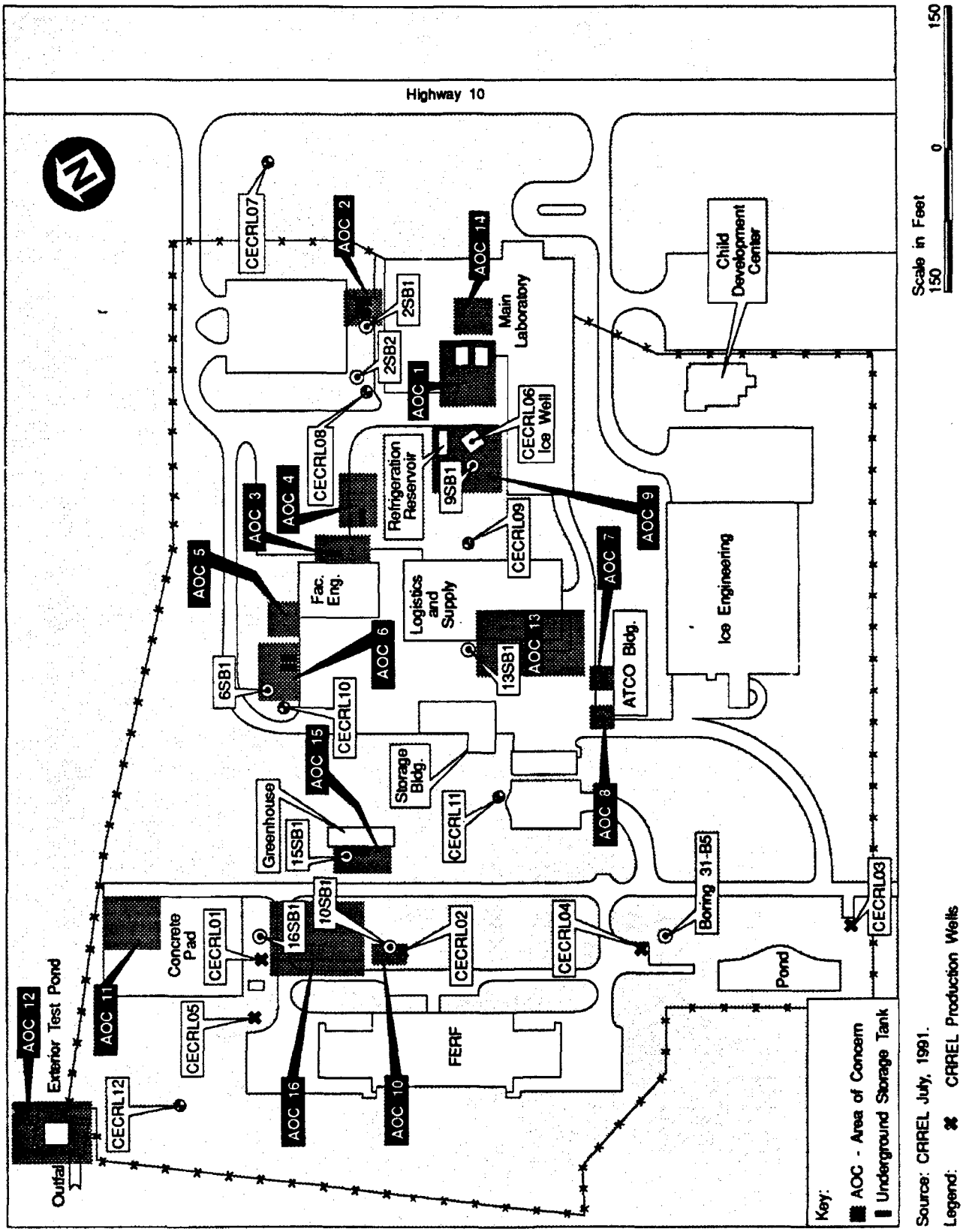

Figure 1-3 AREAS OF CONCERN

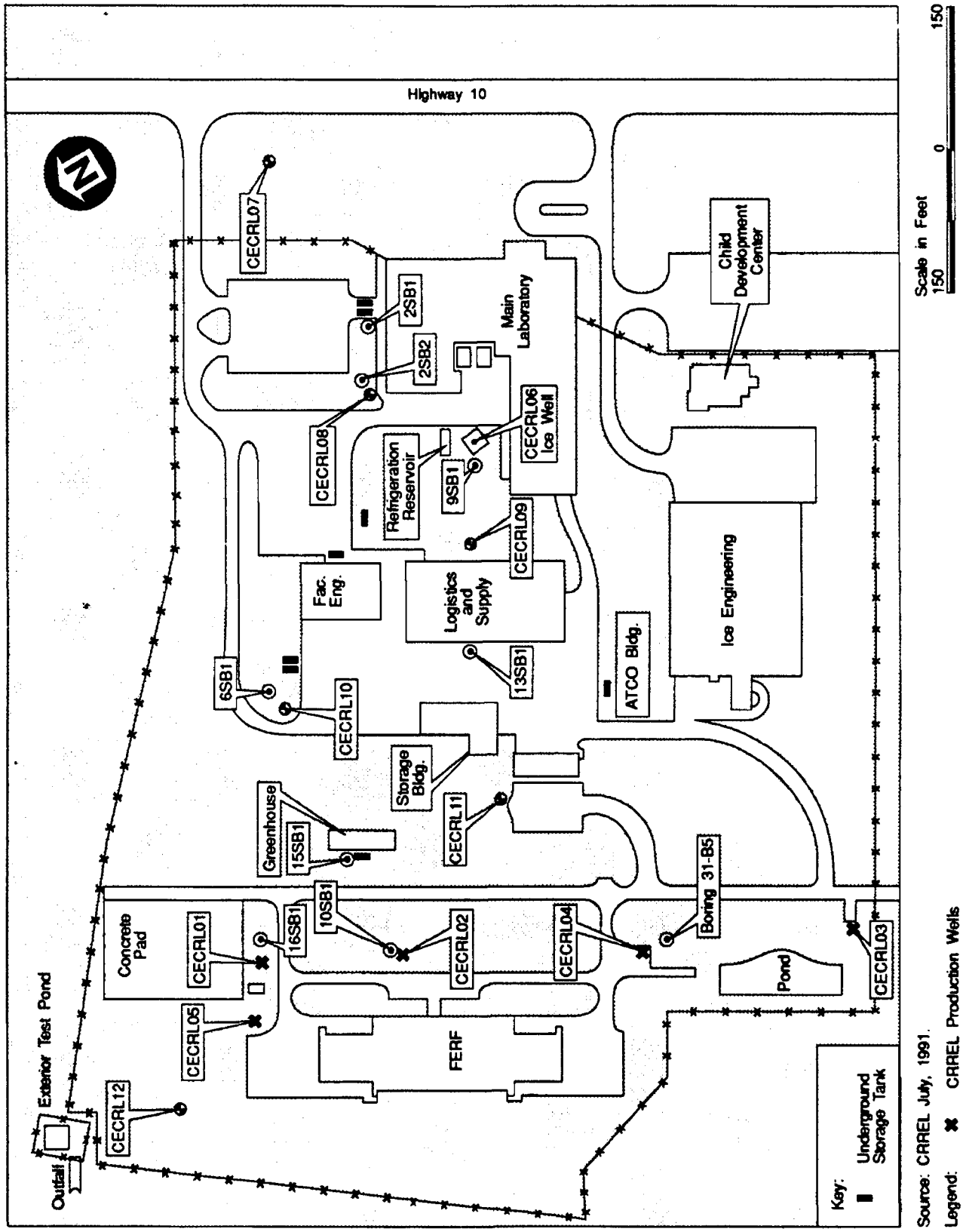

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Figure 1-4 UNDERGROUND STORAGE TANKS

Table 1-1

UNDERGROUND STORAGE TANKS

Location	Inst. Date	Removal Date	Capacity (gallons)	Construct. Material	Release Detection	Corrosion Protection	Use	Remarks
AOC 2	1960	1989	12,000	steel	manual tank gauging	none	#5 fuel oil #2 fuel oil	Contradictory removal/closure information
AOC 2	1973	1989	10,000	steel	manual tank gauging	none	#2 fuel oil	Replaced tank above. TCE odor at removal.
AOC 2	1960	1972	10,000	steel	manual tank gauging	none	TCE	Evidence of leakage. TCE odor at removal.
AOC 3	1968	1989	3,000	steel	manual tank gauging	none	#2 fuel oil	Failed tightness test on 1-24-89 and 2-1-89. Hole in tank, contaminated clay mixed with gravel for backfill.
AOC 4	1975	1989	3,000	steel	manual tank gauging	none	#2 fuel oil	Passed tightness test 1-24-89.
AOC 4	1989	--	6,000	steel	interstitial monitoring with automatic inventory monitoring	double steel wall cathodic	#2 fuel oil	Replaced tank above.
AOC 6	1968	1989	2,000	steel	manual tank gauging	none	gasoline	Failed tightness test on 1-24-89. Piping system leak.
AOC 6	1968	1989	2,000	steel	manual tank gauging	none	gasoline	Failed tightness test on 1-24-89. Piping system leak.
AOC 7	1974	--	2,000	steel	manual tank gauging	none	#2 fuel oil	Passed tightness test 1-24-89.
AOC 15	1973	1986	2,000	steel	manual tank gauging	none	#2 fuel oil	Known release 7+ barrels of oil leaked.

RC507

Source: Ecology and Environment, Inc.

- AOC 5: Location of two 500 gallon ASTs containing diesel fuel and gasoline. There are no known releases from these tanks.

- AOC 6: Location of two former USTs, each with a 2,000 gallon capacity and used for gasoline storage. These tanks failed tightness tests and were removed in 1989. Failure of the tightness test was attributed to piping system with a leakage rate estimated at 0.3 gallons per hour.

- AOC 7: Location of a 2,000 gallon fuel oil UST installed in 1974 and currently in use. This tank was certified tight during testing on 24 January 1989. However, a leakage rate of 0.05 gallons per hour was attributed to piping. Tests indicated a leakage rate of 0.0018 gallons per hour from the tank itself.

- AOC 8: Location of a 500 gallon waste oil AST installed in 1990 and currently in use. There is no known release from this tank.

- AOC 9: Location of the ice well in which TCE was used in refrigeration lines and drilling fluid mixtures. This area may also contain TCE-contaminated soils resulting from the 1970 explosion of the former TCE tank in AOC 1.

- AOC 10: Location of a former open storage area. This site was used for the storage of containerized wastes, including TCE, from 1965 to 1974.

- AOC 11: Location of the concrete storage pad built in 1974, and used for storage of containerized wastes, including TCE.

- AOC 12: Location of the exterior test pond. The exterior test pond is used for sea ice experimentation. This pond is fed by water from the CRREL storm sewer system and, as a result, may contain TCE. There are no known releases from experimental activities at this location.

- AOC 13: Location of the former gravel pad used for the disposal of spent TCE. This pad was covered over by the Logistics and Supply building.

- AOC 14: Location of the Main Laboratory machine room. Spills of TCE were noted on several occasions in this area.

- AOC 15: Location of the former 2,000 gallon greenhouse UST, installed in 1973 and used to store fuel oil. This tank was removed in 1986 after leakage was observed. Prior to removal, the tank's contents were removed by pumping. A total of seven barrels of leaked fuel oil were recovered from the UST area in 1986.

- AOC 16: Location of a former open storage area. This site was used for the storage of containerized wastes, including TCE, until 1974. Visual observations of drum leakage and soil contamination were reported in this area. Both AOC 16 and AOC 10 were covered with fill during construction of the Frost Effects Research Facility (FERF) building.

1.3 SITE HISTORY

CRREL was established on 1 February 1961, by the United States Army Corps of Engineers (USACE), combining the work of two predecessor organizations: the Snow, Ice, and Permafrost Research Establishment, which was formed on 27 August 1947; and the Arctic Construction and Frost Effects Laboratory, established on 25 February 1953 (CRREL undated). At the time of this merger, construction of facilities at the site was underway and the Main Laboratory was partially in use. CRREL performs basic and applied research in snow, ice, and frozen ground. In addition, CRREL provides the United States Department of the Army with practical engineering research to develop equipment and procedures for application in cold regions.

In 1960, USACE leased 19.2 acres of land from Dartmouth College for the purpose of constructing a research facility. Dartmouth College had purchased the land from Walter Record in 1932. Prior to construction, the land was used primarily for agricultural purposes, although gravel was also mined on the western edge of the site (CRREL 1991). The cornerstone for the Main Laboratory building was laid on 15 June 1960. Since then, CRREL has grown significantly with the addition of several new buildings. These include the Facilities Engineering building (1968), the Logistics and Supply building (1976), the Main Laboratory addition (1977), the Ice Engineering building (1978), the FERF building (1985), and the Cradle and Crayon Child Development Center (1990) (Figure 1-2). In 1982, 11.02 acres of additional land was purchased to accommodate the FERF. This land is located along the western border of the original CRREL tract. This purchase expanded CRREL to its current size of 30.22 acres.

1.3.1 Contamination Discovery History

On 19 September 1990, Colonel Charles S. Nichols, Commander and Director of CRREL, received a letter from the Department of the Air Force concerning the potential for tetrachloroethylene (PCE) contamination at the site. PCE is a constituent of a polyurethane mixture with the trade name of "Percol." Percol was added to cement during low-temperature rapid runway repair studies performed at CRREL in 1985 and 1986.

On 15 to 16 November 1990, ground water samples were taken from the CRREL production wells and the Hanover municipal well to test for the presence of PCE as well as other organic compounds.

On 19 November 1990, sample analysis by CRREL personnel using in-house analytical capabilities indicated that PCE was not present but that TCE was present in CRREL production wells CECRL01, CECRL02, and CECRL04.

On 28 November 1990, USACE and USATHAMA representatives were notified of the TCE contamination at CRREL.

On 14 December 1990, limited ground water sampling conducted by CRREL in Vermont revealed TCE contaminantion in the Goodrich and Peacock wells. Subsequent to this, CRREL collected samples from wells within a two-mile radius of the installation whose owners desired to have their water tested. No additional contaminated wells were identified during this testing.

On 21 December 1990, the Vermont Department of Health (VTDOH) began monthly sampling and analysis of 13 wells located near CRREL on the Vermont side of the Connecticut River, including the Goodrich and Peacock residential wells.

On 19 March 1991, water samples were collected by CRREL and submitted to a USATHAMA-approved laboratory. Samples were collected from the five CRREL production wells, the ice well, the CRREL outfall, and the Goodrich and Peacock wells. These samples were subjected to complete analytical scans including VOCs, semi-volatiles, total metals and anions, and pesticides. As a result of the sampling, VOCs were identified as the primary contaminants of concern at CRREL.

On 24 June 1991, water samples were collected at the CRREL site by the New Hampshire Department of Environmental Services (NHDES). This sampling confirmed the presence of VOCs in ground water at the CRREL site.

1.3.2 History of TCE at CRREL

A site history report (Faran undated) indicates that TCE was the secondary refrigerant of the cooling system in CRREL's main laboratory throughout 1960 to 1987. TCE was also used as a degreaser. TCE leaks were commonplace in the machinery and pipes. Pump seals, cold room piping, and pipe changeouts were identified as possible leak sources. Waste TCE drums were known to leak or known to have been emptied into a gravel pit area. There was also a large UST and a 10,000 gallon AST containing TCE. In 1970, an explosion occurred at the AST. Approximately 3,000 gallons of TCE were spilled on the ground and subsequently hosed into the storm sewer by the fire department. TCE was also used as a drilling fluid and refrigerant during experimentation involving the ice well (CECRL06), which is located west of the Main Laboratory building.

2. ENVIRONMENTAL SETTING

The environmental setting involves all naturally-occuring physical aspects of the site, including the site's topography, climate, geology, and hydrology. Included in this section is information on how the surface and subsurface of the site area formed, as well as recent statistical history of seasonal weather patterns of the area.

2.1 TOPOGRAPHY

The CRREL site is located in the upper Connecticut River valley on a stepped terrace consisting of unconsolidated sediments (Figure 1-1). Elevations at the site range from approximately 460 to 520 feet above mean sea level (MSL) (USGS 1988; CRREL 1990). The CRREL site, at its lowest point, is approximately 80 feet above the elevation of the nearby Connecticut River. The original topography has been altered during construction of the various buildings and roads that comprise CRREL. Most notably, the area around the FERF was altered extensively during construction. During the period of FERF construction, soils at AOC 10 and AOC 16 were probably disturbed and covered with approximately six feet of additional soil. Topography in this area originally expressed the presence of a buried glacial esker to a much greater degree. Gravel quarrying operations located west and north of the site have also altered the local topography. Topographic expression of the glacial esker can still be observed to the north and south of the site along the Connecticut River.

2.2 CLIMATE

The climate in the Hanover area is characterized as humid and continental, with four distinct seasons and fairly extreme temperatures. The variable conditions are caused by the influence of marine and continental air flows, and from polar and tropical air masses. The 30-year mean monthly temperature, as measured at the Hanover station, ranged from 18.2°F (January) to 69.5°F (July), with an annual mean temperature of 44.9°F (National Climatic Center 1983). The normal annual precipitation is 36.67 inches with 2.74 inches occurring during the month of January and 3.3 inches occurring during the month of July (National Climatic Center 1983). The 2-year, 24-hour rainfall is 2.5 inches (U.S. Department of Commerce, undated). Mean annual lake evaporation is 25 inches and the mean annual total snowfall is 80 inches. The prevailing direction and annual mean wind speed is southeast at 7 miles per hour (U.S. Department of Commerce 1979).

2.3 GEOMORPHOLOGY, STRUCTURE, AND DRAINAGE

CRREL is located within the New England Physiographic province of the Appalachian Mountains. This province is a structurally complex north-northeast trending band of igneous- and metamorphic-rock consisting primarily of amphibolites, gneiss, quartzites, quartz conglomerates, schists, phyllites, and granite (Billings 1955). Up to 6,000 feet of

relief is present in this province, and topography is controlled primarily by structural features. In much of the region, the Paleozoic metamorphic rocks form a surface lower than the Precambrian gneiss and granite, but higher than the slightly metamorphosed or non-metamorphosed rocks which form basins (Hunt 1967). CRREL is situated on the northwest flank of the Lebanon dome, a small intrusive feature of the Oliverian Plutonic series. This Plutonic episode formed a series of igneous intrusions that trend north-south along the east side of the Connecticut River (Billings 1955). The site is within the Connecticut River Valley Synclinorium in an area covered by glacial and post-glacial deposits that form a mantle over the crystalline igneous and metamorphic bedrock.

The Connecticut River, entrenched in a channel cut into the complex crystalline bedrock, varies significantly in width, and has steep, abrupt walls (Stewart and MacClintock 1969). The shape of the valley varies, partially due to differing bedrock hardnesses, which influenced the effectiveness of glacial and fluvial erosion. Glacial activity in the Connecticut River valley has also produced the major geomorphic features of the area. These features include eskers, kame terraces, and lacustrine depositional basins (Lyons 1958).

The site is located within the Connecticut River drainage system, which encompasses a total area of 4,092 square miles (Blakley, et al. 1989). The Connecticut River is discussed in greater detail in Section 2.8.

2.4 SOILS

The soils at the CRREL site are of the Hadley-Winooski-Windsor association (CRBCC 1970). These are deep, well-drained, moderately well-drained, and excessively drained soils, having silty and sandy textures. The CRREL soils, from east to west across the site, consist primarily of the Hitchcock silt loam (8 to 15 percent slope), the Hitchcock silt loam (15 to 60 percent slope), and the Windsor loamy fine sand (15 to 60 percent slope), respectively (USDA 1939).

The Hitchcock silt loam (15 to 60 percent slope) consists of very deep, well-drained soils that are silty on terrace escarpments along the Connecticut River Valley. Included with this soil are small areas of moderately-drained Dartmouth soils on narrow benches, poorly-drained Binghamville soils on narrow ravine floors and at the base of slopes, and excessively-drained Windsor soils that occur at the intersection of escarpments and strata of contrasting material (USDA 1939).

Typically, the surface layer of the Hitchcock series is a brown silt loam, six inches thick, underlain by a gray silt loam to a depth of eight inches. This surface layer is underlain by subsoils of light olive brown silt loam to a depth of 13 inches and light yellowish brown silt to 19 inches. The substratum consists of 12 inches of grayish-brown silt loam underlain by olive gray silt to a depth of 65 inches (USDA 1939).

The Windsor series consists of very deep, excessively-drained soils on glaciofluvial land forms. These formed in glacial outwash deposits of sands and loamy sands derived mainly from crystalline rock. In undisturbed areas, a two-inch thick, very dark, grayish-brown loamy sand surface is typical. The subsoil from 2 to 20 inches is brown and yellowish brown loamy sand and from 20 to 24 inches is light yellowish brown sand. The substratum at a depth of 24 to 65 inches is pale brown and light brownish-gray, loose stratified sand (USDA 1939).

Due to the extensive construction activities and re-working of soils at the site, it is doubtful that significant areas of undisturbed native soils remain.

2.5 GLACIAL GEOLOGY

Glacial episodes are the primary influence on geomorphology in the site area. Glaciers covered the site twice during the Wisconsin period, approximately 25,000 to 10,000 years ago. Most evidence for pre-Wisconsin glaciers has been destroyed by the Wisconsin glaciers, although such glaciation probably occurred (Stewart 1961; Stewart and MacClintock 1969). During the first (older) Wisconsin glacial advance, known in Vermont as the Bennington Glacial Stade, glaciers advanced primarily from the northwest. A glacier lake formed in the Connecticut River valley when the glaciers retreated (Stewart and MacClintock 1969). During the Shelburn Glacial Stade, approximately 20,000 years ago, glaciers once again advanced, moving essentially down the Connecticut River valley from the northeast. The glaciers of these two advances were approximately one mile thick. The Connecticut River valley was made deeper and steepened by these advances into the typical U-shape associated with glaciation. Glaciofluvial kames, kame terraces, and eskers were formed within the valley.

Approximately 13,000 to 11,000 years ago, the glaciers of the Shelburn Glacial Stade retreated from the site area and a glacial lake, known as Lake Hitchcock, filled the Connecticut River valley when a glacial moraine blocked the valley near what is today Middletown, Connecticut (Lyons 1958; Stewart 1961; Stewart and MacClintock 1969). The Lake Hitchcock Interstade lasted a minimum of 2,300 years (Stewart and MacClintock 1969) and possibly up to 4,100 years (Stewart 1961). The level of lacustrine deposits along valley walls indicate that the level of Lake Hitchcock was about 650 to 700 feet above MSL (Elston and Washburn 1954; Lyons 1958; Stewart and MacClintock 1969). This is approximately 300 feet higher than the present river elevation.

Eskers are long, narrow sand and gravel deposits with a winding or sinuous trend (Stewart 1961). They are formed by deposition as channel deposits of subglacial streams. These deposits can rise and fall over local topographic features, indicating stagnant ice at the time of origin (Stewart and MacClintock 1969). The esker that underlies the western portion of the CRREL site extends for 50 miles along the Connecticut River from Bradford to White River Junction, Vermont. It crosses the river approximately 3,500 feet north of CRREL and continues

south on the New Hampshire side for several miles. This crossing location is just south of the Norwich town well, which produces from the esker. Based on the great depth to bedrock at the Norwich well site (greater than 100 feet below river level), it is likely that a remnant of the original sand and gravel esker extends beneath the river (Winkley and Caswell 1990). The width of the esker is estimated to be 500 feet (Hodges et al. 1976).

Experiences in drilling production well CECRL03 indicate that the contact between the esker and surrounding lake sediments is fairly abrupt and steep. The first attempt to drill this well (approximately 20 feet east of its present location and 150 feet deep) missed the highly permeable sands and gravels of the esker, resulting in extremely low yields of one pint per hour (Gatto and Shoop 1991).

Varved silts and clays, and sands of lacustrine origins surround and overlie the esker at the CRREL site. Varves are typical of proximal lake-bottom deposits and are formed by alternate deposition of a winter clay layer (less than 2 centimeters thick) and a summer layer of laminated fine-grained sand and silt (greater than 30 centimeters thick) (Larsen 1987). In some areas, the lacustrine sediment is predominantly well sorted, fine-grained sand that contains no apparent lamination or bedding (Stewart 1961). The relatively high percentage of sand within the lake sediments in the CRREL area may indicate a higher energy depositional environment than is usually associated with lacustrine deposition (Flanagan 1992). Since the disappearance of Lake Hitchcock, the Connecticut River has eroded the lake sediments, leaving former flood plains elevated as stream terraces above the level of the present flood plain (Larsen 1987).

2.6 BEDROCK GEOLOGY

Gatto summarized the local geologic history as consisting of five stages (Gatto and Shoop 1991): calcareous sediments followed by arenaceous sediments with volcanics were deposited from Cambrian to Ordovician time (Stage 1); Taconic orogeny occurred and created the Taconic Mountains (Stage 2); this was followed by Devonian sedimentation with subsequent erosion (Stage 3); the Acadian orogeny followed with large granitic intrusions and accompanying metamorphism (Stage 4); there is a meager geologic record from the close of the Devonian to the Pleistocene with some diabase dikes (possibly Mississippian age), followed by Pleistocene glacial erosion and deposition, and recent fluvial erosion and deposition, all of which comprise Stage 5.

The Ordovician-age Orfordville Formation underlies the CRREL area and consists of a variety of rock types including phyllite, mica schist, hornblende, quartzite, and chlorite schist (Lyons 1954; Lyons 1958). The most common lithologic types in the area are black garnetiferous schist and phyllite. The Orfordville Formation metasediments were derived from several thousand feet of interbedded sands, muds, and volcanics which were deformed and metamorphosed during the Acadian orogeny (Hadley 1950).

The Post Pond volcanic member of the Ordovician Orfordville Formation underlies the immediate site area (Billings 1955; Lyons 1958). The Post Pond member consists primarily of hornblende schist or chlorite-sericite schist, depending on the degree of metamorphism. Minor interstratified metasediments are also found within this member. In addition, numerous dikes and sills of quartzose schist, hornblende schists, and amphibolite intrude the Post Pond member. (Lyons 1954; Lyons 1958). The Post Pond member is considered to be equivalent to the Ammonoosuc volcanics in the Mt. Cube area to the north, which are composed of amphibolite, greenstone, and felsic schists (Aleinoff 1977). A columnar section of the CRREL area is shown in Figure 2-1.

Minor folds superimposed on major structures complicate the bedrock configuration in the site area. In most outcrops, bedding and cleavage are more or less parallel, possibly due to isoclinal folding (Lyons 1955). Axial-plane, bedding, slip, and fracture cleavage are present with the dominant cleavage being axial-plane (Lyons 1955). Bedrock bedding and schistocity of the Post Pond member strike north-northeast and dip northwest at angles of 30° to 45° in the immediate site vicinity (Hodges et al. 1976). The Ammonoosuc fault is located just west of CRREL on the Vermont side of the Connecticut River. This fault trends north-south, parallel to the river, and is a normal fault dipping 30° to 50° west with a displacement of 2.5 miles (Gatto and Shoop 1991). Figure 2-2 shows a regional structural cross-section of the CRREL area.

2.7 HYDROGEOLOGY

The CRREL site is located within the middle part of the Connecticut River drainage basin, commonly referred to as the upper Connecticut River Valley, or simply the "upper valley". Ground water supplies in the upper valley are typically found in fractured bedrock, glacial till, and highly permeable water course (valley fill) aquifers (Cotton 1976). Bedrock aquifers, which produce from irregularly distributed and poorly connected fractures, usually do not have sufficient yields for municipal or industrial use.

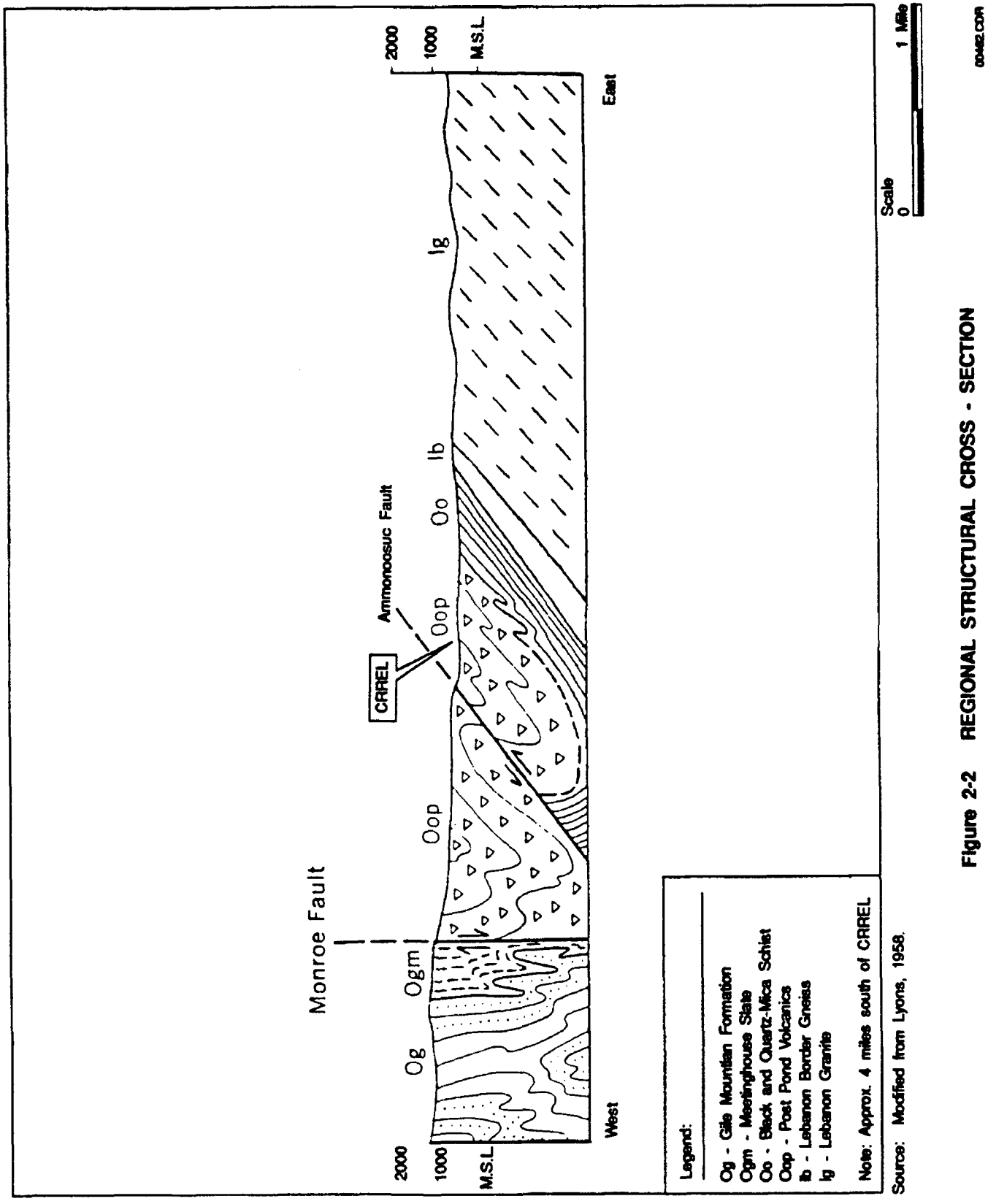
Glacial till is an unsorted mixture of clay, silt, sand, gravel, and boulders. Till overlies bedrock and is found throughout the area directly overlying bedrock although not under the CRREL site. The average thickness of till is probably less than 30 feet, although in some places it exceeds 100 feet (Cotton 1976). Thick till can store large amounts of water, but small inter-granular pore spacing transmits the water slowly. This makes till a low quality aquifer that is inadequate for municipal or industrial needs (Cotton 1976).

The high-yield aquifers in the upper valley are generally water course aquifers consisting of highly permeable sands and gravels lying along stream channels, and are in close hydraulic connection with the stream. These deposits, which include eskers, are derived from streams that were within or adjacent to ice masses near the end of Pleistocene glaciation. Abundant pore space in these deposits may amount to more

AGE	FORMATION	SYMBOL	COLUMNAR SECTION	LITHOLOGY	THICKNESS IN FEET	PLUTONIC ROCKS
QUATERNARY	DRIFT AND ALLUVIUM			Till, glacial outwash, varved clay, and alluvium	0-200	
LOWER DEVONIAN	LITTLETON FORMATION	Dl		Black mica schist and quartz-mica schist	1500+	Lebanon granite and associated rocks (lg) (Devonian)
MIDDLE SILURIAN	FITCH FM. CLOUGH QTZT.			These four formations absent from this area because of the Northey Hill thrust	4000±	
UPPER ORDOVICIAN(?)	AMMONOOSUC VOLCANICS ALBEE FM.	Oop	gn	Black to tan phyllite, mica schist, and quartz-mica schist, commonly containing porphyroblasts of biotite or garnet (Oo); upper part of formation composed chiefly of hornblende or chlorite schist (Oop = Post Pond volcanic member); lentils of gray marble (Ooc); discontinuous meta-quartz conglomerate (Ooh = Hardy Hill quartzite member); lentils of hornblende or chlorite schist (Oov = volcanics?)	1500-2000	Lit-par-lit and other gneiss of uncertain origin and age (gn)
MIDDLE ORDOVICIAN(?)	ORFORDVILLE FORMATION	Ooc Oo Oov Ooh Oo	lg		3500-4000 0-300	Intrusive hornblende schist of uncertain age (h)
	GILE MOUNTAIN FORMATION	Ogm Og Ogc Og Ogv	h	Tan quartz-mica schist and quartzite with minor interbedded gray to black pelitic schist (Og); black phyllite or schist with thin interbeds of tan quartz-mica schist (Ogm = Meetinghouse slate member; possibly equivalent to Oo) black calcite-quartz schist, with interbedded pelitic schist (Ogc); lentils of hornblende schist (Ogv)	6500± 1500±	
	WAITS RIVER FORMATION	Ows Owv Ow		Rusty-weathering calcite-mica schist, with interbedded mica schist, quartz-mica schist and quartzite (Ow); hornblende schist with minor interbedded pelitic and psammitic schist (Ows = Standing Pond amphibolite member); lentils of hornblende schist (Owv)	4000+ 125-650	

Source: Lyons, 1955

Figure 2-1 COLMNAR SECTION OF CRREL AREA



Source: Modified from Lyons, 1958.

Figure 2-2 REGIONAL STRUCTURAL CROSS - SECTION

than 30 percent of the total volume of the deposit. Water saturated sediments in these deposits are more than 80 feet thick in some places. These aquifers can yield large quantities of water for municipal and industrial purposes (Cotton 1976).

The Norwich water supply is owned and operated by the Norwich Fire District. This system consists of approximately 308 connections, the majority of which are located within the boundaries of the Norwich Fire District (McClellan 1991). Numerous residents of the area are still using private water supply wells either by choice or because these residents are located outside the district boundaries (Lindberg 1992). The district water supply is derived from a well located approximately one mile north of CRREL on the Vermont side of the Connecticut River. This well is capable of producing 350 gallons per minute (gpm) (McClellan 1991). An older well at this location is currently used as a back-up source. Water from the supply well is pumped to the Norwich Fire District reservoir prior to distribution (Lindberg 1992).

The Hanover municipal well, located approximately 1,000 feet north of CRREL (Figure 1-1), is used on demand during drought or emergency conditions and is capable of producing a maximum of 500 gpm (Brown 1991). The Hanover Water Company, which owns this well, normally obtains its supply from two surface water impoundments located approximately 1.5 miles east of CRREL at elevations of 699 and 775 feet above MSL (USGS 1984). The water is supplied to residents of the valley living at elevations less than 600 feet above MSL. An average of 1.5 million gallons a day is supplied to approximately 1,500 connections (Brown 1991).

Residential wells utilizing both unconsolidated surficial aquifers and bedrock aquifers exist in the site area. Generally these are low-yield wells, located mostly in Vermont, and are used for domestic water supplies. Most residents on the New Hampshire side of the Connecticut River in the site area are connected to the Hanover municipal water supply, with the exception of a few residents living north of CRREL (Brown 1991).

Three distinct hydrologic units are present at the CRREL site: the esker, lake sediments, and fractured bedrock. CRREL has 5 high-yield production wells completed in the esker (Figure 2-1). Production well CECRL05 is the most recently completed well at the site and is not currently in use. The esker is used as a source of water for the refrigeration/cooling system at CRREL. The esker is also used as a source of drinking water for the towns of Norwich, Vermont, and Hanover, New Hampshire.

Screened interval information exists for CRREL production wells CECRL01, CECRL03, and CECRL04. In CECRL01 and CECRL03, 40-foot screens were installed at 110 to 150 feet below ground surface (BGS) and 127 to 167 feet BGS, respectively. In well CECRL04, 100-slot screen was installed from 126 to 131 feet BGS and 20 slot screen was installed from a depth of 131 to 149 feet BGS.

CRREL maintains pumping records for the 4 operating production wells. The pumps operate on demand and at regular intervals with flow volume and operating time being recorded. These wells produce at an average combined rate of approximately 700 gpm or 1 million gallons per day. These discharge rates indicate that the esker is a highly permeable aquifer capable of high yields.

Permeability in fractured bedrock aquifers in the site vicinity is caused primarily from stress-induced and bedding-plane fractures, and schistocity. Fracturing in the bedrock is irregular, due to the complicated folding and faulting, and the wide variety of lithologic types. Bedrock yields in the area are generally low, approximately 4 to 10 gpm, and vary significantly between different formations. Fracturing of the Orfordville Formation in association with the nearby Monroe and Ammonoosuc faults may explain the relatively higher bedrock yields of this formation (Hodges et al. 1976). The Post Pond Volcanic member in the site vicinity has a median yield of 9.09 gpm (Cotton et al. 1976).

2.8 SURFACE WATER HYDROLOGY

The Connecticut River drainage encompasses an area of 4,092 square miles with a discharge that ranges from 82 cubic feet per second (ft^3/sec) to 136,000 ft^3/sec. An average discharge of 7,121 ft^3/sec was calculated at the West Lebanon gauging station, located 5.6 miles downstream of CRREL (Blakley et al. 1989). Average discharge at a point approximately one-half mile upstream from CRREL has been estimated to be 4,900 ft^3/sec (Hodges et al. 1976). The Connecticut River valley is entrenched in a bedrock channel cut into complex crystalline bedrock. The valley varies greatly in width and has steep abrupt walls (Stewart and MacClintock 1969). Bedrock hardness, which influenced the rate of erosion by glaciers and the river, is partially responsible for the shape of the valley. The water level in the Connecticut River at CRREL is controlled by the New England Power Company dam at Wilder, Vermont, which is 4.5 miles downstream from CRREL. The Wilder Dam reservoir extends 30 miles upstream to the Piermont-Haverhill, New Hampshire area. The normal residence time of water in the reservoir ranges from two to five days, depending on discharge at the dam (3.5 days with average discharge). The river is approximately 500 feet wide, fluctuates between 380 and 385 feet above MSL, and averages 33 feet in depth at CRREL (Gatto and Shoop 1991). The water level in the reservoir normally does not fluctuate more than one foot a day with drawdown occurring during peak power usage (Wehran 1991).

3. PREVIOUS SAMPLING AND INVESTIGATIONS

USATHAMA, CRREL, and various agencies have individually conducted previous investigations and sampling related to suspected VOC contamination within the CRREL site area. These investigations include: USATHAMA sampling; Norwich, Vermont, Ground Water Investigation; New Hampshire Department of Environmental Services (NHDES) Sampling; Vermont Department of Health (VTDOH) Sampling; Aerial Photographic Analysis; the CRREL Site Investigation; and the CRREL Connecticut River Study. The data generated from the USATHAMA sampling are the only chemical data that have been generated by a USATHAMA-approved analytical laboratory. Each of these investigations is summarized below.

3.1 USATHAMA SAMPLING

Water samples were collected by CRREL and submitted to a USATHAMA-approved laboratory on 19 March 1991. Samples were collected from the outfall, the five CRREL production wells, the ice well, and the Goodrich and Peacock residential wells. A complete analysis was performed on these samples by the Arthur D. Little Co. (ADL) of Cambridge, Massachusetts, a USATHAMA-approved laboratory. This analysis was the basis for selecting VOCs as the contaminants of concern for the CRREL site. Analytical results of the USATHAMA sampling are shown in Table 3-1. The analytical methods utilized by ADL for USATHAMA are shown in Appendix A. The presence of butylbenzyl phthalate and acetone in samples from CRREL production well CECRL03 is a result of laboratory contamination.

3.2 GROUND WATER INVESTIGATION IN NORWICH, VERMONT

In early 1991, the State of Vermont Department of Environmental Conservation (VTDEC) awarded a contract to Wehram Engineering Corporation of Burlington, Vermont to perform a ground water investigation in Norwich, Vermont. This report was initiated as a result of TCE contamination being found in two residential bedrock wells, both located in Norwich, across the Connecticut River from CRREL. A total of seven borings were advanced with a 4.25-inch hollow stem auger. These borings ranged from 15 to 88.5 feet BGS in depth. Monitoring wells were installed in six of these borings. An existing monitoring well located near the Norwich municipal well was also used in the study. This well is owned by the Norwich Fire District.

Monitoring wells 1S, 1D, and 1B were installed in the immediate vicinity of the Goodrich well (in which TCE contamination had been detected). Monitoring well 2 was installed 300 feet north of the Goodrich well. Monitoring well 4 was installed 300 feet south of the Peacock well (in which TCE had also been detected). Monitoring well 5 was installed on the Vermont side of the river approximately 3.2 miles south of CRREL. The Norwich Fire District well was designated as monitoring well 6, and is the only well in this study that is screened within the

Table 3-1

USATHAMA WATER SAMPLE RESULTS
(Sample Date: 19 March 1991)

Sample Location	Analytical Method***	MCL (ppb)	Compound	Frequency Detected Above MCL	Detected Concentration (ppb)
ORGANICS					
New Hampshire Outfall	UG05	5	Trichloroethylene	1/1	360
New Hampshire Outfall	UM17	5	Trichloroethylene	1/1	236
Well CECRL01	UG05	5	Trichloroethylene	1/1	930
Well CECRL01	UM17	5	Trichloroethylene	1/1	849
Well CECRL02	UG05	5	Trichloroethylene	1/1	220
Well CECRL02	UM17	5	Trichloroethylene	1/1	142
Well CECRL02	UM17	5	Tetrachloroethylene	1/1	18.2
Well CECRL03	UM16	4*	Butylbenzyl phthalate	1/1	12.0
Well CECRL03	UM17	N/A	Acetone	--	11.0
Well CECRL04	UG05	5	Trichloroethylene	0/1	4.10
Well CECRL04	UM17	5	Trichloroethylene	1/1	5.28
Well CECRL05	UG05	5	Trichloroethylene	1/1	55
Well CECRL05	UM17	5	Trichloroethylene	1/1	104
Ice Well	UM17	5	Trichloroethylene	1/1	28,300
Ice Well	UG05	5	Trichloroethylene	1/1	14,000
Ice Well	UG05	5	Tetrachloroethylene	1/1	1,700
Ice Well	UM16	5	Tetrachloroethylene	1/1	200
Ice Well	UM16	5	2-Methylnapthalene	1/1	38

RC507

Table 3-1 (Cont.)

USATHAMA WATER SAMPLE RESULTS
(Sample Date: 19 March 1991)

Sample Location	Analytical Method***	MCL (ppb)	Compound	Frequency Detected Above MCL	Detected Concentration (ppb)
Ice Well	UM16	--	4-Chloroaniline	--	13
Ice Well	UM17	5	1,2-Dichloroethylene	1/1	149
Ice Well	UM17	10**	1,2-Dimethylbenzene	1/1	200
Ice Well	UM17	10**	1,3-Dimethylbenzene	1/1	100
Ice Well	UM17	100	Chloroform	0/1	22.6
Ice Well	UM17	5	Trimethylbenzene	1/1	500
Goodrich Well	UG05	5	Trichloroethylene	1/1	17
Peacock Well	UG05	5	Trichloroethylene	1/1	27
INORGANICS					
New Hampshire Outfall	99	5000	Barium	0/1	20.1
New Hampshire Outfall	99	100	Chromium	0/1	4.78
New Hampshire Outfall	99	300+	Iron	1/1	345
New Hampshire Outfall	99	50+	Manganese	1/1	63
Well CECRL01	99	5000	Barium	0/1	17.3
Well CECRL01	99	1000+	Copper	0/1	16
Well CECRL01	99	300+	Iron	1/1	421
Well CECRL01	99	50+	Manganese	1/1	73
Well CECRL02	99	1000	Copper	0/1	12
Well CECRL02	99	300+	Iron	1/1	380

PC507

Table 3-1 (Cont.)

USATHAMA WATER SAMPLE RESULTS
(Sample Date: 19 March 1991)

Sample Location	Analytical Method***	MCL (ppb)	Compound	Frequency Detected Above MCL	Detected Concentration (ppb)
Well CECRL02	99	50+	Manganese	1/1	121
Well CECRL03	99	5000	Barium	0/1	29.9
Well CECRL03	99	1000+	Copper	0/1	28.4
Well CECRL03	99	300+	Iron	1/1	353
Well CECRL03	99	50+	Manganese	1/1	90.8
Well CECRL03	99	5000+	Zinc	0/1	94.7
Well CECRL04	99	5000	Barium	0/1	25.2
Well CECRL04	99	300+	Iron	1/1	720
Well CECRL04	99	50+	Manganese	1/1	56.7
Well CECRL04	99	5000+	Zinc	0/1	20.5
Well CECRL05	99	5000	Barium	0/1	31.1
Well CECRL05	99	100	Chromium	0/1	6.5
Well CECRL05	99	1000+	Copper	0/1	25.6
Well CECRL05	99	300+	Iron	1/1	760
Well CECRL05	99	50+	Manganese	1/1	107
Ice Well	99	N/A	Barium	N/A	6.1
Ice Well	99	N/A	Copper	N/A	9.5
Ice Well	99	N/A	Iron	N/A	2900
Ice Well	99	N/A	Manganese	N/A	310

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Table 3-1 (Cont.)

USATHAMA WATER SAMPLE RESULTS
(Sample Date: 19 March 1991)

Sample Location	Analytical Method***	MCL (ppb)	Compound	Frequency Detected Above MCL	Detected Concentration (ppb)
Ice Well	99	N/A	Zinc	N/A	1400
Goodrich Well	99	5000	Barium	0/1	47
Goodrich Well	99	1000+	Copper	0/1	26.2
Goodrich Well	99	300+	Iron	0/1	49.5
Goodrich Well	99	50+	Manganese	1/1	79.3
Peacock Well	99	5000	Barium	0/1	67
Peacock Well	99	1000+	Copper	0/1	36.1
Peacock Well	99	300+	Iron	0/1	204
Peacock Well	99	5000+	Zinc	0/1	410

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* Proposed MCL for phthalates.
** Total xylenes.
*** Analytical Methods
UG05 - Halocarbons in H2O by GC/CON
UM16 - Semivolatiles in H2O by GC/MS
UM17 - Volatiles in H2O by GC/MS
99 - Metals
\+ Regulated secondary maximum contaminant levels (SMCL)

Source: USATHAMA, IRDMIS, 1991

esker that provides water at CRREL. All the wells with the exception of 1B were screened in unconsolidated sediments. Monitoring well 1B was screened in the top 10 feet of bedrock. Samples were collected from these monitoring wells on 23 April 1991. The analytical results from this sampling event were all below the applicable detection limits for all parameters tested using EPA Method 8240. This method tests for VOCs, including TCE.

No overburden hydraulic conductivity (K) tests were performed in the overburden wells during the study. A general K value of 10^{-3} to 10^{-5} cm/sec was indicated based on sediment types and water level responses during development of the wells. A comparison of hydraulic heads in wells that are screened at different depths, including bedrock, shows low vertical gradients on the order of 10^{-2} feet/foot, indicating an insignificant vertical component of flow in the overburden. Horizontal gradients between the wells are relatively high (0.88 feet/foot between monitoring well 2 and monitoring well 4). Ground water contours developed for the report indicate a general easterly flow of ground water toward the Connecticut River. The report indicates there is no significant regional down-valley (i.e., southward) ground water flow in the area.

The Wehran (1991) report concludes that:

- The lack of observed overburden contamination in monitoring wells near the Peacock and Goodrich wells indicates that the source of contamination is not in the immediate vicinity of these wells.

- The TCE in the Peacock and Goodrich wells does not pose a significant threat to local town water supplies on the Vermont side of the Connecticut River.

- The ground water flow in the overburden appears to be generally horizontal and toward the Connecticut River.

- Hydrogeologic data obtained about the overburden indicates that CRREL has not been shown to be a direct source of contamination in Vermont. However, the potential exists for contamination of wells on the Vermont side of the river from the historical releases at CRREL if there was significant vertically downward movement of chlorinated solvents into bedrock.

- Migration of contaminants through bedrock is possible, especially if bedrock fractures are oriented in an east-west direction.

Since the completion of this investigation, ground water sampling and analysis of these monitoring wells has been conducted on a quarterly basis by the Vermont Department of Environmental Control. No contamination has been detected during this testing (Young 1992).

3.3 NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES SAMPLING

On 4 June 1991, as a result of the TCE contamination at CRREL, the New Hampshire Department of Environmental Services conducted water sampling. These samples were collected from five locations at and near the CRREL site. NHDES Laboratories analyzed these samples following EPA Method 624, which analyzes for VOCs. This analysis was performed using gas chromatograph-mass spectrometry equipment. This sampling yielded the following results (Minicucci 1991):

Location	TCE Concentration (ppb)
Refrigeration reservoir (near ice well)	1,700
Outfall catch basin (near exterior test pond)	510
Connecticut River 50 feet upstream of outfall	ND
At outfall	98
50 feet downstream	6.8

ND = Non Detect

3.4 VERMONT DEPARTMENT OF HEALTH SAMPLING

The VTDOH has conducted ground water sampling and analysis of 13 wells on the Vermont side of the Connecticut River on a monthly basis since 21 December 1990. These wells include the Peacock well, the Goodrich well, and the Norwich municipal well (Figure 1-1). VOC analysis is performed by VTDOH laboratories following EPA Method 524.2. VOC concentrations in all 13 wells, except for the Peacock and Goodrich wells, have been found to be below detection limits in all sampling rounds. The Peacock and Goodrich wells have consistently been found to contain elevated levels of TCE and cis 1,2-dichloroethene (cis 1,2 DCE). Very low levels of trans 1,2-dichloroethene (Trans 1,2 DCE) have also been detected in the Goodrich well. The Peacock residence was hooked up to the Norwich, Vermont water supply in September 1991 and was last sampled in August 1991. A carbon filtration unit has been installed at the Goodrich residence and was sampled in February 1992. The Goodrich residence will be connected to the Norwich water supply in the near future. These latest samples yielded the following results (Young 1992):

- Peacock well: 330.0 ppb TCE
  9.2 ppb cis 1,2 DCE

- Goodrich well: >300.0 ppb TCE
  15.0 ppb cis 1,2 DCE
  .6 ppb Trans 1,2 DCE

3.5 AERIAL PHOTOGRAPHIC ANALYSIS

The Environmental Photographic Interpretation Center (EPIC), through an interagency agreement between the EPA and USATHAMA, has performed imagery analysis support at the CRREL site (EPIC 1991). The objective of this study was to obtain, analyze, and provide aerial photographic coverage of the region taken between 1942 and 1982 (the most recent year of regional coverage). Analysis focused on activity and features within the CRREL site, and also within an approximate 3.2 kilometer (2-mile) radius of CRREL. Man-made features that may have caused or represent a potential source of ground water or surface water contamination were given special attention. USATHAMA also requested a photogeologic analysis; however, due to site location and lack of distinct photogeologic signatures, this analysis was not performed. The EPIC report is dated September 1991.

The major features identified during this inventory include: an auto junkyard located approximately 1.7 miles northwest of CRREL, which was first identified on a 1956 photograph; three extraction areas (quarries) first identified on 1942 and 1956 photographs; an extraction/probable disposal area located approximately 1.5 miles downstream of CRREL on the west side of the Connecticut River, and first identified on the 1970 photograph; a fill area; and an open storage area on what is now the Goodrich property, located on the west side of the river across from CRREL, and first identified on a 1956 photograph.

3.6 CRREL SITE INVESTIGATION

CRREL has generated several reports relating to the TCE contamination at the facility:

- CRREL Site Investigation Report, 26 April 1991 (CRREL 1991);
- History of TCE Use and Handling at CRREL, undated, by Karen J. Faran (Faran undated);
- Geology and Geohydrology at CRREL: A Preliminary Site Investigation, May 1991, by Lawrence W. Gatto and Sally A. Shoop (Gatto and Shoop 1991);
- The Fate and Treatment of Trichloroethylene (TCE) in Air, Water, and Soil: A Compilation of References and Abstracts, January 1991, by Dr. Giles Marion (Marion 1991); and
- CRREL's Site Investigation and Analysis for Trichloroethylene, 1991, by L.B. Perry et al. (Perry et al. 1991).

The work by Perry is a summary of analytical data from CRREL's ongoing in-house study of TCE contamination in the site area. This investigation includes soil, soil-gas, ground water, surface water, and sediment sampling. All water, soil, sediment, and soil-gas samples were analyzed using the headspace gas chromatography (HSGC) technique. The HSGC method uses a portable GC instrument that employs a photoionization detector.

Ground water samples were first collected from the CRREL production wells and the Hanover municipal well on 15 to 16 November 1990, approximately two months after notification of possible PCE contamination at the site. Upon analysis for VOCs, it was discovered that PCE was not present, but TCE had been detected in production wells CECRL01, CECRL02, and CECRL04. No detectable contamination was found in production well CECRL03 or the Hanover municipal well. Production well CECRL05 was not tested at this time. On 14 December, analytical results from 7 wells and 1 spring sampled by CRREL on the Vermont side of the river indicated TCE contamination in the Goodrich and Peacock residential wells, and the spring. Further testing of the spring proved this first result to be false. Upon receiving this information, Colonel Nichols, Commander and Director of CRREL, initiated Operation Sweetwater to use CRREL's in-house capabilities to analyze the water supplies of any concerned residents in the site area. TCE was not detected in any other nearby drinking water supplies tested as a part of Operation Sweetwater.

In addition to Operation Sweetwater, CRREL has sampled the production wells, the refrigeration reservoir, and the Navy manhole (outfall catch basin) on a weekly basis since contamination was initially discovered. Results of this sampling are reported to EPA Region I and NHDES. CRREL has also collected samples from three locations on the Connecticut River on a weekly basis (weather permitting) since the discovery of TCE contamination. CRREL collected samples from the Goodrich and Peacock residential wells while these wells were active. Former users of the Goodrich and Peacock wells are now connected to the municipal water supply. The results from both the on-going sampling and Operation Sweetwater sampling are summarized in Tables 3-2 and 3-3.

Results of soil sampling revealed TCE levels of 2 to 10 parts per billion (ppb) at depths ranging from 2 to 12 feet near the former TCE underground storage tank (Figure 1-4, AOC 2). TCE concentrations of 2 to 22 ppb were found in soil samples taken at depths ranging from 2 to 12 feet near the ice well (Figure 1-4, AOC 9). All other soil sample locations had TCE concentrations below detection limits.

3.7 CRREL CONNECTICUT RIVER STUDY

As a result of the TCE tank explosion on 2 July 1970, approximately 3,000 gallons of TCE entered the Connecticut River through the CRREL storm sewer system. Soon after this, CRREL's Earth Sciences Branch attempted to locate any pools of TCE on the river bottom and determine

Table 3-2

NEW HAMPSHIRE
WATER SAMPLE DATA

Sample	Maximum Contaminant Level (MCL) for TCE (ppb)	Frequency of Detection	Frequency Detected Above MCL	Detectable* Concentration Range TCE (ppb)
CRREL Well 1	5	64/64	64/64	19 - 1,988
CRREL Well 2	5	55/55	55/55	43.08 - 7,112
CRREL Well 3	5	0/65	0/65	--
CRREL Well 4	5	57/64	35/64	<d - 20.7
Outfall catch basin (Navy)	5	58/58	58/58	16 - 1,622
Residence, Deming, Q.	5	0/1	0/1	--
Residence, Chinlund	5	0/1	0/1	--
Residence, Moir, W.	5	0/1	0/1	--
Residence, Holbrook, M.	5	0/1	0/1	--
Residence, Creagh, J.	5	0/1	0/1	--
Residence, Jodoin, J.	5	0/1	0/1	--
Residence, Bailey, E.	5	0/1	0/1	--
Residence, Black, P.	5	0/1	0/1	--
Residence, Henry, K.	5	0/1	0/1	--
Residence, Higgins, J.	5	0/1	0/1	--

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Key at end of table

Table 3-2 (Cont.)

NEW HAMPSHIRE
WATER SAMPLE DATA

Sample	Maximum Contaminant Level (MCL) for TCE (ppb)	Frequency of Detection	Frequency Detected Above MCL	Detectable* Concentration Range TCE (ppb)
Refrigeration reservoir	5	57/57	57/57	19 - 2,236
Deep hole (ice well)	5	5/5	5/5	1,200 - 4,500
CRREL Well 5	5	1/1	1/1	26
Discharge CT River	5	24/24	24/24	8.6 - 502.5
CT River, 100 feet upstream	5	0/24	0/24	—
CT River, 100 feet downstream	5	13/24	4/24	1.0 - 56.1

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Source: Ecology and Environment, Inc.

* Headspace-gas chromatography method.
Samples collected and analyzed by CRREL 19 December 1990 to 10 March 1992.

Table 3-3

VERMONT
WATER SAMPLE DATA

Sample	Maximum Contaminant Level (MCL) for TCE (ppb)	Frequency of Detection	Frequency Detected Above MCL	Detectable* Concentration Range TCE (ppb)
Residence, Britton, A.	5	0/4	0/4	—
Residence, Britton, D.	5	0/3	0/3	—
Residence, Peacock, N.	5	28/28	28/28	25 - 546**
Residence, Goodrich, M.	5	30/30	30/30	40 - 600**
Residence, Sachs, R.	5	0/3	0/3	--
Residence, Vacant	5	0/1	0/1	—
Residence, Edgerton	5	0/3	0/3	—
Residence, Forcier, J.H.	5	0/3	0/3	—
Residence, Forcier, J.	5	0/2	0/2	--
Residence, Pinello, C.	5	0/5	0/5	—
River Road Veterinary Clinic	5	0/3	0/3	—
Residence, Prozinski	5	0/1	0/1	—
Residence, Gardner	5	0/1	0/1	—
Residence, Britton	5	0/1	0/1	--
Goodrich Four Corners Brook	5	0/1	0/1	—
Residence, Pickett, M.	5	0/2	0/2	—

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Key at end of table

Table 3-3 (Cont.)

VERMONT
WATER SAMPLE DATA

Sample	Maximum Contaminant Level (MCL) for TCE (ppb)	Frequency of Detection	Frequency Detected Above MCL	Detectable* Concentration Range TCE (ppb)
Residence, Jones, D.	5	0/1	0/1	--
Norwich Town Well Pump	5	0/1	0/1	--
Hartford Town Well	5	0/3	0/3	--
Norwich Meadows	5	0/4	0/4	--
Hawk Pine Hill	5	0/1	0/1	--
Norwich Town Well Faucet	5	0/1	0/1	--
Personal Well (Caretaker)	5	0/1	0/1	--
Garage Office	5	0/1	0/1	--
Norwich Elementary	5	0/1	0/1	--
Ompompanoosuc River	5	0/1	0/1	--
Connecticut River (Lyme Bridge)	5	0/1	0/1	--
Residence, Porter, G.	5	0/4	0/4	--
Residence, Alexander, P.	5	0/1	0/1	--
Residence, Flanigan, M.	5	0/1	0/1	--
Residence, Blake, LR.	5	0/1	0/1	--
Huggetts Mobile Gas Station	5	0/1	0/1	--
Residence, Guest, J.	5	0/1	0/1	--
Residence, Carmasin, A.	5	0/1	0/1	--

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Key at end of table

Table 3-3 (Cont.)

VERMONT
WATER SAMPLE DATA

Sample	Maximum Contaminant Level (MCL) for TCE (ppb)	Frequency of Detection	Frequency Detected Above MCL	Detectable* Concentration Range TCE (ppb)
Residence, Nelson, M.	5	0/1	0/1	--
Residence, Smith, M.	5	0/1	0/1	--
Residence, Stanley, J.	5	0/1	0/1	--
Residence, Schaaf, Tim	5	0/2	0/2	--
Residence, Sullivan, Denis	5	0/2	0/2	--
Residence, Agway Energy Products	5	0/1	0/1	--
Residence, Walsh, Robert	5	0/1	0/1	--
Residence, Montshire Museum	5	0/1	0/1	--
Residence, Devaux, W.	5	0/1	0/1	--
Residence, Hodder, Cornelia	5	0/1	0/1	--
Melview Ridge	5	0/1	0/1	--
Residence, DeRubbo, Pat	5	0/1	0/1	--
Apartment 7, Ledges Apartment	5	0/1	0/1	--
Apartment 11, Ledges Apartment	5	0/1	0/1	--

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Source: Ecology and Environment, Inc.

* Headspace-gas chromatography
Samples collected and analyzed by CRREL 19 December 1990 to 23 April 1991

** Ranges presented are of the raw H_2O source prior to any treatments (i.e., carbon filters).

the degree of contamination in the river from the spill (Faran undated). First attempts to locate TCE by bottom sampling of the river near the storm drain outfall were made on 7 July 1970. Significant amounts of TCE-contaminated sediments were collected and an effort was made to map the topography of the river bottom by soundings conducted from a small boat. All of the TCE was found within the river bottom sediments, and no free standing pools of TCE were discovered (Faran undated). Bottom samples from the middle of the river channel were taken at distances up to 1/4 mile downstream of the outfall, with no free standing pools of TCE being found (Faran undated).

Quantitative analyses of water samples from the river were conducted from 14 to 30 July 1970. Quality assurance/quality control (QA/QC) information for these analyses is not included. Samples collected on 14 July at the Hanover bridge, located 2 miles downstream, and the Wilder dam, located 4.5 miles downstream, contained TCE concentrations of 20 ppb and 22 ppb, respectively. Samples collected at the same locations on 17 July 1970 contained TCE concentrations of 16 ppb and 7 ppb respectively. On this date, samples were also collected approximately 1 mile and 5 miles north of CRREL, and contained 7 ppb and 0 ppb, respectively. A number of samples were collected from the river on 24 July, and the following week samples were collected at locations upstream of the CRREL outfall as far north as Wells River, Vermont (approximately 30 miles). TCE concentrations in these samples ranged from 10 to 20 ppb. CRREL concluded that upstream TCE sources probably exist and that the 2 July explosion did not raise the concentration of TCE in the Connecticut River significantly above background levels (Faran undated).

4. FIELD INVESTIGATION METHODOLOGY

RI field activities were performed at the CRREL site between 26 August 1991 and 10 April 1992. The primary objectives of the field investigation were to:

- o Identify the various types of contamination present at CRREL,
- o Identify the sources and extent of contamination, and
- o Determine the geologic and hydrogeologic parameters of the site that may affect contaminant distribution.

The specific field tasks performed to fulfill these objectives, and the time period in which they were performed, are as follows:

o Geophysical Survey	26 Aug. 1991 to 30 Aug. 1991
o Soil Gas Survey	9 Sept. 1991 to 25 Sept. 1991
o Soil Borings/ Well Installation	10 Jan. 1992 to 20 Feb. 1992
o Ground Water Sampling	
First Round	6 Mar. 1992 to 13 Mar. 1992
Second Round	7 Apr. 1992 to 10 Apr. 1992
o Surface Water/ Sediment Sampling	9 Apr. 1992

This section describes the methodology of each field task, and deviations from procedures specified in the Field Sampling Plan (FSP). All samples were analyzed for EPA VOC Target Compound List (TCL) and TPHC. The analytical results of samples collected during field activities are discussed in Section 6.3. Subsurface information obtained during the well installation and soil boring field tasks is discussed in Section 6.1.

The five existing CRREL production wells are designated as CECRL01 through CECRL05. The ice well, located west of the Main Laboratory, is designated as CECRL06. The six monitoring wells installed during the CRREL RI are designated as CECRL07 through CECRL12. Sample identifiers used during this investigation are listed in Table 4-1.

4.1 GEOPHYSICAL SURVEY

A limited geophysical survey was performed at the CRREL site to confirm and delineate major subsurface objects indicated on base maps provided by CRREL, and to identify any additional subsurface objects not included on the base maps. The geophysical survey information was also used to design the soil gas survey, and in the selection of soil boring

Table 4-1

CRREL REMEDIAL INVESTIGATION SAMPLE IDs

ID	LOCATION
Soil Borings	
2SB1	AOC2: Former TCE UST
2SB2	AOC2: Former TCE UST
6SB1	AOC6: Former Gasoline UST
9SB1	AOC9: Ice Well/TCE AST Explosion
10SB1	AOC10: Former Drum Storage Area
13SB1	AOC13: Former TCE Surface Disposal Area (Gravel Pad)
15SB1	AOC15: Former Fuel Oil UST
16SB1	AOC16: Former Drum Storage Area
CRREL Production Wells	
CECRL01	CRREL Production Well No. 1
CECRL02	CRREL Production Well No. 2
CECRL03	CRREL Production Well No. 3
CECRL04	CRREL Production Well No. 4
CECRL05	CRREL Production Well No. 5
Ice Well	
CECRL06	Ice Well
Monitoring Wells	
CECRL07	Upgradient Location
CECRL08	AOC2: Former TCE UST
CECRL09	AOC9: Ice Well/TCE AST Explosion
CECRL10	AOC6: Former Gasoline UST
CECRL11	AOC13: Former TCE Surface Disposal Area (Gravel Pad)
CECRL12	Downgradient of CRREL Production Wells
Surface Water	
CONN01 (CONNSW1)	100 Feet Upstream of CRREL Outfall
CONN02 (CONNSW2)	At CRREL Outfall
CONN03 (CONNSW3)	100 Feet Downstream of CRREL Outfall
Sediment	
CONN01 (CONNSED1)	100 Feet Upstream of CRREL Outfall
CONN02 (CONNSED2)	At CRREL Outfall
CONN03 (CONNSED3)	100 Feet Downstream of CRREL Outfall
Hanover Town Well	
HANOVER	Hanover Town Well

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Source: Ecology and Environment, Inc.

and monitoring well locations. The geophysical survey methodology is discussed in Appendix B.

4.2 SOIL GAS SURVEY

A Petrex(R) passive soil gas survey was conducted by Northeast Research Institute, Inc., (NERI) of Farmington, Connecticut, under subcontract to E & E (NERI 1991). The purpose of the survey was to verify VOC contamination at the 16 AOCs identified at CRREL, and to identify any additional source areas. The soil gas data were also utilized in the selection of soil boring and monitoring well locations. The Petrex(R) method was chosen because it allows the coverage of a relatively large area in a timely and cost effective manner. In addition, the Petrex(R) method is also very adept at identifying VOCs, which are the primary contaminants of concern at the CRREL site.

The Petrex(R) method is a passive, time-integrated soil gas technique based on the adsorption of VOCs to a collector. The collector consists of a ferromagnetic wire, coated with activated carbon, mounted in an open-ended glass test tube. When buried in the ground, these samplers collect contaminants from the soil, vadose zone, and ground water for a specified exposure time. A total of 460 samplers were installed at CRREL.

Relative flux maps were generated by NERI for TCE; PCE; benzene, toluene, and xylene (BTX); as well as fuel oil character. Results of the soil gas survey are discussed in Section 6.3.1.

4.3 SOIL BORINGS/SOIL SAMPLING

A total of eight soil borings were completed at the CRREL site between 10 January 1992 and 20 January 1992 (Figure 1-2). The purpose of the soil boring task was to characterize VOC contamination at suspected CRREL AOCs, and to obtain information on soils at the site. Soil borings were performed by WTD Environmental Drilling of Schofield, Wisconsin, under contract to E & E, utilizing a Canterra Model CT-250 drilling rig. E & E provided drilling oversight and health and safety monitoring during this field task. Ambient air quality in the drilling area and breathing zone was monitored with an HNu Model 101 photoionizing detector (HNu), a Photovac Microtip photoionizing detector (PID), and an O_2/Explosimeter. Field boring logs are included in Appendix C. The soil borings are listed in Table 4-2.

Soil borings were advanced with 6 1/4-inch inside diameter (ID) hollow-stem augers and continuously sampled with split spoons. Due to frozen ground conditions, split-spoon sampling at some locations was initiated at a depth of approximately one foot. Samples were logged by a field geologist, and monitored for the presence of VOCs using an HNu and a PID. Split spoon sampling was performed in conjunction with a standard penetration test as described in the American Society for Testing and Materials (ASTM) Designation D1586-84, "Standard Method for Penetration Test and Split-Barrel Sampling of Soils". The penetration

Table 4-2

**CRREL REMEDIAL INVESTIGATION
SOIL BORINGS**

Site ID	Field Sample IDs	Total Depth	Sample Depth	Date
2SB1	2SB1/9-11	45	9-11	1/18/92
	2SB1/15-17		15-17	1/18/92
	2SB1/24-26		24-26	1/18/92
	2SB1/24-26D		24-26	1/18/92
	2SB1/44-46		44-46	1/18/92
2SB2	2SB2/1-3	10.5	1-3	1/20/92
	2SB2/8-10		8-10	1/20/92
6SB1	6SB1/1-3	10.5	1-3	1/20/92
	6SB1/8.5-10.5		8.5-10.5	1/20/92
9SB1	9SB1/2-4	55	2-4	1/16/92
	9SB1/13-15		13-15	1/16/92
	9SB1/17-19		17-19	1/16/92
	9SB1/53-55		53-55	1/17/92
10SB1	10SB1/0-1	10	0-2	1/14/92
	10SB1/4-5		4-6	1/14/92
	10SB1/9-10		9-10	1/14/92
13SB1	13SB1/1.5-3.5	18.5	1.5-3.5	1/20/92
	13SB1/5.5-7.5		5.5-7.5	1/20/92
	13SB1/5.5-7.5D		5.5-7.5	1/20/92
	13SB1/17-19		17-19	1/20/92
	13SB1/17-19D		17-19	1/20/92
15SB1	15SB1/0-1	35.5	0-2	1/15/92
	15SB1/19-21		19-21	1/15/92
	15SB1/25-27		25-27	1/15/92
	15SB1/33-35		33-35	1/15/92
16SB1	16SB1/0-1	11.5	0-2	1/16/92
	16SB1/7-8		6-7.5	1/16/92
	16SB1/9-11		9.5-11.5	1/16/92

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Source: Ecology and Environment, Inc.

Notes: 1) All samples analyzed for TPHC and VOC except 9SB1/13-15 which was analyzed for TPHC only.
2) Depths in feet BGS

data were used to assess the relative density of the overburden at each boring location. Soil descriptions were based on the Unified Soil Classification System (USCS) as described in ASTM designation D-2487-5 "Standard Test Method for Classification of Soils for Engineering Purposes".

Both field screening (HNu and PID) and visual inspection were used in the field to determine if contaminated soils were encountered during augering. Soil borings exhibiting no contamination were terminated at a depth of approximately 10 feet. If contamination was encountered, the borings were to be advanced to a depth below the contamination. Soil borings 2SB2, 6SB1, 10SB1, and 16SB1 exhibited no VOC readings above background levels during monitoring with the HNu and PID, and were advanced to the minimum depth of approximately 10 feet. Two samples each, from borings 2SB2 and 6SB1, were collected for chemical analysis. Three samples each, from borings 10SB1 and 16SB1, were collected for chemical analysis.

Soil borings 2SB1, 9SB1, 13SB1, and 15SB1 exhibited elevated VOC readings during screening and were either advanced to a depth beyond the contamination, or to a depth at which HNu and PID readings dropped significantly relative to maximum readings encountered in the boring. This latter criteria was employed for borings in which attaining a depth below contamination would not have been practical with respect to both cost effectiveness and additional information gained. Three samples were collected for chemical analysis from boring 13SB1. Four samples each, from borings 2SB1, 9SB1, and 15SB1, were collected for chemical analysis.

The USATHAMA-approved water source, used for all drilling and decontamination, was CRREL production well CECRL03. All drilling and sampling equipment was decontaminated according to procedures outlined in the FSP (E & E 1991). Preservation, shipping, and handling procedures were performed in accordance with the QAPjP (Quality Assurance Project Plan) (E & E 1991b) and FSP (E & E 1991).

Soil cuttings generated during the soil boring task were screened with the HNu and PID. Soils with readings greater than 5 parts per million (ppm) above background were containerized in 55-gallon drums, labeled, and stored on-site pending a disposal method determination. Soils with readings below 5 ppm were removed from the boring vicinity and deposited on-site. All soil borings were back-filled with bentonite hole plug.

High HNu and PID readings in the breathing zone during the advancement of boring 9SB1 resulted in part of this work being performed in Level C personal protection equipment, with continuous ambient air quality monitoring by the E & E site safety officer.

A total of 25 samples for chemical analysis were collected during this field task. In addition, three field duplicate samples, two equipment rinsate samples, and two trip blanks were submitted for laboratory

analysis to fulfill quality assurance/quality control (QA/QC) requirements. Results of the soil sample chemical analysis are discussed in Section 6.3.2.

4.4 GROUND WATER MONITORING WELL INSTALLATION

Six monitoring wells were installed at CRREL between 21 January 1992 and 20 February 1992 (Figure 1-2). All monitoring wells were installed by WTD Environmental Drilling of Schofield, Wisconsin, a subcontractor to E & E, using a Canterra Model CT-250 drilling rig. E & E provided drilling oversight and health and safety monitoring during this field task. Monitoring well CECRL07 was located upgradient of suspected AOCs to assess background conditions of the ground water at CRREL. Field boring logs for the monitoring wells are included in Appendix D.

During drilling, split spoon samples were obtained from each monitoring well. Sampling was initiated at 5-foot intervals, however the sample interval length was increased to hasten drilling operations once the geologic framework of the site was established. Samples were logged by a geologist and screened for VOCs with the HNu and PID. Penetration tests and soil classifications were performed as described in Section 4.3. One soil sample was collected from each split spoon during drilling. From these samples, a total of 20 samples were selected for geotechnical analysis, which includes:

- **Grain Size Analysis.** The grain size distribution of samples obtained from the site was determined by mechanical sieve analysis, and also included hydrometer analyses. Tests were performed in accordance with ASTM standard method designation D-422, "Method for Particle-Size Analysis of Soils."

- **Atterberg Limits Analysis.** Selected samples from the site, which were sufficiently fine grained and/or cohesive, were subjected to Atterberg Limits determination analyses. Atterberg Limits assist in the classification and in the determination of the engineering properties of fine-grained soils. Atterberg Limits testing was performed in accordance with ASTM designation D-4318, "Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils."

The samples submitted for geotechnical analysis represent the various soil types encountered during monitoring well installation. These samples were submitted to the Toledo Testing Laboratory of Toledo, Ohio, on 18 February 1992. Samples not submitted for geotechnical analysis were stored at CRREL. Results of the geotechnical sampling are discussed in Section 6.1.2 and presented in Appendix E.

Soil cuttings and decontamination water generated during monitoring well installation were screened with both the HNu and PID. This screening produced no readings greater than 5 ppm above background. Soils were removed from the borehole vicinity and deposited on site.

4.4.1 Well Construction

Figure 4-1 shows a construction diagram for permanent monitoring wells installed at CRREL. The well construction logs for each monitoring well are included in Appendix F. Well protection diagrams for each monitoring well are included in Appendix G. All permanent wells were constructed of 4-inch ID Schedule 40 PVC riser and .010-inch machine-slotted Schedule 40 PVC screen of the same diameter. The permanent monitoring wells, with the exception of CECRL12, utilized a 10-foot section of screen placed completely within the saturated zone. In CECRL12, a 20-foot section of screen was placed within the bedrock at a depth of 78 to 98 feet BGS. This longer screen length was employed to ensure adequate ground water production from the bedrock aquifer.

4.4.2 Monitoring Well Development

The six monitoring wells installed at CRREL were developed during the period from 28 January 1992 to 20 February 1992. The purpose of well development is to repair formation damage caused by the drilling operation, thereby restoring the natural hydraulic properties of the formation, and to enhance water flow into wells. Well development logs are presented in Appendix H.

Measurements of the pH, conductivity, temperature and turbidity were taken prior to development, during development, and after development, and recorded on the development logs. Development water was initially containerized in 55-gallon drums and screened with the HNu and PID. This screening process failed to produce readings greater than 5 ppm above background, and the development water was subsequently released to the ground surface. Visual inspection of the development water for gross contamination was also performed.

The FSP (E & E 1991) required that a volume equal to five-times the calculated standing water volume within the well and saturated annulus (assuming 30 percent porosity within the sandpack) plus five-times the volume of drilling fluid lost, be removed from each well during development.

Although the volumetric well development criteria was not met in all instances due to the excessively large volume of water required, pH and conductivity readings stabilized prior to completion of development and the water was free of particulates. A one-pint sample of the final development water from each well was collected and retained at CRREL.

4.5 GROUND WATER SAMPLING

Two rounds of ground water samples were collected during the CRREL RI. The first round of ground water samples were collected from 6 March 1992 to 13 March 1992. The second round of ground water samples were collected from 7 April 1992 to 10 April 1992. Ground water samples were

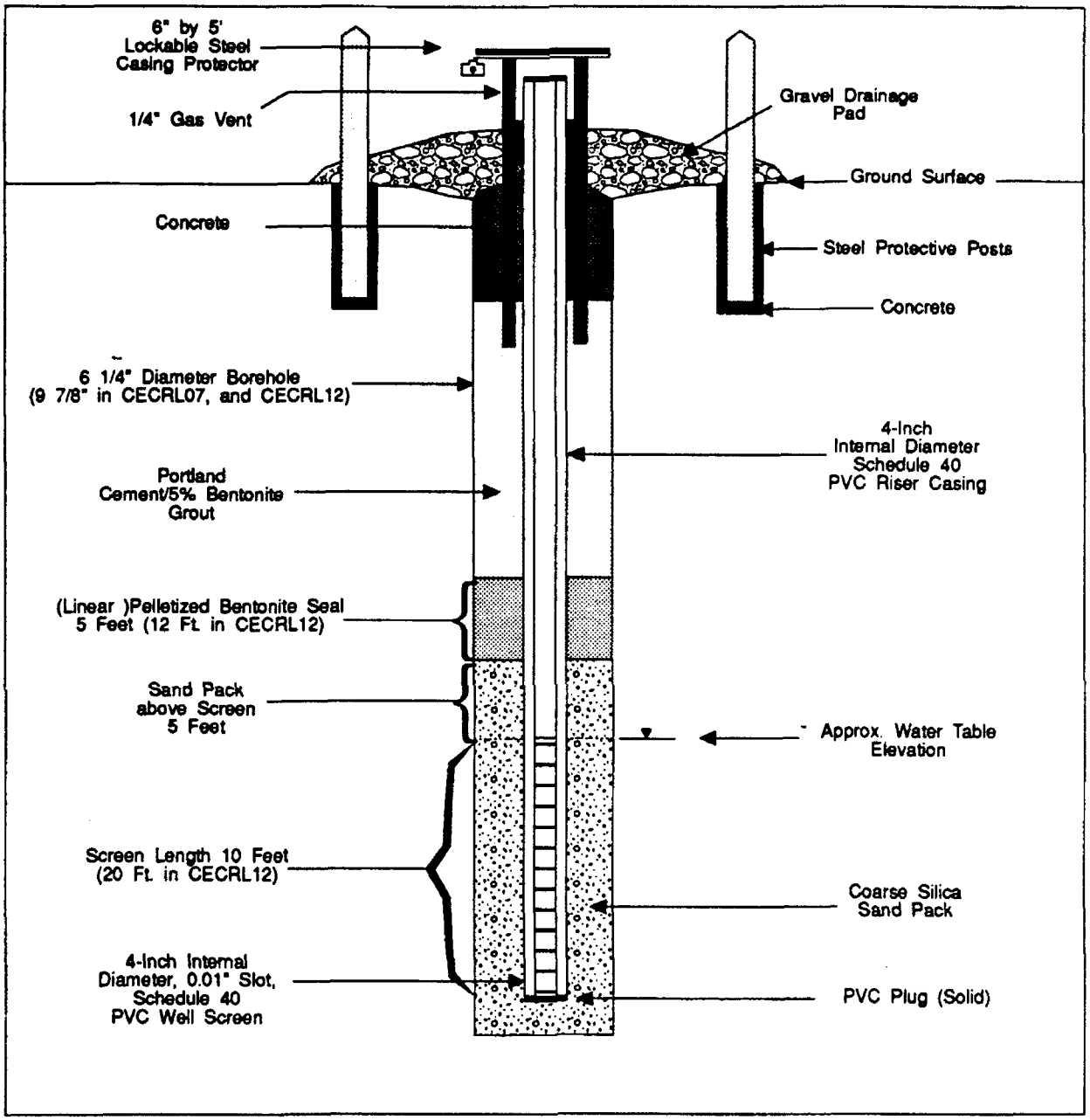

Figure 4-1 MONITORING WELL CONSTRUCTION

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obtained from the five existing CRREL production wells, the ice well, the six monitoring wells installed during the RI, and the Hanover municipal well. All samples were handled, preserved, and shipped according to procedures outlined in the FSP (E & E 1991) and QAPjP (E & E 1991b). Ground water quality parameters including pH, conductivity, and temperature readings were obtained and logged for each ground water sample.

Water level readings were obtained from the six monitoring wells with an audible electronic water level indicator prior to ground water sampling. Water level measurement logs for these wells are presented in Appendix I. Water levels were not obtainable from CRREL production wells CECRL01, CECRL03, CECRL04, CECRL05, and the town of Hanover well. This was due to either the lack of an access port or, when present, the obstruction of the access port by corrosion or existing water level measurement devices. These devices were deemed unreliable due to uncertainty about their accuracy and the surface datum from which they measure. The pump housing and down-hole pump assembly for CRREL production well CECRL02 had been removed by CRREL for routine well maintenance prior to the ground water sampling events. This enabled the use of the electronic water level indicator to obtain water level measurements from this well. The ground water elevations for the monitoring wells and CECRL02 are presented in Table 4-3. Depths to the top of the air/water interface and the water/ice interface in the ice well (CECRL06) measured 7 feet and 63 feet BGS, respectively, and were obtained on 10 April 1992 with the use of a weighted rope. The surface elevation of the Connecticut River was measured at 383 feet above MSL on 10 April 1992 at a railroad culvert that had been surveyed during the ground water investigation discussed in Section 3.2.

Dedicated Teflon bailers, fitted with dedicated polyethylene rope, were used to collect ground water samples from the six monitoring wells installed at CRREL, and from CRREL production well CECRL02. All bailers were steam cleaned with approved water prior to both rounds of ground water sampling. Samples from the remaining CRREL production wells and the Hanover municipal well were collected directly from the sampling spigot. Vials for VOC analysis were collected first, with care being taken to minimize sample agitation.

Twenty-six ground water samples were collected during this field task. In addition, three field duplicates, two equipment rinsate blanks, and seven trip blanks were collected to fulfill QA/QC requirements. The results of the ground water sampling events are discussed in Section 6.3.3.

4.5.1 Well Purging

To ensure that a fresh and representative ground water sample was obtained from each monitoring well, the FSP (E & E 1991) required that a volume equal to five times the calculated standing water volume within the well and saturated well annulus (assuming 30 percent porosity within the sand filter pack) be removed prior to sampling. This volume does

Table 4-3

CRREL REMEDIAL INVESTIGATION
MONITORING WELL AND GROUND WATER ELEVATIONS

			Well Elevations			Water Levels					
						Collected 24 Jan 1992 - 20 Feb 1992		Collected 6 Mar 1992 - 13 Mar 1992		Collected 10 Apr 1992	
Well ID	Total Depth	Screened Interval	Ground Surface	Top of Inner Casing	Top of Protective Casing	Depth	Elevation	Depth	Elevation	Depth	Elevation
CECRL02	167	N/A	468.2	---	---	---	---	87.75	380.45	87.9	380.3
CECRL07	188.5	169-179	523.0	525.61	525.8	140.00	383.00	140.00	383.00	139.69	383.31
CECRL08	149	136.5-146.5	512.7	515.38	515.54	129.70	383.00	129.82	382.88	131.02	381.68
CECRL09	139	126.5-136.5	507.2	509.75	509.89	125.00	382.2	125.25	381.95	126.05	381.15
CECRL10	129	117-127	493.1	495.96	496.3	112.00	381.10	111.54	381.56	112.34	380.76
CECRL11	118.5	106.5-116.5	476.5	479.14	479.35	94.80	381.70	94.66	381.84	95.86	380.64
CECRL12	100	78-98	467.8	470.16	470.41	85.20	382.60	85.64	382.16	84.84	382.96

RC507

Source: Ecology and Environment, Inc.

Notes:
1) Depths in feet BGS
2) Elevations in feet above MSL
3) N/A = Not Available
4) Connecticut River surface water level on 10 April 1992 equaled 383 feet above MSL

not include water obtained during initial well development. In all instances, the required preseample purge volumes were obtained prior to sampling. The well purging logs are presented in Appendix J.

Prior to sampling of CECRL01, CECRL03, CECRL04, CECRL05, and the Hanover municipal well, the sampling spigots were allowed to run for a minimum of five minutes. A Teflon bailer was used to remove five gallons of water from CECRL02 prior to sampling.

4.6 SURFACE WATER AND SEDIMENT SAMPLING

Surface water and sediment samples were collected from the Connecticut River, located directly west of the CRREL site, on 9 April 1992. A total of three surface water and three sediment samples were collected at the following locations: 100 feet upstream of the CRREL outfall (CONNSW1 and CONNSED1), at the CRREL outfall (CONNSW2 and CONNSED2), and approximately 100 feet downstream of the CRREL outfall (CONNSW3 and CONNSED3). Samples were collected from downstream to upstream to prevent cross contamination due to any disturbances (turbulence) caused by the sampling activities. At each location, the surface water sample was collected prior to collection of the corresponding sediment sample. Field measurements of pH, conductivity, and temperature were obtained from each surface water sample and logged.

Surface water samples were collected by carefully submerging precleaned bottles directly into the river, with care being taken to minimize agitation of the water. Several unsuccessful attempts were made to obtain sediment samples using a Ponar dredge. The failure of the Ponar dredge was attributed to both the presence of boulders and large cobbles on the river bottom, and the compact nature of the sands and gravels comprising the river sediments. In lieu of the Ponar dredge, a precleaned shovel was used to collect the sediment samples from a nearshore location.

A total of three surface water and three sediment samples were collected during this field task. In addition, one surface water field duplicate sample and one sediment field duplicate sample was collected at the CRREL outfall location, and one trip blank was submitted to fulfill QA/QC requirements. Sample preservation, shipping, and handling was performed according to procedures set forth in the FSP (E & E 1991) and QAPjP (E & E 1991b).

