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Sampling and Analysis Report

Identification and Delineation of Contaminant Source Area For Excavation Design Purposes

Individual Hazardous Substance Site 119.1 Operable Unit 1

Environmental Restoration • Rocky Flats Environmental Technology Site

April 1996

DOCUMENT CLASSIFICATION REVIEW WAIVER PER CLASSIFICATION OFFICE

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Rocky Mountain Remediation Services, L.L.C.

April 1996

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ACRONYMS

ATH	ambient temperature headspace
CDPHE	Colorado Department of Public Health and Environment
DCE	dichloroethene
DMR	Document Modification Request
DNAPL	dense nonaqueous phase liquids
DRC	Dispute Resolution Committee
EPA	Environmental Protection Agency
FDER	Florida Department of Environmental Regulation
FID	flame ionization detector
GPS	Global Positioning System
IHSS	Individual Hazardous Substance Site
LNAPL	light nonaqueous phase liquids
NAPL	nonaqueous phase liquid
OU	Operable Unit
OVA	organic vapor analyzer
PCE	tetrachloroethene
RFEDS	Rocky Flats Environmental Database System
SAP	sampling analysis plan
SSAL	Subsurface Soil Action Levels
TCA	trichloroethane
TCE	trichloroethene
VOC	volatile organic compounds

EXECUTIVE SUMMARY

The purpose of this sampling and analysis report is to identify the location and approximate volume of contaminated subsurface soil[1] that is the source for the groundwater contaminant plume originating from Operable Unit 1 (OU 1).

The Proposed Plan originally submitted to the U.S. Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) was disputed. The Dispute Resolution Committee (DRC) for OU 1 agreed that the remedy was to conduct a source removal in the vicinity of Individual Hazardous Substance Site (IHSS) 119.1 located in OU 1 to reduce the groundwater contamination over time. Most of the contaminated soil should be removed as a result of an excavation, but some residual contaminants trapped in the weathered bedrock may remain after the excavating. A sampling and analysis plan was implemented to focus on the source location and approximate volume of contaminated soil to be excavated.

Forty soil borings were drilled in IHSS 119.1 in areas where contaminated groundwater had been identified. Soil samples were collected continuously in each soil boring and analyzed for the presence of volatile organic compounds (VOCs). Soil gas headspace methodologies were used to evaluate the soil.

Two source areas were identified in IHSS 119.1. Both of these areas are located where drums had previously been stored. Removal of between 900 and 1,900 cubic yards of soil should eliminate both of these source areas.

The data presented in this report is intended to be used in the preparation of an excavation work plan. This report is not intended to be used as a work plan.

[1] To be consistent with the Rocky Flats Cleanup Agreement, Subsurface Soil includes all sedimentary material six inches and more below land surface. This includes soil, alluvium, colluvium and bedrock.

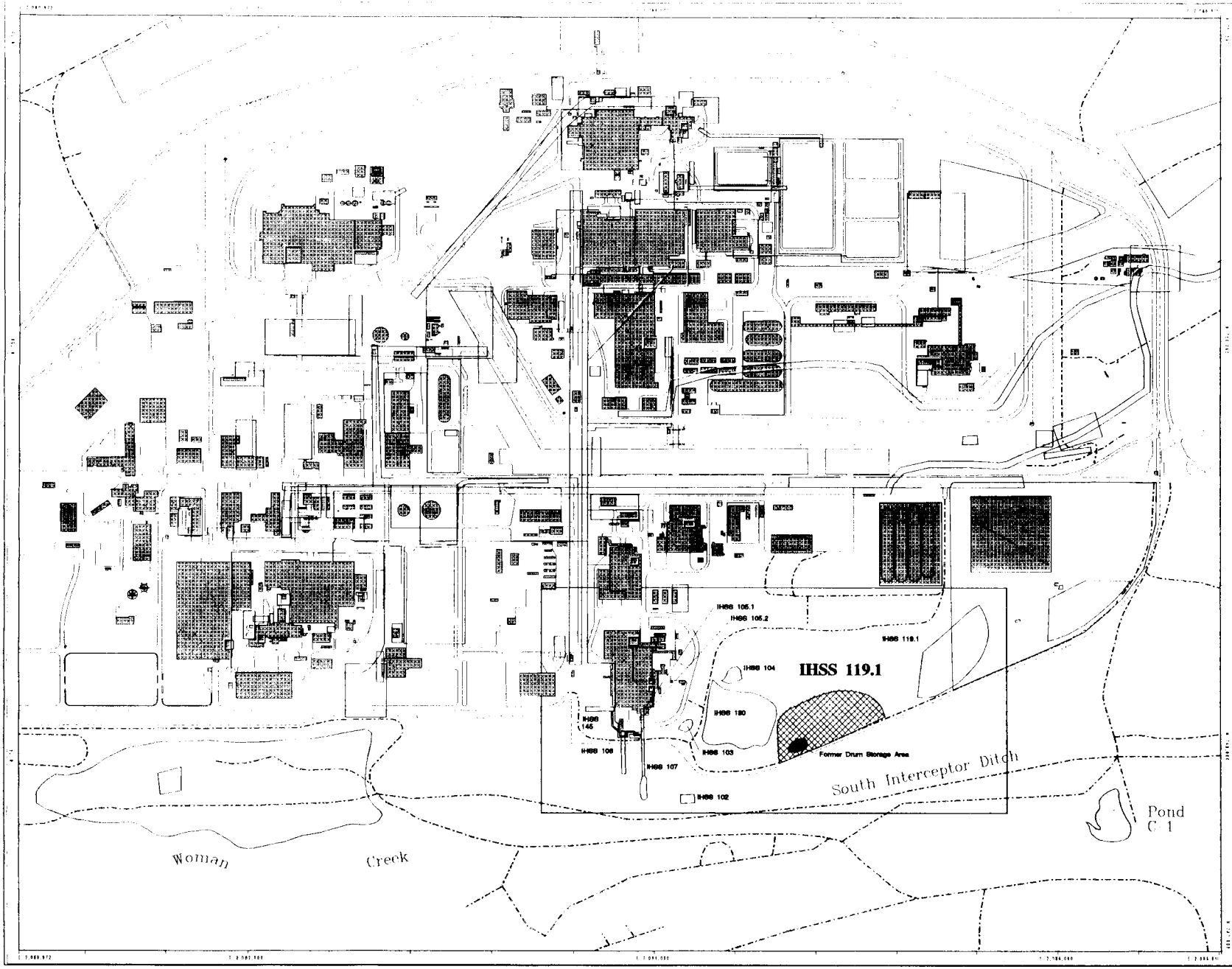
1.0 INTRODUCTION

The purpose of this Sampling and Analysis Report is to present, summarize, and interpret the data collected during the soil gas survey conducted at Operable Unit (OU) 1 during January and February 1996. The soil gas survey was performed to better delineate the location and approximate volume of contaminated soil that will be excavated at Individual Hazardous Substance Site (IHSS) 119.1 in OU 1. The Preferred Alternative remedy presented in the Proposed Plan originally submitted to the U.S. Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) was disputed. A Dispute Resolution Committee (DRC) was formed to resolve the dispute of the Preferred Alternative remedy. The Dispute Resolution Committee for OU 1 agreed that the Preferred Alternative remedy for OU 1 was to conduct a source removal in the vicinity of IHSS 119.1 to reduce the groundwater contamination over time. Most of the contaminated soil should be removed as a result of an excavation, but some residual contaminants trapped in the weathered bedrock may remain after the excavation. Figure 1-1 shows the location of OU 1, IHSS 119.1, and the drum storage area formerly located within IHSS 119.1.

1.1 BACKGROUND

IHSS 119.1 is a former drum and scrap metal storage area located east of Building 881 along the southern perimeter road (see Figure 1-1). The scrap metal was coated with residual oils and/or hydraulic coolants containing chlorinated volatile organic compounds (VOCs). The OU 1 Phase III Resource Conservation and Recovery Act (RCRA) Facility Investigation/ Remedial Investigation (RFI/RI) (DOE 1994) was completed during June 1994 and the Corrective Measures Study/Feasibility Study (CMS/FS) (DOE 1995) was completed during February 1995. These documents indicate that groundwater is impacted by VOCs in the IHSS 119.1 area. However, no VOC-contaminated soil above subsurface soil action levels was identified in these studies.