4.7 SURVEYING

The six monitoring wells installed during the RI were surveyed by Kenneth A. LeClair Associates, Inc., of Hanover, New Hampshire, a registered professional surveying company. Survey field work was performed on 23 March 1992. A WILD(R) theodilite, equipped with a built-in electronic distance measuring device, was used to measure angles and distances. A standard engineers' level was used to determine elevations. The survey field notes and a table of Universal Transverse Mercator (UTM) coordinates and elevations are provided in Appendix K. This

survey was performed to specifications set forth in the FSP (E & E 1991).

UTM coordinates and elevations were determined for each monitoring well. Elevations were determined for the ground surface, the top of the inside casing (PVC pipe), and the top of the protective casing. Elevation control was provided by a United States Geological Survey (USGS) bench mark (State of New Hampshire bench mark No. 108), located near the A & B McGuiness store, which is directly north of the CRREL site. This bench mark elevation was projected to the CRREL site using a series of turning points. The elevations for each monitoring well were then determined using a standard engineering level. Loop closure for the elevations was within 1/100 of a foot. Estimated elevation error for each monitoring well is also ± 1/100 of a foot (LeClair 1992).

UTM coordinates for the monitoring wells were calculated relative to UTM coordinates determined previously for the five existing CRREL production wells, and other key locations at CRREL. This previous work was performed by U.S. Army personnel from Fort Drum, New York, using a Position Azimuth Determining System, which is accurate to within ± 1.5 feet. From these previously surveyed control points, distances to the newly installed monitoring wells were determined. Using these distances, UTM coordinates were calculated for the monitoring wells. The estimated error of the UTM coordinates for each monitoring well, relative to the other monitoring wells, is ± 1/10 of a foot (LeClair 1992).

4.8 QUALITY ASSURANCE/QUALITY CONTROL METHODS

QA/QC procedures for the field sampling and laboratory analysis for the CRREL RI were specified in the QAPjP. Field QC samples were collected to evaluate precision, accuracy, representativeness, comparability, and completeness parameters. The project QA officer evaluated the analytical data from ADL to determine the overall effect on data usability; these QA concerns are discussed in Section 6.5.

4.8.1 Sample Preservation and Handling

During the CRREL RI sampling activities, sample management procedures were performed in accordance with the FSP (E & E 1991) and QAPjP (E & E 1991b). These include sample container and preservation, chain-of-custody records, and sample tracking and shipping. Water samples were preserved in the field with hydrochloric acid (VOC samples) and sulfuric acid (TPHC samples), and were immediately placed on ice. On the date of collection, samples were labeled, packed, and shipped to ADL.

4.8.2 Laboratory Quality Procedures

Laboratory analysis of all samples collected during the CRREL RI were carried out in accordance with the requirements of the USATHAMA Quality Assurance Program (USATHAMA, January 1990) and specifications in

the QAPjP (E & E 1991b). Samples were conveyed to the subcontractor laboratory in accordance with specified chain-of-custody (COC) procedures. Data validation was performed by E & E as discussed in the QAPjP (E & E 1991b).

During chemical analyses, ADL's QA/QC Coordinator, on a weekly basis, provided E & E with all system and performance audit reports; COC logs; holding time/extraction analysis reports; batching reports; instrument logs; maintenance and calibration records; and complete analytical QC documentation as submitted to USATHAMA (control charts, method blanks, surrogate recovery, and matrix spike results). ADL provided copies of all corrective actions to E & E for approval. While ADL provided operational control of the laboratory, E & E's QA Coordinator/Manager retained ultimate responsibility for data quality.

4.8.3 Field QC Samples

Various types of field QC samples were used to check the integrity of field procedures. These samples were analyzed to assess sampling, decontamination, and transport procedures as possible sources of sample contamination, and to determine overall sampling and analytical precision. The analytical results for the QC samples collected during the CRREL RI are discussed in Section 6.5.

Field QC samples and the frequency of collection are described below:

Trip Blanks are field blanks that were not exposed to field conditions. Their analytical results provided the overall level of contamination from sources other than ambient field conditions. Trip blanks were prepared at ADL prior to the sampling event and shipped with the sample bottles. Trip blanks were prepared by adding organic-free water to a 40-ml VOA vial containing 2 to 3 drops of concentrated hydrochloric acid. One trip blank was used with every cooler of samples, or one trip blank per 10 volatile organic samples was used, whichever was greater. Each trip blank was transported to the sampling location, handled like a sample, and returned to the laboratory for analysis without being opened in the field.

Field Equipment/Rinsate Blanks are field blank samples designed to demonstrate that sampling equipment was properly prepared and cleaned before field use and that cleaning procedures between samples were sufficient to minimize cross-contamination. Rinsate blanks were prepared by passing analyte-free water over sampling equipment and analyzing the samples for all applicable parameters. Rinsate blanks were collected at a frequency of 1 per 20 samples or per decontamination event as specified in the RI FSP (E & E 1991).

Field Duplicates consist of a set of two samples collected independently at a sampling location during a single sampling event. Field duplicates were sent to the laboratory and were

indistinguishable from other analytical samples, so that personnel performing the analyses were not able to determine which samples were field duplicates. Field duplicates assess the consistency of the overall sampling and analytical system. Duplicates were collected for every 20 samples of each type of matrix as specified in the RI FSP (E & E 1991).

4.9 DECONTAMINATION

Sampling methods and equipment were chosen to minimize decontamination requirements and prevent the possibility of cross-contamination. Non-disposable equipment was decontaminated between discrete sampling locations. The USATHAMA-approved water source, used for all decontamination activities, was CRREL production well CECRL03. This water was obtained from a spigot located inside the Ice Engineering building. All drilling equipment was decontaminated prior to arrival on site, prior to commencement of drilling activities, between the drilling of each soil boring/monitoring well, and after the completion of all drilling activities. Special attention was given to the drilling assembly and augers. PVC casing and screens used in the construction of monitoring wells were kept in sealed containers and cleaned with a high-pressure steam washer prior to use. Drilling equipment decontamination consisted of:

- high-pressure steam cleaning;
- scrubbing with brushes, if soil remained on equipment; and
- high-pressure steam rinse.

During the soil boring/soil sampling field task, split-spoon samplers and other non-disposable equipment were decontaminated following the procedures described above. Since no samples were collected for chemical analysis and no gross contamination was observed during monitoring well installation, split-spoon samplers and other non-disposable equipment used during this field task were decontaminated as follows:

- scrubbing with brushes,
- triple rinsing with USATHAMA-approved water, and
- air drying.

The decontamination area was set up on a paved surface at the CRREL site. Salt and sand were continuously applied to this surface to further minimize slip/fall hazards. Throughout field activities, samples of decontamination water were collected for field head-space analysis using the HNu and PID. Since no readings greater than 5 ppm above background were obtained during this analysis, and no gross contamination was visually observed, decontamination water was allowed to run onto the ground surface surrounding the decontamination area.

4.10 CONTROL OF INVESTIGATION-DERIVED WASTE

During RI field activities, IDW was generated at the CRREL site. Efforts were made to minimize the amount of IDW generated. A portion of the IDW consisted of disposable sampling equipment (surgical gloves, stainless steel spoons, etc.). Screening of this equipment with the HNu and PID during field activities failed to produce readings greater than 5 ppm above background. As a result, disposable sampling equipment was double-bagged and deposited into dumpsters at the CRREL site.

The remaining IDW consisted of soil cuttings, drilling fluids, development/purge water, and decontamination-derived water. Soil cuttings generated during the soil boring and monitoring well installation field activities were monitored with the HNu and PID. Any material with readings greater than 5 ppm above background was containerized in 55-gallon drums. During the soil boring field task, a total of 10 drums of contaminated (>5 ppm) soil was generated from three of the borings. This material was containerized and stored in a secured area at CRREL. On 20 April 1992, a total of three samples (one sample per contaminated boring) were collected from these drums by Clean Harbors Environmental Services of Hooksett, New Hampshire, under subcontract to E & E. These samples were analyzed for TCLP, VOCs, metals, herbicides, and pesticides. The analtyical results were compared to the regulatory limits and no exceedances were found. CRREL will make a determination as to the proper disposal of the IDW. The analytical results of the IDW soils are presented in Appendix L. The monitoring well installation activities failed to produce soil cuttings with readings greater than 5 ppm. As a result, these cuttings were disposed of at the site.

Drilling fluids generated during the installation of monitoring wells CECRL07 and CECRL12 were containerized in 55-gallon drums and screened with the HNu and PID. This monitoring failed to produce readings greater than 5 ppm above background. Therefore, at the request of CRREL, drilling fluids were transported from the drilling areas and deposited into the small pond located near the southwest corner of CRREL property.

Development water, well purge water, and decontamination water were screened with the HNu and PID during field activities. Since this monitoring failed to produce readings greater than 5 ppm above background, and gross contamination was not observed, this water was allowed to flow onto the ground surface.

5. DATA MANAGEMENT PROGRAM

This section describes the data management program that was implemented to ensure that accurate and complete data were provided for the production of the CRREL RI report and associated computer files. The discussion below outlines the steps that E & E and its subcontractor, ADL, followed to ensure the flow and quality of data from input in the field to delivery to USATHAMA's Installation Restoration Data Management Information System (IRDMIS). The discussion also outlines QA/QC procedures for assessing data usability implemented as part of the analytical data review process. The ultimate uses of IRDMIS data files include routine summary reporting and hydrogeological assessments.

5.1 DATABASE MANAGEMENT

The overall data management program covers three categories of data, which originated from different sources:

- o map data,
- o geotechnical data, and
- o chemical data.

Figure 5-1 illustrates the data flow by which these data were captured from their respective sources and entered into the central USATHAMA IRDMIS computer system. For each of these data categories, three levels of data quality are distinguished, as follows:

- o Level I: raw data collected in the field or laboratory;
- o Level II: data as transmitted to the USATHAMA IRDMIS computer system; and
- o Level III: data in IRDMIS that have been validated and for which QA/QC has been performed.

In general, data quality begins at Level I in the field or laboratory, and increases to Level II and Level III as successive validation and QA/QC checks are performed on the data during the investigation phases of the project. The three levels are used to track the degree of validation that has been completed on the data.

Site-specific data validation and reporting requirements were incorporated into the RI Work Plan (E & E 1991a), the RI FSP (E & E 1991), and the RI QAPjP (E & E 1991b). The plans provided initial requirements for sampling locations, site and field identifications, chemical tests, and QC sample requirements.

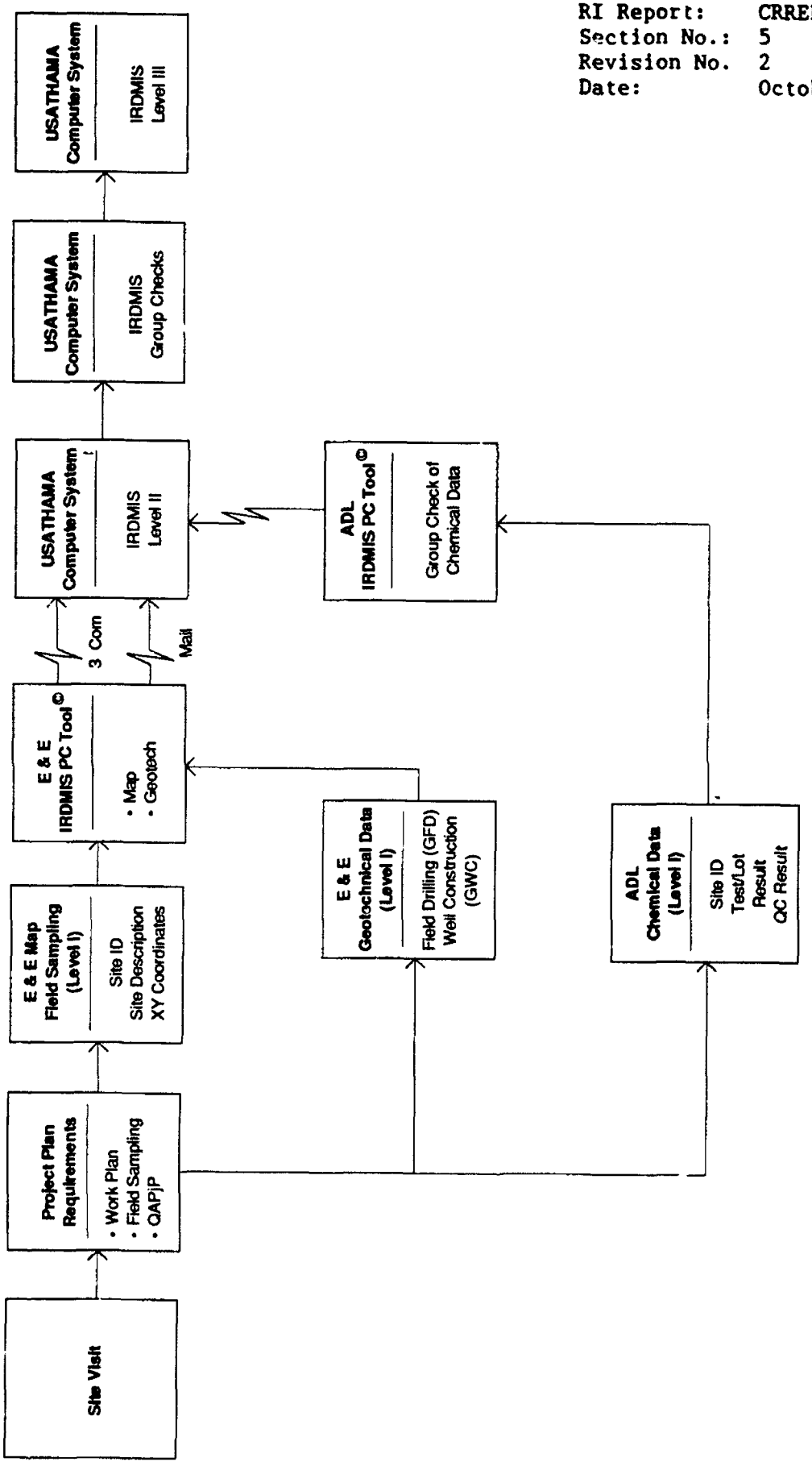

Figure 5-1 DATA MANAGEMENT PROGRAM BLOCK DIAGRAM

During the field investigation, E & E field personnel filled out two standardized forms: one for Map Data, and one for Geotechnical Data. The Level I map data defined the specific site by providing a site identifier, description, and X-Y coordinates of a reference point in the UTM coordinate system. The Level I geotechnical data included information on field drilling, well construction, soil identification, water level measurements, and other items. Data were entered from the standardized form by E & E personnel into a microcomputer using the Data Entry and Validation Subsystem Software (PC version of IRDMIS).

Once entered into the microcomputer, both map data and geotechnical data were transmitted to the USATHAMA IRDMIS system by uploading these files over the 3COM network to the central computer or by sending diskettes to USATHAMA. USATHAMA would then validate these files and either accept or reject the data. If rejected, E & E was informed and the particular file or site data were reviewed, corrected, and re-submitted by E & E.

E & E field personnel completed chain-of-custody (COC) records for all samples sent to ADL for chemical analysis. The COC record includes site identifier, field sample identifier, sample date, and chemical tests. This information was transferred by ADL into the PC version of IRDMIS and the samples were assigned to individual lots (i.e., analytical batches) for each chemical test. After analysis was performed and the lot was determined to be acceptable, ADL entered raw laboratory analytical results (Level I) using the PC version of IRDMIS. These data were subsequently group checked to Level II and uploaded to the central USATHAMA computer over the 3COM network. Site map data had to be uploaded to the USATHAMA computer before IRDMIS would accept the corresponding analytical (chemical) data from ADL.

At this point in the data management process, all three categories of site data (map, geotechnical, and chemical) were collected in the central USATHAMA IRDMIS data base, at Level II quality. IRDMIS performed validation checks on the quality of these data and exceptions (errors) were noted. Level II data for which exceptions were noted could not be made available for further processing (i.e., elevated to Level III) until the errors were corrected. In addition, chemical data files had to receive acceptance from the USATHAMA Chemistry Branch.

Once the data validation and error correction process was complete, the data could be processed to Level III and the data reduction and reporting phase initiated. The data reduction and reporting phase is described below.

5.2 DATA REDUCTION AND REPORTING

For the field data, a report was generated that includes all of the analytical data (see Appendix M). The report is separated by each file type, such as sample media (which includes ground water (GW), sediment (SE), soil (SO), and surface water (SW)).

5.3 ANALYTICAL DATA REVIEW

Chemical analysis of CRREL RI samples was performed by ADL. Analyses included TCL VOCs and TPHC; VOCs were analyzed using USATHAMA certified methods, and TPHC was analyzed using uncertified methods. The TPHC parameters do not require USATHAMA certification as explained in the USATHAMA Quality Assurance Program (January 1990).

Analytical data generated using certified and uncertified methods are presented as method-specific lots, except for percent solids. For each lot, ADL submitted weekly control charts to the USATHAMA Chemistry Branch. The USATHAMA Chemistry Branch reviews all certified method control charts and determines acceptability for submission to IRDMIS.

Table 5-1 summarizes the number of lots provided by ADL for each analytical parameter for each matrix, and the number of acceptable and unacceptable lots for certified methods as determined by USATHAMA. All lots of data for certified methods are accepted by USATHAMA with E & E's qualification. For uncertified methods, USATHAMA acknowledges receipt of the lots but does not require official acceptance. These lots are indicated with two asterisks on Table 5-1.

The USATHAMA Chemistry Branch must submit a flag to IRDMIS indicating that acceptable control charts have been received before the data can be elevated to Level III.

The results were reviewed to ensure that the appropriate values were reported in the correct units, that all chemical tests were included even if no "hits" are present, and that the appropriate field sample identifiers were matched to the site identifiers. This data review step provided a final check on the validation of Level II data to Level III data, and the overall completeness of the database. Any errors or exceptions noted were resolved by comparing the error or exception with the ADL raw data and the COC documentation. The errors in the Level III data were then adjusted and the data reduction process repeated.

In addition to the chemical data file, ADL provided a hard copy data package with all calibration information, raw data, and a case narrative describing any problems. This original data file, along with the weekly control charts and acceptance letters, were compared to the all-data table to ensure that appropriate flagging codes, which indicate other that usual analytical conditions or results, were added to the database. Any data flags or other QC problems potentially impacting data usability are described in Section 6.5 of this report.

As discussed in Section 4.8, several types of field and laboratory QC samples were taken throughout the RI. The QC sample results were reviewed and used to make qualitative statements about the quality of the analytical data presented for each type of matrix. All QC sample results are presented in Appendix N.

Table 5-1

SUMMARY OF LOT STATUS FOR CRREL RI

Matrix	Parameter	Number of Lots	Number of Acceptable Lots	Number of Lots Acceptable as Uncertified*
Water	Volatiles	11	11	0
	TPHC**	5	0	5
Soil	Volatiles	5	5	0
	TPHC**	3	0	3

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NOTES:

* Lot accepted as generated from an uncertified method; non-detects are reported as "ND"
**Checked and filed by USATHAMA; no "acceptance", as analytes are not determined by a certified method

Source: E & E, 1992

6. NATURE AND EXTENT OF CONTAMINATION

Various aspects of the site's environmental setting influence contaminant migration, such as overburden and bedrock geology, surface drainage, and ground water hydrology. These site attributes are discussed in this section, as well as the concentrations and areal extent of contaminants detected in the various media at the CRREL site. These media include soil gas, soil, ground water, surface water, and sediments.

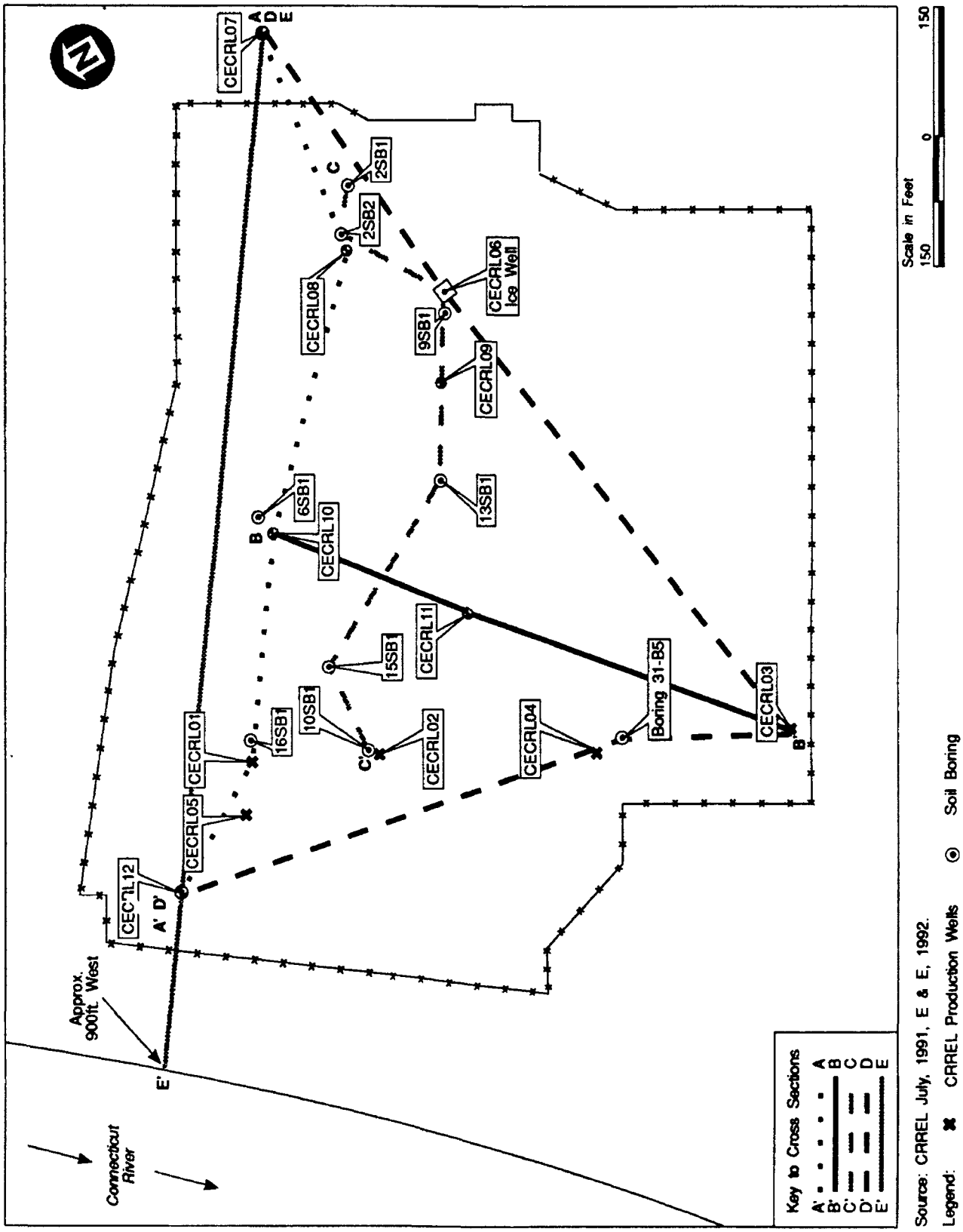
This information is synthesized to develop an assessment of the fate and transport of contaminants which potentially pose a threat to human health and/or the environment (presented in Section 7). Analytical data results from the RI field sampling are provided in Appendix M. QA/QC sample results and summary tables are provided in Appendix N. Tables summarizing concentrations for VOCs are provided for each sample media with the exception of soil gas, for which data were provided under separate cover.

6.1 SITE GEOLOGY

Site-specific information regarding the overburden and bedrock geology at CRREL was obtained from the the following sources:

- Examination of split-spoon samples and drill cuttings collected during the completion of soil borings and ground water monitoring wells,
- Review of pre-existing boring logs,
- Evaluation of relative overburden densities using blow counts of split spoons,
- Interpretation of geotechnical analyses performed on selected soil samples,
- Review of ground water investigations previously conducted in the site vicinity, and
- Review of published literature.

To aid in understanding site geologic conditions, several diagrams of cross-sections are included. The configuration of these cross sections are shown on Figure 6-1. Soil classifications indicated on these cross-sections incorporate classifications assigned by the geotechnical laboratory, which in some instances vary from field classifications.



Source: CRREL July, 1991, E & E, 1992.

Legend: ✖ CRREL Production Wells ⊙ Soil Boring
⊕ CRREL Monitoring Wells —X— Fence

Figure 6-1 CROSS-SECTION CONFIGURATION MAP

6.1.1 Geophysical Survey Interpretation

The geophysical work performed at the site included total earth field magnetics and electromagnetic ground conductivity. Five geophysical grid systems were established in selected areas at CRREL.

Several anomalies were delineated on both the total earth field magnetics contour maps and the electromagnetic ground conductivity contour maps generated over the various grid areas. Many of the observed anomalies can be attributed to subsurface features that were identified on base maps provided by CRREL. Other anomalies can be attributed to interference from various surficial objects such as metal buildings, dumpsters, tanks, and automobiles. For each gridded area, the observed anomalies and their probable cause are briefly described in Appendix B. A grid location map, and magnetic and ground conductivity contour maps generated from the survey are also presented in Appendix B.

The effectiveness of the geophysical survey was curtailed by the large amount of surficial interference present at the CRREL site. Also, the relatively tight data point spacing required to obtain an adequate degree of resolution limited the amount of area that could be surveyed within a reasonable time period. The survey was useful in confirming the presence of some buried utilities and structures. It also identified at least two anomalies (Grids 4 and 5) that are not easily attributable and may warrant further investigation.

6.1.2 Overburden Characteristics

Overburden at the CRREL site consists of fine to coarse-grained sand and gravel of the glacial esker; and silt, clay, and silt/sand mixtures of lacustrine origin. The esker overlies bedrock in the vicinity of the FERF building and is surrounded and overlain by the finer-grained lake sediments. The esker is penetrated by each of the CRREL production wells (CECRL01 through CECRL05) and by several previously completed test borings. Esker sediments were also encountered during the drilling of monitoring well CECRL12. The lake sediments surrounding and overlying the esker were encountered in the eight soil borings, and the six monitoring wells completed during the CRREL RI. They are also described on boring logs of the CRREL production wells, and various other on-site test boring logs.

Monitoring well CECRL12 was proposed to penetrate the esker sediments at a location just west of the CRREL production wells. From the ground surface to 12 feet BGS, the overburden is described as primarily silt with some sand and gravel. Abundant sands were encountered at depths below approximately 12 feet BGS in the original borehole. These are described as primarily olive-gray, very fine to coarse-grained sands with some gravel and cobbles. Blow counts indicate that these sands are dense (30 to 49 blows/foot). Geotechnical analysis performed on three samples from CECRL12 classified the sands as being

SW-SM from 22.5 to 24.5 feet BGS, SW from 37.5 to 39.5 feet BGS, and SP from 57.5 to 59.5 feet BGS. The soils encountered from 12 feet BGS to the top of bedrock are of esker origin. A summary of geotechnical analyses results is shown in Table 6-1, which also contains Unified Soil Classification System (USCS) descriptions.

Bedrock in CECRL12 was encountered at a depth of 65 feet BGS. This depth is approximately 100 feet shallower than anticipated, indicating a bedrock high between the CRREL production wells and the Connecticut River. Figure 6-2 shows a east-west cross-section of the CRREL site that includes monitoring wells CECRL07, CECRL08, CECRL10, and CECRL12, as well as production well CECRL01. One possible bedrock/esker configuration is indicated on this figure.

Overburden encountered in monitoring well CECRL07 represents the entire sequence of lake sediments present at the CRREL site, penetrating 181 feet of the lake sediments above bedrock (Figure 6-2). To a depth of approximately 23 feet BGS, sediments are described as varved, olive-gray silts. These sediments are fairly cohesive, plastic, and are of low (0 to 10 blows/foot) to medium (10 to 29 blows/foot) density. Geotechnical analysis performed on a sample from 13 to 15 feet BGS classifies this sediment as CL. The laboratory description of this sample is gray clayey silt with a trace of sand that is usually associated with the classification of ML. This sample was classified as ML in the field, therefore the designation of CL by the laboratory may be erroneous.

Below 23 feet, sediments consist of primarily silt/sand mixtures. Split spoon samples from 23 to 60 feet BGS are described as varved, olive-gray, very fine-grained silty sands displaying little cohesiveness or plasticity. These sediments are of medium density (10 to 29 blows/foot). A few thin clay layers were observed in this interval including a 2-inch layer encountered at 29.9 feet BGS. A sample from the 28 to 30 foot interval was submitted for geotechnical analysis and classified by the geotechnical laboratory as CL, gray clayey silt with a trace of sand. This classification may be in error, as explained in the previous paragraph.

Samples from 78 to 152 feet BGS are olive-gray, fine to medium-grained sands with no cohesiveness or plasticity. An olive-gray, medium to coarse-grained sand was encountered in the sample from 158 to 160 feet BGS. Samples collected in the 78 to 160 foot interval are medium dense (10 to 29 blows/foot) to dense (30 to 49 blows/foot). Samples collected from 165.5 to 167.5 feet BGS and 174.5 to 176.5 feet BGS intervals are medium-gray, very fine-grained silty sands. These sands are very dense (greater than 50 blows/foot), with the exception of the 174.5 to 175.5 foot interval, which is dense (30 to 49 blows/foot). The sediments encountered below 165.5 feet BGS contrast sharply to those above, and are presumed to continue to the top of bedrock at 181 feet BGS. The lake sediments encountered in the other monitoring wells and borings, with the exception of monitoring well CECRL12, are similar to

Table 6-1

CRREL REMEDIAL INVESTIGATION
SUMMARY OF GEOTECHNICAL RESULTS

			Particle Size Distribution						Atterberg Limits			
Well Number	Sample I.D.*	Depth of Sample BGS (ft)	Percent Gravel	Percent Coarse Sand	Percent Medium Sand	Percent Fine Sand	Percent Silt	Percent Clay	Liquid Limit (Percent)	Plastic Limit (Percent)	Plasticity Index (Percent)	Classification**
CECRL07	S-3	13-15	0	0	0	1	86	13	29	27	2	CL
CECRL07	S-6	28-30	0	0	0	4	83	13	29	26	3	CL
CECRL07	S-14	150-152	0	0	15	72	13	+	--	--	--	SM
CECRL07	S-17	174.5-176.5	0	0	0	72	28	+	--	--	--	SM
CECRL08	S-2	38-40	5	1	0	65	29	+	--	--	--	SM
CECRL08	S-4	79-81	0	0	0	72	28	+	--	--	--	SM
CECRL08	S-7	139-141	1	0	35	44	20	+	--	--	--	SM
CECRL09	S-2	38.5-40.5	1	0	0	0	79	20	30	26	4	ML
CECRL09	S-4	78.5-80.5	1	0	1	38	48	12	23	21	2	ML
CECRL09	S-8	139-141	0	0	5	84	11	+	--	--	--	SM
CECRL10	S-3	58-60	3	0	1	27	55	14	Non-Plastic	Non-Plastic	Non-Plastic	ML
CECRL10	S-5	98-100	0	0	1	55	34	10	Non-Plastic	Non-Plastic	Non-Plastic	ML
CECRL10	S-7	124-126	0	0	29	55	16	+	--	--	--	SM
CECRL11	S-1	18-20	0	0	0	10	85	5	29	26	3	ML
CECRL11	S-2	38-40	2	0	0	0	54	44	40	28	12	ML
CECRL11	S-3	58-60	0	0	0	4	84	12	29	25	4	ML
CECRL11	S-7	118.5-120.5	0	0	1	78	21	+	--	--	--	ML
CECRL12	S-5	22.5-24.5	13	23	47	10	7	+	--	--	--	SW-SM
CECRL12	S-8	37.5-39.5	48	15	28	5	4	+	--	--	--	SW
CECRL12	S-12	57.5-59.5	0	0	11	83	6	+	--	--	--	SP

RC507

Source: Ecology and Environment, Inc.

* Samples collected January and February, 1992.
** Based upon USCS classification as presented in ASTMD 2487-85
\+ Hydrometer Analysis not performed - clay fraction (percent) included with silt fraction

Key

CL = Silty clay
ML = Clayey silt with trace of sand
SM = Silty sand
SW-SM = Gravelly sand with trace of silt
SW = Gravel and sand with trace of silt
SP = Sand with trace of silt

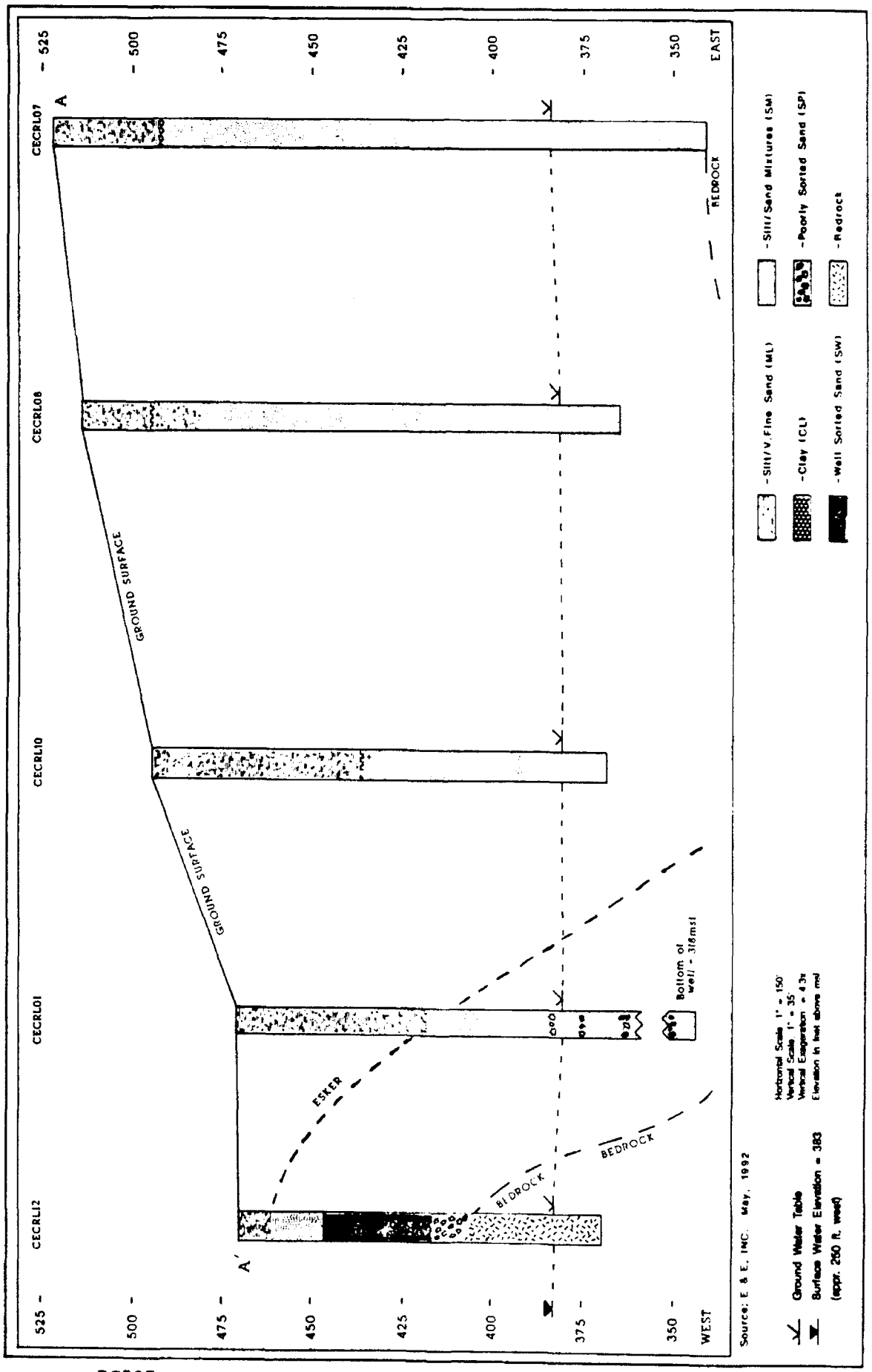


Figure 6-2 CROSS-SECTION A-A'

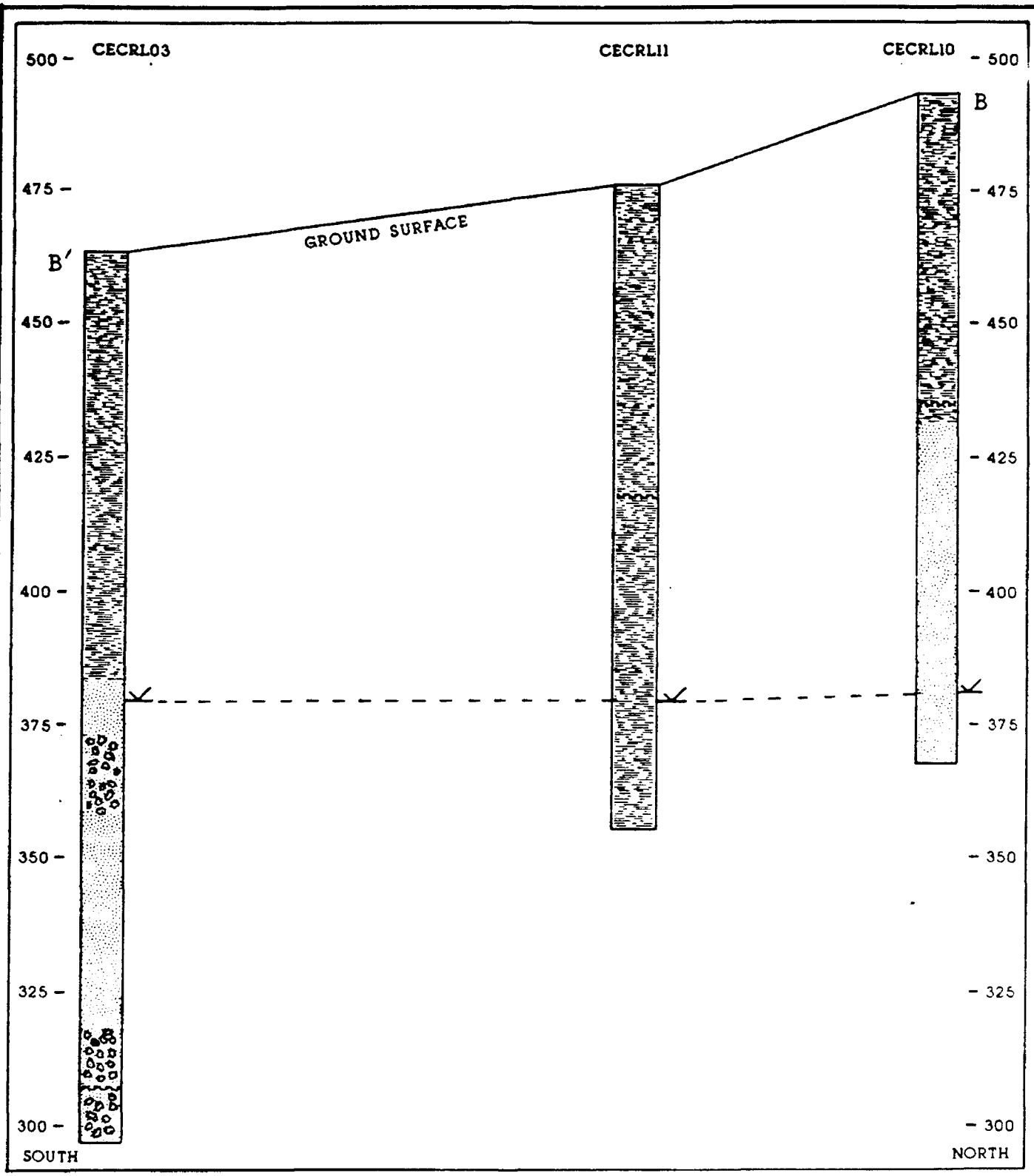
those described for CECRL07. Figure 6-3 is a north-south cross-section that includes monitoring wells CECRL10 and CECRL11, and production well CECRL03. Figure 6-4 is an east-west cross-section that includes six of the RI soil borings in addition to monitoring well CECRL09 and the ice well (CECRL06). Monitoring wells CECRL08 through CECRL11 were completed in the top of the overburden water table, an estimated 40 feet above bedrock, and did not encounter the gray fine-grained silty sand seen in CECRL07 just above bedrock.

The eight soil borings completed during the RI encountered only the silt and very fine-grain sand portion of the lake sediments as seen in the soil borings included in Figure 6-4. The silt/sand (SM) indicated at the surface in boring 2SB1 may be due to fill material utilized in this area after the removal of underground storage tanks. Clay layers were penetrated at several depths within boring 2SB1 and also at the bottom of borings 10SB1, 13SB1, 15SB1, and 16SB1. A large amount of clay was also described in the log for boring 6SB1. It should be noted that no geotechnical analysis was performed on samples collected during the soil boring field task and that classifications are based on field observations.

6.1.3 Bedrock Characteristics

Bedrock underlying the CRREL site is of the Post Pond volcanic member of the Ordovician-age Orfordville Formation. The Post Pond member has been described as primarily hornblende-schist or chlorite-sericite schist. Bedrock was penetrated during the drilling of monitoring wells CECRL07 and CECRL12. Bedrock cuttings from these two wells consisted of approximately 50 percent phyllite, 30 percent white to yellow quartzite, and 20 percent chlorite and mica schist.

Bedrock has also been encountered at the CRREL site during the drilling of CRREL production well CECRL03 and test boring 31-B5, and may have been penetrated during drilling of the ice well (CECRL06). Boring 31-B5 was completed prior to the RI and is presented in Appendix O. Figure 6-5 utilizes these control points and monitoring wells CECRL07 and CECRL12 to show a possible configuration of bedrock underlying the CRREL site. The top of bedrock is shown at 200 feet BGS in the ice well, which is the total depth for this well. The actual depth to bedrock in the ice well is uncertain, and may be as shallow as 180 feet. The use of this shallower depth would decrease the amount bedrock dip indicated between CECRL07 and CECRL12. The most significant bedrock information is provided by monitoring well CECRL12. The original bore hole for this well encountered bedrock at 65 feet BGS, approximately 100 feet shallower than anticipated. This indicates a bedrock high between the CRREL production wells and the Connecticut River. Prior to the drilling of this well, it was assumed that bedrock sloped from east to west towards the Connecticut River. The bedrock configuration indicated on Figure 6-5 suggests a former bedrock channel underlying the CRREL site, with the esker being formed in the deepest part of this channel.



Source; E & E, INC. May, 1992

Figure 6-3 CROSS-SECTION B-B'

Horizontal scale; 1" = 110 feet
Vertical scale; 1" = 25 Feet
Vertical exageration = 4.4x
Elevation in feet above msl

-Ground Water Table

-Poorly Sorted Sand (SP)

-Silt/V. Fine Sand (ML)

-Clay (CL)

-Silt/Sand Mixtures (SM)

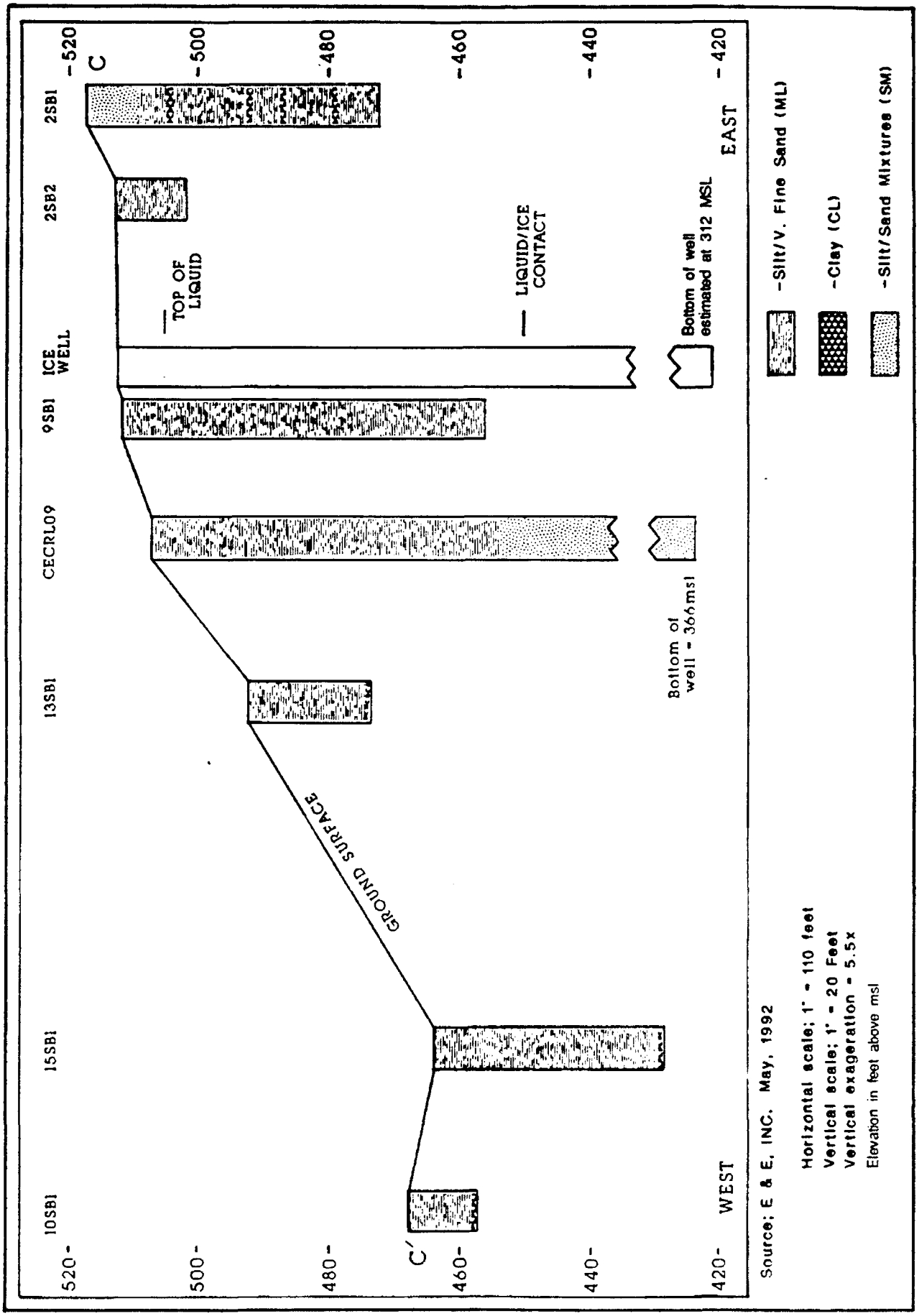


Figure 6-4 CROSS-SECTION C-C'

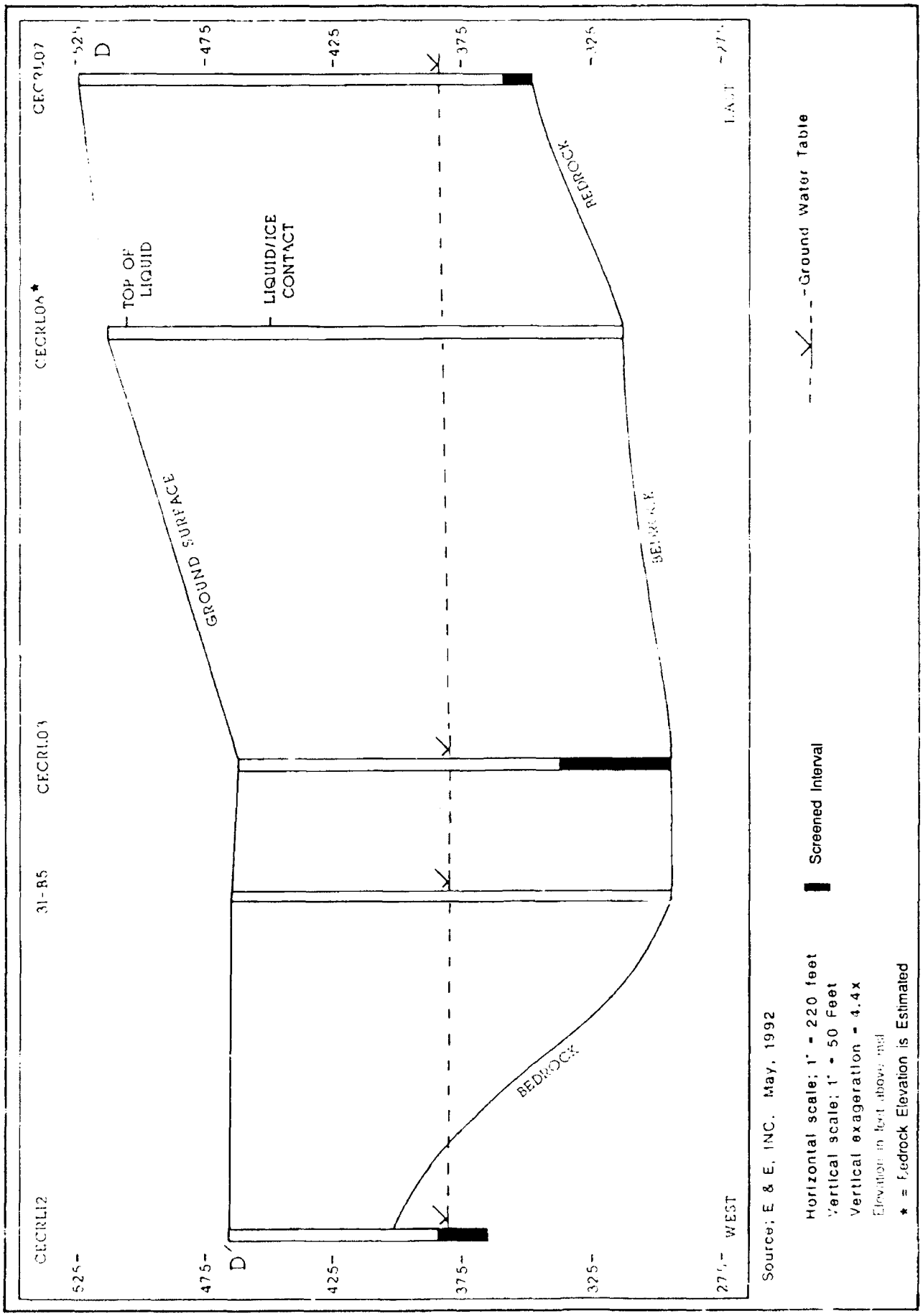


Figure 6-5 CROSS-SECTION D-D'

Figure 6-6 is a cross-section of the CRREL area that includes both on-site wells and the Goodrich and Peacock wells on the west side of the Connecticut River. This cross-section was constructed by projecting the locations of CECRL06, boring 31-B5, the Goodrich well, and the Peacock well onto a straight line drawn through CECRL07 and CECRL12. In addition, this cross-section is constructed with no vertical exaggeration to more accurately illustrate spatial relationships. This figure shows a possible configuration of the overburden and bedrock. No subsurface data are available for the area beneath the Connecticut River. The bedrock high beneath CECRL12 is evident on this figure, in addition to the hydraulic connection between the river and ground water. Bedrock in the CRREL area is believed to be dipping to the west-northwest at angles of 30° to 45°.

6.2 SITE HYDROGEOLOGY

6.2.1 CRREL Storm Sewer System and Surface Drainage

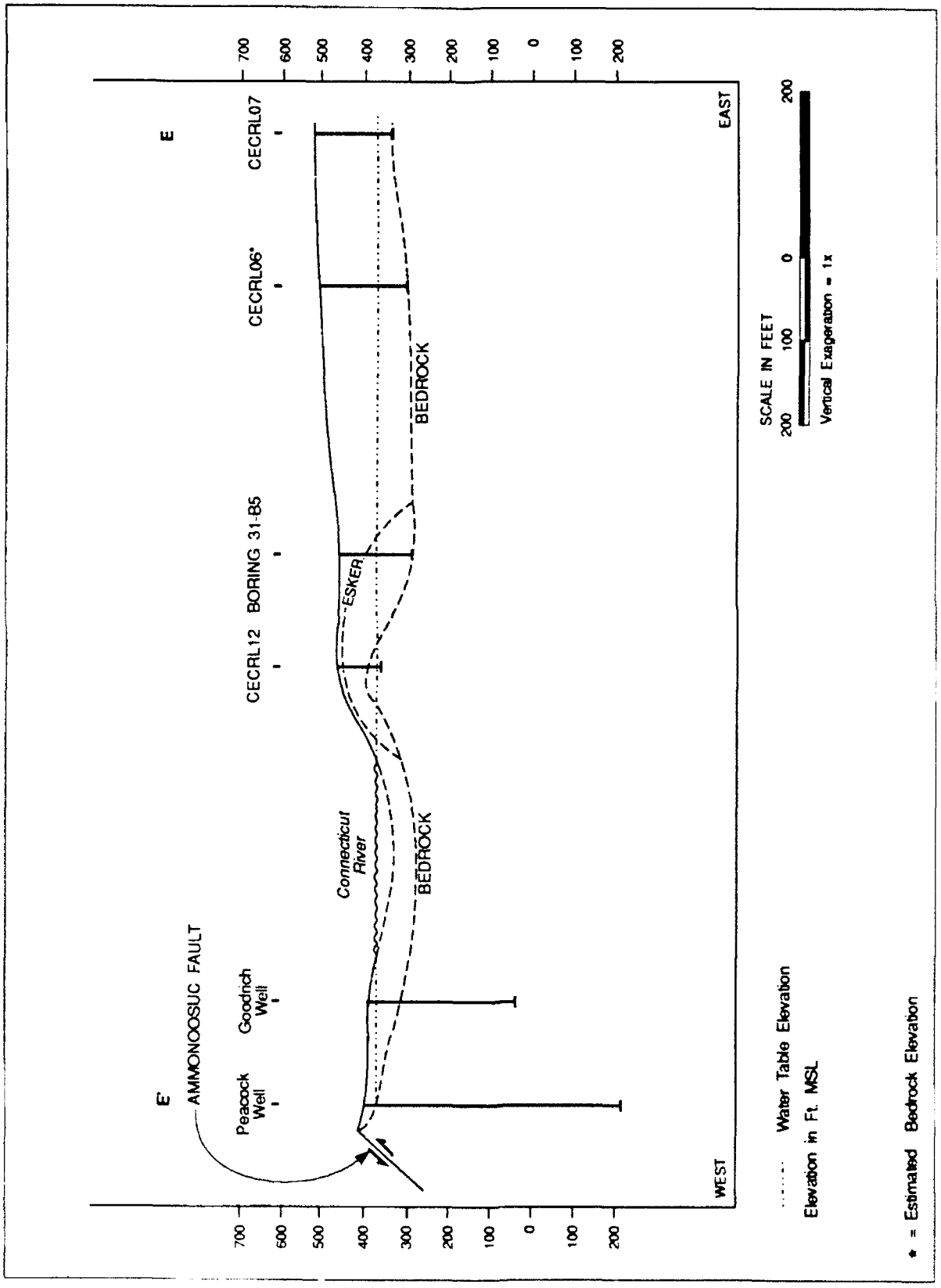
Surface water drainage is generally from east to west across the site towards the Connecticut River. In the vicinity of CRREL production well CECRL03, drainage is to the south in a ravine that runs along the east side of the esker ridge. Water flowing in this ravine would eventually enter the Connecticut River. This drainage is indicated on aerial photographic analysis of the site (EPIC 1991).

A large portion of the surface water run-off is collected by the extensive storm system at CRREL. This system is augmented by drainage culverts and swales, and has an outfall to the Connecticut River. The CRREL storm sewer system is shown in Figure 6-7. In addition to surface water run-off, the storm sewer system also handles spent refrigeration/cooling water from the CRREL facility. This water is obtained from the CRREL production wells, pumped to various buildings, circulated through the refrigeration/cooling systems, and returned to Connecticut River via the storm sewers. CRREL has estimated that on an average yearly basis, 365 million gallons of cooling water and 23 million gallons of stormwater are discharged through the storm sewer system to the Connecticut River. All other waste water is discharged to the municipal sewer system, operated by the Hanover Water Company.

The small pond at the southwest corner of the site receives both surface run-off and run-off from the roof of the Ice Engineering building. Water from this pond is periodically pumped to the Connecticut River via the storm sewer system (Gaskin 1992).

6.2.2 Ground Water Hydrology

Ground water level measurements were collected from the six monitoring wells installed during the RI, and CRREL production well CECRL02. Monitoring wells CECRL07 through CECRL11 produce water from the overburden lake sediments; monitoring well CECRL12 is screened within the bedrock. The five CRREL production wells are screened within



Source: E & E, 1992

Figure 6-6 CROSS-SECTION E - E'

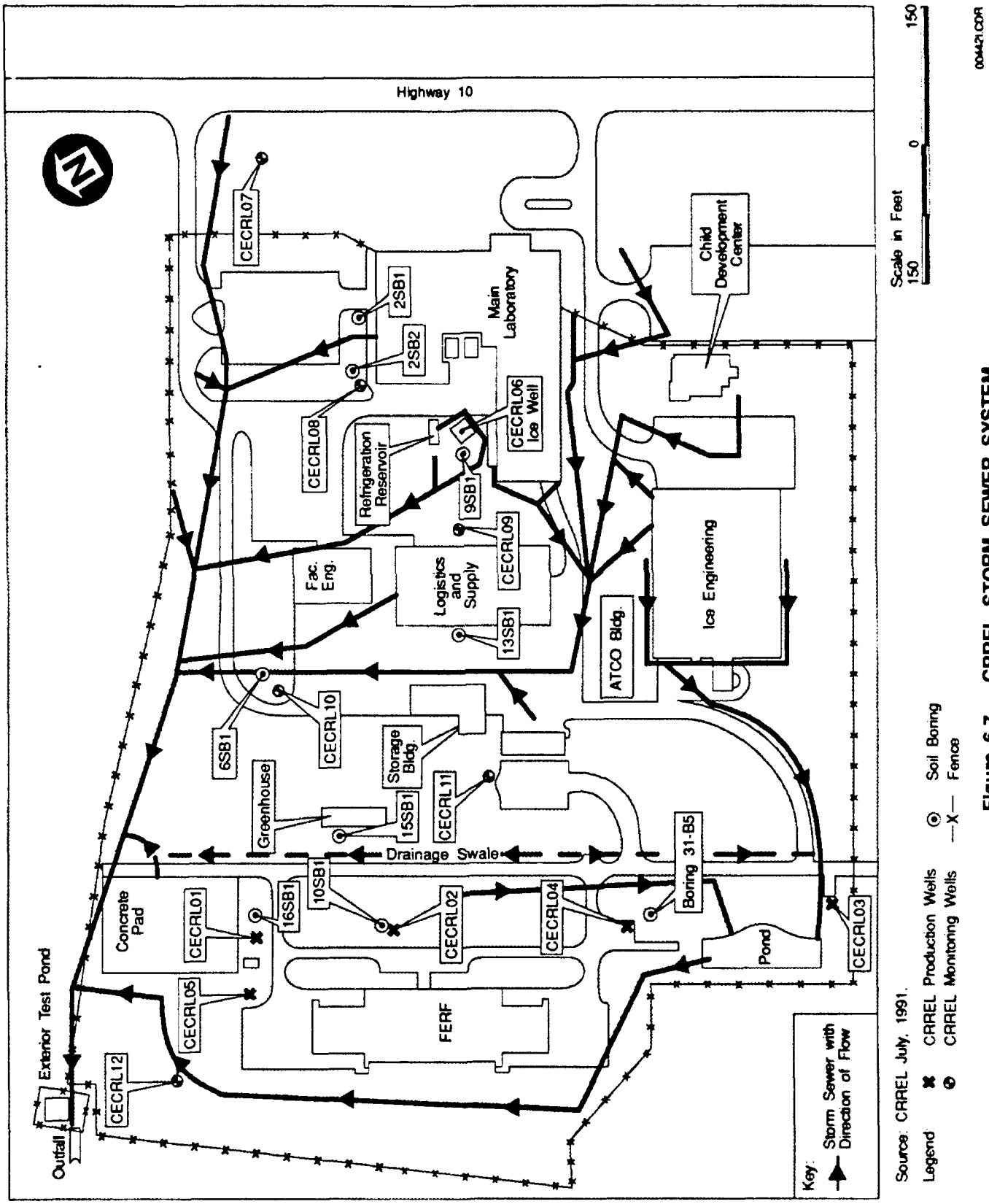


Figure 6-7 CRREL STORM SEWER SYSTEM

the overburden esker sediments. On 10 April 1992, water level measurements were obtained from the monitoring wells. Also on this date, a surface water level of the Connecticut River was obtained. These data are included in Table 4-3, and is used for all ground water calculations and figures. For the ice well (CECRL06), the elevations for the top of liquid and liquid/ice contact are derived from the measurements obtained on 10 April 1992 and are presented in Section 4.5.

Based on water level data and subsurface boring logs, the overburden and bedrock beneath the site are interpreted as being one continuous aquifer. No confining layer was identified between the overburden and bedrock, and ground water appears to pass freely from one medium to the next. For this discussion, the overburden and bedrock is considered to be a single hydrostratigraphic unit.

Figure 6-8 shows a potentiometric map of the ground water table beneath the CRREL site. This map illustrates the cone of depression caused by the pumping wells at CRREL. It should be noted that the water level measurements for CECRL02 were obtained when this well was not pumping. Water levels within the pumping wells will be several feet deeper, and would show a greater cone of depression than is shown on Figure 6-8. Information on CECRL01 indicates that the water level in this well is approximately 88 feet BGS under static conditions, and 110 feet BGS with the pump running. During pump testing at the Norwich well, a drawdown of 3.44 feet was observed during pumping from this well and an observation well at a combined rate of 975 gpm. The production wells at CRREL pump an average combined rate of approximately 700 gallons per minute. As can be seen on Figure 6-8, the entire area beneath CRREL appears to be within the area of capture. Water elevations in CECRL07 and CECRL12 at the eastern and western edge of the site were highest, with water levels in the remaining wells measuring lower. The north-south elongation of the cone of depression is plausible due to the configuration of the pumping wells and orientation of the esker at the site. Flow arrows indicate that ground water flow at CECRL03 may be partially from south to north. This water would not come in contact with CRREL AOCs, and may explain why VOCs have not been detected in this well.

The top of the water table is also shown on Figures 6-2, 6-3, and 6-5. These figures again illustrate that the aquifer beneath CRREL is one hydrostratigraphic unit. Figure 6-2 also indicates that the surface water elevation of the Connecticut River and ground water elevations beneath CRREL are essentially the same, indicating hydraulic communication. It should be noted that the water levels for wells CECRL01 and CECRL03 and for boring 31-B5 are projected from CECRL02. On Figures 6-2 and 6-5, the depressed water table elevations caused by the pumping wells are difficult to distinguish due to scale. However, these two figures show that the water table beneath CRREL does not appear to be significantly influenced by either the surface topography or by the configuration of the bedrock surface as seen in Figure 6-5.

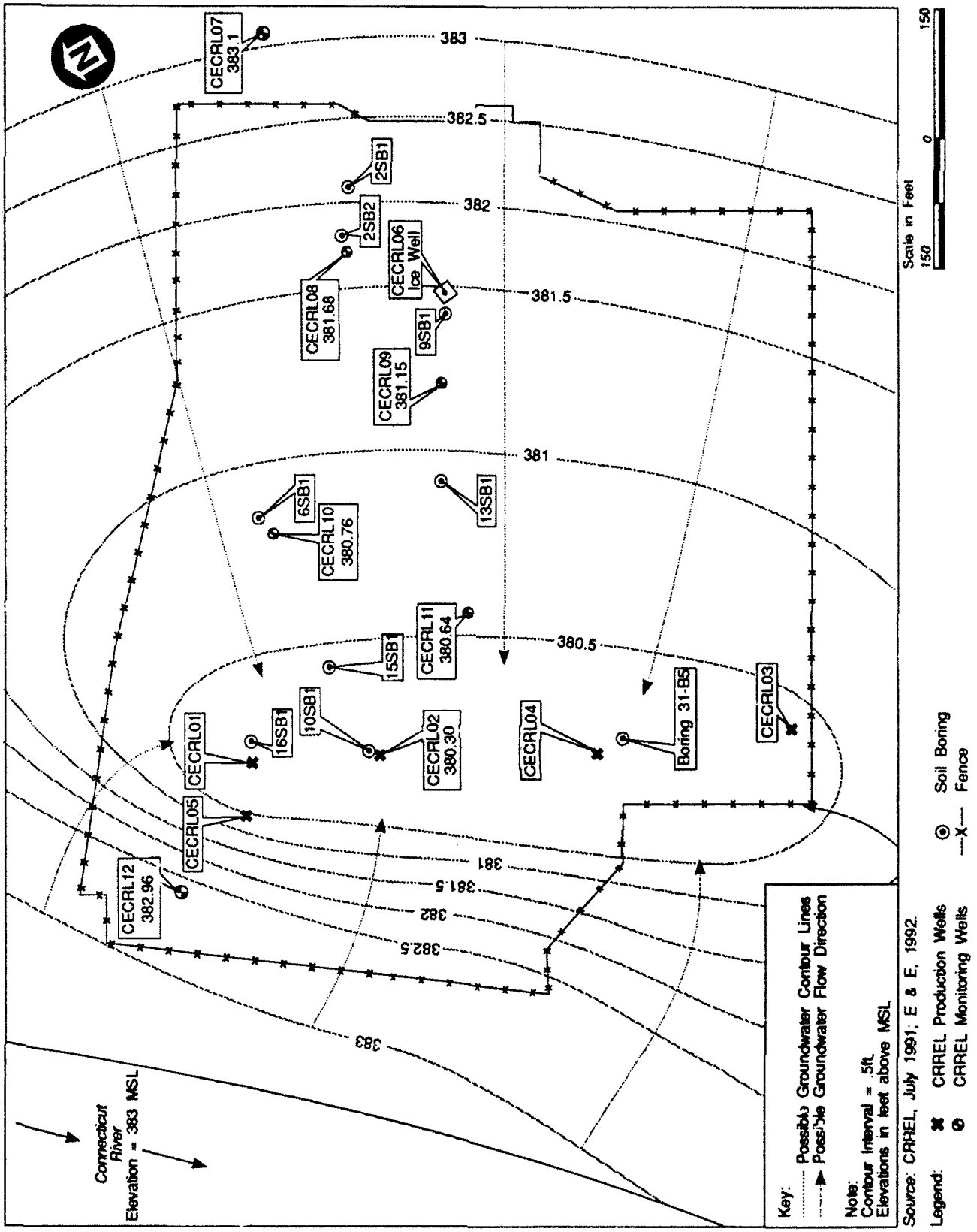


Figure 6-8 CONCEPTUAL GROUND WATER TABLE CONTOUR MAP 4/10/92

A horizontal hydraulic gradient of .0048 feet/foot was calculated between monitoring wells CECRL07 and CECRL08. Between CECRL08 and CECRL09, the gradient was calculated at .0022 feet/foot. Hydraulic gradients continue to flatten towards the pumping wells, with the lowest hydraulic gradient of .00042 feet/foot calculated between CECRL10 and CECRL11. As previously mentioned, the water level measurements at CECRL02 were obtained while this well was not pumping. Hydraulic gradients would be expected to steepen significantly near the production wells due to drawdown of the aquifer caused by pumpage. These gradients are all from east to west across the site toward the pumping wells. The highest gradient at the site, between CECRL12 and CECRL02, was calculated at .0078 feet/foot and is from west to east. This steeper gradient may be caused by either the pumping wells, high bedrock relief between CECRL12 and the pumping wells, or a combination of these two factors.

Data were not available to calculate vertical gradients at the CRREL site. As part of the ground water investigation performed directly across the river from CRREL, low vertical gradients, on the order of 10^{-2} were calculated. This report concludes that vertical components of flow are not significant in the overburden (Wehran 1991).

No hydraulic conductivity (K) tests were performed during the CRREL RI. The hydrogeologic evaluation report for the Norwich town well states a K-value of 0.1 feet/day (2×10^{-2} cm/sec.) for the fine-grained lacustrine sediments (Caswell 1990). This value is several orders of magnitude higher than K-values of 10^{-3} to 10^{-7} cm/sec. generally assigned to this sediment type (Freeze and Cherry 1979). Using the grain size analysis of the soils from the monitoring wells installed in the lacustrine sediments (CECRL07 through CECRL11), a general trend of silt overlying fine sands was observed. Using the Hazen formula, it is estimated that the hydraulic conductivity of the lacustrine sediment ranges from 10^{-3} to 10^{-5}. Since field-determined hydraulic conductivity values are often several orders of magnitude higher than calculated values, it is assumed that the 2×10^{-2} cm/sec. value is based on field tests and may more closely fit conditions at CRREL. It can be assumed that K-values would vary within the lake sediments, generally increasing with depth as sand content increases and silt content decreases.

Based on results of the Norwich town well pump tests, the hydraulic conductivity of the esker is 1.48×10^{-1} cm/sec. This value is within the published range of K-value for sediment types present within the esker, and suggests that the esker is a highly permeable aquifer. The average calculated bulk transmissivity for the esker is 275,000 gallons per day (gpd)/foot. Low hydraulic gradients between the Norwich well and observation wells, on the order of .001 feet/foot, were evident even at the maximum pumping rate of 300 gpm. It is estimated that at least 80 percent of the water pumped from the esker during pump tests was replaced by recharge from the Connecticut River (Caswell 1990).

During the drilling of monitoring wells CECRL09, CECRL10, CECRL11, and soil boring 15SB1, saturated clay-rich sediments were encountered in the near surface. This suggests the presence of perched water tables at the CRREL site. This is further substantiated by test boring 31-B5 in which a perched water table level of approximately 3 feet BGS was established.

Permeability in the bedrock is primarily caused by stress-induced fractures and bedding plane fracturing. Circulation losses experienced during bedrock drilling at monitoring well CECRL07 and CECRL12 is attributed to fracturing. Permeability can also be caused by schistocity. Approximately 20 percent of the bedrock cuttings from CECRL07 and CECRL12 were identified as schist. Fracture permeability at the CRREL site may also be enhanced by the nearby Ammonoosuc fault. Hydraulic conductivity values ranging from approximately 10^{-5} to 10^{-2} are generally assigned to fractured bedrock aquifers. However, K-values can be several orders of magnitude higher within highly fractured aquifers.

6.3 EXTENT OF CONTAMINATION OF ENVIRONMENTAL MEDIA

The following sections include a summary of the chemical contamination discovered at the CRREL site during the RI between September 1991 and April 1992. The following media were sampled in order to assess the extent of contamination on and off the site:

- Soil gas;
- Subsurface soil from borings;
- Ground water from the monitoring wells, production wells, Hanover municipal well, and the ice well; and
- Surface water and sediment from the Connecticut River.

A summary of samples and analytical requirements for CRREL are presented in Table 6-2. Analytical data summaries for the various media sampled, with the exception of the soil gas, are provided. The soil gas survey report and associated contour maps were finalized and distributed to the various agencies and organizations involved with the CRREL RI in December 1991. Soil gas survey results are discussed in Section 6.3.1. Appendix M contains a tabulation of all analytical results including tentatively identified compounds (TICs).

All analytical data were reviewed by E & E prior to reporting. A discussion of the data qualification is presented in Section 6.5 of this report. In general, common laboratory contaminants, including methylene chloride and acetone, are included in the tables, however, these compounds are not discussed when detected in the field samples at concentrations similar to those in the method blanks.

Table 6-2

SUMMARY OF CRREL RI ANALYTICAL REQUIREMENTS

Event/Parameter	Sample Type	No. of Samples	Field Duplicates	Rinsate Blanks	Trip Blanks	Total Samples
Soil Sampling						
TPHC	Soil Boring	25	3	2	0	30
VOC	Soil Boring	24	3	2	2	31
Ground Water Sampling						
Round 1						
TPHC	Water	13	1	1	0	15
VOC	Water	13	1	1	4	19
Round 2						
TPHC	Water	13	2	1	0	16
VOC	Water	13	2	1	3	19
Sediment/Surface Water						
TPHC	Sediment	3	1	--	--	4
VOC	Sediment	3	1	--	--	4
TPHC	Water	3	1	--	0	4
VOC	Water	3	1	--	1	5

RC507

Source: Ecology and Environment, Inc.

TPHC = Total Petroleum Hydrocarbons
VOC = Volatile Organic Compounds

6.3.1 Soil Gas

The Petrex(R) soil samplers installed at CRREL were analyzed at NERI's laboratory in Lakewood, Colorado. Collector analysis was performed with an Extranuclear Quadruple Mass Spectrometer equipped with a Curie-point pyrolysis/thermal desorption inlet. This analysis generates a relative ion count for the various compounds collected on each sampler. The reported ion counts are representative of a flux, which is not a measure of concentration but represents the compound's emanation rate at a particular sample location. There has been no absolute equation established from which subsurface contaminant concentrations may be calculated from surficial flux levels.

The ion count values are best utilized as a qualitative measure where a change in ion count values by orders of magnitude, such as 10,000 to 100,000, is considered significant for determining potential contamination source areas.

Soil gas data reflect VOCs collected at a point in the shallow subsurface. The source of these VOCs may be in the stratigraphic column or in the ground water below the collection point. Thus, the VOCs can be derived from surface spills, deposition, or migration into the deeper vadose zone and/or ground water. Relative ion count flux maps were generated for PCE, TCE, BTX compounds, and fuel oil character. These are contour maps at moderate and high ion flux counts detected in the soil gas samplers.

TCE ion flux anomalies detected at the CRREL site correlate well with AOCs identified prior to the soil gas survey. Anomalies were mapped at AOC 2, AOC 9, AOC 13, and AOC 16. Much smaller TCE anomalies were detected at AOC 6 and AOC 15. PCE was detected predominantly at AOC 16. Small areas were delineated at AOC 2 and AOC 9. Another small moderate-response PCE anomaly was delineated at AOC 6. BTX relative ion flux anomalies were identified at AOC 2, AOC 6, AOC 10, AOC 13, and AOC 16. Fuel oil character anomalies were identified at AOC 2, AOC 6, and AOC 13. Small responses were detected at AOC 9 and AOC 15. DCE was detected at four sample locations near AOC 9. In addition, Freon 11, 1,1,1-trichloroethane, and carbon tetrachloride were detected in few sample locations.

Upon review of the soil gas maps, all soil borings and monitoring wells, with the exception of monitoring well CECRL07, were located within or immediately downgradient of identified soil gas anomalies. Monitoring well CECRL07 was proposed to test ground water quality upgradient of AOCs and was not associated with soil gas anomalies.

6.3.2 Soil

A total of 25 soil samples were collected from the 8 soil borings completed during the CRREL RI. Each split spoon sample was monitored for the presence of VOCs using an HNu and PID to determine which soil

samples would be submitted for chemical analysis. Subsurface soil samples were analyzed for TCL organics and TPHC. Table 6-3 presents the VOCs found in soil samples submitted for chemical analyses and Figure 6-9 portrays the location of the samples and lists the results. Volatile organic compounds, primarily chlorinated hydrocarbons, were found in soils from borings 2SB1, 9SB1, 13SB1, 15SB1, and 16SB1. These compounds were detected at low concentrations, with TCE being the most commonly detected compound. VOCs were not detected in soils from borings 2SB2, 6SB1, and 10SB1. TPHC was detected in one sample from 15SB1. In addition, soil boring 15SB1 was the only boring in which petroleum-related VOCs were detected.

TCE was detected in soils collected from borings 2SB1, 9SB1, and 13SB1. At 2SB1, a total of four soil samples were collected for chemical analysis. The sample from the 15 to 17 foot interval exhibited the highest concentration of TCE (2.87 ppm) detected in subsurface soils analyzed during the RI. Low concentrations of TCE were also found in three of four soil samples collected from 9SB1. TCE was detected in the soils from the 2 to 4, 13 to 15, and 17 to 19 foot intervals, with concentrations increasing with depth. TCE was detected in all three samples collected from 13SB1. TCE was found at similar concentrations in the 1.5 to 3.5 and 5.5 to 7.5 foot interval, with concentrations of 0.17 and 0.13 ppm, respectively. At the 17 to 19 foot interval, a TCE concentration of 0.234 ppm was detected. Cis-DCE was detected at similar concentrations (0.012 and 0.008 ppm) in the 5.5 to 7.5 and 17 to 19 foot interval respectively.

Methylethyl ketone was detected at low concentrations in the soil samples collected from 2SB1 and 16SB1. At 2SB1, methylethyl ketone was detected at .014 ppm in soils collected from the 44 to 46 foot interval. At 16SB1, methylethyl ketone was detected at .044 ppm in soils collected from the 7 to 8 foot interval. These results are suspect due to potential field contamination because methylethyl ketone was detected in the rinsate blanks at comparable levels.

Three petroleum-related VOCs were detected in soils collected from 15SB1. Low concentrations of o-xylene, m-xylene, and ethylbenzene were detected in samples collected from the 25 to 27 foot interval. A TPHC concentration of 172 ppm was also detected in soils from the 25 to 27 foot interval.

6.3.3 Ground Water

During the RI, two rounds of ground water samples were collected from the five CRREL production wells (CECRL01 through CECRL05), the ice well (CECRL06), the six monitoring wells (CECRL07 through CECRL12), and the Hanover municipal well. Theses samples were analyzed for TCL organics and TPHC. Results from the first round, conducted in March 1992, are shown in Table 6-4. Results from the second round, conducted April 1992, are presented in Table 6-5. In addition, samples from the

Table 6-3

CHEMICAL SUMMARY REPORT OF SOILS AT CRREL

		Boring ID/Sample Interval (ft. BGS)*							
Test	Parameter	2SB1 9-11 (UGG)	2SB1 15-17 (UGG)	2SB1 24-26 (UGG)	2SB1 44-46 (UGG)	2SB2 1-3 (UGG)	2SB2 8-10 (UGG)	6SB1 1-3 (UGG)	6SB1 8.5-10.5 (UGG)
TCL VOCs	ACETONE	NA	ND	0.042	0.062	ND	ND	ND	ND
	(cis)1,2-DICHLOROETHYLENE	NA	ND	ND	ND	ND	ND	ND	ND
	METHYLENE CHLORIDE	NA	0.011	0.010	0.008	0.007	0.007	0.007	0.008
	METHYLETHYL KETONE	NA	ND	ND	0.014	ND	ND	ND	ND
	TRICHLOROETHYLENE	NA	2.870	ND	ND	ND	ND	ND	ND
	ETHYLBENZENE	NA	ND	ND	ND	ND	ND	ND	ND
	O-XYLENE	NA	ND	ND	ND	ND	ND	ND	ND
	M-XYLENE	NA	ND	ND	ND	ND	ND	ND	ND
TPHC	TOTAL PETROLEUM HYDROCARBONS	ND	ND	ND	ND	ND	ND	ND	ND

RC507

* = Samples collected in January 1992.
NA = Not Analyzed
ND = Not Detected

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1992

Table 6-3 (Cont.)
CHEMICAL SUMMARY REPORT OF SOILS AT CRREL

		Boring ID/Sample Interval (ft. BGS)*								
Test	Parameter	9SB1 2-4 (UGG)	9SB1 13-15 (UGG)	9SB1 17-19 (UGG)	9SB1 53-55 (UGG)	10SB1 0-1 (UGG)	10SB1 4-5 (UGG)	10SB1 9-10 (UGG)	13SB1 1.5-3.5 (UGG)	13SB1 5.5-7.5 (UGG)
TCL VOCs	ACETONE	ND	0.043	0.010	ND	ND	ND	ND	ND	ND
	(cis)1,2-DICHLOROETHYLENE	ND	ND	ND	ND	ND	ND	ND	ND	0.012
	METHYLENE CHLORIDE	0.004	0.009	0.003	0.008	0.005	0.006	0.006	0.006	0.007
	METHYLETHYL KETONE	ND	ND	ND	ND	ND	ND	ND	ND	ND
	TRICHLOROETHYLENE	0.017	0.051	0.106	ND	ND	ND	0.004	0.017	0.013
	ETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
	O-XYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
	M-XYLENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
TPHC	TOTAL PETROLEUM HYDROCARBONS	ND	ND	ND	ND	ND	ND	ND	ND	ND

RC507

* = Samples collected in January 1992.
NA = Not Analyzed
ND = Not Detected

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1992

Table 6-3 (Cont.)
CHEMICAL SUMMARY REPORT OF SOILS AT CRREL

		Boring ID/Sample Interval (ft. BGS)*							
Test	Parameter	13SB1 17-19 (UGG)	15SB1 0-1 (UGG)	15SB1 19-21 (UGG)	15SB1 25-27 (UGG)	15SB1 33-35 (UGG)	16SB1 0-1 (UGG)	16SB1 7-8 (UGG)	16SB1 9-11 (UGG)
TCL VOCs	ACETONE	ND	ND	ND	ND	ND	ND	ND	ND
	(cis)1,2-DICHLOROETHYLENE	0.008	ND	ND	ND	ND	ND	ND	ND
	METHYLENE CHLORIDE	0.009	0.005	0.006	0.005	0.006	ND	ND	0.003
	METHYLETHYL KETONE	ND	ND	ND	ND	ND	ND	0.014	ND
	TRICHLOROETHYLENE	0.234	ND	ND	ND	ND	ND	ND	ND
	ETHYLBENZENE	ND	ND	ND	0.009	ND	ND	ND	ND
	O-XYLENE	ND	ND	ND	0.010	ND	ND	ND	ND
	M-XYLENE	ND	ND	ND	0.017	ND	ND	ND	ND
TPHC	TOTAL PETROLEUM HYDROCARBONS	ND	ND	ND	172.000	ND	ND	ND	ND

RC507

* = Samples collected in January 1992.
NA = Not Analyzed
ND = Not Detected

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1992

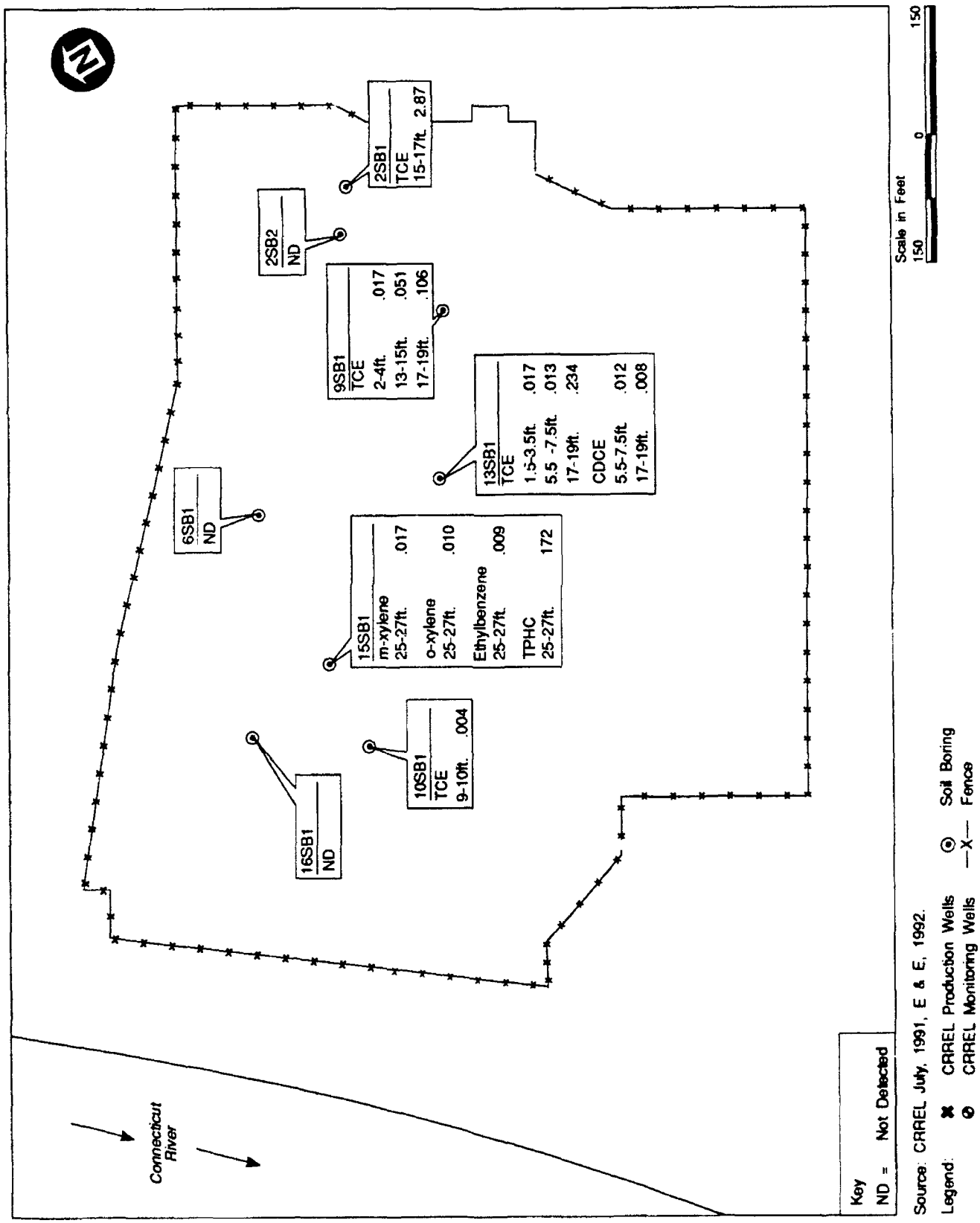


Figure 6-9 VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES (UG/G)

Table 6-4

CHEMICAL SUMMARY REPORT OF GROUND WATER AT CRREL
FIRST ROUND

		Well ID						
Test	Parameter	HANOVER (UGL)	CECRL01* (UGL)	CECRL02 (UGL)	CECRL03 (UGL)	CECRL04 (UGL)	CECRL05 (UGL)	CECRL06** (UGL)
TCL VOCs	1,2-DICHLOROETHYLENE (TOTAL)	ND	ND	ND	ND	ND	ND	ND
	ACETONE	ND	ND	8.600	ND	ND	ND	ND
	CIS 1,2-DICHLOROETHYLENE	NR	NR	0.810	NR	NR	NR	ND
	CHLOROFORM	ND	0.503	3.820	ND	ND	ND	ND
	METHYLENE CHLORIDE	6.370	8.430	3.240	7.750	6.760	7.450	294.000
	METHYLETHYL KETONE	ND	ND	ND	ND	ND	ND	ND
	TETRACHLOROETHYLENE	ND	ND	ND	ND	ND	ND	1290.000
	TRICHLOROETHYLENE	ND	531.000	29.700	ND	6.050	49.900	13800.000
TPHC	TOTAL PETROLEUM HYDROCARBONS	ND	ND	ND	ND	ND	ND	544000.000

RC507

Note: Samples collected in March 1992.

ND = Not Detected
NR = Not Reported

* TCE analyzed at a 10 dilution
** Sample analyzed at a 200 dilution
Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.

Table 6-4 (Cont.)
CHEMICAL SUMMARY REPORT OF GROUND WATER AT CRREL
FIRST ROUND

		Well ID					
Test	Parameter	CECRL07 (UGL)	CECRL08* (UGL)	CECRL09** (UGL)	CECRL10 (UGL)	CECRL11* (UGL)	CECRL12 (UGL)
TCL_VOCs	1,2-DICHLOROETHYLENE (TOTAL)	ND	ND	ND	ND	1.580	ND
	ACETONE	12.000	74.000	ND	11.000	33.000	46.000
	CIS-1,2-DICHLOROETHYLENE	ND	ND	ND	ND	9.500	3.300
	CHLOROFORM	ND	ND	ND	ND	1.710	ND
	METHYLENE CHLORIDE	3.430	3.040	ND	3.530	3.920	3.240
	METHYLETHYL KETONE	ND	73.000	ND	ND	10.000	36.000
	TETRACHLOROETHYLENE	ND	ND	ND	ND	ND	0.317
	TRICHLOROETHYLENE	5.940	1190.000	63700.000	170.000	1550.000	191.000
TPHC	TOTAL PETROLEUM HYDROCARBONS	ND	ND	ND	ND	ND	ND

RC507

Note: Samples collected in March 1992.

ND = Not Detected
NR = Not Reported

* TCE analyzed at a 20 dilution.
** Sample analyzed at a 50 dilution except TCE analyzed at a 1,000 dilution.
Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.

Table 6-5

CHEMICAL SUMMARY REPORT OF GROUND WATER AT CRREL
SECOND ROUND

Test	Parameter	Well ID						
		HANOVER (UGL)	CECRL01* (UGL)	CECRL02 (UGL)	CECRL03 (UGL)	CECRL04 (UGL)	CECRL05 (UGL)	CECRL06** (UGL)
TCL VOCs	1,1-DICHLOROETHYLENE	ND	ND	ND	ND	ND	ND	ND
	1,2-DICHLOROETHYLENE	ND	ND	ND	ND	ND	ND	ND
	1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
	1,3-DIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND
	CHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
	ACETONE	ND	ND	ND	ND	ND	ND	ND
	CIS 1,2-DICHLOROETHYLENE	ND	ND	ND	ND	ND	ND	ND
	CHLOROFORM	ND	ND	1.410	ND	ND	ND	ND
	METHYLENE CHLORIDE	6.670	196.000	8.330	6.180	6.270	5.200	1550.000
	METHYLETHYL KETONE	ND	ND	ND	ND	ND	ND	ND
	TETRACHLOROETHYLENE	ND	ND	ND	ND	ND	ND	15200.000
	TRICHLOROETHYLENE	ND	849.000	7.640	ND	3.720	29.700	34000.000
	TRIMETHYLBENZENES	ND	ND	ND	ND	ND	ND	6000.000
TPHC	TOTAL PETROLEUM HYDROCARBONS	ND	ND	ND	ND	ND	ND	1,990,000.000

RC507

Note: Samples collected in April 1992.

ND = Not Detected
NR = Not Reported

* Sample analyzed at a 20 dilution
** Sample analyzed at a 200 dilution
Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.

Table 6-5 (Cont.)
CHEMICAL SUMMARY REPORT OF GROUND WATER AT CRREL
SECOND ROUND

		Well ID					
Test	Parameter	CECRL07 (UGL)	CECRL08* (UGL)	CECRL09* (UGL)	**CECRL10 (UGL)	CECRL11* (UGL)	CECRL12 (UGL)
TCL VOCs	1,1-DICHLOROETHYLENE	ND	ND	ND	ND	34.500	ND
	1,2-DICHLOROETHYLENE	ND	ND	ND	ND	19.800	ND
	1,1-DICHLOROETHANE	ND	ND	ND	ND	14.000	ND
	1,3-DIMETHYLBENZENE	ND	ND	ND	ND	80.000	ND
	CHLOROBENZENE	ND	ND	ND	ND	40.800	ND
	ACETONE	ND	ND	ND	ND	ND	11.000
	CIS 1,2-DICHLOROETHYLENE	ND	ND	ND	ND	ND	5.000
	CHLOROFORM	ND	ND	ND	ND	18.100	ND
	METHYLENE CHLORIDE	6.860	176.000	8820.000	6.080	196.000	6.960
	METHYLETHYL KETONE	13.000	ND	ND	ND	ND	12.000
	TETRACHLOROETHYLENE	ND	ND	ND	ND	39.600	ND
	TRICHLOROETHYLENE	89.200	10600.000	212000.000	318.000	4250.000	212.000
	TRIMETHYLBENZENES	ND	ND	ND	ND	ND	ND
TPHC	TOTAL PETROLEUM HYDROCARBONS	ND	ND	ND	ND	ND	ND

RC507

Note: Samples collected in April 1992.

ND = Not Detected
NR = Not Reported

* Sample analyzed at a 20 dilution.
** Sample analyzed at a 1,000 dilution.
Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.

production wells, ice well, and Hanover municipal well were collected by USATHAMA in March 1991. Ground water analytical results from all three sampling events are summarized in Table 6-6 and portrayed by sample location in Figure 6-10. Samples collected by USATHAMA were analyzed for several different parameters including VOCs. Samples collected during the RI were analyzed for TCL organics and TPHC.

Production Wells

TCE was found in four of the five production wells: CECRL01, CECRL02, CECRL04, and CECRL05. TCE concentrations ranged from 3.72 ppb in CECRL04 to 930 ppb in CECRL01. Chloroform was also detected in low concentrations in CECRL01. PCE and cis 1,2 DCE were detected in CECRL02. TPHC was not detected in any of the production wells.

During all three sampling events, CECRL01 shows the highest concentration of TCE in the production wells. In CECRL02, a variety of VOC contamination was found, including TCE, PCE, chloroform, and cis 1,2 DCE. TCE was found at low concentrations in CECRL02 during the first and second RI sampling rounds (7.64 to 29.7 ppb) in comparison to a higher level detected during USATHAMA's March 1991 sampling round (220 ppb). This may be due in part to the fact that CECRL02 was not in operation during the RI sampling. PCE (18.2 ppb) was detected in CECRL02 once during the March 1991 sampling event. Chloroform was detected twice at low concentrations (1.41 to 3.82 ppb) during the first and second RI sampling rounds. The levels of TCE contamination in CECRL04 (3.72 ppb to 6.05 ppb) and CECRL05 (29.7 ppb to 49.9 ppb) are consistently low. CECRL03 did not show VOC contamination during any of the three sampling events.

Ice Well

The ice well was sampled during all three sampling rounds. VOCs and semi-volatiles were detected in samples collected by USATHAMA. VOCs and TPHC were detected in samples from the two RI sampling rounds (see Table 6-6).

A total of four VOCs were detected in samples from the ice well, although the presence of two of these VOCs was not consistent between rounds. TCE and PCE were detected in samples from all three rounds at concentrations ranging from 13,800 ppb to 34,000 ppb and 200 ppb to 15,200 ppb, respectively. Trimethylbenzene was detected during the USATHAMA sampling, and the second RI sampling round at concentrations ranging from 500 ppb to 6,000 ppb, but not in samples from the first RI sampling round. Chloroform was detected in the March 1991 sample only, at a concentration of 22.6 ppb. Results of the first and second RI sampling indicate TPHC concentrations of 554,000 ppb and 1,990,000 ppb, respectively.

Table 6-6

**CRREL REMEDIAL INVESTIGATION
SUMMARY OF GROUND WATER
ANALYTICAL RESULTS 1991 & 1992**

Sample Location	Date	Method*	Compound	Concentration (UGL)
OUTFALL	March 1991	UG05	Trichlorethylene	360.000
		UM17	Trichlorethylene	236.000
CECRL01	March 1991	UG05	Trichlorethylene	930.000
		UM17	Trichlorethylene	849.000
	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	8.430
			Chloroform	0.503
			Trichlorethylene	531.000
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	196.000
			Trichloroethylene	849.000
CECRL02	March 1991	UG05	Trichlorethylene	220.000
		UM17	Trichlorethylene	142.000
			Tetrachlorethylene	18.200
	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Acetone	8.600
			cis,1,2-dichloro-ethylene	0.810
			Methylene chloride	3.240
			Chloroform	3.820
			Trichlorethylene	29.700
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Chloroform	1.410
			Methylene chloride	8.330
			Trichloroethylene	7.640
CECRL03	March 1991	UM16	Butylbenzyl Phthalate	12.000
		UM17	Acetone	11.000
	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	7.750
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	6.180
CECRL04	March 1991	UG05	Trichlorethylene	4.100
		UM17	Trichlorethylene	5.280
	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	6.760
			Trichloroethylene	6.050
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	6.270
			Trichloroethylene	3.720

RC507

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1991 and 1992

Table 6-6 (Cont.)
CRREL REMEDIAL INVESTIGATION
SUMMARY OF GROUND WATER ANALYTICAL RESULTS 1991 & 1992

Sample Location	Date	Method*	Compound	Concentration (UGL)
CECRL05	March 1991	UG05	Trichlorethylene	55.000
		UM17	Trichlorethylene	104.000
	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	7.450
			Trichloroethylene	49.900
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	5.200
			Trichloroethylene	29.700
CECRL06	March 1991	UG05	Trichlorethylene	14000.000
		UM17	Trichlorethylene	28300.000
		UG05	Tetrachloroethylene	1700.000
		UM16	Tetrachloroethylene	200.000
		UM17	1,2-Dichloroethylene	149.000
		UM17	1,2-Dimethylbenzene	200.000
		UM17	1,3-Dimethylbenzene	100.000
		UM16	2-Methylnapthalene	38.000
		UM16	4-Chloroaniline	13.000
		UM17	Chloroform	22.600
		UM17	Trimethylbenzene	500.000
	March 1992	--	Total Petroleum Hydrocarbons	544000.000
		UM33	Methylene chloride	294.000
			Trichloroethylene	13800.000
			Tetrachloroethylene	1290.000
	April 1992	--	Total Petroleum Hydrocarbons	1,990,000.000
		UM33	Methylene chloride	1550.000
			Trichloroethylene	34000.000
			Tetrachloroethylene	15200.000
			Trimethylbenzenes	6000.000
CECRL07	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Acetone	12.000
			Methylene chloride	3.430
			Trichlorethylene	5.940
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	6.860
			Methylethyl ketone	13.000
			Trichloroethalene	89.200
CECRL08	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Acetone	74.000
			Methylene chloride	3.430
			Methylethyl ketone	73.000
			Trichlorethylene	1190.000
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	176.000
			Trichloroethylene	10600.000

RC507

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1991 and 1992.

Table 6-6 (Cont.)
CRREL REMEDIAL INVESTIGATION
SUMMARY OF GROUND WATER ANALYTICAL RESULTS 1991 & 1992

Sample Location	Date	Method*	Compound	Concentration (UGL)
CECRL09	March 1992	--	Total Petroleum Hydrocarbons	ND
			Trichlorethylene	63700.000
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	8820.000
			Trichloroethylene	212000.000
CECRL10	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Acetone	11.000
			Methylene chloride	3.530
			Trichlorethylene	170.000
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	6.080
			Trichloroethylene	318.000
CECRL11	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Acetone	33.000
			1,2 Dichloroethylene	1.580
			Cis,1,2-dichloroethylene	9.500
			Chloroform	1.710
			Methylene chloride	3.920
			Methylethyl ketone	10.000
			Trichlorethylene	1550.000
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	1,1-Dichloroethylene	34.500
			1,2-Dichloroethylene	19.800
			1,1-Dichloroethane	14.000
			1,3-Dimethylbenzene	80.000
			Chlorobenzene	40.800
			Chloroform	18.100
			Methylene chloride	196.000
			Trichloroethylene	4250.000
			Tetrachloroethylene	39.600
CECRL12	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Acetone	46.000
			Cis 1,2-dichloroethylene	3.300
			Methylene chloride	3.240
			Methylethyl ketone	36.000
			Tetrachloroethylene	0.317
			Trichlorethylene	191.000
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Acetone	11.000
			Cis 1,2-dichloroethylene	5.000
			Methylene chloride	6.960
			Methylethyl ketone	12.000
			Trichlorethylene	212.000

RC507

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1991 and 1992

Table 6-6 (Cont.)
CRREL REMEDIAL INVESTIGATION
SUMMARY OF GROUND WATER ANALYTICAL RESULTS 1991 & 1992

Sample Location	Date	Method*	Compound	Concentration (UGL)
HANOVER	March 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	6.370
	April 1992	--	Total Petroleum Hydrocarbons	ND
		UM33	Methylene chloride	6.670

RC507

* Analytical Methods
UG05 - Halocarbons in water by GC/CON
UM16 - Semivolatiles in water by GC/MS
UM17 - Volatiles in water by GC/MS
UM33 - Volatiles in water by purge and trap GC/MS
-- - EPA method 418.1. Not certified under USATHAMA program

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1991 and 1992

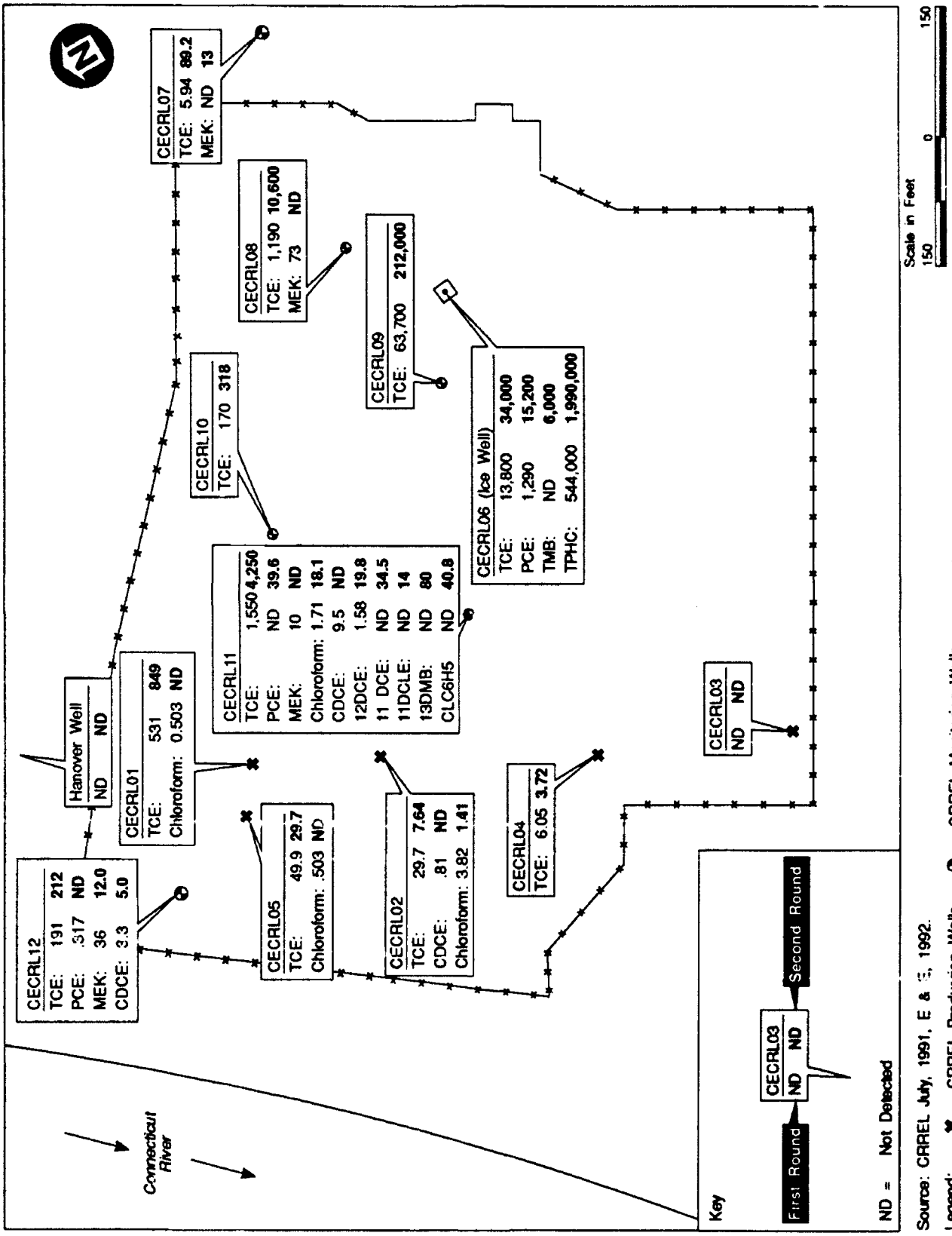


Figure 6-10 VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUND WATER - FIRST AND SECOND ROUNDS (UG/L)

Monitoring Wells

During the RI, two rounds of ground water samples were collected from the six monitoring wells at CRREL (See Table 6-4 and Table 6-5). Ground water flow patterns depicted on Figure 6-8 indicate that monitoring well CECRL07 is in an upgradient position with respect to most of the other wells. However, this figure also implies flow in an easterly direction at CECRL05 and CECRL12. Because of this, these two wells may not be in a true down-gradient position with respect to CECRL07. Ground water was not encountered in the overburden at CECRL12, which is screened within the bedrock. Figure 6-8 implies that CECRL01 and CECRL05 are down gradient of CECRL12.

TCE was detected in all monitoring wells including CECRL07. PCE was detected in CECRL12 (first round) and CECRL11 (second round). Cis 1,2 DCE was detected in CECRL11 during both rounds. In addition, several other VOCs were detected in CECRL11 during the second round, including 1,1-dichloroethylene (1,1-DCE), 1,2-dichloroethylene (1,2-DCE), 1,1-dichloroethane (1,1-DCA), 1,3-dimethylbenzene (m-xylene), and chlorobenzene.

Monitoring wells CECRL07, CECRL08, CECRL09, CECRL10, and CECRL11 showed significant increase in TCE concentrations between sampling rounds. The highest concentration of TCE was detected in CECRL09. Analysis from the first and second sampling rounds yielded concentrations of 63,700 ppb and 212,000 ppb, respectively. The largest increase was seen in CECRL07 in which concentrations increased almost 15 times, from 5.94 ppb to 89.2 ppb. Only in CECRL12 did the TCE concentrations remain relatively constant, with 191 ppb and 212 ppb detected during the first and second sampling rounds, respectively.

6.3.4 Surface Water

Three surface water samples were collected from the Connecticut River. These samples were analyzed for TCL organics and TPHC. CONNSW2 was taken at the CRREL outfall, and was the only surface water sample that exhibited VOC contamination. CONNSW1 and CONNSW3 were collected 100 feet upstream and 100 feet downstream of the CRREL outfall, respectively. TCE was detected at a concentration of 203 ppb in CONNSW2. The March 1991 sampling of the outfall detected a similar concentration (236 ppb) (see Table 6-6). TPHC was not detected in the three surface water samples collected. Table 6-7 summarizes the results of the surface water sample analysis.

6.3.5 Sediment

Three sediment samples were collected from the Connecticut River in conjunction with the surface water samples. These sediment samples were also analyzed for TCL organics and TPHC. Analysis of the sediment did not indicate VOC or TPHC contamination. Table 6-8 summarizes the results of the sediment sample analysis. The sediments collected from

Table 6-7

CHEMICAL SUMMARY REPORT OF SURFACE WATER

		Sample ID		
Test	Parameter	CONNSW1 (UGL)	CONNSW2 (UGL)	CONNSW3 (UGL)
VOC	Methylene chloride	6.370	5.000	5.200
	Trichloroethylene	ND	223.000	ND
TPHC	Total Petroleum Hydrocarbons	ND	ND	ND

RC507

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.

Note: Samples collected in April 1992

Table 6-8

CHEMICAL SUMMARY REPORT OF SEDIMENTS

		Sample ID		
Test	Parameter	CONNSED1 (UGG)	CONNSED2 (UGG)	CONNSED3 (UGG)
VOC	Methylene chloride	0.009	0.009	0.008
TPHC	Total Petroleum Hydrocarbons	ND	ND	ND

RC507

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.

Note: Samples collected in April 1992

the Connecticut River near the CRREL site consisted primarily of sand and gravel. Very little organic matter was observed in these sediments.

6.4 DATA ASSESSMENT SUMMARY

Analytical results of the soil collected from the 8 borings show TCE, cis-DCE, and methylethyl ketone to be present at various locations. TCE was found in soils from borings 2SB1, 9SB1, and 13SB1, which were located within AOCs where a TCE release is known or expected to have occurred. Cis-DCE was also found in soils from 13SB1. Methylethyl ketone was detected at low concentrations in soils from 16SB1 located in an area of former drum storage. The results for methylethyl ketone are suspect due to potential field contamination because methylethyl ketone was detected in the rinsate blanks at comparable levels.

TPHC was detected in soil samples from boring 15SB1 located in AOC 15, where a fuel oil spill is known to have occurred. Low concentrations of petroleum-related VOCs (m-xylene, o-xylene, and ethylbenzene) were also detected at this location. 15SB1 is the only location where TPHC and petroleum-related VOCs were detected.

Results of both ground water sampling rounds indicate that TCE is present in four of the five production wells; the ice well; and in the six monitoring wells, including the upgradient well (CECRL07). PCE was detected in CECRL12 during the first RI round only, and in CECRL11 during the second RI round only. PCE was also found in the ice well (CECRL06) during all three sampling events.

Cis 1,2 DCE, a degradation product of both TCE and PCE, was detected in CECRL02, CECRL11 and CECRL12. Chloroform was detected in CECRL02, CECRL05, and CECRL11. Methylethyl ketone was detected in monitoring wells CECRL07, CECRL08, CECRL11, and CECRL12. Methylethyl ketone in the ground water samples cannot be attributed to laboratory or field contamination based on available data. In CECRL11, four additional VOCs were detected in samples collected during the second RI sampling round. These include the following: 1,1 DCE and 1,1 DCA, which are degradation products of TCE; chlorobenzene; and m-xylene, which is a petroleum-related compound.

High levels of TPHC were detected in the ice well (CECRL06) during both RI sampling rounds, but not in the production wells, monitoring wells, or Hanover municipal well. Results of the RI ground water sampling rounds show CECRL03 and the Hanover municipal well to be free of TCL volatile organics.

Based on the information gathered during the CRREL RI, the 16 AOCs can be grouped into the general categories described in the following paragraphs.

AOC 4 and AOC 7 currently contain fuel oil USTs. There are no known releases from the UST currently located at AOC 4 or from the UST that existed previously at this location. Minor leakage was detected in the UST at AOC 7 during tightness testing.

AOC 5 and AOC 8 currently contain ASTs used for gasoline and waste oil. There are no documented releases from these ASTs. It is also expected that the ASTs in AOC 5 will be relocated due to the construction of the Remote Sensing Facility currently in progress.

AOC 2, AOC 3, AOC 6, and AOC 15 contain former USTs used for gasoline and fuel oil storage. There were no known releases from the former fuel oil USTs at AOC 2. TPHC was not detected in soil borings 2SB1 and 2SB2 or monitoring well CECRL08 (located down gradient). However, BTX and fuel oil character soil gas anomalies were detected at AOC 2, and residual fuel oil may exist in the soils.

The former USTs in AOC 3 and AOC 6 are known to have had past releases based on tightness testing. Soil gas anomalies were detected at these AOCs for BTX and fuel oil character. Soil boring 6SB1 and monitoring well CECRL10 were installed downgradient of AOC 6. It should be noted that 6SB1 and CECRL10 are also approximately 175 feet downgradient of AOC 3. TPHC and VOCs were not detected in either 6SB1 or CECRL10. Since TPHC and petroleum-related VOCs were not detected in ground water samples collected downgradient of AOC 3 and AOC 6, it is likely that any petroleum contamination at these locations is residual, and limited to the soils.

The former UST at AOC 15 was known to have leaked fuel oil based on visual observation. BTX and fuel oil character soil gas anomalies were detected at this AOC. In addition, TPHC, ethylbenzene, m-xylene, and O-xylene were detected in soils from the 27 to 29 feet BGS interval in boring 15SB1 located within AOC15. However, no monitoring well was completed within AOC 15, therefore there are not enough data to determine if this contamination is residual and limited to soils.

Within AOC 10, AOC 11, AOC 14, and AOC 16, surficial TCE spills were suspected or known to have occurred. These spills were likely minor in terms of the amount spilled and their overall contribution to the TCE ground water contamination at CRREL.

Suspected TCE releases at AOC 10, AOC 11, and AOC 16 were thought to have occurred as surface spills in connection with drum storage at these locations. Soil gas anomalies for TCE and PCE were detected in these areas. Soil borings 10SB1 and 16SB1 were located in the general area of these three AOCs. Analytical results of the soils from these borings did not reveal VOC or TPHC contamination, with the exception of 16SB1, in which methylethyl ketone was detected, the results for which are suspect, as explained earlier.

AOC 12 is the location of the exterior test pond. No releases of TCE or other chemical compounds are known to have occurred at this location. The only sampling performed at this AOC involved the placement of two soil gas samplers, one of which indicated a moderate TCE ion flux response. The exterior test pond is still in use, and is fed by water from the CRREL storm sewer system.

AOC 1, AOC 2, AOC 9, and AOC 13 have been identified as probable sources of TCE contamination at CRREL. AOC 2 contained a former leaking TCE UST that released an unknown amount of TCE. At AOC 1, AOC 9, and AOC 13, surficial releases of various magnitudes have occurred. TCE was detected in soil gas, soil, and ground water in the vicinity of these AOCs.

At AOC 1, a TCE release occurred as a result of an AST explosion. The majority of this TCE was flushed down the CRREL storm sewers to the Connecticut River. A portion of this TCE may also have been released to the soils directly downgradient of the asphalt underlying the AST area.

The ice well, located within AOC 9, was used in the past for various ice drilling experiments that at times involved the use of TCE and diesel fuel as drilling fluids. TCE was also contained in refrigeration pipes within the ice well that are known to have leaked in the past. Unknown amounts of TCE were also released to the ground surface at this location through leaking above-ground piping systems, and from usage during drilling experiments.

The refrigeration system for the ice well is no longer in operation, however, liquids and ice still exist within this well. The extent and condition of the ice is unknown. The ice well liquid was sampled on three occasions, yielding elevated concentrations of VOCs including TCE and PCE, semi-volatiles, and petroleum hydrocarbons. On 10 April 1992, depths to the top of the liquid and the liquid/ice contact were measured at 7 feet BGS and 63 feet BGS, respectively.

AOC 13 contained the gravel pad at which TCE was known to have been poured onto the ground surface. The gravel pad is now covered by the Logistics and Supply building and an asphalt parking lot. TCE was detected in soils from boring 13SB1 and ground water from CECRL11, both of which are downgradient of AOC 13. Degradation products of TCE were detected in CECRL11, including 1,1-dichloroethylene and 1,1-dichloroethane. Petroleum-related hydrocarbons (chlorobenzene and m-xylene) were also detected in CECRL11, indicating that AOC 13 may also be a source of petroleum-related ground water contamination. It should be noted that CECRL11 is the only well at CRREL in which petroleum-related hydrocarbons were detected. AOC 13 is in a downgradient position relative to AOC 1, AOC 2, and AOC 9, therefore, the contamination found in CECRL11 may be partially derived from these AOCs.

6.5 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

QC samples were collected in the field to assess overall precision, accuracy, and representativeness of the sampling and analytical efforts. The analytical results for the QC samples and summary tables are provided in Appendix N. QC samples collected during the RI are included in Table 6-2. Twenty-five soil, three sediment, and three surface water samples were analyzed for TCL VOCs, and TPHC. Two rounds of ground

water samples from the 6 monitoring wells, 5 production wells, the ice well, and the town of Hanover well were also analyzed for VOCs and TPHC.

Trip blanks were sent with sample shipments throughout the RI, and analyzed for VOCs to assess potential contamination during transport. The trip blank contaminants were relatively uniform, and attributable to background laboratory contamination.

Four rinsate samples were collected, one each during ground water sampling on 12 March 1992 and 10 April 1992, and two during soil sampling on 20 January 1992 and 16 January 1992. The results for the rinsate samples are presented in Appendix N. The rinsate sample results for ground water are directly comparable to ground water sample results. The rinsate sample results for the soil samples are reported in micrograms per liter (µg/l) and are not directly comparable to the soil sample results which are reported in micrograms per gram (µg/g). The rinsate sample results must be converted to µg/g before the levels in the soil samples can be compared. Compounds detected in both rinsate and original field samples are considered suspect if the concentration in the sample is less than five times the concentration in the rinsate.

Laboratory method blank results are also presented in Appendix N. Laboratory method blanks were analyzed for standard water and soil matrices for each lot. These results are directly comparable to results for samples analyzed in that lot. Any sample results less than five times the blank levels may be attributable to laboratory background contamination.

Field duplicates were taken to assess overall sampling and analytical precision for various matrices. Field duplicates were taken for soil boring samples 2SB1/24-26, 13SB1/5.5-7.5, and 13SB1/17-19; for first round ground water samples at well CECRL08; for second round ground water samples at wells CECRL08 and CECRL12; for surface water sample CONNSW2; and for sediment samples CONNSED2. Analytical results are presented in Appendix N.

The laboratory also analyzed standard matrix spikes for each analytical lot. In general, the standard matrix spike results must be within control criteria for the analysis to be accepted. Therefore, these results are not presented. In a few cases, lots were considered acceptable even though standard spike results were not within the control criteria.

All field and laboratory QC blank results were compared to the sample results, and any compounds attributable to potential background contamination are discussed below. Field duplicate results that indicate samples are potentially not homogenous lead to estimated analytical results. In addition, all analytical lots were evaluated to determine whether all laboratory QC parameters were in control. Specific issues which might impact the use of the data are described below. Analytical results with no laboratory QC issues reported in the

analytical case narrative or USATHAMA acceptance letters were considered usable for all purposes.

All samples were analyzed within holding times according to USATHAMA certified methods. Methylene chloride and acetone in the samples (including the field duplicates) are attributable to laboratory background contamination. 1,1,2,2-Tetrachloroethane was detected in two method blanks but not in the field samples. Several other chlorinated compounds were detected in the method blanks. These compounds are most likely due to carryover from the previous high standard, and do not affect data usability. No total petroleum hydrocarbons were in the method blanks.

Methylene chloride was detected in all trip blanks. The presence of this compound is due to laboratory background contamination. Low levels of PCE and TCE were detected in one trip blank. The trip blank was analyzed with high level samples, and may be due to carry over in the laboratory. However, these compounds were also detected in several rinsate blanks, indicating potential field contamination. Overall, concentrations of these target compounds less than 1.000 µg/l should be considered suspect. Methylethyl ketone was also detected in the rinsates associated with the soil borings, indicating the concentrations of this compound in the soil samples are suspect.

All field duplicates indicate excellent precision for both water and soil samples, with the exception of TCE detected in one soil boring sample (see Appendix N). This inhomogeniety is most likely due to variable intervals within the 2-foot split spoon from which soil samples were collected, since the samples were not homogenized.

7. FATE AND TRANSPORT

A variety of chemical compounds were detected in the environmental media sampled at the CRREL site. A complete analysis (VOCs, semi-volatiles, inorganics, etc.) was performed on samples collected by USATHAMA in March 1991. This analysis (see Section 3.1) was the basis for selecting VOCs as the contaminants of concern at the CRREL site. The fate and transport of these compounds in the environment is a function of the physical and chemical properties of the compound, and of the environmental conditions at the site. To facilitate the understanding of chemical fate and transport, organic compounds can be classified into categories according to their similarity in chemical structure or physical/chemical properties (i.e., factors that would influence mobility in the environment). The organic chemicals detected at the CRREL site can be classified into the following three categories: halogenated aliphatic hydrocarbons (mono-, di-, and tri-chloroethanes and ethenes); aromatic hydrocarbons (benzene, toluene, and xylenes); and ketones. The physical-chemical properties for the organics detected in the environmental media at the CRREL site are presented in Table 7-1.

7.1 ENVIRONMENTAL CHEMISTRY OF THE ORGANIC CHEMICALS

The majority of VOCs detected in the environmental media at the CRREL site can be classified into three chemical categories.

7.1.1 Halogenated Aliphatic Hydrocarbons

TCE, PCE, and cis 1,2 dichloroethylene (1,2 DCE) are the most frequently detected halogenated aliphatic compounds at the CRREL site. These chemicals are volatile, moderately to poorly water-soluble compounds, and are liquids at 20°C. These chemicals have densities greater than water; therefore, they may form a separate phase in the aquifer if present in sufficient volume. Halogenated aliphatic hydrocarbons tend to be poorly sorbed to soils, and are persistent in ground water.

Transformation reactions have been reported for many of the chemicals in this class. PCE in anaerobic soils has been shown to be slowly transformed via a series of biotic and abiotic reactions to TCE, 1,1-dichloroethylene, 1,2-dichloroethylene, and vinyl chloride (Bouwer and McCarty 1983; Vogel and McCarty 1985). In general, the frequent observation of vinyl chloride accumulation in aquifers contaminated with TCE and PCE appears to indicate that conditions conducive to transformation of vinyl chloride to CO_2 are not prevalent in the natural aquifer system environment. The rate and extent of transformation reactions to degradation products are highly dependent on site-specific factors such as nutrient availability and microbial composition of the soil.

The ultimate fate of halogenated aliphatic hydrocarbons in surface soils and surface water is generally volatilization to the atmosphere

Table 7-1

PHYSICAL-CHEMICAL PROPERTIES OF ORGANIC CONTAMINANTS OF CONCERN

Chemical Name	CAS Number	Mole Weight (g/mole)	Physical State at 20°C	Water Solubility (mg/l)	Liquid Density (g/ml)	Vapor Pressure (mm Hg)	Henry's Law Constant ($atm\text{-}m^3/mol$)	K_{oc} (ml/g)	Log K_{ow}	BCF	Source
Halogenated Aliphatic Hydrocarbons											
1,1 Dichloroethane	75-34-3	99.0	Liquid	5.50 E+03	1.17	1.82 E+02	4.31 E-03	30	1.79	—	B,C,E,F,G
1,1 Dichloroethylene	75-35-4	97.0	Liquid	2.50 E+02	1.22	5.91 E+02	3.00 E-02	14	1.48	1.2	A,C,E,G
1,2-Dichloroethylene (total)	540-59-0	97.0	Liquid	3.50 E+03	1.28	2.08 E+02	7.50 E-03	49	2.09	1.5	A,B,C,E,G
Tetrachloroethylene	127-18-4	165.8	Liquid	1.50 E+03	1.63	1.85 E+0	1.49 E-02	277	3.40	66	C,E,G,+
Trichloroethylene	79-01-6	131.4	Liquid	1.10 E+03	1.47	6.90 E+01	1.20 E-03	126	2.42	13	A,B,C,E,G
Aromatic Hydrocarbons											
Chlorobenzene	108-90-7	112.6	Liquid	4.72 E+02	1.11	1.19 E+01	3.46 E-03	3.30 E+02	2.84	1.00 E 01	A,B,F,+
Ethylbenzene	100-41-4	106.2	Liquid	1.61 E+02	0.86	9.53 E+00	8.44 E-03	1.10 E+03	3.15	3.75 E01	C,D,G
Xylenes (total)	1330-20-7	106.2	Liquid	1.60 E+02	0.86	1.00 E+01	6.82 E-03	240	3.20	70	A,C,E,F,G
Ketones											
Methylethyl ketone	78-93-3	72.1	Liquid	2.68 E+05	0.81	7.75 E+01	2.74 E-05	4.50 E+00	0.20	9.30 E01	C,F,+

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Key:

A = Mabey, W., et al., 1982, Aquatic Fate Process Data for Organic Priority Pollutants.
B = Mackay, D. and W. Shiu, 1981, J. Phys. Chem. Ref. Data, 19:1175-1179.
C = Howard, P., 1989, Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Volume 1, Lewis Publishers, Inc.
D = Windholtz, M., et al., 1976, The Merck Index, 9th Edition, Merck and Company, Inc.
E = Weast, R., ed., 1983, Handbook of Chemistry and Physics, 63rd Edition, CRC Press.
F = Verschueren, K., 1983, Handbook of Environmental Data on Organic Chemicals, Van Nostrand Reinhold, New York.
G = Arthur D. Little, Inc., 1989, The Installation Program Toxicology Guide, Volumes 1 to 4.
+ = Miscellaneous Physical Constant Handbooks.

and subsequent photo-oxidation (USEPA 1979). These compounds are not significantly bioaccumulated (Howard 1990).

7.1.2 Aromatic Hydrocarbons

The aromatic hydrocarbons detected at the CRREL site include ethylbenzene, chlorobenzene, m-xylene, and o-xylene. Detection of these compounds at the CRREL site was primarily limited to the soil samples collected in soil boring 15SB1, and ground water samples collected in monitoring well CECRL11. These compounds have similar physio-chemical properties (see Table 7-1) and can be grouped together when discussing their fate and transport in the environment. Based on their high vapor pressures and relatively low water solubilities (Verschueren 1983), the primary fate of these aromatic hydrocarbons in surface soil and surface water is expected to be volatilization to the atmosphere (USEPA 1979). Photo-oxidation in the troposphere is the dominant atmospheric fate of these compounds (USEPA 1979). Using generally accepted principles to evaluate adsorption phenomena, benzene is classified as "highly" mobile in soil, toluene and o-xylene are classified as "medium", while m- and p-xylene are considered to have "low" mobility (Kostecki and Calabrese 1991).

Aromatic hydrocarbons may leach from soils into ground water. The organic carbon participation coefficient (K_{oc}) values range from 83 to 9,200, and indicate that limited sorption to organic matter in soils or sediments may occur. The aromatic hydrocarbons detected at the CRREL site have a liquid density less than water, and may form a separate phase above the water table if present in sufficient quantity (e.g., as part of a gasoline or fuel oil liquid phase). Based on the available ground water quality data for the site (i.e., general absence of aromatic hydrocarbons in wells), two phase transport in ground water does not appear to be occurring. However, it should be noted that vapor phase diffusion from ground water in the area of 15SB1 may be a significant transport process in unsaturated soils, if a seasonal perched water table exists.

Impacts of hydrocarbon contamination depend on the rate of transport, the process of transformation, and dilution (by dispersion and diffusion). Aromatic hydrocarbons can be biologically transformed in some soils and sediments (Barker et al., 1987). The rate and extent of transformation is highly dependent on site-specific factors such as temperature, pH, and the microbial composition of the soil. Aromatic hydrocarbons do not appreciably concentrate in plant or animal tissue (USEPA 1979).

7.1.3 Ketones

The ketone identified at the CRREL site is methylethyl ketone, which has a density less than that of water. Possessing low Henry's Law constants, this chemical will volatilize slowly from water or wet soil. Ketones are poorly adsorbed in soils and highly mobile in ground water.

However, ketones are biotransformed in soils and natural waters, and eventually degrade to carbon dioxide. Based on their low octanol-water partition coefficients (K_{ows}), ketones would not be expected to bioaccumulate in plants or animal tissue.

7.2 TRANSPORT PATHWAYS

Contaminants were primarily introduced at the CRREL site through surface spills, UST leaks, an above ground storage tank explosion, and possibly leakage from the ice well. The actual volume of chlorinated solvents and petroleum hydrocarbons discharged to the site is unknown. Although several VOCs have been identified, the principal pollutant is TCE. Since the concentration of the parent compound (TCE) is generally higher than the concentration of the degradation products (1,1-DCA and cis 1,2 DCE) in the RI samples, transformation of halogenated aliphatic compounds at the site appears to be limited. It should be noted that degradation products were detected at only four sample locations.

Hydrocarbons and chlorinated solvents can exist in four separate phases: the liquid phase (i.e., nonaqueous phase liquid); dissolved in water as an aqueous phase in ground water, or in pore water surrounding particles in the unsaturated zone; in the gaseous phase as vapor in soil gas; and as the adsorbed phase held onto solid surfaces or particles. The primary contaminant transport pathways from areas of high contaminant concentrations to the surrounding uncontaminated media include diffusion into the soil gas, overland flow, downward percolation through the unsaturated zone, and ground water flow in the saturated zone.

Soil gas surveys take advantage of the presence of readily detectable volatile organic compounds (e.g., TCE, BTX, fuels) that migrate into the soil vapor as a function of vapor pressure and concentration gradients. The passive soil gas survey that was conducted at CRREL utilized 460 Petrex samplers in 20-, 60-, and 120-foot intervals throughout the CRREL property. Higher resolution grid patterns were used in areas of former VOC use and storage.

The soil gas survey data reflect volatile organics that may occur in either the stratigraphic column or ground water beneath the collection point. Thus, the organics can be derived from surface spills, deposition, or migration into the deep vadose zone and ground water. The depth to ground water ranges from 140 feet BGS at CECRL07 (upgradient well) to 85 feet BGS at CECRL12. The soil gas survey revealed areal extents of contamination, and was used in the selection of the boring locations and groundwater monitoring wells during the CRREL RI. Results from the data generated by the survey revealed the presence of TCE, PCE, benzene, toluene, xylene, and a fuel oil character in the soil gas. TCE is the predominant VOC, and was detected around the ice well (AOC 9), former TCE UST (AOC 2), and gravel pit area (AOC 13). A notable PCE anomaly was mapped in the vicinity of CECRL01 and CECRL05, and north of the FERF building. BTX as well as fuel oil

character may have common source areas, with the exception of toluene, which may also be originating from a source in the former gravel pit area.

The TCE plume beneath the CRREL site has developed as a result of various types of spills (AOC 1, AOC 2, AOC 9, and AOC 13). Since TCE is denser than water and of low viscosity, its movement in the subsurface is largely controlled by gravity. TCE is considered volatile and slightly soluble. Therefore, TCE can migrate in the vapor phase, as a soluble component moving along with the ground water, and as a separate or free phase.

Small TCE spills may have occurred in the overburden. This TCE may evaporate into a gas phase which sinks to the capillary fringe of the water table, and then spreads laterally. The TCE vapors move with air circulating in the soil. Precipitation and percolation through these contaminated zones will then move the contaminant in solution down to the water table. It will then flow in solution along with ground water flow. The residual TCE in the sediment contaminates the ground water as water moves past it, and the solution plume is carried with the ground water flow.

8. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Remedial action objectives are specific goals for soil, ground water, and surface water for protecting human health and the environment. These objectives are established under the broad guidelines of meeting all applicable or relevant and appropriate requirements (ARARs).

This section identifies ARARs, and other standards, criteria, and guidelines "to be considered" (TBC), on a preliminary basis. They are listed for possible contravention and remediation of soils, ground water, and surface water.

Three types of ARARs and TBCs will be identified:

- Chemical Specific - Chemical specific ARARs establish health requirement or risk-based concentration limits for specific environmental media and a specific hazardous substance. Such ARARs may prove useful in identifying cleanup levels.

- Remedial Action Specific - These ARARs establish controls or restrictions for particular remedial actions (e.g., RCRA standards for closure of hazardous waste disposal units).

- Location Specific - These ARARs set restrictions on remedial activities, depending on site characteristics or immediate environs (e.g., zoning requirements and land use restrictions).

The ARARs for the contaminated media of concern (i.e., soils, ground water, and surface water) are presented below.

8.1 SOILS

8.1.1 Applicable or Relevant and Appropriate Requirements

The most significant ARARs for soils are derived from RCRA and the New Hampshire Hazardous Waste Rules (New Hampshire Code of Administrative Rules - Department of Environmental Services, Chapters Env-Wm 100-1000 - Hazardous Waste Rules) (BNA 1990). These regulations contain requirements for generation, transportation, treatment, storage, and disposal of hazardous wastes. The State's hazardous waste regulations parallel the Federal RCRA regulations. The EPA has authorized New Hampshire to implement hazardous waste regulations in lieu of the RCRA regulations established prior to the Hazardous and Solid Waste Amendments (HSWA) of 1984. EPA remains the implementing agency for HSWA requirements.

Part Env-Wm 404.02 pertains to spill residues and contaminated soil, water, and debris. These regulations state "spill residues and contaminated soil, water, or other debris resulting from spillage and/or cleanup of any wastes listed in parts Env-Wm 402, Env-Wm 403, or Env-Wm 404 shall be considered hazardous wastes." These wastes shall be handled as a hazardous waste mixture in accordance with Env-Wm 404.01.

Soils at the CRREL site may contain the following listed wastes:

F001 - The following spent halogenated solvents used in degreasing: PCE, TCE, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride.

F002 - The following spent halogenated solvents: PCE, methylene chloride, TCE, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane, and still bottoms from the recovery of these spent solvent mixtures.

U228 - TCE

F001 wastes were identified because TCE was used as a degreaser (Faran undated). F002 wastes could be present as a result of solvent use at the facility. U228, TCE, was also identified because the CRREL facility used TCE as a secondary refrigerant in the cooling system in the main laboratory from 1960 to 1987; there was a large UST and a 10,000-gallon AST containing TCE; there was an explosion involving the AST and spillage of 3,000 gallons of TCE; and TCE was used as a drilling fluid and refrigerant during experiments involving drilling in the ice well.

In 1984, Congress passed the HSWA, which mandated new land disposal restrictions and deadlines. As required by HSWA, EPA must develop treatment standards to protect human health and the environment. RCRA hazardous wastes can only be land disposed if they contain concentrations of contaminants below the standards, are treated so that contaminants meet the treatment standards, or a treatability variance has been obtained. Treatment standards for F001 and F002 wastes are presented in Table 8-1.

NHDES's Interim Policy for the Management of Soils Contaminated from Spills/Releases of Virgin Petroleum Products (NHDES 1991) is a TBC for cleanup of UST-related contamination.

There are no known location-specific ARARs that were identified for CRREL from the background search performed.

8.1.2 Discussion for Soils

Contaminated soils must be managed as hazardous waste until the hazardous constituents are removed by treatment. Treatment standards

Table 8-1

TREATMENT STANDARDS FOR SELECTED CONSTITUENTS OF F001 AND F002 LISTED WASTES

Constituents of Concern	Nonwastewater TCLP (mg/l)
Tetrachloroethylene	0.05
Trichloroethylene	0.091

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Source: McCoy 1990

for non-wastewater are based on toxicity characteristic leaching procedure (TCLP). The TCLP tests a waste extract for 40 contaminants including heavy metals, pesticides, and selected organic compounds (e.g., TCE and PCE). Treatment standards have been developed for all listed and characteristic (e.g., ignitability, corrosivity, reactivity, and toxicity) hazardous wastes. These treatment standards are set at levels considered to be protective of human health and the environment when wastes are land disposed (e.g., placed in a landfill, surface impoundment, concrete vault, etc.). These treatment standards specify the concentration limits that the waste must meet prior to land disposal in a RCRA-permitted facility (see Table 8-1). Contaminants of concern include chloroform, cis-1,2-dichloroethylene, ethylbenzene, PCE, TCE, and xylene.

8.2 GROUND WATER

8.2.1 Applicable or Relevant and Appropriate Requirements

Ground water ARARs include National Primary and Secondary Drinking Water Regulations which establish maximum contaminant levels (MCLs). Table 8-2 presents MCLs for contaminants detected during both rounds of sampling at the CRREL site. NHDES's Proposed Ambient Ground Water Quality Standards (NHDES 1992) is a TBC and Table P-1 in Appendix P presents these MCLs for organic compounds detected during both rounds of sampling at the CRREL site.

8.2.2 Discussion for Ground Water

Ground water is used for drinking water in the towns of Norwich, Vermont, and Hanover, New Hampshire. The Norwich municipal well is located approximately one-mile north of CRREL on the Vermont side of the Connecticut River. The Hanover municipal well is located 1,000-feet north of CRREL. It is used on demand during the summer months. The primary source of water is two surface impoundments located approximately 1.5 miles east of CRREL at elevations of 699 and 775 feet above MSL. Water is supplied to residents of the valley living at elevations less than 600 feet above MSL. Private residential wells located mostly in Vermont are used for potable water supplies. Most residents on the New Hampshire side of the Connecticut River in the site area are connected to the Hanover municipal water supply, with the exception of a few residents living north of CRREL (Brown 1991).

8.3 SURFACE WATER

8.3.1 Applicable or Relevant and Appropriate Requirements

New Hampshire classifies surface water into 3 grades: Class A, B, and C. The Connecticut River near the CRREL site is Class B.

New Hampshire also has designated water quality criteria for toxic substances (see Table 8-3).

Table 8-2

NATIONAL PRIMARY AND SECONDARY DRINKING WATER REGULATIONS

Chemical	Maximum Contaminant Level (mg/l)
Tetrachloroethylene	0.005 (effective 7/30/92)
Trichloroethylene	0.005
Methylethyl Ketone	-----
cis-1,2-dichloroethylene	0.07 (effective 7/30/92)
1,1 Dichloroethylene	0.007
1,1 Dichloroethane	----
Chlorobenzene	----
Chloroform	0.1

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Source: FR:56; 30 January 1991

Table 8-3

NEW HAMPSHIRE
WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

	Protection of Aquatic Life Concentrations in ug/l		Protection of Human Health Units per Liter	
Chemical	Fresh Acute Criteria	Fresh Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only
Benzene	5,300		5 ug	40 ug
Carbon Tetrachloride	35,200		5.0 ug	6.94 ug
Chloroform	28,900	1,240	0.19 ug	15.7 ug
Dichloroethane 1,2	118,000	20,000	5.0 ug	243 ug
Dichloroethylenes	11,600			
Dichloroethylenes 1,1			7.0 ug	1.85 ug
Halomethanes	11,000		0.19 ug	15.7 ug
Tetrachlorinated Ethanes	9,320			
Tetrachloroethane 1,1,2,2		2		
Tetracloroethanes	9,320			
Tetrachloroethylene	5,280	840	0.80 ug	8.85 ug
Trichlorinated Ethanes	18,000			
Trichloroethane 1,1,1			0.2 mg	1.03 g
Trichloroethane 1,1,2		9,400	0.6 ug	41.8 ug
Trichloroethylene	45,000	21,900	5.0 ug	80.7 ug
Vinyl Chloride			2.0 ug	525 ug

RC507

Source: Bureau of National Affairs, Inc.

8.3.2 Discussion for Surface Water

One surface water sample, located at the CRREL storm water outfall in the Connecticut River, contained elevated levels of TCE. Currently, approximately 1 million gallons of ground water containing VOCs are used as cooling water at CRREL and are discharged to the river. A ground water treatment facility is planned for the CRREL facility and is expected to be on-line later this year.

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9. SUMMARY AND CONCLUSIONS

The RI field activities provided additional information regarding the nature and occurrence of overburden sediments, bedrock, and ground water at CRREL. The thickness of overburden sediments, which consist of esker and lake sediments, ranges from approximately 65 feet at CECRL12 to 180 feet at CECRL07. The esker sediments are composed of fine- to medium-grained sands with intervals of gravel. Lake sediments at CRREL generally consist of a 30- to 50-foot section of varved silts with few clay layers overlying very fine- to fine-grained sands and silty sands up to 150 feet in thickness. Bedrock at the site consists of phyllite, quartzite, and schist of the Orfordville Formation. Permeability in the bedrock is caused primarily by fracturing. Fluid losses during drilling at CECRL07 and CECRL12 imply the presence of bedrock fractures in the bedrock at CRREL. Drilling at CECRL12 also revealed the presence of a bedrock high extending above the water table, with a relief of approximately 100 feet compared to bedrock elevations at the CRREL production wells.

Depth to the ground water table at the site ranges from approximately 85 feet BGS (382.96 feet MSL) at CECRL12 to 140 feet BGS (383.10 feet MSL) at CECRL07, and the water table occurs both within the overburden sediments and bedrock. Five of the six monitoring wells installed during the CRREL RI are screened within the overburden lacustrine sediments; ground water was not encountered in the overburden sediments at CECRL12, and this well was screened within the bedrock. No monitoring wells were completed within the esker in which the CRREL production wells are screened. The five production wells at CRREL pump an average of one million gallons per day of ground water from highly permeable esker sediments located beneath the western portion of the site. After circulation through refrigeration and cooling systems at CRREL, this water is discharged to the Connecticut River via the storm sewer.

Water level measurements and inferred ground water flow patterns indicate hydraulic connection between ground water at CRREL and the Connecticut River. As a result, water table fluctuations may be linked to variations in the river level which are controlled by water release at the Wilder Dam. There is apparently no hydraulic barrier between the overburden and bedrock at CRREL, although a thin layer of clay may exist directly on top of the bedrock as seen in CECRL07. Horizontal hydraulic gradients were calculated using water levels obtained during the RI, and ranged from .00042 to .0073 feet/foot. However, these gradients are not representative of much steeper hydraulic gradients that would be calculated close to the production wells under pumping conditions. Water table contours and flow lines in the conceptual site model indicate that ground water beneath the site is within the area of capture of the pumping wells, and that recharge is occuring from the Connecticut River. In addition, flow lines indicate that ground water pumped by CECRL03 may not include ground water from beneath CRREL AOCs,

explaining the absence of contamination in this well. Similar ground water flow patterns may exist at the Hanover well.

Hydraulic conductivity testing was not performed during the RI, however, it is likely that the conductivity of the esker sediments is several orders of magnitude higher than the conductivity of both the finer grained lake sediments and fractured bedrock. A large percentage of ground water recharge for the production wells is likely to occur within the area of higher conductivity created by the esker sediments, which are situated between the possible bedrock high to the west, and lake sediments to the east. A prime location for recharge to the esker from the river is approximately 3,000 feet north of the pumping wells where the esker intersects the river channel.

The soil gas survey revealed the presence of TCE, PCE, BTX, and fuel oil character anomalies throughout the site, with many positive anomalies being identified as known AOCs. Soil samples analyzed during the RI also indicate the presence of soil contamination in the vicinity of several AOCs. The majority of soil contamination encountered was TCE, although petroleum-related contamination was found at one sampling location. Results of surface water and sediment sampling revealed TCE contamination in only the surface water sample collected at the CRREL outfall.

VOCs, primarily TCE, were detected in all wells sampled during the RI at levels exceeding Federal and State drinking water standards, with the exception of CECRL03 and the Hanover municipal well, which were free of VOC contamination (below detection levels). This includes TCE detected in the hydraulically upgradient well. The highest TCE concentration detected was 212,000 ppb in monitoring well CECRL09.

AOCs at CRREL have been prioritized based on data gathered during the RI, with AOC 1, AOC 2, AOC 9, and AOC 13 being considered the primary sources of TCE contamination at CRREL. TCE releases may have occurred at several other AOCs; however, their overall contribution to TCE ground water contamination is probably minimal. Releases of petroleum-related contamination have also occurred at several of the AOCs. However, these compounds were detected in ground water only from monitoring well CECRL11. This suggests that AOC 13 may be the sole source of petroleum-related ground water contamination at CRREL, and that other contamination of this type is limited to soils. Due to the close proximity of the four TCE-related AOCs, and their alignment with respect to probable ground water flow patterns, these AOCs may create a single contamination plume beneath CRREL.

The fate of TCE in the subsurface at CRREL depends on the amount of TCE that was released, as well as overburden composition and ground water conditions. Small spills of TCE in the fine-grained soils at CRREL may not have exceeded the retention capacity of the soils, remaining as residual material within the unsaturated soil pores. Precipitation and percolation through these contaminated soils will then move the contamination in solution down to the water table, where it flows with

the ground water. The presence of a thick section of fine-grained sediments above the ground water table at the site may have facilitated the retention of TCE in contaminated soils. Larger TCE releases may have exceeded the retention capacity of both the unsaturated and saturated sediments, allowing a free phase of liquid to sink to bedrock where it would migrate to bedrock lows or be intercepted by bedrock fractures. If such a release has occurred, the possibility of contaminant migration through bedrock is greatly increased.

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New Hampshire Department of Environmental Services
Proposed Ambient Ground Water Quality Standards

APPENDIX A

A.D. LITTLE ANALYTICAL METHODS

A.D. LITTLE ANALYTICAL METHODS

SUMMARY

Table	Method
A-1	SB03
A-2	TT08
A-3	SD24
A-4	UG05
A-5	UM16
A-6	UM17
A-7	UP04
A-8	LM16
A-9	UM33

Table A-1

USATHAMA CERTIFICATION DATABASE FOR ARTHUR D. LITTLE
(Received 16 May 1991)

Method Number	Method Name	Matrix	Units	STDCODE	Hold Time	Hold Times		Certification	
						Prep	Extract	Level	Date
SB03	Metals/Water/CVAA	WA	UGL	N	28	0	0	C1	04/10/87

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
Mercury	0.566000	10.0000	Y	2.0000	8.0000	N	0.0000	1.02

RC507

Source: A.D. Little

Table A-2

USATHAMA CERTIFICATION DATABASE FOR ARTHUR D. LITTLE
(Received 16 May 1991)

Method Number	Method Name	Matrix	Units	STDCODE	Hold Time	Hold Times		Certification	
						Prep	Extract	Level	Date
TT08	Anions/Water/IC	WA	UGL	N	28	0	0	C1	01/04/89

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
Nitrite	28.300000	1000.0000	Y	50.0000	750.0000	N	0.0000	.998
Nitrate	24.300000	200.0000	Y	50.0000	150.0000	N	0.0000	.906
Sulfate	137.000000	5000.0000	Y	200.0000	4000.0000	Y	800.0000	.937

RC507

Source: A.D. Little

Table A-3

USATHAMA CERTIFICATION DATABASE FOR ARTHUR D. LITTLE
(Received 16 May 1991)

Method Number	Method Name	Matrix	Units	STDCODE	Hold Time	Hold Times		Certification	
						Prep	Extract	Level	Date
SD24	Metals/Water/GFAA	WA	UGL	N	180	0	0	C1	01/30/89

Analyte	*Certified* Reporting Limit	*Upper* Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
Arsenic	3.090000	20.0000	Y	2.0000	7.5000	N	0.0000	1.12
Lead	4.740000	40.0000	Y	10.0000	30.0000	N	0.0000	.875

RC507

Source: A.D. Little

Table A-4

USATHAMA CERTIFICATION DATABASE FOR ARTHUR D. LITTLE
(Received 16 May 1991)

Method Number	Method Name	Matrix	Units	STDCODE	Hold Time	Hold Times		Certification	
						Prep	Extract	Level	Date
UG05	Halocarbons/Water/GCCON	WA	UGL	N	14	0	0	C1	07/01/88

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
1,1,1-Trichloroethane	0.179000	1.9800	Y	0.5000	1.5000	N	0.0000	1.09
1,1,2-Trichloroethane	0.066000	2.0000	N	0.0000	0.0000	N	0.0000	.934
1,1-Dichloroethene	0.170000	1.9800	Y	0.5000	3.0000	N	0.0000	.973
1,2-Dichlorobenzene	0.548000	3.9700	N	0.0000	0.0000	N	0.0000	1.01
1,2-Dichloroethane	0.269000	2.0100	N	0.0000	0.0000	N	0.0000	1.10
1,3-Dichlorobenzene	0.235000	4.0200	Y	0.5000	3.0000	N	0.0000	.969

RC507

Source: A.D. Little

Table A-4 (Cont.) - Method UG05

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
1,4-Dichlorobenzene	0.394000	3.9700	N	0.0000	0.0000	N	0.0000	.999
Vinyl Chloride (Chloroethene)	0.460000	10.0000	Y	0.7000	7.5000	N	0.0000	1.15
Chloroform	0.727000	2.0000	N	0.0000	0.0000	N	0.0000	1.20
trans-1,2-Dichloroethene	0.667000	4.0000	N	0.0000	0.0000	N	0.0000	.999
Tetrachloroethylene	0.030000	1.0000	N	0.0000	0.0000	N	0.0000	1.05
Trichloroethylene	0.366000	1.9900	Y	0.6000	1.5000	N	0.0000	1.07

RC507

Source: A.D. Little

Table A-5

USATHAMA CERTIFICATION DATABASE FOR ARTHUR D. LITTLE
(Received 16 May 1991)

Method Number	Method Name	Matrix	Units	STDCODE	Hold Time	Hold Times		Certification	
						Prep	Extract	Level	Date
UM16	Organics/Water/GCMS	WA	UGL	Y	0	7	40	1A	03/15/88

Analyte	*Certified* Reporting Limit	*Upper* Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
1,2,3-Trichlorobenzene	3.600000	200.0000	N	0.0000	0.0000	N	0.0000	.597
1,2,4-Trichlorobenzene	2.800000	200.0000	N	0.0000	0.0000	N	0.0000	.620
1,2-Dichlorobenzene	10.000000	100.0000	N	0.0000	0.0000	N	0.0000	.582
1,3-Dichlorobenzene	8.500000	100.0000	N	0.0000	0.0000	N	0.0000	.537
1,4-Dichlorobenzene	4.400000	100.0000	N	0.0000	0.0000	N	0.0000	.559
2,4-Dinitrotoluene	5.500000	200.0000	N	0.0000	0.0000	N	0.0000	.929

RC507

Source: A.D. Little

Table A-5 (Cont.) - Method UM16

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
2,6-Dinitrotoluene	6.600000	200.0000	N	0.0000	0.0000	N	0.0000	.854
2-Chloronaphthalene	9.600000	100.0000	N	0.0000	0.0000	N	0.0000	.688
alpha-Benzenehexachloride (alpha-Hexachlorocyclohexane)	6.800000	100.0000	N	0.0000	0.0000	N	0.0000	.789
Aldrin	12.000000	100.0000	N	0.0000	0.0000	N	0.0000	.719
Acenaphthene	14.000000	100.0000	N	0.0000	0.0000	N	0.0000	.667
Acenaphthylene	19.000000	100.0000	N	0.0000	0.0000	N	0.0000	.607
Anthracene	20.000000	100.0000	N	0.0000	0.0000	N	0.0000	.572
Bis (2-chloroethyl)ether	8.100000	100.0000	N	0.0000	0.0000	N	0.0000	.672
Bis (2-ethylhexyl)phthalate	32.000000	200.0000	N	0.0000	0.0000	N	0.0000	.628
Benzo[A]anthracene	14.000000	100.0000	N	0.0000	0.0000	N	0.0000	.704
Benzo[A]pyrene	10.000000	100.0000	N	0.0000	0.0000	N	0.0000	.690
Benzo[B]fluoranthene	23.000000	100.0000	N	0.0000	0.0000	N	0.0000	.765
Beta-benzenehexachloride (beta-Hexachlorocyclohexane)	4.900000	100.0000	N	0.0000	0.0000	N	0.0000	.976
Benzo[G,H,I]perylene	7.100000	100.0000	N	0.0000	0.0000	N	0.0000	.813
Benzo[K]fluoranthene	21.000000	100.0000	N	0.0000	0.0000	N	0.0000	.536

Source: A.D. Little

RC507

Table A-5 (Cont.) - Method UM16

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
Chrysene	15.000000	100.0000	N	0.0000	0.0000	N	0.0000	.639
Hexachlorobenzene	8.300000	200.0000	N	0.0000	0.0000	N	0.0000	.693
Hexachloroethane	5.100000	200.0000	N	0.0000	0.0000	N	0.0000	.470
p-Chlorophenylmethyl Sulfide	5.900000	100.0000	N	0.0000	0.0000	N	0.0000	.732
p-Chlorophenylmethyl Sulfoxide	6.800000	200.0000	N	0.0000	0.0000	N	0.0000	.863
p-Chlorophenylmethyl Sulfane	38.000000	100.0000	N	0.0000	0.0000	N	0.0000	.733
Dibenz]A,H]anthracene	7.500000	100.0000	N	0.0000	0.0000	N	0.0000	.965
Delta-Benzenehexachloride/ delta-Hexachlorocyclohexane	6.400000	100.0000	N	0.0000	0.0000	N	0.0000	.965
Diethyl phthalate	13.000000	100.0000	Y	0.0000	1.0000	N	0.0000	.730
Dithiane	7.700000	100.0000	N	0.0000	0.0000	N	0.0000	.678
Dieldrin	11.000000	100.0000	N	0.0000	0.0000	N	0.0000	.745
Di-N-octyl-phthalate	15.000000	100.0000	N	0.0000	0.0000	N	0.0000	.653
Endrin	6.600000	200.0000	N	0.0000	0.0000	N	0.0000	1.00
Fluoranthene	20.000000	100.0000	N	0.0000	0.0000	N	0.0000	.647
Hexachlorobutadiene	18.000000	100.0000	N	0.0000	0.0000	N	0.0000	.607

Source: A.D. Little

RC507

Table A-5 (Cont.) - Method UM16

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Exterded Range		Accuracy
				Low	High	(Y/N)	Level	
Heptachlor	6.200000	100.0000	N	0.0000	0.0000	N	0.0000	.804
Heptachlor Epoxide	7.200000	200.0000	N	0.0000	0.0000	N	0.0000	.870
Ideno [1,2,3-C,D]pyrene	7.200000	100.0000	N	0.0000	0.0000	N	0.0000	1.04
Lindane/gamma-Benzene hexachloride/ gamma-Hexachlorocyclohexane	5.800000	200.0000	N	0.0000	0.0000	N	0.0000	.799
Malathion	7.300000	200.0000	N	0.0000	0.0000	N	0.0000	.805
Naphthalene	17.000000	100.0000	N	0.0000	0.0000	N	0.0000	.605
Nitrobenzene	5.600000	100.0000	Y	0.0000	1.0000	N	0.0000	.731
Nitrosodi-N-propylamine	4.500000	100.0000	N	0.0000	0.0000	N	0.0000	.726
1,4-Oxathiane	9.100000	100.0000	N	0.0000	0.0000	N	0.0000	.627
Phenanthrene	22.000000	100.0000	N	0.0000	0.0000	N	0.0000	.593
2,2-Bis(p-chlorophenyl)-1,1-dichloroethane	9.700000	200.0000	N	0.0000	0.0000	N	0.0000	.690
2,2-Bix(p-chlorophenyl)-1,1-dichloroethene	9.300000	200.0000	N	0.0000	0.0000	N	0.0000	.735
2,2-Bix(p-chlorophenyl)-1,1-trichloroethane	7.300000	200.0000	N	0.0000	0.0000	N	0.0000	.754
Parathion	4.700000	200.0000	N	0.0000	0.0000	N	0.0000	.999
Pyrene	17.000000	100.0000	N	0.0000	0.0000	N	0.0000	.636

RC507

Source: A.D. Little

Table A-6

USATHAMA CERTIFICATION DATABASE FOR ARTHUR D. LITTLE
(Received 16 May 1991)

Method Number	Method Name	Matrix	Units	STDCODE	Hold Time	Hold Times		Certification	
						Prep	Extract	Level	Date
UM17	Volatiles/Water/GCMS	WA	UGL	Y	14	0	0	1A	03/15/88

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
1,1,1-Trichloroethane	4.100000	200.000	N	0.0000	0.0000	N	0.0000	.911
1,1,2-Trichloroethane	17.000000	200.000	N	0.0000	0.0000	N	0.0000	.913
1,1-Dichloroethylene/ 1,1-Dichloroethene	18.000000	200.000	N	0.0000	0.0000	N	0.0000	1.12
1,2-Dichloroethenes/ 1,2-Dichloroethylenes (cis and transisomers)	1.100000	200.000	N	0.0000	0.0000	N	0.0000	1.01
1,2-Dichlorobenzene	9.700000	200.000	N	0.0000	0.0000	N	0.0000	.922

RC507

Source: A.D. Little

Table A-6 (Cont.) - Method UM17

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
1,2-Dichloroethane	7.600000	200.000	N	0.0000	0.0000	N	0.0000	1.10
1,2-Dichloropropane	2.800000	200.000	N	0.0000	0.0000	N	0.0000	1.00
1,3-Dichlorobenzene	9.200000	200.000	N	0.0000	0.0000	N	0.0000	.942
1,3-Dichloropropane	3.800000	200.000	N	0.0000	0.0000	N	0.0000	.989
1,4-Dichlorobenzene	8.100000	200.000	N	0.0000	0.0000	N	0.0000	.889
(2-Chloroethoxy)ethene/ 2-Chloroethylvinyl ether	82.000000	200.000	N	0.0000	0.0000	N	0.0000	.933
Bromodichloromethane	7.900000	200.000	N	0.0000	0.0000	N	0.0000	1.05
Chloroethene/Vinyl Chloride	2.900000	200.000	N	0.0000	0.0000	N	0.0000	1.21
Chloroethane	5.000000	200.000	N	0.0000	0.0000	N	0.0000	1.26
Benzene	2.400000	200.000	N	0.0000	0.0000	N	0.0000	1.02
Carbon Tetrachloride	5.600000	200.000	N	0.0000	0.0000	N	0.0000	.947
Methylene Chloride	5.400000	200.000	N	0.0000	0.0000	N	0.0000	1.02
Chloromethane	1.600000	200.000	N	0.0000	0.0000	N	0.0000	1.48
Bromoform	8.200000	200.000	N	0.0000	0.0000	N	0.0000	.846
Chloroform	0.830000	200.000	N	0.0000	0.0000	N	0.0000	.994

RC507

Source: A.D. Little

Table A-6 (Cont.) - Method UM17

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
Chlorobenzene	1.400000	200.000	N	0.0000	0.0000	N	0.0000	.980
Dibromochloromethane	6.500000	200.000	N	0.0000	0.0000	N	0.0000	.916
Ethylbenzene	9.300000	200.000	N	0.0000	0.0000	N	0.0000	.968
Toluene	8.700000	200.000	N	0.0000	0.0000	N	0.0000	1.08
1,1,2,2-Tetrachloroethane	4.700000	200.000	N	0.0000	0.0000	N	0.0000	.949
Tetrachloroethylene	2.700000	200.000	N	0.0000	0.0000	N	0.0000	.990
Trichloroelthylene/ Trichloroethene	7.000000	200.000	N	0.0000	0.0000	N	0.0000	1.06

RC507

Source: A.D. Little

Table A-7

USATHAMA CERTIFICATION DATABASE FOR ARTHUR D. LITTLE
(Received 16 May 1991)

Method Number	Method Name	Matrix	Units	STDCODE	Hold Time	Hold Times		Certification	
						Prep	Extract	Level	Date
UP04	Aromatics/Water/GCPID	WA	UGL	Y	14	0	0	1A	10/31/88

Analyte	Certified Reporting Limit	Upper Reporting Limit	QC Chart	Spiking Levels		Extended Range		Accuracy
				Low	High	(Y/N)	Level	
1,2-Dichlorobenzene	0.167000	3.9700	Y	0.3000	3.0000	N	0.0000	1.09
1,4-Dichlorobenzene	0.215000	4.0800	Y	0.3000	3.0000	N	0.0000	1.04
Benzene	0.128000	3.9800	Y	0.3000	3.0000	N	0.0000	1.07
Toluene	0.362000	3.9900	Y	0.7000	3.0000	N	0.0000	1.06

RC507

Source: A.D. Little

APPENDIX B

GEOPHYSICAL CONTOUR MAPS

GEOPHYSICAL SURVEY

Two subsurface geophysical survey methods were applied at the site; total earth field magnetics and electromagnetic ground conductivity. Five geophysical grid systems were established in selected areas at CRREL. Grids No. 1, 2, and 3 were established adjacent to each other in the vicinity of the ice well, located west of the Main Laboratory building. Grid No. 4 was established adjacent to the north end of the Main Laboratory building in the vicinity of the former TCE underground storage tank. Grid No. 5 was established near the FERF building, between the pump houses for CRREL production wells CECRL01 and CECRL02. Data were collected at 10-foot intervals within each of the grid areas. The results of the geophysical survey are discussed in Section 6.1.1.

Total Earth Field Magnetics

Total earth field magnetic data were collected with an EG&G Geometrics G-856 proton magnetometer. This instrument measures the intensity of the earth's magnetic field approximately nine feet above the terrain at each collection point. Subtle variations in this field may be caused by the natural distribution of iron oxides within the soil and rock. More significant changes in the magnetic field intensity are caused by the presence of buried objects composed of steel, iron, or other ferrous alloys. The response of the magnetometer is a function of the object's depth and mass.

All magnetic data were stored directly in the memory of the G-856 magnetometer. At each location, the G-856 stored the magnetic field strength, time, station number, and assigned survey line number. The data were downloaded into an IBM compatible computer using the software package MAGPAC, Version 4.1.5, by EG&G Geometrics. MAGPAC corrects field data for diurnal drift and then converts these data to a form suitable for contouring. The corrected data were then plotted and contoured using the software package SURFER, Version 4.10, by Golden Software, Inc.

Electromagnetic Ground Conductivity

The electromagnetic investigation was performed using a Geonics EM-31 terrain conductivity meter equipped with an Omni Data Logger Model 516GE-64-A. When in the vertical dipole configuration, this instrument provides a composite conductivity value for all subsurface materials to a depth of approximately 20 feet. By rotating the instrument 90 degrees, the transmitter and receiver dipoles become horizontal, and the approximate depth of investigation is reduced to 10 feet. In the horizontal dipole position, the instrument is more sensitive to shallow subsurface features. At each data point, a measurement was obtained in both the vertical and horizontal modes.

At each data point, the data logger stores the magnitude of the ground conductivity, and the x and y coordinates of that location for both the vertical and horizontal dipole modes. These data were then downloaded into an IBM compatible computer using the software package DAT31, Version 2.03, by Geonics, Limited. DAT31 converts the field data into a form suitable for contouring. These adjusted data were then plotted and contoured using SURFER Version 4.10 by Golden Software, Inc. Ground conductivity maps were generated for both the vertical and horizontal dipole modes.

Geophysical Survey Results

Data points are designated by the horizontal coordinate, followed by the vertical coordinate, which are enclosed in brackets.

Grid 1

An anomaly, located at data point [40, 80] on both the vertical dipole ground conductivity and magnetometer contour maps, is caused by the underground fuel oil storage tank at the Facilities Engineering building. A strong anomaly, occurring on all three maps at data point [120, 80], is attributable to a power pole at this location. Anomalies on all three maps, along the western edge of the grid, are caused by a concentration of buried utilities shown on CRREL base maps. A somewhat linear anomaly occurs on the vertical dipole ground conductivity map, trending northwest-southeast across the southwest portion of the grid. This is likely caused by a town water line that is indicated on CRREL maps in a similar orientation. Other smaller anomalies seen on the magnetic contour maps are attributable to surface features such as fire hydrants and metal pipes.

Grid 2

The strong anomaly seen on all three maps at data point [150, 40] is caused by a corrugated metal building that encloses the ice well. A weaker anomaly, occurring on all three maps just north of the ice well at data point [130, 70], is slightly elongated in the east-west direction. This anomaly is caused by either the CRREL refrigeration reservoir or a municipal water line, both of which are located in this area, and have east-west orientations. A strong anomaly, occurring at data point [70, 10] on both the magnetic and horizontal dipole conductivity maps, is due to a metal bicycle rack and other metal structures at the south end of the enclosed "swimming pool" structure. The contour gradient occurring on all three maps along the western edge of the grid is probably due to the Logistics and Supply building located just west of the grid.

Grid 3

A strong magnetic contour gradient trending northwest-southeast defines the edge of several metal-sided buildings, and two above ground storage tanks. In a similar manner, the sharp magnetic gradient along the southern edge of the grid is due to metal trash dumpsters. Ground conductivity anomalies occurring in these areas are also caused by this surficial interference. Conductivity anomalies along the western edge of the grid are attributable to the ice well, refrigeration reservoir, and possibly a shallow copper pipe buried in a north-south orientation at this location.

Grid 4

The strong magnetic anomaly, occurring along the southern edge of the grid, is due to metal stairs at the north end of the Main Laboratory building. The magnetic anomalies at datapoints [90,0] and [110,0] are probably caused by electrical utilities located both underground, and just inside the Main Laboratory, at this location. The small anomaly, at data point [60, 10] on the vertical dipole conductivity map, corresponds to a iron storm sewer drain cover. Ground conductivity-contour gradients, occurring along the southern edge of the grid, are attributable to the Main Laboratory building located just south of the grid. Gradients along the western edge are likely caused by parked automobiles. An anomaly, occurring near data point [120, 20] on all three contour maps, is not easily attributed and may be related to the former USTs located in this area. This area may warrant further investigation.

Grid 5

Anomalies occur on all three maps in the southwest corner of the gird. These are due to metal drums and pipe stored on the ground surface in this area. Another anomaly, located at data point [40, 140] on all maps, is attributable to a corrugated metal building located directly to the north. The intense magnetic anomaly, occurring at data point [150, 130], is caused by a large metal dumpster. A north-south trending ground conductivity anomaly, located along the eastern edge of the grid, is attributed to a sanitary sewer line. A weak linear anomaly occurring on all three maps, trends northeast-southwest from data point [70, 10] to data point [120, 30]. This anomaly is not easily attributable to surface interference or underground utilities, and may warrant further investigation. The strong ground conductivity anomaly occurring at data point [30, 100] is due to a metal light pole at this location.