EPA guidance *Dense Nonaqueous Phase Liquids* (EPA 1992) states that if a specific VOC is present in groundwater at one percent of its aqueous solubility, that is evidence that the compound is present as a separate nonaqueous phase. Using this guidance, the compounds listed in Table 1-1 may be present as a separate nonaqueous phase liquid (NAPL) in the soil near the contaminated groundwater plume in IHSS 119.1. The subsurface soil action levels as listed in the Action Levels and Standards Framework of the draft Rocky Flats Cleanup Agreement (DOE 1996) for the Rocky Flats Environmental Technology Site are also shown in Table 1-1. Table 1-2 lists these compounds and their physical properties.



881 Hillside Area (OU1)
In the Vicinity of IHSS 119.1

Location of OU1, IHSS 119.1, and Former Drum Storage Area

Figure 1-1

EXPLANATION

- IHSS 119.1
- Former Drum Storage Area
- Individual Hazardous Substance Sites
- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Paved roads
- Dirt roads

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr., EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - (date unknown)
Ground Water data provided by RMRS/Hydrogeology - 1996.
Borehole Sampling locations provided by Geosciences.

Scale = 1 : 5350
1 inch represents approximately 446 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
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MAP ID: Fig1-1

April 24, 1996

Table 1-1 Subsurface Soil Action Levels

Compound	Subsurface Soil Action Levels (SSAL)
carbon tetrachloride (CCl_4)	11 mg/kg
1,1-dichloroethene (1,1-DCE)	11.9 mg/kg
tetrachloroethene (PCE)	11.5 mg/kg
1,1,1-trichloroethane (TCA)	378 mg/kg
trichloroethene (TCE)	9.27 mg/kg

Table 1-2 Summary of VOC Physical Characteristics

Compound	Solubility (mg/L)	Specific Density (20°) (g/cc)	Log K_{ow}, Octanol Water Coefficient	Henry's Law Constant (atm-m^3/mol)
CCl_4	800	1.59	2.83	0.0302
1,1-DCE	400	1.22	2.13	0.021
TCA	1360	1.34	2.47	0.018
PCE	150	1.62	2.60	0.0153
TCE	1100	1.46	2.53	0.0091

Note: Table compiled from Cohen, R.M., Mercer, J.W., and Mathews, J., 1993. DNAPL Site Evaluation: C.K. Smoley, Publisher.

Table 1-3 lists monitoring wells located in the vicinity of IHSS 119.1, contaminants of concern identified in the groundwater near IHSS 119.1, and the groundwater contaminant concentration range from 1987 to 1995. Two wells in the area of 119.1 (974 and 4387) have groundwater concentrations exceeding one percent of the compound solubility.

1.2 IHSS 119.1 CONCEPTUAL MODEL

The hydrogeologic setting at IHSS 119.1 consists of a thin layer of fill and colluvium overlying weathered claystone bedrock of the Arapahoe or Laramie Formations (see RFI/RI, DOE 1994). Colluvial material consists of sandy clay and clayey gravel. Colluvium thickness ranges from three to 18 feet in the vicinity of this study. Groundwater occurs at a depth of approximately eight feet near the southern boundary of IHSS 119.1. The weathered claystone bedrock beneath OU 1 has a mean hydraulic conductivity that is two orders of magnitude lower than the OU 1 colluvium (1×10^{-6} cm/s in claystone and 1×10^{-4} cm/s in Rocky Flats colluvium). Groundwater flow is southeasterly along the weathered bedrock and colluvial interface.

2.0 SAMPLING AND DATA QUALITY OBJECTIVES

The primary objective of this Sampling and Analysis Report is to better define the location and approximate volume of contaminated soil to excavate. The data collected identify and delineate the contaminated soil within and directly upgradient of the contaminated groundwater plume.

Table 1-3 Summary of VOC Concentrations in Groundwater, IHSS 119.1, 1987 – 1995

Well Number	Compound	Range of Concentrations (ug/L)
0974	CCl_4	5U – 2,800
	1,1-DCE	500U – 48,000
	TCA	1,220 – 30,250
	PCE	430 – 13,200
	TCE	1,500 – 72,000
1074	CCl_4	2,500E - 5,000
	1,1-DCE	42J - 120
	TCA	50U - 390
	PCE	100U - 49
	TCE	790 - 3,600
0487	CCl_4	46 - 2,600
	1,1-DCE	2U - 12
	TCA	3.2 - 20
	PCE	14 - 590
	TCE	220 - 9,500
4387	CCl_4	40U - 2,100
	1,1-DCE	1,400 - 11,000
	TCA	1,700 - 20,000
	PCE	61 - 7,590
	TCE	100 - 15,540
37891	CCl_4	0.2U
	1,1-DCE	0.2U
	TCA	0.1U
	PCE	0.1U - 7.1B
	TCE	0.1U - 1.3
37991	CCl_4	0.1U - 0.2
	1,1-DCE	0.2U
	TCA	0.1U
	PCE	0.1U - 16
	TCE	0.1U - 3.3
32591	CCl_4	0.1
	1,1-DCE	0.68 - 6
	TCA	0.4 - 2
	PCE	1 - 3
	TCE	5U - 1100

Legend:

U – Not detected at or above method detection limit
B – Appeared in method blank
E – Estimated value
J – Estimated Value
Note: Well 0587 had 12 ug/L TCE on (8/92), Well 33491 had 1 ug/L TCE (11/94), and Wells 33691 and 38291 were not samples.

2.1 DATA QUALITY OBJECTIVES

The Data Quality Objective is to acquire adequate field screening data to approximately define the three-dimensional extent of contaminated soil in IHSS 119.1. These data will be used to design a future excavation project to remove contaminated soil.

2.2 DATA ADEQUACY

Previous subsurface soil investigations have been broad in scope and did not concentrate on locating a source area(s) for the contaminated groundwater observed at IHSS 119.1. There appeared to be a lack of aerial coverage and subsurface data in the previous drum storage area of IHSS 119.1, where contaminated groundwater was detected. The subsurface soils in the drum storage area were investigated to assess the upgradient extent of the groundwater contaminant source. The soils in the vicinity of the contaminated groundwater were evaluated to determine the downgradient extent of the contaminant source.

3.0 SAMPLE COLLECTION AND ANALYSES

3.1 SAMPLING AND ANALYSES

All boreholes were drilled with a hydraulic push drill rig to two to six feet into bedrock or to a sufficient depth to confirm the presence of weathered bedrock. Depths of the boreholes averaged between 12 to 20 feet.

Samples were collected continuously in two-foot intervals from the surface to approximately four feet into bedrock using a hydraulic sampling tool (Geoprobe). Core samples were first subjected to radiological field screening for the detection of radiological contamination, and then logged. They were then placed in eight ounce glass jars and sealed. The samples were inspected visually for evidence (staining or free product) of liquid phase VOCs. The jars and soil samples were warmed to approximately 20° to allow any VOCs present in the soil samples to volatilize in the sealed container's headspace. The headspace in the sealed container was then evaluated with an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). Samples with OVA readings of 10 or greater parts per million (ppm) were considered to be above the sampling and analysis plan (SAP) action level for VOCs with respect to this field study. The samples were then placed in core boxes for storage. *Soil Gas Sampling and Field Analysis* (5-21000-ER-OPS-GT.09) procedures were used during the soil sampling. A list of procedures relating to this field analyses is included as Table 3-1.

3.2 SOIL BORING LOCATIONS

Soil borings were located by targeting the area with known groundwater contamination and then following the contaminant plume upgradient (up surface slope) to its source (i.e., contaminated soil). The gradient

controlling the flow of the dense nonaqueous phase liquids (DNAPLs) was believed to be approximately the same as the groundwater gradient, which is approximately the same as the ground surface slope. The initial borings were placed directly upgradient of monitoring wells containing contaminate groundwater. Additional borings were installed upgradient until contaminated subsurface material was no longer observed above the SAP action level.