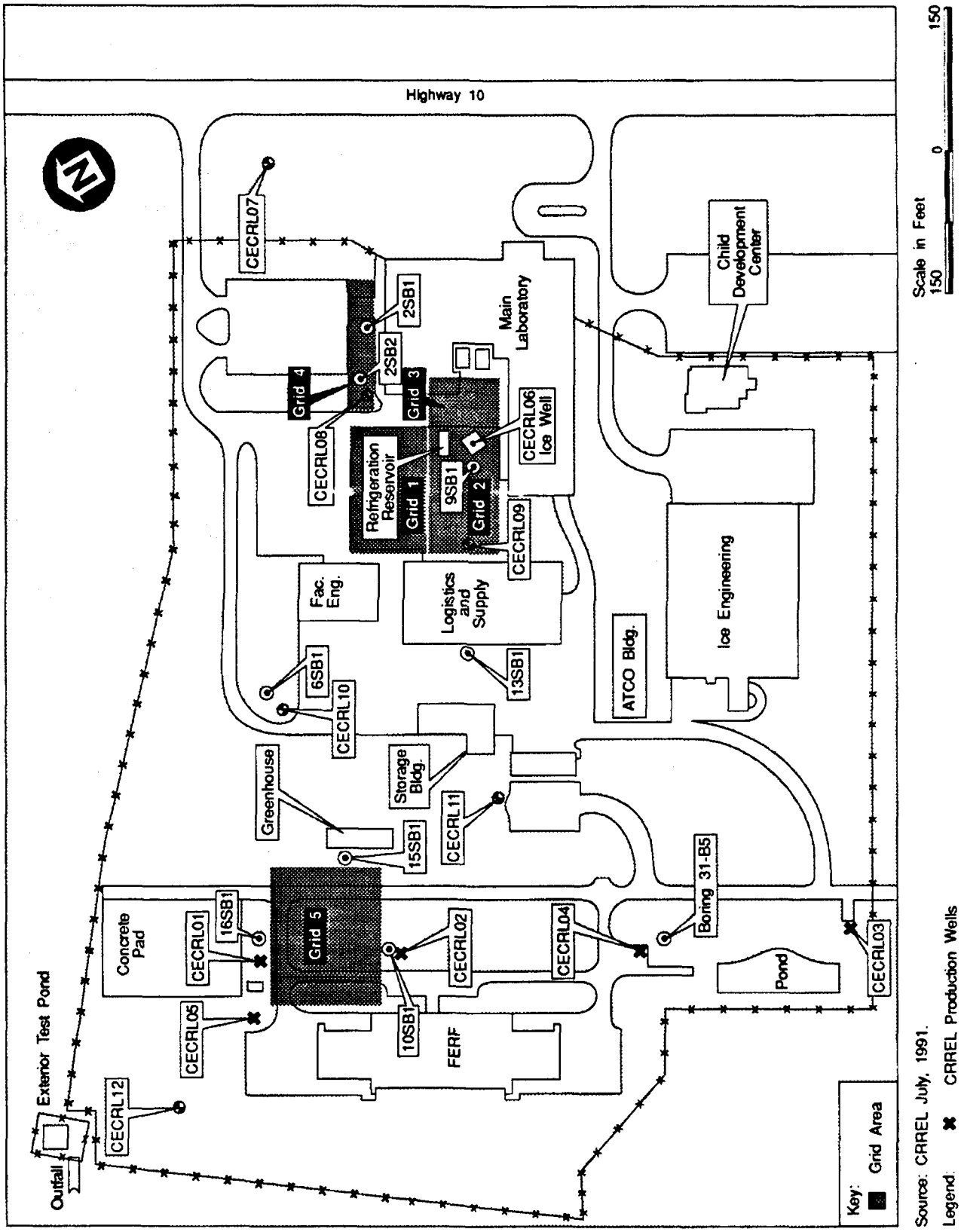
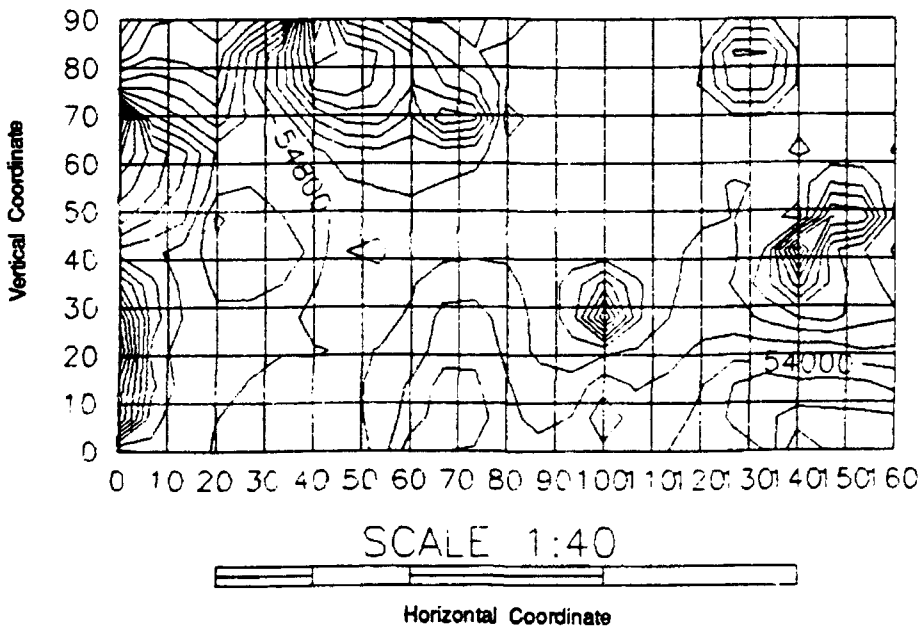
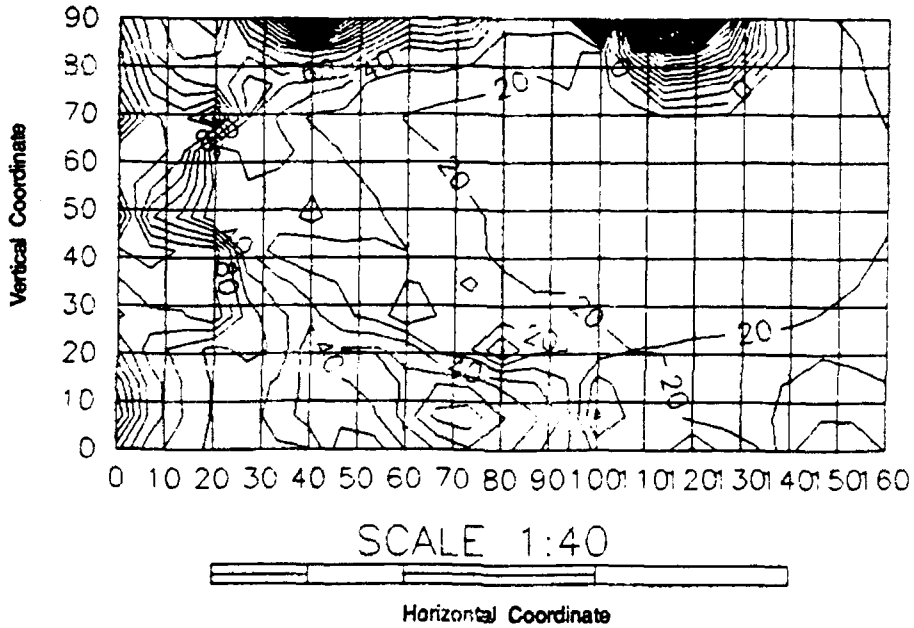


Figure B-1 CRREL GEOPHYSICAL GRID AREAS



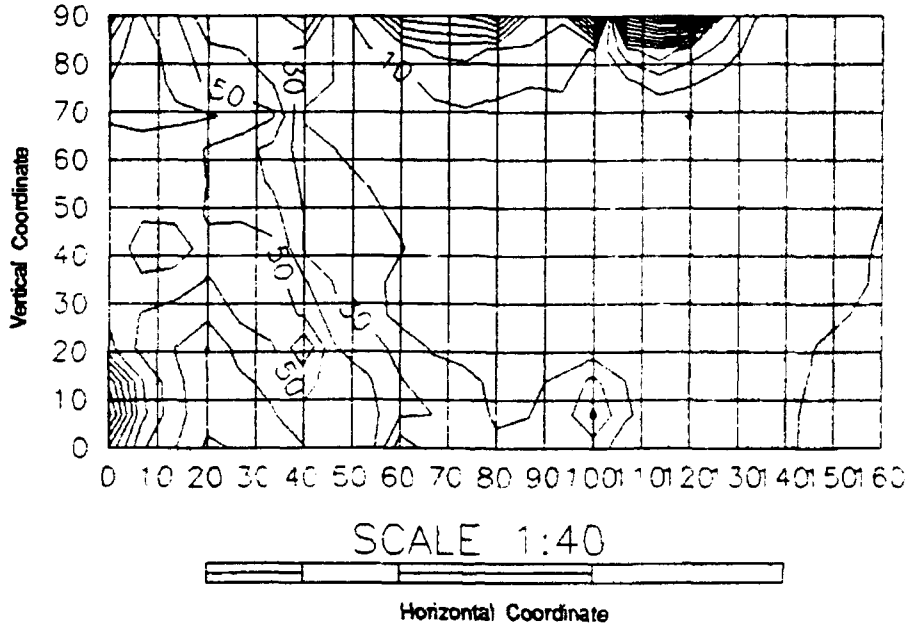
Source: E & E, 1992.
C.I. = 400 gammas

Figure B-2 GRID 1: MAGNETIC CONTOUR MAP



Source: E & E, 1992.
C.I. = 10 mS/meter

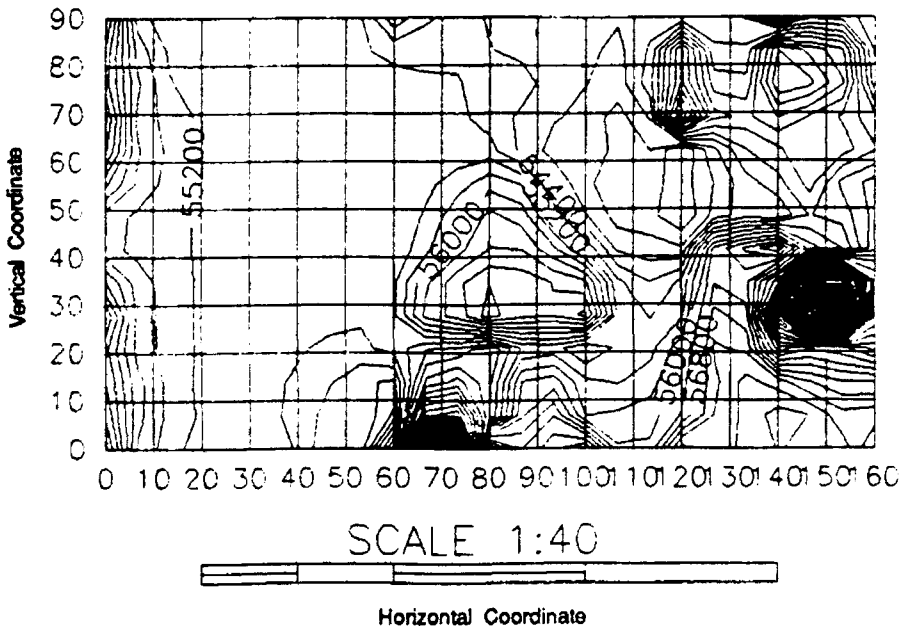
Figure B-3 GRID 1: GROUND CONDUCTIVITY CONTOUR MAP - VERTICAL DIPOLE



Source: E & E, 1992.
C.I. = 10 mS/meter

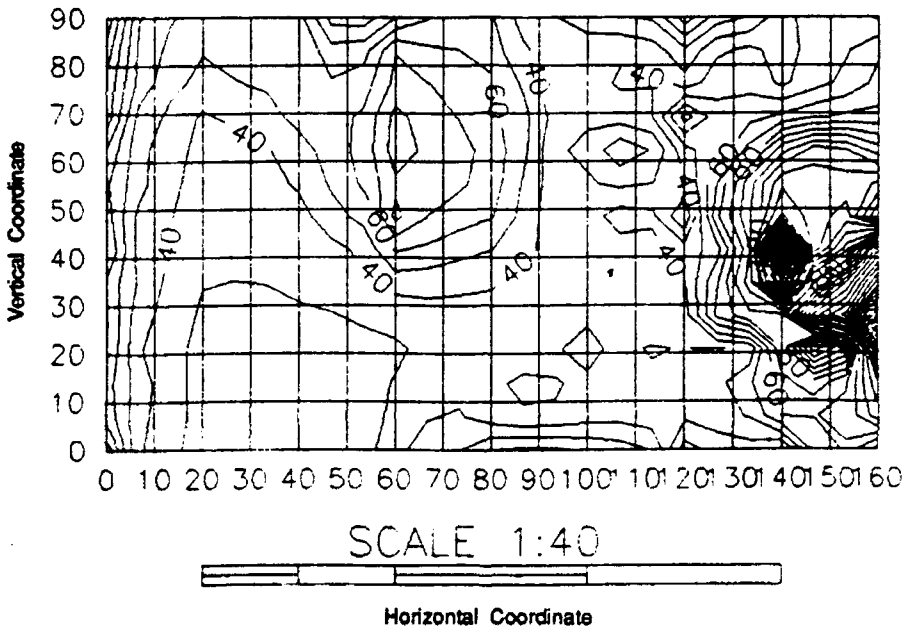
Figure B-4 GRID 1: GROUND CONDUCTIVITY CONTOUR MAP - HORIZONTAL DIPOLE

00441D.CDR



Source: E & E, 1992.
C.I. = 400 gammas

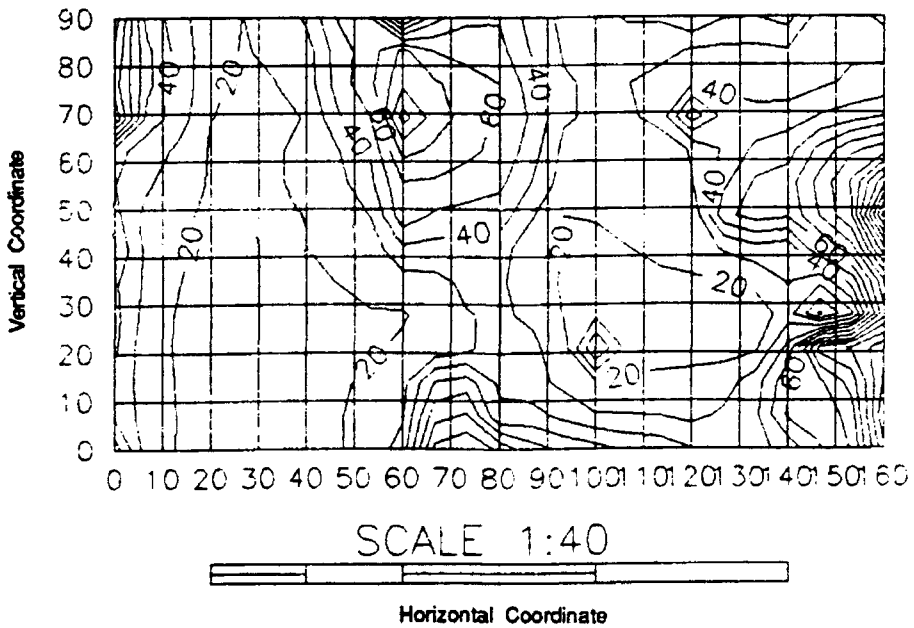
Figure B-5 GRID 2: MAGNETIC CONTOUR MAP



Source: E & E, 1992.
C.I. = 10 mS/meter

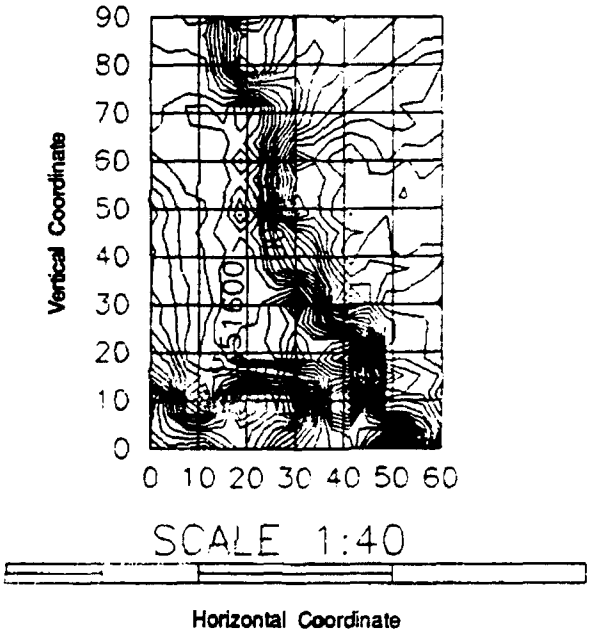
Figure B-6 GRID 2: GROUND CONDUCTIVITY CONTOUR MAP - VERTICAL DIPOLE

00441.CDR



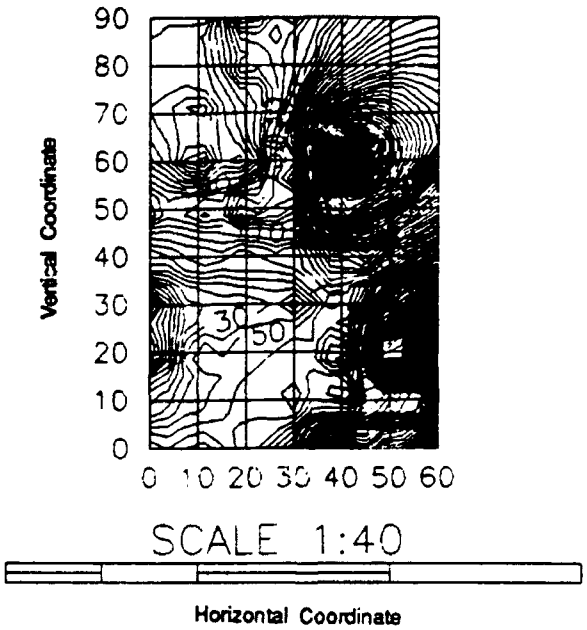
Source: E & E, 1992.
C.I. = 10 mS/meter

Figure B-7 GRID 2: GROUND CONDUCTIVITY CONTOUR MAP - HORIZONTAL DIPOLE



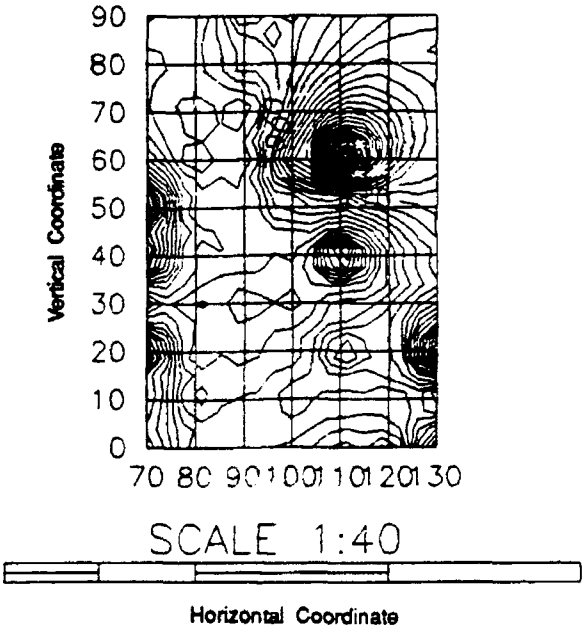
Source: E & E, 1992.
C.I. = 400 gammas

Figure B-8 GRID 3: MAGNETIC CONTOUR MAP



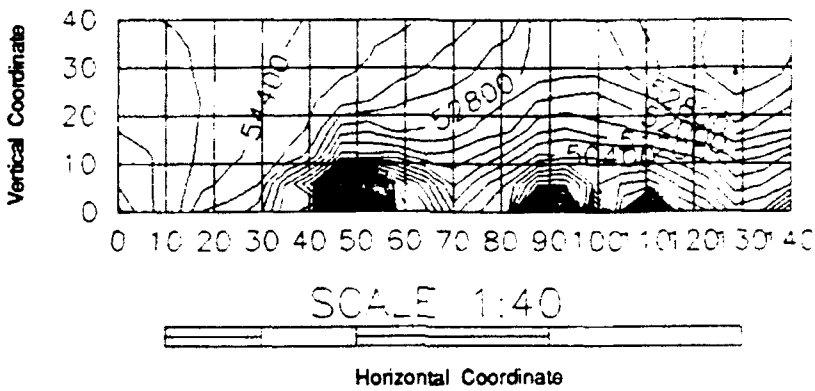
Source: E & E, 1992.
C.I. = 10 mS/meter

Figure B-9 GRID 3: GROUND CONDUCTIVITY CONTOUR MAP - VERTICAL DIPOLE



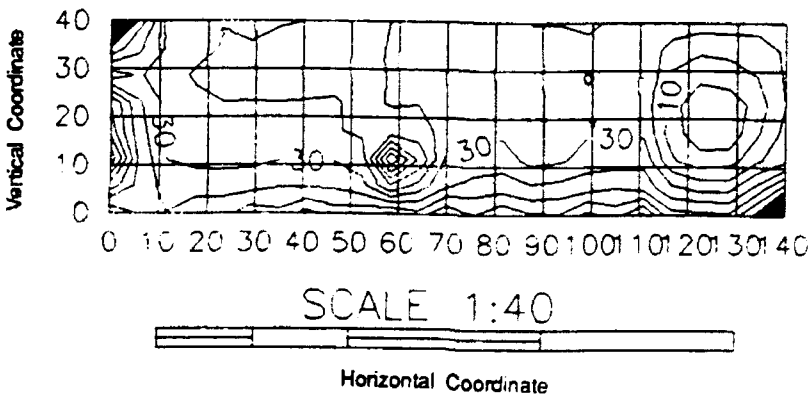
Source: E & E, 1992.
C.I. = 10 mS/meter

Figure B-10 GRID 3: GROUND CONDUCTIVITY CONTOUR MAP - HORIZONTAL DIPOLE



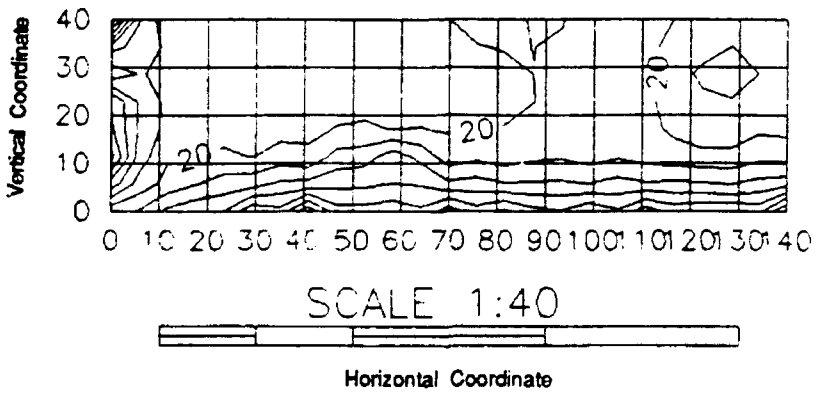
Source: E & E, 1992.
C.I. = 400 gammas

Figure B-11 GRID 4: MAGNETIC CONTOUR MAP



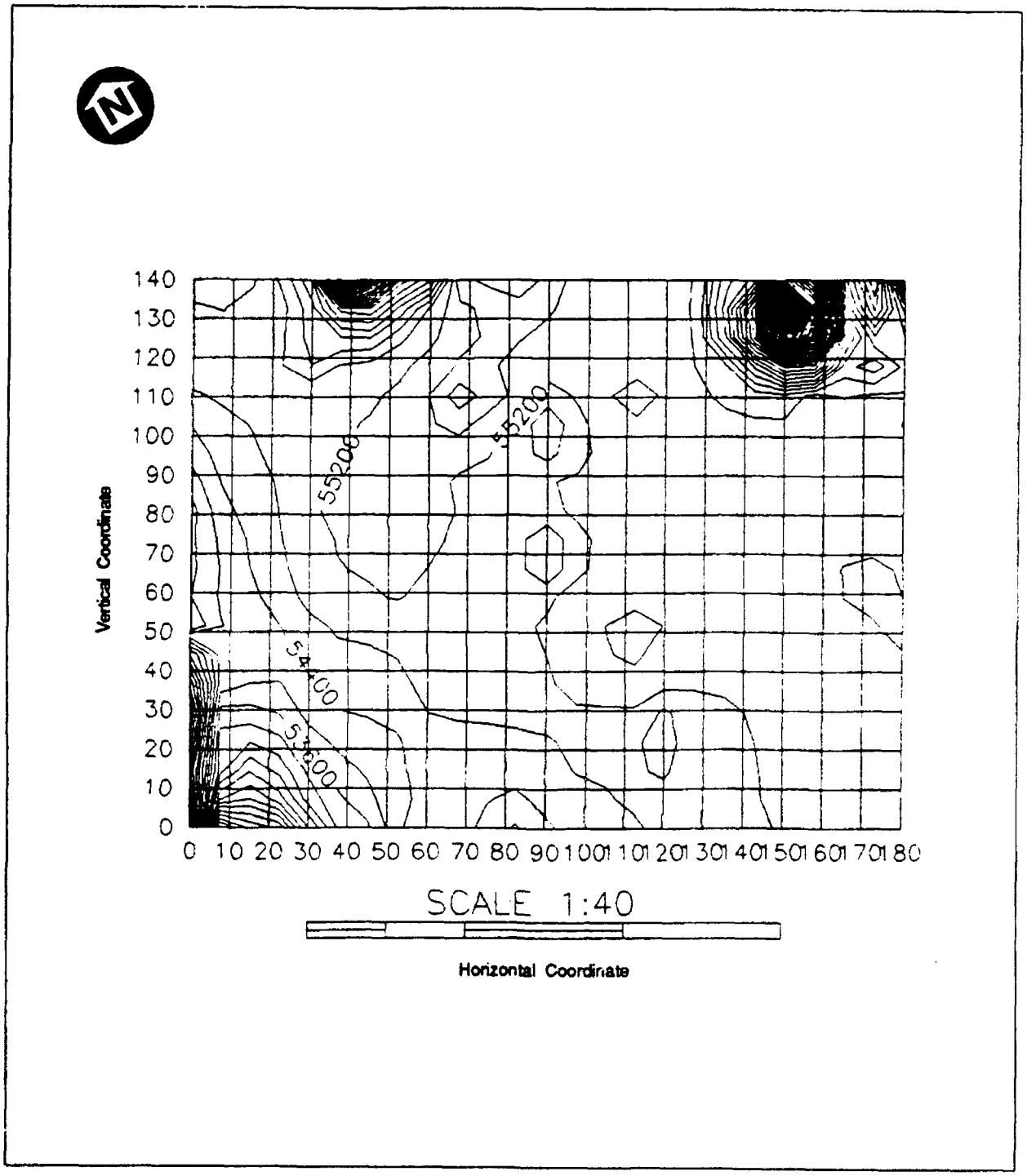
Source: E & E, 1992.
C.I. = 10 mS/meter

Figure B-12 GRID 4: GROUND CONDUCTIVITY CONTOUR MAP - VERTICAL DIPOLE



Source: E & E, 1992.
C.I. = 10 mS/meter

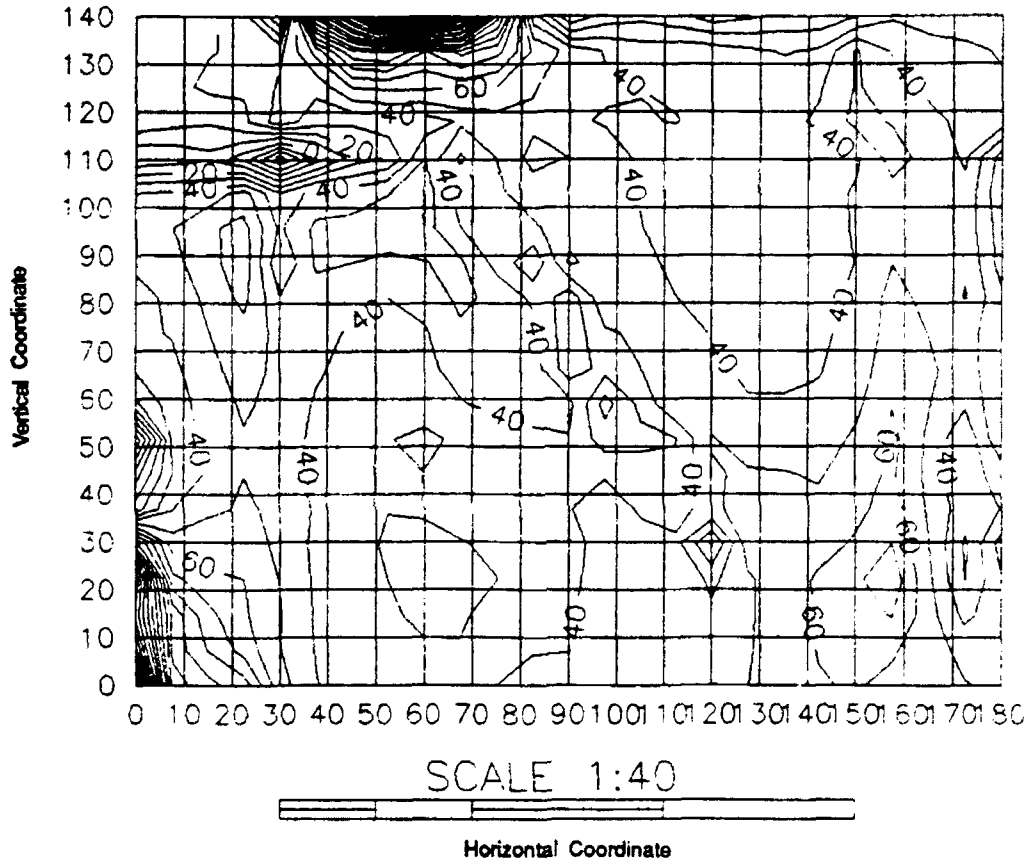
Figure B-13 GRID 4: GROUND CONDUCTIVITY CONTOUR MAP - HORIZONTAL DIPOLE



Source: E & E, 1992.
C.I. = 400 gammas

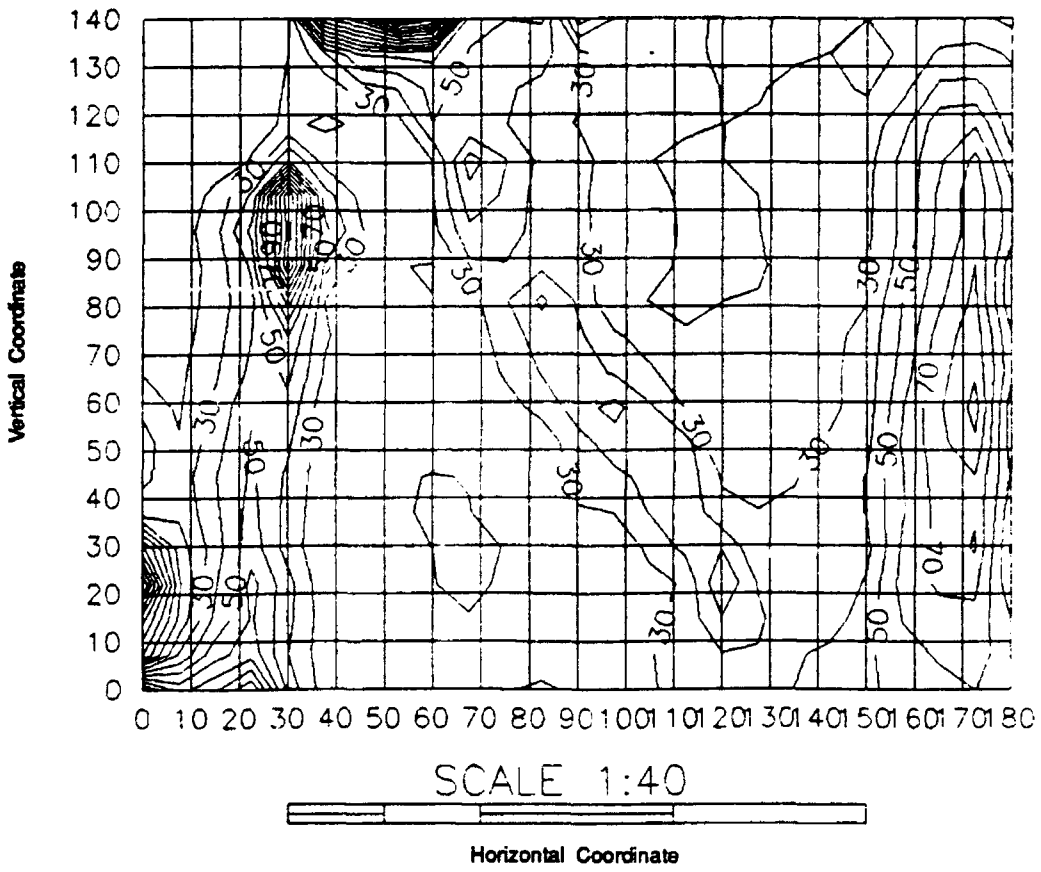
Figure B-14 GRID 5: MAGNETIC CONTOUR MAP

00441Q.CDR



Source: E & E, 1992.
C.I. = 10 mS/meter

Figure B-15 GRID 5: GROUND CONDUCTIVITY CONTOUR MAP - VERTICAL DIPOLE



Source: E & E, 1992.
C.I. = 10 mS/meter

Figure B-16 GRID 5: GROUND CONDUCTIVITY CONTOUR MAP - HORIZONTAL DIPOLE

00441S.CDR

APPENDIX C

SOIL BORING LOGS

BORING LOG GENERAL DATA
Borehole Number: 25B1
Page: 1 of 6
Signature: [illegible]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

BORING LOG GENERAL DATA

Project: CRREL Boring: 25B1 Page: 1 of 6

Driller & Company: MARK PRUEHER WTD ENVIRONMENTAL

Geologist/Logger & Company: JOHN PECK E+E INC. Signature: [illegible]

Date Boring Started: 1/18/92 Completed: 1/18/92

Water Levels (from Ground Surface) Drilling Rig:

First Encountered: Dry boring Date: 1/18/92

While Drilling: Dry boring Date: 1/18/92

At Boring Completion: Dry Boring Date: 1/18/92

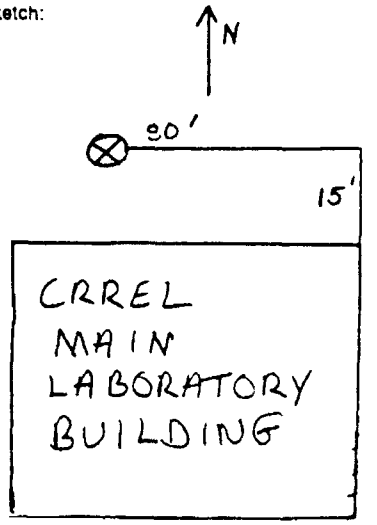
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
1/18/92	09:45	16:45	0'	45'					

Abbreviations:

Abbr.	Meaning
R	Recovery
A	ANALYTICAL SAMPLE TAKEN
HNU	HNU MODEL 101 PHOTOIONIZER (ppm)
PID	PHOTOIONIZATION DETECTOR (ppm)
S	Sample
2X	2"x2' SPLIT SPOON
2.5X	2.5'x2' SPLIT SPOON
3X	3"x2' SPLIT SPOON
(3X)	3"x1.5' SPLIT SPOON

Location Sketch:



usagnoat.pm4

32

BORING LOG GENERAL DATA
Borehole Number: 25B1
Page: 2 of 6
Signature: [illegible]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL
Boring: 25B1
Page: 2 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
0		GROUND SURFACE			
		Asphalt and GRAVEL	11:05		Note: 1) All samples driven by 140lb hammer with 30" FreeFall
		FILL (SAND AND GRAVEL) HNU=0 PID=0	S#1	80 / 100/.1	2) All depths & recoveries in Feet
2			3"	R-.5'	3) Depths From ground surface
		COPPER WIRE + DEBRIS (CONCRETE) HNU=0 PID=0	11:30 / S#2	4 / 6 / 3 / 3	4) Samples driven inside 6¼" hollow stem auger
	SP		2.5"	R-.25'	
4		SAND FILL DRY HNU=1.5 PID=3	11:45 / S#3	3 / 4 / 4 / 5	Note 0'
		5Y 6/4	2"	R-.6'	1) Boring placed through asphalt
6		SAND FILL W/ SILT AND GRAVEL PID=5 HNU=1	11:56 / S#4	4 / 3 / 2 / 2	2) S#1 - no recovery due to cement layer (3") refusal 3) Drilled through cement 4) Drove 2.5x 2' to 4'
			2"	R-.5'	
8		SILT w/ WOOD DEBRIS 5Y 4/4 70% Fines F-M SAND (30%F 0%M) HNU=13 PID=17 Dry - NON PLASTIC	12:00 / S#5 A	2 / 1 / 2 / 4	5) Drove 2x to 6' 6) Drove 2x to 8' 7) Drove 2x to 10'
	ML		2"	R-1.0'	
10					

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BORING LOG GENERAL DATA
Borehole Number: 25B1
Page: 3 of 6
Signature: [signature]
Xerox: X
Sent to USATHAMA:
Date Sent: 1/21/92

Project: CRREL | Boring: 25B1 | Page: 3 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
10		SAND Fill	12:05	4	
			~~A~~ 0P		
		HNU = 0	S#6	5	8) Drove 2X to 12'
		PID = 0		5	
	ML	POOR RECOVERY NO PHYSICAL SAMPLE	2"	5 R-.20'	9) Drove 2X to 14'
12		DRY SILT w SAND	12:13	5	
		Fines 60% 5Y 5/2		6	10) Drove 2X to 16'
		F-M SAND F 40% m 0% HNU = 100	S#7		
	CL	CLAY MOIST 5Y 4/1 PID = 70		7	11) Drove 2.5X to 18'
		100% Fines			
		med Plastic	2"	9 R-1.8'	
14			12:44	10	12) Drove 2X to 20'
		HNU = 200	S#8	13	
		PID = 400	A	18	
		SILT w SAND		22	
		Fines 60%	2"	R-1.5	
16	ML	F-M SAND F 40% m 0%	12:50	12	
		HNU = 90		14	
		PID = 150	S#9	17	
		Dry 5Y 5/2		19	
18		Varved	2.5"	R-1.0	
		Non Plastic	12:55	9	
		HNU = 40		7	
		PID = 100	S#10	7	
				9	
20			2.0"	R-1.8	

usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: 25B1
Page: 4 of 6
Signature: [illegible]
Xerox: x
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL
Boring: 25B 1
Page: 4 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
20			13:00	10	
		HNU = 30 PID = 80	S#11	11	13) Drove 3x to 22'
		Silt w/ SAND 70% FINES F-m SAND - F 30% - m 0%		12	
22			3"	12 R-1.5'	14) Drove 2x to 24'
	ML	HNU = 80 PID = 150	13:15	14	
		Varved Dry Non Plastic 5Y 5/2	S#12	13	15) Drove (3x) to 25.5'
				16	16) Drove 2x to 27.5'
24			2"	8 R-1.0'	
			13:20	8	17) Drove 2x to 29.5
		HNU = 30 PID = 210	S#13 A	8	
	CL	SILTY CLAY 100% FINES moist 5Y 5/2	3"	13 R-.8'	
	ML	Silt w/ Sand (as above) HNU = 40	13:30	14	
26	CL	SILTY CLAY 100% FINES PID = 78 moist	S#14	17	
				18	
		SILT W/ SAND 60% FINES F-m SAND < 40% F < 0% m	2"	16 R-2.0'	
			13:45	13	
28	ML	HNU = 50 PID = 90 5Y 6/4	S#15	12	
		Dry Non PLASTIC		14	
			2"	12 R-2.0'	
30	CL	SILTY CLAY 100% FINES moist 5Y 5/2	15:00 S#16	14	

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BORING LOG GENERAL DATA
Borehole Number: 2581
Page: 5 of 6
Signature:
Xerox:
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL | Boring: 2581 | Page: 5 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
30		HNU = 90 PID = 90		14	
			S#16	15	
		SILT W SAND FINES 70%			
	ML	F-M SAND - F 30% - M 0%	2.5"	9 R-2.0'	18) Drove 2.5x to 31.5'
			15:15	11	
32		DRY VARVED HNU = 120 PID = 160		14	19) Drove 2x to 33.5'
			S#17	15	
	CL	SILTY CLAY 5Y 5/2 100% FINES MOIST-WET			20) Drove 2.5x to 35.5'
			2"	9 R-2.0'	
			15:30	16	21) Drove 2x to 37.5
34				15	
		HNU = 20 PID = 88	S#18		
				13	22) Drove 3x to 39.5
	ML	SILT FINES - 80% F-M SAND - F 20% - M 0%	2.5"	6 R-2.0'	
			15:40	9	
36		5Y 7/2 HNU = 70 PID = 190		15	
			S#19		
		Dry Varved		18	
			2"	12 R-2.0'	
	CL	SILTY CLAY 5Y 5/2 100% FINES MOIST	16:07	16	
38				17	
		5Y 7/2 HNU = 70 PID = 90	S#20		
	ML			38	
		SILT FINES - 80% F-M SAND - F 20% - M 0%		18	
			3"	R-1.5	
			16:10	15	
40			S#21		

usagnoat.pm4

BORING LOG GENERAL DATA
Borehole Number: 25B1
Page: 6 of 6
Signature: [signature]
Xerox: X
Sent to USATHAMA: 1/21/92
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Project: CRREL | Boring: 25B1 | Page: 6 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
40		DRY		17	23) Drove 2X to 41.5
		HNU=90	5#21	17	
		PID=160		15	24) Drove 2X to 43.5
		NON PLASTIC VARVED (as above)	2"	R-2.0	
			16:25	16	25) Drove (3X) to 45'
42	ML	HNU=350	5#22	18	
		PID=270		17	26) Boring Filled w/ 27 Bags of bentonite hole plug.
			2"	15 R-1.5	
			16:40	11	
44		HNU=130			27) 100 gallons of water added to hole plug
		PID=180	5#23 A	23	
			3"	19 R-1.5	END 18 JAN 1992
		BOTTOM OF BORING = 45' 27 BAGS OF BENTONITE HOLE PLUG			
46					
48					
50					

usagndat.pm4

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BORING LOG GENERAL DATA

Project: CRREL Boring: 25B2 Page: 1 of 2

Driller & Company: Mark Prucher WTD ENVIRONMENTAL

Geologist/Logger & Company: Bob Meyers E+E Inc Signature:

Date Boring Started: 1/20/92 Completed: 1/20/92

Water Levels (from Ground Surface) Drilling Rig: Centurion CT-250

First Encountered: Dry boring Date: 1/20/92

While Drilling: Dry boring Date: 1/20/92

At Boring Completion: Dry boring Date: 1/20/92

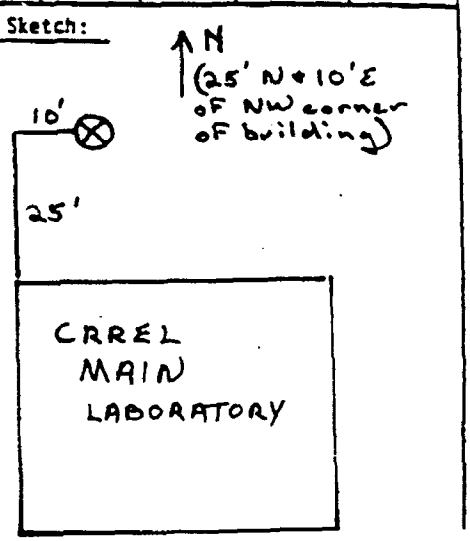
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
Jan 20	08:40	09:15	0'	10.5'					

Abbreviations:

Abbr	Meaning
R	Recovery
A	Analytical Sample taken
HNU	HNU Model 101 Photoionizer (ppm)
PID	Photoionizing Detector (ppm)
2x	2" x 2' split spoon
2.5x	2.5" x 2' split spoon
3x	3" x 2' split spoon
(3x)	3" x 1.5 split spoon

Location Sketch:



Project: CRREL	Boring: 25B2	Page: 2 of 2

1/20/92 Begin 08:40

Depth/ Elevation	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
0		1'-3'			
	ML	[illegible] Sandy SILT slightly moist Non-plastic, Non cohesive varved. 10gr 5/4 100% Fines	~~X~~ 1'-3'	~~[illegible]~~	HNU - 0ppm PID - 0ppm Note: 1) Samples driven w/140 lb hammer with 30' Free Fall [illegible]
			3" S-1 A R-20'	7 7	2) Depths + Recoveries in Ft 3) Depths measured From ground surface
2			~~S-2~~ BD ~~2~~	6 6	3' 4) Samples driven inside 6¼" hollow stem auger. Note 0' 1) Drove 3X to 3'
		5'-5', [illegible]	S-2	7	2) Drove 2X to 5' 3) Drove 2X to 7' [illegible]
4	ML			8 8	4) Drove (3X) to 8.5', 5) Drove 2X to 10.5' 6) Boring Filled w/ 4 bags of bentonite hole plug + 16 gals H_2O
			2" R-0.0'	6	
		5'-7', [illegible] SILT, varved Some Limonitic staining Non-plastic & Non cohesive 10YR 5/4 100% Fines	S-3	4 5 5 6	5' HNU = 0ppm PID = 0ppm HNU = 0ppm in BZ, [illegible] [illegible]
6	ML		R-20'		7' 7) 1st sample 1-3' due to Frozen, ground in top 1'
		7-8.5 Gray fine SILT with clayey varves, Some Limonitic staining. Tighter than above Non-plastic, slightly cohesive 8.5 to 10.5	S-4	3 5 6 4	[illegible] HNU = 0ppm PID = 0ppm 8) Hollow stem augers pulled prior to plugging
8	ML		3" R-1.5'		
		Gray SILT with some VF Sand Loose Non-plastic & Non-cohesive 10YR 5/4 100% Fines	A S-5	5 6 6 5	[illegible] HNU = 0ppm PID = 0ppm
10	ML		2" R-2.0'		END 20 Jan 1992

B.O.H @ 10.5' BGS

BORING LOG GENERAL DATA

Project: CRREL Boring: 65B1 Page: 1 of

Driller & Company: Mark Prucher WTD ENVIRONMENTAL

Geologist/Logger & Company: Bob Meyers E&E, Inc. Signature:

Date Boring Started: 1/20/92 Completed: 1/20/92

Water Levels (from Ground Surface) Drilling Rig: Centerra CT-250

First Encountered: Dry Boring Date: 1/20/92

While Drilling: Dry Boring Date: 1/20/92

At Boring Completion: Dry Boring Date: 1/20/92

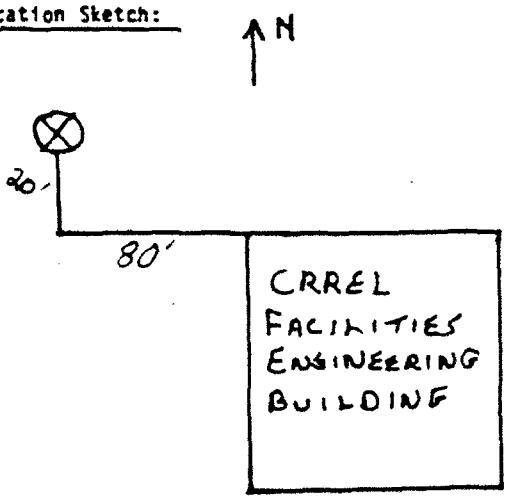
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
20 Jan	10:50	11:45	0	10.5'					

Abbreviations:

Abbr	Meaning
R	Recovery
A	Analytical Sample
HNU	HNU Model 100 Photoionizer (ppm)
PID	Photoionizing Detector (ppm)
2X	2"x2' split spoon
2.5X	2.5"x2' split spoon
3X	3" x 2' split spoon
(3X)	3" x 1.5' split spoon

Location Sketch:



Project: CRREL	Boring: 6SB1	Page: 1 of 1

Motor Pool UST

start Time 10:50

Depth/ Elevation	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
	ML	1'-3'; 1' to 2.2' clayey SILT w/clay seams and VF sand seams. Gray NON-plastic, slightly cohesive.	S-1 A	9	HNU = 0 ppm PID = 0 ppm Note: 1) Samples driven w/ 140 lb hammer w/ free fall of 30" 1100 2) Depths & recoveries in feet 3) Depths from ground surface
	CL	2.2'-3' silty CLAY, gray, cohesive and moderately plastic 5Y5/2 100% Fines	3"	10	4) Samples driven in 6¼" hollow stem auger
				10	Note 0': 1) Drove 3x to 3' Sample 1 at 1-3' due to frozen ground
				11	2) Drove 3x to 5'
			R-	2.0'	3) Drove 2x to 7'
	CL	3'-5' 10% - F sand 3' to 4' silty gray clay NON plastic, cohesive 5Y5/2 90% Fines 4' to 4.2' VF SAND with silt brown NON-plastic, NON-cohesive	3" S-2	6	HNU = 0ppm PID = 0ppm
				8	Saturated 4.2' to 4.4'
	CL	4.2' to 4.4' Gray CLAY, plastic & cohesive, saturated 100% Fines		8	1106 4) Drove (3X) to 8.5'
				8	5) Drove 3x to 10.5
			R-	1.4'	
	ML	5'-7': 5'-6' moist clayey SILT, NON-plastic moderately cohesive, Gray	2" S-3	6	HNU = 0ppm PID = 0ppm
				5	5' to 6' → moist
	CL	6'-7' saturated gray silty CLAY moderately cohesive and plastic 5Y5/2 100% Fines		5	6' to 7' → wet
				8	Zero ppm in hole & BZ 1114 6) Boring filled w/ 4 bags of bentonite hole plug + 16 gal H_2O
	CL	7' to 8.5' silty brown gray CLAY, cohesive, slightly plastic	R-	2.0'	
			3' SH	8	HNU = 3ppm PID = 0ppm
				8	1126 7) Hollow Stem Augers pulled prior to plugging
			R	10, -1.5'	
	CL	8.5' to 10.5', saturated gray silty CLAY, cohesive and plastic, Some Limonitic staining * HNU reading caused by moisture. 100% Fines 5Y 3/2	SS 3" A	8	1138 HNU = 42 ppm * PID = 0ppm
				8	NO oil sheen
				9	NO odor
		3.0.H @ 10.5' BGS	R-	9 2.0'	All readings in BH & BZ were zero ppm END 20 JAN 1992

BORING LOG GENERAL DATA
Borehole Number: 9581
Page: 1 of 7
Signature:
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:
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BORING LOG GENERAL DATA

Project: CRREL Boring: 9581 Page: 1 of 7

Driller & Company: Mark Prueher WTD Environmental

Geologist/Logger & Company: John Peck E+E Inc Signature: [signature]

Date Boring Started: 1/16/92 Completed: 1/17/92

Water Levels (from Ground Surface) Drilling Rig: Canterra CT-250

First Encountered: Dry boring Date: 1/17/92

While Drilling: Dry boring Date: 1/17/92

At Boring Completion: Dry boring Date: 1/17/92

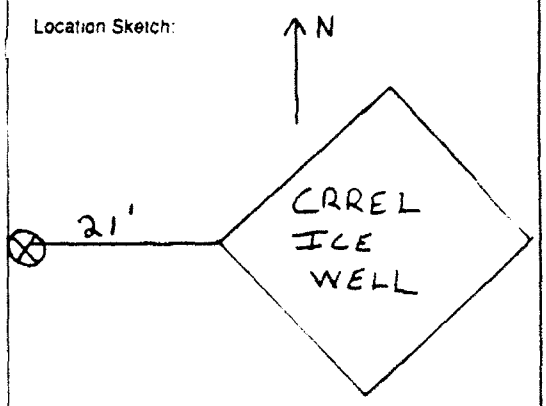
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
1/16/92	11:30	15:00	0'	29'					
1/17/92	12:30	16:45	29'	55'					

Abbreviations:

Abbr.	Meaning
R	Recovery
A	Analytical sample taken
~~A*~~	Analytical sample taken & not shipped
HNU	HNU model 101 Photoionizer
PID	Photoionization Detector
2x	2"x2' Splitspoon
2.5x	2.5"x2' Splitspoon
3x	3"x2' Splitspoon
(3x)	3"x1.5' Splitspoon

Location Sketch:



usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: 95B1
Page: 2 of 7
Signature:
Xerox:
Sent to USATHAMA:
Date Sent: 1/21/97

Project: CRREL
Boring: 95B1
Page: 2 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
0		GROUND SURFACE	11:45	100/.1	Note: 1) All samples driven with 140 lb hammer w/ Free Fall of 30"
			S#1		
		Silt	No samp.		2) All depths & recoveries in Feet.
		Dry	3"	R-.1	
2		Low Plasticity	12:00	5	3) Depths measured from ground surface.
		95% Fines PID=3	S#2	6	
		HNU=3		8	4) Samples driven inside 6¼ hollow stem augers
	ML	F-M Sand - F 5% M 0%		7	
4			2.5"	R-1.5	
		Varved	12:10	4	
		w/ limonite staining PID=6	S#3	4	
		5Y 5/2 HNU=5		5	Note: 1) Refusal of S#1 due to Frozen ground
			2"	6 R-1.5	
6			12:20	5	
		HNU=25		6	2) Drove 3" x to 2'
		PID=30	S#4	7	3) Drove 2.5 x 4'
			2.5"	6 R-2.0	4) Drove 2 x to 6'
8			12:25	4	5) Drove 2.5 x to 8'
		HNU=28		6	
		PID=26	S#5	7	6) Drove 2 x to 10'
			2.0"	8 R-1.6	
10					

BORING LOG GENERAL DATA
Borehole Number: 95B1
Page: 3 of 7
Signature: [illegible]
Xerox: X
Sent to USATHAMA: 1/21/97
Date Sent:

Project: CRREL
Boring: 95B1
Page: 3 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
10			12:30	3	
		HNU = 30 PID = 37	S#6	7	7) Drove (3x) to 11.5'
				8	
			3"	R-1.0	8) Drove 2x to 13.5'
			12:40	5	
12		HNU = 100 PID = 105			9) Drove 2x to 15.5'
			S#7 A*	5	
		SILT (as above)		6	10) Drove (3x) to 17'
			2"	6 R-2.0	
			12:45	5	11) Drove 2x to 19'
14		HNU = 400 PID = 760		7	
	ML		S#8 A	7	12) Drove 3x to 21'
		ODOR PRESENT		9	
			2"	R-1.8	
			13:10	7	
16		HNU = 200 PID = 700	S#9	13	
			3"	16 R-1.8	
			13:30	7	
		17' to 19' - TCE odor first detected in split spoon samples	S#10	9	
18				13	
			2"	12 R-1.5	
			14:00	5	
			S#11	7	
20					

usagnoat.pm4

BORING LOG GENERAL DATA
Borehole Number: 9531
Page: 4 of 7
Signature:
Xerox:
Sent to USATHAMA:
Date Sent:
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Project: CRREL
Boring: 9531
Page: 4 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
20				12	
		PID=2183	S#11		
		HNU=500		18	
			3"	R-1.0	13) Drove 2x to 23'
		Silt (as above)	14:05	11	
					14) Drove 2x to 25'
		HNU=NR		16	
22		PID=2 NR	S#12		
				12	15) Drove 2x to 27'
				19	
			2"	R-1.0	16) Drove 2x to 29'
		23' to 25' strong TCE odor	14:15	11	
		HNU=500		9	~~17) Drove 3x to 31'~~ DP
24	ML	PID=1956	S#13		
				14	18) Shut down rig for day & will resume drilling tomm. in Level C due to high HNU + PID readings.
				19	
			2"	R-1.5	
			14:30	12	
				18	
26		HNU=350 PID=1200	S#14		
				16	
				15	
			2"	R-1.0	
		SANDY SILT	14:40	11	
		HNU=500		16	
28		PID=1000	S#15		
		75% Fines		18	
		F-M SAND - F 25% m 0 %		13	
			2"	R-1.0	END 16 Jan 92
		Dry, Loose	0945	13	BEGIN 17 Jan 92
		Non Plastic	S#16	17	18) DP
		5Y 7/2			
30					

usapncatc-4

BORING LOG GENERAL DATA
Borehole Number: 9501
Page: 5 of 7
Signature:
Xerox: X
Sent to USATHAMA: 1/21/91
Date Sent:

Project: CRREL | Boring: 9501 | Page: 5 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
30			S#16 NO SAMP 3"	21	Note 29'
				26 R-0.0	1) Drilling in Level w/ monitoring
			13:07	21	
				24	2) Drove 3x to 31'
32		HNU=500 PID=NR	S#17	28	3) Drove 2.5x to 33'
		Sandy Silt (as above)		36	
			2.5"	R-1.8	4) Drove 2x to 35'
			13:16	14	
		HNU=500 PID=NR		22	5) Drove 2x to 37'
34	ML		S#18	24	
				33	6) Drove 2x to 39'
			2"	R-2.0	
			13:24	9	
		HNU=500 PID=NR	S#19	17	
36				16	
			2"	27 R-1.8	
			14:00	12	
		HNU=300 PID=900	S#20	26	
38				28	
			2"	31 R-1.2	
			14:05	18	
			S#21	25	
40					

usacrda.pm4

BORING LOG GENERAL DATA
Borehole Number: 95B1
Page: 6 of 7
Signature: [signature]
Xerox: X
Sent to USATHAMA: 1/2/92
Date Sent:

Project: CRREL | Boring: 95B1 | Page: 6 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
40		HNU = 130 PID = 300	S#21	27	
				33	
			2.5"	R-1.5	7) Drove 2.5X to 41'
			15:05	12	
		HNU = 300 PID = 480	S#22	21	8) Drove 2X to 43'
42				29	
		Sandy Silt (as above)		32	9) Drove 2X to 45'
			2"	R-2.0	
			15:12	12	
		HNU = 170 PID = 300		18	10) Drove 2X to 47'
44	ML		S#23	21	
				27	11) Drove 3X to 49'
			2.0"	R-2.0	
			15:30	10	
		HNU = 300 PID = 425		14	12) Drove 3X to 51'
46			S#24	17	
				18	
			2"	R-2	
			15:40	16	
		HNU = 120 PID = 240		22	
48			S#25	28	
				34	
			3"	R-1.8	
			16:00	12	
			S#26	18	
50					

usaghoat.pm4

63

BORING LOG GENERAL DATA
Borehole Number: 9531
Page: 7 of 7
Signature: [illegible]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL
Boring: 9531
Page: 7 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
50					
		HNU = 90 PID = 200	S#26 3"	22 26 R-1.6	13) Drove 2x to 53'
			16:09	13	14) Drove 2x to 55'
52	ML	HNU = 100 PID = 56	S#27	16	
		Sandy Silt (as above)	2"	19 21 R-2.0	15) Pulled 6¼" Hollow stem augers
			16:40	13	16) Boring Filled w/ 31 bags of bentonite hole plug
54		HNU = 90 PID = 220	S#28 A	19 19	
			2"	21 R-2.0	17) 124 gallons of water added to hole plug END 17 Jan 92
		Bottom of Boring = 55' 31 Bags of Bentonite hole plug			
56					
58					
60					

usagncal.pm4

64

BORING LOG GENERAL DATA
Borehole Number: 10SB1
Page: 1 of 2
Signature: [signature]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

BORING LOG GENERAL DATA

Project: CRREL Boring: 10SB1 Page: 1 of 2

Driller & Company: Mark Prueher WTD Environmental

Geologist/Logger & Company: JOHN PECK E+E, Inc. Signature: [signature]

Date Boring Started: 1/14/92 Completed: 1/14/92

Water Levels (from Ground Surface) Drilling Rig: CANTERRA CT-250

First Encountered: 4' Date: 1/14/92

While Drilling: 4' Date: 1/14/92

At Boring Completion: 2' Date: 1/14/92

Drilling Shifts:

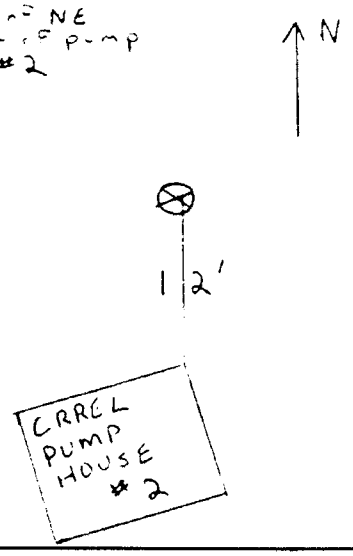
Date	Time		Depth of Drilling Per Shift		Date	Time		Depth of Drilling Per Shift	
1992	Start	End	Start	End		Start	End	Start	End
14 Jan	10:40A	12:00	0	10					

Abbreviations

Abbr.	Meaning
R	Recovery
A	ANALYTICAL SAMPLE TAKEN
HNU	HNU MODEL 101 PHOTOIONIZER (Readings in ppm)
S	Sample
2x	2" x 2' SPLIT SPOON
2.5x	2.5" x 2' SPLIT SPOON
3x	3" x 2' SPLIT SPOON

Location Sketch

12' N of NE corner of pump house #2



usagnoa1.pm4

32

BORING LOG GENERAL DATA
Borehole Number: 105B1
Page: 2 of 2
Signature: [illegible]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL
Boring: 105B 1
Page: 2 of 2

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		GROUND SURFACE			
0		Top 6" Frozen	10:32	48	Note: 1) All samplers Driven by 140 lb hammer, Falling 30"
		SANDY SILT W/ GRAVEL 80% FINES (FILL)	S#1 A	13	2) All depths and recoveries in Feet
1		F-M SAND - 10% F - 0% m	HNU=0	9	3) Depths From ground surface
		10% Gravel	3"	10 R 2.0	4) Auger size: 8" (30N.A stem) 5) Raining while sampling
2		Low Plasticity Homogeneous	11:15	6	
	ML	5Y 5/2	S#2 HNU=0	6	Note C' 1) High blowcount in top 6" due to Frozen ground
3				5	2) Drove 3x to 2'
			2.5"	4 R 1.0	3) Drove 2.5x to 4'
4		✓ MOIST SAT (PERCHED WATER TABLE?)	11:30 A	4	4) Drove 2.5x to 6'
5			S#3 HNU=0	5	5) Drove 2.0x to 8'
				8	
		SANDY SILT 85% FINES	2.5"	12 R 1.5	6) Drove 2.0x to 10'
6		F-M Sand - 10% F - 5.0% m	11:40	9	7) No topsoil observed
7		5Y 5/2	S#4 HNU=0	18	8) Boring Filled with 3 Bags of Bentonite Hole Plug
				18	
			2"	16 R-2.0	
8			11:50	9	9) 12 gallons of water added to hole plug ~~10) Hot~~ JP
			S#5	18	
9		BS SILTY CLAY	A	18	
	CL	MOIST 100% Fines MED PLASTICITY 5Y 4/1		16	
10			2"	R-2.0	End 14 Jan 92

Bottom of Boring = 10'

usagndat.pm4

33

BORING LOG GENERAL DATA

Project: CRREL Boring: 135B1 Page: 1 of 3

Driller & Company: WTD ENVIRONMENTAL Mark Prusher

Geologist/Logger & Company: B. Meyers E+E, Inc. Signature:

Date Boring Started: 1/20/92 Completed: 1/20/92

Water Levels (from Ground Surface) Drilling Rig: Centurra CT-250

First Encountered: Dry Boring Date: 1/20/92

While Drilling: Dry Boring Date: 1/20/92

At Boring Completion: Dry Boring Date: 1/20/92

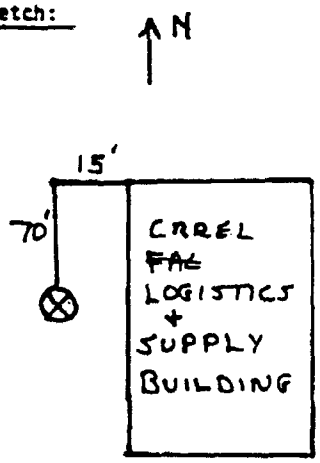
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
20 Jan	13:20	14:30	0'	19'					

Abbreviations:

Abbr	Meaning
R	Recovery
A	Analytical Sample taken
HNU	HNU Model 101 Photoionizer (ppm)
PID	Photoionizing Detector (ppm)
S	Sample
2X	2" x 2' Split spoon
2.5X	2.5" x 2' Split spoon
3X	3" x 2' Split spoon
(3X)	3" x 1.5' Split spoon

Location Sketch:



Project: CRREL	Boring: 13SB1	Page: 2 of 3

Begin 13:20

0'-1.5' = Ashphalt + Cement

Depth/ Elevation	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
1.5'		1.5'-3.5': 1.5' to 2.5' V.Fine to coarse SAND and rounded Gravel with some silt. Loose	S1 3" A	120 27 12	punched through cement; HNU = ~~12pp~~ - 5ppm; PID = 12ppm; 13:35
	ML	2.5' to 3.5' tight clayey SILT med. Brown, nonplastic non-cohesive 5Y5/2 100% Fines		12 8	Dry; Note: 1) Samples driven by 140 lb hammer w/ 30" Free Fall
3.5'	ML	3.5' to 5.5' Loose brown SILT NON-cohesive, NON-plastic 5Y5/2 100% Fines	R- S2 2"	2.0' 11 10 10 9	2) Depths + recoveries in Ft 3) Depths from ground sur. 4) 6¼" Hollow stem auger; 13:40; HNU = 7ppm; PID = 21ppm; Note 0': 1) Drove 3X 1.5 - 3.5' due to asphalt + cement; Dry
5.5'	ML	5.5' to 7.5' Gray SILT with V.Fine sand seams, varved Some Limonitic staining cohesive, ~~slightly~~ Non plastic PID reads zero in the BH, BZ and off cuttings ~~5Y/5/~~ 5Y 5/2 100% Fines	R- S3 2" A	2.0' 11 20 20 7	2) Drove 2X to 5.5' 3) Drove 2X to 7.5'; HNU = 7ppm; PID = 7ppm; 13:45; moist; Duplicate Collected
7.5'	ML	7.5' to 9.5' Grayish brown clayey SILT, varved cohesive, Non-plastic 5Y 5/2 100% Fines	R- S4 2.5"	2.0' 9 3 4 7	4) Drove 2.5X to 9.5'; HNU = 2ppm; PID = 3ppm; 1400; moist; 5) Drove 2.5X to 11.5 6) Drove (3X) to 13'
9.5' ↑ shortened interval ↓	ML	9.5' to 11.5 Gray wet SILT varved, cohesive, non-plastic 5Y5/2 100% Fines	R- S5 2"	1.2' 5 20 16	wet; HNU = 3ppm; PID = 1.5ppm; 1406
11.5'		11.5' to 13' same as above with trace Limonitic staining 5Y 5/2 100% Fines	R- S6 3"	1.0' 16 5	HNU = 6ppm (moisture?); PID = 1.5ppm; 1415; ~~Tube Dip Taken~~
			R-	1.2'	

Project: CRREL | Boring: 135B1 | Page: 3 of 3

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
~~12.5~~					
13	ML	13' to 15' Very Fine Brown sand + silt w/ limonitic staining 5Y 5/2 100% Fines DRY	5-7 2" 14:21	8 6 8 11	HNU = 4.5ppm PID = 12.4ppm 7) Drove 2x to 15' 8) Drove 2x to 17' 9) Drove 3x to 18.5'
14			R-	1.2'	10) Boring filled w 7 Bag of bentonite hole plug + 28 gal of H_2O
~~14.5~~		15' to 17' No sample obtained R = 0 0.0ppm in BZ 0.1ppm in BH	5-8 14:20 2" R	16 11 18 16 0.0'	11) 6¼ HSA pulled prior to plugging
16					
18		17' to 18.5' Varved Gray CLAY, highly plastic + cohesive with Few Fine sand partings. Organic sand lense at 18.4' had 16ppm PID reading 5Y 5/2 100% Fines	5-9 14:44 3" R	6 6 8 1.5	END 20JAN92
		Bottom of Boring = 18.5'			
20					

usagnoat.pm4

BORING LOG GENERAL DATA
Borehole Number: 15501
Page: 1 of 7
Signature: [illegible]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:
58

BORING LOG GENERAL DATA

Project: CRREL Boring: 15501 Page: 1 of 57

Driller & Company: Mark Prucher WTD ENVIRONMENTAL

Geologist/Logger & Company: JOHN PECK E+E Inc Signature: [illegible]

Date Boring Started: 1/15/92 Completed: 1/15/92

Water Levels (from Ground Surface) Drilling Rig: CANTERRA CT-250

First Encountered: 7' Date: 1/15/92

While Drilling: 7' Date: 1/15/92

At Boring Completion: NONE IN BORING Date: 1/15/91

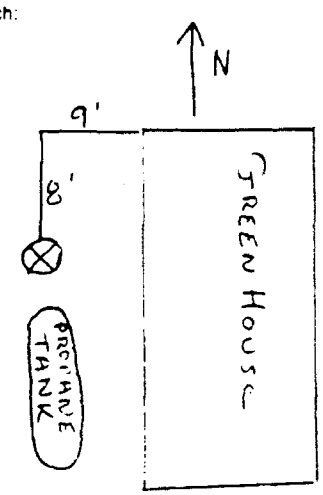
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
15 Jan	06:30	15:00	0	35.5					

Abbreviations:

Abbr.	Meaning
R	RECOVERY
A	ANALYTICAL SAMPLE TAKEN
A*	ANALYTICAL SAMPLE TAKEN + NOT SHIPPED
HNU	HNU PHOTOIONIZER (READINGS IN PPM)
PID	PHOTOIONIZATION DETECTOR (ppm)
2X	2"x2' SPLIT SPOON
2.5X	2.5"x2' SPLIT SPOON
3X	3"x2' SPLIT SPOON
(3X)	3"x1.5' SPLIT SPOON

Location Sketch:



usagnda:pm4

58

BORING LOG GENERAL DATA
Borehole Number: 155B1
Page: 2 of 7
Signature: [signature]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL | Boring: 155B1 | Page: 2 of 57 AP

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		GROUND SURFACE			
		Grass Mat - Gravel	09:00	85	Note 1) Samples driven by 140lb hammer w/ 30" Free Fall
	Gravel Fill	Gravel (crushed stone 1") Dry	A	70	2) DEPTHS AND recoveries in Feet
			S#1 HNU=0	35	3) Depths From ground surface
			3"	20 R-1.8'	4) Odor present in S#4
2'		~~Silty S~~ AP Sandy Silt 80% Fines	09:15	5	5) 8" solid stem Flyte augers to 23.5'
			S#2 HNU=0	4	6) 6¼" hollow stem auger 23.5' to 35.5'
	ML	F-M Sand < 20% 0%		3	
4'		Moist Loose Low Plasticity Varved 5Y 6/4	2"	2 R-1.9'	
			09:27	3	Note 0'
			S#3 HNU=0	4	1) High blow counts in top 12" due to Frozen ground
				5	2) Drove 3x to 2'
6'			3"	5 R-1.5'	3) Drove 2x to 4'
		Odor Present	09:40	4	4) Drove 3x to 6'
			S#4 HNU=3	4	5) Drove 2x to 8'
				5	6) Drove 2x to 10'
		✓MOIST SAT		4	7) No top soil observed
8		Sandy Silt (same as above) Slight Odor Present (petroleum)	2"	R-1.8'	8) Boring Filled with bentonite hole plug (9 Bags)
			09:50	1	
			S#5 HNU=.5	2	
				2	
10			2"	3 R-1.8'	

~~Bottom of Boring = 10'~~ AP

usagndat.pms

59

BORING LOG GENERAL DATA
Borehole Number: 15501
Page: 3 of 7
Signature: [signature]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL | Boring: 15501 | Page: 3 of ~~5~~ 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
10			10:15	1	
		HWU = 1.5	S#6	2	9) Drove (3x) to 11.5'
		Sandy Silt 90% Fine F-M SAND - F 10% - M 0% Moist 10y 4/2	(3")	4 R-1.5	
			10:30	4	10) Drove 2x to 13.5'
12		HWU = 1	S#7	5	11) Drove 2.5x to 15.5'
				7	
			2"	7 R-2.0	12) Drove 2x to 17.5'
			10:50	6	
14	ML		A*	7	13) Drove 2x to 19.5'
		HWU = 2	S#8	7	
			2.5"	6 R-1.5	
			11:40	8	
16		HWU = 3	S#9	9	
		Sandy Silt (oil sheen) 80% Fines F-M SAND F 20% M 0%		11	
	ML		2.0"	4 R-1.2'	
			12:00	6	
18		HWU = 1.6	S#10	10	
		Moist Non Plastic 10Y 4/2		11	
			2"	6 R-2.0	
20			S#11	12 ~~10~~	

60

BORING LOG GENERAL DATA
Borehole Number: 15531
Page: 6 of 7
Signature: [signature]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL | Boring: 15531 | Page: 6 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
20			12:15	11	
		HNU = 50	5#11 A	12	
			3"	4 R-1.8	14) Drove 3x to 21.5'
			12:30	7	15) Drove 2x to 23.5'
22				7	
		HNU = 1.6	5#12	8	16) Drove 2x to 25.5'
		Sandy Silt Varved (same as above)	2"	3 R-1.8	
			12:40	4	17) Drove 3x to 27.5'
24	ML	HNU-3.4	5#13	4	18) Drove 2x to 29.5
				4	
			2"	7 R-2.0	
			14:30	11	
26		HNU = 56	5#14 A	14	
				27	
			3"	5 R-1.8	
			14:40	9	
28		HNU	5#15	11	
				15	
			2"	11 R-2.0	
			14:50 5#16	15	
30					

usagndat.bm4

63

BORING LOG GENERAL DATA
Borehole Number: 15581
Page: 7 of 7
Signature:
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL | Boring: 15581 | Page: 7 of 7

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
30		No HNU		11	
			S#16	17	
				21	19) Drove 2x to 31.5'
		Sandy Silt (as above)	2"	R-1.5	
			14:55	4	20) Drove 2.5x to 33.5
32		PID = 1.9		10	
			S#17	10	21) Drove 2x to 35.5
	ML			13	
			2.5"	R-1.6	22) 36 gallons of water added to hole plug
			15:00	8	
34		No HNU		10	
			S#18	12	
	CL	SILTY CLAY (Gray) 100% FINES MOIST SB 5/1 No odor	2.5'	13 R-2.0	END 15 JAN 92
36		Bottom of Boring = 35.5'			
		9 Bags bentonite hole plug			
38					
40					

usagnda: pm4

BORING LOG GENERAL DATA
Borehole Number: 165B1
Page: 1 of 3
Signature:
Xerox:
Sent to USATHAMA: 1/21/92
Date Sent:

BORING LOG GENERAL DATA

Project: CRREL Boring: 165B1 Page: 1 of 3

Driller & Company: MARK PRUHER WTD ENVIRONMENTAL

Geologist/Logger & Company: JOHN PECK Signature:

Date Boring Started: 1/16/92 Completed: 1/16/92

Water Levels (from Ground Surface) Drilling Rig: CANTERA CT-250

First Encountered: Dry Date: 1/16/92

While Drilling: " Date: 1/16/92

At Boring Completion: Dry Date: 1/16/92

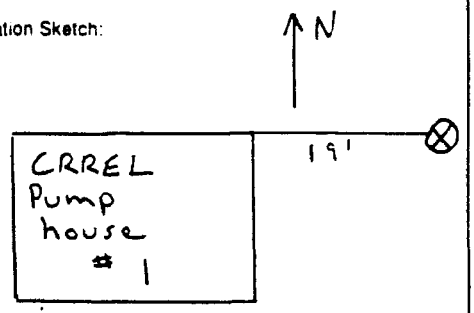
Drilling Shifts:

Date	Time		Depth of Drilling Per Shift		Date	Time		Depth of Drilling Per Shift	
	Start	End	Start	End		Start	End	Start	End
1/16/92	08:15	09:30	0'	11.5'					

Abbreviations:

Abbr.	Meaning
R	RECOVERY
A	ANALYTICAL SAMPLE TAKEN
HNU	HNU PHOTOIONIZER (readings in ppm)
PID	Photoionization detector (ppm)
2X	2"x2' SPLIT SPOON
2.5X	2.5"x2' SPLIT SPOON
3X	3"x2' SPLIT SPOON
(3X)	3"x1.5' SPLIT SPOON

Location Sketch:



usagndat.pm4

32

BORING LOG GENERAL DATA
Borehole Number: 16SB1
Page: 2 of 3
Signature:
Xerox:
Sent to USATHAMA: 1/21/92
Date Sent:

Project: CRREL | Boring: 16SB1 | Page: 2 of 3

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
0		GROUND SURFACE			
		FROZEN GRAVEL FILL PID = 0	08:18	80	Note: 1) Samples driven by 140lb hammer Free Fall = 30"
			S#1	40	
		SANDY SILT W/ GRAVEL 70% Fines F-m Sand - F - 10% m 0% 20% Gravel MOIST LOW PLASTICITY 5Y 3/2	A	17	2) Depths + recoveries in Feet
				18	
2			3"	R-2.0	3) Depths From ground surface
			08:30	10	
			S#2	10	4) Samples driven inside of 6¼" Hollow stem auger
				8	
				6	
4			2.5"	R-.8	
		HNU = 0 PID = 0	08:40	3	Note 0'
	ML	ASPHALT DEBRIS	S#3	15	1) High blow counts in top ~~6"~~ 12" due to Frozen ground
		SANDY SILT W GRAVEL (as above) HNU = 0 PID = 0		18	
				18	
6			2"	D-.5	
			08:50	7	2) Drove 3x to 2'
		PLASTIC AND WOOD DEBRIS 5Y 3/2	S#4	8	3) Drove 2.5x to 4'
				8	
			3"	R-1.8	4) Drove 2x to 6'
			09:06	4	
8		HNU = 0 PID = .1	S#5	11	5) Drove (3x) to 7.5'
			A	11	
				15	6) Drove 2.5x to 9.5'
SP	SM	LOOSE SAND F 70% m 30%	2.5"	R-2.0	
		SANDY SILT 5Y 4/4 60% FINES MOIST F-M < 30% < 70%	09:20 S#6	9	
10					

33

usagncat.pm4

BORING LOG GENERAL DATA
Borehole Number: 16SB1
Page: 3 of 3
Signature: [signature]
Xerox: X
Sent to USATHAMA: 1/21/92
Date Sent: 1/21/92
34

Project: CRREL | Boring: 16SB1 | Page 3 of 3

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
10	ML	MOIST - LOOSE Hwu = 0 PID = .4	S#6 A 2"	8 11 13 R-1.2	7) Drove 2x to 11.5' 8) No topsoil 9) Boring Filled w/ 4 bags of bentonite hole plug END 16 Jan 92
12		End of Boring = 11.5 feet 4 bags bentonite hole plug 16 gallons of water.			
14					
16					
18					
20					

usagndat.pm4

APPENDIX D

MONITORING WELL BORING LOGS

BORING LOG GENERAL DATA
Borehole Number: CERCLO7
Page: 1 of 6
Signature: Robert A. Meyers
Xerox:
Sent to USATHAMA: 2/4/92
Date Sent:

BORING LOG GENERAL DATA

Project: CRREL Boring: CERCLO7 Page: 1 of 6

Driller & Company: Mark Prueher

Geologist/Logger & Company: Robert Meyers Signature: Robert A. Meyers

Date Boring Started: 1-28-92 Completed: 1 FEB 1992

Water Levels (from Ground Surface) Drilling Rig: Canterra CT-250

First Encountered: Date:

While Drilling: Date:

At Boring Completion: 140 Date: 4 Feb 1992

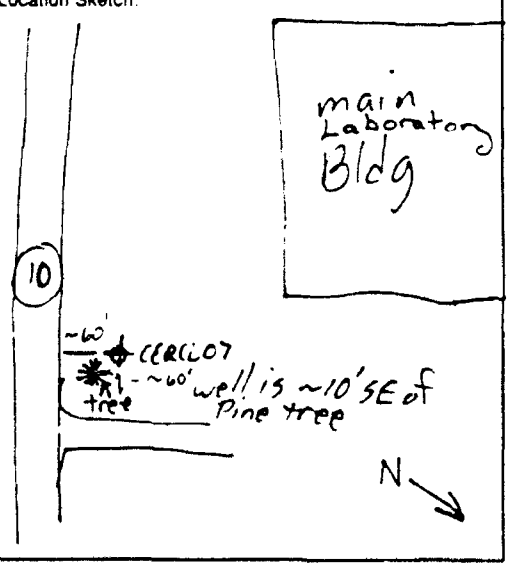
Drilling Shifts:

Date	Time		Depth of Drilling Per Shift		Date	Time		Depth of Drilling Per Shift	
	Start	End	Start	End		Start	End	Start	End
1-28-92	1425	1815	0'	100'					
1-29-92	0800	1744	100'	132'					
1-30-92	0800	1645	132'	150'					
1-31-92	0800	2015	150'	188.5'					
2-1-92	0800	1730	—	—					
2-2-92	0820	17:00	—	—					

Abbreviations:

Abbr.	Meaning
BGS	Below Ground Surface
R	Recovery
HNU	HNU Model 101 photoionizer (ppm)
.5	Sample
2X	2" x 2' split spoon

Location Sketch:



usagndat.pm4

58

BORING LOG GENERAL DATA
Borehole Number: CERCL07
Page: 2 of 6
Signature: Robert A. Meyer
Xerox:
Sent to USATHAMA: 2/4/92
Date Sent:

Project: CRREL | Boring: CERCL07 | Page: 2 of 6

Depth/ Elevation (Ft.)	USCS Sym. of Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		GROUND SURFACE			
3'	ml	0'-3' frozen brown silt loam			Note 1) All samples driven by 140 lb hammer w 30" Free fall 2) All depths + recoveries in feet 3) Depths From ground surface moist 4) Boring made using 9⅞" open roller bit 40/81
5'	ml	S-1, 3' to 5', SILT (100%) cohesive, non-plastic NO inclusions 5Y 5/2 100% Fines	S-1 3'-5' 2" R=0.8'	2 5 6 6	1410 HNu = 0ppm Note 0': 1) Drove 2X to 5' 2) Drove 2X 8' to 10' 3) Drove 2X 13' to 15' 4) Drove 2X 18' to 20'
8'	ml	Auger through same silt 5' to 8'			
10'	ml	S-2, 8'-10' NO Recovery ~~5Y 5/2~~ 8P	S-2 8'-10 2" R=0.0'	8 9 6 6	1435 HNu = 0ppm
13'	ml	Augered up the same silt Between 10' + 13'			
15'	ml	S-3, 13'-15' SILT (100%) Cohesive, NON-plastic NO inclusions 1/4" Band of Limonitic staining 5Y 5/2 100% Fines	S-3 13'-15' 2" 1.4'=R	3 5 5 4	moist 1450 HNu = 0ppm 0ppm H_2S 20.9% O_2 0% LEL
18'	ml	S-4, 18'-20', SILT (99%) Same brown as above Il. clay band @ 19.6' BGS 5Y 5/2 100% Fines	S-4 18'-20' 2" R=1.5'	3 5 5 8	moist HNu = 0ppm 1510
20'					

usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: CERCL07
Page: 3 of 6
Signature: Robert A Meyer
Xerox:
Sent to USATHAMA: 2/4/92
Date Sent:

Project: CRREL | Boring CERCL 07 | Page 3 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		20' to 23' same SILT			
23'	Sm	S-5, 23'-25', VF silty SAND (100%) Slightly Cohesive NONplastic 5Y 5/2 30% Fine sand 70% Silt	S-5 2" 23'-25' R=1.4'	7 8 8 8	slightly moist 1316 PID = 0.3ppm HNu = 0.3ppm Note: HNu originally read 60ppm but was not confirmed by PID or head space from geotechnical jar elements later.
25'					
28'	Sm	S-6, 28'-30', VF silty SAND (99%), 1% gray clay layer @ 29.9' BGS NON-cohesive, NON-plastic SAND, the clay is highly plastic & cohesive 5Y 4/2	S-6 2" 28'-30 R=1.5'	7 8 8 10	moist @ bottom of split spoon. HNu = 0ppm PID = 0ppm 1531 5) Drove 2x 23'-25' 6) Drove 2x 28'-30' 7) Drove 2x 38'-40' 8) Drove 2x 48'-50'
30'					
38	Sm	S-7 38'-40' VF silty SAND (99%) with little clay Non plastic, NON Cohesive 5Y 4/2	S-7 38'-40' 2" R=1.8	8 8 8 12	Dry HNu = 0ppm PID = 0 ppm 1600
54					
40 est. 35					
48'	Sm	S-8, 48'-50', silty SAND (grayish brn) 48' to 48.5' was SILT with Limonitic staining (oxidation zone) 48.5' to 50', VF SAND, grayish brown, Non-cohesive, NON-plastic No inclusions 5Y 5/2	48'-50' S-8 2" R=1.3'	9 13 15 15	Dry HNu = Malfunction PID = 0ppm 1620 20.5% O_2 0ppm H_2S 0% LEL
50'					

usagndat.pm4

60

BORING LOG GENERAL DATA
Borehole Number: CERCL07
Page: 4 of 6
Signature: Kolenta Mayer
Xerox:
Sent to USATHAMA: 2/Feb/92
Date Sent:

Project: CRREL | Boring: CERCL07 | Page: 4 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		VF SAND Augered up			
58'	Sm	S-9, 58' to 60', VF Gray-Brn SAND NON-Cohesive NON-plastic no staining 5Y 5/2	S-9 2" 58'-60'	14 15 15 18 R=1.5'	moist 1654 HNu is Malfunctioning PID = 0ppm
60'		*Probable Gravel Zone 64'-76'			Note: Slow drilling zone encountered @ 64' (+:11?) hard cuttings (maybe caused by
78'	Sm	S-10, 78'-80', F-M grained SAND (Brown) 100% non cohesive 5Y 3/2 non-plastic no staining or inclusions *Apparently not a gravel zone, the drilling is slow & difficult for no apparent reason.	S-10 2" 78'-80'	4 4 11 25 R=1.2'	1811 moist PID = 0ppm rig problems) 9) Drove 2x 58'-60' 10) Drove 2x 78'-80' 11) Drove 2x 98'-100'
80'		Same SAND			
98'	Sm	S-11, 98'-100', Same as above, 100% F-M grained SAND, non-plastic, non-cohesive, does have single 1/8" oxidation band. 5Y 3/2	S-11 2" 98'-100'	15 12 13 11 R=1.4'	1938 PID=10ppm moist 12) Drove 2x 118'-120' END 28 JAN 1992 BEGIN 29 JAN 1992
100'		Same SAND			
118'	Sm	S-12, 118'-120', F-M grained SAND, dark brown non-plastic non-cohesive no inclusions no staining 5Y 4/2	S-12 2"	24 32 27 28 R=1.5'	1611 PID = 0ppm HNu = 0ppm Moist
120'					

usagnda1.pm4

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BORING LOG GENERAL DATA
Borehole Number: CERCL07
Page: 5 of 6
Signature: [illegible]
Xerox: ____
Sent to USATHAMA: 2/4/92
Date Sent: ____

Project: UC 3050 CRREL | Boring: CERCL07 | Page 5 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
130	Sm	S-13, 130' to 132', brown F-M grained SAND no staining non-cohesive, non-plastic 5Y 4/2	S-13 2" 130-132	8, 40, 21, 27 R=1.8'	13) Drove 2X 130-132 HNU = 0ppm PID = 0ppm 1717 END 1/29/92
132					BEGIN 1/30/92
142		Water (prior to development) H_2O			Note 150'
150	Sp Sm	S-14 150 to 152' F-M Grained Sand non plastic F-50% non cohesive M-50% no staining Very Moist but not saturated 5Y3/2	S 14 2"	18, 21, 24, 26 R=1.3	1) Drove 2X 150'-152' 2) Drove 2X 158-160 10:00 HNU = 0ppm PID = 0ppm END 1/30/92
152					
158	Sp Sm	Medium to Coarse-grained sand Fine - 75% Coarse - 25% non cohesive non plastic 5Y3/2 Saturated at bottom remainder is wet	S-15 2"	21, 23, 22, 24 R=1.0	3) Drove 2X 165.5-167.5 11:45 HNU = 0ppm PID = 0ppm very moist to wet
160		↑ cuttings included large sand ↓ grains and clay (all Gray)			
165.5	Sm	S-16, 165.5' to 167.5' 60% VF Gray SAND 40% Gray silt non cohesive, non-plastic no staining or inclusions N5 (medium gray)	S-16 2" 165.5 to 167.5'	19, 36, 37, 44 R=0.8	very moist to wet 1300 HNU = 0ppm PID = 0ppm
167.5					

usagndat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL 07
Page: 6 of 6
Signature: [signature]
Xerox:
Sent to USATHAMA: 2/4/92
Date Sent:

Project: VC-3050 CRREL | Boring: CERCL07 | Page: 6 of 6

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
174.5	Sm	S-17 174.5 - 176.5 Very Fine Gray Sand 50% VF sand 50% silt moist at top 6" Maybe wet at bottom 3" non cohesive non plastic no inclusions N5 (medium gray)	S-17 3"	35 50 R=.9'	4) Drove 2X 174.5-176.5 5) Switched to 9 7/8" Solid Tricone bit at 181 14:11 HNU = 0ppm PID = 0ppm 6) Mud loss at ~183' 7) Drilled to 186' could not maintain circulation 8) Pulled Drill rod END 31 JAN 1992
176.5					
181		Top of Bedrock @ 181' BGS Bedrock is phyllite of the Orfordville Formation			BEGIN 2/1/92 Note 1) Hole had sluffed to above bedrock overnight 2) Hole redrilled to 182' + rods pulled 3) Bentonite plug 180'-182' 4) 4" well w/ 10' screen will be installed above plug. 5) Water level at 142' BTOC on 4 Feb 1992 prior to development END 1 FEB 1992

usagndat.pm4

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BORING LOG GENERAL DATA

Project: CRREL UC3050 Boring: CERCL08 Page: 1 of 4

Driller & Company: MARK PRUEHER WTD ENVIRONMENTAL

Geologist/Logger & Company: JOHN PECK E&E, INC. Signature: J. Peck

Date Boring Started: 16 FEB 1992 Completed: 17 Feb 1992

Water Levels (from Ground Surface) Drilling Rig: CANTERRA CT-250

First Encountered: 133' Date: 17 FEB

While Drilling: 133' Date: 17 FEB

At Boring Completion: 129.7' Date: 18 FEB

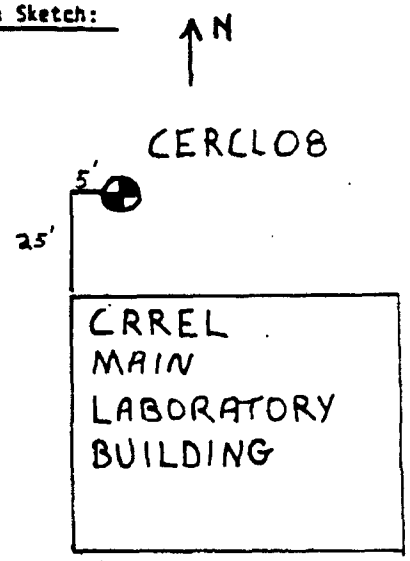
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
16 FEB	13:30	16:00	0'	52'					
17 FEB	09:00 * LEVEL C ON 17 FEB (~¾ hrs)	15:00	52'	149'					

Abbreviations:

Abbr	Meaning
S	SAMPLE
R	RECOVERY
HNU	HNU MODEL 101 PHOTOIONIZER
PID	PHOTOVAC MICROTIP
2x	2" x 2' SPLITSPOON
NA	NOT AVAILABLE

Location Sketch:



p. 1 of 4

19 FEB 1992

J. Peck Sent to USATHAMA CERCL08

BORING LOG GENERAL DATA
Borehole Number: CERCL08
Page: 2 of 4
Signature:
Xerox:
Sent to USATHAMA: 2/19
Date Sent:

Project: CRREL UC3050 | Boring: CERCL08 | Page: 2 of 4

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
					BEGIN 16 FEB 1992
18	ML	S-1 18-20'	S-1	6	NOTE: 1) ALL SAMPLES DRIVEN W/ 140 LB HAMMER W/ 30" FREEFALL
	CL	18-18.4 Brown 5:14 100% FINES NON-PLASTIC NON-COHESIVE, SLIGHTLY MOIST 5Y6/4	15:25	8	2) DEPTHS FROM GROUND SURFACE
	ML	18.4-19.1 GRAY SILTY CLAY & COHESIVE + MED. PLASTIC WET 5Y5/2	PID=.6 HNU=0	14	3) DEPTHS AND RECOVERIES IN FEET.
20		19.1-19.5 VF GRAY SAND VARVED WITH SOME TAN SAND. DRY + NON-COH. LIMONITE STAINING NG	R=1.5	14	4) SAMPLES DRIVEN INSIDE 6¼" inside DIAMETER HOLLOW STEM AUGERS.
38		S-2 38-40'			
	ML	VERY FINE SAND NON COHESIVE + PLASTIC DRY. NO LIMONITE STAINING 90% VF SAND 10% SILT 5Y6/2	S-2 15:45	12 12	
			PID=60	12	
40			HNU=NA R=1.2	13	NOTE 0': 1) DROVE 2X 18-20' 2) DROVE 2X 38-40' 3) STOPPING ON 16 FEB DUE TO HIGH PID READINGS WILL RESUME IN LEVEL C AT 52'.
52		END 16 FEB 1992 DEPTH = 52' BEGIN 17 FEB 1992			
59		S-3 59-61'	S-3 10:00	19 18	END 16 FEB 1992 BEGIN 17 FEB 1992
	ML	VERY-FINE GRAINED SAND W SILT 80% VF SAND 20% SILT 5Y5/2 NON COHESIVE OR PLASTIC DRY	PID=NA HNU=360	20	Note 52': 1) BEGIN IN LEVEL C PROTECTION
61			R=1.4	21	2) DROVE 2X 59-61' 3) DOWNGRADE TO LEVEL D PRIOR TO S-3 DUE TO LOW READINGS IN BREATHING ZONE

usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: CERCL 08
Page 3 of 4
Signature: [signature]
Xerox: ____
Sent to USATHAMA: 2/19/92
Date Sent: ____

Project: CRREL UC3050 | Boring: CERCL08 | Page: 3 of 4

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
79	ML	S-4 Very Fine Grained SAND w SILT 75% V.F. SAND 25% SILT NON-COHESIVE OR PLASTIC DRY NO ODOR 5Y7/2	S-4 10:40 PID=NA HNU=6 R=1.6	9 15 20 27	Note: 4) Drove 2X 79-81' 5) Drove 2X 99-101' 6) Drove 2X 119-121' 7) Drove 2X 129-131' 8) Drove 2X 139-141' 9) Bottom of Auger hole = 149 4" PVC well with 10" screen - 137-147 will be set in this boring.
81					
99	SP	S-5 Fine-grained SAND w/ Silt YELLOW-BROWN 85% F-SAND 15% Silt DRY NON-COHESIVE OR PLASTIC NO ODOR 5Y6/2	S-5 11:35 PID=NA HNU=3 R=1.6	8 8 9 9	
101					
119	SP	S-6 FINE GRAINED SAND GRAY w/ specks of biotite + hornblende NON COHESIVE OR PLASTIC DRY W/TRACE SILT 90% F-SAND 10% SILT N6	S-6 13:05 PID=NA HNU=1 R=1.5	10 11 11 12	
121					
129.7		✓ Water at 129.7			
139	SP	S-7 Fine to Medium-GRAINED SAND w/trace SILT F-Sand 70% M-SAND 25% SILT 5% WET 5Y5/2 NON COHESIVE OR PLASTIC	S-7 14:25 PID=NA HNU=2 R=2	10 11 14 12	
141					

usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: CERCL 08
Page: 4 of 4
Signature:
Xerox:
Sent to USATHAMA: 2/19/92
Date Sent:

Project:
Boring:
Page: 5 of 5

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
					END 17 FEB 1992
		Bottom of Auger hole = 149'			

usagndat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL 09
Page: 1 of 4
Signature: [signature]
Xerox: ____
Sent to USATHAMA: 13 FEB 1992
Date Sent: ____
58

BORING LOG GENERAL DATA

Project: CRREL UC3050 Boring: CERCL09 Page: 1 of 4

Driller & Company: Mark Prucher WTD ENVIRONMENTAL

Geologist/Logger & Company: JOHN PECK E+E, Inc. Signature: [signature]

Date Boring Started: 11 FEB 1992 Completed:

Water Levels (from Ground Surface) Drilling Rig: CANTERRA CT-250

First Encountered: 127' Date: 12 FEB 1992

While Drilling: 127' Date: 12 FEB 1992

At Boring Completion: 125' BGS Date: 12 FEB 1992

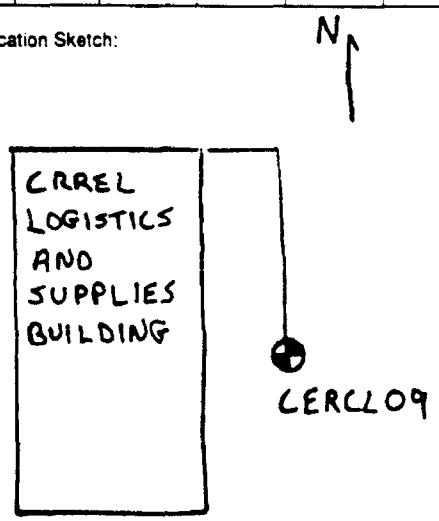
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
11 FEB	09:00	16:30	0	120.5					
12 FEB	08:00	18:00	120.5	139					

Abbreviations:

Abbr.	Meaning
S	Sample
R	Recovery
HNu	HNu Model 101 photoionizer
PID	Photovac Microtip photoionizing detector
2x	2"x2' split spoon sampler

Location Sketch:



usagndat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERLL09
Page: 2 of 4
Signature: [illegible]
Xerox:
Sent to USATHAMA: 13 FEB
Date Sent:

Project: CRREL
Boring: CERLL09
Page: 2 of 4

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		GROUND SURFACE			Begin 11 FEB 1992
					Note: 1) Sampler driven by 140lb hammer w/ 30" Free Fall
18.5	SM ML	S-1 18.5-20.5 18.5-19.0 Dry silt with trace of sand 85% Fines 15% F-sand non cohesive non plastic 19.0-20.5 Clay moist-wet 100% Fines plastic + cohesive Auger cuttings indicating very clay rich strata 0' Feet BGS 5Y5/4	S-1 09:45 PID=.1 HNU=0	6 7 7	2) Depths + recoveries in Feet 3) Depths From ground surface 4) Samples driven inside 6¼" I.D. hollow stem augers.
20.5	CL		R=2.0	7	
38.5		S-2 38.5-40.5' Clay with some silt 80% Clay 20% Silt + Fine sand Moist-Wet-Homogeneous No HNU or PID readings on cuttings or inside auger hole. 5Y4/2 cohesive + plastic	S-2 11:30 PID=.5 HNU=0	8 11 11	Note 0': 1) Drove 2x 18.5-20.5 2) Drove 2x 38.5-40.5 3) Drove 2x 58.5-60.5
40.5	CL		R=2.0	10	
58.5		S-3 58.5-60.5 58.5-59.5 SLUFF From up hole. 5Y4/2 59.5-60.5 Very Fine grained Silty Sand 90% Fines 10% V. Fine Sand Moist Varved non cohesive low plasticity	S-3 12:40 PID=1.0 HNU=0	5 8 11	
60.5	SM		R=2.0	20	

usagndat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL 09
Page: 3 of 4
Signature: [illegible]
Xerox: ____
Sent to USATHAMA: 13 FEB
Date Sent: ____

Project: UC3050 CRREL | Boring: CERCL 09 | Page: 3 of 4

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
78.5		S-4 78.5 - 80.5	S-4	7	4) Drove 2x 78.5-80.5
		78.5-79.5 SLUFF From up hole 5Y 4/2	13:50	9	
		79.5-80.5 V. Fine grained silty sand 80% Fines Varved 20% V. Fine sand Dry - Non Plastic - Non Cohesive 1.5" concretion at 80.0' surrounded by limonite staining Dry	PID=9ppm HNU=5	8	5) Drove 2x 98.5 - 100.5 hole open to bottom
	SM			15	6) At 110' PID=29 ppm out of auger hole. 3.4ppm background 0ppm in Breathing zone.
80.5			R=2.0		
98.5		S-5 98.5' - 100.5			
		Fine grained silty-sand. Varved 60% F-sand 40% Fines Dry 5Y 6/2 Non cohesive or plastic	S-5	9	7) Drove 2x 118.5 - 120.5
	SM		15:00	13	
			PID=NA HNU=15	14	
			R=1.5	14	
100.5					
118.5		S-6 118.5-120.5			
		Fine grained sand w/ some silt 80% F-sand 20% Fines Non-Varved Non-cohesive or plastic Dry 5Y 7/2	S-6	10	
	SM		16:25	19	
			PID=29 HNU=18	19	
			R=2.0	20	
120.5					END 11 FEB 1992
127		saturated (H_2O level)			BEGIN 12 FEB 1992
129		S-7 129-131			Note 120.5':
		Fine to Medium grained sand 75% F-sand 25% M-sand Non-cohesive or plastic Saturated Homogeneous 5Y 5/2	S-7	13	1) Drove 2x 129-131
	SP		09:30	18	
			PID=30 HNU=60	23	2) PID Background = 3.5 ppm HNU Background = 0ppm
			R=1.7	23	
131					

usagndat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL 09
Page: 4 of 4
Signature:
Xerox:
Sent to USATHAMA: 13 Feb
Date Sent:

Project: UC 3050
Boring: CERCL09
Page: 4 of 4

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
139	SP	S-8 139-141' Fine-grained Sand 95% F-sand 5% Fines Non cohesive or plastic Saturated 5Y 4/2	S-8 11:00 PID=200 Hnu=60 R=1.7	14 16 12 18	3) Drove 2x 139'-141' 4) Drillers insert auger plug at 139' to remove ~1' of heaved material inside augers. 5) 4" PVC well w/ 10' screen will be installed with screened interval at ~127-137'. 6) ~40 gallons of thin bentonite mud added at 139'-139' to control heaving sands.
141		Bottom of auger hole = 139'. Last sample at 139-141'.			End 12 FEB 1992

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usagnoal.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL 10
Page: 1 of 3
Signature: JL Peck
Xerox:
Sent to USATHAMA: 2/4/92
Date Sent:

BORING LOG GENERAL DATA

Project: UC3050 CRREL Boring: CERCL 10 Page: 1 of 3

Driller & Company: Mark Prucher WTD ENVIRONMENTAL

Geologist/Logger & Company: JOHN PECK Signature: JL Peck

Date Boring Started: 2/3/92 Completed: 2/4/92

Water Levels (from Ground Surface) Drilling Rig: CANTERRA CT-250

First Encountered: 112' Date: 2/4/92

While Drilling: 112' Date: 2/4/92

At Boring Completion: 112' Date: 2/4/92

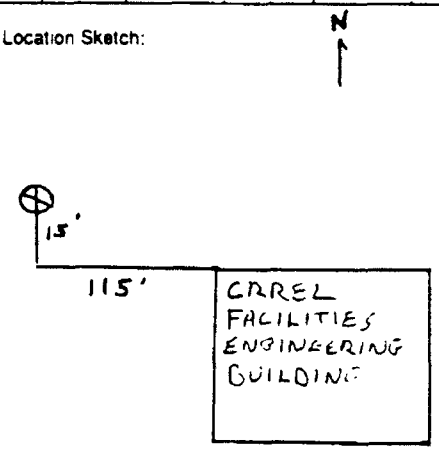
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
2/3	16:00	19:00							
2/4	08:00	13:00							

Abbreviations:

Abbr.	Meaning
S	Sample
R	Recovery
HNU	HNU Model 101 photoionizer (ppm)
PID	Photovac Microtip (ppm) photo ionizing detector
08:30	Time
2x	2"x2' split spoon

Location Sketch:



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usagndat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL 10
Page: 2 of 3
Signature: [illegible]
Xerox: ____
Sent to USATHAMA: 2/4/92
Date Sent: ____

Project: UC3050 CRREL
Boring: CERCL10
Page: 2 of 3

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
0		GROUND SURFACE			Note: 1) Sample driven w/140lb hammer 30" Free Fall 2) Depths in Feet + B.G.S. 3) Sampling inside 6¼" hollow stem auger
18	ML	S-1 18-20' Silt + Silty Clay 100% Fines Dry Non Cohesive Low Plasticity Bottom .2' Clay Silt Moist Cohesive PID = .4 ppm in borehole 5Y6/2 PID = .6 ppm	S-1 2" 1630	8 7 7 6 R=2.0	Note 0': 1) Drove 2x 18-20' 2) Drove 2x 38-40' 3) Drove 2x 58-60
20					
38	ML	S-2 38-40' Clay rich Silt Dry 100% Fine Noncohesive Low Plasticity HNU = 0 ppm PID = NA 5Y5/2	S-2 2" 17:10	4 5 9 8 R=2.0	
40					
58	CL	S-3 58-60' 58-59' Clay 100% Fines moist Cohesive 59-60' Sand with Silt 80% Fine grained Sand 20% Silt Dry PID = 0.9 ppm (maybe high background) Limonite Staining 2" layer between Clay & Silt 5Y5/2	S-3 2" 18:00	10 11 14 16 R=2.0	
	SM				
60					

usag-rdat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL10
Page: 3 of 3
Signature: [illegible]
Xerox: [illegible]
Sent to USATHAMA: 2/4/92
Date Sent:

Project: UC3050 CRREL
Boring: CERCL10
Page 3 of 3

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
78	CL	S-4 78-80'	S-4 2" 18:50	7	4) Drove 2x 78-80'
		78-78.4 Clay 100% Fines, moist cohesive 5Y4/2		7	5) Stopped at 19:00 hrs on 2/3/92
	SM	78.4-80' Silty Sand 75% Fine Sand 25% Silt Varved Dry, Non Cohesive, Low Plasticity 5Y6/2 PID=0ppm		11	
80				14 R=1.5'	END 2/3/92
					BEGIN 2/4/92
98	CL	S-5 98-100'			Note 98':
		98-98.4 Clay moist 100% Fines 5Y3/2	S-5 2" 08:40	7	1) Drove 2x 98-100'
	SM	98.4-98.8' Brown Sand 85% Sand 15% Silt PID=6ppm 5Y6/2		13	2) Getting PID readings in augers up to 30ppm, 2-4ppm in breathing zone + 2-3 off fittings @ 110-120' monitoring
100		98.8-99.6 Sand (Light Colored) Limonite staining at top of Light Sand 90% Sand 10% Silt		22	
				27 R=1.6'	3) Drove 2x 118-120'
112		Water at 112'			4) Water at 112' after driving 118-120' sample
118		S-6 118-120			5) Augers getting tight at 118'
		118-118.6 Sand Wet Med Sand 45% Fine Sand 50% Silt 5% 5Y5/2	S-6 2" 10:15	5	6) Drove 2x 124-126'
	CL	118.6-119.2 Clay Wet 5Y5/2 100% Fines		6	7) Water level at 112'
		119.2-120 Sand Wet PID=0ppm Med Sand 60% Fine Sand 35% Silt 5%		7	8) Auger depth = 124'
120	SM			12 R=2.0'	9) Will set 4" well with 10' screen
124		S-7 124-126'			
		124'-125.5' Sand Wet Med 65% Fine 30% Silt 5% 5Y3/2	S-7 2" 11:57	7	
		125.5-126' Lt. Brown Sand Wet Fine 75% Med 20% Silt 5% PID=.5ppm 5Y4/2		7	
				9	
126				12 R=2.0'	END 2/4/92

E. of Boring = 124'
Last Sample = 124-126'

BORING LOG GENERAL DATA

Project: UC3050 Boring: CERCL11 Page: 1 of 3

Driller & Company: Mark Prueher WTD Environmental

Geologist/Logger & Company: John Peck E+E, Inc Signature: John Peck

Date Boring Started: 14 FEB 1992 Completed: 15 Feb 1992

Water Levels (from Ground Surface) Drilling Rig: Canterra CT-250

First Encountered: (perched water at 78') Saturated sample at 103.5-105.5 Date: 15 FEB

While Drilling: 103.5 Date: 15 FEB

At Boring Completion: 94.8 Date: 15 FEB

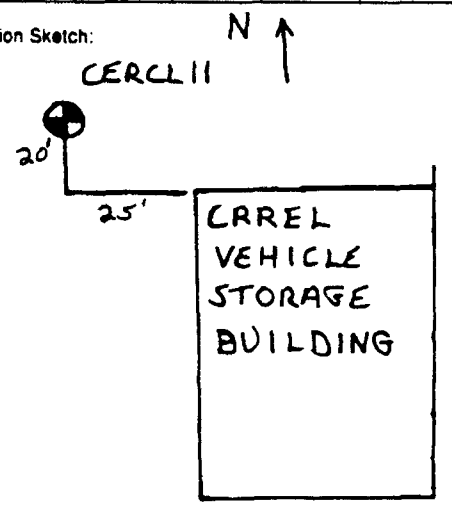
Drilling Shifts:

Date 1992	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End	Date	Time Start	Time End	Depth of Drilling Per Shift Start	Depth of Drilling Per Shift End
14 FEB	12:30	19:00	0'	78'					
15 FEB	08:30	12:00	78'	118.5'					

Abbreviations:

Abbr.	Meaning
S	Sample
R	Recovery
HNU	HNU Model 10L photoionizer
PID	Photovac Microtip
2X	2'x2" splitspoon
P	photo of splitspoon taken

Location Sketch:



Sent to USATHAMA: 2/18/92 Date Sent:

Page: 1 of 3 Xerox: Signature:

BORING LOG GENERAL DATA Borehole Number: CERCL11

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usagnost.pm4

BORING LOG GENERAL DATA
Borehole Number: CERCL 11
Page: 2 of 3
Signature: [signature]
Xerox:
Sent to USATHAMA: 2/11/92
Date Sent:

Project: UC3050 CRREL | Boring: CERCL 11 | Page: 2 of 3

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		GROUND SURFACE			12:30 Begin 14 FEB 1992
18	ML	S-1 18'-20' Silt w trace of sand WET Non cohesive or plastic 95% Silt - Fines 5% F-sand 5Y3/2	S-1 13:06 Hnu=0 PID=0 R=1.3	2, 3, 5, 5	Note: 1) Samples driven by 140lb hammer w 30" Free Fall 2) Depth & recoveries in Feet 3) Depths From ground surface 4) Samples driven in 6¼" I.D. hollow stem augers. Using in hole wireline hammer
20					
38	ML	S-2 38'-40' Silt Wet 100% Fines 5Y6/1	S-2 14:15 PID=18 Hnu=30 P R=1.5	9, 11, 11, 12	Note 0': 1) Drove 2X 18'-20' 2) Drove 2X 38-40' 3) Drove 2X 58'-60'
40					
58	CL, ML	S-3 58'-60' 58-58.3 Silty Clay Wet 58.3'-58.8' Silt Dry 5Y4/2	S-3 17:30 PID=90 Hnu=19 R=8'	7, 6, 9, 9	4) PID: 49ppm in hole at 78' 0ppm in BZ (breathing zone) 5) Drove 2X 78'-80'
60					
78	ML	S-4 78'-80' 78-78.7 Silty Clay 30% Silt 70% Clay Medium plasticity + cohesiveness 78.7-~~80.7~~ 79.7 GP Silt Dry Non cohesive + plastic 5Y5/2	S-4 18:59 PID=25 Hnu=15 R=1.7	25, 24, 23, 24	
80					END 14 FEB 1992

usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: CERL11
Page: 3 of 3
Signature: [illegible]
Xerox: ____
Sent to USATHAMA: 2/18/92
Date Sent: ____

Project: UC3050 CRREL
Boring: CERCL11
Page: 3 of 2

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
					BEGIN 15FEB1992
93.5	ML	S-5 93.5 - 95.5 5Y5/2	S-5	23	Note 78':
	CL	93.5 - 93.9 Varved silty-sand Wet 60% F-sand 40% Fines 5Y3/2	09:55	20	1) Reverse auging at 78' 08:30
	SP	93.9 - 94.2 Clay 100% Fines 5Y3/2	Hw: 3		2) Drove 2X 93.5-95.5
		Water table at 94.8'	BD: 9	25	3) Took 2 photos of 93.5-95.5
		94.2 - 95 F-M SAND F-sand 60% 5Y5/2 M-sand 40% moist	P		4) Drove 2X 103.5-105.5
95.5			R: 1.5	23	
103.5		S-6 103.5 - 105.5	S-6	21	5) Take 2 photo of 103.5-105.5
	SP	F-M SAND F- 60% M- 40% 5Y4/2 Saturated	10:30	30	6) Drove 2X 118.5-120.5
			BD: 6		7) 4" PVC well with 10' screen set in 107-117' will be set in this hole.
			Hw: 3	25	
			P		
105.5			R: 1.5	27	
118.5		S-7 118.5 - 120.5	S-7	21	
	SP	Fine Sand 100% Saturated 5Y4/2	11:50	23	
			BD: 10		
			Hw: 11	24	
120.5			R: 20	24	END 15 FEB 1992
		Bottom of auger hole = 118.5 last sample 118.5 - 120.5.			

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BORING LOG GENERAL DATA
Borehole Number: CERCL12
Page: 1 of 5
Signature: Roberta Meyer
Xerox:
Sent to USATHAMA: 2/3/92
Date Sent:

BORING LOG GENERAL DATA

Project: CRREL Boring: CERCL12 Page: 1 of 5

Driller & Company: Mark Pruhy (WTD) Environmental

Geologist/Logger & Company: Bob Meyers (E+E) Signature: Roberta Meyer

Date Boring Started: 1-21-92 Completed:

Water Levels (from Ground Surface) Drilling Rig: Cataract-250

First Encountered: 88.2' (only in replacement hole) Date: 1-24-92

While Drilling: Unable to obtain Date:

* abandoned first drilling location for CERCL12, hole collapsed after augers removed

Auger Refusal @ ~ 65' BGS

At Boring Completion: 45' BGS Date: 1-27-92

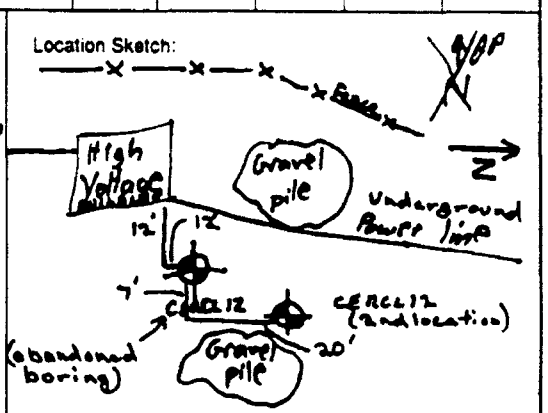
Drilling Shifts:

Date	Time		Depth of Drilling Per Shift		Date	Time		Depth of Drilling Per Shift	
	Start	End	Start	End		Start	End	Start	End
1-21-92	0800	~1800	*0' BGS	*65'					
1-22-92	0730	1735	0'	72'					
1-23-92	0730	1745	72'	100'					
1-24-92	0725	1733	100'	100'					
1-25-92	0728	2015	100'	100'					

Abbreviations:

Abbr.	Meaning
BGS	Below Ground Surface
HNU	HNU MODEL 101 Photoionizer
PID	Photoionizing Detector (Photovac Microtip)
S	Sample
2X	2" x 2' Splitspoon
0340	Sample time
R	Recovery

Location Sketch:



usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: CRCL 12
Page: 2 of 5
Signature: Robert A. Mayer
Xerox:
Sent to USATHAMA: 2/3/92
Date Sent:

Project: CRREL
Boring: CRCL12
Page: 2 of 5

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		GROUND SURFACE			Began 0844
2.5'	SP	S1, 2.5' to 4.5', 2.5' to 3.1' VF to Coarse SAND with some silt + Trace Gravel	S1	16	0908
		3.1' to 4.5' Gray SILT with trace Gravel 5Y 5/2	2"	15	HNU = 0ppm
	ML	Cohesive, non-plastic 75% Sand 20% Silt 5% Gravel	2.5'-4.5'	15	PID = 0ppm
				12	Dry
4.5'		4.5' to 7.5' Augered up SILT and rounded cobbles/pebbles	R:	2.0'	Note: 1) Samples driven by 140lb Hammer w/ 30" Free Fall 2) Depths and recoveries in Feet 3) Depths From ground surface
7.5'	ML	S2, 7.5' to 9.5', Brown SILT with some VF to Coarse sand and Gravel. Angular to rounded and a single rounded cobble. cohesive NON-plastic 5Y 3/2 80% Silt 20% Sand + Gravel	S2	6	0920
			2"	9	HNU = 0ppm
			7.5'-9.5'	15	PID = 0ppm
				17	Dry
9.5'		~~9.5' to 12.5', silt + cobbles~~	R:	0.8'	4) Sampler driven inside 6¼" hollow stem auger
12.5'	SP	S3, 12.5' to 14.5' VF to Coarse SAND with silt and rounded pebbles 60% Sand 5Y 6/1 5% Silt 35% Pebbles + Small Cobbles	S3	3	Note 0': 1) 2X driven 2.5 to 4.5' (frozen ground) 0929
			2"	9	HNU = 0ppm
			12.5'-14.5'	11	PID = 0ppm
				15	DRY
14.5'			R:	0.6'	2) Drove 2x 7.5'-9.5' 3) Drove 2x 12.5'-14.5' 4) Drove 2x 17.5'-19.5 (no recovery)
17.5'		S-4 17.5-19.5 No Recovery moist silt on tip of spoon	S4	14	HNU = 0ppm
			2"	27	PID = 0ppm moist
			17.5'-19.5	33	0952
				40	
19.5'			R:	0.0'	

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BORING LOG GENERAL DATA
Borehole Number: CERCL12
Page: 3 of 5
Signature: Robert C. Mayer
Xerox:
Sent to USATHAMA: 2/3/92
Date Sent:

Project: CRREL
Boring: CERCL12
Page: 3 of 5

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
		SAND & Gravel (70% & 30%)			
22.5'	SP	S5, 22.5' to 24.5', VF to Coarse SAND (80%) and rounded gravel (20%), trace silt 5Y 6/1	S5 2" 22.5' to 24.5'	12	Dry HNU=0ppm PID=0ppm
				23	1059
				29	5) Drove 2x 22.5'-24.5' 6) Drove 2x 27.5'-29.5'
24.5'			R=	31 1.8'	7) Drove 2x 32.5'-34.5' 8) Drove 2x 37.5'-39.5'
27.5'	SP	S6, 27.5' to 29.5', VF to Coarse SAND (95%) with Subrounded Gravel (5%) Trace silt 5Y 6/1	S6 2" 27.5' to 29.5'	11	Dry HNU=0ppm PID=0ppm
				15	1123
				18	
29.5'			R=	20 1.9'	
32.5'	SP	S7, 32.5' to 34.5', VF to Coarse SAND (85%), Gravel (14%), 1% rounded cobble, trace silt. 5Y 6/1	S7 2" 32.5' to 34.5'	17	Dry HNU=0ppm PID=0ppm
				17	
				24	1133
34.5'			1.8'	25 R=1.8'	
37.5'	SP	S8, 37.5' to 39.5', Same as above 5Y 6/1 Sand 60% Gravel 30% Silt 10%	S8 2" 37.5' to 39.5'	9	Dry HNU=0ppm PID=0ppm
				16	
				32	1142
39.5'			R=1.9'	20 1.9'	

usagndat.pm4

BORING LOG GENERAL DATA
Borehole Number: CERL12
Page: 4 of 5
Signature: Robert A Wagner
Xerox:
Sent to USATHAMA: 2/2/92
Date Sent:

Project: CRREL
Boring: CERL12
Page: 4 of 5

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
42.5'		59 No Recovery	59 2"	19	1210
				13	9) Drove 2x 42.5-44.5 (No sample recovered)
				21	10) Drove 2x 47.5'-49.5'
				26	11) Drove 2x 52.5-54.5'
44.5'			R=	0.0'	12) Drove 2x 57.5-59.5'
47.5'		S10, 47.5' to 49.5', fine grained SAND, 90% Quartz, with trace silt, (<10%). 5Y 6/1			
	SP 5M		S10 2"	10	Dry HNU = 0ppm PID = 0ppm
				11	
				12	1229
49.5'			R=	1.9'	
52.5'		S11, 52.5' to 54.5' 52.5' to 53.5' VF to Med. grained SAND with 10% rounded gravel. 53.5' to 54.5', Very fine grained SAND (Quartz) 5Y 6/1			
	SP		S11 2" 52.5' to 54.5'	12	Dry HNU = 0ppm PID = 0ppm
				18	
				21	1255
54.5'			R=	21 2.0'	
57.5'		S12, 57.5' to 59.5', fine grained Quartz SAND. 5Y 6/1	S12 2"	6	DRY HNU = 0ppm PID = 0ppm
	SM			14	1352
				21	
59.5'			R=	21 1.8'	

usagndat.pm4

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BORING LOG GENERAL DATA
Borehole Number: CERCL12
Page: 5 of 5 Xerox: Sent to USATHAMA: 2/3/92
Signature: Robert C. Meyer Date Sent:

Project: CRREL | Boring: CERCL12 | Page: 5 of 5

Depth/ Elevation (Ft.)	USCS Symbol/ Core Sketch	Soil/Rock Description	Sample Number & Depth	Blow Count & Recovery	Drilling Data
62.5'	SP	Augered through rounded Gravel S13, 62.5' to 64.5', broken cobbles of fine grained chlorite rich metamorphic rock. Dry	2", 62.5 to 64.5'	100/.8 refusal	HNU = 0ppm PID = 0ppm 1408 No physical sample taken
64.5'		NOTE: Auger refusal @ 65' BGS, hole abandoned, Switching to mud Rotary drilling, hole moved ~20', will con't sampling @ 67.5' BGS.	S-13 R=	0.8'	13) Drove 2X 62.5-64.5 (No sample Recovered) 14) Bottom of boring = 65' 15) boring abandoned 1/21/92 16) 6¼" hollow stem augers pulled prior to plugging 17) boring plugged with 24 bags of bentonite hole plug + 96 gallons of H_2O
100'		Bottom of Boring = 65' B.G.S. Original borehole abandoned after auger refusal @ 65' BGS. Hole collapsed to ~13' BGS as augers were removed. In the "new" CERCL12 location bedrock was encountered @ 62' BGS, the bedrock from 62' to 100' was phyllite of the orfordville formation with interbedded Quartz rich chlorite. B.O.H @ 100' BGS NOTE: Prior to permanent well installation the water level stabilized @ 85.2' BGS Also: We lost mud circulation @ 81.5' BGS (large fracture). Another fracture was encounter @ ~ 97' BGS.			END 21 JAN 92 Drilled with mud rotary (5⅞" tri-cone) from 0' to 100', after which we set a 2" pvc temporary well which was air surged & bailed to determine if we had reached groundwater. Then we reamed the hole to 10" with a tri-cone bit and set the well after flushing out the drilling mud. END 25 JAN 92

usagndat.pm4

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WELL BORING ABANDONMENT LOG

p. 1 of 1

Site ID:
Well /Boring Number: CERCL 12
Job Number: UC-3050
Date: 1-22-92

1. Location with respect to replacement well/boring (if any): 7' west & 20' south of replacement CERCL 12

2. Original Well/Boring:

Water/mud level prior to grouting: Date: 1-22-92 Level: Dry hole
Open depth prior to grouting: 13' BGS due to cave-in
Depth to which grout pipe was placed: 13' BGS
Total quantity of grout used during initial grouting: 24 (50 lbs) bags of Bentonite holeplug
Daily quantities of grout used to compensate for settlement: 96 gallons water per bag of bentonite.

3. Casing left in hole: Depth: None
Composition:
Size:

Remaining casing above ground surface: Stick-up: None
Composition:
Size:

4. Items left in hole: Depth: None
Description:
Composition:

5. Total drilling depth of original hole: 65' BGS

6. Sampling depths within original hole: every five feet from 0' to 65' BGS

7. Attach a copy of the Boring Log. (see CERCL 12 Boring log)

8. Attach a copy of the Construction Diagram. (NA)

Abandoned By: [signature] Date: 1-22-92

WELL BORING ABANDONMENT LOG
Well Number: CERCL 12
Page: 1 of 1
Signature:
Xerox:
Sent to USATHAMA: 2/3/92
Date Sent:
55

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USAWBAL PM4

APPENDIX E

GEOTECHNICAL ANALYSIS RESULTS

Project No. CM-14311

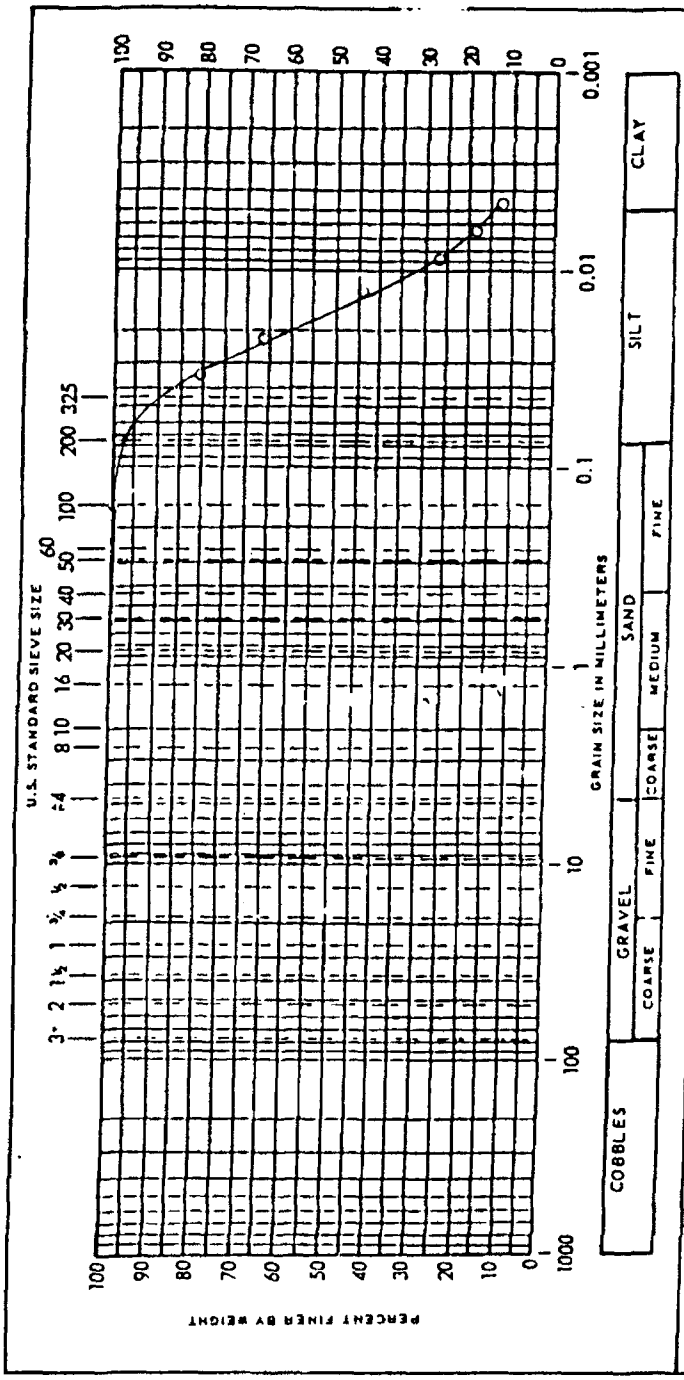
TOLEDO TESTING LABORATORY

Sheet 1 Of 1

TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample Tip	Elevation of Sample Tip	Standard Penetration (Number of Blows/Foot Unless Otherwise Stated)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Unconfined Compressive Strength (PSF)		Particle Size Distribution: Gravel (Percent)	Coarse Sand (Percent)	Medium Sand (Percent)	Fine Sand (Percent)	Silt (Percent)	Clay (Percent)	Colloids (Percent)	Atterberg Limits: Liquid Limit (Percent)	Plastic Limit (Percent)	Plasticity Index (Percent)	Group Designation and Index (AASHTO)
CECRL07	-S3								0	0	0	1	86	13		29	27	2	A-4b (8)
	-S6								0	0	0	4	83	13		29	26	3	A-4b (8)
	-S14								0	0	15	72	—13	—					
	-S17								0	0	0	72	—28	—					
CECRL08	-S2								5	1	0	65	—29	—					
	-S4								0	0	0	72	—28	—					
	-S7								1	0	35	44	—20	—					
CECRL09	-S2								1	0	0	0	79	20		30	26	4	A-4b (8)
	-S4								1	0	1	38	48	12		23	21	2	a-4a (5)
	-S8								0	0	5	84	—11	—					
CECRL10	-S3								3	0	1	27	55	14		NON-PLASTIC			A-4a (0)
	-S5								0	0	1	55	34	10		NON-PLASTIC			A-4a (0)
	-S7								0	0	29	55	—16	—					
CECRL11	-S1								0	0	0	10	85	5		29	26	3	A-4b (8)
	-S2								2	0	0	0	54	44		40	28	12	A-6a (9)
	-S3								0	0	0	4	84	12		29	25	4	A-4b (8)
	-S7								0	0	1	78	—21	—					
CECRL12	-S5								13	23	47	10	—7	—					
	-S8								48	15	28	5	—4	—					
	-S12								0	0	11	83	—6	—					

SOIL CLASSIFICATION SHEET

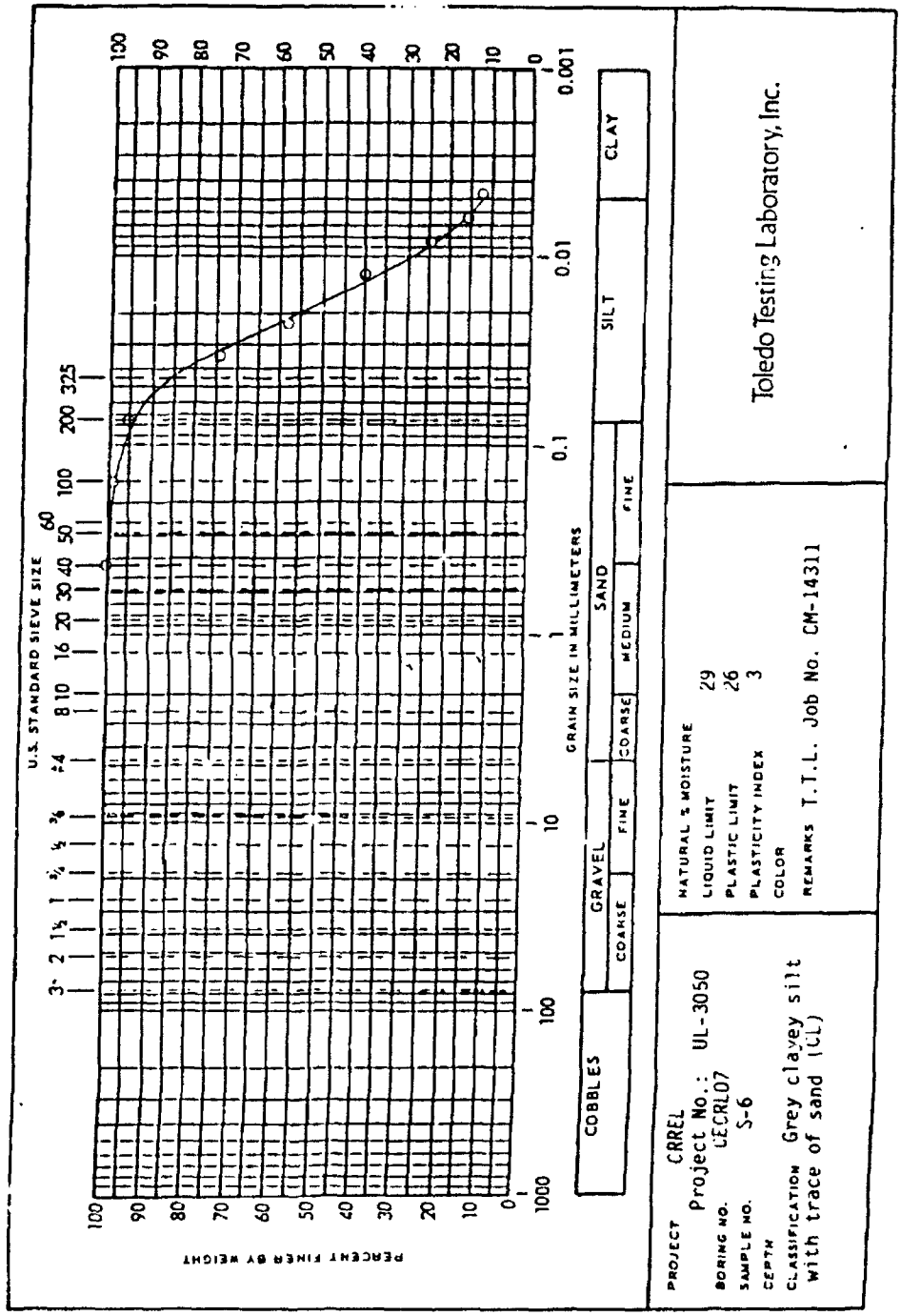


Toledo Testing Laboratory, Inc.

PROJECT CRREL
Project No.: UL-3050
BORING NO. CEURLU7
SAMPLE NO. S-3
DEPTH
CLASSIFICATION Grey clayey silt with trace of sand (ML)

NATURAL % MOISTURE 29
LIQUID LIMIT 27
PLASTIC LIMIT 2
PLASTICITY INDEX
COLOR
REMARKS T.T.L. Job No. CM-1431'

SOIL CLASSIFICATION SHEET



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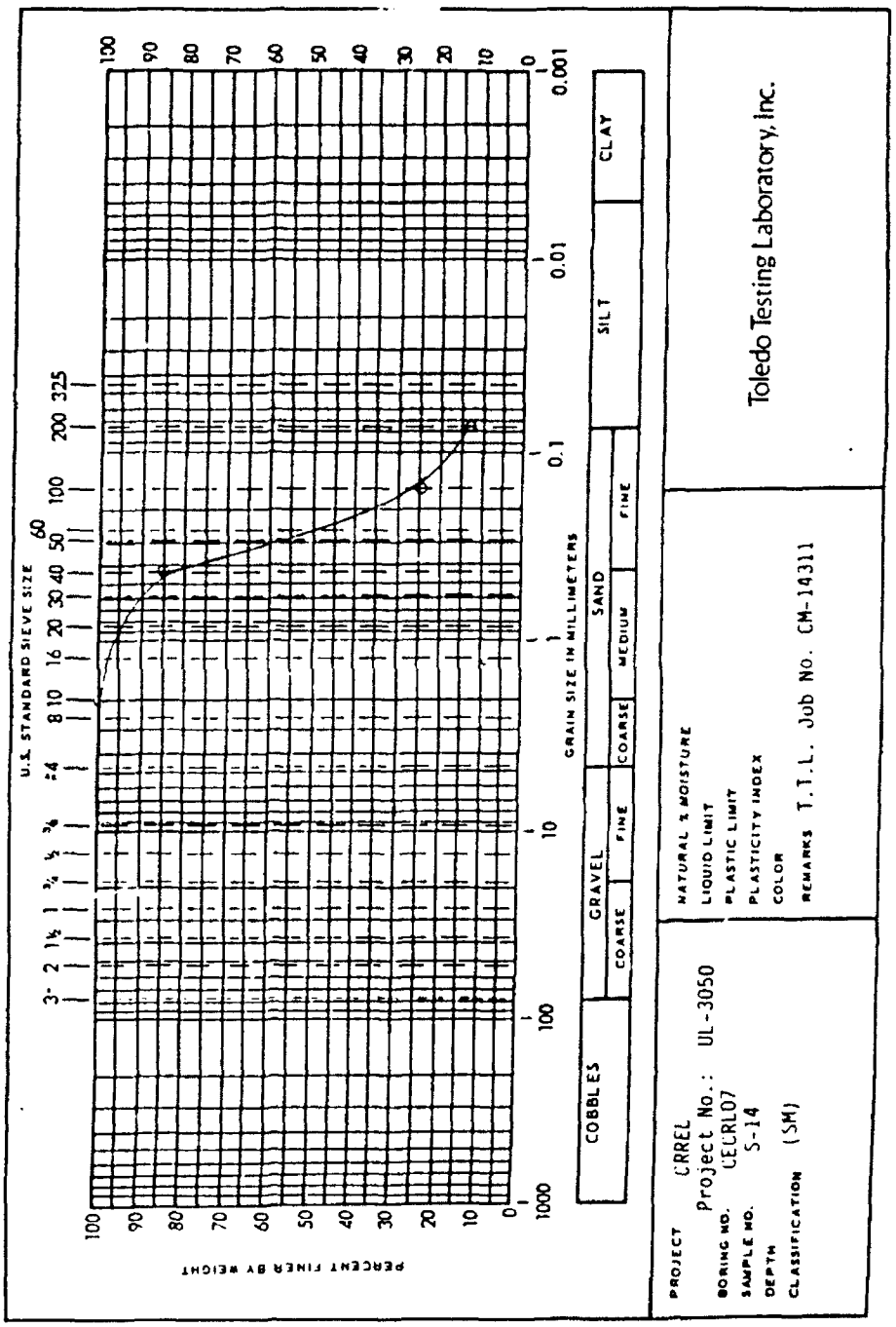

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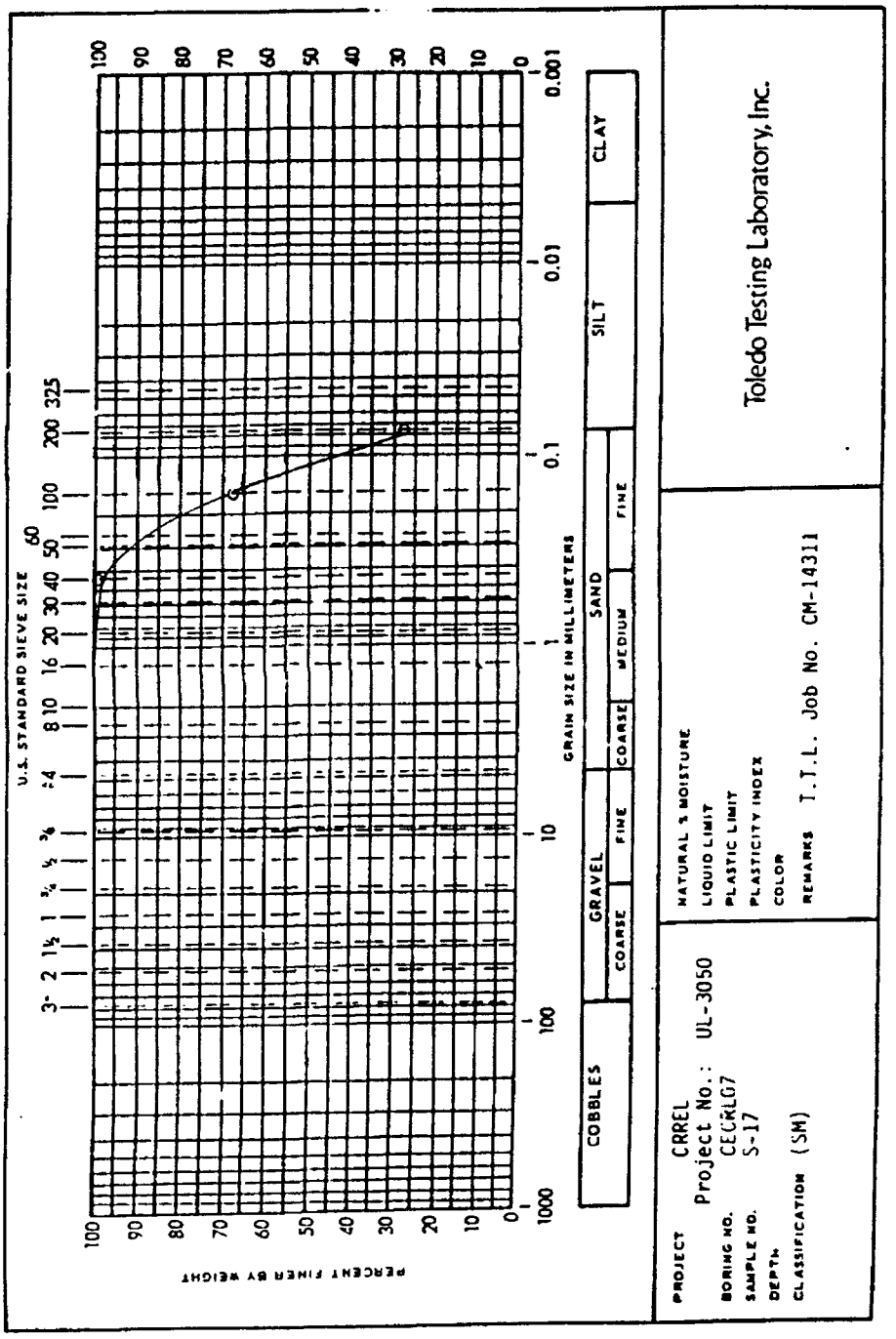

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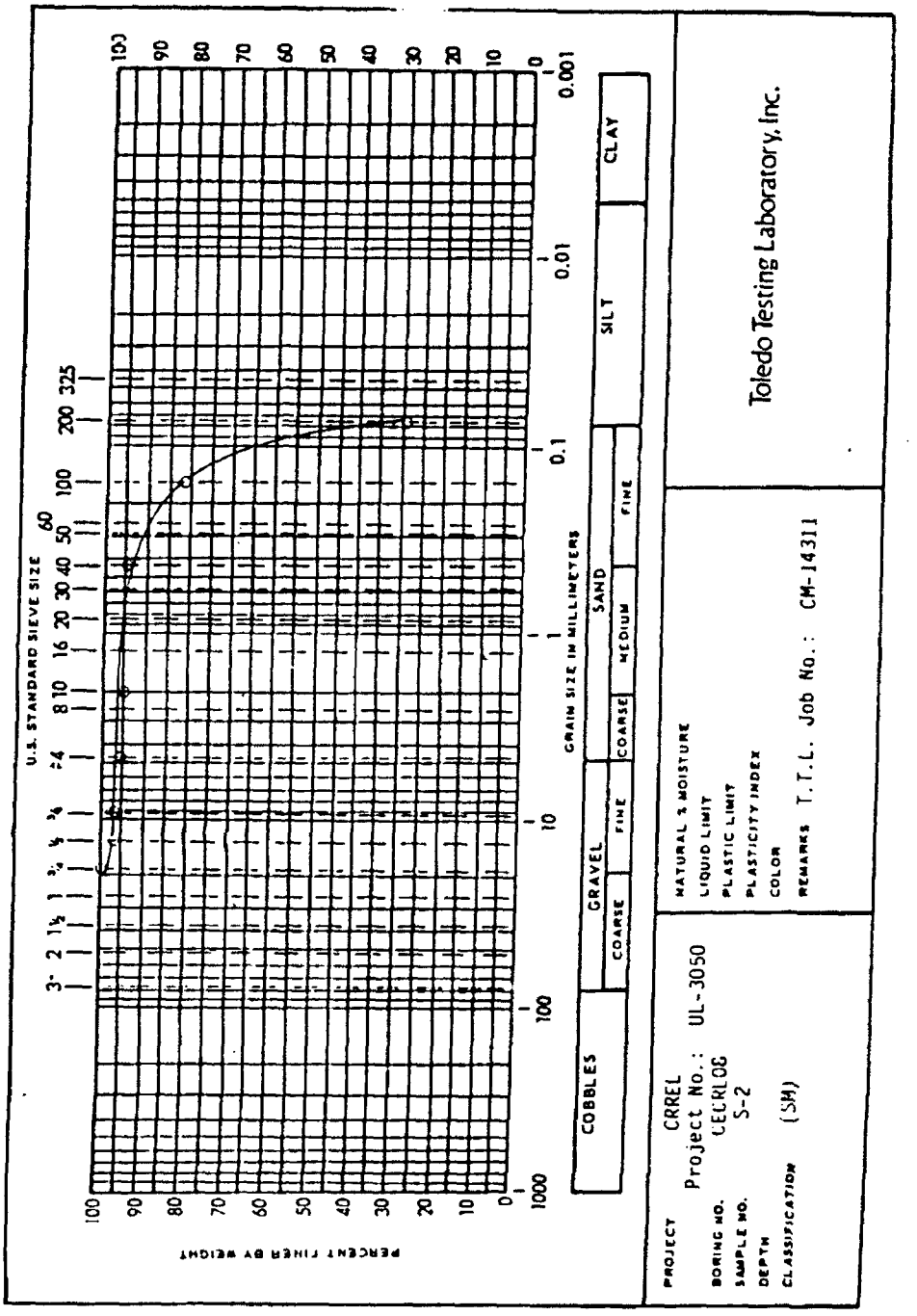

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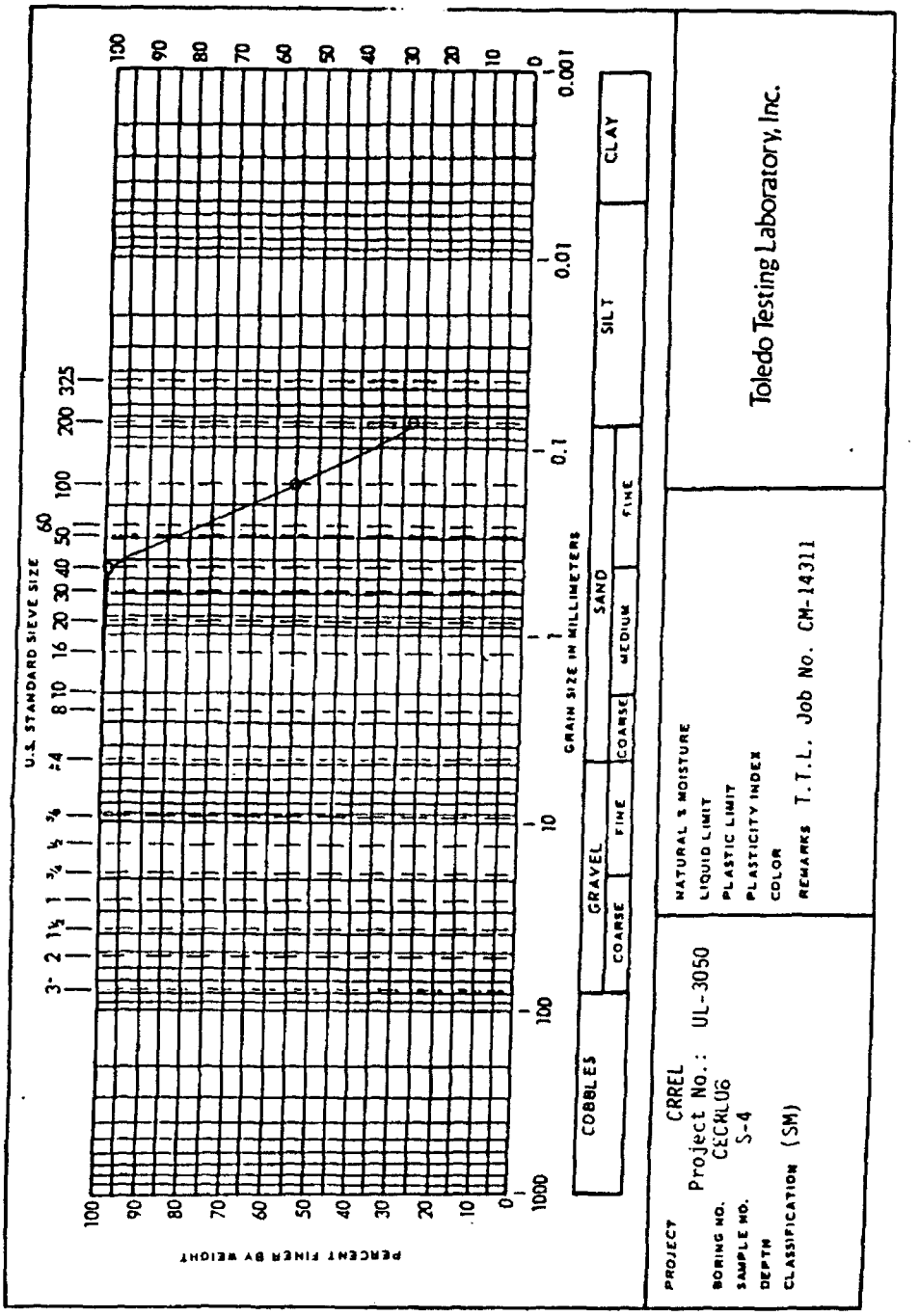

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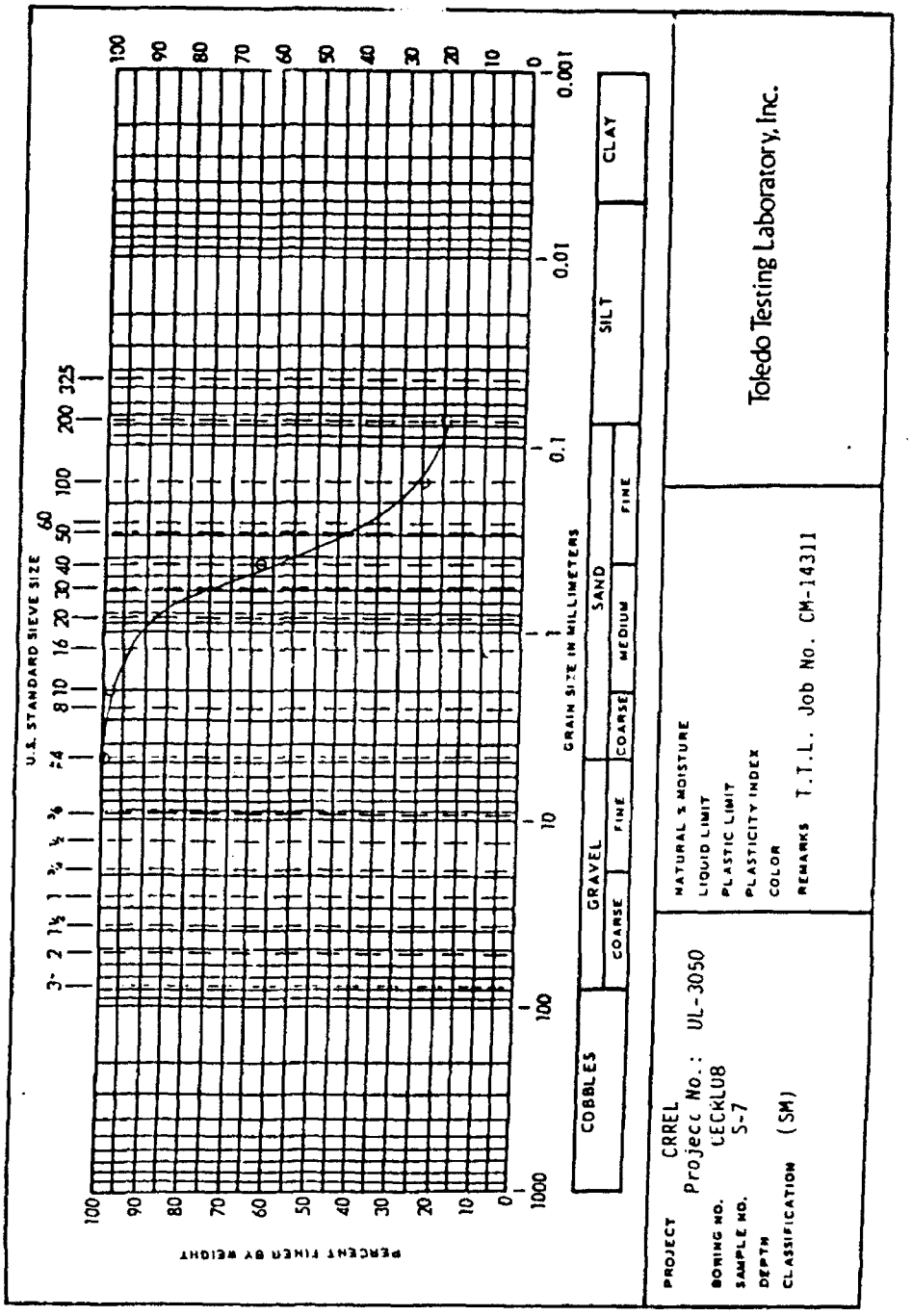

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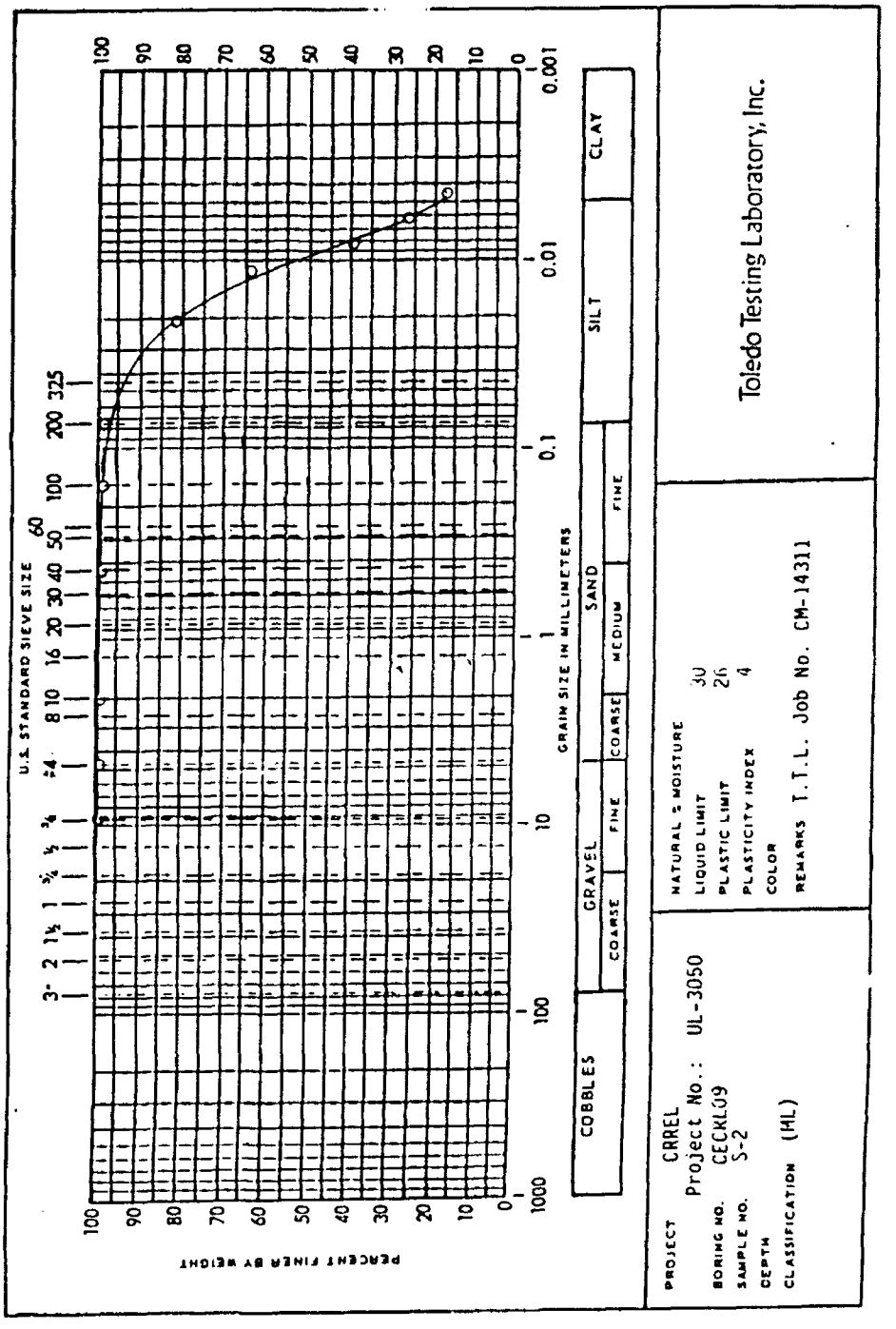
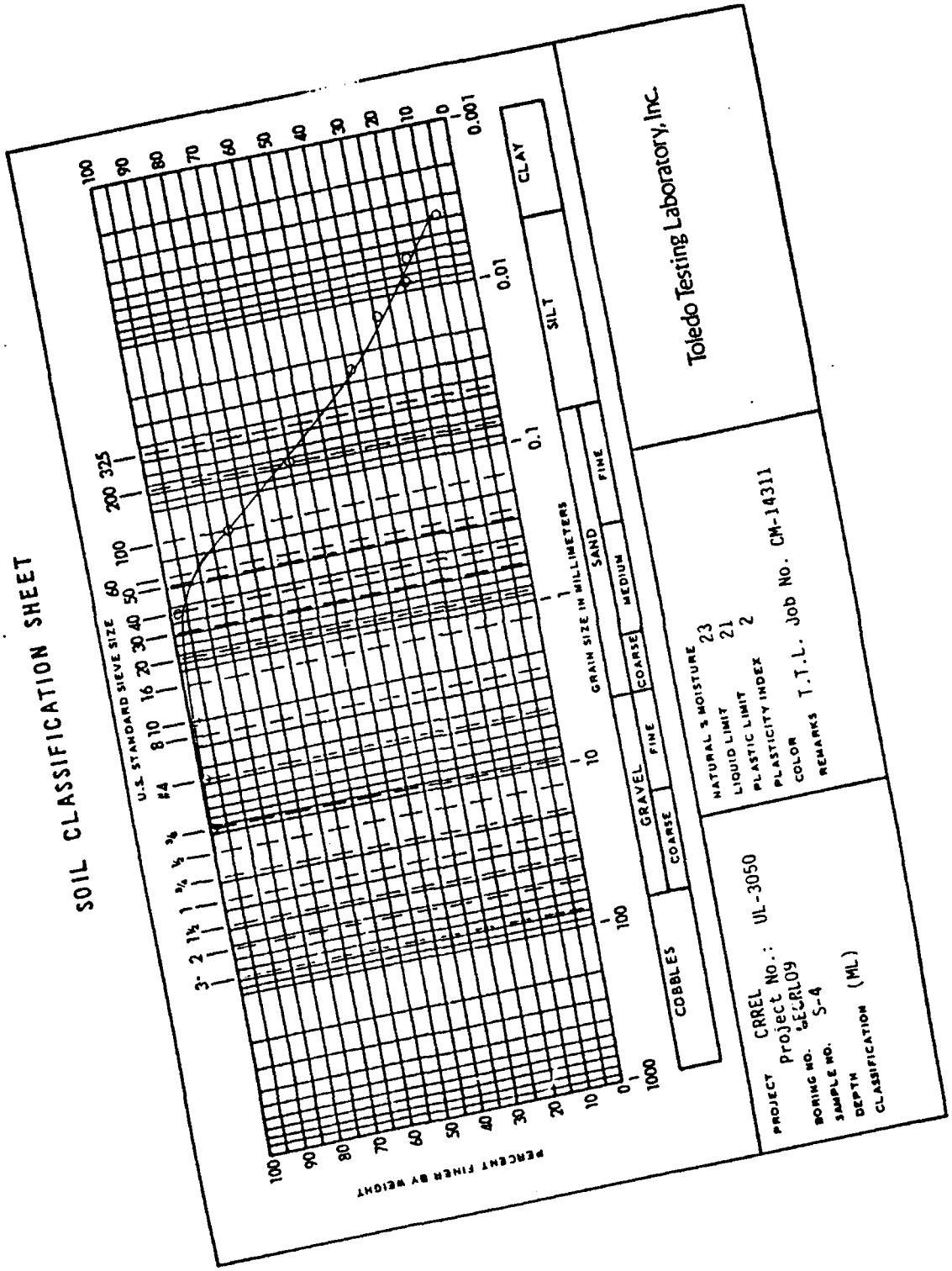
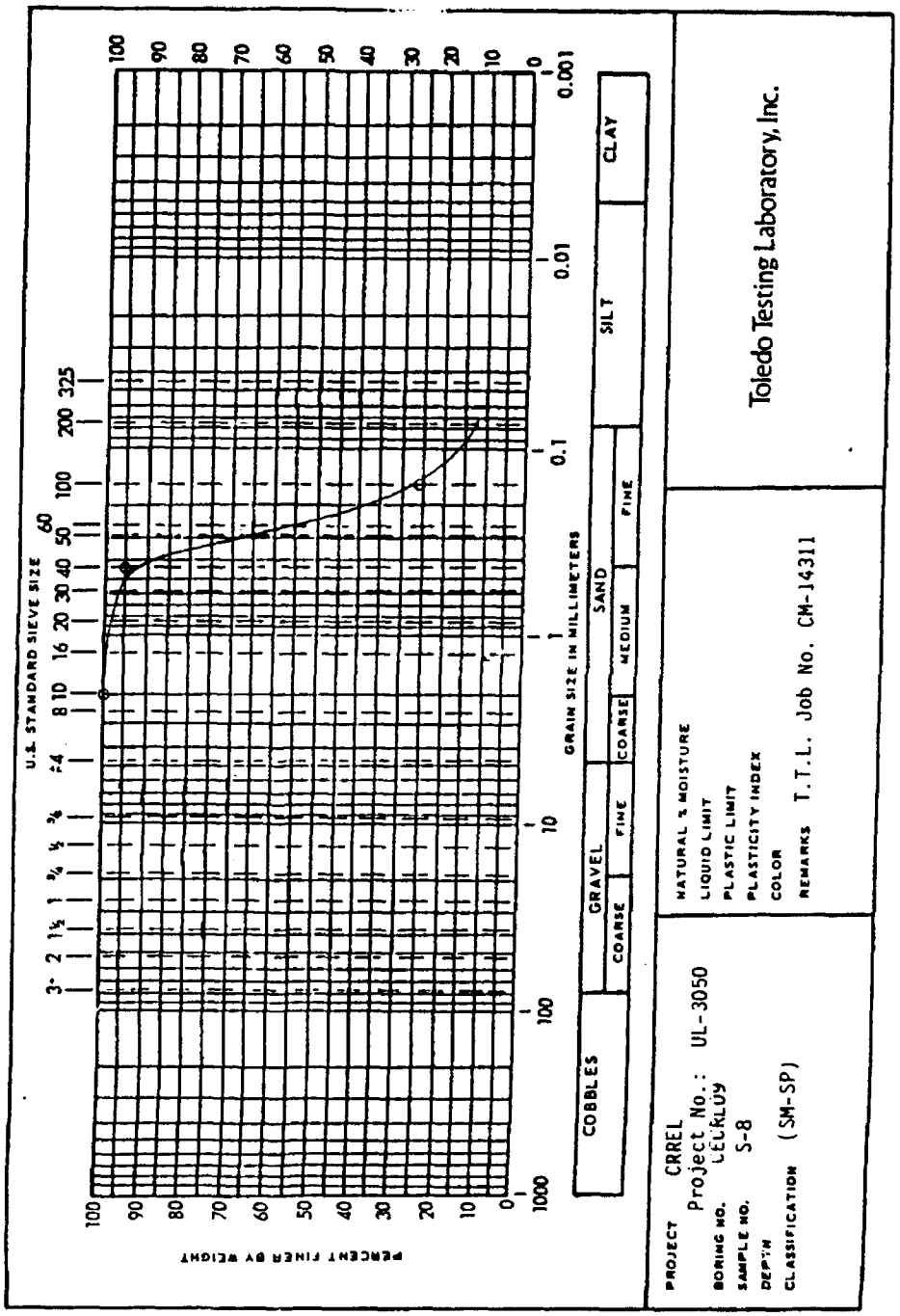
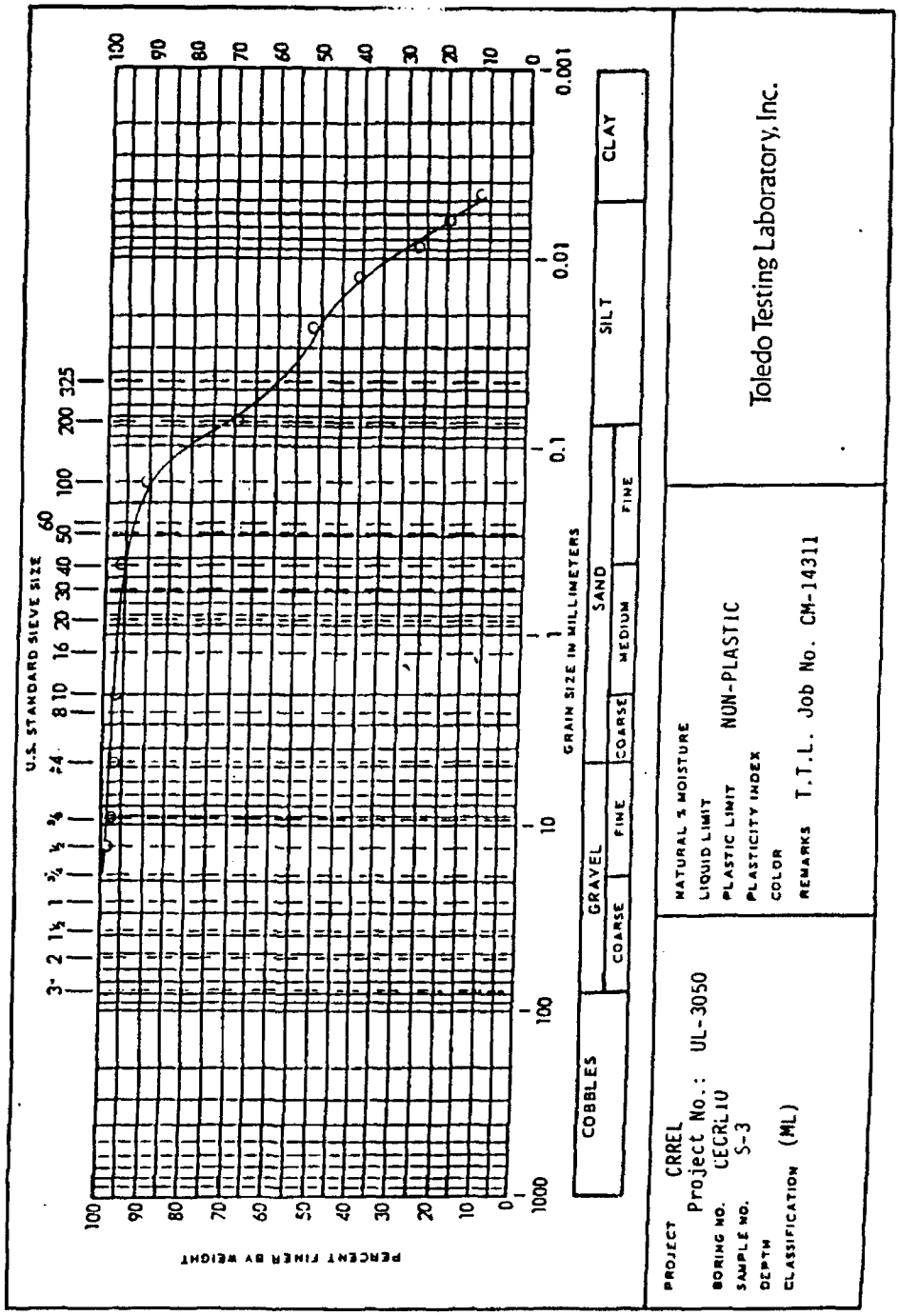



SOIL CLASSIFICATION SHEET
U.S. STANDARD SIEVE SIZE
3" 2 1½ 1 ¾ ½ ⅜ #4 8 10 16 20 30 40 50 60 100 200 325
PERCENT FINER BY WEIGHT
100 90 80 70 60 50 40 30 20 10 0
GRAIN SIZE IN MILLIMETERS
1000 100 10 1 0.1 0.01 0.001
COBBLES
GRAVEL
COARSE
FINE
SAND
COARSE
MEDIUM
FINE
SILT
CLAY
Toledo Testing Laboratory, Inc.
NATURAL % MOISTURE 23
LIQUID LIMIT 21
PLASTIC LIMIT 2
PLASTICITY INDEX
COLOR
REMARKS T.T.L. Job No. CM-14311
PROJECT CRREL
Project No.: UL-3050
BORING NO. SECRL09
SAMPLE NO. S-4
DEPTH
CLASSIFICATION (ML)

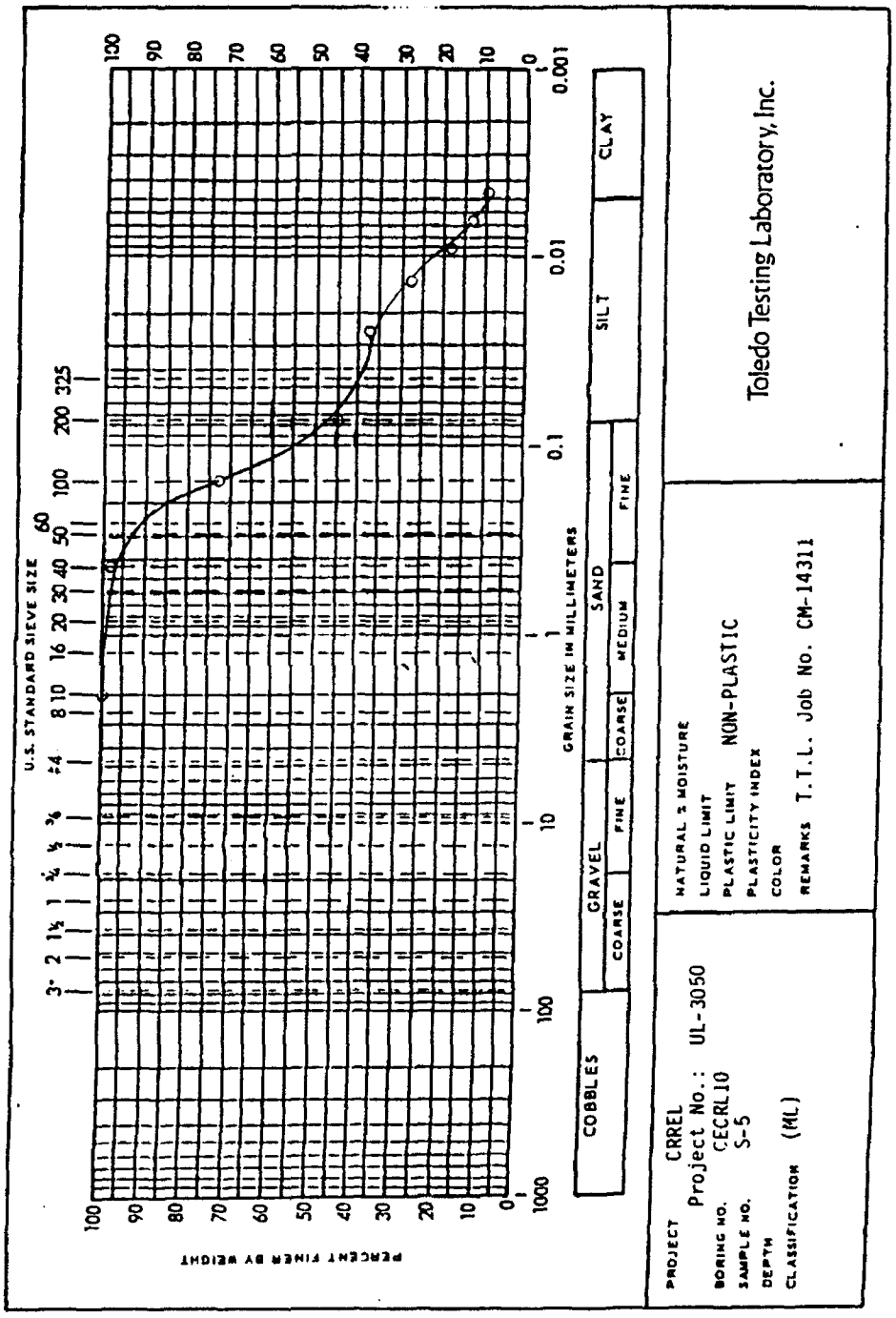
SOIL CLASSIFICATION SHEET



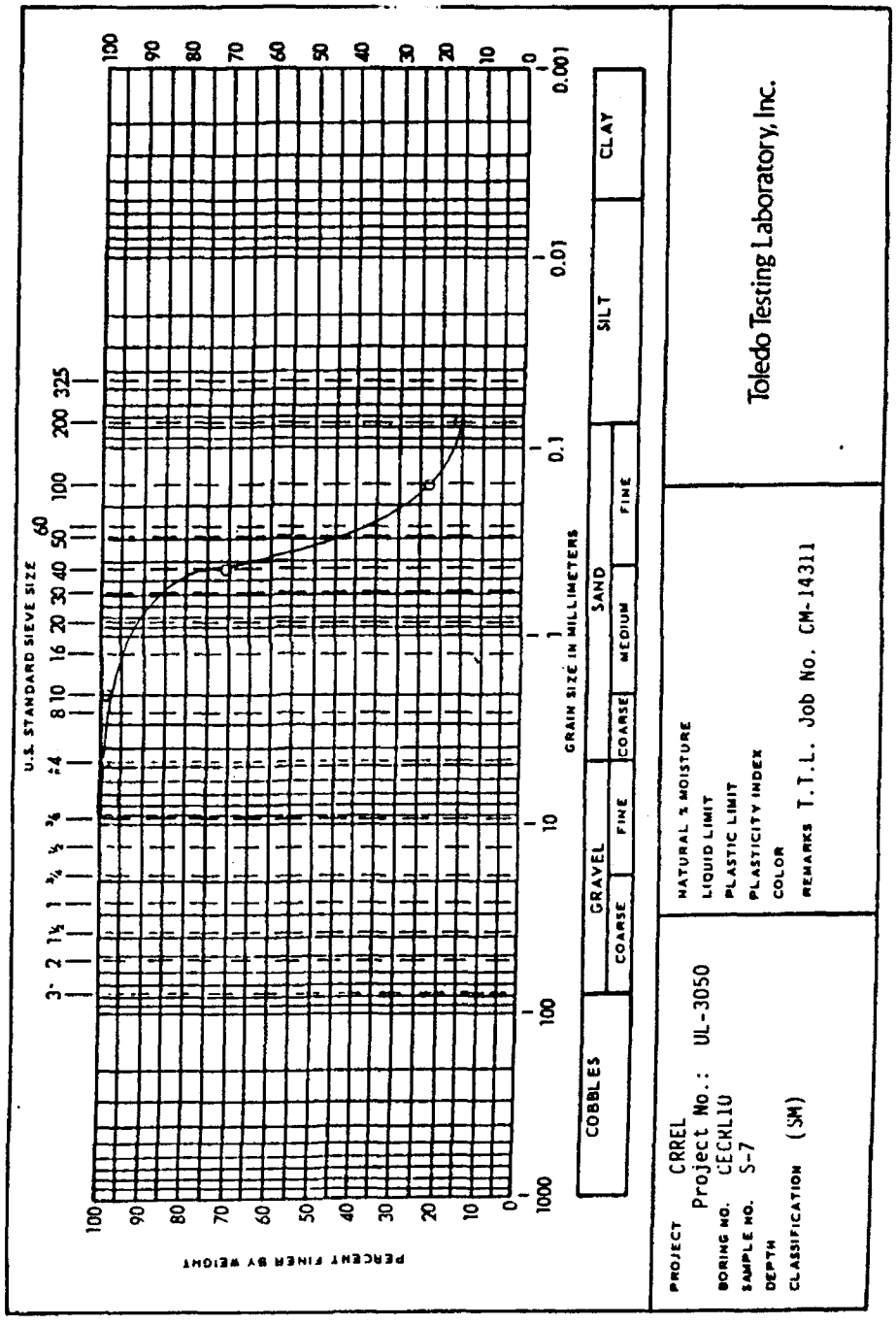
SOIL CLASSIFICATION SHEET



SOIL CLASSIFICATION SHEET



SOIL CLASSIFICATION SHEET



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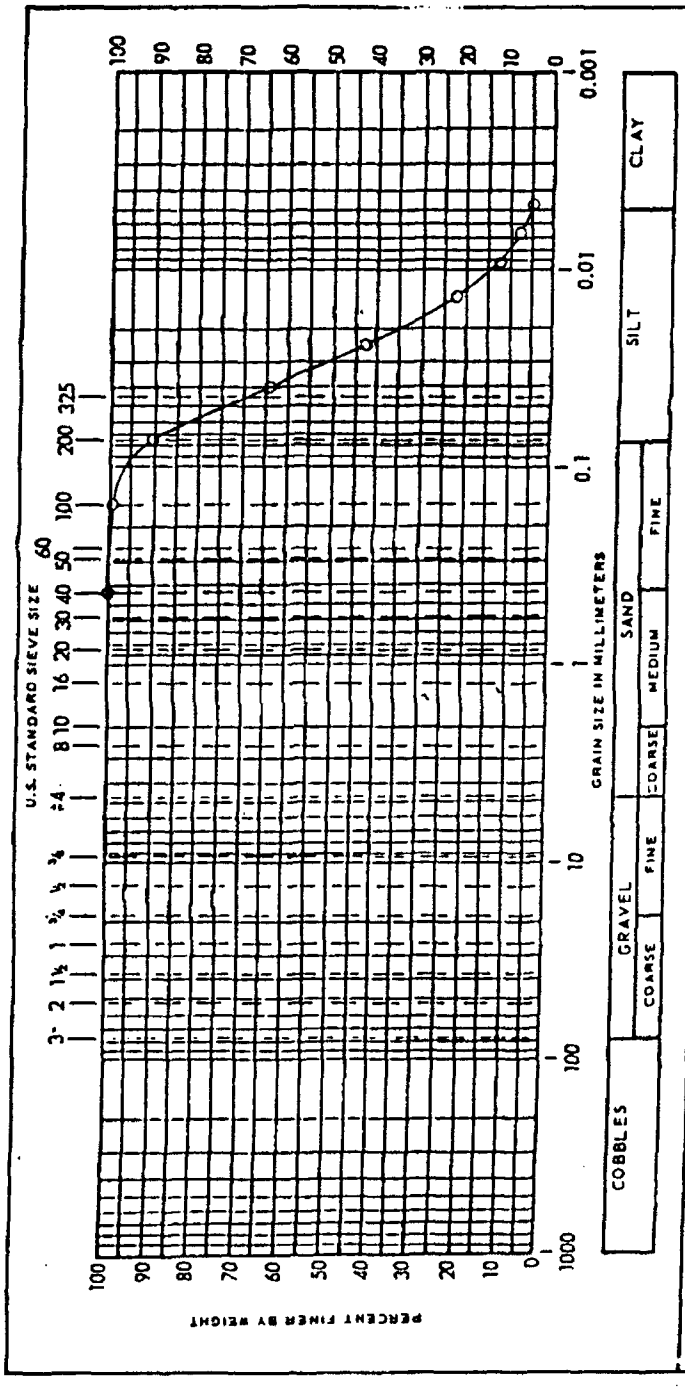
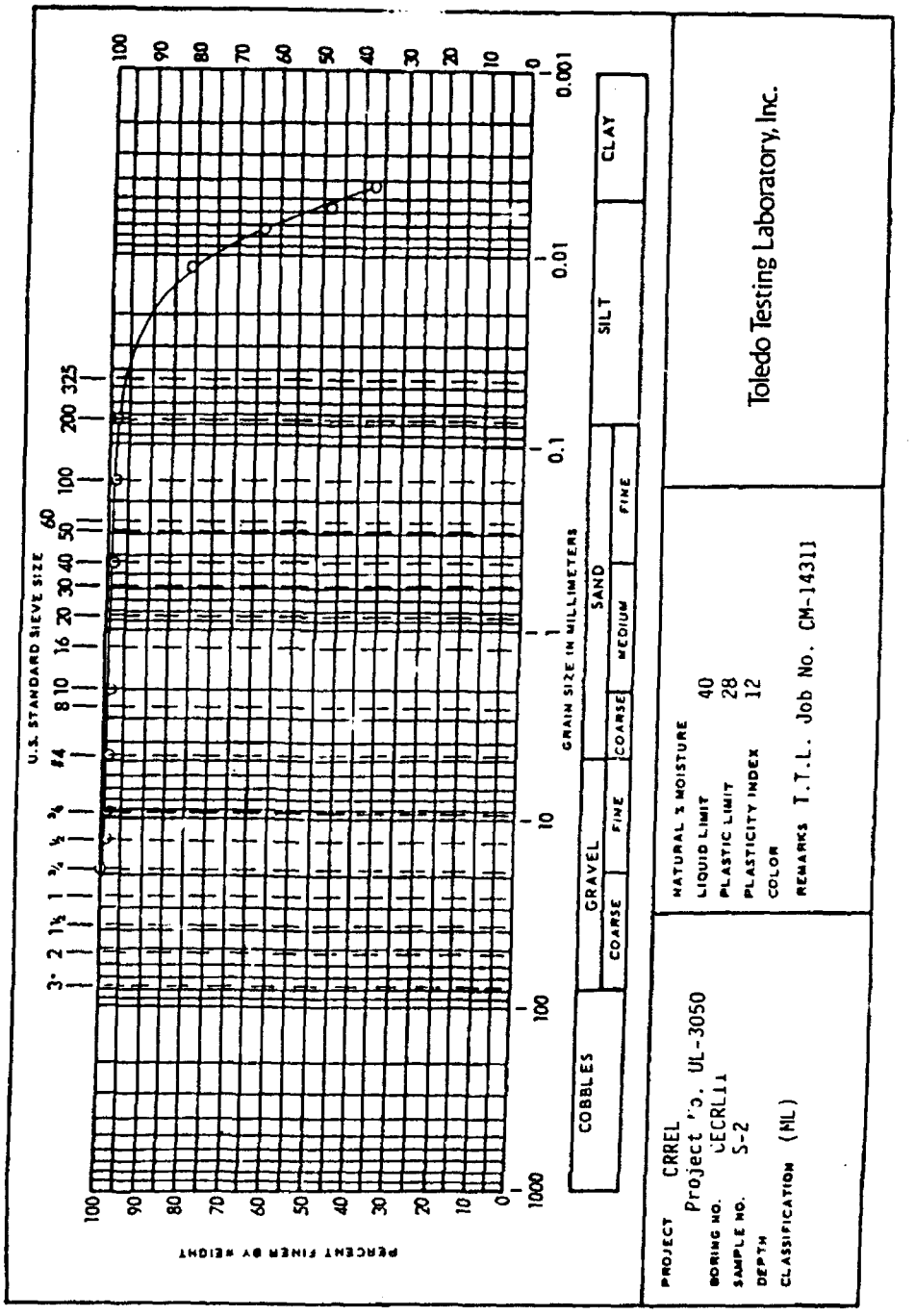


Toledo Testing Laboratory, Inc.