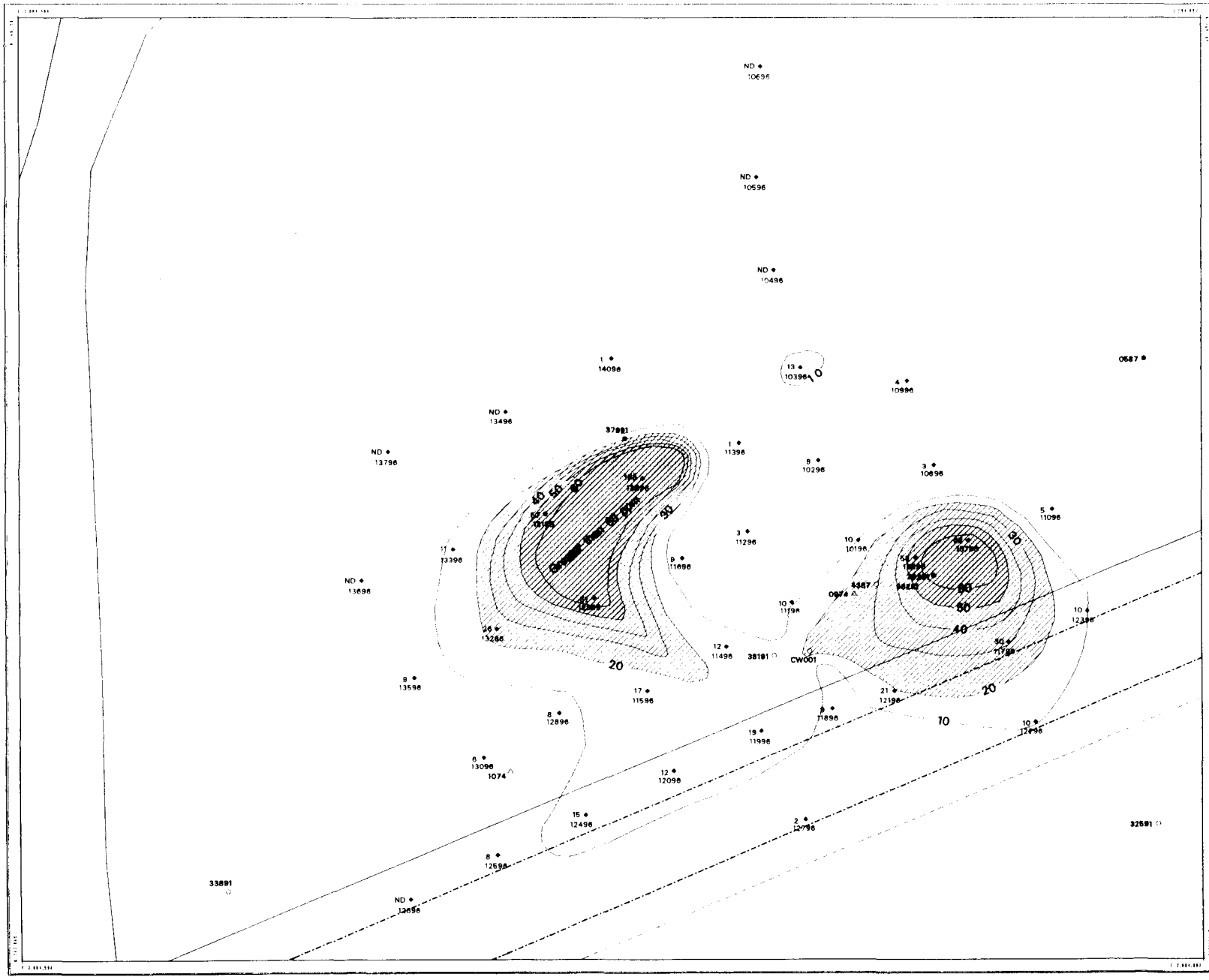
Table 3-1 Field and Administrative Standard Operating Procedures

Identification Number	Procedure Title
5-21000-OPS-FO.3	General Equipment Decontamination
5-21000-OPS-FO.6	Handling of Personal Protective Equipment
5-21000-OPS-FO.7	Handling of Decontaminated Water and Waste Water
5-21000-OPS-FO.10	Receiving, Labeling, and Handling Environmental Materials Containers
5-21000-OPS-FO.11	Field Communications
5-21000-OPS-FO.12	Decontamination Facility Operations
5-21000-OPS-FO.14	Field Data Management
5-21000-OPS-FO.15	Photoionization Detectors and Flame Ionization Detectors
5-21000-OPS-FO.16	Field Radiological Measurements
5-21000-ER-OPS-GT.01	Logging Alluvial and Bedrock Material
5-21000-ER-OPS-GT.02	Drilling and Sampling Using Hollow Stem Auger Techniques
5-21000-ER-OPS-GT.05	Plugging and Abandonment Boreholes
5-21000-ER-OPS-GT.09	Soil Gas Sampling and Field Analysis
4-S64-ER-OPS-GT.39	Push Subsurface Soil Sample
1-50000-ADM-12.01	Control of Measuring and Test Equipment

Contaminated groundwater had previously been identified in two areas (near monitoring wells 1074 and 4387) along the southern boundary of IHSS 119.1. The initial soil boring was placed directly upgradient/slope of monitoring well 4387 (see Figures 3-1 and 6-1). The second soil boring was placed 20 feet upgradient/slope (north) of the initial boring. Soil borings were placed 20 feet apart in a line upgradient/slope until no VOCs were observed above the SAP action level as measured using headspace analyses.

Additional borings were installed 20 feet cross gradient/slope and parallel to the initial borings in a grid pattern. The grid pattern was continued until no soil or groundwater contamination was detected above the SAP action level (as measured using the headspace methodology). When soil or groundwater contamination was observed above the SAP action level in any boring that was not surrounded by borings within the 20 x 20 feet grid pattern, additional borings were installed until the area of upgradient/slope soil and groundwater contamination was delineated.

A headspace soil gas survey was also conducted downgradient of the IHSS boundary to assess the presence of contaminated soil in the vadose zone downgradient/slope from the IHSS and to search for liquid-phase VOCs. Even though there have been no reports of VOCs being stored or discharged south of the IHSS boundary, liquid phase VOCs may have migrated downgradient of the discharge area in the subsurface soils.



881 Hillside Area (OU1) In the Vicinity of IHSS 119.1

Volatile Chlorinated Hydrocarbon Head Space Concentractions

Figure 6-1

EXPLANATION

- Pre-1986 Wells (Abandoned)
- Borehole Locations
- Groundwater WELLS (Alluvium)
- Groundwater WELLS (Bedrock)
- Piezometers
- Individual Hazardous Substance Sites
- Fences
- Dirt Roads
- Contours Intervals 10 ppm

ND = Not Detected
NS = Not Sampled
Head Space readings in ppm
Detection limit 0.1 ppm

Concentrations represent *greatest readings* from 0-22 feet below grades

- Estimated excavation Area using 20ppm head space concentrations as the cut off.
- Estimated excavation area using 50ppm head space concentrations as the cut off.

DATA SOURCE:
Ground Water data provided by RMRS/Hydrogeology, 1996.
Borehole Sampling locations provided by Geosciences.

Scale = 1 : 250
1 inch represents approximately 21 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
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MAP ID: Fig6-1

April 26, 1996

3.3 SOIL BORING SURVEYING AND ABANDONMENT

The borings were marked with unique numbered stakes and flags immediately after completion of each individual boring. The numbering system on the flags correlated with the sample analyses numbering system. Boring locations were surveyed using a Global Positioning System (GPS) which provides digital location information. These GPS-surveyed coordinates were stored in the Rocky Flats Environmental Database System (RFEDS). The digital information was used to produce computer-generated maps of the soil boring locations. The GPS survey was conducted in accordance with the manuals provided by the manufacturer of the surveying equipment, Ashtech, Inc.

The borings were abandoned in accordance with procedure 5-21000-ER-OPS-GT.05, *Plugging and Abandonment of Boreholes*, which was modified through a Document Modification Request (DMR) as follows: "Boreholes were backfilled with powdered or granular bentonite from ground surface."

4.0 SAMPLE DESIGNATION

A block of one hundred location codes was obtained from RFEDS. These RFEDS location codes were indexed to appropriate sample location designations in the field logbook and on a sketch map of the area. Soil cores that were subject to field screening were identified by the sample location code and depth interval where each sample was obtained.

5.0 SAMPLING EQUIPMENT AND PROCEDURES

Sampling was conducted using the Geoprobe drilling rig, which was equipped for core recovery. The core recovery equipment was operated in accordance with procedures presented in GT.02, subsection 5.3.5, and as modified by GT.39, *Push Subsurface Soil Sample*.

Core samples were subject to field screening by visual techniques and by OVA/FID instruments operated in accordance with procedures GT.09, *Soil Gas Sampling and Field Analysis*, subsections 5.1 and 5.2, and FO.15, *Photoionization Detectors and Flame Ionization Detectors*. Calibration verification, modified through a DMR, performed daily and not after every 20 samples as specified in the procedure. The SAP determined that calibration the OVA daily was adequate. Headspace analysis was performed using sealed containers.

A field notebook was created and maintained for the project by the project manager's designee. This notebook was used in conjunction with the appropriate field data forms that were required by the operating procedures governing the field activities occurring during this project. It was not necessary to duplicate items recorded on field data forms in the field notebook, but if additional clarification of entries on the forms was required, they were recorded in the field notebook. The field notebook included time and date information concerning the field activities and a sketch map of actual sample locations. Soil cores were

logged in accordance with procedure 5-21000-ER-OPS-GT.01, *Logging Alluvial and Bedrock Material* with the following exceptions. The logging was conducted with sufficient detail in the field to accommodate the objective of this project, detailed logging was not performed as described in sections 6.1 and 6.2 apart from subsection 6.2.1 of the procedure. The procedure changes were made through a DMR. Soil core observations were recorded on Form GT.1A, *Rocky Flats Plant Borehole Log* and not on Form GT.1B, *Preliminary Well-Site Field Log*. Soil core was screened for VOCs and radioactive contaminants. The cores were used for ambient temperature headspace (ATH) readings per GT.09, and then placed into a core box and stored for future reference. Samples for ATH were labeled with location code and depth interval. Soil samples were not photographed.

6.0 RESULTS OF FIELD INVESTIGATION

Forty soil borings (numbers 10196 through 14096) were installed as part of the contaminated soil investigation. Twenty-nine soil borings were installed inside IHSS 119.1 and 11 were installed directly downgradient of the IHSS. Table 6-1 contains the soil boring numbers, location coordinates, and the OVA/FID headspace readings. The complete soil boring logs are contained in Appendix A. No staining or free-phase VOCs were observed as a result of the visual inspections. Soil samples with the greatest OVA/FID readings were screened with a black light, but no positive results (i.e., florescence) were observed. The lack of black light florescence is an indication that liquid free-phase VOCs were not present in the cores. The black light methods are not sensitive enough to identify residual VOCs.

Two potential groundwater contamination source areas were identified during this project. Figure 6-1 shows the two contaminant source areas in IHSS 119.1. The eastern most source area is located directly east of recovery well CW001, and the western source area is located approximately 50 feet northwest of recovery well CW001.

Figure 6-1 shows the highest headspace concentration observed from all samples collected at each soil boring. The concentrations were contoured to help identify the areas that should be excavated to remove the groundwater contaminant source.

The eastern source area was first detected in soil boring 13996 near the location of radionuclide-contaminated soil removed in 1994. Four soil borings (10796, 11796, 12196, and 13996) in the eastern source area contained soil samples that exhibited headspace readings above 20 ppm. Of these four, only two soil borings (10796 and 13996) exhibited headspace readings above 50 ppm. The eastern source area is surrounded by soil borings that exhibited maximum headspace readings below 20 ppm. The following soil borings surround the eastern source area: soil boring 10896 upgradient, 11096 on the east flank, 11196 on the west flank, and 12296 on the downgradient side.

Table 6-1 Borehole Location and Headspace Data

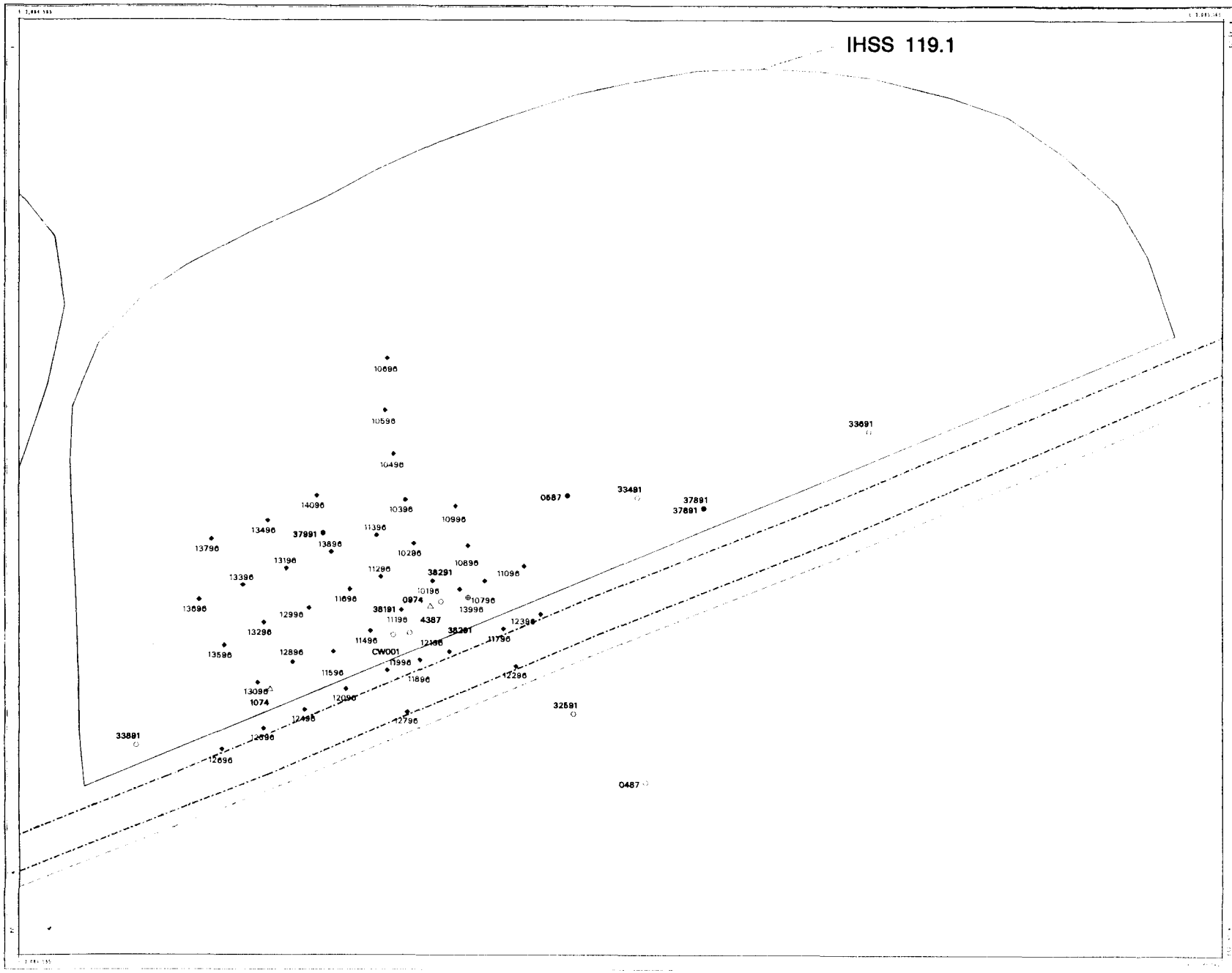
Borehole Number	Borehole Location		Surface Elevation	Depth to Bedrock	Top of Bedrock	Organic Vapor Analyzer (OVA) Flame Ionization Detector (FID) Headspace (readings in parts per million [ppm])											
	Easting	Northing	(ft)	(ft)	(ft)	0' to 2'	2' to 4'	4' to 6'	6' to 8'	8' to 10'	10' to 12'	12' to 14'	14' to 16'	16' to 18'	18' to 20'	20' to 22'	0' to 22'
10196	2084784	748040	5926	12	5914	1	6	10	2	2	2	4	NS	NS	NS	NS	10
10296	2084775	748058	5928	11	5917	ND	1	2	2	8	8	NS	NS	NS	NS	NS	8
10396	2084771	748079	5932	6	5926	ND	ND	ND	ND	13	NS	NS	NS	NS	NS	NS	13
10496	2084765	748101	5934	6	5928	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	ND
10596	2084761	748122	5936	4	5932	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	ND
10696	2084762	748147	5938	3	5935	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	ND
10796	2084809	748040	5925	6	5919	ND	1	4	23	62	19	2	NS	NS	NS	NS	62
10896	2084801	748057	5929	8	5922	ND	1	ND	1	1	3	NS	NS	NS	NS	NS	3
10996	2084795	748076	5931	4	5928	ND	ND	ND	ND	4	NS	NS	NS	NS	NS	NS	4
11096	2084828	748047	5924	8	5916	ND	ND	ND	ND	5	1	NS	NS	NS	NS	NS	5
11196	2084769	748026	5925	18	5907	3	ND	1	4	6	4	4	2	2	10	3	10
11296	2084759	748042	5928	18	5911	ND	1	ND	1	1	1	1	1	3	3	NS	3
11396	2084757	748062	5930	7	5924	ND	ND	ND	ND	1	NS	NS	NS	NS	NS	NS	1
11496	2084754	748016	5925	14	5911	ND	1	2	3	6	7	4	12	2	NS	NS	12
11596	2084736	748006	5925	14	5911	ND	1	2	2	2	10	16	17	1	NS	NS	17
11696	2084744	748036	5927	16	5911	ND	ND	3	8	9	5	3	4	4	3	NS	9
11796	2084818	748017	5921	6	5915	ND	ND	ND	5	15	30	NS	NS	NS	NS	NS	30
11896	2084778	748002	5922	9	5913	ND	ND	ND	3	6	9	NS	NS	NS	NS	NS	9
11996	2084762	747997	5922	12	5910	ND	ND	1	3	12	12	8	19	5	NS	NS	19
12096	2084742	747988	5922	8	5914	ND	ND	1	10	12	11	NS	NS	NS	NS	NS	12
12196	2084792	748006	5921	7	5914	ND	1	2	3	17	21	NS	NS	NS	NS	NS	21
12296	2084824	747999	5921	7	5914	ND	ND	ND	ND	2	10	6	NS	NS	NS	NS	10
12396	2084836	748024	5921	7	5914	ND	ND	1	1	4	10	NS	NS	NS	NS	NS	10
12496	2084722	747978	5923	6	5917	ND	ND	1	1	15	NS	NS	NS	NS	NS	NS	15
12596	2084702	747969	5923	5	5918	ND	ND	ND	ND	7	8	NS	NS	NS	NS	NS	8
12696	2084682	747959	5924	7	5917	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	ND
12796	2084772	747977	5921	10	5911	ND	ND	1	1	2	1	ND	NS	NS	NS	NS	2
12896	2084716	748001	5925	11	5914	ND	ND	1	7	8	2	NS	NS	NS	NS	NS	8
12996	2084724	748027	5928	14	5914	1	2	10	13	7	61	53	10	NS	NS	NS	61
13096	2084699	747991	5926	11	5915	ND	1	2	1	1	2	6	2	NS	NS	NS	6
13196	2084713	748046	5930	6	5924	ND	ND	ND	10	35	57	NS	NS	NS	NS	NS	57
13296	2084702	748020	5929	8	5921	1	1	3	12	24	26	NS	NS	NS	NS	NS	26
13396	2084692	748038	5931	5	5926	ND	ND	ND	ND	4	9	11	NS	NS	NS	NS	11
13496	2084704	748069	5934	4	5930	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	ND
13596	2084683	748009	5930	12	5918	1	1	2	2	4	9	3	NS	NS	NS	NS	9
13696	2084671	748031	5929	7	5922	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	ND