NATURAL % MOISTURE 29
LIQUID LIMIT 26
PLASTIC LIMIT 3
PLASTICITY INDEX
COLOR
REMARKS T.T.L. Job No. CM-14311

PROJECT CRREL
Project No. UL-3050
BORING NO. CECRL11
SAMPLE NO. S-1
DEPTH
CLASSIFICATION (ML)

SOIL CLASSIFICATION SHEET



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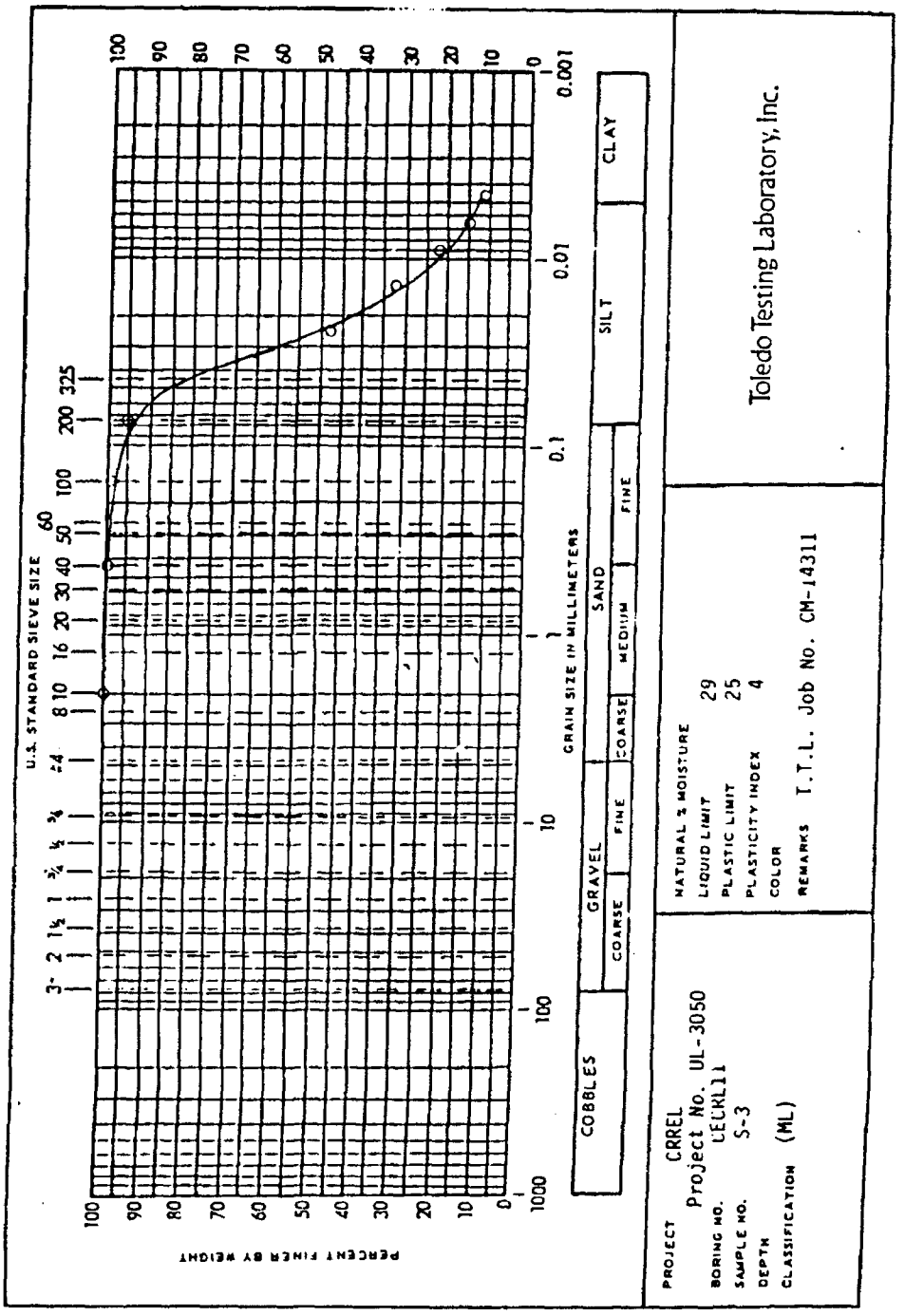

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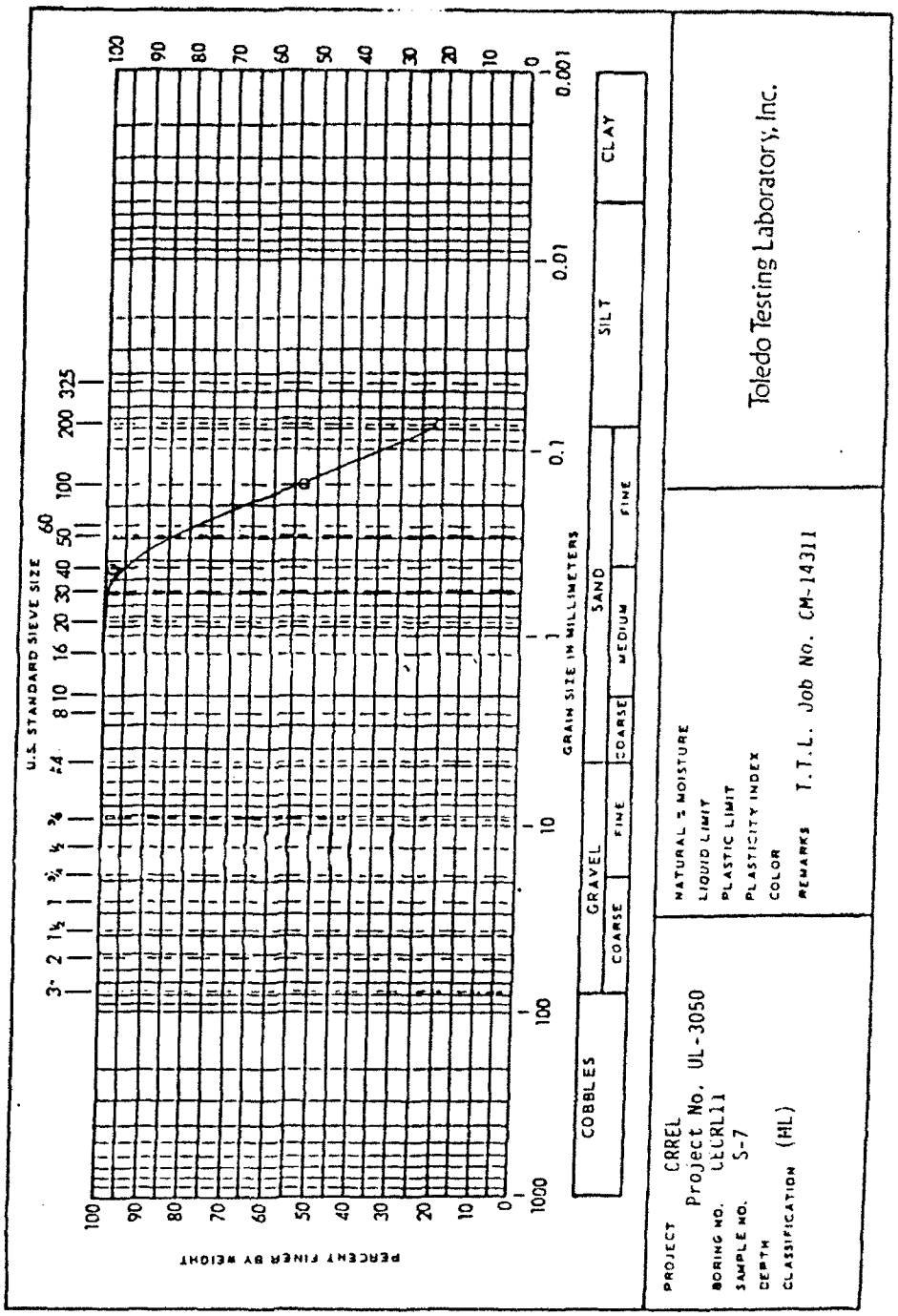

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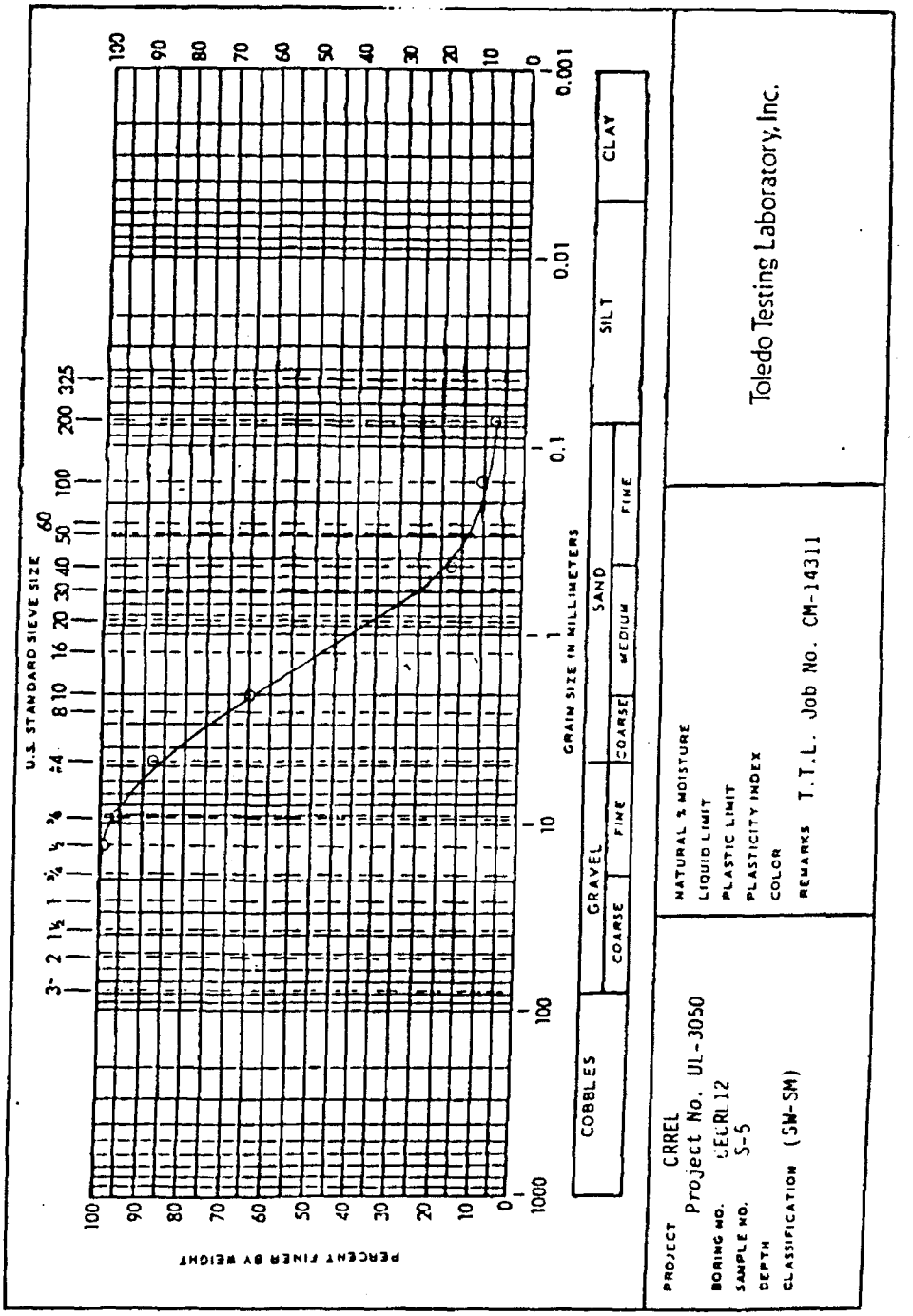

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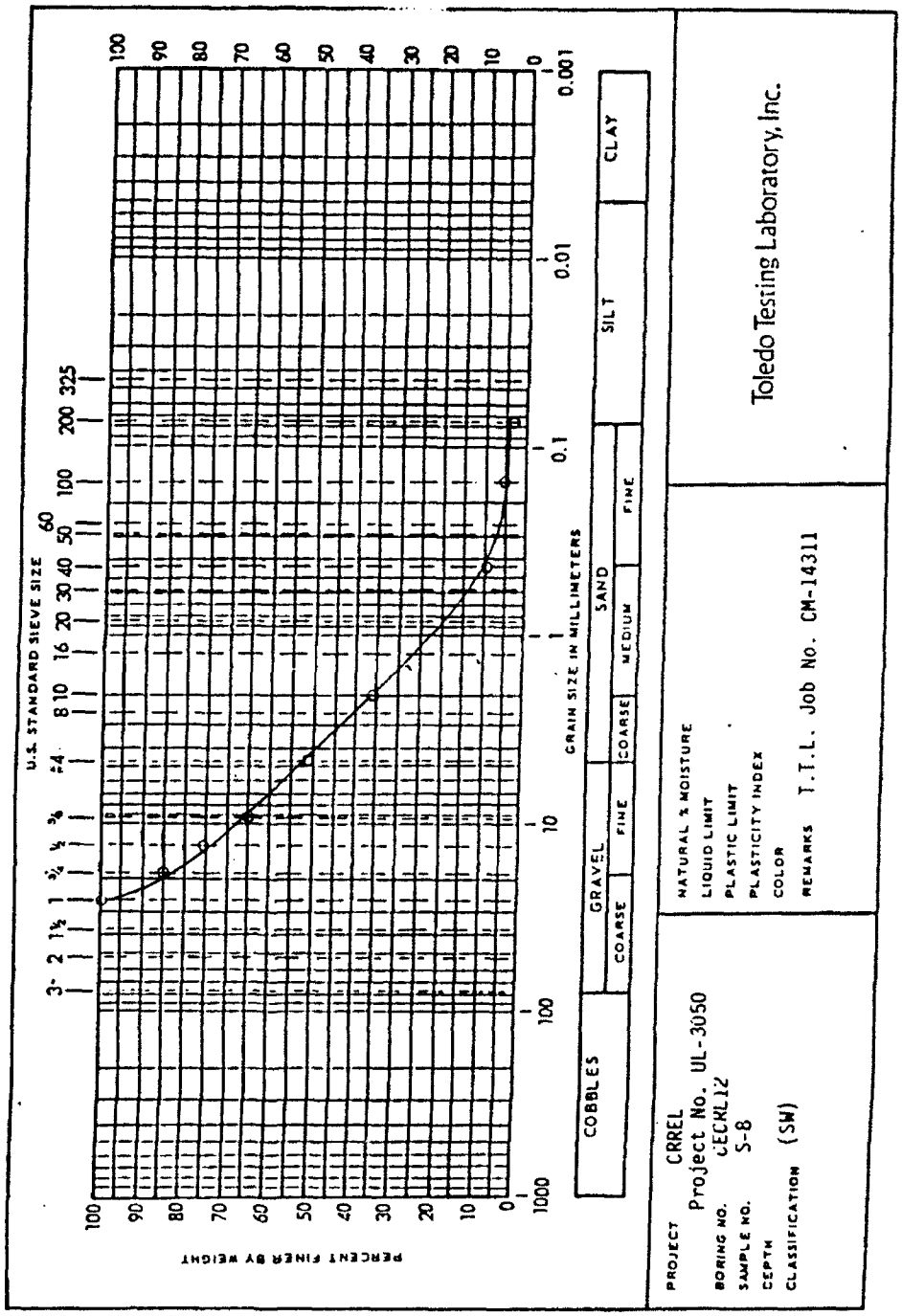

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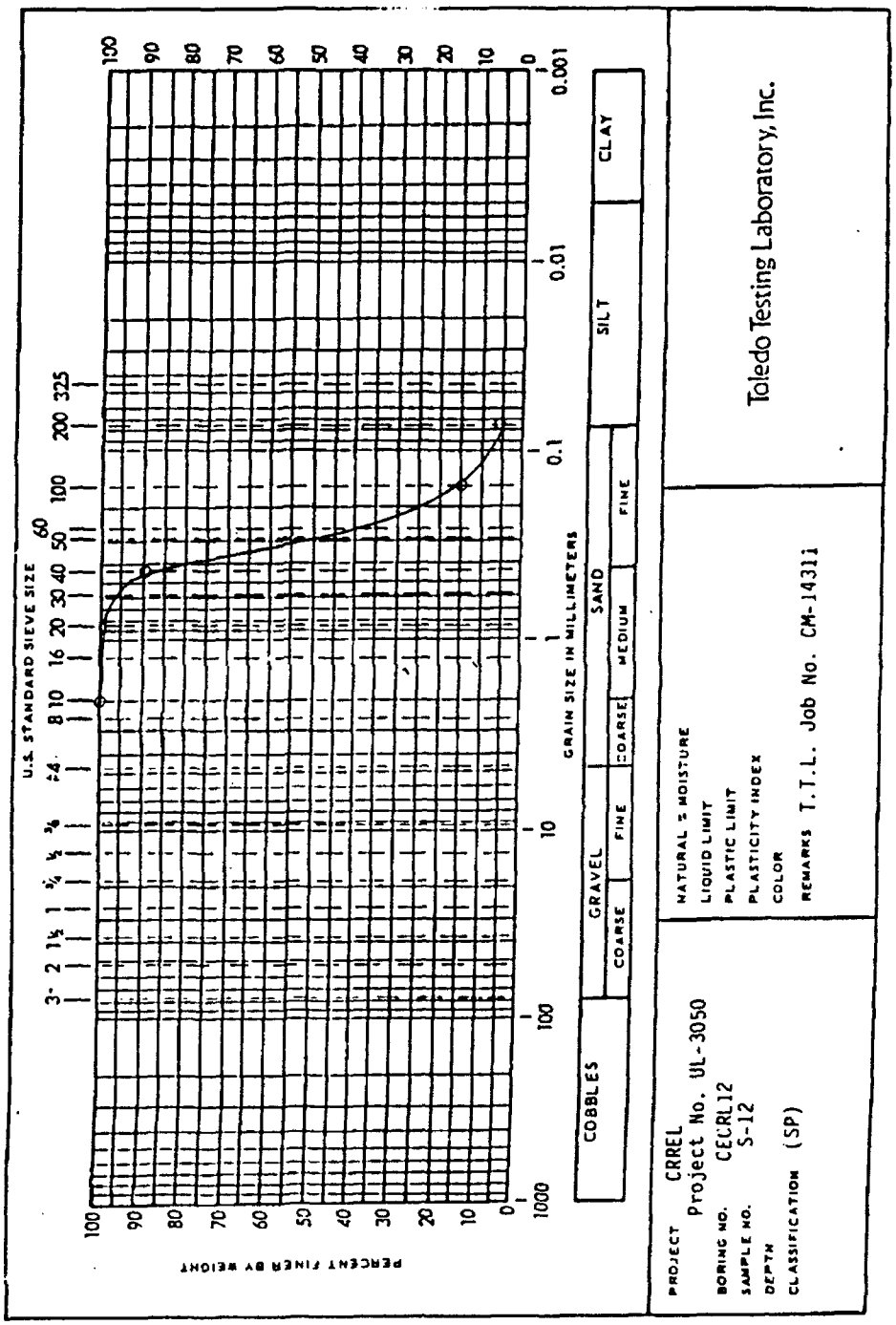

APPENDIX F

WELL CONSTRUCTION LOGS

WELL CONSTRUCTION LOG
Well Number: CERCL 07
Page 1 of 3 Xerox: Signature: Robert A. Miller
Sent to USATHAMA: 2/4/92 Date Sent:
74

WELL CONSTRUCTION LOG

Page: 1 of 3

Site ID:
Well Number: CERCL 07
Job Number: UC-3050
Today's Date:
Well Start/Completion Dates: 1/28/92 , 2/3/92

Installation Difficulties: Sand collapsing into the hole, detecting groundwater, water loss in lg. frac from 182' to 184' BGS

Remarks: all obstacles overcome set a well of good integrity.

Check as appropriate, record depths as below ground surface (BGS)

Screen:

Manufacturer: Monoflex
Schedule: Sch. 40
Type: Continuous Slot
Perforated ✓
Louvre
Other

Materials: Stainless Steel
PVC ✓
Other

Length: 10 foot
Screened Interval: 169' to 179' Below Ground Surface
Diameter: (ID) 3.998 (OD) 4.500
Thickness: 0.251
Slot: Size (inches): .010" Configuration: horizontal
Open Area per Foot of Screen: 6.71%, 1/8" spacing between slots

Casing

Manufacturer: Monoflex
Schedule: Sch. 40
Material: Stainless Steel
PVC ✓
Other
Length:
Diameter: (ID) 3.998 (OD) 4.500
Thickness: .251
Joint(s): Design Threaded Flush Joint
Composition PVC
Depth(s)

Centralizer: Design
Composition NONE
Depth(s)

Solvent, Glues, Cleaners: Manufacturer NONE
Use(s)

Protective Casing: Material steel
Inner Diameter

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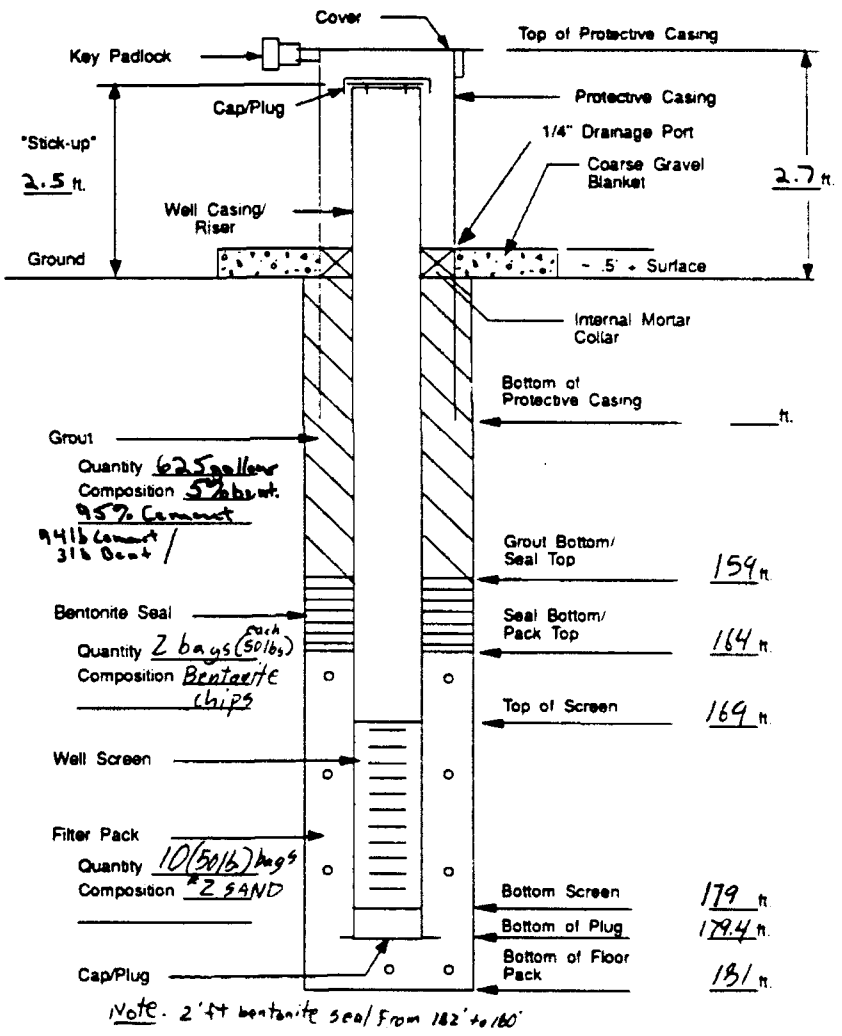
WELL CONSTRUCTION LOG
Well Number: CERCL 07
Page 2 of 3 Xerox:
Signature: Robert A. Meyers
Sent to USATHAMA: 2/4/92
Date Sent:

75

Page: 2 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 07
Today's Date: 2-3-92

WELL CONSTRUCTION



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WELL CONSTRUCTION LOG

Page: 1 of 3

Site ID:
Well Number: CERCL 08
Job Number: JC3050
Today's Date: 17 FEB 1992
Well Start/Completion Dates:
16 FEB 1992 / 17 FEB 1992

Installation Difficulties: Took large amount of grout.

Remarks: Should produce very nicely due to quality of water bearing sand.

Check as appropriate, record depths as below ground surface (BGS)

Screen:

Manufacturer: MonoFlex
Schedule: 40
Type: Continuous Slot
Perforated ✓
Louvre
Other

Materials: Stainless Steel
PVC ✓
Other

Length: 10'
Screened Interval: 136.5 - 146.5
Diameter: (ID) 3.998" (OD) 4.5"
Thickness: 0.251"
Slot: Size (inches): .010" Configuration: Horizontal
Open Area per Foot of Screen: 6.71% (1/8" slot spacing)

Casing

Manufacturer: MonoFlex
Schedule: 40
Material: Stainless Steel
PVC ✓
Other
Length: 139'
Diameter: (ID) 3.998" (OD) 4.5"
Thickness: 0.251"
Joint(s): Design Flush
Composition Threaded
Depth(s) At 10' intervals from 136.5 BGS to surface
Centralizer: Design None
Composition
Depth(s)
Solvent, Glues, Cleaners: Manufacturer None
Use(s)
Protective Casing: Material Steel
Inner Diameter 4.75"

Sent to USATHAMA: 2/19/92
Date Sent:
Page 1 of 3 Xerox:
Signature:
WELL CONSTRUCTION LOG
Well Number: CERCL 08
74

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Sent to USATHAMA: 2/19/92
Date Sent:

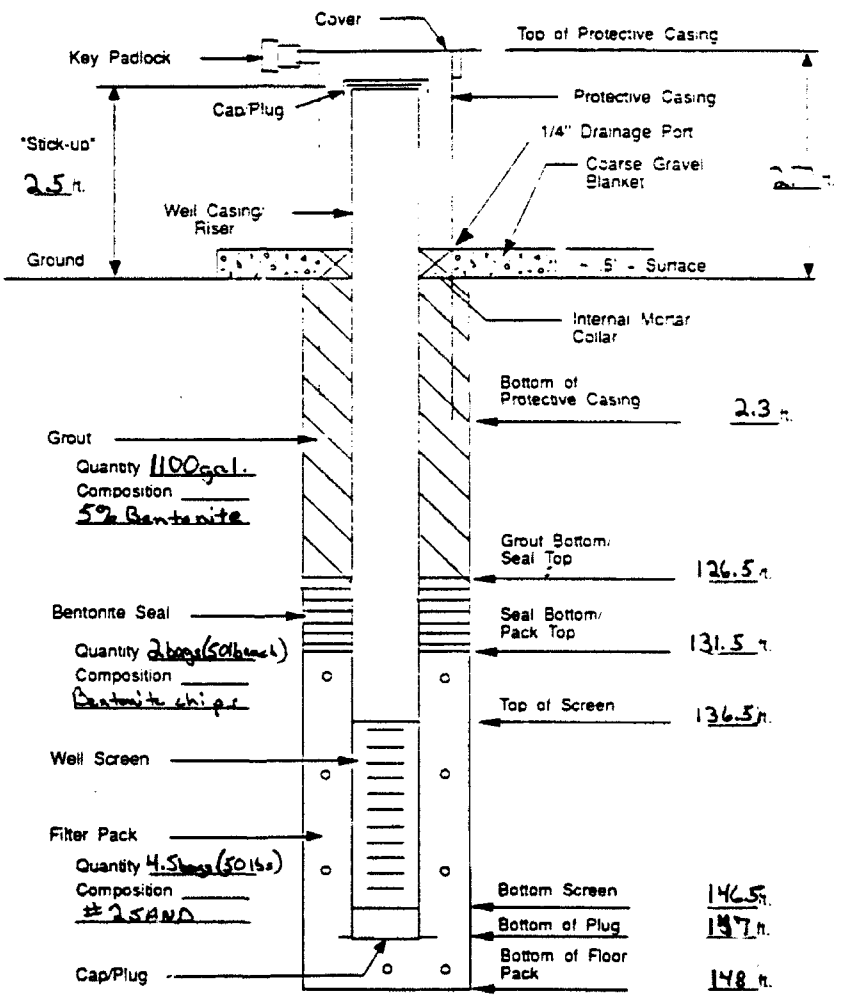
Page 2 of 3
Xerox:
Signature:

WELL CONSTRUCTION LOG
Well Number: CERCL 08

75

Well Construction Log:
Site ID Number:
Well Number: CERCL 08
Today's Date: 17 FEB 1992

WELL CONSTRUCTION



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WELL CONSTRUCTION LOG
Well Number: CERCL 09
Page 1 of 3
Signature: [signature]
Xerox:
Sent to USATHAMA: 13 FEB
Date Sent:
74

WELL CONSTRUCTION LOG

Site ID:
Well Number: CERCL 09
Job Number: UC3050
Today's Date: 12 FEB 1992
Well Start/Completion Dates:
11 FEB 1992 / 12 FEB 1992

Page: 1 of 3

Installation Difficulties: Added ~~50~~ 40 gal of bentonite mud toaugers to control heaving sands.

Remarks:

Check as appropriate, record depths as below ground surface (BGS)

Screen:

Manufacturer: MonoFlex
Schedule: 40
Type: Continuous Slot
Perforated ✓
Louvre
Other

Materials: Stainless Steel
PVC ✓
Other

Length: 10'
Screened Interval: 126.5 - 136.5
Diameter: (ID) 3.998" (OD) 4.500"
Thickness: 0.251"
Slot: Size (inches): .010" Configuration: horizontal
Open Area per Foot of Screen:

Casing

Manufacturer: MonoFlex
Schedule: 40
Material: Stainless Steel
PVC ✓
Other
Length: 129'
Diameter: (ID) 3.998" (OD) 4.500"
Thickness: 0.251"
Joint(s): Design Threaded Flush Joint
Composition PVC - threaded
Depth(s) At 10' intervals from 126.5 to 2.5' above ground.
Centralizer: Design NONE
Composition
Depth(s)
Solvent, Glues, Cleaners: Manufacturer NONE
Use(s)
Protective Casing: Material Steel
Inner Diameter 4.75"

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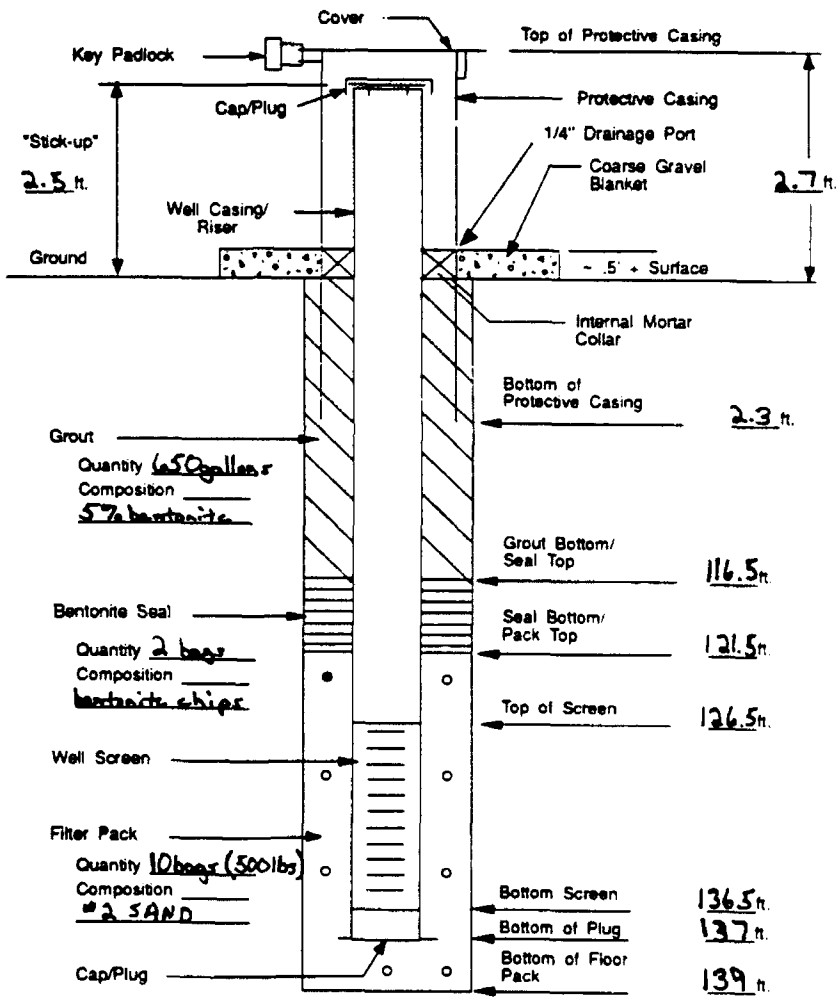
WELL CONSTRUCTION LOG
Well Number: CERCL 09
Page 2 of 3
Signature:
Xerox:
Sent to USATHAMA: 13 FEB
Date Sent:

75

Page: 2 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 09
Today's Date: 12 FEB 1992

WELL CONSTRUCTION



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Sent to USATHAMA: 2/5/91
Date Sent:

Page 1 of 3
Signature:
Xerox:

WELL CONSTRUCTION LOG
Well Number: CERCL10

48

WELL CONSTRUCTION LOG

Page: 1 of 3

Site ID:
Well Number: CERCL 10
Job Number: VC3050
Today's Date: 2/4/92
Well Start/Completion Dates: 2/3/92 / 2/4/92

Installation Difficulties: Running sands in augers. Added 50 gallons of bentonite fluid to redrill through water table to remove sands from augers.
Remarks: This method was successful & able to place screen 3' deeper than when originally augered

Check as appropriate, record depths as below ground surface (BGS)

Screen:

Manufacturer: MonoFlex
Schedule: 40
Type: Continuous Slot
Perforated ✓
Louvre
Other

Materials: Stainless Steel
PVC ✓
Other

Length: 10'
Screened Interval: 117'-127'
Diameter: (ID) 3.998" (OD) 4.5
Thickness: 0.251"
Slot: Size (inches): .010" Configuration: horizontal
Open Area per Foot of Screen: 6.71% (1/8" spacing between slots)

Casing

Manufacturer: MonoFlex
Schedule: 40
Material: Stainless Steel
PVC ✓
Other
Length: 117 + 2.5 stickup = 119.5
Diameter: (ID) 3.998" (OD) 4.500"
Thickness: Ram 0.251
Joint(s): Design Threaded flush joint
Composition PVC - threaded
Depth(s) 10' intervals
Centralizer: Design NONE
Composition
Depth(s)
Solvent, Glues, Cleaners: Manufacturer NONE
Use(s)
Protective Casing: Material Steel
Inner Diameter 4.75"

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Sent to USATHAMA: 2/5/92
Date Sent:

Page 2 of 3
Signature: [illegible]
Xerox:

WELL CONSTRUCTION LOG
Well Number: CERCL10

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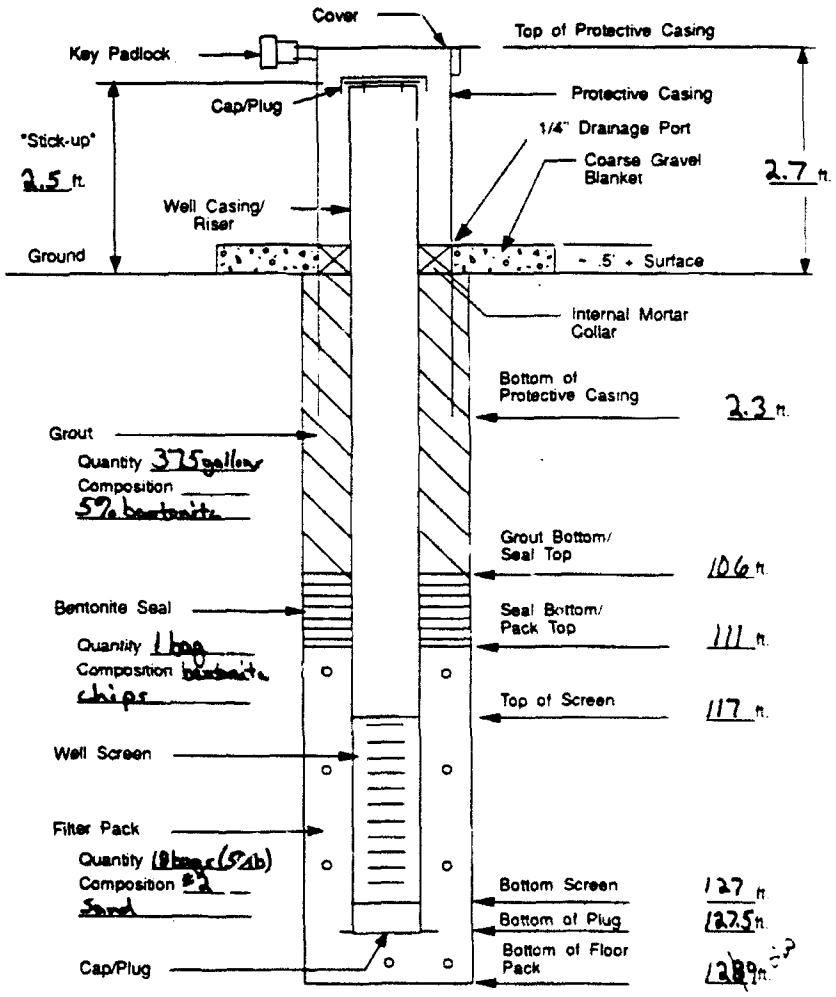
Page: 2 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL10
Today's Date: 2/4/92

WELL CONSTRUCTION



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WELL CONSTRUCTION LOG
Page 1 of 3 Xerox: Sent to USATHAMA:
Signature: Date Sent:
Well Number:
74

WELL CONSTRUCTION LOG

Page: 1 of 3

Site ID:
Well Number: CERCL 11
Job Number: UC3050
Today's Date: 15 FEB 1992
Well Start/Completion Dates: 14 FEB 1992 / 15 FEB 1992

Installation Difficulties: Some perched water a <60'. Required more grout than would be expected
Remarks: Grout added until no Further settlement

Check as appropriate, record depths as below ground surface (BGS)

Screen:

Manufacturer: MonoFlex
Schedule: 40
Type: Continuous Slot
Perforated ✓
Louvre
Other

Materials: Stainless Steel
PVC ✓
Other

Length: 10'
Screened Interval: 106.5 - 116.5
Diameter: (ID) 3.998" (OD) 4.5"
Thickness: 0.251"
Slot: Size (inches): .010" Configuration: horizontal
Open Area per Foot of Screen: 6.71% 1/8" between slots

Casing

Manufacturer: Mono Flex
Schedule: 40
Material: Stainless Steel
PVC ✓
Other
Length: 109'
Diameter: (ID) 3.998" (OD) 4.5"
Thickness: 0.251"
Joint(s): Design Flush joint
Composition Threaded
Depth(s) At 10' intervals From 106.5 BGS to surface
Centralizer: Design None
Composition
Depth(s)
Solvent, Glues, Cleaners: Manufacturer None
Use(s)
Protective Casing: Material Steel
Inner Diameter 4.75"

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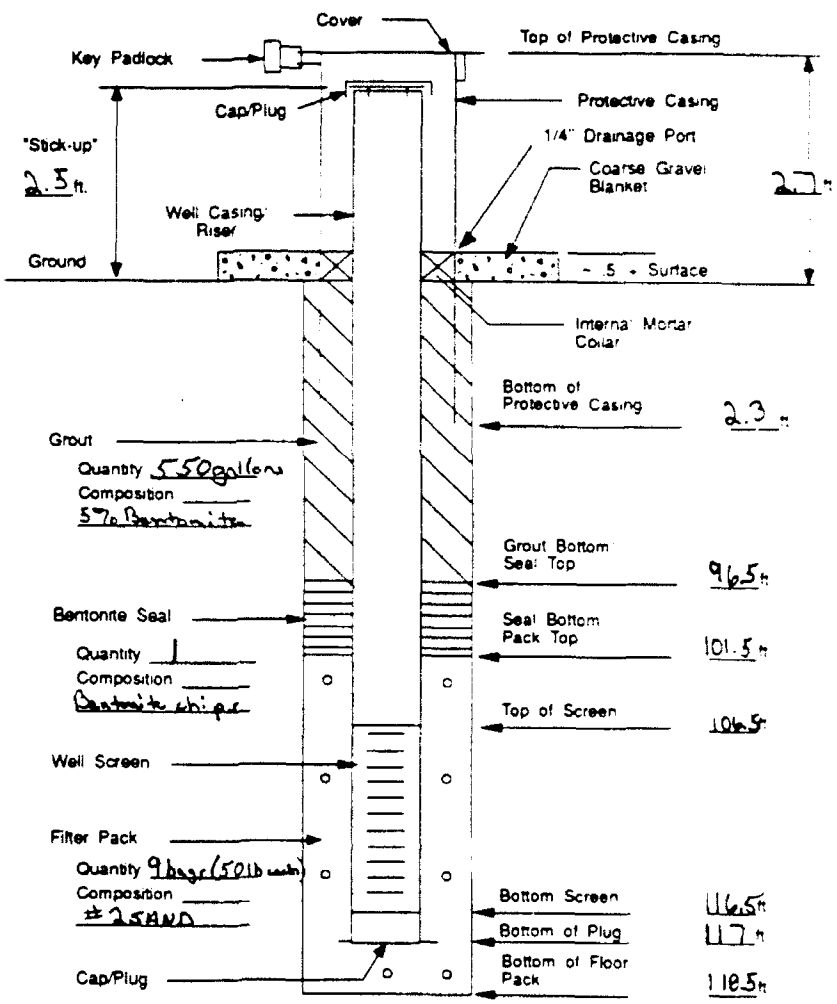
WELL CONSTRUCTION LOG
Well Number: CERCL 11
Page 2 of 3
Signature: [signature]
Xerox:
Sent to USATHAMA: 2/19/92
Date Sent:

75

Page 2 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 11
Today's Date: 15 FEB 1992

WELL CONSTRUCTION



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WELL CONSTRUCTION LOG
Well Number: CERCL 12
Page 1 of 3
Signature: [illegible]
Xerox:
Sent to USATHAMA: 2/3/92
Date Sent:
48

WELL CONSTRUCTION LOG

Page: 1 of 3

Site ID:
Well Number: CERCL 12
Job Number: UC-3050
Today's Date: 1-25-92
Well Start/Completion Dates: 1-21-92

Installation Difficulties:

Remarks:

Check as appropriate, record depths as below ground surface (BGS)

Screen:

Manufacturer: Monoflex
Schedule: Sch 40
Type: Continuous Slot
Perforated ✓
Louvre
Other

Materials: Stainless Steel
PVC ✓
Other

Length: 20'
Screened Interval: 78' - 98'
Diameter: (ID) 3.998 (OD) 4.500
Thickness: ~~0.502~~ 0.251"
Slot: Size (inches): .010" Configuration: horizontal
Open Area per Foot of Screen: 6.71% (1/8" spacing between slots)

Casing

Manufacturer: Monoflex
Schedule: Sch 40
Material: Stainless Steel
PVC ✓
Other
Length: 80'
Diameter: (ID) 3.998" (OD) 4.500
Thickness: ~~0.502~~ RAM 0.251"
Joint(s): Design Threaded Flush Joint
Composition PVC - Threaded
Depth(s) every 10' from 98' up to 2' above grade

Centralizer: Design
Composition NONE
Depth(s)

Solvent, Glues, Cleaners: Manufacturer NONE
Use(s)

Protective Casing: Material Steel
Inner Diameter 5 3/4"

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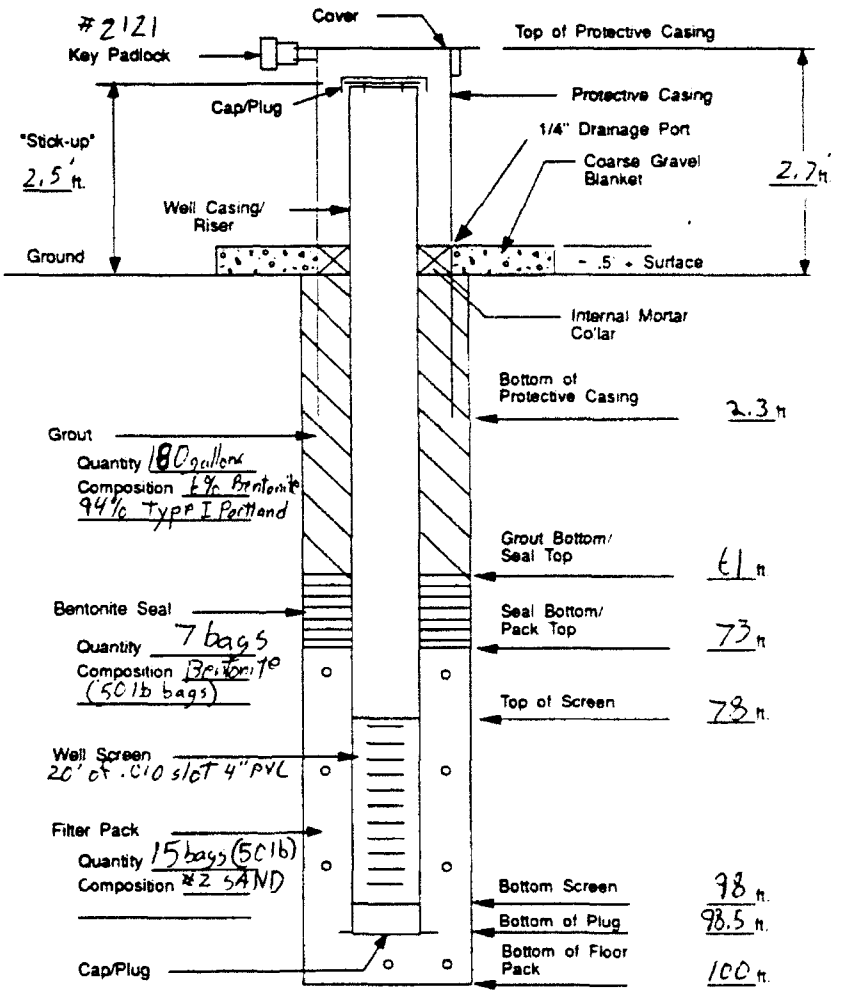
WELL CONSTRUCTION LOG
Well Number: CERCL 12
Page 2 of 3
Signature: Robert A. Meyer
Xerox:
Sent to USATHAMA: 2/3/92
Date Sent:

Page: 2 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 12
Today's Date: 1-25-92

WELL CONSTRUCTION



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APPENDIX G

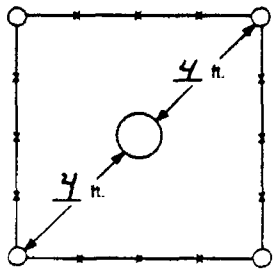
WELL PROTECTION DIAGRAMS

WELL CONSTRUCTION LOG
Well Number: CERCL07
Page 3 of 3
Signature:
Xerox:
Sent to USATHAMA: 2/19/92
Date Sent:
76

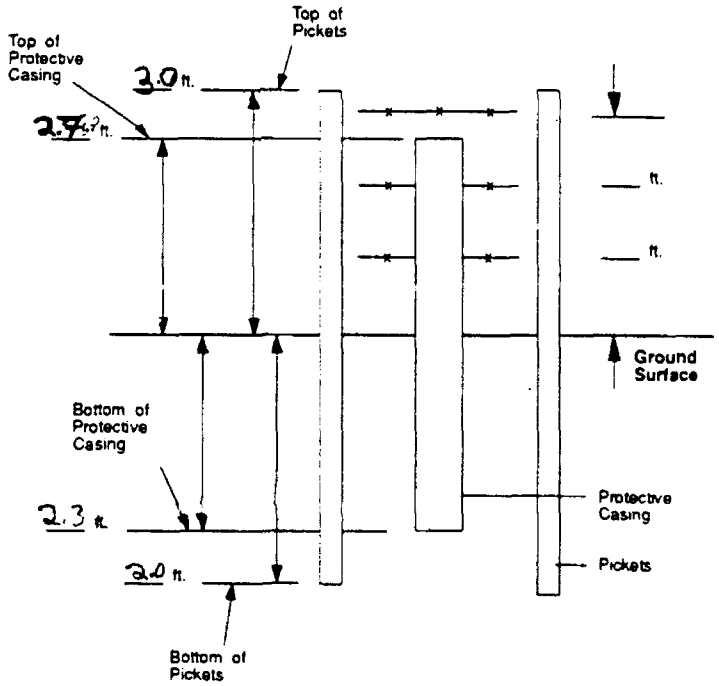
Page: 3 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL07
Today's Date: 2/18/92

WELL PROTECTION DIAGRAM



PLAN



PROFILE

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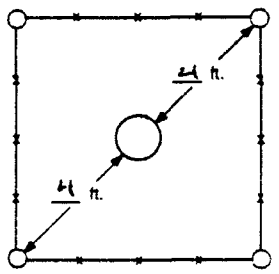
WELL CONSTRUCTION LOG
Well Number: CERCL 08
Page 3 of 3
Signature:
Xerox:
Sent to USATHAMA: 2/19/92
Date Sent:

Page 3 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 08
Today's Date: 2/19/92

WELL PROTECTION DIAGRAM



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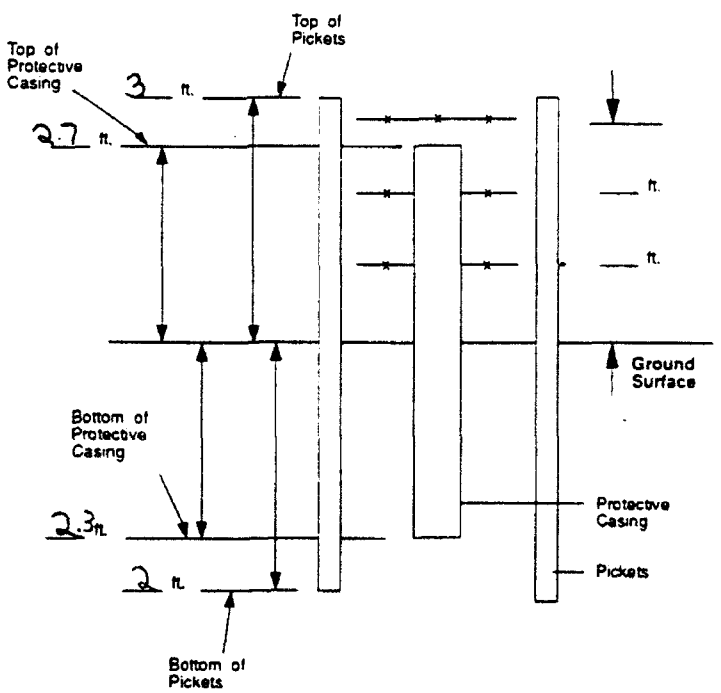

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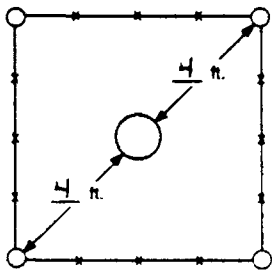
WELL CONSTRUCTION LOG
Well Number: CERCL 09
Page 3 of 3 Xerox: Signature:
Sent to USATHAMA: 2/19/92
Date Sent:

76

Page: 3 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 09
Today's Date: 2/18/92

WELL PROTECTION DIAGRAM



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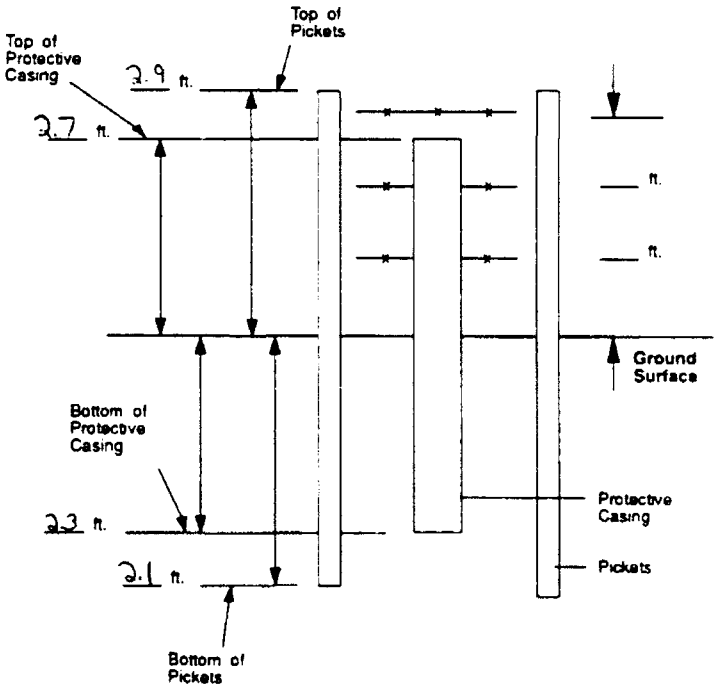

PROFILE

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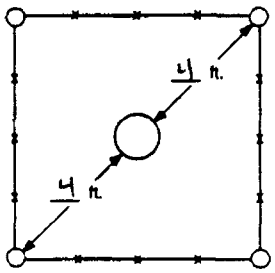
WELL CONSTRUCTION LOG
Well Number: CERCL 10
Page 3 of 3
Signature:
Xerox:
Sent to USATHAMA: 2/19/92
Date Sent:
50

Page: 3 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 10
Today's Date: 2/18/91

WELL PROTECTION DIAGRAM



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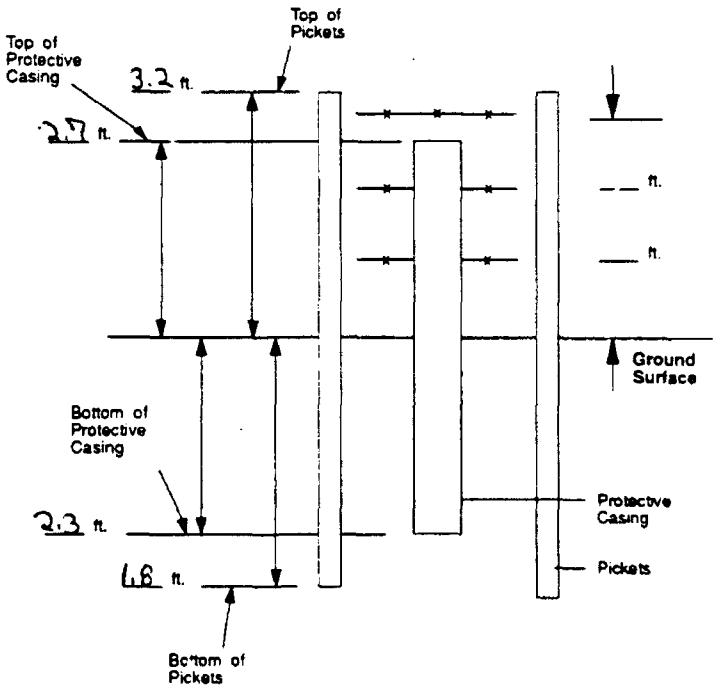

PROFILE

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50

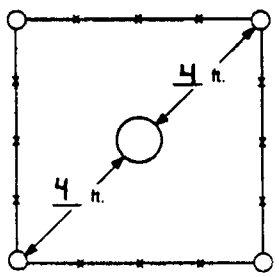
WELL CONSTRUCTION LOG
Well Number: CERCL11
Page 3 of 3
Signature: [signature]
Xerox: ____
Sent to USATHAMA: 2/19/92
Date Sent: ____

76

Page: 3 of 3

Well Construction Log: ____
Site ID Number: ____
Well Number: CERCL11
Today's Date: 18 FEB 1992

WELL PROTECTION DIAGRAM



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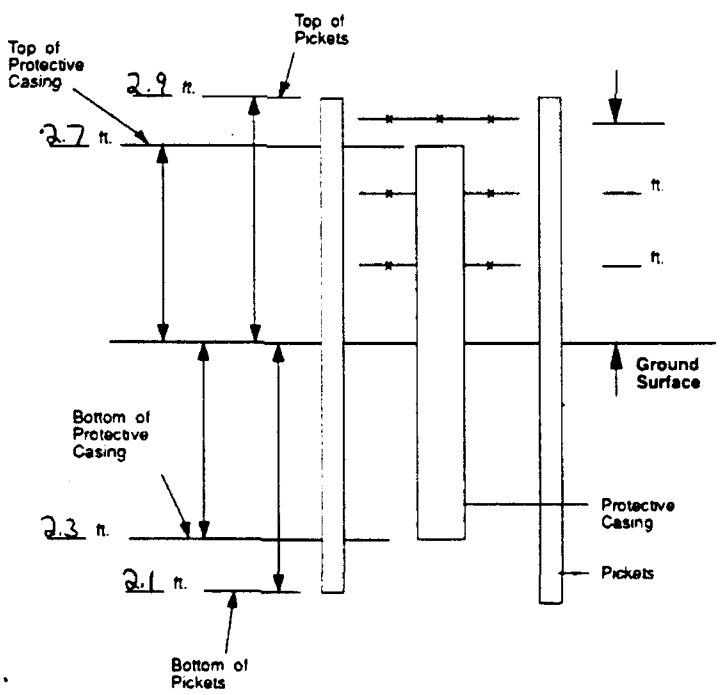

PROFILE

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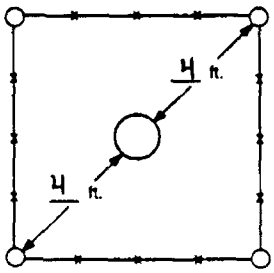
WELL CONSTRUCTION LOG
Well Number: CERCL 12
Page 3 of 3
Signature:
Xerox:
Sent to USATHAMA: 2/19
Date Sent: 2
50

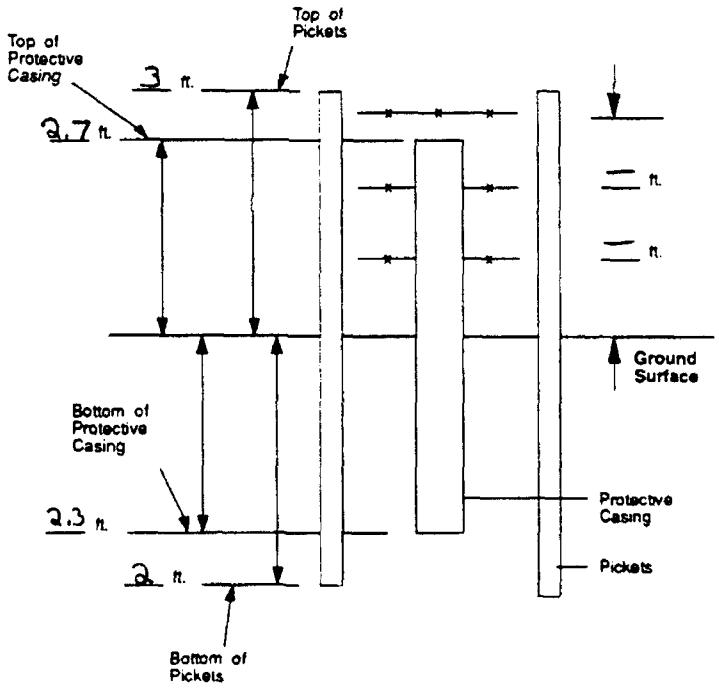
Page: 3 of 3

Well Construction Log:
Site ID Number:
Well Number: CERCL 12
Today's Date: 2/18/92

WELL PROTECTION DIAGRAM



PLAN



PROFILE

usainfo3.cdr

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APPENDIX H

WELL DEVELOPMENT LOGS

WELL DEVELOPMENT LOG p. 1 of 2

Well Number: CERLL 07

Date: 11 FEB 1992

Site ID: _____ Well Lock Number: 2121

Job Number: UC-3050

Well Installation Date: 2/3/92

Inner Casing Stick-up: 2.5'

QUANTITY OF MUD/WATER:

1. Lost during drilling:	* 2000	(400)	(gallons)
*2. Removed prior to well insertion: (Geo. Req. Sect. III. D. 11)	0	0	(gallons)
*3. Lost during thick fluid displacement: (Geo. Req. Sect. III.C.9 & III.D.6)	50	50	(gallons)
*4. Added during filter pack placement:	0	0	(gallons)
5. Volume of water within the casing:	24	24	(gallons)
6. Volume of water within the annulus assuming a 30% porosity:	38	38	(gallons)
*One well volume = 1+2+3+4+5+6			
1 well volume =	2112	(512)	(gallons)
5 well volumes =	10,560	(2560)	(gallons)

* Check Geotechnical Requirements for Calculation Methodology

* 1600 gallons of this mud lost to bedrock fracture at 182'-184' (below screened interval)

INITIAL DEVELOPMENT WATER: (Date: 2/13 Time: _____)

pH: 6.90 Conductivity: 16,800

Color: None Clarity: _____

Clarity: Clear Particulates: None

Odor: None Depth to sediments within casing _____ (TOC)

Depth to water: 142.5 (TOC)

FINAL DEVELOPMENT WATER: (Date: 2/14 Time: 16.10)

(submit a 1- pint sample to USATHAMA)

pH: 7.05 Conductivity: 16,910

Color: None Clarity: _____

Clarity: Clear Particulates: None

Odor: None Depth to sediments within casing ~2" (TOC)

Depth to water: ~~144~~ 142.5 (TOC)

DESCRIPTION OF DEVELOPMENT TECHNIQUE: Developed with 3.5" submersible pump.

Sent to USATHAMA: 2/18/92 Date Sent: _____

Xerox: _____

Page: 1 of 2 Signature: _____

WELL DEVELOPMENT LOG Well Number: CERLL07

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USAWDL PM4

WELL DEVELOPMENT LOG p. 2 of 2

Well Number: CERCLO7

Date:

TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	pH	COND. (umhos/cm)	TEMP. (C)	TURB. (NTU)	COMMENTS
2/2 to 2/3	424 → Pumped prior to grouting of well						
2/11	110						Clear water
2/13	210		6.90	16800	9.7°	<50NTU	Clear water
15:10	50 ~~30~~ → Tot=260						clear
15:35	280		7.09	17,200	10.1°	<50NTU	Clear
1600	300						
1630	325						
0910	490		7.09	14,010	13.2°	<50NTU	Clear with trace gray formation silt
1020	530		6.99	16,910	11.2°	<50NTU	"
1140	600		7.14	16,930	12.2°	<50NTU	Clear
1250	650		7.02	16,470	13.5°	<50NTU	Clear
1510	700		7.09	16,860	10.8°		
1610	775		7.05	16,910	11.1°	<50NTU	Clear

2/13 → 2/14

Estimated Pumping Rate: .75 gal/min

Estimated Recharge Rate: .75 gal/min

Water level 24 hours after development: 142' BGS

Well Developed By: Date:

WELL DEVELOPMENT LOG
Well Number: CERCLO7
Page: 2 of 2
Signature: Robert A. Meyers
Xerox:
Sent to USATHAMA: 2/18/92
Date Sent:

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usawd-pm4

WELL DEVELOPMENT LOG p. 1 of 2

Well Number: CERCL 08

Date: 2-17-92

Site ID: _____ Well Lock Number: 2121

Job Number: UC-3050

Well Installation Date: 2-17-92

Inner Casing Stick-up: _____

QUANTITY OF MUD/WATER:

1. Lost during drilling: 80 (gallons)
*2. Removed prior to well insertion: (Geo. Req. Sect. III. D. 11) 0 (gallons)
*3. Lost during thick fluid displacement: (Geo. Req. Sect. III.C.9 & III.D.6) 0 (gallons)
*4. Added during filter pack placement: 0 (gallons)
5. Volume of water within the casing: 10.4 (gallons)
6. Volume of water within the annulus assuming a 30% porosity: 16.4 (gallons)

***One well volume = 1+2+3+4+5+6**

1 well volume = 106.8 (gallons)

5 well volumes = 534 (gallons)

* Check Geotechnical Requirements for Calculation Methodology

INITIAL DEVELOPMENT WATER: (Date: 2/20/92 Time: 1030)

pH: 7.0 Conductivity: 17,210
Color: Brown Clarity: Poor
Clarity: very poor Particulates: silt + drill mud
Odor: None Depth to sediments within casing _____ (TOC)
Depth to water: 132.3 (TOC)

FINAL DEVELOPMENT WATER: (Date: 2/20/92 Time: 1430)

(submit a 1- pint sample to USATHAMA)

pH: 7.02 Conductivity: 17,300
Color: Clear Clarity: Clear
Clarity: Clear Particulates: None
Odor: None Depth to sediments within casing None Observed (TOC)
Depth to water: 132.5 (TOC)

DESCRIPTION OF DEVELOPMENT TECHNIQUE: Submersible pump w/surging 3.5"

Sent to USATHAMA: 2/21/92
Date Sent: _____
Page: 1 of 2
Signature: _____
Xerox: _____
WELL DEVELOPMENT LOG
Well Number: CERCL 08
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USAWOL PMM

WELL DEVELOPMENT LOG

Page 2 of 2

Well Number: CERL 06

Date: 2/20/92

TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL	pH	COND (umhos/cm)	TEMP (C)	TURB (NTU)	COMMENTS
1030	0		7.0	17,210	8.4°	~800	Cloudy Brown
1300	450		6.9	17,330	11.8°	<50	Clear
1315	495		7.03	17,250	11.5°	<50	"
1330	540		6.99	17,295	11.7°	<50	"
1400	660		7.06	17,220	11.9°	<50	"
1430	750		7.02	17,300	11.5°	<50	Clear

Estimated Pumping Rate: 3 gal/min

Estimated Recharge Rate: 3 gal/min

Water level 24 hours after development: _____

Well Developed By: Robert A. Meyer Date: 2-20-92

Sent to USATHAMA: 3/20/92
Date Sent

Page 2 of 2
Signature: Xerox

WELL DEVELOPMENT LOG
Well Number: CERL 06

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WELL DEVELOPMENT LOG p. 1 of 2

Well Number: CERCL09

Date: 13 FEB 1992

Site ID: _____ Well Lock Number: 2121

Job Number: UC 3050

Well Installation Date: 12 FEB 1992

Inner Casing Stick-up: 2.5'

QUANTITY OF MUD/WATER:

1. Lost during drilling:	40	(gallons)
*2. Removed prior to well insertion: (Geo. Req. Sect. III. D. 11)		(gallons)
*3. Lost during thick fluid displacement: (Geo. Req. Sect. III.C.9 & III.D.6)	40	(gallons)
*4. Added during filter pack placement:		(gallons)
5. Volume of water within the casing:	8	(gallons)
6. Volume of water within the annulus assuming a 30% porosity:	~~15~~ 12	(gallons)
*One well volume = 1+2+3+4+5+6		
1 well volume =	100	(gallons)
5 well volumes =	500	(gallons)

* Check Geotechnical Requirements for Calculation Methodology

INITIAL DEVELOPMENT WATER: (Date: 2-16-92 Time: 1100)

pH: 13.20 Conductivity: 17,500

Color: Brown Clarity: Poor

Clarity: very Cldy Particulates: 30% vF silts/drilling mud

Odor: None Depth to sediments within casing ~0.5' (TOC)

Depth to water: 125.65/127.5 (TOC)

FINAL DEVELOPMENT WATER: (Date: 2/17 Time: 15:58)

(submit a 1- pint sample to USATHAMA)

pH: 7.06 Conductivity: 17,350

Color: None Clarity: _____

Clarity: Very Clear Particulates: None

Odor: None Depth to sediments within casing None (TOC)

Depth to water: 127.5 (TOC)

DESCRIPTION OF DEVELOPMENT TECHNIQUE: 3.5" Submersible Pump

Sent to USATHAMA: 2/18/92 Date Sent: _____

Xerox: _____ Page: 1 of 2 Signature: _____

WELL DEVELOPMENT LOG Well Number: CERCL 09

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USAWC PM

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WELL DEVELOPMENT LOG

p. 2 of 2

Well Number: CERCLO9

Date: 2-16-92

TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	pH	COND. (umhos/cm)	TEMP. (C)	TURB. (NTU)	COMMENTS
1100	0		13.20	17,500	12.2°C	>1000	Muddy
1610	830	RAM	7.63	17,340	11.4	<50 NTU	Crystal Clear
1440	880	7.21 →	~~7.55~~	17,380	11.6	<50 NTU	"
1505	930		7.05	17,360	11.4	<50 NTU	"
1525	1000		7.07	17,350	11.5	"	"
1540	1050		7.04	17,360	11.7	"	"
1558	1100		7.06	17,350	11.6	"	"

Estimated Pumping Rate: 3.3 gpm

Estimated Recharge Rate: 3.3 gpm

Water level 24 hours after development:

Well Developed By: Robert A Meyers Date: 2-17-92

WELL DEVELOPMENT LOG
Well Number: CERCLO9
Page: 2 of 2
Signature: Robert A Meyers
Xerox:
Sent to USATHAMA: 2/18/92
Date Sent:

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usawd pm4

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WELL DEVELOPMENT LOG p. 1 of 2

Well Number: CERCL10

Date: 11 FEB 1992

Site ID: _____ Well Lock Number: 2121

Job Number: K3050

Well Installation Date: 5 FEB 1992

Inner Casing Stick-up: 2.5'

QUANTITY OF MUD/WATER:

1. Lost during drilling:	80	(gallons)
*2. Removed prior to well insertion: (Geo. Req. Sect. III. D. 11)		(gallons)
*3. Lost during thick fluid displacement: (Geo. Req. Sect. III.C.9 & III.D.6)	80	(gallons)
*4. Added during filter pack placement:		(gallons)
5. Volume of water within the casing:	10	(gallons)
6. Volume of water within the annulus assuming a 30% porosity:	16	(gallons)
*One well volume = 1+2+3+4+5+6		
1 well volume =	186	(gallons)
5 well volumes =	930	(gallons)

* Check Geotechnical Requirements for Calculation Methodology

INITIAL DEVELOPMENT WATER: (Date: 2/15 Time: 08:00)

pH: 7.9 Temp 8.4°C Conductivity: 13350

Color: Yellow - Brown Clarity: _____

Clarity: _____ Particulates: Some silt

Odor: None Depth to sediments within casing _____ (TOC)

Depth to water: 114.5 (TOC)

FINAL DEVELOPMENT WATER: (Date: 2/15 Time: 17:30)

(submit a 1- pint sample to USATHAMA)

pH: 7.12 Conductivity: 17290

Color: None Clarity: _____

Clarity: Clear, No Silt Particulates: NONE

Odor: None Depth to sediments within casing ~1.5" in bottom (TOC)

Depth to water: ~~112.8~~ 114.5 (TOC)

DESCRIPTION OF DEVELOPMENT TECHNIQUE: 3.5" Submersible pump

WELL DEVELOPMENT LOG Well Number: CERCL10 Page: 1 of 2 Signature: _____ Xerox: _____ Sent to USATHAMA: 2/10/92 Date Sent: _____

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USAWOL PMM

WELL DEVELOPMENT LOG p. 2 of 2

Well Number: CERCL10

Date: 2/15/92

TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	pH	COND. (umhos/cm)	TEMP. (C)	TURB. (NTU)	COMMENTS
08:30	3	~~2.9~~	7.9	13350	8.4 C	400	
1115	250		7.65	17,300	10.9°C	<50NTU	Clear. No silt
1415	520		7.44	17,300	11.3°C	<50NTU	"
1450	570		7.11	17,330	11.2°C	<50NTU	"
1555	670		7.14	17,270	11.5°C	<50NTU	"
1730	800		7.12	17,240	11.3°C	<50NTU	"

Estimated Pumping Rate: 1.5 gal/min

Estimated Recharge Rate: 1.5 gal/min

Water level 24 hours after development: 114 TOC

Well Developed By: Robert A Meyers Date: 2-15-92

WELL DEVELOPMENT LOG
Well Number: CERCL10
Page: 2 of 2
Signature: Robert A Meyers
Xerox:
Sent to USATHAMA: 2/18/92
Date Sent:

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WELL DEVELOPMENT LOG p. 1 of 2

Well Number: CERCL11

Date: 2-18-92

Site ID:

Well Lock Number: 2121

Job Number: UC-3050

Well Installation Date:

Inner Casing Stick-up:

QUANTITY OF MUD/WATER:

1. Lost during drilling:	100	(gallons)
*2. Removed prior to well insertion: (Geo. Req. Sect. III. D. 11)	0	(gallons)
*3. Lost during thick fluid displacement: (Geo. Req. Sect. III.C.9 & III.D.6)	0	(gallons)
*4. Added during filter pack placement:	0	(gallons)
5. Volume of water within the casing:	14.3	(gallons)
6. Volume of water within the annulus assuming a 30% porosity:	22.6	(gallons)
*One well volume = 1+2+3+4+5+6		
1 well volume =	136.9	(gallons)
5 well volumes =	684.5	(gallons)

* Check Geotechnical Requirements for Calculation Methodology

INITIAL DEVELOPMENT WATER: (Date: 2/18/92 Time: 16:00)

pH: 8.414 Conductivity: 12,300

Color: Brown Clarity:

Clarity: Poor Particulates:

Odor: None Depth to sediments within casing ~2" in well (TOC)

Depth to water: 97.3 (TOC)

FINAL DEVELOPMENT WATER: (Date: 09:30 Time: 09:30)

(submit a 1-pint sample to USATHAMA)

pH: 6.97 Conductivity: 16,970

Color: Clear Clarity:

Clarity: Clear Particulates: None

Odor: None Depth to sediments within casing None (TOC)

Depth to water: 97.3 (TOC)

DESCRIPTION OF DEVELOPMENT TECHNIQUE: 3.5" submersible pump

Sent to USATHAMA: 2/20/92 Date Sent:

Page: 1 of 2 Signature: Xerox:

WELL DEVELOPMENT LOG Well Number: CERCL08

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USAWC PM4

WELL DEVELOPMENT LOG

p. 2 of 2

Well Number: CERCL11

Date: 2-15-92

TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	pH	COND. (umhos/cm)	TEMP. (C)	TURB. (NTU)	COMMENTS
1600	5		8.44	17,300	13.2°C	700	Drilling mud
1740	25		7.62	17,210	11.6°C	70	some drill mud & silt
1515	200		6.94	16,700	12.2°C	<50	Crystal Clear
1550	210		7.02	16,600	11.0°	<50	"
1635	220		6.96	16,680	11.4°	<50	"
1740	235		7.00	16,660	11.5°	<50	"
18:00	260		6.97	16,690	11.4°	<50	Crystal Clear
18:30	280		6.98	16,810	11.4°	<50	"
19:00	300		6.98	16,700	11.5°	<50	"
0710	345		6.95	16,730	11.8°	<50	"
0740	365		7.04	17,100	11.4°	<50	Clear
0830	380		6.98	16,810	11.7°	<50	"
0845	400		7.02	17,100	11.9°	"	"
0905	415		6.92	16,950	11.5°	"	"
09:30	435		6.97	16,970	11.6°	"	"

Estimated Pumping Rate: pumped dry then allowed to recharge

Estimated Recharge Rate: 0.25 gal/min

Water level 24 hours after development: 125 BGS

Well Developed By: Robert A Meyers Date: 2-20-92

WELL DEVELOPMENT LOG
Well Number: CERCL11
Page: 2 of 2
Signature: Robert A Meyers
Xerox:
Sent to USATHAMA: 2/20/92
Date Sent:

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usawc pm4

WELL DEVELOPMENT LOG p. 1 of 2

Well Number: CERCL 12

Date: 2/1/92

Site ID: _____ Well Lock Number: 2121

Job Number: UC-3050

Well Installation Date: 1-25-92

Inner Casing Stick-up: 2.5'

QUANTITY OF MUD/WATER:

1. Lost during drilling:	~600	(gallons)
*2. Removed prior to well insertion: (Geo. Req. Sect. III. D. 11)	0	(gallons)
*3. Lost during thick fluid displacement: (Geo. Req. Sect. III.C.9 & III.D.6)	0	(gallons)
*4. Added during filter pack placement:	0	(gallons)
5. Volume of water within the casing:	35.86	(gallons)
6. Volume of water within the annulus assuming a 30% porosity:	62.75	(gallons)
*One well volume = 1+2+3+4+5+6		
1 well volume =	698.61	(gallons)
5 well volumes =	3,493.05	(gallons)

* Check Geotechnical Requirements for Calculation Methodology

INITIAL DEVELOPMENT WATER: (Date: 1-28-92 Time: 0910)

pH: 8.33
Color: Cloudy Brown, >1000 NTU
Clarity: " " , "
Odor: None
Depth to water: 60.7' (TOC)

Conductivity: 17300. µmhos
Clarity: Cloudy Brown >1000 NTU
Particulates: VF silt to clay size particulates measureable
Depth to sediments within casing NONE within well casing (TOC)

FINAL DEVELOPMENT WATER: (Date: 2/1/92 Time: 12:35)

(submit a 1- pint sample to USATHAMA)

pH: 7.76
Color: —
Clarity: Clear
Odor: None
Depth to water: 87.25' (TOC)

Conductivity: 17,100
Clarity: —
Particulates: None
Depth to sediments within casing 98.5' (TOC)

DESCRIPTION OF DEVELOPMENT TECHNIQUE: Submersible Pump 3.5" diameter

WELL DEVELOPMENT LOG
Well Number: CERCL 12
Page: 1 of 2
Signature: [signature]
Xerox: _____
Sent to USATHAMA: 2/3/92
Date Sent: _____

USAWDL PM4

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WELL DEVELOPMENT LOG

Well Number: CERCL 12

Date: 1-28-92 to 2-1-92

84.75 BGS = static W.L.

p. 2 of 2

TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	pH	COND. (umhos/cm)	TEMP. (C)	TURB. (NTU)	COMMENTS	W.L. (TOIC)
0910	30		8.33	17,300	12.7°C	>1000	10 GPM	60.7'
0937	31		8.31	17,290	12.7°C	>1000		89.0'
1315	36		8.20	16,900	12.5°C	>1000	Clearing	88.5'
1/28 1045	51						Clearing	~85'
1115	58		8.34	17340	12.0°C	~250		85.2'
1150	68		8.32	17,230	11.6°C	~200		87'
1645	75		8.18	17,250	12.2°C	~150		87.2'
1/29 0830	90							~85'
1/30 0910	97 (2 gal)		8.02	17,220	13.0°C	~130	Clearing	87 TOIC
1405	102 (5 gal)		7.62	17,130	12.1°C	~100	fairly clear	87.25 TOIC
1440	107		7.55	17,130	11.1°C	~90	"	87.30 TOIC
1555	122		7.80	17,090	11.1°C	~130	*Cloudier	87' TOIC
1645	132		7.50	17,080	11.2°C	~130	"	87.25 TOIC
1/31 1801	252		7.71	17,160	11.1°C	~60 NTU	Clear	87.25 TOIC
1925	310		7.95	17,160	11.2°C	~50 NTU	clear	87.25 TOIC
2/1 1215	340		7.89	17,090	11.2°C	~50 NTU	clear	87.25 TOIC
1235	355		7.76	17,100	11.3°C	~50 NTU	clear	87.25 TOIC

* Purged total of ~355 gallons as per discussion with USATHAMA.

Estimated Pumping Rate: 10 gpm to 20 gpm

Estimated Recharge Rate: 1 gallon/2 minutes

Water level 24 hours after development: 84.75 BGS or 87.25 TOIC

* Water cloudier because we lowered pump to bottom of hole to remove silt

Well Developed By: 3.5 Submersible Pump Date: 1-28-92 to 2-1-92

TOIC = Top of inner casing (PVC)

Page: 2 of 2 Signature: Xerox: Sent to USATHAMA: 2/3/92 Date Sent:

WELL DEVELOPMENT LOG Well Number: CERCL 12

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usawd pm4

APPENDIX I

WATER LEVEL MEASUREMENT LOGS

WATER LEVEL MEASUREMENT LOG p. 1 of 1

Site ID: CRREL (CECRL07)

WELL NO.	WATER LEVEL TOC	WATER LEVEL BGS	DATE	TIME	MEASURED BY	COMMENTS
CECRL07		23	2Feb			Prior to grout & removal of Annulus Water
"		140	4Feb			After Completion
"	142		4Feb			Prior to Dev.
	142.5					Prior to Dev.
	142.5					After Dev.
		140	6Mar			Prior to pre-sample purge GW-1
	142.4		7Apr			Prior to pre-sample purge GW-2
	142.3		10Apr			Complete Round

Submitted By: [signature] Date:

WATER LEVEL MEASUREMENT LOG
Well Number:
Page: 1 of 1
Signature:
Xerox:
Sent to USATHAMA:
Date Sent:

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WATER LEVEL MEASUREMENT LOG p. 1 of 1

Site ID: CRREL (CECRL08)

WELL NO.	WATER LEVEL TOC	WATER LEVEL BGS	DATE	TIME	MEASURED BY	COMMENTS
CECRL08		133	17 Feb			During Augering at 137.5 BGS
"		129.7	18 Feb			At Completion
"	132.2		19 Feb			Prior to Dev.
"	132.5		20 Feb			After Dev.
"	132.5		13 Mar			Prior to pre-sample purge GW-1
"	133.5		9 Apr			Prior to pre-sample purge GW-1
"	133.7		10 Apr			Complete Round

Submitted By: [signature] Date:

80 WATER LEVEL MEASUREMENT LOG Page: 1 of 1 Xerox: Sent to USATHAMA:
Well Number: Signature: Date Sent:

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USAWML PM4

WATER LEVEL MEASUREMENT LOG

Page: 1 of 1
Signature:
Xerox:
Sent to USATHAMA:
Date Sent:
Well Number:

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WATER LEVEL MEASUREMENT LOG

p. 1 of 1

Site ID: CRREL (CECRL09)

WELL NO.	WATER LEVEL TOC	WATER LEVEL BGS	DATE	TIME	MEASURED BY	COMMENTS
CECRL09		127	12 Feb			During augering @ 131' BGS
"		125	12 Feb			At Completion
		127.5	13 Feb			Prior to Dev.
		127.5	17 Feb			After Dev.
	127.8		12 Mar			Prior to pre-sample purging GW-1
	128.6		10 Apr			Complete Round

Submitted By: J. Ren Date:

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USAWM_PM4

WATER LEVEL MEASUREMENT LOG

p. 1 of 1

Site ID: CRREL (CECRL10)

WELL NO.	WATER LEVEL TOC	WATER LEVEL BGS	DATE	TIME	MEASURED BY	COMMENTS
CECRL10		112	4 Feb			Auguring at 116' BGS
"		112	4 Feb			During augering at 124'
"		112	4 Feb			At Completion
"	114		12 Feb			Prior to Dev.
	114.5		15 Feb			Prior to Dev.
	114.5		15 Feb			After Dev.
	114		16 Feb			24 hrs after Dev.
	114.4		12 Mar			Prior to pre-sample purge GW-1
	115.1		9 Apr			Prior to pre-sample purge GW-2
	115.2		10 Apr			Complete Round

Submitted By: [signature] Date:

WATER LEVEL MEASUREMENT LOG
Well Number:
Page: 1 of 1
Signature:
Xerox:
Sent to USATHAMA:
Date Sent:

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WATER LEVEL MEASUREMENT LOG

Sent to USATHAMA: Date Sent:

Page: 1 of 1 Xerox:

Signature:

WATER LEVEL MEASUREMENT LOG

Well Number:

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WATER LEVEL MEASUREMENT LOG

p. 1 of 1

Site ID: CRREL (CECRL11)

WELL NO.	WATER LEVEL		DATE	TIME	MEASURED BY	COMMENTS
	TOC	BGS				
CECRL11		103.5	15 Feb			During auger-ed @ 105.5' BGS
"		94.8	15 Feb			At Completion
"	97.3		18 Feb			Prior to Dev.
"	97.3		18 Feb			After Dev.
"	97.3		11 Mar			Prior to pre-sample purge GW-1
"	98.5		10 Apr			Complete Round

Submitted By: Date:

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USAWML PM4

WATER LEVEL MEASUREMENT LOG

p. 1 of 1

Site ID: CRREL (CELRL12)

WELL NO.	WATER LEVEL TOC	WATER LEVEL BGS	DATE	TIME	MEASURED BY	COMMENTS
CELRL12*		85	24 Jan			* In 2" Temporary Well after Dev.
		45	27 Jan			Prior to Dev. in Perm. MW
		85	29 Jan			During Dev.
	87.25		1 Feb			After Dev
	87.25		2 Feb			24 hrs after Dev.
	88.0		12 Mar			Prior to pre-sample purge GW-1
	87.2		10 Apr			Complete Round

Submitted By: D. Pen Date:

WATER LEVEL MEASUREMENT LOG
Well Number:
Page: 1 of 1
Signature:
Xerox:
Sent to USATHAMA:
Date Sent:

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USAWML PM4

APPENDIX J

WELL PURGING AND SAMPLING LOGS

WELL PURGING AND SAMPLING
Well Number: CECRL07
Page: 1 of 1
Signature: [illegible]
Xerox:
Sent to USATHAMA: 18 March 1992
Date Sent:

WELL PURGING AND SAMPLING LOG

p. 1 of 1

Well Number: CECRL07
Date: 3/11/92

Site ID:
Job Number: VC30550
Well Installation Date: 2/3/92
Depth to Water: 140' B.G.S.
Well Lock Number: 2121
Bailer ID Number:
Well Total Depth: 179.4

QUANTITY OF WATER WITHIN THE:

1. Casing: 24 (gallons)
2. Annulus (assuming a 30% porosity) : 38 (gallons)

One purge-water well volume = 1+2

1 Purge-water well volume = 62 (gallons)
5 Purge-water well volumes = 310 (gallons)

WELL PURGING - PARAMETER MEASUREMENTS

	TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	COMMENTS
3/11	13:30	60		15min @4gal/min
	14:15	~~90~~ 150		45min @3.0gal/min
	15:00	175		10min @2.5gal/min
	15:30	325		75min @2gal/min
4/7	10:40	7.5		5min @2.5/min → dry
	10:45	32.5		10min @2.5/min → dry
	11:45	257.5		1.5hr @1.5/min
	12:15	317.5		.5hr @2.0gal/min

Water very clear throughout purging

Well Purged By: J. Pach
Date: 3/11/92
Well Sampled By: [illegible] B. Tapper
Date: 3/12/92

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USAPSLOG PM4

WELL PURGING AND SAMPLING LOG p. 1 of 1

Well Number: CECRL08

Date: 3/13/92

Site ID: CRREL

Job Number: U63050

Well Installation Date: 17 FEB 1992

Depth to Water: 132.5 TOC = 130 BGS

Well Lock Number: 2121

Bailer ID Number:

Well Total Depth: 147

QUANTITY OF WATER WITHIN THE:

1. Casing: 10.4 (gallons)
2. Annulus (assuming a 30% porosity) : 16.4 (gallons)

One purge-water well volume = 1+2

1 Purge-water well volume = 26.8 (gallons)

5 Purge-water well volumes = 134 (gallons)

WELL PURGING - PARAMETER MEASUREMENTS

	TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	COMMENTS
3/13 —	09:00	240		1hr @ 4gal/min
				pumping
				continuously
9 April —	18:15	180		90min @ 2gal/min

Well Purged By: [signature] Date: 3/13/92

Well Sampled By: J. Peck B. Taper Date: 3/13/92

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USAPSLOG PM4

WELL PURGING AND SAMPLING
Well Number: CECRL08
Page: 1 of 1
Signature: [signature]
Xerox
Sent to USATHAMA: 18 Mar 1992
Date Sent:
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WELL PURGING AND SAMPLING LOG p. 1 of 1

Well Number: CECRL09

Date: 3/12/92

Site ID:

Job Number: UC3050

Well Installation Date: 12 FEB 1992

Depth to Water: 127.8 BTOIC = 125.3 BGS

Well Lock Number: 2121

Bailer ID Number:

Well Total Depth: 137

QUANTITY OF WATER WITHIN THE:

1. Casing: 8 (gallons)

2. Annulus (assuming a 30% porosity) : 12 (gallons)

One purge-water well volume = 1+2

1 Purge-water well volume = 20 (gallons)

5 Purge-water well volumes = 100 (gallons)

WELL PURGING - PARAMETER MEASUREMENTS

	TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	COMMENTS
3-12 —	20:30	225		2.5gal/min. For 90min
	~~22:00~~ DP.			
				pumps continuous
9 Apr —	12:50	82.5		35 @ 1.5gal/min 15 @ 2gal/min
9 Apr —	16:10	~~45.5~~		35 min @ 1.3gal/min
		128 DP.		

Well Purged By: J. Pearl Date: 3/12/92

Well Sampled By: J. Pearl B. Toper Date: 3/12/92

WELL PURGING AND SAMPLING
Well Number: CECRL09
Page: 1 of 1
Signature: J. Pearl
Xerox:
Sent to USATHAMA: 18 March 1992
Date Sent:

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USAPSLOG PM4

WELL PURGING AND SAMPLING
Well Number: CECRL 10
Page: 1 of 1
Signature: J. Peck
Xerox:
Sent to USATHAMA: 18 March 1992
Date Sent:
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WELL PURGING AND SAMPLING LOG

p. 1 of 1

Well Number: CECRL 10

Date: 3/12/92

Site ID:

Job Number: VC3050

Well Installation Date: 4 FEB 1992

Depth to Water: 18H BTOIC = 111.9 BGS

Well Lock Number: #2121

Bailer ID Number:

Well Total Depth: 127.5

QUANTITY OF WATER WITHIN THE:

1. Casing: 10 (gallons)

2. Annulus (assuming a 30% porosity) : 16 (gallons)

One purge-water well volume = 1+2

1 Purge-water well volume = 26 (gallons)

5 Purge-water well volumes = 130 (gallons)

WELL PURGING - PARAMETER MEASUREMENTS

	TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	COMMENTS
3/12 —	17:30	150		75min @ 2gal/min
				Running continuous
9 April —	10:03	16		4min @ 4gal/min
	10:10	173.5		105min @ 1.5gal/min

Well Purged By: J. Peck Date: 3/12/92

Well Sampled By: J. Peck B. Taper Date: 3/12/92

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USAPSLOG PM4

WELL PURGING AND SAMPLING
Well Number: CELR211

Sent to USATHAMA: 18 March 1992
Date Sent:

Page: 1 of 1
Signature: A. Peck

Xerox:

WELL PURGING AND SAMPLING LOG

p. 1 of 1

Well Number: CELR211
Date: 3/12/92

Site ID:
Job Number: UC3050
Well Installation Date: 15 FEB 1992
Depth to Water: 94.8 BGS = 97.3 TOC

Well Lock Number: #2121
Bailer ID Number:
Well Total Depth: 117

QUANTITY OF WATER WITHIN THE:

1. Casing: 14.30 (gallons)
2. Annulus (assuming a 30% porosity) : 22.60 (gallons)

One purge-water well volume = 1+2

1 Purge-water well volume = 36.90 (gallons)
5 Purge-water well volumes = 184.5 (gallons)

WELL PURGING - PARAMETER MEASUREMENTS

	TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	COMMENTS
3/12	07:20	60		30min @ 2gal/min → dry
	08:15	60 080		10min @ 2gal/min → dry
	08:40	(72) 152		60min @ 1.2gal/min → dry
	09:55	197		45min @ 1gal/min → dry
8 Apr	09:55	20		20min @ 1gal/min → dry
	10:15	32.5		5min @ 2.5gal/min → dry
	10:55	47.5		5min @ 3gal/min → dry
	11:56	77.5		30min @ 1gal/min → dry
	12:57	100.5		23min @ 1gal/min → dry
	14:01	122.5		11min @ 2gal/min → dry
	14:53	140		6min @ 3gal/min → dry
	15:24	159.6		14min @ 1.4gal/min → dry
	16:10	180.6		7min @ 3gal/min → dry

Well Purged By: A. Peck Date: 3/12/92
Well Sampled By: J. Peck B. Tapp Date: 3/12/92

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USAPS:LOG PM4

WELL PURGING AND SAMPLING
Well Number: CECRL12
Page: 1 of 1
Signature: J. Peck
Xerox:
Sent to USATHAMA: 18 March 1992
Date Sent:
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WELL PURGING AND SAMPLING LOG

p. 1 of 1

Well Number: CECRL12
Date: 3/12/92

Site ID:
Job Number: UC 3050
Well Installation Date: 25 JAN 92
Depth to Water: 85.5'

Well Lock Number: 2121
Bailer ID Number:
Well Total Depth: 98.5

QUANTITY OF WATER WITHIN THE: 13' of water

1. Casing: 8.5 (gallons)
2. Annulus (assuming a 30% porosity) : 13.35 (gallons)

One purge-water well volume = 1+2

1 Purge-water well volume = 21.85 (gallons)

5 Purge-water well volumes = 109.25 (gallons)

WELL PURGING - PARAMETER MEASUREMENTS

	TIME	TOTAL VOL. WITHDRAWN GALS.	TOTAL VOL. WITHDRAWN BORE VOL.	COMMENTS
	11:30	60		30min @ 2gal/min → dry
3/12 —	12:30	79.5		15min 1.3gal/min → dry
	13:00	119.5		40min @ 1.0gal/min → dry
	15:20	149.5		3min @ 10gal/min → dry
	15:15	30		20min @ 1.5gal/min → dry
7 April —	15:15	55		10min @ 1.5gal/min 5min @ 2gal/min → dry
	16:28	77.5		15min @ 1.5gal/min → dry
	17:07	99.5		11min @ 2gal/min → dry
	17:28	117.5		9min @ 2gal/min → dry

Well Purged By: J. Peck Date: 3/12/92
Well Sampled By: J. Peck B. Topor Date: 3/12/92

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USAPSLOG PM4

APPENDIX K

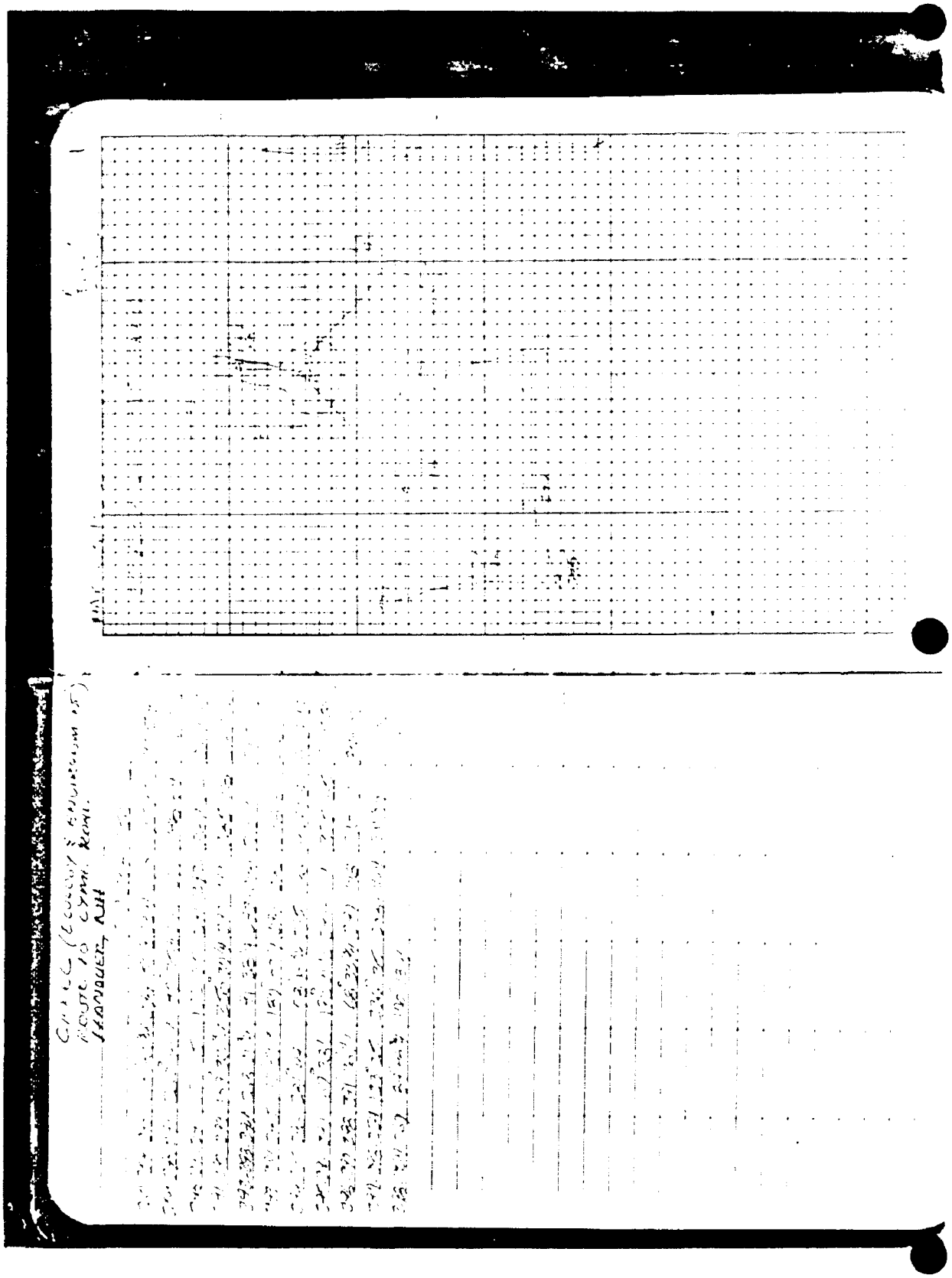
SURVEY FIELD NOTES

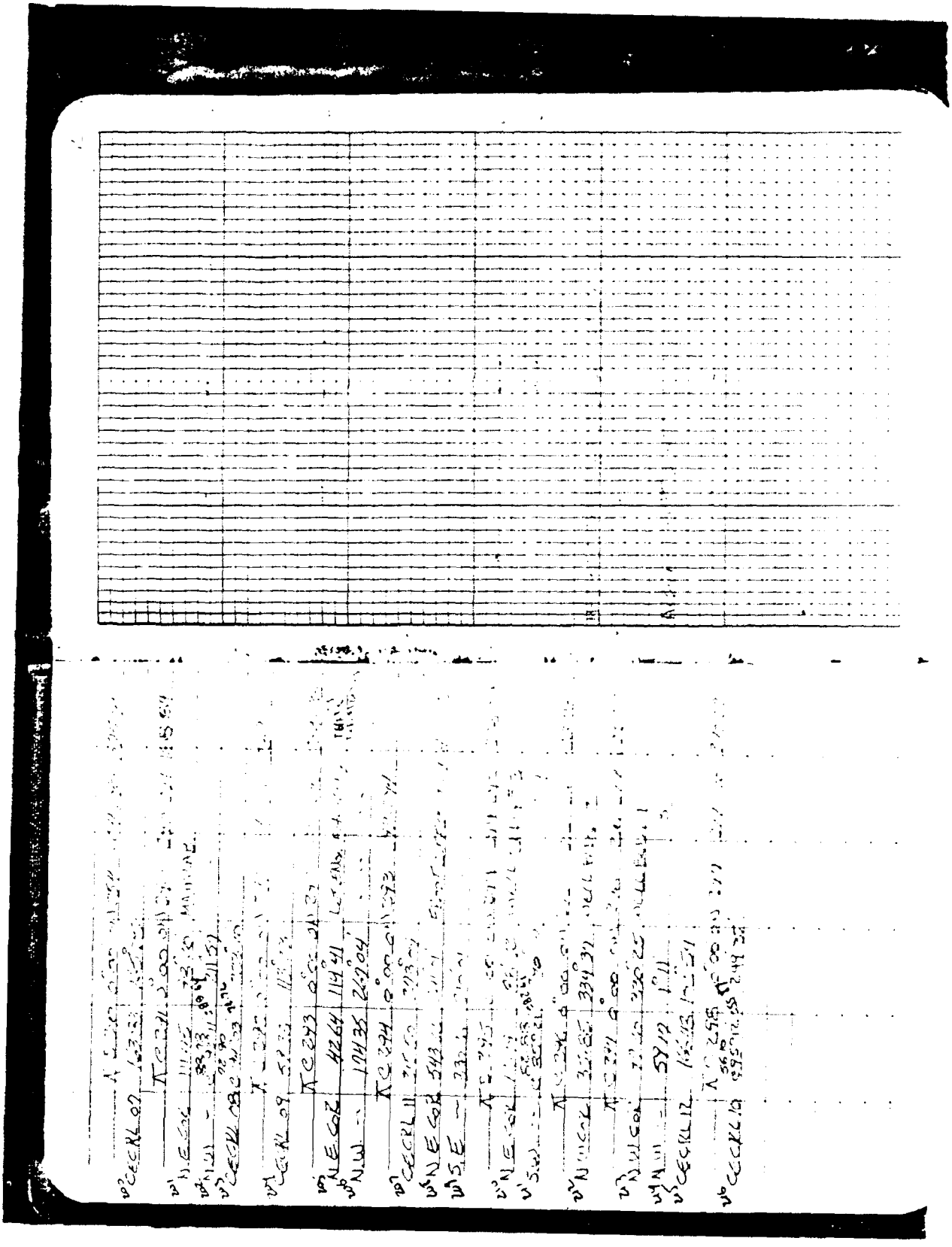
Kenneth A. LeClair Assoc. Inc.
REGISTERED PROFESSIONAL ENGINEERS
VERMONT AND NEW HAMPSHIRE
GREAT HOLLOW ROAD
P.O. BOX 614, HANOVER, N.H. 03755
TEL. 643-3511
CONSULTING ENGINEERS & LAND SURVEYORS

MONITORING WELL LOCATIONS & ELEVATIONS
CRREL SITE
LYME ROAD
HANOVER, N.H.

Note: Elevations are based on NVGD Datum. Coordinates are UTM Coordinates that were computed from existing coordinate data of various points on site that were supplied by Ecology & Environment, Inc.

Well	North(Meters)	East(Meters)	Elev.(Feet) (Top PVC Pipe)	Elev.(Ft.) (Top of Lid)	Ground Elev.(Ft)
CECRL 07	4844585.88	719932.73	525.61	525.80	523.0
CECRL 08	4844564.62	719832.11	515.38	515.54	512.7
CECRL 09	4844545.13	719760.53	509.75	509.89	507.2
CECRL 10	4844633.31	719725.40	495.96	496.30	493.1
CECRL 11	4844565.05	719669.29	479.14	479.35	476.5
CECRL 12	4844720.63	719580.56	470.16	470.41	467.8





BM108	3.63	[illegible]		[illegible]	USGS
TP 1	5.73	[illegible]			
TP 2	2.44	[illegible]	[illegible]	[illegible]	
TP 3	0.985	513.[illegible]	11.925	[illegible]	
TP 4	3.89	517.[illegible]	4.965	[illegible]	
CRREL BM	3.845	516.915	[illegible]	513.07 513.07	
TP 4	4.[illegible]	513.09	[illegible]	508.34	
TP 3	12.[illegible]	524.315	[illegible]	512.32	
TP 2	9.[illegible]	531.035	[illegible]	521.815	
TP 1	5.80	530.935	5.70	525.135	
BM108			3.775	527.14	
	57.315		57.315		
CRREL BM	4.325	517.395		513.07	
CECRL 08	7.91	523.295	[illegible]	515.385	
TOP CASING			[illegible]	15.54	
GR SHOT			10.[illegible]	12.7	
TP 5	8.915	526.355	[illegible]	517.44	
CECRL 07	1.63	527.29	0.745	525.61	
TOP CASING			1.49	25.80	
GR SHOT			[illegible]	23.0	
TP 5	[illegible]	523.70	[illegible]	517.435	
TP 6	3.73	517.49	[illegible]	513.56	
CRREL BM			4.415	513.07	513.07
	[illegible]		[illegible]		
CRREL BM	2.73	516.000		513.07	
CECRL 09	5.885	515.635	6.[illegible]	509.75	
TOP CASING			5.745	09.89	
GR SHOT			8.1	07.2	
CRREL BM			[illegible]	513.07	513.07
	[illegible]		8.0[illegible]		

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(STATE OF NH BM #108)

E HIGH POINT

4

CRREL BM	[illegible]	513.41		513.07	
TP 7	2.215	510.685	[illegible]	508.47	
TP 8	[illegible]	502.30	[illegible]	499.84	
[illegible]	1.3[illegible]	497.36	[illegible]	495.96	
TOP CASING			1.[illegible]	96.30	
GR SHOT			[illegible]	93.1	
TP 9	[illegible]	486.65	[illegible]	483.30	
[illegible] 11	[illegible]	481.81	[illegible]	479.14	
TOP CASING			[illegible]	79.35	
GR SHOT			[illegible]	76.5	
TP 10	1.[illegible]	471.935	11.48[illegible]	470.325	
TP 11	6.27	475.84	[illegible]	469.570	
[illegible] 12	6.015	476.175	[illegible]	470.16	
TOP CASING			5.[illegible]	70.41	
GR SHOT			3.[illegible]	67.78	
TP 11	1.24	470.80	[illegible]	469.56	
TP 12	15.24	485.10	0.94	469.86	
TP 9	14.745	498.035	1.61	483.29	
TP 13	8.43	502.45	4.06	493.97	
TP 8	12.[illegible]	512.105	[illegible]	499.63	
TP 7	6.73	515.185	[illegible]	508.46	
CRREL BM			2.125	513.06	513.07
	89.[illegible]		87.[illegible]		

APPENDIX L

IDW ANALYTICAL RESULTS

CleanHarbors
ANALYTICAL SERVICES, INC.
BEDFORD DIVISION
213 BURLINGTON ROAD, BEDFORD, MA 01730
(617) 275-6111

REPORT OF ANALYSIS

Clean Harbors of Kingston, Inc.
New Hampshire Division
9 Hooksett Industrial Park Dr.
Hooksett, NH 03106

Project: Cold Region Research
P.O. #: NH5136

Date Received: 05/01/92
CHAS Lab #: 92X05001

Attn: Mr. Mike Ritsch

Enclosed are the results for the sample(s) delivered to our laboratory on the date indicated above.

The methods listed represent those methodologies which were used to develop the best analytical techniques. Analytical results and quality assurance protocols are based on these guidelines. These meet the requirements for the reporting of results under the RCRA, NPDES and Safe Drinking Water Act regulations.

Clean Harbors Analytical Services has an active program of quality assurance and quality control. The program closely follows the guidance provided in the EPA Contract Laboratory Program Statement of Work, the guidance provided in SW-846, and many other pertinent documents.

Should you have any questions concerning this work, please do not hesitate to contact me at the number above.

Please note that samples will be held for a period not to exceed 30 days from date of final report.

The information contained in this report is, to the best of my knowledge, accurate and complete.

Per/Date: Richard Ravenelle 5/15/92
Richard Ravenelle
Laboratory Manager

Clean Harbors Analytical Services, Bedford Division, has New Hampshire certification for all drinking water parameters; and all wastewater parameters except orthophosphate.

MASSACHUSETTS RHODE ISLAND CONNECTICUT NEW YORK NEW JERSEY MAINE NEW HAMPSHIRE MARYLAND ILLINOIS OHIO

RC507 L-3

recycled paper ecology and environment

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 2SB1
Sample Type: Solid

CHAS Lab #: 92X05001-01
Date Received: 05/01/92

TCLP Wastes

Waste Code	Description	Regulatory Level*	MDL*	Conc.*
D004	Arsenic	5.0	0.50	ND
D005	Barium	100.0	1.0	ND
D018	Benzene	0.5	0.10	ND
D006	Cadmium	1.0	0.030	ND
D019	Carbon Tetrachloride	0.5	0.10	ND
D020	Chlordane	0.03	0.02	ND
D021	Chlorobenzene	100.0	0.10	ND
D022	Chloroform	6.0	0.10	ND
D007	Chromium	5.0	0.040	ND
D026	Total Cresol	200.0	0.025	ND
D016	2,4-D	10.0	0.02	ND
D027	1,4-Dichlorobenzene	7.5	0.025	ND
D028	1,2-Dichloroethane	0.5	0.10	ND
D029	1,1-Dichloroethylene	0.7	0.10	ND
D030	2,4-Dinitrotoluene	0.13	0.025	ND
D012	Endrin	0.02	0.004	ND
D031	Heptachlor (and its Epoxide)	0.008	0.004	ND
D032	Hexachlorobenzene	0.13	0.025	ND
D033	Hexachlorobutadiene	0.5	0.025	ND
D034	Hexachloroethane	3.0	0.025	ND
D008	Lead	5.0	0.50	ND
D013	Lindane	0.4	0.004	ND
D009	Mercury	0.2	0.0020	ND
D014	Methoxychlor	10.0	0.02	ND
D035	Methyl Ethyl Ketone	200.0	0.40	ND
D036	Nitrobenzene	2.0	0.025	ND
D037	Pentachlorophenol	100.0	0.13	ND
D038	Pyridine	5.0	0.025	ND
D010	Selenium	1.0	0.60	ND
D011	Silver	5.0	0.20	ND
D039	Tetrachloroethylene	0.7	0.10	ND
D015	Toxaphene	0.5	0.02	ND
D040	Trichloroethylene	0.5	0.10	ND
D041	2,4,5-Trichlorophenol	400.0	0.13	ND
D042	2,4,6-Trichlorophenol	2.0	0.13	ND
D017	2,4,5-TP (Silvex)	1.0	0.02	ND
D043	Vinyl Chloride	0.2	0.10	ND

Notes: ND - Below minimum detectable level (MDL)
TR - Trace amount present but below MDL
* - mg/l
TCLP - Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

This is a summary report. Please see the following pages for full results.

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 2SB1
Sample Type: Solid

CHAS Lab #: 92X05001-01A
Date Received: 05/01/92
Internal Code: VS30

Volatile Organics - System D
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Method 8260 (ref. c)

Zero Headspace Extraction Date: 05/05/92

Analysis Date: 05/06/92

Parameter	MDL*	Conc.*	Parameter	MDL*	Conc.*
Benzene	0.10	ND	1,1-Dichloroethylene	0.10	ND
Carbon Tetrachloride	0.10	ND	Methyl Ethyl Ketone	0.40	ND
Chlorobenzene	0.10	ND	Tetrachloroethylene	0.10	ND
Chloroform	0.10	ND	Trichloroethylene	0.10	ND
1,2-Dichloroethane	0.10	ND	Vinyl Chloride	0.10	ND

Notes

ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:		Acceptance Criteria: Water	Acceptance Criteria: Soil
1,2-Dichloroethane-d4:	109 %	76-114%	70-121%
Toluene-d8:	99 %	88-110%	84-138%
p-BFB:	102 %	86-115%	59-113%

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 2SB1
Sample Type: Solid

CHAS Lab #: 92X05001-01M
Date Received: 05/01/92

Parameter	MDL*	Result*	Digestion Date	Analysis Date	Method Number and Reference
Arsenic - TCLP	0.50	ND	05/06/92	05/07/92	3010/6010(c)
Barium - TCLP	1.0	ND	05/06/92	05/07/92	3010/6010(c)
Cadmium - TCLP	0.030	ND	05/06/92	05/07/92	3010/6010(c)
Chromium - TCLP	0.040	ND	05/06/92	05/07/92	3010/6010(c)
Lead - TCLP	0.50	ND	05/06/92	05/07/92	3010/6010(c)
Mercury - TCLP	0.0020	ND	05/07/92	05/08/92	7470(c)
Selenium - TCLP	0.60	ND	05/06/92	05/07/92	3010/6010(c)
Silver - TCLP	0.20	ND	05/06/92	05/07/92	3005/6010(c)

Sample extracted on 05/04/92.

Notes: ND = Below minimum detectable level (MDL)
* = mg/l
All metal results are blank corrected.
Soil/solid samples based on sample dry weight.

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

CleanHarbors

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 2SB1
Sample Type: Solid

CHAS Lab #: 92X05001-01M
Date Received: 05/01/92
Internal Code: SS30

Semi-Volatile Base/Neutral and Acid Extractable Organics - System C
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Methods 3510/8270 (ref. c)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/05/92
Analysis Date: 05/11/92

Parameter	MDL*	Conc.*	Parameter	MDL*	Conc.*
Total Cresols	0.025	ND	Nitrobenzene	0.025	ND
1,4-Dichlorobenzene	0.025	ND	Pentachlorophenol	0.13	ND
2,4-Dinitrotoluene	0.025	ND	Pyridine	0.025	ND
Hexachlorobenzene	0.025	ND	2,4,5-Trichlorophenol	0.13	ND
Hexachlorobutadiene	0.025	ND	2,4,6-Trichlorophenol	0.13	ND
Hexachloroethane	0.025	ND			

Notes

ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:	Acceptance Criteria: Water	Acceptance Criteria: Soil
2-Fluorophenol: 40 %	21-100%	25-121%
Phenol-d5: 34 %	10-94%	24-113%
Nitrobenzene-d5: 82 %	35-114%	23-120%
2-Fluorobiphenyl: 67 %	43-116%	30-115%
2,4,6-Tribromophenol: 55 %	10-123%	19-122%
Terphenyl-d14: 72 %	33-141%	18-137%

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 2SB1
Sample Type: Solid

CHAS Lab #: 92X05001-01M
Date Received: 05/01/92
Internal Code: PS30

Organochlorine Pesticides
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Methods 3510/8080 (ref. c)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/05/92
Analysis Date: 05/12/92

Parameter	MDL*	Conc.*
Endrin	0.004	ND
Lindane (Gamma-BHC)	0.004	ND
Methoxychlor	0.02	ND
Toxaphene	0.02	ND
Chlordane	0.02	ND
Heptachlor	0.004	ND
Heptachlor Epoxide	0.004	ND

Notes: * = mg/l
ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 2SB1
Sample Type: Solid

CHAS Lab #: 92X05001-01M
Date Received: 05/01/92
Internal Code: HS30

Chlorinated Phenoxy Acid Herbicides
Toxicity Characteristic Leaching Procedure (TCLP)
by Method 509B (ref. b)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/13/92
Analysis Date: 05/13/92

Parameter	MDL*	Conc.*
2,4-D	0.02	ND
2,4,5-TP (Silvex)	0.02	ND

Notes: * = mg/l
ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

CleanHarbors

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 9SB1
Sample Type: Solid

CHAS Lab #: 92X05001-02
Date Received: 05/01/92

TCLP Wastes

Waste Code	Description	Regulatory Level*	MDL*	Conc.*
D004	Arsenic	5.0	0.50	ND
D005	Barium	100.0	1.0	1.8
D018	Benzene	0.5	0.10	ND
D006	Cadmium	1.0	0.030	ND
D019	Carbon Tetrachloride	0.5	0.10	ND
D020	Chlordane	0.03	0.02	ND
D021	Chlorobenzene	100.0	0.10	ND
D022	Chloroform	6.0	0.10	ND
D007	Chromium	5.0	0.040	0.047
D026	Total Cresol	200.0	0.025	ND
D016	2,4-D	10.0	0.02	ND
D027	1,4-Dichlorobenzene	7.5	0.025	ND
D028	1,2-Dichloroethane	0.5	0.10	ND
D029	1,1-Dichloroethylene	0.7	0.10	ND
D030	2,4-Dinitrotoluene	0.13	0.025	ND
D012	Endrin	0.02	0.004	ND
D031	Heptachlor (and its Epoxide)	0.008	0.004	ND
D032	Hexachlorobenzene	0.13	0.025	ND
D033	Hexachlorobutadiene	0.5	0.025	ND
D034	Hexachloroethane	3.0	0.025	ND
D008	Lead	5.0	0.50	ND
D013	Lindane	0.4	0.004	ND
D009	Mercury	0.2	0.0020	ND
D014	Methoxychlor	10.0	0.02	ND
D035	Methyl Ethyl Ketone	200.0	0.40	ND
D036	Nitrobenzene	2.0	0.025	ND
D037	Pentachlorophenol	100.0	0.13	ND
D038	Pyridine	5.0	0.025	ND
D010	Selenium	1.0	0.60	ND
D011	Silver	5.0	0.20	ND
D039	Tetrachloroethylene	0.7	0.10	ND
D015	Toxaphene	0.5	0.02	ND
D040	Trichloroethylene	0.5	0.10	ND
D041	2,4,5-Trichlorophenol	400.0	0.13	ND
D042	2,4,6-Trichlorophenol	2.0	0.13	ND
D017	2,4,5-TP (Silvex)	1.0	0.02	ND
D043	Vinyl Chloride	0.2	0.10	ND

Notes: ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

This is a summary report. Please see the following pages for full results.

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 9SB1
Sample Type: Solid

CHAS Lab #: 92X05001-02A
Date Received: 05/01/92
Internal Code: VS30

Volatile Organics - System D
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Method 8260 (ref. c)

Zero Headspace Extraction Date: 05/05/92

Analysis Date: 05/06/92

Parameter	MDL*	Conc.*	Parameter	MDL*	Conc.*
Benzene	0.10	ND	1,1-Dichloroethylene	0.10	ND
Carbon Tetrachloride	0.10	ND	Methyl Ethyl Ketone	0.40	ND
Chlorobenzene	0.10	ND	Tetrachloroethylene	0.10	ND
Chloroform	0.10	ND	Trichloroethylene	0.10	ND
1,2-Dichloroethane	0.10	ND	Vinyl Chloride	0.10	ND

Notes

ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:		Acceptance Criteria: Water	Acceptance Criteria: Soil
1,2-Dichloroethane-d4:	111 %	76-114%	70-121%
Toluene-d8:	99 %	88-110%	84-138%
p-BFB:	100 %	86-115%	59-113%

CleanHarbors

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 9SB1
Sample Type: Solid

CHAS Lab #: 92X05001-02M
Date Received: 05/01/92

Parameter	MDL*	Result*	Digestion Date	Analysis Date	Method Number and Reference
Arsenic - TCLP	0.50	ND	05/06/92	05/07/92	3010/6010(c)
Barium - TCLP	1.0	1.8	05/06/92	05/07/92	3010/6010(c)
Cadmium - TCLP	0.030	ND	05/06/92	05/07/92	3010/6010(c)
Chromium - TCLP	0.040	0.047	05/06/92	05/07/92	3010/6010(c)
Lead - TCLP	0.50	ND	05/06/92	05/07/92	3010/6010(c)
Mercury - TCLP	0.0020	ND	05/07/92	05/08/92	7470(c)
Selenium - TCLP	0.60	ND	05/06/92	05/07/92	3010/6010(c)
Silver - TCLP	0.20	ND	05/06/92	05/07/92	3005/6010(c)

Sample extracted on 05/04/92.

Notes: ND = Below minimum detectable level (MDL)
* = mg/l
All metal results are blank corrected.
Soil/solid samples based on sample dry weight.

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

CleanHarbors

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 9SB1
Sample Type: Solid

CHAS Lab #: 92X05001-02M
Date Received: 05/01/92
Internal Code: SS30

Semi-Volatile Base/Neutral and Acid Extractable Organics - System C
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Methods 3510/8270 (ref. c)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/05/92
Analysis Date: 05/11/92

Parameter	MDL*	Conc.*	Parameter	MDL*	Conc.*
Total Cresols	0.025	ND	Nitrobenzene	0.025	ND
1,4-Dichlorobenzene	0.025	ND	Pentachlorophenol	0.13	ND
2,4-Dinitrotoluene	0.025	ND	Pyridine	0.025	ND
Hexachlorobenzene	0.025	ND	2,4,5-Trichlorophenol	0.13	ND
Hexachlorobutadiene	0.025	ND	2,4,6-Trichlorophenol	0.13	ND
Hexachloroethane	0.025	ND			

Notes

ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:	Acceptance Criteria: Water	Acceptance Criteria: Soil
2-Fluorophenol: 36 %	21-100%	25-121%
Phenol-d5: 31 %	10-94%	24-113%
Nitrobenzene-d5: 75 %	35-114%	23-120%
2-Fluorobiphenyl: 61 %	43-116%	30-115%
2,4,6-Tribromophenol: 55 %	10-123%	19-122%
Terphenyl-d14: 64 %	33-141%	18-137%

Clean Harbors

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 9SB1
Sample Type: Solid

CHAS Lab #: 92X05001-02M
Date Received: 05/01/92
Internal Code: PS30

Organochlorine Pesticides
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Methods 3510/8080 (ref. c)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/05/92
Analysis Date: 05/12/92

Parameter	MDL*	Conc.*
Endrin	0.004	ND
Lindane (Gamma-BHC)	0.004	ND
Methoxychlor	0.02	ND
Toxaphene	0.02	ND
Chlordane	0.02	ND
Heptachlor	0.004	ND
Heptachlor Epoxide	0.004	ND

Notes: * = mg/l
ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 9SB1
Sample Type: Solid

CHAS Lab #: 92X05001-02M
Date Received: 05/01/92
Internal Code: HS30

Chlorinated Phenoxy Acid Herbicides
Toxicity Characteristic Leaching Procedure (TCLP)
by Method 509B (ref. b)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/12/92
Analysis Date: 05/13/92

Parameter	MDL*	Conc.*
2,4-D	0.02	ND
2,4,5-TP (Silvex)	0.02	ND

Notes: * = mg/l
ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 13SB1
Sample Type: Solid

CHAS Lab #: 92X05001-03
Date Received: 05/01/92

TCLP Wastes

Waste Code	Description	Regulatory Level*	MDL*	Conc.*
D004	Arsenic	5.0	0.50	ND
D005	Barium	100.0	1.0	ND
D018	Benzene	0.5	0.10	ND
D006	Cadmium	1.0	0.030	ND
D019	Carbon Tetrachloride	0.5	0.10	ND
D020	Chlordane	0.03	0.02	ND
D021	Chlorobenzene	100.0	0.10	ND
D022	Chloroform	6.0	0.10	ND
D007	Chromium	5.0	0.040	ND
D026	Total Cresol	200.0	0.025	ND
D016	2,4-D	10.0	0.02	ND
D027	1,4-Dichlorobenzene	7.5	0.025	ND
D028	1,2-Dichloroethane	0.5	0.10	ND
D029	1,1-Dichloroethylene	0.7	0.10	ND
D030	2,4-Dinitrotoluene	0.13	0.025	ND
D012	Endrin	0.02	0.004	ND
D031	Heptachlor (and its Epoxide)	0.008	0.004	ND
D032	Hexachlorobenzene	0.13	0.025	ND
D033	Hexachlorobutadiene	0.5	0.025	ND
D034	Hexachloroethane	3.0	0.025	ND
D008	Lead	5.0	0.50	ND
D013	Lindane	0.4	0.004	ND
D009	Mercury	0.2	0.0020	ND
D014	Methoxychlor	10.0	0.02	ND
D035	Methyl Ethyl Ketone	200.0	0.40	ND
D036	Nitrobenzene	2.0	0.025	ND
D037	Pentachlorophenol	100.0	0.13	ND
D038	Pyridine	5.0	0.025	ND
D010	Selenium	1.0	0.60	ND
D011	Silver	5.0	0.20	ND
D039	Tetrachloroethylene	0.7	0.10	ND
D015	Toxaphene	0.5	0.02	ND
D040	Trichloroethylene	0.5	0.10	ND
D041	2,4,5-Trichlorophenol	400.0	0.13	ND
D042	2,4,6-Trichlorophenol	2.0	0.13	ND
D017	2,4,5-TP (Silvex)	1.0	0.02	ND
D043	Vinyl Chloride	0.2	0.10	ND

Notes: ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

This is a summary report. Please see the following pages for full results.

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 13SB1
Sample Type: Solid

CHAS Lab #: 92X05001-03A
Date Received: 05/01/92
Internal Code: VS30

Volatile Organics - System D
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Method 8260 (ref. c)

Zero Headspace Extraction Date: 05/05/92

Analysis Date: 05/06/92

Parameter	MDL*	Conc.*	Parameter	MDL*	Conc.*
Benzene	0.10	ND	1,1 Dichloroethylene	0.10	ND
Carbon Tetrachloride	0.10	ND	Methyl Ethyl Ketone	0.40	ND
Chlorobenzene	0.10	ND	Tetrachloroethylene	0.10	ND
Chloroform	0.10	ND	Trichloroethylene	0.10	ND
1,2-Dichloroethane	0.10	ND	Vinyl Chloride	0.10	ND

Notes

ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:		Acceptance Criteria: Water	Acceptance Criteria: Soil
1,2-Dichloroethane-d4:	105 %	76-114%	70-121%
Toluene-d8:	98 %	88-110%	84-138%
p-BFB:	99 %	86-115%	59-113%

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 13SB1
Sample Type: Solid

CHAS Lab #: 92X05001-03M
Date Received: 05/01/92

Parameter	MDL*	Result*	Digestion Date	Analysis Date	Method Number and Reference
Arsenic - TCLP	0.50	ND	05/07/92	05/08/92	3010/6010(c)
Barium - TCLP	1.0	ND	05/07/92	05/08/92	3010/6010(c)
Cadmium - TCLP	0.030	ND	05/07/92	05/08/92	3010/6010(c)
Chromium - TCLP	0.040	ND	05/07/92	05/08/92	3010/6010(c)
Lead - TCLP	0.50	ND	05/07/92	05/08/92	3010/6010(c)
Mercury - TCLP	0.0020	ND	05/07/92	05/08/92	7470(c)
Selenium - TCLP	0.60	ND	05/07/92	05/08/92	3010/6010(c)
Silver - TCLP	0.20	ND	05/07/92	05/08/92	3005/6010(c)

Sample extracted on 05/04/92.

Notes: ND = Below minimum detectable level (MDL)
* = mg/l
All metal results are blank corrected.
Soil/solid samples based on sample dry weight.

TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

CleanHarbors

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 13SB1
Sample Type: Solid

CHAS Lab #: 92X05001-03M
Date Received: 05/01/92
Internal Code: SS30

Semi-Volatile Base/Neutral and Acid Extractable Organics - System C
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Methods 3510/8270 (ref. c)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/06/92
Analysis Date: 05/11/92

Parameter	MDL*	Conc.*	Parameter	MDL*	Conc.*
Total Cresols	0.025	ND	Nitrobenzene	0.025	ND
1,4-Dichlorobenzene	0.025	ND	Pentachlorophenol	0.13	ND
2,4-Dinitrotoluene	0.025	ND	Pyridine	0.025	ND
Hexachlorobenzene	0.025	ND	2,4,5-Trichlorophenol	0.13	ND
Hexachlorobutadiene	0.025	ND	2,4,6-Trichlorophenol	0.13	ND
Hexachloroethane	0.025	ND			

Notes

ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
* = mg/l
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:	Acceptance Criteria: Water	Acceptance Criteria: Soil
2-Fluorophenol: 46 %	21-100%	25-121%
Phenol-d5: 43 %	10-94%	24-113%
Nitrobenzene-d5: 81 %	35-114%	23-120%
2-Fluorobiphenyl: 71 %	43-116%	30-115%
2,4,6-Tribromophenol: 65 %	10-123%	19-122%
Terphenyl-d14: 66 %	33-141%	18-137%

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 13SB1
Sample Type: Solid

CHAS Lab #: 92X05001-03M
Date Received: 05/01/92
Internal Code: HS30

Chlorinated Phenoxy Acid Herbicides
Toxicity Characteristic Leaching Procedure (TCLP)
by Method 509B (ref. b)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/12/92
Analysis Date: 05/13/92

Parameter	MDL*	Conc.*
2,4-D	0.02	ND
2,4,5-TP (Silvex)	0.02	ND

Notes: * = mg/l
ND = Below minimum detectable level (MDL)
TR = Trace amount present but below MDL
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

Client: Clean Harbors of Kingston, Inc.
Sample I.D.: 13SB1
Sample Type: Solid

CHAS Lab #: 92X05001-03M
Date Received: 05/01/92
Internal Code: PS30

Organochlorine Pesticides
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Methods 3510/8080 (ref. c)

TCLP Extraction Date: 05/04/92
Organic Extraction Date: 05/06/92
Analysis Date: 05/12/92

Parameter	MDL*	Conc.*
Endrin	0.004	ND
Lindane (Gamma-BHC)	0.004	ND
Methoxychlor	0.02	ND
Toxaphene	0.02	ND
Chlordane	0.02	ND
Heptachlor	0.004	ND
Heptachlor Epoxide	0.004	ND

Notes: * - mg/l
ND - Below minimum detectable level (MDL)
TR - Trace amount present but below MDL
TCLP - Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

CleanHarbors

Clean Harbors Analytical 213 Burlington Rd Bedford MA 01730 | CHAIN OF CUSTODY RECORD | Sample Custodian (617) 275-6111 | Page 1 of 2

Client: C.H.I. - New Hampshire
Project Name: (OLD) Regions Research & Eng. - Off 9 Brookside Ind. Park
Project/P.O. #: NH5136
Date: 4/31/92
Report To: Mike Ritsch
Address:
Phone #: 603-~~[illegible]~~ 644-3633
Invoice To:
Address:
Date Samples Collected: 4/20/92
by: Mike Ritsch
Date Samples Received: ~~4/30/92~~ 5/1/92
Airbill/Bill of Lading? Y (N)
NOTE: Samples received unpreserved will be preserved upon arrival at CHAS.
Samples were: Preserved (Unpreserved)

Sample I.D.	Sampling Information: Date	Time	Station Location	Sample Type	T.C.L. VOA	T.C.L. Semi-Vol	T.C.L. Metals	T.C.L. Pest./PCB						# of con.	Comments (Special instructions, cautions, etc.) TCLP	CHAS Sample # 92X0500
2 SB1	4/20	2pm	DRUM	Solid	✓	✓	✓	✓						4	01M 01MS 01X1	01AB 01M
4SB1	↓	↓	↓	↓	✓	✓	✓	✓						4	02X1	02AB 02M
13SB1	↓	↓	↓	↓	✓	✓	✓	✓						4	03X1	03AB 03M

Please Add Arthur D Little
C.O.C. TO This Group
Same Sample.
Not Called

See attached COC in folder 5/1/92

VOA Vial	X											
Glass Bottle		X	X	X								
Plastic Bot.												
Pres.												
Volume												

Relinquished by: Mike Ritsch
Date: 4/30/92 Time: 6:00pm
Received by: Paula Benham
Date: 4/30/92 Time: 6:00pm
Relinquished by:
Date: Time:
Received by: [illegible]
Date: 5/1/92 Time:

Preservation Key: A - Acidified with _____
B - Filtered, C - Sample chilled, D - NaOH,
E - Nathiosulfate, W - Sample Ambient, F - Other

REMARKS: (Sample storage, nonstandard sample bottles, special instructions)
I will have Debbie Young call w/ P.O. #
Thank you M.R.

Standard laboratory turnaround time is 2 weeks form date of receipt. Accelerated turnaround may be assessed a surcharge. Accelerated turnaround requested:
Confirmed by: Surcharge:

Location of samples: R1 R3 R3
Turnaround: 24 Hrs 48 Hrs 1 Week (2 Weeks) Other:

716-614-F060 x 2573

Cooler Number: 1 of 1

Arthur D. Little, Inc.
CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJ. NO	PROJECT NAME	SAMPLE PROGRAM*	SAMPLE TECHNIQUE*	FLAGGING CODE*	QC TEST CODE*	ANALYSES	REMARKS
UC3050	COLD REGIONS RESEARCH + ENG. LAB						ECOLOGY + ENVIRONMENT ANY ?'S CALL B. TOPOR AT (716) 684-8060
SAMPLERS (Signature) B. TOPOR		INSTALLATION*					

SITE ID*	DATE	TIME	FIELD SAMPLE NUMBER*	FILE TYPE* (matrix)	SITE TYPE*	DEPTH* (sample)	PRESERVATION	SAMPLE TECHNIQUE*	FLAGGING CODE*	QC TEST CODE*	~~TCLP-ORG~~	~~SEMI-VOL~~	PEST HERB	MTLS			REMARKS
2SB1	4-10-92	1200	2SB1	SOIL	NA	NA	None				1						DRUM SAMPLE 2SB1
9SB1	4-10-92	1210	9SB1	SOIL	NA	NA	None				1						DRUM SAMPLE 9SB1
13SB1	4-10-92	1215	13SB1	SOIL	NA	NA	None				1						DRUM SAMPLE 13SB1

B. Topor 4-10-92

TRANSFERED this information & Samples transfered TO C.H.I. C.O.C.

Relinquished by (Signature)	Date / Time	Received by (Signature)	Shipped to
Barbara Topor	4-10-92		Mike Rich Clean Harbors #9 Hooksett Ind. Park Hooksett, NH 03106 603 644 3633
[signature]	4-10-92	[signature]	
[signature]	4/30/92 6:15 pm	Paula Benham 4/30	Date / Time: 4-10-92 — Carrier / Airbill #: FED. XPRESS 3415725843

Distribution: Original Accompanies Shipment, Yellow Copy to Case Manager, Pink Copy for Field Files

Arthur D. Little, Inc. 25 Acorn Park, Cambridge, MA 02140
Tel (617) 864-5770 FAX (617) 661-5830

* If necessary, refer to USATHAMA User's Guide IRDMIS Volume II Data Dictionary for acceptable entries

Method References

(a) "Methods for Chemical Analysis of Water and Wastes." Publication EPA-600/4-79-020. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, 1979, revised March 1983.

(b) "Standard Methods for the Examination of Water and Wastewater," 16th ed., American Public Health Association, American Water Works Association, Water Pollution Control Federation, Washington, D.C., 1985.

(c) "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods," 2nd ed., U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C., July 1982.

(d) "The Determination of Polychlorinated Biphenyls in Transformer Fluid and Waste Oils," Publication EPA-600/4-81-045, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, 1981.

(e) "EPA-CLP Organic Analyses of Low and Medium Hazardous Waste Sample (Water and Soil) Procedures Revision," U.S. Environmental Protection Agency, July 1985.

(f) "Test Procedures for Analyses of Organic Pollutants," Code of Federal Regulations, Appendix A, Part 136, July 1, 1985.

(g) "Measurement of Purgeable Organic Compounds in Drinking Water by Gas Chromatography/Mass Spectrometry," Method 524, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati.

(h) "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," Publication EPA-600/4-80-032, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, August 1980.

(i) "Clean Harbors Radiological Environmental Analytical Procedures," Clean Harbors Analytical Services, Braintree, MA, October 1985.

(j) "Methods for Chlorinated Phenoxy Acid Herbicides in Industrial Effluents," MDQARL, Cincinnati, November 28, 1973.

(k) "Annual Book of Standards," Section 11: Water and Environmental Technology, Vols. 11.01-11.04, American Society for Testing and Materials, Philadelphia, 1983, 1984, 1985.

(l) "Methods for Benzidine, Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater," U.S. Environmental Protection Agency, September 1978.

(m) "Methods for Organochlorine Pesticides in Industrial Effluents," MDQARL, Environmental Protection Agency, Cincinnati, November 28, 1973.

(n) "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," Techniques of Water-Resources Investigation of the U.S. Geological Survey, Book 5, Chapter A-1, U.S. Department of the Interior, 1979.

(o) "Measurement of Trihalomethanes in Drinking Water by Gas Chromatography/Mass Spectrometry and Selected Ion Monitoring," Method 501.3, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati.

(p) "The Analysis of Trihalomethanes in Finished Waters by the Purge and Trap Method," U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati.

(q) "The Analysis of Trihalomethanes in Drinking Water by Liquid/Liquid Extraction," U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati.

(r) "Official Methods of Analysis," Association of Official Analytical Chemists, 14th ed., 1984.

(s) "Hach Handbook of Water Analysis," Hach Chemical Company, Loveland, CO, 1979.

(t) E.M. Prichard and T.P. Gesell, "Rapid Measurement of Rn-222 Concentrations in Water with a Commercial Liquid Scintillation Counter," Health Physics, Vol. 33, 1977, pp. 577-581.

(u) "Petroleum Products and Lubricants (I): D56-D1660," Annual Book of ASTM Standards, Volume 5.01, American Society for Testing and Materials, Philadelphia, 1985.

(v) "Petroleum Products and Lubricants (III): D2981-Latest: Catalysts," Annual Book of ASTM Standards, Vol. 5.03, American Society for Testing and Materials, Philadelphia, 1985.

APPENDIX M

ANALYTICAL RESULTS

INSTALLATION RESTORATION PROGRAM

CHEMICAL REPORT
Mon Jun 1 08:28:09 1992

For Parameters :

Installation = Cold Regions Res & Eng Lab, NH
Beginning Date = 01-jan-92
Ending Date = 01-jun-92
Media Type = Chemical Soil
Maximum (X, Y) = (719933, 4844996)
Minimum (X, Y) = (719326, 4844457)
Booleans = Y

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Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 10SB1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
9.5	14-jan-1992	00	TPHC	LT	7.36e+01	UGG
4.5	14-jan-1992	00	TPHC	LT	7.46e+01	UGG
0.5	14-jan-1992	00	TPHC	LT	7.47e+01	UGG
0.0	14-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	14-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	14-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	14-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	14-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	14-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	14-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	14-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	14-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	14-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	14-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	14-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	14-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	14-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	14-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	14-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	14-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	14-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	14-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	14-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	14-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	14-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	14-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	14-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	14-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	14-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	14-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	14-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	14-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	14-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	14-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	14-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	14-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	14-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	14-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	14-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	14-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	14-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	14-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	14-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	14-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	14-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	14-jan-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	ACET	ND	1.00e-02	UGG

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 2
Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 10SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	14-jan-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	14-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	14-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	14-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	14-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	14-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	14-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	14-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	14-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	14-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	14-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	14-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	14-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	14-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	14-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	14-jan-1992	LM16	CH2CL2		5.36e-03	UGG
0.0	14-jan-1992	LM16	CH2CL2		5.42e-03	UGG
0.0	14-jan-1992	LM16	CH2CL2		5.50e-03	UGG
0.0	14-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	14-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	14-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	14-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	14-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	14-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	14-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	14-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	14-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	14-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	14-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	14-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	14-jan-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	14-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG

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Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 10SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	14-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	14-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	14-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	14-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	14-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	14-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	14-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	14-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	14-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	14-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	14-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	14-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	14-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	14-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	14-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	14-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	14-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	14-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	14-jan-1992	LM16	UNK166		3.80e-03	UGG

Site: BORE 13SB1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
6.5	20-jan-1992	00	TPHC	LT	7.44e+01	UGG
2.5	20-jan-1992	00	TPHC	LT	7.45e+01	UGG
6.5	20-jan-1992	00	TPHC	LT	7.45e+01	UGG
18.0	20-jan-1992	00	TPHC	LT	7.46e+01	UGG
18.0	20-jan-1992	00	TPHC	LT	7.46e+01	UGG
2.5	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
6.5	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
6.5	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 4
Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 13SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
18.0	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
18.0	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
2.5	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
6.5	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
6.5	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
18.0	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
18.0	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
2.5	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
6.5	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
6.5	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
18.0	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
18.0	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
2.5	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
6.5	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
6.5	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
18.0	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
18.0	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
6.5	20-jan-1992	LM16	12DCE		1.17e-03	UGG
2.5	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
6.5	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
18.0	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
18.0	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
2.5	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
6.5	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
6.5	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
18.0	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
18.0	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
2.5	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
6.5	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
6.5	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
18.0	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
18.0	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
2.5	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
6.5	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
6.5	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
18.0	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
18.0	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
2.5	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
6.5	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
6.5	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
18.0	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
18.0	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
2.5	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
6.5	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
6.5	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
18.0	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
18.0	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
2.5	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 5
Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 13SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
6.5	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
6.5	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
18.0	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
18.0	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
2.5	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
6.5	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
6.5	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
18.0	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
18.0	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
2.5	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
6.5	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
6.5	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
18.0	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
18.0	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
2.5	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
6.5	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
6.5	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
18.0	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
18.0	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
2.5	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
2.5	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
6.5	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
6.5	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
18.0	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
18.0	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
18.0	20-jan-1992	LM16	C12DCE		7.64e-03	UGG
6.5	20-jan-1992	LM16	C12DCE		1.17e-02	UGG
6.5	20-jan-1992	LM16	C12DCE		3.58e-02	UGG
2.5	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
2.5	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
2.5	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
6.5	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
6.5	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
18.0	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
18.0	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
2.5	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG

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Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 13SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
6.5	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
6.5	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
18.0	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
18.0	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
2.5	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
6.5	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
6.5	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
18.0	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
18.0	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
2.5	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
2.5	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
6.5	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
6.5	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
18.0	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
18.0	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
2.5	20-jan-1992	LM16	CH2CL2		5.76e-03	UGG
6.5	20-jan-1992	LM16	CH2CL2		6.90e-03	UGG
6.5	20-jan-1992	LM16	CH2CL2		7.95e-03	UGG
18.0	20-jan-1992	LM16	CH2CL2		8.60e-03	UGG
18.0	20-jan-1992	LM16	CH2CL2		8.81e-03	UGG
2.5	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
2.5	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
6.5	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
6.5	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
18.0	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
18.0	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
2.5	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
6.5	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
6.5	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
18.0	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
18.0	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
2.5	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
6.5	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
6.5	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
18.0	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
18.0	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
2.5	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
6.5	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
6.5	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
18.0	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG

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From: 01-jan-92 To: 01-jun-92

Site: BORE 13SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
18.0	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
2.5	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
2.5	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
6.5	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
6.5	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
18.0	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
18.0	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
2.5	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
6.5	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
6.5	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
18.0	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
18.0	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
2.5	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
6.5	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
6.5	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
18.0	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
18.0	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
2.5	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
2.5	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
2.5	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
6.5	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
18.0	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
2.5	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
2.5	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
6.5	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
18.0	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
2.5	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
6.5	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG

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From: 01-jan-92 To: 01-jun-92

Site: BORE 13SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
6.5	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
18.0	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
18.0	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
2.5	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
6.5	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
6.5	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
18.0	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
18.0	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
6.5	20-jan-1992	LM16	TRCLE		1.29e-02	UGG
2.5	20-jan-1992	LM16	TRCLE		1.68e-02	UGG
6.5	20-jan-1992	LM16	TRCLE		4.81e-02	UGG
18.0	20-jan-1992	LM16	TRCLE		2.16e-01	UGG
18.0	20-jan-1992	LM16	TRCLE		2.34e-01	UGG
6.5	20-jan-1992	LM16	UNK252		4.77e-03	UGG

Site: BORE 15SB1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
26.0	15-jan-1992	00	TPHC		1.72e+02	UGG
20.0	15-jan-1992	00	TPHC	LT	7.43e+01	UGG
0.5	15-jan-1992	00	TPHC	LT	7.44e+01	UGG
34.0	15-jan-1992	00	TPHC	LT	7.47e+01	UGG
0.0	15-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	15-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	15-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	15-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	15-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	15-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	15-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	15-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	15-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	15-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	15-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	15-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	15-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	15-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	15-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	15-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	15-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	15-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG

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From: 01-jan-92 To: 01-jun-92

Site: BORE 15SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	15-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	15-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	15-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	15-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	15-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	15-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	15-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	15-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	15-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	15-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	15-jan-1992	LM16	12DMB		9.58e-03	UGG
0.0	15-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	15-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	15-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	15-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	15-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	15-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	15-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	15-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	15-jan-1992	LM16	13DMB		1.72e-02	UGG
0.0	15-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	15-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	15-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	15-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	15-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	15-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	15-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	15-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	15-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	15-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	15-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	15-jan-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	15-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	15-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	15-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	15-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG

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SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	15-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	15-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	15-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	15-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	15-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	15-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	15-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	15-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	15-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	15-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	15-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	15-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	15-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	15-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	15-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	15-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	15-jan-1992	LM16	CH2CL2		5.17e-03	UGG
0.0	15-jan-1992	LM16	CH2CL2		5.46e-03	UGG
0.0	15-jan-1992	LM16	CH2CL2		5.96e-03	UGG
0.0	15-jan-1992	LM16	CH2CL2		6.01e-03	UGG
0.0	15-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	15-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	15-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	15-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	15-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	15-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	15-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	15-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	15-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	15-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	15-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	15-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	15-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	15-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	15-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	15-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	15-jan-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	CS2	ND	5.00e-03	UGG

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SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	15-jan-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	15-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	15-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	15-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	15-jan-1992	LM16	ETC6H5		8.91e-03	UGG
0.0	15-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	15-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	15-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	15-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	15-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	15-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	15-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	15-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	15-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	15-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	15-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	15-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	15-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	15-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	15-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	15-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	15-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	15-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	15-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	15-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	15-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	15-jan-1992	LM16	UNK106		7.37e-03	UGG
0.0	15-jan-1992	LM16	UNK114		2.46e-02	UGG

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Site: BORE 15SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	15-jan-1992	LM16	UNK125		1.23e-02	UGG
0.0	15-jan-1992	LM16	UNK127		9.83e-03	UGG
0.0	15-jan-1992	LM16	UNK133		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK143		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK144		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK147		9.83e-03	UGG
0.0	15-jan-1992	LM16	UNK149		1.23e-02	UGG
0.0	15-jan-1992	LM16	UNK157		1.01e-02	UGG
0.0	15-jan-1992	LM16	UNK157		7.37e-02	UGG
0.0	15-jan-1992	LM16	UNK160		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK163		7.37e-03	UGG
0.0	15-jan-1992	LM16	UNK164		1.23e-02	UGG
0.0	15-jan-1992	LM16	UNK165		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK166		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK170		4.91e-02	UGG
0.0	15-jan-1992	LM16	UNK171		1.01e-02	UGG
0.0	15-jan-1992	LM16	UNK171		4.91e-02	UGG
0.0	15-jan-1992	LM16	UNK173		1.23e-02	UGG
0.0	15-jan-1992	LM16	UNK175		1.27e-02	UGG
0.0	15-jan-1992	LM16	UNK175		9.83e-02	UGG
0.0	15-jan-1992	LM16	UNK176		1.14e-02	UGG
0.0	15-jan-1992	LM16	UNK176		8.60e-02	UGG
0.0	15-jan-1992	LM16	UNK178		1.27e-02	UGG
0.0	15-jan-1992	LM16	UNK178		1.23e-01	UGG
0.0	15-jan-1992	LM16	UNK179		7.60e-03	UGG
0.0	15-jan-1992	LM16	UNK179		7.37e-02	UGG
0.0	15-jan-1992	LM16	UNK181		4.91e-03	UGG
0.0	15-jan-1992	LM16	UNK182		2.53e-02	UGG
0.0	15-jan-1992	LM16	UNK182		2.46e-01	UGG
0.0	15-jan-1992	LM16	UNK185		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK186		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK187		3.69e-02	UGG
0.0	15-jan-1992	LM16	UNK189		5.07e-03	UGG
0.0	15-jan-1992	LM16	UNK189		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK190		3.80e-03	UGG
0.0	15-jan-1992	LM16	UNK192		1.27e-02	UGG
0.0	15-jan-1992	LM16	UNK192		9.83e-02	UGG
0.0	15-jan-1992	LM16	UNK194		1.27e-02	UGG
0.0	15-jan-1992	LM16	UNK194		8.60e-02	UGG
0.0	15-jan-1992	LM16	UNK195		3.69e-03	UGG
0.0	15-jan-1992	LM16	UNK196		3.69e-02	UGG
0.0	15-jan-1992	LM16	UNK197		2.53e-02	UGG
0.0	15-jan-1992	LM16	UNK198		4.91e-02	UGG
0.0	15-jan-1992	LM16	UNK200		5.07e-03	UGG
0.0	15-jan-1992	LM16	UNK200		3.69e-02	UGG
0.0	15-jan-1992	LM16	UNK201		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK202		5.07e-03	UGG
0.0	15-jan-1992	LM16	UNK202		2.46e-02	UGG

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SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	15-jan-1992	LM16	UNK204		3.80e-03	UGG
0.0	15-jan-1992	LM16	UNK204		2.46e-02	UGG
0.0	15-jan-1992	LM16	UNK206		5.07e-03	UGG
0.0	15-jan-1992	LM16	UNK207		6.14e-03	UGG
0.0	15-jan-1992	LM16	UNK207		8.87e-03	UGG

Site: BORE 16SB1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.5	16-jan-1992	00	TPHC	LT	7.42e+01	UGG
7.5	16-jan-1992	00	TPHC	LT	7.44e+01	UGG
10.0	16-jan-1992	00	TPHC	LT	7.45e+01	UGG
0.5	16-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
7.5	16-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
10.0	16-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
0.5	16-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
7.5	16-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
10.0	16-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
0.5	16-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
7.5	16-jan-1992	LM16	11DCE	LT	1.90e-02	UG
10.0	16-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
0.5	16-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
7.5	16-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
10.0	16-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.5	16-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
7.5	16-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
10.0	16-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
0.5	16-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
7.5	16-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
10.0	16-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.5	16-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
7.5	16-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
10.0	16-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.5	16-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
7.5	16-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
10.0	16-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.5	16-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
7.5	16-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
10.0	16-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
0.5	16-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
7.5	16-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
10.0	16-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.5	16-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
7.5	16-jan-1992	LM16	13DCP	LT	1.30e-03	UGG

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Site: BORE 16SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
10.0	16-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
0.5	16-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
7.5	16-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
10.0	16-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
0.5	16-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
7.5	16-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
10.0	16-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.5	16-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
7.5	16-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
10.0	16-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.5	16-jan-1992	LM16	ACET	ND	1.00e-02	UGG
7.5	16-jan-1992	LM16	ACET	ND	1.00e-02	UGG
10.0	16-jan-1992	LM16	ACET	ND	1.00e-02	UGG
0.5	16-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
7.5	16-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
10.0	16-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.5	16-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
7.5	16-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
10.0	16-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.5	16-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
7.5	16-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
10.0	16-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.5	16-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
7.5	16-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
10.0	16-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.5	16-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
7.5	16-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
10.0	16-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.5	16-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
7.5	16-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
10.0	16-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
0.5	16-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
7.5	16-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
10.0	16-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.5	16-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
7.5	16-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
10.0	16-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
10.0	16-jan-1992	LM16	CH2CL2		3.14e-03	UGG
0.5	16-jan-1992	LM16	CH2CL2	LT	5.70e-03	UGG
7.5	16-jan-1992	LM16	CH2CL2	LT	5.70e-03	UGG
0.5	16-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
7.5	16-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
10.0	16-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.5	16-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
7.5	16-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
10.0	16-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.5	16-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
7.5	16-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG

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Site: BORE 16SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
10.0	16-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.5	16-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
7.5	16-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
10.0	16-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.5	16-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
7.5	16-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
10.0	16-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.5	16-jan-1992	LM16	CS2	ND	5.00e-03	UGG
7.5	16-jan-1992	LM16	CS2	ND	5.00e-03	UGG
10.0	16-jan-1992	LM16	CS2	ND	5.00e-03	UGG
0.5	16-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
7.5	16-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
10.0	16-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.5	16-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
7.5	16-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
10.0	16-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.5	16-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
7.5	16-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
10.0	16-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
7.5	16-jan-1992	LM16	MEK		1.37e-02	UGG
0.5	16-jan-1992	LM16	MEK	ND	1.00e-02	UGG
10.0	16-jan-1992	LM16	MEK	ND	1.00e-02	UGG
0.5	16-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
7.5	16-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
10.0	16-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
0.5	16-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
7.5	16-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
10.0	16-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
0.5	16-jan-1992	LM16	STYR	ND	5.00e-03	UGG
7.5	16-jan-1992	LM16	STYR	ND	5.00e-03	UGG
10.0	16-jan-1992	LM16	STYR	ND	5.00e-03	UGG
0.5	16-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
7.5	16-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
10.0	16-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.5	16-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
7.5	16-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
10.0	16-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.5	16-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
7.5	16-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
10.0	16-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.5	16-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
7.5	16-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
10.0	16-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG

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SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
10.0	18-jan-1992	00	TPHC	LT	7.40e+01	UGG
25.0	18-jan-1992	00	TPHC	LT	7.42e+01	UGG
16.0	18-jan-1992	00	TPHC	LT	7.43e+01	UGG
45.0	18-jan-1992	00	TPHC	LT	7.43e+01	UGG
25.0	18-jan-1992	00	TPHC	LT	7.46e+01	UGG
16.0	18-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
25.0	18-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
25.0	18-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
45.0	18-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
16.0	18-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
25.0	18-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
25.0	18-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
45.0	18-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
16.0	18-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
25.0	18-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
25.0	18-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
45.0	18-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
16.0	18-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
25.0	18-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
25.0	18-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
45.0	18-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
16.0	18-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
25.0	18-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
25.0	18-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
45.0	18-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
16.0	18-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
25.0	18-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
25.0	18-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
45.0	18-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
16.0	18-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
25.0	18-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
25.0	18-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
45.0	18-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
16.0	18-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
25.0	18-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
25.0	18-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
45.0	18-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
16.0	18-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
25.0	18-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
25.0	18-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
45.0	18-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
16.0	18-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
25.0	18-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
25.0	18-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
45.0	18-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
16.0	18-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
25.0	18-jan-1992	LM16	13DCP	LT	1.30e-03	UGG

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Site: BORE 2SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
25.0	18-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
45.0	18-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
16.0	18-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
25.0	18-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
25.0	18-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
45.0	18-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
16.0	18-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
25.0	18-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
25.0	18-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
45.0	18-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
16.0	18-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
25.0	18-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
25.0	18-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
45.0	18-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
25.0	18-jan-1992	LM16	ACET		4.22e-02	UGG
45.0	18-jan-1992	LM16	ACET		6.19e-02	UGG
16.0	18-jan-1992	LM16	ACET	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	ACET	ND	1.00e-02	UGG
16.0	18-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
25.0	18-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
25.0	18-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
45.0	18-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
16.0	18-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
45.0	18-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
16.0	18-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
45.0	18-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
16.0	18-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
25.0	18-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
25.0	18-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
45.0	18-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
16.0	18-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
25.0	18-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
25.0	18-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
45.0	18-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
16.0	18-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
25.0	18-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
25.0	18-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
45.0	18-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
16.0	18-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
45.0	18-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
16.0	18-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
25.0	18-jan-1992	LM16	CCL4	LT	5.60e-03	UGG

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Site: BORE 2SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
25.0	18-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
45.0	18-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
45.0	18-jan-1992	LM16	CH2CL2		7.74e-03	UGG
25.0	18-jan-1992	LM16	CH2CL2		9.21e-03	UGG
25.0	18-jan-1992	LM16	CH2CL2		9.80e-03	UGG
16.0	18-jan-1992	LM16	CH2CL2		1.11e-02	UGG
16.0	18-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
45.0	18-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
16.0	18-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
25.0	18-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
25.0	18-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
45.0	18-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
16.0	18-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
25.0	18-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
25.0	18-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
45.0	18-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
16.0	18-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
25.0	18-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
25.0	18-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
45.0	18-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
16.0	18-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
25.0	18-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
25.0	18-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
45.0	18-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
16.0	18-jan-1992	LM16	CS2	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	CS2	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	CS2	ND	5.00e-03	UGG
45.0	18-jan-1992	LM16	CS2	ND	5.00e-03	UGG
16.0	18-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
25.0	18-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
25.0	18-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
45.0	18-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
16.0	18-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
25.0	18-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
25.0	18-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
45.0	18-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
16.0	18-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
25.0	18-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
25.0	18-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
45.0	18-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
45.0	18-jan-1992	LM16	MEK		1.44e-02	UGG
16.0	18-jan-1992	LM16	MEK	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	MEK	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	MEK	ND	1.00e-02	UGG
16.0	18-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	MIBK	ND	1.00e-02	UGG

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SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
25.0	18-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
45.0	18-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
16.0	18-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
25.0	18-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
45.0	18-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
16.0	18-jan-1992	LM16	STYR	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	STYR	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	STYR	ND	5.00e-03	UGG
45.0	18-jan-1992	LM16	STYR	ND	5.00e-03	UGG
16.0	18-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
25.0	18-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
45.0	18-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
16.0	18-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
25.0	18-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
25.0	18-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
45.0	18-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
16.0	18-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
25.0	18-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
25.0	18-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
45.0	18-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
16.0	18-jan-1992	LM16	TRCLE		2.87e+00	UGG
25.0	18-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
25.0	18-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
45.0	18-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG

Site: BORE 2SB2

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
2.0	20-jan-1992	00	TPHC	LT	7.44e+01	UGG
9.0	20-jan-1992	00	TPHC	LT	7.46e+01	UGG
2.0	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
9.0	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
2.0	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
9.0	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
2.0	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
9.0	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
2.0	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
9.0	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
2.0	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
9.0	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
2.0	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
9.0	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG

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Site: BORE 2SB2 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
2.0	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
9.0	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
2.0	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
9.0	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
2.0	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
9.0	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
2.0	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
9.0	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
2.0	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
9.0	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
2.0	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
9.0	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
2.0	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
9.0	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
2.0	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
9.0	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
2.0	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
9.0	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
9.0	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
2.0	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
9.0	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
9.0	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
9.0	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
2.0	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
9.0	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
2.0	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
9.0	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
2.0	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
9.0	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
9.0	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
2.0	20-jan-1992	LM16	CH2CL2		6.84e-03	UGG
9.0	20-jan-1992	LM16	CH2CL2		7.26e-03	UGG
2.0	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
9.0	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
9.0	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
2.0	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
9.0	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
2.0	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
9.0	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
2.0	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
9.0	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
2.0	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
9.0	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG

Site: BORE 2SB2 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
2.0	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
9.0	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
2.0	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
9.0	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
2.0	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
9.0	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
2.0	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
9.0	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
9.0	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
9.0	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
9.0	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
9.0	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
9.0	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
2.0	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
9.0	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
2.0	20-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
9.0	20-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
9.0	20-jan-1992	LM16	UNK251		2.21e-02	UGG

Site: BORE 6SB1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
2.0	20-jan-1992	00	TPHC	LT	7.43e+01	UGG
9.5	20-jan-1992	00	TPHC	LT	7.43e+01	UGG
2.0	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
9.5	20-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
2.0	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
9.5	20-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
2.0	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
9.5	20-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
2.0	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
9.5	20-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
2.0	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
9.5	20-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
2.0	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
9.5	20-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
2.0	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
9.5	20-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
2.0	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG

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SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
9.5	20-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
2.0	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
9.5	20-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
2.0	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
9.5	20-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
2.0	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
9.5	20-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
2.0	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
9.5	20-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
2.0	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
9.5	20-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
2.0	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
9.5	20-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
2.0	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
9.5	20-jan-1992	LM16	ACET	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
9.5	20-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
2.0	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
9.5	20-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
9.5	20-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
9.5	20-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
2.0	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
9.5	20-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
2.0	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
9.5	20-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
2.0	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
9.5	20-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
9.5	20-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
2.0	20-jan-1992	LM16	CH2CL2		7.26e-03	UGG
9.5	20-jan-1992	LM16	CH2CL2		8.30e-03	UGG
2.0	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
9.5	20-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
9.5	20-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
2.0	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
9.5	20-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
2.0	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
9.5	20-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
2.0	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
9.5	20-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
2.0	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
9.5	20-jan-1992	LM16	CS2	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
9.5	20-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
2.0	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 23
Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 6SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
9.5	20-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
2.0	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
9.5	20-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
2.0	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
9.5	20-jan-1992	LM16	MEK	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
9.5	20-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
9.5	20-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
2.0	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
9.5	20-jan-1992	LM16	STYR	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
9.5	20-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
2.0	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
9.5	20-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
2.0	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
9.5	20-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
2.0	20-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG
9.5	20-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG

Site: BORE 9SB1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
18.0	16-jan-1992	00	TPHC	LT	7.43e+01	UGG
3.0	16-jan-1992	00	TPHC	LT	7.46e+01	UGG
14.0	16-jan-1992	00	TPHC	LT	7.46e+01	UGG
54.0	17-jan-1992	00	TPHC	LT	7.46e+01	UGG
3.0	16-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
14.0	16-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
18.0	16-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
54.0	17-jan-1992	LM16	111TCE	LT	4.20e-03	UGG
3.0	16-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
14.0	16-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
18.0	16-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
54.0	17-jan-1992	LM16	112TCE	LT	2.00e-02	UGG
3.0	16-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
14.0	16-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
18.0	16-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
54.0	17-jan-1992	LM16	11DCE	LT	1.90e-02	UGG
3.0	16-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
14.0	16-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
18.0	16-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
54.0	17-jan-1992	LM16	11DCLE	LT	1.70e-03	UGG
3.0	16-jan-1992	LM16	12DCE	LT	2.00e-03	UGG

Jun 1, 1992

Installation: Cold Region Res & Eng Lab, NHPage 24
Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 9SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
14.0	16-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
18.0	16-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
54.0	17-jan-1992	LM16	12DCE	LT	2.00e-03	UGG
3.0	16-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
14.0	16-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
18.0	16-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
54.0	17-jan-1992	LM16	12DCLB	LT	1.20e-03	UGG
3.0	16-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
14.0	16-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
18.0	16-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
54.0	17-jan-1992	LM16	12DCLE	LT	3.10e-03	UGG
3.0	16-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
14.0	16-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
18.0	16-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
54.0	17-jan-1992	LM16	12DCLP	LT	2.20e-03	UGG
3.0	16-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
14.0	16-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
18.0	16-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
54.0	17-jan-1992	LM16	12DMB	ND	2.00e-03	UGG
3.0	16-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
14.0	16-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
18.0	16-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
54.0	17-jan-1992	LM16	13DCLB	LT	2.00e-03	UGG
3.0	16-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
14.0	16-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
18.0	16-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
54.0	17-jan-1992	LM16	13DCP	LT	1.30e-03	UGG
3.0	16-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
14.0	16-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
18.0	16-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
54.0	17-jan-1992	LM16	13DMB	ND	2.00e-03	UGG
3.0	16-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
14.0	16-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
18.0	16-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
54.0	17-jan-1992	LM16	14DCLB	LT	9.00e-04	UGG
3.0	16-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
14.0	16-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
18.0	16-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
54.0	17-jan-1992	LM16	2CLEVE	LT	4.80e-02	UGG
18.0	16-jan-1992	LM16	ACET		9.77e-03	UGG
14.0	16-jan-1992	LM16	ACET		4.34e-02	UGG
3.0	16-jan-1992	LM16	ACET	ND	1.00e-02	UGG
54.0	17-jan-1992	LM16	ACET	ND	1.00e-02	UGG
3.0	16-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
14.0	16-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
18.0	16-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
54.0	17-jan-1992	LM16	BRDCLM	LT	3.30e-03	UGG
3.0	16-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 25
Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 9SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
14.0	16-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
18.0	16-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
54.0	17-jan-1992	LM16	C13DCP	ND	5.00e-03	UGG
3.0	16-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
14.0	16-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
18.0	16-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
54.0	17-jan-1992	LM16	C2AVE	ND	1.00e-02	UGG
3.0	16-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
14.0	16-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
18.0	16-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
54.0	17-jan-1992	LM16	C2H3CL	LT	1.50e-02	UGG
3.0	16-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
14.0	16-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
18.0	16-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
54.0	17-jan-1992	LM16	C2H5CL	LT	2.70e-02	UGG
3.0	16-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
14.0	16-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
18.0	16-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
54.0	17-jan-1992	LM16	C6H6	LT	2.90e-03	UGG
3.0	16-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
14.0	16-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
18.0	16-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
54.0	17-jan-1992	LM16	CCL3F	ND	5.00e-03	UGG
3.0	16-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
14.0	16-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
18.0	16-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
54.0	17-jan-1992	LM16	CCL4	LT	5.60e-03	UGG
18.0	16-jan-1992	LM16	CH2CL2		3.13e-03	UGG
3.0	16-jan-1992	LM16	CH2CL2		3.57e-03	UGG
54.0	17-jan-1992	LM16	CH2CL2		8.01e-03	UGG
14.0	16-jan-1992	LM16	CH2CL2		8.97e-03	UGG
3.0	16-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
14.0	16-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
18.0	16-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
54.0	17-jan-1992	LM16	CH3BR	ND	1.00e-02	UGG
3.0	16-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
14.0	16-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
18.0	16-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
54.0	17-jan-1992	LM16	CH3CL	LT	1.70e-02	UGG
3.0	16-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
14.0	16-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
18.0	16-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
54.0	17-jan-1992	LM16	CHBR3	LT	1.80e-02	UGG
3.0	16-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
14.0	16-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
18.0	16-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
54.0	17-jan-1992	LM16	CHCL3	LT	2.30e-03	UGG
3.0	16-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 26
Analytical Results for Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 9SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
14.0	16-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
18.0	16-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
54.0	17-jan-1992	LM16	CLC6H5	LT	2.80e-03	UGG
3.0	16-jan-1992	LM16	CS2	ND	5.00e-03	UGG
14.0	16-jan-1992	LM16	CS2	ND	5.00e-03	UGG
18.0	16-jan-1992	LM16	CS2	ND	5.00e-03	UGG
54.0	17-jan-1992	LM16	CS2	ND	5.00e-03	UGG
3.0	16-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
14.0	16-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
18.0	16-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
54.0	17-jan-1992	LM16	DBRCLM	LT	1.40e-02	UGG
3.0	16-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
14.0	16-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
18.0	16-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
54.0	17-jan-1992	LM16	ETC6H5	LT	3.30e-03	UGG
3.0	16-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
14.0	16-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
18.0	16-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
54.0	17-jan-1992	LM16	MEC6H5	LT	8.40e-03	UGG
3.0	16-jan-1992	LM16	MEK	ND	1.00e-02	UGG
14.0	16-jan-1992	LM16	MEK	ND	1.00e-02	UGG
18.0	16-jan-1992	LM16	MEK	ND	1.00e-02	UGG
54.0	17-jan-1992	LM16	MEK	ND	1.00e-02	UGG
3.0	16-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
14.0	16-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
18.0	16-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
54.0	17-jan-1992	LM16	MIBK	ND	1.00e-02	UGG
3.0	16-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
14.0	16-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
18.0	16-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
54.0	17-jan-1992	LM16	MNBK	ND	1.00e-02	UGG
3.0	16-jan-1992	LM16	STYR	ND	5.00e-03	UGG
14.0	16-jan-1992	LM16	STYR	ND	5.00e-03	UGG
18.0	16-jan-1992	LM16	STYR	ND	5.00e-03	UGG
54.0	17-jan-1992	LM16	STYR	ND	5.00e-03	UGG
3.0	16-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
14.0	16-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
18.0	16-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
54.0	17-jan-1992	LM16	T13DCP	ND	5.00e-03	UGG
3.0	16-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
14.0	16-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
18.0	16-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
54.0	17-jan-1992	LM16	TCLEA	LT	1.60e-03	UGG
3.0	16-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
14.0	16-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
18.0	16-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
54.0	17-jan-1992	LM16	TCLEE	LT	1.90e-03	UGG
3.0	16-jan-1992	LM16	TRCLE		1.68e-02	UGG

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 27
Analytical Results fo. Chemical Soil
From: 01-jan-92 To: 01-jun-92

Site: BORE 9SB1 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
14.0	16-jan-1992	LM16	TRCLE		5.09e-02	UGG
18.0	16-jan-1992	LM16	TRCLE		1.06e-01	UGG
54.0	17-jan-1992	LM16	TRCLE	LT	3.80e-03	UGG

Report completed normally.