Table 6-1 (continued)

Borehole Number	Borehole Location		Surface Elevation	Depth to Bedrock	Top of Bedrock	Organic Vapor Analyzer (OVA) Flame Ionization Detector (FID) Headspace (readings in parts per million [ppm])											
	Easting	Northing	(ft)	(ft)	(ft)	0' to 2'	2' to 4'	4' to 6'	6' to 8'	8' to 10'	10' to 12'	12' to 14'	14' to 16'	16' to 18'	18' to 20'	20' to 22'	0' to 22'
13796	2084677	748060	5934	6	5928	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	ND
13896	2084735	748054	5930	6	5924	ND	ND	ND	1	6	9	166	NS	NS	NS	NS	166
13996	2084797	748036	5924	9	5916	58	52	25	37	6	4	NS	NS	NS	NS	NS	58
14096	2084728	748081	5934	9	5925	ND	1	ND	1	ND	ND	1	NS	NS	NS	NS	1

Legend:

NS – Not selected
ND – Not determined



881 Hillside Area (OU1) In the Vicinity of IHSS 119.1

IHSS 119.1 Monitoring Wells and Boring Locations

Figure 3-1

EXPLANATION

- Pre-1986 Wells (Abandoned)
- Borehole Locations
- Groundwater WELLS (Alluvium)
- Groundwater WELLS (Bedrock)
- Piezometers
- Individual Hazardous Substance Sites
- Fences
- Dirt Roads

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr., EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - (date unknown)
Ground Water data provided by RMRS/Hydrogeology. - 1995.
Borehole Sampling locations provided by Geosciences.

Scale = 1 : 520
1 inch represents approximately 43 feet

10 0 20 40 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
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MAP ID: Fig3-1

April 24, 1996

The western source area was first detected in soil boring 12996. Four soil borings (12896, 13196, 13296, and 13896) in the western source area contained soil samples that exhibited headspace readings above 20 ppm. Of these four, three soil borings (12896, 13196, and 13896) exhibited headspace readings above 50 ppm. The western source area is surrounded by soil borings that exhibited maximum headspace readings below 20 ppm. The following soil borings surround the western source area: soil borings 13496 and 14096 upgradient, 11396 and 11696 on the east flank, 13596 and 13696 on the west flank, and 11496, 11596, and upgradient, and 11496, 11596, and 12896 on the downgradient side.

Headspace readings above 20 ppm were observed to a depth of 12 feet in the eastern source area and to a depth of approximately 15 feet belowgrade in the western source area. Contamination below 8 feet in depth may be below the groundwater table in some areas of the study area.

Elevated headspace readings were observed below the top of the weathered bedrock in many of the borings. A headspace reading of 166 ppm was detected in soil boring 13896 five to six feet below the top of bedrock. The elevated headspace readings detected below the top of bedrock appeared to correspond to small fractures and cracks observed in the weathered bedrock.

7.0 CONCLUSION (PROPOSED EXCAVATION AREAS)

Excavation of between 900 and 1,900 cubic yards of soil (colluvium and weathered bedrock) should remove most of the contaminant source for the groundwater contaminant plume at IHSS 119.1. It is believed that an area of soil containing VOCs above (SSALs) will be confirmed, during excavation, to be between the 50 and 20 ppm headspace reading contours (see Figure 6-1). If headspace readings of 50 ppm and greater are used to estimate the area to excavate, approximately 900 cubic yards of soil will be removed. If headspace readings of 20 ppm and greater are used to estimate the excavation, then approximately 1,900 cubic yards of soil will be removed.

The volumes of soil proposed to be excavated were calculated by measuring the surface areas within the 50 and 20 ppm contours in both the source areas. The surface areas in the eastern source were multiplied by 12 feet, which corresponds to the depth that contaminated subsurface soil was observed in that area. The surface areas in the western source were multiplied by 15 feet, which corresponds to the maximum depth that contaminated subsurface soil was observed in that area.

Guidelines for correlating headspace analyses to laboratory analyses for DNAPLs in soils could not be identified. However, guidelines for using headspace analyses for identifying soils contaminated with light nonaqeous phase liquids (LNAPLs) were developed by the Florida Department of Environmental Regulation (FDER) and documented in a publication *titled Guidelines for Assessment and Remediation of Petroleum Contaminated Soils* (FDER 1992). The FDER studies found that with soils contaminated with fresh gasoline, headspace readings of 500 ppm roughly corresponded to a total hydrocarbon concentration in soil of 10 to 20 ppm.

The primary volatile constituent in gasoline (benzene) has a similar vapor pressure as three of the VOCs found at IHSS 119.1 (TCE, 1,1-DCE, and CCL_4). Table 7-1 lists relevant compounds and their respective vapor pressures. The other VOCs found at IHSS 119.1 (PCE and TCA) have vapor pressures of approximately 1/10 that of benzene. Headspace readings of 50 ppm for PCE and TCA should approximate 10 to 20 ppm concentration in soil. The SSALs for PCE and TCA are 11.5 and 9.27 ppm, respectively.

The 50 ppm headspace reading contour line, as shown on Figure 6-1, was chosen as the minimum proposed excavation area because of the vapor pressure of PCE and TCA. The maximum proposed excavation area was chosen as the 20 ppm headspace reading contour line on Figure 6-1. Using FDER guidance, field data, and the headspace concentration contour maps, the following decisions were made:

- Soil located within the 50 ppm headspace reading contour line probably contains residual VOCs but free-phase VOCs are most likely not mobile. This area presumably is the primary source for groundwater contamination at this IHSS.

- Soil located within the 20 to 50 ppm headspace reading contours probably contains groundwater or residual groundwater (water that is trapped in the soil) contaminated with VOCs, and may contain residual VOCs. This area probably is a minor source for groundwater contamination at this IHSS.

- Soil located between the 20 ppm headspace readings contour and within the vicinity of the soil borings that registered detectable OVA/FID readings, probably contains only groundwater or residual groundwater with low levels of dissolved VOCs. This area is probably not a source for groundwater contamination at this IHSS.

Table 7-1 Vapor Pressures of IHSS 119.1 and Gasoline Constituents

Common Gasoline Constituents	
Compounds	**Vapor Pressure (ATM)**
Benzene	0.125
Toluene	0.0371
Xylenes	0.0106
Ethylbenzene	0.0126
IHSS 119.1 Constituents	
Tetrachloroethene	0.0242
1,1,1-Trichloroethane	0.163
Trichloroethene	0.0948
Carbon tetrachloride	0.148
1,1-Dichloroethene	0.3

7.1 DISCUSSION OF EXCAVATION SIZE

Excavating within the 50 ppm contour on Figure 6-1 to a depth of approximately 15 feet in the western area and 12 feet in the eastern area will probably remove most of the soil contaminated with residual VOCs above the SSALs. However, the evaluation of the soil gas data indicates that the soil within the 50 ppm headspace reading contour is surrounded by soil containing residual and mobile groundwater contaminated with dissolved VOCs.

By removing the soil contaminated with residual VOCs most of the groundwater contaminant source material should be removed; but the soil contaminated with dissolved VOCs in residual groundwater will remain as a low-level contaminant source for the groundwater directly downgradient of IHSS 119.1.

Excavating within the 50 ppm headspace reading contour line may only require the removal of monitoring well 37991. No other wells or piezometers should be affected.

Excavating within the 20 ppm headspace reading contour on Figure 6-1 to a depth of approximately 15 feet in the western area and 12 feet in the eastern area will probably remove most the soil contaminated with residual VOCs and most of the soil contaminated with dissolved VOCs in residual groundwater. The levels of dissolved VOCs in the groundwater downgradient of IHSS 119.1 should decrease much more quickly if the soil within the 20 ppm headspace reading contour is removed rather than within the 50 ppm headspace contour line. However, excavating within the 20 ppm headspace reading contour may result in removing soil that has contaminant levels below the SSALs.

Excavating within the 20 ppm headspace reading contour line may require the removal of monitoring wells 37991, 38191, and 4387; piezometer 38291; and recovery well CW001. No other wells or piezometers should be affected. If removal of recovery well CW001 is required, the groundwater recovery and treatment at IHSS 119.1 will be terminated. However, the soil excavation should negate the need for remediation of groundwater at this IHSS.

The actual size of the excavation will likely be determined in the field during remediation. The excavation will use onsite screening methods to determine the concentration of contaminants of concern in excavated soils.

8.0 REFERENCES

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DOE 1996, *Draft Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site,* U.S. Department of Energy, Rocky Flats Plant, Golden, Colorado, March.

EPA 1992, *Dense Nonaqueous Phase Liquids -- A Workshop Summary,* EPA/600/R-92/030, Office of Research and Development, February.

FDER 1992, *Guidelines for Assessment and Remediation of Petroleum Contaminated Soils,* Florida Department of Environmental Regulation, Tallahassee, Florida, May.

Appendix A

Soil Boring Logs

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5926 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH 748040	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	10196
EAST 2084784	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/16/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER

TEMPO GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%	2 00 /2 00	5926	0			CL	0 0-2 0' Gravelly Clay moist, stiff to very stiff, f g to c g gravel, angular trace to some f g to c g sand FID 0-1 0' 1 0 ppm 1 0-2 0' 1 0 ppm
					5925	1				
					5924	2			CL	2 0-4 0' Sandy Clay moist, stiff, some f g to c g sand FID 2 0-2 6' 1 0 ppm 2 6-3 5' 2 0 ppm 3 5-4 0' 6 0 ppm
				2 00 /2 00	5923	3				
					5922	4			CL	4 0-6 0' Sandy Clay trace dark brown staining along vertical front (4 6-5 4'), becomes stiff at 5 0', moist FID 4 0-4 6' 6 0 ppm 4 6-5 4' 9 5 ppm 5 4-6 0' 9 0 ppm
				2 00 /2 00	5921	5				
					5920	6			SP	6 0-7 3' Gravelly Sand with clay 38% f g to c g gravel, f g to c g sand clay matrix, slightly moist FID 6 0-6 7' 2 0 ppm 6 7-7 5' 1 0 ppm No recovery (7 3-8 0')
				1 30 /2 00	5919	7				
					5918	8			SP	8 0-9 0' Gravelly Sand with clay same as 6 0-7 3' FID 8 0-8 5' 1 5 ppm 8 5-9 0' 0 5 ppm No recovery (9 0-10 0')
				1 00 /2 00	5917	9				
						10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT)	5926 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748040	AREA 001, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	10196
EAST	2084784	LOCATOR NUMBER 18	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/16/96	
REMARKS	BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER						

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	1 00 /2 00	5916	10			GC	10 0-11 0' Sandy Gravel thin sandy clay layer at 10 5' ø 1 in orange brown, f g to c g gravel, FID 10 0-10 5' 2 0 ppm 10 5-11 0' 1 5 ppm No recovery (11 0-12 0')
				5915	11				
				5914	12			CL	12 0-12 4' Sandy Clay fine sand, orange brown to brown, moist, no free water FID 12 0-12 5' 1 0 ppm
			2 00 /2 00	5913	13			CLAYSTONE	12 4-14 0' Top of Bedrock at 12 4 Claystone No free water FID 12 5-13 0' 0 5 ppm 13 0-13 5' 4 0 ppm 13 5-14 0' 3 0 ppm
				5912	14				
				5911	15				Total Depth Drilled 14 00
				5910	16				
				5909	17				
				5908	18				
				5907	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5928 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748058	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	10296
EAST	2084775	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/16/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