INSTALLATION RESTORATION PROGRAM

CHEMICAL REPORT
Mon Jun 1 08:25:57 1992

For Parameters :

Installation = Cold Regions Res & Eng Lab, NH
Beginning Date = 01-mar-92
Ending Date = 31-mar-92
Media Type = Chemical Ground Water
Maximum (X, Y) = (719933, 4844996)
Minimum (X, Y) = (719326, 4844457)
Booleans = Y

Jun 1, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 1
Analytical Results for Chemical Ground Water
From: 01-mar-92 To: 31-mar-92

Site: WELL CECRL01

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-mar-1992	00	TPHC	LT	1.15e+03	UGL
0.0	09-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-mar-1992	UM33	12DMB	ND	2.00e+00	UGL
0.0	09-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-mar-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-mar-1992	UM33	CH2CL2		8.43e+00	UGL
0.0	09-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-mar-1992	UM33	CHCL3		5.03e-01	UGL
0.0	09-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	TRCLE		5.31e+02	UGL

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Site: WELL CECRL02

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	13-mar-1992	00	TPHC	LT	1.12e+03	UGL
0.0	13-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	13-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	13-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	13-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	13-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	13-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	13-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	13-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	13-mar-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	13-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	13-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	13-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	13-mar-1992	UM33	ACET		8.60e+00	UGL
0.0	13-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	13-mar-1992	UM33	C12DCE		8.10e-01	UGL
0.0	13-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	13-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	13-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	13-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	13-mar-1992	UM33	CH2CL2		3.24e+00	UGL
0.0	13-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	13-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	13-mar-1992	UM33	CHCL3		3.82e+00	UGL
0.0	13-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	13-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	13-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	13-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	13-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	13-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	13-mar-1992	UM33	TRCLE		2.97e+01	UGL

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Site: WELL CECRL03

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-mar-1992	00	TPHC	LT	1.18e+03	UGL
0.0	09-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-mar-1992	UM33	12DMB	ND	2.00e+00	UGL
0.0	09-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-mar-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-mar-1992	UM33	CH2CL2		7.75e+00	UGL
0.0	09-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	TRCLE	LT	5.00e-01	UGL

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Site: WELL CECRL04

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-mar-1992	00	TPHC	LT	1.24e+03	UGL
0.0	09-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-mar-1992	UM33	12DMB	ND	2.00e+00	UGL
0.0	09-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-mar-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-mar-1992	UM33	CH2CL2		6.76e+00	UGL
0.0	09-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-mar-1992	UM33	CHCL3	LT	8.3[illegible]e-01	UGL
0.0	09-mar-1992	UM33	CLC6H5	LT	1.4[illegible]e+00	UGL
0.0	09-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	TRCLE		6.05e+00	UGL

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Site: WELL CECRL05

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-mar-1992	00	TPHC	LT	1.14e+03	UGL
0.0	09-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-mar-1992	UM33	12DMB	ND	2.00e+00	UGL
0.0	09-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-mar-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-mar-1992	UM33	CH2CL2		7.45e+00	UGL
0.0	09-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-mar-1992	UM33	TRCLE		4.99e+01	UGL

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Site: WELL CECRL06

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	13-mar-1992	00	TPHC		5.44e+05	UGL
0.0	13-mar-1992	UM33	111TCE	LT	4.10e+02	UGL
0.0	13-mar-1992	UM33	112TCE	LT	6.30e+01	UGL
0.0	13-mar-1992	UM33	11DCE	LT	1.42e+02	UGL
0.0	13-mar-1992	UM33	11DCLE	LT	1.10e+02	UGL
0.0	13-mar-1992	UM33	12DCE	LT	1.10e+02	UGL
0.0	13-mar-1992	UM33	12DCLB	LT	9.70e+02	UGL
0.0	13-mar-1992	UM33	12DCLE	LT	7.60e+02	UGL
0.0	13-mar-1992	UM33	12DCLP	LT	2.80e+02	UGL
0.0	13-mar-1992	UM33	12DMB	ND	5.00e+02	UGL
0.0	13-mar-1992	UM33	13DCLB	LT	9.20e+02	UGL
0.0	13-mar-1992	UM33	13DCP	LT	3.80e+02	UGL
0.0	13-mar-1992	UM33	13DMB	ND	5.00e+02	UGL
0.0	13-mar-1992	UM33	14DCLB	LT	8.10e+02	UGL
0.0	13-mar-1992	UM33	2CLEVE	LT	8.20e+03	UGL
0.0	13-mar-1992	UM33	ACET	ND	1.00e+03	UGL
0.0	13-mar-1992	UM33	BRDCLM	LT	7.90e+02	UGL
0.0	13-mar-1992	UM33	C12DCE	ND	5.00e+02	UGL
0.0	13-mar-1992	UM33	C13DCP	ND	5.00e+02	UGL
0.0	13-mar-1992	UM33	C2AVE	ND	1.00e+03	UGL
0.0	13-mar-1992	UM33	C2H3CL	LT	5.00e+01	UGL
0.0	13-mar-1992	UM33	C2H5CL	LT	2.12e+02	UGL
0.0	13-mar-1992	UM33	C6H6	LT	2.40e+02	UGL
0.0	13-mar-1992	UM33	CCL4	LT	3.70e+02	UGL
0.0	13-mar-1992	UM33	CH2CL2		2.94e+02	UGL
0.0	13-mar-1992	UM33	CH3BR	ND	1.00e+03	UGL
0.0	13-mar-1992	UM33	CH3CL	LT	1.60e+02	UGL
0.0	13-mar-1992	UM33	CHBR3	LT	8.20e+02	UGL
0.0	13-mar-1992	UM33	CHCL3	LT	8.30e+01	UGL
0.0	13-mar-1992	UM33	CLC6H5	LT	1.40e+02	UGL
0.0	13-mar-1992	UM33	CS2	ND	5.00e+02	UGL
0.0	13-mar-1992	UM33	DBRCLM	LT	6.50e+02	UGL
0.0	13-mar-1992	UM33	ETC6H5	LT	9.30e+02	UGL
0.0	13-mar-1992	UM33	MEC6H5	LT	8.70e+02	UGL
0.0	13-mar-1992	UM33	MEK	ND	1.00e+03	UGL
0.0	13-mar-1992	UM33	MIBK	ND	1.00e+03	UGL
0.0	13-mar-1992	UM33	MNBK	ND	1.00e+03	UGL
0.0	13-mar-1992	UM33	STYR	ND	5.00e+02	UGL
0.0	13-mar-1992	UM33	T13DCP	ND	5.00e+02	UGL
0.0	13-mar-1992	UM33	TCLEA	LT	4.70e+02	UGL
0.0	13-mar-1992	UM33	TCLEE		1.29e+03	UGL
0.0	13-mar-1992	UM33	TRCLE		1.38e+04	UGL
0.0	13-mar-1992	UM33	UNK172		1.00e+03	UGL
0.0	13-mar-1992	UM33	UNK176		7.00e+02	UGL
0.0	13-mar-1992	UM33	UNK180		3.00e+02	UGL
0.0	13-mar-1992	UM33	UNK184		7.00e+02	UGL
0.0	13-mar-1992	UM33	UNK191		2.00e+04	UGL

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Site: WELL CECRL07

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	12-mar-1992	00	TPHC	LT	1.14e+03	UGL
0.0	12-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	12-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	12-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	12-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	12-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	12-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	12-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	12-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	12-mar-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	12-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	12-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	12-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	12-mar-1992	UM33	ACET		1.20e+01	UGL
0.0	12-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	12-mar-1992	UM33	C12DCE	ND	1.10e+00	UGL
0.0	12-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	12-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	12-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	12-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	12-mar-1992	UM33	CH2CL2		3.43e+00	UGL
0.0	12-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	12-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	12-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	12-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	12-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	12-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	12-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	12-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	12-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	12-mar-1992	UM33	TRCLE		5.94e+00	UGL

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Site: WELL CECRL08

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	13-mar-1992	00	TPHC	LT	1.12e+03	UGL
0.0	13-mar-1992	00	TPHC	LT	1.12e+03	UGL
0.0	13-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	13-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	13-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	13-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	13-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	13-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	13-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	13-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	13-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	13-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	13-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	13-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	13-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	13-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	13-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	13-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	13-mar-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	13-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	13-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	13-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	13-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	13-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	13-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	13-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	13-mar-1992	UM33	ACET		5.40e+01	UGL
0.0	13-mar-1992	UM33	ACET		7.40e+01	UGL
0.0	13-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	13-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	13-mar-1992	UM33	C12DCE	ND	1.10e+00	UGL
0.0	13-mar-1992	UM33	C12DCE	ND	1.10e+00	UGL
0.0	13-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	13-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	13-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	13-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	13-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	13-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	13-mar-1992	UM33	CCL4	LT	3.70e+00	UGL

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Site: WELL CECRL08 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	13-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	13-mar-1992	UM33	CH2CL2		3.04e+00	UGL
0.0	13-mar-1992	UM33	CH2CL2		3.43e+00	UGL
0.0	13-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	13-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	13-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	13-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	13-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	13-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	13-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	13-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	13-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	13-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	13-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	13-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	13-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	13-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	13-mar-1992	UM33	MEK		5.20e+01	UGL
0.0	13-mar-1992	UM33	MEK		7.30e+01	UGL
0.0	13-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	13-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	13-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	13-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	13-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	13-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	13-mar-1992	UM33	TRCLE		1.10e+03	UGL
0.0	13-mar-1992	UM33	TRCLE		1.19e+03	UGL

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Site: WELL CECRL09

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	12-mar-1992	00	TPHC	LT	1.16e+03	UGL
0.0	12-mar-1992	UM33	111TCE	LT	2.05e+02	UGL
0.0	12-mar-1992	UM33	112TCE	LT	3.15e+01	UGL
0.0	12-mar-1992	UM33	11DCE	LT	7.10e+01	UGL
0.0	12-mar-1992	UM33	11DCLE	LT	5.50e+01	UGL
0.0	12-mar-1992	UM33	12DCE	LT	5.50e+01	UGL
0.0	12-mar-1992	UM33	12DCLB	LT	4.85e+02	UGL
0.0	12-mar-1992	UM33	12DCLE	LT	3.80e+02	UGL
0.0	12-mar-1992	UM33	12DCLP	LT	1.40e+02	UGL
0.0	12-mar-1992	UM33	12DMB	ND	2.50e+02	UGL
0.0	12-mar-1992	UM33	13DCLB	LT	4.60e+02	UGL
0.0	12-mar-1992	UM33	13DCP	LT	1.90e+02	UGL
0.0	12-mar-1992	UM33	13DMB	ND	2.50e+02	UGL
0.0	12-mar-1992	UM33	14DCLB	LT	4.05e+02	UGL
0.0	12-mar-1992	UM33	2CLEVE	LT	4.10e+03	UGL
0.0	12-mar-1992	UM33	ACET	ND	5.00e+02	UGL
0.0	12-mar-1992	UM33	BRDCLM	LT	3.95e+02	UGL
0.0	12-mar-1992	UM33	C12DCE	ND	5.50e+01	UGL
0.0	12-mar-1992	UM33	C13DCP	ND	2.50e+02	UGL
0.0	12-mar-1992	UM33	C2AVE	ND	5.00e+02	UGL
0.0	12-mar-1992	UM33	C2H3CL	LT	2.50e+01	UGL
0.0	12-mar-1992	UM33	C2H5CL	LT	1.06e+02	UGL
0.0	12-mar-1992	UM33	C6H6	LT	1.20e+02	UGL
0.0	12-mar-1992	UM33	CCL4	LT	1.85e+02	UGL
0.0	12-mar-1992	UM33	CH2CL2	LT	2.70e+02	UGL
0.0	12-mar-1992	UM33	CH3BR	ND	5.00e+02	UGL
0.0	12-mar-1992	UM33	CH3CL	LT	8.00e+01	UGL
0.0	12-mar-1992	UM33	CHBR3	LT	4.10e+02	UGL
0.0	12-mar-1992	UM33	CHCL3	LT	4.15e+01	UGL
0.0	12-mar-1992	UM33	CLC6H5	LT	7.00e+01	UGL
0.0	12-mar-1992	UM33	CS2	ND	2.50e+02	UGL
0.0	12-mar-1992	UM33	DBRCLM	LT	3.25e+02	UGL
0.0	12-mar-1992	UM33	ETC6H5	LT	4.65e+02	UGL
0.0	12-mar-1992	UM33	MEC6H5	LT	4.35e+02	UGL
0.0	12-mar-1992	UM33	MEK	ND	5.00e+02	UGL
0.0	12-mar-1992	UM33	MIBK	ND	5.00e+02	UGL
0.0	12-mar-1992	UM33	MNBK	ND	5.00e+02	UGL
0.0	12-mar-1992	UM33	STYR	ND	2.50e+02	UGL
0.0	12-mar-1992	UM33	T13DCP	ND	2.50e+02	UGL
0.0	12-mar-1992	UM33	TCLEA	LT	2.35e+02	UGL
0.0	12-mar-1992	UM33	TCLEE	LT	2.50e+01	UGL
0.0	12-mar-1992	UM33	TRCLE		6.37e+04	UGL

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Site: WELL CECRL10

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	12-mar-1992	00	TPHC	LT	1.12e+03	UGL
0.0	12-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	12-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	12-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	12-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	12-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	12-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	12-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	12-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	12-mar-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	12-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	12-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	12-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	12-mar-1992	UM33	ACET		1.10e+01	UGL
0.0	12-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	12-mar-1992	UM33	C12DCE	ND	1.10e+00	UGL
0.0	12-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	C2H3CL	LT	5.00e-01	[illegible]
0.0	12-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	12-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	12-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	12-mar-1992	UM33	CH2CL2		3.53e+00	UGL
0.0	12-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	12-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	12-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	12-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	12-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	12-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	12-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	12-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	12-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	12-mar-1992	UM33	TRCLE		1.70e+02	UGL

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Site: WELL CECRL11

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	12-mar-1992	00	TPHC	LT	1.12e+03	UGL
0.0	12-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	12-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	12-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	12-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	12-mar-1992	UM33	12DCE		1.58e+00	UGL
0.0	12-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	12-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	12-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	12-mar-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	12-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	12-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	12-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	12-mar-1992	UM33	ACET		3.30e+01	UGL
0.0	12-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	12-mar-1992	UM33	C12DCE		9.50e+00	UGL
0.0	12-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	12-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	12-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	12-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	12-mar-1992	UM33	CH2CL2		3.92e+00	UGL
0.0	12-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	12-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	12-mar-1992	UM33	CHCL3		1.71e+00	UGL
0.0	12-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	12-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	12-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	12-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	12-mar-1992	UM33	MEK		1.00e+01	UGL
0.0	12-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	12-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	12-mar-1992	UM33	TRCLE		1.55e+03	UGL

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Site: WELL CECRL12

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	12-mar-1992	00	TPHC	LT	1.12e+03	UGL
0.0	12-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	12-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	12-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	12-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	12-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	12-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	12-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	12-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	12-mar-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	12-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	12-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	12-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	12-mar-1992	UM33	ACET		4.60e+01	UGL
0.0	12-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	12-mar-1992	UM33	C12DCE		3.30e+00	UGL
0.0	12-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	12-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	12-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	12-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	12-mar-1992	UM33	CH2CL2		3.24e+00	UGL
0.0	12-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	12-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	12-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	12-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	12-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	12-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	12-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	12-mar-1992	UM33	MEK		3.60e+01	UGL
0.0	12-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	12-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	12-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	12-mar-1992	UM33	TCLEE		3.17e-01	UGL
0.0	12-mar-1992	UM33	TRCLE		1.91e+02	UGL

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Analytical Results for Chemical Ground Water
From: 01-mar-92 To: 31-mar-92

Site: WELL HANOVER

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	06-mar-1992	00	TPHC	LT	1.12e+03	UGL
0.0	06-mar-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	06-mar-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	06-mar-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	06-mar-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	06-mar-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	06-mar-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	06-mar-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	06-mar-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	06-mar-1992	UM33	12DMB	ND	2.00e+00	UGL
0.0	06-mar-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	06-mar-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	06-mar-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	06-mar-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	06-mar-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	06-mar-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	06-mar-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	06-mar-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	06-mar-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	06-mar-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	06-mar-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	06-mar-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	06-mar-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	06-mar-1992	UM33	CH2CL2		6.37e+00	UGL
0.0	06-mar-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	06-mar-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	06-mar-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	06-mar-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	06-mar-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	06-mar-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	06-mar-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	06-mar-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	06-mar-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	06-mar-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	06-mar-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	06-mar-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	06-mar-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	06-mar-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	06-mar-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	06-mar-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	06-mar-1992	UM33	TRCLE	LT	5.00e-01	UGL

Report completed normally.

INSTALLATION RESTORATION PROGRAM

CHEMICAL REPORT
Mon Jun 1 08:27:01 1992

For Parameters :

Installation = Cold Regions Res & Eng Lab, NH
Beginning Date = 01-apr-92
Ending Date = 30-apr-92
Media Type = Chemical Ground Water
Maximum (X, Y) = (719933, 4844996)
Minimum (X, Y) = (719326, 4844457)
Booleans = Y

Jun 1, 1992

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Analytical Results for Chemical Ground Water
From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL01

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	08-apr-1992	00	TPHC	LT	1.05e+03	UGL
0.0	08-apr-1992	UM33	111TCE	LT	8.20e+01	UGL
0.0	08-apr-1992	UM33	112TCE	LT	1.26e+01	UGL
0.0	08-apr-1992	UM33	11DCE	LT	2.84e+01	UGL
0.0	08-apr-1992	UM33	11DCLE	LT	2.20e+01	UGL
0.0	08-apr-1992	UM33	12DCE	LT	2.20e+01	UGL
0.0	08-apr-1992	UM33	12DCLB	LT	1.94e+02	UGL
0.0	08-apr-1992	UM33	12DCLE	LT	1.52e+02	UGL
0.0	08-apr-1992	UM33	12DCLP	LT	5.60e+01	UGL
0.0	08-apr-1992	UM33	12DMB	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	13DCLB	LT	1.84e+02	UGL
0.0	08-apr-1992	UM33	13DCP	LT	7.60e+01	UGL
0.0	08-apr-1992	UM33	13DMB	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	14DCLB	LT	1.62e+02	UGL
0.0	08-apr-1992	UM33	2CLEVE	LT	1.64e+03	UGL
0.0	08-apr-1992	UM33	ACET	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	BRDCLM	LT	1.58e+02	UGL
0.0	08-apr-1992	UM33	C12DCE	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	C13DCP	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	C2AVE	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	C2H3CL	LT	1.00e+01	UGL
0.0	08-apr-1992	UM33	C2H5CL	LT	4.24e+01	UGL
0.0	08-apr-1992	UM33	C6H6	LT	4.80e+01	UGL
0.0	08-apr-1992	UM33	CCL4	LT	7.40e+01	UGL
0.0	08-apr-1992	UM33	CH2CL2		1.96e+02	UGL
0.0	08-apr-1992	UM33	CH3BR	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	CH3CL	LT	3.20e+01	UGL
0.0	08-apr-1992	UM33	CHBR3	LT	1.64e+02	UGL
0.0	08-apr-1992	UM33	CHCL3	LT	1.66e+01	UGL
0.0	08-apr-1992	UM33	CLC6H5	LT	2.80e+01	UGL
0.0	08-apr-1992	UM33	CS2	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	DBRCLM	LT	1.30e+02	UGL
0.0	08-apr-1992	UM33	ETC6H5	LT	1.86e+02	UGL
0.0	08-apr-1992	UM33	MEC6H5	LT	1.74e+02	UGL
0.0	08-apr-1992	UM33	MEK	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	MIBK	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	MNBK	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	STYR	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	T13DCP	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	TCLEA	LT	9.40e+01	UGL
0.0	08-apr-1992	UM33	TCLEE	LT	1.00e+01	UGL
0.0	08-apr-1992	UM33	TRCLE		8.49e+02	UGL

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From: 01-apr-92 To: 30-apr 92

Site: WELL CECRL02

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	10-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	10-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	10-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	10-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	10-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	10-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	10-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	10-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	10-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	10-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	10-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	10-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	10-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	10-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	10-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	10-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	10-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	10-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	10-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	10-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	10-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	10-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	10-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	10-apr-1992	UM33	CH2CL2		8.33e+00	UGL
0.0	10-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	10-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	10-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	10-apr-1992	UM33	CHCL3		1.41e+00	UGL
0.0	10-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	10-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	10-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	10-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	10-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	10-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	10-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	10-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	10-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	10-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	10-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	10-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	10-apr-1992	UM33	TRCLE		7.64e+00	UGL
0.0	10-apr-1992	UM33	TPHC	LT	1.05e+03	[illegible]

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Installation: Cold Regions Res & Eng Lab, NHPage 3
Analytical Results for Chemical Ground Wat r
From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL03

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	08-apr-1992	00	TPHC	LT	1.07e+03	UGL
0.0	08-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	08-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	08-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	08-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	08-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	08-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	08-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	08-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	08-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	08-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	08-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	08-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	08-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	08-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	08-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	08-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	08-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	08-apr-1992	UM33	CH2CL2		6.18e+00	UGL
0.0	08-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	08-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	08-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	08-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	08-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	08-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	08-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	08-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	08-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	08-apr-1992	UM33	TRCLE	LT	5.00e-01	UGL

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Analytical Results for Chemical Ground Water
From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL04

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	08-apr-1992	00	TPHC	LT	1.06e+03	UGL
0.0	08-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	08-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	08-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	08-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	08-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	08-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	08-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	08-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	08-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	08-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	08-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	08-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	08-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	08-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	C2AVE	ND	1.00e+01	UG
0.0	08-apr-1992	UM33	C2H3CL	LT	5.00e-01	[illegible]
0.0	08-apr-1992	UM33	C2H5CL	LT	2.12e+00	UG
0.0	08-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	08-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	08-apr-1992	UM33	CH2CL2		6.27e+01	UGL
0.0	08-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	08-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	08-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	08-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	08-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	08-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	08-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	08-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	08-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	08-apr-1992	UM33	TRCLE		3.72e+00	UGL

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Analytical Results for Chemical Ground Water
From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL05

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	00	TPHC	LT	1.08e+03	UGL
0.0	09-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-apr-1992	UM33	CH2CL2		5.20e+00	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	TRCLE		2.97e+01	UGL

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Site: WELL CECRL06

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	10-apr-1992	UM33	111TCE	LT	8.20e+02	UGL
0.0	10-apr-1992	UM33	112TCE	LT	1.26e+02	UGL
0.0	10-apr-1992	UM33	11DCE	LT	2.84e+02	UGL
0.0	10-apr-1992	UM33	11DCLE	LT	2.20e+02	UGL
0.0	10-apr-1992	UM33	12DCE	LT	2.20e+02	UGL
0.0	10-apr-1992	UM33	12DCLB	LT	1.94e+03	UGL
0.0	10-apr-1992	UM33	12DCLE	LT	1.52e+03	UGL
0.0	10-apr-1992	UM33	12DCLP	LT	5.60e+02	UGL
0.0	10-apr-1992	UM33	12DMB	ND	1.00e+03	UGL
0.0	10-apr-1992	UM33	13DCLB	LT	1.84e+03	UGL
0.0	10-apr-1992	UM33	13DCP	LT	7.60e+02	UGL
0.0	10-apr-1992	UM33	13DMB	ND	1.00e+03	UGL
0.0	10-apr-1992	UM33	14DCLB	LT	1.62e+03	UGL
0.0	10-apr-1992	UM33	2CLEVE	LT	1.64e+04	UGL
0.0	10-apr-1992	UM33	ACET	ND	2.00e+03	UGL
0.0	10-apr-1992	UM33	BRDCLM	LT	1.58e+03	UGL
0.0	10-apr-1992	UM33	C12DCE	ND	1.00e+03	UGL
0.0	10-apr-1992	UM33	C13DCP	ND	1.00e+03	UGL
0.0	10-apr-1992	UM33	C2AVE	ND	2.00e+03	UGL
0.0	10-apr-1992	UM33	C2H3CL	LT	1.00e+02	UGL
0.0	10-apr-1992	UM33	C2H5CL	LT	4.24e+02	UG
0.0	10-apr-1992	UM33	C6H6	LT	4.80e+02	[illegible]
0.0	10-apr-1992	UM33	CCL4	LT	7.40e+02	U[illegible]
0.0	10-apr-1992	UM33	CH2CL2		1.55e+03	UGL
0.0	10-apr-1992	UM33	CH3BR	ND	2.00e+03	UGL
0.0	10-apr-1992	UM33	CH3CL	LT	3.20e+02	UGL
0.0	10-apr-1992	UM33	CHBR3	LT	1.64e+03	UGL
0.0	10-apr-1992	UM33	CHCL3	LT	1.66e+02	UGL
0.0	10-apr-1992	UM33	CLC6H5	LT	2.80e+02	UGL
0.0	10-apr-1992	UM33	CS2	ND	1.00e+03	UGL
0.0	10-apr-1992	UM33	DBRCLM	LT	1.30e+03	UGL
0.0	10-apr-1992	UM33	ETC6H5	LT	1.86e+03	UGL
0.0	10-apr-1992	UM33	MEC6H5	LT	1.74e+03	UGL
0.0	10-apr-1992	UM33	MEK	ND	2.00e+03	UGL
0.0	10-apr-1992	UM33	MIBK	ND	2.00e+03	UGL
0.0	10-apr-1992	UM33	MNBK	ND	2.00e+03	UGL
0.0	10-apr-1992	UM33	STYR	ND	1.00e+03	UGL
0.0	10-apr-1992	UM33	T13DCP	ND	1.00e+03	UGL
0.0	10-apr-1992	UM33	TCLEA	LT	9.40e+02	UGL
0.0	10-apr-1992	UM33	TCLEE		1.52e+04	UGL
0.0	10-apr-1992	UM33	TRCLE		3.40e+04	UGL
0.0	10-apr-1992	UM33	TRIMBZ		6.00e+03	UGL
0.0	10-apr-1992	UM33	UNK173		1.60e+03	UGL
0.0	10-apr-1992	UM33	UNK182		1.60e+03	UGL
0.0	10-apr-1992	UM33	UNK197		2.00e+03	UGL
0.0	10-apr-1992	UM33	UNK199		2.00e+03	UGL
0.0	10-apr-1992	UM33	UNK205		6.00e+03	UGL
0.0	10-apr-1992	UM33	UNK209		8.00e+03	UGL

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Site: WELL CECRL06 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	10-apr-1992	UM33	UNK212		2.00e+03	UGL
0.0	10-apr-1992	UM33	UNK213		1.60e+03	UGL
0.0	10-apr-1992	UM33	UNK215		6.00e+03	UGL
0.0	10-apr-1992	UM33	UNK216		6.00e+03	UGL
0.0	10-apr-1992	UM33	UNK221		6.00e+03	UGL
0.0	10-apr-1992	UM33	UNK223		1.00e+04	UGL
0.0	10-apr-1992	UM33	UNK229		1.20e+03	UGL
0.0	10-apr-1992	UM33	UNK233		1.80e+03	UGL
0.0	10-apr-1992	UM33	UNK236		1.20e+03	UGL
0.0	10-apr-1992	UM33	UNK238		1.40e+03	UGL
0.0	10-apr-1992	UM33	UNK239		1.80e+03	UGL
0.0	10-apr-1992	UM33	UNK243		1.60e+03	UGL
0.0	10-apr-1992	UM33	UNK246		2.00e+04	UGL
0.0	10-apr-1992	UM33	UNK249		6.00e+03	UGL
0.0	10-apr-1992	UM33	UNK252		4.00e+03	UGL
0.0	10-apr-1992	UM33	UNK254		4.00e+03	UGL
0.0	10-apr-1992	UM33	UNK256		4.00e+03	UGL
0.0	10-apr-1992	[illegible]	TPH[illegible]		1.99e+06	UGL

Site: WELL CECRL07

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	07-apr-1992	00	TPHC	LT	1.04e+03	UGL
0.0	07-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	07-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	07-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	07-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	07-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	07-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	07-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	07-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	07-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	07-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	07-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	07-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	07-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	07-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	07-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	07-apr-1992	UM33	C6H6	LT	2.40e+00	UGL

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Site: WELL CECRL07 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	07-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	07-apr-1992	UM33	CH2CL2		6.86e+00	UGL
0.0	07-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	07-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	07-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	07-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	07-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	07-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	07-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	07-apr-1992	UM33	MEK		1.30e+01	UGL
0.0	07-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	07-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	07-apr-1992	UM33	TRCLE		8.92e+01	UGL

Site: WELL CECRL08

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	111TCE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	111TCE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	112TCE	LT	1.26e+01	UGL
0.0	09-apr-1992	UM33	112TCE	LT	1.26e+01	UGL
0.0	09-apr-1992	UM33	11DCE	LT	2.84e+01	UGL
0.0	09-apr-1992	UM33	11DCE	LT	2.84e+01	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	2.20e+01	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	2.20e+01	UGL
0.0	09-apr-1992	UM33	12DCE	LT	2.20e+01	UGL
0.0	09-apr-1992	UM33	12DCE	LT	2.20e+01	UGL
0.0	09-apr-1992	UM33	12DCLB	LT	1.94e+02	UGL
0.0	09-apr-1992	UM33	12DCLB	LT	1.94e+02	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	1.52e+02	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	1.52e+02	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	5.60e+01	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	5.60e+01	UGL
0.0	09-apr-1992	UM33	12DMB	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	12DMB	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	1.84e+02	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	1.84e+02	UGL
0.0	09-apr-1992	UM33	13DCP	LT	7.60e+01	UGL
0.0	09-apr-1992	UM33	13DCP	LT	7.60e+01	UGL

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Site: WELL CECRL08 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	13DMB	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	13DMB	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	1.62e+02	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	1.62e+02	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	1.64e+03	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	1.64e+03	UGL
0.0	09-apr-1992	UM33	ACET	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	ACET	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	1.58e+02	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	1.58e+02	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	4.24e+01	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	4.24e+01	UGL
0.0	09-apr-1992	UM33	C6H6	LT	4.80e+01	UGL
0.0	09-apr-1992	UM33	C6H6	LT	4.80e+01	UGL
0.0	09-apr-1992	UM33	CCL4	LT	7.40e+01	UGL
0.0	09-apr-1992	UM33	CCL4	LT	7.40e+01	UGL
0.0	09-apr-1992	UM33	CH2CL2		1.76e+02	UGL
0.0	09-apr-1992	UM33	CH2CL2		1.76e+02	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	3.20e+01	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	3.20e+01	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	1.64e+02	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	1.64e+02	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	1.66e+01	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	1.66e+01	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	2.80e+01	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	2.80e+01	UGL
0.0	09-apr-1992	UM33	CS2	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	CS2	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	1.30e+02	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	1.30e+02	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	1.86e+02	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	1.86e+02	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	1.74e+02	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	1.74e+02	UGL
0.0	09-apr-1992	UM33	MEK	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	MEK	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	MIBK	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	MIBK	ND	2.00e+02	UGL

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Site: WELL CECRL08 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	MNBK	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	MNBK	ND	2.00e+02	UGL
0.0	09-apr-1992	UM33	STYR	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	STYR	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	1.00e+02	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	9.40e+01	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	9.40e+01	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	1.00e+01	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	1.00e+01	UGL
0.0	09-apr-1992	UM33	TRCLE		1.06e+04	UGL
0.0	09-apr-1992	UM33	TRCLE		1.06e+04	UGL
0.0	09-apr-1992	UM33	TPHC	LT	1.08e+03	[illegible]

Site: WELL CECRL09

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	111TCE	LT	4.10e+03	UGL
0.0	09-apr-1992	UM33	112TCE	LT	6.30e+02	[illegible]
0.0	09-apr-1992	UM33	11DCE	LT	1.42e+03	[illegible]
0.0	09-apr-1992	UM33	11DCLE	LT	1.10e+03	UGL
0.0	09-apr-1992	UM33	12DCE	LT	1.10e+03	UGL
0.0	09-apr-1992	UM33	12DCLB	LT	9.70e+03	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	7.60e+03	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	2.80e+03	UGL
0.0	09-apr-1992	UM33	12DMB	ND	5.00e+03	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	9.20e+03	UGL
0.0	09-apr-1992	UM33	13DCP	LT	3.80e+03	UGL
0.0	09-apr-1992	UM33	13DMB	ND	5.00e+03	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	8.10e+03	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	8.20e+04	UGL
0.0	09-apr-1992	UM33	ACET	ND	1.00e+04	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	7.90e+03	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	5.00e+03	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	5.00e+03	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	1.00e+04	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	5.00e+02	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	2.12e+03	UGL
0.0	09-apr-1992	UM33	C6H6	LT	2.40e+03	UGL
0.0	09-apr-1992	UM33	CCL4	LT	3.70e+03	UGL
0.0	09-apr-1992	UM33	CH2CL2		8.82e+03	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	1.00e+04	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	1.60e+03	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	8.20e+03	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	8.30e+02	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	1.40e+03	UGL

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From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL09 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	CS2	ND	5.00e+03	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	6.50e+03	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	9.30e+03	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	8.70e+03	UGL
0.0	09-apr-1992	UM33	MEK	ND	1.00e+04	UGL
0.0	09-apr-1992	UM33	MIBK	ND	1.00e+04	UGL
0.0	09-apr-1992	UM33	MNBK	ND	1.00e+04	UGL
0.0	09-apr-1992	UM33	STYR	ND	5.00e+03	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	5.00e+03	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	4.70e+03	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	5.00e+02	UGL
0.0	09-apr-1992	UM33	TRCLE		2.12e+05	UGL
0.0	09-apr-1992	UM33	TPHC	LT	1.08e+03	UGL

Site: WELL CECRL10

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	00	TPHC	LT	1.08e+03	UGL
0.0	09-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-apr-1992	UM33	13DCP	LT	3.[illegible]e+00	UGL
0.0	09-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-apr-1992	UM33	CH2CL2		6.08e+00	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	[illegible]00e+01	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL

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Analytical Results for Chemical Ground Water
From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL10 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	TRCLE		3.18e+02	UGL

Site: WELL CECRL11

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	08-apr-1992	00	TPHC	LT	1.04e+03	
0.0	08-apr-1992	UM33	111TCE	LT	8.20e+01	UGL
0.0	08-apr-1992	UM33	112TCE	LT	1.26e+01	UGL
0.0	08-apr-1992	UM33	11DCE		3.45e+01	UGL
0.0	08-apr-1992	UM33	11DCLE		1.40e+01	UGL
0.0	08-apr-1992	UM33	12DCE		1.98e+01	UGL
0.0	08-apr-1992	UM33	12DCLB	LT	1.94e+02	UGL
0.0	08-apr-1992	UM33	12DCLE	LT	1.52e+02	UGL
0.0	08-apr-1992	UM33	12DCLP	LT	5.60e+01	UGL
0.0	08-apr-1992	UM33	12DMB	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	13DCLB	LT	1.84e+02	UGL
0.0	08-apr-1992	UM33	13DCP	LT	7.60e+01	UGL
0.0	08-apr-1992	UM33	13DMB		8.00e+01	UGL
0.0	08-apr-1992	UM33	14DCLB	LT	1.62e+02	UGL
0.0	08-apr-1992	UM33	2CLEVE	LT	1.64e+03	UGL
0.0	08-apr-1992	UM33	ACET	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	BRDCLM	LT	1.58e+02	UGL
0.0	08-apr-1992	UM33	C12DCE	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	C13DCP	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	C2AVE	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	C2H3CI	LT	1.00e+01	UGL
0.0	08-apr-1992	UM33	C2H5CL	LT	4.24e+01	UGL
0.0	08-apr-1992	UM33	C6H6	LT	4.80e+01	UGL
0.0	08-apr-1992	UM33	CCL4	LT	7.40e+01	UGL
0.0	08-apr-1992	UM33	CH2CL2		1.96e+02	UGL
0.0	08-apr-1992	UM33	CH3BR	ND	2.00e+02	UGL

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From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL11 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	08-apr-1992	UM33	CH3CL	LT	3.20e+01	UGL
0.0	08-apr-1992	UM33	CHBR3	LT	1.64e+02	UGL
0.0	08-apr-1992	UM33	CHCL3		1.81e+01	UGL
0.0	08-apr-1992	UM33	CLC6H5		4.08e+01	UGL
0.0	08-apr-1992	UM33	CS2	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	DBRCLM	LT	1.30e+02	UGL
0.0	08-apr-1992	UM33	ETC6H5	LT	1.86e+02	UGL
0.0	08-apr-1992	UM33	MEC6H5	LT	1.74e+02	UGL
0.0	08-apr-1992	UM33	MEK	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	MIBK	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	MNBK	ND	2.00e+02	UGL
0.0	08-apr-1992	UM33	STYR	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	T13DCP	ND	1.00e+02	UGL
0.0	08-apr-1992	UM33	TCLEA	LT	9.40e+01	UGL
0.0	08-apr-1992	UM33	TCLEE		3.96e+01	UGL
0.0	08-apr-1992	UM33	TRCLE		4.25e+03	UGL

Site: WELL CECRL12

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	07-apr-1992	00	TPHC	LT	1.04e+03	UGL
0.0	07-apr-1992	00	TPHC	LT	1.05e+03	UGL
0.0	07-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	07-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	07-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	07-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	07-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	07-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	07-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	07-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	07-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	07-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	07-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	07-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	07-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	07-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	07-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	07-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	07-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	07-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	07-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	07-apr-1992	UM33	13DCP	LT	3.80e+00	UGL

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From: 01-apr-92 To: 30-apr-92

Site: WELL CECRL12 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	07-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	07-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	07-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	07-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	07-apr-1992	UM33	ACET		9.80e+00	UGL
0.0	07-apr-1992	UM33	ACET		1.10e+01	UGL
0.0	07-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	07-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	07-apr-1992	UM33	C12DCE		5.00e+00	UGL
0.0	07-apr-1992	UM33	C12DCE		5.00e+00	UGL
0.0	07-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	07-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	07-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	07-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	07-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	07-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	07-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	07-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	07-apr-1992	UM33	CH2CL2		6.18e+00	UGL
0.0	07-apr-1992	UM33	CH2CL2		6.96e+00	UGL
0.0	07-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	07-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	07-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	07-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	07-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	07-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	07-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	07-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	07-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	07-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	07-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	07-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	07-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	07-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	07-apr-1992	UM33	MEK		1.10e+01	UGL
0.0	07-apr-1992	UM33	MEK		1.20e+01	UGL
0.0	07-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	MIBK	ND	1.00e+01	UGL

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Site: WELL CECRL12 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	07-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	07-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	07-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	07-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	07-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	07-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	07-apr-1992	UM33	TRCLE		2.12e+02	UGL
0.0	07-apr-1992	UM33	TRCLE		2.65e+02	UGL

Site: WELL HANOVER

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	08-apr-1992	00	TPHC	LT	1.05e+03	UGL
0.0	08-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	08-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	08-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	08-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	08-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	08-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	08-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	08-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	08-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	08-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	08-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	08-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	08-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	08-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	08-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	08-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	08-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	08-apr-1992	UM33	CH2CL2		6.67e+01	UGL
0.0	08-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	08-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL

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Analytical Results for Chemical Ground Water
From: 01-apr-92 To: 30-apr-92

Site: WELL HANOVER (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	08-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	08-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	08-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	08-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	08-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	08-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	08-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	08-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	08-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	08-apr-1992	UM33	TRCLE	LT	5.00e-01	UGL

Report completed normally.

INSTALLATION RESTORATION PROGRAM

CHEMICAL REPORT
Tue May 26 11:01:42 1992

For Parameters :

Installation = Cold Regions Res & Eng Lab, NH
Beginning Date = 01-apr-92
Ending Date = 26-may-92
Media Type = Chemical Surface Water (CSW)
Maximum (X, Y) = (719933, 4844996)
Minimum (X, Y) = (719326, 4844457)
Booleans = Y

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Analytical Results for Chemical Surface Water
From: 01-apr-92 To: 26-may-92

Site: RVEK CONNSW1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	00	TPHC	LT	1.12e+03	UGL
0.0	09-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	2.10e+00	UGL
0.0	09-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-apr-1992	UM33	CH2CL2		6.37e+00	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	TRCLE	LT	5.00e-01	UGL

May 26, 1992 Installation: Cold Regions Res & Eng Lab, NHPage 2
Analytical Results for Chemical Surface Water
From: 01-apr-92 To: 26-may-92

Site: RVER CONNSW2

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	9.70e+00	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	9.70e+00	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-apr-1992	UM33	CH2CL2		5.00e+00	UGL
0.0	09-apr-1992	UM33	CH2CL2		5.00e+00	UGL

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From: 01-apr-92 To: 26-may-92

Site: RVER CONNSW2 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	1.60e+00	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	TRCLE		2.02e+02	UGL
0.0	09-apr-1992	UM33	TRCLE		2.23e+02	UGL
0.0	09-apr-1992	UM33	TPHC	LT	1.12e+03	UGL

Site: RVER CONNSW3

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	111TCE	LT	4.10e+00	UGL
0.0	09-apr-1992	UM33	112TCE	LT	6.30e-01	UGL
0.0	09-apr-1992	UM33	11DCE	LT	1.42e+00	UGL
0.0	09-apr-1992	UM33	11DCLE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCE	LT	1.10e+00	UGL
0.0	09-apr-1992	UM33	12DCLB	LT	9.70e+00	UGL
0.0	09-apr-1992	UM33	12DCLE	LT	7.60e+00	UGL

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Site: RVER CONNSW3 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	UM33	12DCLP	LT	2.80e+00	UGL
0.0	09-apr-1992	UM33	12DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	13DCLB	LT	9.20e+00	UGL
0.0	09-apr-1992	UM33	13DCP	LT	3.80e+00	UGL
0.0	09-apr-1992	UM33	13DMB	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	14DCLB	LT	8.10e+00	UGL
0.0	09-apr-1992	UM33	2CLEVE	LT	8.20e+01	UGL
0.0	09-apr-1992	UM33	ACET	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	BRDCLM	LT	7.90e+00	UGL
0.0	09-apr-1992	UM33	C12DCE	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	C2AVE	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	C2H3CL	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	C2H5CL	LT	2.12e+00	UGL
0.0	09-apr-1992	UM33	C6H6	LT	2.40e+00	UGL
0.0	09-apr-1992	UM33	CCL4	LT	3.70e+00	UGL
0.0	09-apr-1992	UM33	CH2CL2		5.20e-00	UGL
0.0	09-apr-1992	UM33	CH3BR	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	CH3CL	LT	1.50e+00	UGL
0.0	09-apr-1992	UM33	CHBR3	LT	8.20e+00	UGL
0.0	09-apr-1992	UM33	CHCL3	LT	8.30e-01	UGL
0.0	09-apr-1992	UM33	CLC6H5	LT	1.40e+00	UGL
0.0	09-apr-1992	UM33	CS2	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	DBRCLM	LT	6.50e+00	UGL
0.0	09-apr-1992	UM33	ETC6H5	LT	9.30e+00	UGL
0.0	09-apr-1992	UM33	MEC6H5	LT	8.70e+00	UGL
0.0	09-apr-1992	UM33	MEK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MIBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	MNBK	ND	1.00e+01	UGL
0.0	09-apr-1992	UM33	STYR	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	T13DCP	ND	5.00e+00	UGL
0.0	09-apr-1992	UM33	TCLEA	LT	4.70e+00	UGL
0.0	09-apr-1992	UM33	TCLEE	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	TRCLE	LT	5.00e-01	UGL
0.0	09-apr-1992	UM33	TPHC	LT	1.12e+03	UGL

Report completed normally.

INSTALLATION RESTORATION PROGRAM

CHEMICAL REPORT
Tue May 26 11:00:55 1992

For Parameters :

Installation = Cold Regions Res & Eng Lab, NH
Beginning Date = 01-apr-92
Ending Date = 26-may-92
Media Type = Chemical Sediment (CSE)
Maximum (X, Y) = (719933, 4844996)
Minimum (X, Y) = (719326, 4844457)
Booleans = Y

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From: 01-apr-92 To: 26-may-92

Site: RVER CONNSED1

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	00	TPHC	LT	6.95e+01	UGG
0.0	09-apr-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	09-apr-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	09-apr-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	09-apr-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	09-apr-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	09-apr-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	09-apr-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	09-apr-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DCLP	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	09-apr-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	09-apr-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	09-apr-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	09-apr-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	09-apr-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	09-apr-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	09-apr-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	09-apr-1992	LM16	CH2CL2		8.94e-03	UGG
0.0	09-apr-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	09-apr-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	09-apr-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	09-apr-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	09-apr-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	09-apr-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	09-apr-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	09-apr-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	09-apr-1992	LM16	TRCLE	LT	3.80e-03	UGG

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From: 01-apr-92 To: 26-may-92

Site: RVER CONNSED2

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	BOOL	CONCENTRATION	UNITS
0.0	09-apr-1992	00	TPHC	LT	6.95e+01	UGG
0.0	09-apr-1992	00	TPHC	LT	6.95e+01	UGG
0.0	09-apr-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	09-apr-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	09-apr-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	09-apr-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	09-apr-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	09-apr-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	09-apr-1992	LM16	11DCLE	LT	1.70e-02	UGG
0.0	09-apr-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	09-apr-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	09-apr-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	09-apr-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	09-apr-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	09-apr-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	09-apr-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	09-apr-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	09-apr-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	09-apr-1992	LM16	13DCP	LT	1.30e-03	UGG
0.0	09-apr-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DMB	ND	2.00e-03	UGG
0.0	09-apr-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	09-apr-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	09-apr-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	09-apr-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	09-apr-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	09-apr-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	09-apr-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	09-apr-1992	LM16	C2H5CL	LT	2.70e-02	UGG
0.0	09-apr-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	09-apr-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	09-apr-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	CCL4	LT	5.60e-03	UGG

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Site: RVER CONNSED2 (continued)

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	POOL	CONCENTRATION	UNITS
0.0	09-apr-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	09-apr-1992	LM16	CH2CL2		8.67e-03	UGG
0.0	09-apr-1992	LM16	CH2CL2		8.92e-03	UGG
0.0	09-apr-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	09-apr-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	09-apr-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	09-apr-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	09-apr-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	09-apr-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	09-apr-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	09-apr-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	09-apr-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	09-apr-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	09-apr-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	09-apr-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	09-apr-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	09-apr-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	09-apr-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	09-apr-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	09-apr-1992	LM16	TRCLE	LT	3.80e-03	UGG
0.0	09-apr-1992	LM16	TRCLE	LT	3.80e-03	UGG

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Site: RVER CONNSED3

SAMPLE DEPTH (ft)	SAMPLE DATE	TEST METHOD	COMPOUND	POOL	CONCENTRATION	UNITS
0.0	09-apr-1992	00	TPHC	LT	6.95e+01	UGG
0.0	09-apr-1992	LM16	111TCE	LT	4.20e-03	UGG
0.0	09-apr-1992	LM16	112TCE	LT	2.00e-02	UGG
0.0	09-apr-1992	LM16	11DCE	LT	1.90e-02	UGG
0.0	09-apr-1992	LM16	11DCLE	LT	1.70e-03	UGG
0.0	09-apr-1992	LM16	12DCE	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	12DCLB	LT	1.20e-03	UGG
0.0	09-apr-1992	LM16	12DCLE	LT	3.10e-03	UGG
0.0	09-apr-1992	LM16	12DCLP	LT	2.20e-03	UGG
0.0	09-apr-1992	LM16	12DMB	ND	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DCLB	LT	2.00e-03	UGG
0.0	09-apr-1992	LM16	13DCP	LT	1.30e-02	UGG
0.0	09-apr-1992	LM16	13DMB	ND	2.00e-02	UGG
0.0	09-apr-1992	LM16	14DCLB	LT	9.00e-04	UGG
0.0	09-apr-1992	LM16	2CLEVE	LT	4.80e-02	UGG
0.0	09-apr-1992	LM16	ACET	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	BRDCLM	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	C13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	C2AVE	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	C2H3CL	LT	1.50e-02	UGG
0.0	09-apr-1992	LM16	C2H5CL	LT	[illegible]e-02	UGG
0.0	09-apr-1992	LM16	C6H6	LT	2.90e-03	UGG
0.0	09-apr-1992	LM16	CCL3F	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	CCL4	LT	5.60e-03	UGG
0.0	09-apr-1992	LM16	CH2CL2		5.43e-03	UGG
0.0	09-apr-1992	LM16	CH3BR	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	CH3CL	LT	1.70e-02	UGG
0.0	09-apr-1992	LM16	CHBR3	LT	1.80e-02	UGG
0.0	09-apr-1992	LM16	CHCL3	LT	2.30e-03	UGG
0.0	09-apr-1992	LM16	CLC6H5	LT	2.80e-03	UGG
0.0	09-apr-1992	LM16	CS2	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	DBRCLM	LT	1.40e-02	UGG
0.0	09-apr-1992	LM16	ETC6H5	LT	3.30e-03	UGG
0.0	09-apr-1992	LM16	MEC6H5	LT	8.40e-03	UGG
0.0	09-apr-1992	LM16	MEK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MIBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	MNBK	ND	1.00e-02	UGG
0.0	09-apr-1992	LM16	STYR	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	T13DCP	ND	5.00e-03	UGG
0.0	09-apr-1992	LM16	TCLEA	LT	1.60e-03	UGG
0.0	09-apr-1992	LM16	TCLEE	LT	1.90e-03	UGG
0.0	09-apr-1992	LM16	TRCLE	LT	3.80e-03	UGG

Report completed normally.

APPENDIX N

QA/QC RESULTS

Table N-1

SUMMARY OF TRIP BLANK RESULTS

Trip Blank	Shipping Date	Methylene Chloride (UGL)	Acetone (UGL)	Chloroform (UGL)	Tetrachloro-ethylene (UGL)	Trichloro-ethylene (UGL)	Site Type
1	1-16-92	5.980	<10.000	<0.830	<0.500	<0.500	BORE
2	1-20-92	8.920	<10.000	<0.830	<0.500	<0.500	BORE
3	3-6-92	13.700	10.000	<0.830	<0.500	<0.500	GW ROUND 1
4	3-9-92	12.700	<10.000	<0.830	<0.500	<0.500	GW ROUND 1
5	3-12-92	7.550	<10.000	<0.830	<0.500	<0.500	GW ROUND 1
6	3-13-92	14.700	<10.000	<0.830	0.340	0.370	GW ROUND 1
7	4-7-92	15.700	<10.000	<0.830	<0.500	<0.500	GW ROUND 2
8	4-8-92	19.600	<10.000	<0.830	<0.500	<0.500	GW ROUND 2
9*	4-9-92	9.510	<10.000	<0.830	<0.500	<0.500	GW ROUND 2
10	4-10-92	12.700	<10.000	<0.830	<0.500	<0.500	GW ROUND 2

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* Trip blank also shipped with sediment and surface water samples

BORE = Soil Boring
GW = Ground water

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1992

Table N-2

SUMMARY OF RINSATE BLANK RESULTS

Rinsate Blank	Sample Date	Method	Test Name	Concentration (UGL)	Site Type
R-1	1-16-92	VOC	Acetone	5.200	BORE
			Methylene chloride	4.020	
			Methylethyl ketone	19.000	
			Tetrachloroethylene	0.554	
		TPHC	Total Petroleum Hydrocarbons	<1120.000	
R-2	1-20-92	VOC	Methylene chloride	4.610	BORE
			Methylethyl ketone	25.000	BORE
		TPHC	Total Petroleum Hydrocarbons	<1240.000	
R-3	3-12-92	VOC	Methylene chloride	4.020	GW ROUND 1
			Trichloroethylene	0.410	
		TPHC	Total Petroleum Hydrocarbons	<1120.000	
R-4	4-10-92	VOC	Methylene chloride	7.350	GW ROUND 2
			Trichloroethylene	0.340	
		TPHC	Total Petroleum Hydrocarbons	<1060.000	

RC507

BORE = Soil Boring
GW = Ground Water
VOC = Volatile Organic Compounds
TPHC = Total Petroleum Hydrocarbons

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1992

Table N-3

SUMMARY OF METHOD BLANK RESULTS

Lot	Method	Test Name	Concentration
VIA	VOC-W	Methylene Chloride	4.020
VIB	VOC-W	Methylene Chloride	4.220
VID	VOC-S	Methylene Chloride	0.006
		1,1,2,2-Tetrachloroethane	0.002
		1,2-Dichlorobenzene	0.002
		1,4-Dichlorobenzene	0.001
VHW	VOC-S	Methylene Chloride	0.005
VHY	VOC-S	Acetone	0.010
VHZ	VOC-S	Methylene Chloride	0.008
		Acetone	0.020
VII	VOC-W	Methylene Chloride	7.750
VIL	VOC-W	Methylene Chloride	<5.400
VIJ	VOC-W	Methylene Chloride	3.630
VIX	VOC-S	Methylene Chloride	0.008
VIO	VOC-W	Methylene Chloride	9.800
		1,3-Dichloropropane	3.840
		1,3-Dimethyl benzene	3.400
		Chlorobenzene	1.430
		1,1,2-Trichloroethane	3.270
		1,1,2,2-Tetrachloroethane	4.000
		1,1,2,2-Tetrachloroethylene	0.455
VIR	VOC-W	Methylene Chloride	7.250
VIV	VOC-W	Methylene Chloride	7.940
VIU	VOC-W	Methylene Chloride	7.350
VIW	VOC-W	Methylene Chloride	9.610
PBR	TPHC-S	Total Petroleum Hydrocarbons	<74.700
PBS	TPHC-S	Total Petroleum Hydrocarbons	<74.500
PBT	TPHC-W	Total Petroleum Hydrocarbons	<1120.000
PBW	TPHC-W	Total Petroleum Hydrocarbons	<1120.000
PBX	TPHC-W	Total Petroleum Hydrocarbons	<1120.000
PBZ	TPHC-S	Total Petroleum Hydrocarbons	<69.400
PCA	TPHC-W	Total Petroleum Hydrocarbons	<1040.000
PCB	TPHC-W	Total Petroleum Hydrocarbons	<1040.000

RC507

Note: Soil blanks reported in UGG
Water blanks reported in UGL

TPHC-W = Total Petroleum Hydrocarbons - Water
TPHC-S = Total Petroleum Hydrocarbons - Soil
VOC-W = Volatile Organic Compounds - Water
VOC-S = Volatile Organic Compounds - Soil

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc., 1992

Table N-4

SUMMARY OF FIELD DUPLICATE RESULTS - SOIL

Parameter	2SB1/24-26 (UGG)	2SB1/24-26D (UGG)	RPD
Acetone	0.042	<0.010	--
Methylene chloride	0.010	0.009	10.5

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

TABLE N-4 (Cont.)
SUMMARY OF FIELD DUPLICATE RESULTS - SOIL

Parameter	13SB1/5.5-7.5 (UGG)	13SB1/5.5-7.5D (UGG)	RPD
Trans 1,2-Dichloroethene	<0.002	0.001	--
(cis) 1,2-Dichloroethylene	0.012	0.036	1.0
Methylene chloride	0.007	0.008	13.3
Trichloroethylene	0.013	0.048	117.5

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

Table N-4 (Cont.)
SUMMARY OF FIELD DUPLICATE RESULTS - SOIL

Parameter	13SB1/17-19 (UGG)	13SB1/17-19D (UGG)	RPD
(cis) 1,2-Dichloroethylene	0.008	--	--
Methylene chloride	0.009	0.009	0
Trichloroethene	0.234	0.216	8.0

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

Table N-5

SUMMARY OF FIELD DUPLICATE RESULTS
GROUND WATER - FIRST ROUND

Parameter	CECRL08 (UGL)	CECRL08D (UGL)	RPD
Acetone	74.00	54.00	31
Methylethyl ketone	73.00	52.00	34
Methylene chloride	3.04	3.43	12
Trichloroethylene	1190.00	1110.00	7

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

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Table N-6

SUMMARY OF FIELD DUPLICATE RESULTS
GROUND WATER - SECOND ROUND

Parameter	CECRL08 (UGL)	CECRL08D (UGL)	RPD
Methylene chloride	176.000	176.000	0
Trichloroethylene	10,600.000	10,600.000	0

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

Table N-6 (Cont.)
SUMMARY OF FIELD DUPLICATE RESULTS
GROUND WATER - SECOND ROUND

Parameter	CECRL12 (UGL)	CECRL12D (UGL)	RPD
Acetone	11.000	9.800	12
(Cis)1,2-dichloro-ethylene	5.000	5.000	0.0
Methylene chloride	6.960	6.180	12
Methylethyl ketone	12.000	11.000	8.7
Trichloroethylene	212.000	265.000	22

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

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Table N-7

SUMMARY OF FIELD DUPLICATE RESULTS
SURFACE WATER

Parameter	CONNSW2 (UGL)	CONNSW2DP (UGL)	RPD
Methylene chloride	5.000	5.000	0
Tricaloroethylene	223.000	202.000	10

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

Table N-8

SUMMARY OF FIELD DUPLICATE RESULTS
SEDIMENT

Parameter	CONNSED2 (UGG)	CONNSED2D (UGG)	RPD
Methylene chloride	0.009	0.009	0

RC507

RPD = Relative Percent Difference

Source: USATHAMA IRDMIS Level 3/Ecology and Environment, Inc.,1992

Chemical Quality Control Report
Installation: Cold Regions Res & Eng Lab, NH (CE)

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCNP # 0.03	LM16	MEC6D8	14-jan-1992	AL	0.000	0.023	UGG			GO
	LM16	MEC6D8	14-jan-1992	AL	0.000	0.024	UGG			GO
	LM16	MEC6D8	14-jan-1992	AL	0.000	0.024	UGG			GO
	LM16	MEC6D8	15-jan-1992	AL	0.000	0.023	UGG			GO
	LM16	MEC6D8	15-jan-1992	AL	0.000	0.023	UGG			GO
	LM16	MEC6D8	15-jan-1992	AL	0.000	0.024	UGG			GO
	LM16	MEC6D8	15-jan-1992	AL	0.000	0.025	UGG			GO
	LM16	MEC6D8	16-jan-1992	AL	0.500	0.023	UGG			GO
	LM16	MEC6D8	16-jan-1992	AL	3.000	0.024	UGG			GO
	LM16	MEC6D8	16-jan-1992	AL	7.500	0.023	UGG			GO
	LM16	MEC6D8	16-jan-1992	AL	10.000	0.024	UGG			GO
	LM16	MEC6D8	16-jan-1992	AL	14.000	0.024	UGG			GO
	LM16	MEC6D8	16-jan-1992	AL	18.000	0.023	UGG			GO
	LM16	MEC6D8	17-jan-1992	AL	54.000	0.025	UGG			GO
	LM16	MEC6D8	18-jan-1992	AL	16.000	0.028	UGG			GO
	LM16	MEC6D8	18-jan-1992	AL	25.000	0.024	UGG			GO
	LM16	MEC6D8	18-jan-1992	AL	25.000	0.025	UGG			GO
	LM16	MEC6D8	18-jan-1992	AL	45.000	0.023	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	2.000	0.020	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	2.000	0.020	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	2.500	0.019	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	6.500	0.021	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	6.500	0.025	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	9.000	0.022	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	9.500	0.022	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	18.000	0.021	UGG			GO
	LM16	MEC6D8	20-jan-1992	AL	18.000	0.023	UGG			GO
	LM16	MEC6D8	09-apr-1992	AL	0.000	0.020	UGG			GO
	LM16	MEC6D8	09-apr-1992	AL	0.000	0.020	UGG			GO
	LM16	MEC6D8	09-apr-1992	AL	0.000	0.021	UGG			GO
	LM16	MEC6D8	09-apr-1992	AL	0.000	0.022	UGG			GO
QCNP # 0.12	LM16	12DCD4	14-jan-1992	AL	0.000	0.090	UGG			GO
	LM16	12DCD4	14-jan-1992	AL	0.000	0.092	UGG			GO
	LM16	12DCD4	14-jan-1992	AL	0.000	0.092	UGG			GO
	LM16	12DCD4	15-jan-1992	AL	0.000	0.092	UGG			GO
	LM16	12DCD4	15-jan-1992	AL	0.000	0.092	UGG			GO
	LM16	12DCD4	15-jan-1992	AL	0.000	0.092	UGG			GO
	LM16	12DCD4	15-jan-1992	AL	0.000	0.101	UGG			GO
	LM16	12DCD4	16-jan-1992	AL	0.500	0.110	UGG			GO
	LM16	12DCD4	16-jan-1992	AL	3.000	0.010	UGG			GO
	LM16	12DCD4	16-jan-1992	AL	7.500	0.101	UGG			GO
	LM16	12DCD4	16-jan-1992	AL	10.000	0.101	UGG			GO
	LM16	12DCD4	16-jan-1992	AL	14.000	0.014	UGG			GO
	LM16	12DCD4	16-jan-1992	AL	18.000	0.101	UGG			GO
	LM16	12DCD4	17-jan-1992	AL	54.000	0.119	UGG			GO
	LM16	12DCD4	18-jan-1992	AL	16.000	0.156	UGG			GO
	LM16	12DCD4	18-jan-1992	AL	25.000	0.128	UGG			GO
	LM16	12DCD4	18-jan-1992	AL	25.000	0.128	UGG			GO
	LM16	12DCD4	18-jan-1992	AL	45.000	0.128	UGG			GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCNP # 0.12	LM16	12DCD4	20-jan-1992	AL	2.000	0.009	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	3.000	0.092	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	4.500	0.092	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	5.500	0.092	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	6.500	0.101	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	9.000	0.101	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	9.500	0.101	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	18.000	0.092	UGG			GO
	LM16	12DCD4	20-jan-1992	AL	18.000	0.128	UGG			GO
	LM16	12DCD4	09-apr-1992	AL	0.000	0.110	UGG			GO
	LM16	12DCD4	09-apr-1992	AL	0.000	0.110	UGG			GO
	LM16	12DCD4	09-apr-1992	AL	0.000	0.110	UGG			GO
	LM16	12DCD4	09-apr-1992	AL	0.000	0.119	UGG			GO
	LM16	CD2CL2	14-jan-1992	AL	0.000	0.118	UGG			GO
	LM16	CD2CL2	14-jan-1992	AL	0.000	0.118	UGG			GO
	LM16	CD2CL2	14-jan-1992	AL	0.000	0.127	UGG			GO
	LM16	CD2CL2	15-jan-1992	AL	0.000	0.118	UGG			GO
	LM16	CD2CL2	15-jan-1992	AL	0.000	0.118	UGG			GO
	LM16	CD2CL2	15-jan-1992	AL	0.000	0.127	UGG			GO
	LM16	CD2CL2	15-jan-1992	AL	0.000	0.127	UGG			GO
	LM16	CD2CL2	16-jan-1992	AL	0.500	0.118	UGG			GO
	LM16	CD2CL2	16-jan-1992	AL	3.000	0.118	UGG			GO
	LM16	CD2CL2	16-jan-1992	AL	7.500	0.108	UGG			GO
	LM16	CD2CL2	16-jan-1992	AL	10.000	0.118	UGG			GO
	LM16	CD2CL2	16-jan-1992	AL	14.000	0.137	UGG			GO
	LM16	CD2CL2	16-jan-1992	AL	18.000	0.108	UGG			GO
	LM16	CD2CL2	17-jan-1992	AL	54.000	0.137	UGG			GO
	LM16	CD2CL2	18-jan-1992	AL	16.000	0.176	UGG			GO
	LM16	CD2CL2	18-jan-1992	AL	25.000	0.137	UGG			GO
	LM16	CD2CL2	18-jan-1992	AL	25.000	0.137	UGG			GO
	LM16	CD2CL2	18-jan-1992	AL	45.000	0.127	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	2.000	0.098	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	2.000	0.098	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	2.500	0.098	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	6.500	0.108	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	6.500	0.118	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	9.000	0.118	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	9.500	0.108	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	18.000	0.118	UGG			GO
	LM16	CD2CL2	20-jan-1992	AL	18.000	0.127	UGG			GO
	LM16	CD2CL2	09-apr-1992	AL	0.000	0.118	UGG			GO
	LM16	CD2CL2	09-apr-1992	AL	0.000	0.118	UGG			GO
	LM16	CD2CL2	09-apr-1992	AL	0.000	0.118	UGG			GO
	LM16	CD2CL2	09-apr-1992	AL	0.000	0.127	UGG			GO
	LM16	ETBD10	14-jan-1992	AL	0.000	0.108	UGG			GO
	LM16	ETBD10	14-jan-1992	AL	0.000	0.108	UGG			GO
	LM16	ETBD10	14-jan-1992	AL	0.000	0.118	UGG			GO
	LM16	ETBD10	15-jan-1992	AL	0.000	0.108	UGG			GO
	LM16	ETBD10	15-jan-1992	AL	0.000	0.108	UGG			GO
	LM16	ETBD10	15-jan-1992	AL	0.000	0.118	UGG			GO
	LM16	ETBD10	15-jan-1992	AL	0.000	0.118	UGG			GO
	LM16	ETBD10	16-jan-1992	AL	0.500	0.108	UGG			GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCNP # 0.12	LM16	ETBD10	16-jan-1992	AL	3.000	0.118	UGG			GO
	LM16	ETBD10	16-jan-1992	AL	7.500	0.108	UGG			GO
	LM16	ETBD10	16-jan-1992	AL	10.000	0.118	UGG			GO
	LM16	ETBD10	16-jan-1992	AL	14.000	0.118	UGG			GO
	LM16	ETBD10	16-jan-1992	AL	18.000	0.108	UGG			GO
	LM16	ETBD10	17-jan-1992	AL	54.000	0.118	UGG			GO
	LM16	ETBD10	18-jan-1992	AL	16.000	0.137	UGG			GO
	LM16	ETBD10	18-jan-1992	AL	25.000	0.108	UGG			GO
	LM16	ETBD10	18-jan-1992	AL	25.000	0.118	UGG			GO
	LM16	ETBD10	18-jan-1992	AL	45.000	0.108	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	2.000	0.108	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	2.000	0.118	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	2.500	0.108	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	6.500	0.118	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	6.500	0.127	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	9.000	0.118	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	9.500	0.118	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	18.000	0.108	UGG			GO
	LM16	ETBD10	20-jan-1992	AL	18.000	0.118	UGG			GO
	LM16	ETBD10	09-apr-1992	AL	0.000	0.118	UGG			GO
	LM16	ETBD10	09-apr-1992	AL	0.000	0.118	UGG			GO
	LM16	ETBD10	09-apr-1992	AL	0.000	0.118	UGG			GO
	LM16	ETBD10	09-apr-1992	AL	0.000	0.118	UGG			GO
QCNP # 120.00	UM33	12DCD4	16-jan-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	16-jan-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	20-jan-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	20-jan-1992	AL	0.000	127.000	UGL			GO
	UM33	12DCD4	06-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	06-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	09-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	09-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	09-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	12DCD4	09-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	12DCD4	09-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	12DCD4	12-mar-1992	AL	0.000	90.900	UGL			GO
	UM33	12DCD4	12-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	12-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	12-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	12-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	12-mar-1992	AL	0.000	109.000	UGL			GO
	UM33	12DCD4	13-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	13-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	13-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	13-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	13-mar-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	13-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	07-apr-1992	AL	0.000	86.400	UGL			GO
	UM33	12DCD4	07-apr-1992	AL	0.000	90.900	UGL			GO
	UM33	12DCD4	07-apr-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	07-apr-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	08-apr-1992	AL	0.000	80.000	UGL			GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCNP # 120.00	UM33	12DCD4	08-apr-1992	AL	0.000	80.000	UGL			GO
	UM33	12DCD4	08-apr-1992	AL	0.000	80.000	UGL			GO
	UM33	12DCD4	08-apr-1992	AL	0.000	81.800	UGL			GO
	UM33	12DCD4	08-apr-1992	AL	0.000	84.500	UGL			GO
	UM33	12DCD4	08-apr-1992	AL	0.000	90.000	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	87.300	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	88.200	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	90.900	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	100.000	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	109.000	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	109.000	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	109.000	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	09-apr-1992	AL	0.000	118.000	UGL			GO
	UM33	12DCD4	10-apr-1992	AL	0.000	109.000	UGL			GO
	UM33	12DCD4	10-apr-1992	AL	0.000	109.000	UGL			GO
	UM33	12DCD4	10-apr-1992	AL	0.000	109.000	UGL			GO
	UM33	12DCD4	10-apr-1992	AL	0.000	118.000	UGL			GO
	UM33	CD2CL2	16-jan-1992	AL	0.000	98.000	UGL			GO
	UM33	CD2CL2	16-jan-1992	AL	0.000	98.000	UGL			GO
	UM33	CD2CL2	20-jan-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	20-jan-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	06-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	06-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	09-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	09-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	09-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	09-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	09-mar-1992	AL	0.000	147.000	UGL			GO
	UM33	CD2CL2	12-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	CD2CL2	12-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	12-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	12-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	12-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	12-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	13-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	CD2CL2	13-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	CD2CL2	13-mar-1992	AL	0.000	118.000	UGL			GO
	UM33	CD2CL2	13-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	13-mar-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	13-mar-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	07-apr-1992	AL	0.000	98.000	UGL			GO
	UM33	CD2CL2	07-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	07-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	07-apr-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	08-apr-1992	AL	0.000	92.200	UGL			GO
	UM33	CD2CL2	08-apr-1992	AL	0.000	96.100	UGL			GO
	UM33	CD2CL2	08-apr-1992	AL	0.000	98.000	UGL			GO
	UM33	CD2CL2	08-apr-1992	AL	0.000	98.000	UGL			GO
	UM33	CD2CL2	08-apr-1992	AL	0.000	98.000	UGL			GO
	UM33	CD2CL2	08-apr-1992	AL	0.000	98.000	UGL			GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCNP # 120.00	UM33	CD2CL2	09-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	118.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	118.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	127.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	137.000	UGL			GO
	UM33	CD2CL2	09-apr-1992	AL	0.000	147.000	UGL			GO
	UM33	CD2CL2	10-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	10-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	10-apr-1992	AL	0.000	108.000	UGL			GO
	UM33	CD2CL2	10-apr-1992	AL	0.000	118.000	UGL			GO
	UM33	ETBD10	16-jan-1992	AL	0.000	101.000	UGL			GO
	UM33	ETBD10	16-jan-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	20-jan-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	20-jan-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	06-mar-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	06-mar-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	09-mar-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	09-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	09-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	09-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	09-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	12-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	12-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	12-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	12-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	12-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	12-mar-1992	AL	0.000	134.000	UGL			GO
	UM33	ETBD10	13-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	13-mar-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	13-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	13-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	13-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	13-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	07-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	07-apr-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	07-apr-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	07-apr-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	08-apr-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	08-apr-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	08-apr-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	08-apr-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	08-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	08-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	93.600	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	97.700	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	102.000	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	103.000	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	103.000	UGL			GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCNP # 120.00	UM33	ETBD10	09-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	09-apr-1992	AL	0.000	123.000	UGL			GO
	UM33	ETBD10	10-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	10-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	10-apr-1992	AL	0.000	113.000	UGL			GO
	UM33	ETBD10	10-apr-1992	AL	0.000	123.000	UGL			GO
	UM33	MEC6D8	16-jan-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	16-jan-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	20-jan-1992	AL	0.000	114.000	UGL			GO
	UM33	MEC6D8	20-jan-1992	AL	0.000	114.000	UGL			GO
	UM33	MEC6D8	06-mar-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	06-mar-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-mar-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-mar-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-mar-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-mar-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	12-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	12-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	12-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	12-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	12-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	12-mar-1992	AL	0.000	123.000	UGL			GO
	UM33	MEC6D8	13-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	13-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	13-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	13-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	13-mar-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	13-mar-1992	AL	0.000	114.000	UGL			GO
	UM33	MEC6D8	07-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	07-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	07-apr-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	07-apr-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	08-apr-1992	AL	0.000	87.700	UGL			GO
	UM33	MEC6D8	08-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	08-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	08-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	08-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	08-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	84.200	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	87.700	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	87.700	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	87.700	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	87.700	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	96.500	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	09-apr-1992	AL	0.000	105.000	UGL			GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool	ISC	Prog.
QCNP # 120.00	UM33	MEC6D8	10-apr-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	10-apr-1992	AL	0.000	105.000	UGL			GO
	UM33	MEC6D8	10-apr-1992	AL	0.000	114.000	UGL			GO
	UM33	MEC6D8	10-apr-1992	AL	0.000	114.000	UGL			GO
QCRB # 0.00	00	TPHC	16-jan-1992	AL	0.000	1120.000	UGL	LT		GO
	00	TPHC	20-jan-1992	AL	0.000	1240.000	UGL	LT		GO
	00	TPHC	13-mar-1992	AL	0.000	1120.000	UGL	LT		GO
	UM33	111TCE	16-jan-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	20-jan-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	13-mar-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	10-apr-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	112TCE	16-jan-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	20-jan-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	13-mar-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	10-apr-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	11DCE	16-jan-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	20-jan-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	13-mar-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	10-apr-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCLE	16-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	20-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	13-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	10-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	16-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	20-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	13-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	10-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCLB	16-jan-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	20-jan-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	13-mar-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	10-apr-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLE	16-jan-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	20-jan-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	13-mar-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	10-apr-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLP	16-jan-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	20-jan-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	13-mar-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	10-apr-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DMB	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DCLB	16-jan-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	20-jan-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	13-mar-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	10-apr-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCP	16-jan-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	20-jan-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	13-mar-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	10-apr-1992	AL	0.000	3.800	UGL	LT		GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCRB # 0.00	UM33	13DMB	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	14DCLB	16-jan-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	20-jan-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	13-mar-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	10-apr-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	2CLEVE	16-jan-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	20-jan-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	13-mar-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	10-apr-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	ACET	16-jan-1992	AL	0.000	5.200	UGL		S	GO
	UM33	ACET	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	BRDCLM	16-jan-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	20-jan-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	13-mar-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	10-apr-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	C12DCE	13-mar-1992	AL	0.000	1.100	UGL	ND	R	GO
	UM33	C12DCE	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C2AVE	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2H3CL	16-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	20-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	13-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	10-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H5CL	16-jan-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	20-jan-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	13-mar-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	10-apr-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C6H6	16-jan-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	20-jan-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	13-mar-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	10-apr-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	CCL4	16-jan-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	20-jan-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	13-mar-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	10-apr-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CH2CL2	16-jan-1992	AL	0.000	4.020	UGL		P	GO
	UM33	CH2CL2	20-jan-1992	AL	0.000	4.610	UGL		P	GO
	UM33	CH2CL2	13-mar-1992	AL	0.000	4.020	UGL		P	GO
	UM33	CH2CL2	10-apr-1992	AL	0.000	7.350	UGL		B	GO
	UM33	CH3BR	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CH3BR	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCRB # 0.00	UM33	CH3BR	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3BR	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3CL	16-jan-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	20-jan-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	13-mar-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	10-apr-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CHBR3	16-jan-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	20-jan-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	13-mar-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	10-apr-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHCL3	16-jan-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	20-jan-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	13-mar-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	10-apr-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CLC6H5	16-jan-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	20-jan-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	13-mar-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	10-apr-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CS2	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	DBRCLM	16-jan-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	20-jan-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	13-mar-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	10-apr-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	ETC6H5	16-jan-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	20-jan-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	13-mar-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	10-apr-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	MEC6H5	16-jan-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	20-jan-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	13-mar-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	10-apr-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEK	16-jan-1992	AL	0.000	19.000	UGL		S	GO
	UM33	MEK	20-jan-1992	AL	0.000	25.000	UGL		S	GO
	UM33	MEK	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	STYR	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCRB # 0.00	UM33	T13DCP	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	TCLEA	16-jan-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	20-jan-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	13-mar-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	10-apr-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEE	16-jan-1992	AL	0.000	0.554	UGL			GO
	UM33	TCLEE	20-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	13-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	10-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	16-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	20-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	13-mar-1992	AL	0.000	0.414	UGL		P	GO
	UM33	TRCLE	10-apr-1992	AL	0.000	0.340	UGL		P	GO
QCTB # 0.00	UM33	111TCE	16-jan-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	20-jan-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	06-mar-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	09-mar-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	12-mar-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	13-mar-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	07-apr-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	08-apr-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	09-apr-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	111TCE	10-apr-1992	AL	0.000	4.100	UGL	LT		GO
	UM33	112TCE	16-jan-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	20-jan-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	06-mar-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	09-mar-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	12-mar-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	13-mar-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	07-apr-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	08-apr-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	09-apr-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	112TCE	10-apr-1992	AL	0.000	0.630	UGL	LT		GO
	UM33	11DCE	16-jan-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	20-jan-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	06-mar-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	09-mar-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	12-mar-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	13-mar-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	07-apr-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	08-apr-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	09-apr-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCE	10-apr-1992	AL	0.000	1.420	UGL	LT		GO
	UM33	11DCLE	16-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	20-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	06-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	09-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	12-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	13-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	07-apr-1992	AL	0.000	1.100	UGL	LT		GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCTB # 0.00	UM33	11DCLE	08-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	09-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	11DCLE	10-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	16-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	20-jan-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	06-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	09-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	12-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	13-mar-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	07-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	08-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	09-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCE	10-apr-1992	AL	0.000	1.100	UGL	LT		GO
	UM33	12DCLB	16-jan-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	20-jan-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	06-mar-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	09-mar-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	12-mar-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	13-mar-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	07-apr-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	08-apr-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	09-apr-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLB	10-apr-1992	AL	0.000	9.700	UGL	LT		GO
	UM33	12DCLE	16-jan-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	20-jan-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	06-mar-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	09-mar-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	12-mar-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	13-mar-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	07-apr-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	08-apr-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	09-apr-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLE	10-apr-1992	AL	0.000	7.600	UGL	LT		GO
	UM33	12DCLP	16-jan-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	20-jan-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	06-mar-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	09-mar-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	12-mar-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	13-mar-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	07-apr-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	08-apr-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	09-apr-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DCLP	10-apr-1992	AL	0.000	2.800	UGL	LT		GO
	UM33	12DMB	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	06-mar-1992	AL	0.000	2.000	UGL	ND	R	GO
	UM33	12DMB	09-mar-1992	AL	0.000	2.000	UGL	ND	R	GO
	UM33	12DMB	12-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	07-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	08-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	12DMB	09-apr-1992	AL	0.000	5.000	UGL	ND	R	GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCTB # 0.00	UM33	12DMB	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DCLB	16-jan-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	20-jan-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	06-mar-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	09-mar-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	12-mar-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	13-mar-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	07-apr-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	08-apr-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	09-apr-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCLB	10-apr-1992	AL	0.000	9.200	UGL	LT		GO
	UM33	13DCP	16-jan-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	20-jan-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	06-mar-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	09-mar-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	12-mar-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	13-mar-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	07-apr-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	08-apr-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	09-apr-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DCP	10-apr-1992	AL	0.000	3.800	UGL	LT		GO
	UM33	13DMB	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	06-mar-1992	AL	0.000	2.000	UGL	ND	R	GO
	UM33	13DMB	09-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	12-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	07-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	08-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	09-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	13DMB	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	14DCLB	16-jan-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	20-jan-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	06-mar-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	09-mar-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	12-mar-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	13-mar-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	07-apr-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	08-apr-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	09-apr-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	14DCLB	10-apr-1992	AL	0.000	8.100	UGL	LT		GO
	UM33	2CLEVE	16-jan-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	20-jan-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	06-mar-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	09-mar-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	12-mar-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	13-mar-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	07-apr-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	08-apr-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	09-apr-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	2CLEVE	10-apr-1992	AL	0.000	82.000	UGL	LT		GO
	UM33	ACET	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCTB # 0.00	UM33	ACET	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	06-mar-1992	AL	0.000	10.000	UGL		S	GO
	UM33	ACET	09-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	12-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	07-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	08-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	09-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	ACET	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	BRDCLM	16-jan-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	20-jan-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	06-mar-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	09-mar-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	12-mar-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	13-mar-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	07-apr-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	08-apr-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	09-apr-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	BRDCLM	10-apr-1992	AL	0.000	7.900	UGL	LT		GO
	UM33	C12DCE	12-mar-1992	AL	0.000	1.100	UGL	ND	R	GO
	UM33	C12DCE	13-mar-1992	AL	0.000	1.100	UGL	ND	R	GO
	UM33	C12DCE	07-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C12DCE	08-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C12DCE	09-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C12DCE	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	06-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	09-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	12-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	07-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	08-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	09-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C13DCP	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	C2AVE	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	06-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	09-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	12-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	07-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	08-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	09-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2AVE	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	C2H3CL	16-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	20-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	06-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	09-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	12-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	13-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	07-apr-1992	AL	0.000	0.500	UGL	LT		GO

29-May-1992

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Installation: Cold Regions Res & Eng Lab NH (CE)

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCTB # 0.00	UM33	C2H3CL	08-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	09-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H3CL	10-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	C2H5CL	16-jan-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	20-jan-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	06-mar-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	09-mar-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	12-mar-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	13-mar-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	07-apr-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	08-apr-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	09-apr-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C2H5CL	10-apr-1992	AL	0.000	2.120	UGL	LT		GO
	UM33	C6H6	16-jan-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	20-jan-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	06-mar-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	09-mar-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	12-mar-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	13-mar-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	07-apr-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	08-apr-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	09-apr-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	C6H6	10-apr-1992	AL	0.000	2.400	UGL	LT		GO
	UM33	CCL4	16-jan-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	20-jan-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	06-mar-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	09-mar-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	12-mar-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	13-mar-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	07-apr-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	08-apr-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	09-apr-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CCL4	10-apr-1992	AL	0.000	3.700	UGL	LT		GO
	UM33	CH2CL2	16-jan-199	AL	0.000	5.980	UGL			GO
	UM33	CH2CL2	20-jan-1992	AL	0.000	8.920	UGL			GO
	UM33	CH2CL2	06-mar-1992	AL	0.000	13.700	UGL			GO
	UM33	CH2CL2	09-mar-1992	AL	0.000	12.700	UGL			GO
	UM33	CH2CL2	12-mar-1992	AL	0.000	7.550	UGL			GO
	UM33	CH2CL2	13-mar-1992	AL	0.000	14.700	UGL			GO
	UM33	CH2CL2	07-apr-1992	AL	0.000	15.700	UGL		B	GO
	UM33	CH2CL2	08-apr-1992	AL	0.000	19.600	UGL		B	GO
	UM33	CH2CL2	09-apr-1992	AL	0.000	9.510	UGL		B	GO
	UM33	CH2CL2	10-apr-1992	AL	0.000	12.700	UGL		B	GO
	UM33	CH3BR	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CH3BR	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CH3BR	06-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3BR	09-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3BR	12-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3BR	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3BR	07-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3BR	08-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3BR	09-apr-1992	AL	0.000	10.000	UGL	ND	R	GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Proj.
QCTB # 0.00	UM33	CH3BR	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	CH3CL	16-jan-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	20-jan-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	06-mar-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	09-mar-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	12-mar-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	13-mar-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	07-apr-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	08-apr-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	09-apr-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CH3CL	10-apr-1992	AL	0.000	1.600	UGL	LT		GO
	UM33	CHBR3	16-jan-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	20-jan-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	06-mar-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	09-mar-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	12-mar-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	13-mar-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	07-apr-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	08-apr-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	09-apr-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHBR3	10-apr-1992	AL	0.000	8.200	UGL	LT		GO
	UM33	CHCL3	16-jan-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	20-jan-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	06-mar-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	09-mar-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	12-mar-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	13-mar-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	07-apr-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	08-apr-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	09-apr-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CHCL3	10-apr-1992	AL	0.000	0.830	UGL	LT		GO
	UM33	CLC6H5	16-jan-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	20-jan-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	06-mar-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	09-mar-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	12-mar-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	13-mar-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	07-apr-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	08-apr-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	09-apr-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CLC6H5	10-apr-1992	AL	0.000	1.400	UGL	LT		GO
	UM33	CS2	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	06-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	09-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	12-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	07-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	08-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	09-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	CS2	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	DBRCLM	16-jan-1992	AL	0.000	6.500	UGL	LT		GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCTB # 0.00	UM33	DBRCLM	20-jan-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	06-mar-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	09-mar-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	12-mar-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	13-mar-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	07-apr-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	08-apr-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	09-apr-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	DBRCLM	10-apr-1992	AL	0.000	6.500	UGL	LT		GO
	UM33	ETC6H5	16-jan-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	20-jan-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	06-mar-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	09-mar-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	12-mar-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	13-mar-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	07-apr-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	08-apr-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	ETC6H5	09-apr-1992	AL	0.000	9.300	UGI	LT		GO
	UM33	ETC6H5	10-apr-1992	AL	0.000	9.300	UGL	LT		GO
	UM33	MEC6H5	16-jan-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	20-jan-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	06-mar-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	09-mar-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	12-mar-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	13-mar-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	07-apr-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	08-apr-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	09-apr-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEC6H5	10-apr-1992	AL	0.000	8.700	UGL	LT		GO
	UM33	MEK	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	06-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	09-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	12-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	07-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	08-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	09-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MEK	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	06-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	09-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	12-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	07-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	08-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	09-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MIBK	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	16-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	20-jan-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	06-mar-1992	AL	0.000	10.000	UGL	ND	R	GO

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCTB # 0.00	UM33	MNBK	09-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	12-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	13-mar-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	07-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	08-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	09-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	MNBK	10-apr-1992	AL	0.000	10.000	UGL	ND	R	GO
	UM33	STYR	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	06-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	09-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	12-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	07-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	08-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	09-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	STYR	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	16-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	20-jan-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	06-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	09-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	12-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	13-mar-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	07-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	08-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	09-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	T13DCP	10-apr-1992	AL	0.000	5.000	UGL	ND	R	GO
	UM33	TCLEA	16-jan-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	20-jan-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	06-mar-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	09-mar-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	12-mar-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	13-mar-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	07-apr-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	08-apr-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	09-apr-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEA	10-apr-1992	AL	0.000	4.700	UGL	LT		GO
	UM33	TCLEE	16-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	20-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	06-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	09-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	12-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	13-mar-1992	AL	0.000	0.337	UGL		P	GO
	UM33	TCLEE	07-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	08-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	09-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TCLEE	10-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	16-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	20-jan-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	06-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	09-mar-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	12-mar-1992	AL	0.000	0.500	UGL	LT		GO

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Chemical Quality Control Report
Installation: Cold Regions Res & Eng Lab NH (CE)

QC Type/Samp Type/Spike	Method Code	Test Name	Sample Date	Lab	Depth	Value	Unit Meas.	Meas. Bool.	ISC	Prog.
QCTB # 0.00	UM33	TRCLE	13-mar-1992	AL	0.000	0.372	UGL		P	GO
	UM33	TRCLE	07-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	08-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	09-apr-1992	AL	0.000	0.500	UGL	LT		GO
	UM33	TRCLE	10-apr-1992	AL	0.000	0.500	UGL	LT		GO

** End of Report - 883 Records Found **

APPENDIX 0

BORING LOG 31-B5

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

SP-B

LOG OF BORING B-5

SHEET 1 OF 4

PROJECT AND LOCATION: Frost Effects Research Facility, CRREL, Hanover, N.H.		ELEVATION AND DATUM: 462 ft	PROJECT NO: 78 C 527
DRILLING AGENCY: Granite State Explorations, N.H.	FOREMAN: Jeffrey Cushing	DATE STARTED: 10/2/1979 AM	DATE FINISHED: 10/4/1979
DRILLING EQUIPMENT: Speedstar Model SS-15-II Air Percussion Rig		COMPLETION DEPTH: 171' 8"	ROCK DEPTH: 170' 8"
SIZE AND TYPE OF BIT: 6 in. percussion	SIZE AND TYPE CORE BARREL: N.A	NO SAMPLES: DIST 12	UNDIST 0 CORE 0
CASING: (mud drilling)		WATER LEVEL (FT): FIRST 22 ft	COMPL 24 HR
CASING HAMMER: WEIGHT NA	DROP NA	BORING ANGLE AND DIRECTION: Vertical	
SAMPLER: Standard 2 in OD split spoon			
SAMPLER HAMMER: WEIGHT 140 lb/300 lb	DROP 30 in/12 in.	INSPECTOR: S.V. Nathan	

STANDARD PENETR. RESIST. BLOWS/FT	DESCRIPTION	PIEZ.	DEPTH, FT	SAMPLES: TYPE NUMBER	RECOV. FT	PENETR. RESIST. BLOWS/6 IN.	CORE INDEX TESTS: RECOVERY %	RQD	W_n, %	LL, %	PL, %	-200, %	REMARKS
	Topsoil (18 in)		2										
	Stiff to very stiff brown-gray varved SILT to CLAYEY SILT (ML-CL). non-plastic to low-plastic, occasional thin fine sand layers (SM-SP)		4										
			6										
			8										
			10										
			12										
			14										
			16										
			18										
			20										
			22										
			24										
			26										
			28										
			30										
			32										
			34										
			36										
			38										175

WOODWARD–CLYDE CONSULTANTS
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SP-

LOG OF BORING B-5

SHEET 2 OF 4

STANDARD PENETR. RESIST. BLOWS/FT	DESCRIPTION	PIEZ.	DEPTH, FT	SAMPLES TYPE NUMBER	RECOV. FT	PENETR. RESIST. BLOWS/FT	CORE RECOVERY %	RQD	INDEX TESTS W, %	LL, %	PL, %	-200, %	REMARKS
	Stiff to very stiff brown-gray varved SILT / clayey SILT (ML-CL), low-plastic to non-plastic. occasional thin fine sand layers (SP-SM)		42, 44, 46, 48, 50, 52, 54, 56, 58										Sampling commenced at 60 ft.
64/16	Very stiff green-gray varved SILT, vertical clay laminae (ML-CL)		60, 62, 64, 66, 68	S-3	1.2	12, 20, 44							S-3 & S-4 very moist to wet samples
67	... ditto medium plastic (CL) ...		70, 72, 74, 76, 78	S-4	1.3	10, 19, 48							
60/8"	... ditto becoming at 81 ft. SI FINE SAND, little SILT (SM)		80, 82, 84	S-5	1.2	4, 25, 39, 72							
51	Very stiff green-gray varved SILT / fine sandy SILT / silty FINE SAND (ML-SM)		86, 88	S-6	2.0	8, 16, 35, 86			17.3		NP		Hole depth 90 ft 10/3 o/n reading 4 ft of mud.
140	Dense to very dense brown green-gray silty fine SAND		90	S-5	1.3	22, 56, 84							S-5 very moist sample 17.

WOODWARD–CLYDE CONSULTANTS
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SP-I

LOG OF BORING B-5 SHEET 3 OF 4

STANDARD PENETR. RESIST. BLOWS/FT	DESCRIPTION	PIEZ.	DEPTH, FT	SAMPLES OR CORE: TYPE NUMBER	RECOV. FT	PENETR. RESIST. BLOWS/6IN.	RECOVERY %	RQD	INDEX TESTS: W_n, %	LL, %	PL, %	-200, %	REMARKS
			94										
66	Dense to very dense green-gray SILTY FINE SAND (SM) becoming		96	S6	1.6	19 41 35			24.8			68.9	S-6 through S-8 wet samples, probably saturated masked by too many fines (SILT, est. 30-35%), Est. Water Table (Qut) enc. bet. 90 ft to 92 ft
			98										
105	... ditto trace medium fine sand ...		100	S7	1.5	37 42 63							
			102										
			104										
75	... ditto little medium fine sand, trace coarse sand - (SP-SM)		106	S8	1.5	19 31 44			22.6			54.0	
			108										
			110										
			112										
	115		114										
114	Dense to very dense gray medium to fine sand, trace silt beg. brown in color. Saturated. Subangular quartzitic (SP) coarse sand & fine gravel. subangular. layer at 121 ft		116	S9	1.5	37 60 74			24.9			19.2	← Coarser, less silty & more porous subsoils below 115 ft
			118										
			120										
			122										
			124										
57	Dense brown-gray medium to fine sand, trace (<5%) silt, little coarse sand (SW). Saturated. Subang. quartzitic		126	S10	1.4	19 26 31			20.2			13.1	
			128										
	131		130										
			132										← Distinct coarse grained speckle colored, [illegible] deposits filling below 131 ft
			134										
48	Dense white-black-gray speckled coarse to fine sand, trace silt, well-graded. Subangular & quartzitic (SW)		136	S11	2.0	18 22 26 33 35			14.4			15.2	saturated samples
			138										
			140										
			142										

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WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

SP-B-

LOG OF BORING B-5

SHEET 4 OF 4

STANDARD PENETR. RESIST. BL/FT	DESCRIPTION	PIEZ.	DEPTH, FT	SAMPLES OR CORE INDEX TESTS: TYPE NUMBER	RECOV., FT	PENETR. RESIST. BL/6IN.	RECOVERY, %	RQD	W_n, %	LL, %	PL, %	-200, %	REMARKS
			146										
			148										
43	Dense well-graded white-black-gray speckled coarse to fine sand, little silt, subangular quartzitic (SW-SM)		150	S12	1.0	12 21 22 70 56 70			13.9			10'	
			152										
			154										
			156										
			158										
			160										
			162										
			164										Installed 1½ in. ID PVC to 137 ft. 2 ft stick-up
			166										
			168										
	Bedrock at 170'8"		170										
	Soft phyllite of Orfordville formation		172										Water Level Obs.
			174										Inside PVC:
			176										10/4/79 AM: 12.5 ft PM: 12.5 ft
			178										10/5/79 PM: 13.5 ft.
			180										10/8/79 AM: 14.8 ft
			182										10/9/79 AM: 15.0 ft
			184										Outside PVC (perched water)
			186										10/4/79 AM: 3.5 ft
			188										10/5/79: AM: 3.0 ft
			190										10/8/79 AM: 3.0 ft
			192										10/9/79 AM: 3.0 ft
			194							178			

APPENDIX P

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES PROPOSED AMBIENT GROUND WATER QUALITY STANDARDS

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Table P-1

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
PROPOSED AMBIENT GROUND WATER QUALITY STANDARDS*

Regulated Contaminant	Concentration	MCL	Lifetime HA	BHRA
Acetone	700 µg/l			X
1,1-Dichloroethane	81 µg/l			X
cis-1,2-Dichloroethylene	70 µg/l	X		
Methylethyl ketone	170 µg/l		X	
Tetrachloroethylene	5 µg/l	X		
Trichloroethylene	5 µg/l	X		

RC507

Source: New Hampshire Department of Environmental Services

* Presented only for organic compounds detected during both rounds of sampling at the CRREL site.

Key:

MCL = Maximum Contaminant Level promulgated by EPA
Lifetime HA = Lifetime Health Advisory established by EPA
BHRA = NH Department of Health and Human Services, Division of Public Health Services, Bureau of Health Risk Assessment Health Advisory Level

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