TEMPO GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOIL CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%						CL	0 0-1 6 Sandy Clay to Gravelly Clay dark brown, moist, stiff, f g to c g, angular gravel, f g to c g sand FID 0 0-0 6' ND 0 6-1 1' ND 1 1-1 6' ND No recovery (1 6-2 0')
				1 60 /2 00	5927	1				
					5926	2			CL	2 0-3 8' Sandy Clay dark brown, moist, stiff FID 2 0-2 6' 0 2 ppm 2 6-3 2' 0 3 ppm 3 2-3 8' 0 5 ppm No recovery 3 8-4 0')
				1 80 /2 00	5925	3				
					5924	4			CL	4 0-5 5' Sandy Clay same as 2 0-3 8' FID 4 0-5 0' 2 0 ppm 5 0-5 9' 0 3 ppm
				1 90 /2 00	5923	5				
					5922	6			GC	5 5-5 9' Sandy Gravel moist to dry, clay matrix, dense No recovery 5 9-6 0')
				1 60 /2 00	5921	7			GC	6 0-7 0' Sandy Gravel with clay matrix moist, dense FID 6 0-6 8' 1 0 ppm 6 8-7 0' 2 0 ppm
					5920	8			SC	7 0-7 6' Clayey Sand brown, m g to f g sand, moist, dense No recovery (7 6-8 0')
				2 00 /2 00	5919	9			CL	8 0-10 0' Sandy Clay brown, f g to m g sand, moist, plastic, stiff FID 8 0- 9 0' 4 2 ppm 9 0-10 0' 7 6 ppm
						10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5928 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748058	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	10296
EAST	2084775	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/16/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	2 00 /2 00	5918 5917 5916 5915 5914 5913 5912 5911 5910 5909	10 11 12 13 14 15 16 17 18 19 20			CL	10 0-11 1' Sandy Clay brown, trace to some f g sand decreasing with depth moist, plastic, slightly stiff FID 10 0-11 0' 6 8 ppm 11 0-12 0' 8 0 ppm
								CLAYSTONE	11 1-12 0' Top of Bedrock 11 1' Claystone gray, soft, plastic, moist No free water
									Total Depth Drilled 12 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 10 00	GROUND ELEVATION (FT)	5932 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748079	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	10396
EAST	2084771	LOCATOR NUMBER L9	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/16/96	

REMARKS BACKFILL HOLE WITH 3000 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 80 /2 00	5931	1			CL	0 0-1 8' Sandy Clay dark brown, moist, stiff FID 0-0 9' ND 0 9-1 8' ND No recovery (1 8-2 0')
			1 80 /2 00	5930	2			CL	2 0-3 8' Sandy Clay becomes soft, moist, trace f g gravel, some f g sand FID 2 0-2 9' ND 2 9-3 8' ND No recovery (3 8-4 0')
			2 00 /2 00	5929	3			CL	4 0-5 8' Clay with trace sand f g sand FID 4 0-4 5' ND 4 5-5 0' ND 5 0-5 5' ND 5 5-6 0' ND
			1 80 /2 00	5928	4			CL	5 8-6 0' Clay with trace gravel
			1 80 /2 00	5927	5			SANDY CLAYSTONE	6 0-7 8' Top of Bedrock 6 0' Sandy Claystone olive gray brown, mod to slightly blocky, soft, moist, wet along fractures FID 6 0-6 4' ND 6 4-6 9' ND 6 9-7 4' ND 7 4-7 9' 0 1 ppm No recovery (7 8-8 0')
			2 00 /2 00	5926	6			CLAYSTONE	8 0-10 0' Sandy Claystone same as 6 0-7 8' above No free water FID 8 0- 8 5' 1 0 ppm 8 5- 9 0' 2 5 ppm 9 0- 9 5' 6 5 ppm 9 5-10 0' 13 0 ppm
			2 00 /2 00	5925	7				
				5924	8				
				5923	9				
					10				Total Depth Drilled 10 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 10 00	GROUND ELEVATION (FT)	5934 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748101	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	10496
EAST	2084765	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/17/96	
REMARKS	BACKFILL HOLE WITH 3000 ML BENTONITE NO FREE WATER						

TEXTURE GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%						CL	0 0-0 9' Silty Clay with some sand dark brown, moist, slightly stiff FID 0-0 4' ND No recovery (0 8-2 0')
				0 80 /2 00	5933	1				
					5932	2			CL	2 0-2 1' Gravelly Clay FID 2 0-2 1' ND No recovery (2 1-4 0')
				0 10 /2 00	5931	3				
					5930	4			CL	4 0-4 4' Silty Clay dark brown, moist, slightly stiff, plastic FID 4 0-4 8' ND
				1 60 /2 00	5929	5			CLAYSTONE	4 4-5 6 Top of Bedrock 4 4' Silty Claystone olive gray to orange brown, trace vertical and horizontal fractures moist, soft, plastic, highly weathered FID 4 8-5 6' ND No recovery (5 6-6 0')
					5928	6				
				1 80 /2 00	5927	7			CLAYSTONE	6 0-7 8' Claystone same as 4 4-5 6', strong FeOx staining along fractures FID 6 0-6 9' ND 6 9-8 0' ND No recovery (7 8-8 0')
					5926	8				
				1 60 /2 00	5925	9			CLAYSTONE	8 0-9 6' Claystone same as 6 0-7 8', some trace MnO2 staining FID 8 0-8 9' ND 8 9-9 6' ND No recovery (9 6-10 0')
						10				Total Depth Drilled 10 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 10 00	GROUND ELEVATION (FT) 5936 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748122	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	10596
EAST	2084761	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/17/96	

REMARKS BACKFILL HOLE WITH 3300 ML BENTONITE NO FREE WATER

CHEMICAL SAMPLE DEPTH
GRADATIONAL SAMPLE DEPTH
SAMPLE NUMBER
SAMPLE GRAIN SIZE (0% 50% 100%)
PERCENT RECOVERY (0% 100%)
RECOVERY/INTERVAL
DATUM(FT)
DEPTH(FT)
WELL OR PIEZOMETER CONSTRUCTION
LITHOLOGY
UNIFIED SOILS CLASSIFICATION OR ROCK TYPE
DESCRIPTION

RECOVERY/INTERVAL	DATUM(FT)	DEPTH(FT)	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	5936	0	CL	0 0-0 6' Sandy Clay dark brown FID 0-0 6' ND
1 20 /2 00	5935	1	GC	0 6-2 0' Clayey Gravel FID 0 6-1 2' ND No recovery (1 2-2 0')
	5934	2	CL	2 0-3 6' Sandy Clay dark brown, moist, and slightly plastic FID 2 0-2 8' ND 2 8-3 6' ND
1 60 /2 00	5933	3		No recovery (3 6-4 0')
	5932	4	SILTY CLAYSTONE	4 0-5 8' Top of Bedrock 4 0' Silty Claystone olive gray to orange brown, plastic, soft, along some vertical and horizontal fractures FID 4 0-4 9' ND 4 9-5 8' ND
1 80 /2 00	5931	5		No recovery (5 8-6 0')
	5930	6	SILTY CLAYSTONE	5 0-8 0' Silty Claystone same as 4 0-5 8', 45 degree fracture with FeO2 enfilling, at 7 0' change to predominantly olive gray color FID 6 0-7 0' ND
2 00 /2 00	5929	7		
	5928	8	SILTY CLAYSTONE	8 0-10 0' Silty Claystone same as 4 0-5 8' No free water FID 8 0- 9 0' ND 9 0-10 0' ND
2 00 /2 00	5927	9		
		10		Total Depth Drilled 10 00

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 8 00	GROUND ELEVATION (FT) 5938 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH 748147	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	10696
EAST 2084762	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/17/96	

REMARKS BACKFILL HOLE WITH 3000 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5938	0			CL	0 0-0 6' Gravelly Clay dark brown, stiff, moist FID 0-0 8' ND
			1 60 /2 00	5937	1			GC	0 6-1 6' Clayey Gravel dense, dark brown, moist to dry FID 0 8-1 6' ND No recovery (1 6-2 0')
				5936	2			CL	2 0-3 0' Clay possibly with bedrock roots, moist FID 2 0-2 8' ND 2 8-3 8' ND
			1 60 /2 00	5935	3			CLAYSTONE	3 0-4 0' Top of Bedrock 3 0' Claystone pale olive to orange brown, soft, plastic, moist caliche, FeO2 staining along fractures
				5934	4			CLAYSTONE	4 0-5 8' Claystone same as 3 0-4 0', vertical and horizontal 45 degree fracture with limonite FID 4 0-4 9' ND 4 9-5 8' ND No recovery (5 8-6 0')
			1 80 /2 00	5933	5				
				5932	6			CLAYSTONE	6 0-7 8' Claystone same as 3 0-4 0', trace MnO2, some FeO2 along fractures, moist, becomes mod weathered @ 7 0' No free water FID 6 0-6 9' ND 6 9-7 8' ND No recovery (7 8-8 0')
			1 80 /2 00	5931	7				
				5930	8				Total Depth Drilled 8 00
				5929	9				
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5925 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748040	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	10796
EAST	2084809	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/22/96	

REMARKS BACKFILL HOLE WITH 4 2 L BENTONITE/HYDRATE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	1 40 /2 00	5925 5924	0 1			CL	0 0-1 0 Gravelly Clay dark brown, moist, stiff, angular gravel, silt/sand FID 0-0 5' ND 0 5-1 4' ppm
				5923	2			GC	1 0-1 4' Clayey Gravel f g gravel to f g to c g sand clay matrix, dense, moist No recovery (1 4-2 0')
			1 80 /2 00	5922	3			GC	2 0-3 8' Clayey Gravel same as 1 0-1 4' above FID 2 0-2 9' 0 8 ppm 2 9-3 8' 0 6 ppm No recovery (3 8-4 0')
				5921	4			CL	4 0-5 8' Clay gray, moist, soft, possibly with bedrock, and plastic FID 4 0-4 9' 1 1 ppm 4 9-5 8' 3 9 ppm No recovery (5 8-6 0')
			1 80 /2 00	5920	5				
				5919	6			CLAYSTONE	6 0-7 8' Top of Bedrock 6 8' Claystone with FeO2 staining, gray to brown trace limonite with limonite, moist, soft, friable FID 6 0-6 9' 18 0 ppm 6 9-7 8' 23 0 ppm No recovery (7 8-8 0')
			1 80 /2 00	5918	7				
				5917	8			CLAYSTONE	8 0-10 0' Claystone same as 6 0-7 8' above, with limonite and MnO2 gray to brown FID 8 0- 9 0' 62 0 ppm 9 0-10 0' 36 0 ppm
			2 00 /2 00	5916	9				
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5925 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748040	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	10796
EAST	2084809	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/22/96	

REMARKS BACKFILL HOLE WITH 4 2 L BENTONITE/HYDRATE NO FREE WATER

TEMPO GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%		5915	10			CLAYSTONE	10 0-12 0' Claystone same as 8 0-10 0', becoming blocky, soft, friable, plastic FID 10 0-11 0' 19 0 ppm 11 0-12 0' 2 8 ppm
				2 00 /2 00	5914	11				
					5913	12			CLAYSTONE	12 0-14 0' Claystone same as 10 0-12 0', mod, horizontal, vertical, and random fractures, with limonite, soft, plastic, friable FID 12 0-13 0' 1 5 ppm 13 0-14 0' 2 0 ppm
				2 00 /2 00	5912	13				
					5911	14				Total Depth Drilled 14 00
					5910	15				
					5909	16				
					5908	17				
					5907	18				
					5906	19				
						20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5929 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748057	AREA OU1, THSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	10896
EAST	2084801	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/22/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

HEMIC GRADATIONAL SAMPLE DEPTH | PLE D | SAMPLE NUMBER | SAMPLE GRAIN SIZE (0% 50% 100%) | PERCENT RECOVERY (0% 100%) | RECOVERY/INTERVAL | DATUM (FT) | DEPTH (FT) | WELL OR PIEZOMETER CONSTRUCTION | LITHOLOGY | UNIFIED SOILS CLASSIFICATION OR ROCK TYPE | DESCRIPTION

RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)
	5929	0
1 50 /2 00	5928	1
	5927	2
2 00 /2 00	5926	3
	5925	4
1 50 /2 00	5924	5
	5923	6
2 00 /2 00	5922	7
	5921	8
1 60 /2 00	5920	9
		10

UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
CL	0 0-1 2' Sandy Clay brown, soft, roots, and moist FID 0-0 5' 0 1 ppm 0 5-1 5 ND
GC	1 2-1 5' Clayey Gravel dark brown, soft-mod dense matrix No recovery (1 5-2 0')
CL	2 0-3 0' Gravelly Clay brown, soft, moist FID 2 0-3 0' 0 6 ppm
CL	3 0-4 0' Sandy Clay brown, soft moist FID 3 0-4 0' 0 3 ppm
CL	4 0-4 5' Sandy Clay brown, soft, moist, trace gravel FID 4 0-4 5' ND
CL	4 5-5 5' Clay brown-gray, trace gravel, sand, moist, soft, plastic FID 4 5-5 5' 0 1 ppm No recovery (5 5-6 0')
CL	6 0-7 5' Clay same as 4 5-5 5' above FID 6 0-7 0' 0 2 ppm 7 0-8 0' 0 6 ppm
CLAYSTONE	7 5-8 0' Top of Bedrock 7 5' Claystone gravel, some brown, soft, plastic, friable moist, highly weathered
CLAYSTONE	8 0-9 6' Claystone same as 7 5-8 0' above FID 8 0-9 0' 0 7 ppm 9 0-9 6' 0 5 ppm No recovery (9 6-10 0')

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5929 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH 748057	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST	M WOOD	10896
EAST 2084801	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED	01/22/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			2 00 /2 00	5918	10			CLAYSTONE	10 0-12 0' Claystone becomes brown, trace lignite, same as 7 5-8 0' above, med structure, weathered FID 10 5-11 0' 1 2 ppm 11 0-12 0' 2 6 ppm
				5917	11				
				5916	12				Total Depth Drilled 12 00
				5915	13				
				5914	14				
				5913	15				
				5912	16				
				5911	17				
				5910	18				
					19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 10 00	GROUND ELEVATION (FT)	5931 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748076	AREA OU1, THSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	10996
EAST	2084795	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/22/96	

REMARKS BACKFILL HOLE WITH 3000 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 80 /2 00	5930	1			CL	0 0-1 8' Sandy Clay with gravel brown, stiff, moist clay, slightly plastic, roots FID 0-0 9' 0 4 PPM 0 9-1 8' ND No recovery (1 8-2 0')
			2 00 /2 00	5928	3			CL	2 0-3 5' Sandy Clay moist, gray-brown, soft, plastic, trace gravel and sand, trace roots FID 2 0-3 0' ND 3 0-4 0' ND
			0 80 /2 00	5926	5			CLAYSTONE CLAYSTONE IRONSTONE	3 5-3 8' Top of Bedrock 3 5' Claystone with caliche 3 8-4 0' Ironstone FeO2 cemented 4 0-4 8' Ironstone FeO2 cemented - very hard FID 4 0-4 6' ND No recovery (4 8-6 0')
			1 60 /2 00	5924	7			CLAYSTONE	6 0-7 6' Claystone gray-olive gray, soft, plastic, friable, very weathered, and some FeO2 along fractures FID 6 0-6 8' ND 6 8-7 6' ND No recovery (7 6-8 0')
			2 00 /2 00	5922	9			CLAYSTONE	8 0-10 0' Claystone same as 6 0-7 6' above FID 8 0- 9 0' 0 1 ppm 9 0-10 0' 4 1 ppm
					10				Total Depth Drilled 10 00

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5924 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH 749047	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	11096
EAST 2084828	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/22/96	

REMARKS BACKFILL HOLE WITH 3 6 L BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	1 60 /2 00	5924	0			CL	0 0-1 6' Sandy Clay with gravel clay dark brown, stiff, moist, roots FID 0-0 8' ND 0 8-1 6' ND No recovery (1 6-2 0')
			2 00 /2 00	5923	1			CL	2 0-4 0' Clay becomes medium brown, f g to c g trace gravel FID 2 0-3 0' ND 3 0-4 0' ND
			1 50 /2 00	5922	2			GC	4 0-5 5' Clayey Gravel red brown, dense, moist, plastic clay matrix FID 4 0 -4 75' ND 4 75-5 50' ND No recovery (5 5-6 0')
			0 20 /2 00	5921	3			GC	6 0-6 2 Clayey Gravel same as above with the thin clay intervals FID 6 0-6 2' ND No recovery (6 2-8 0')
			1 80 /2 00	5920	4			GC	8 0-8 2' Clayey Gravel same as 4 0-5 5' above FID 8 0-8 8' 3 0 ppm
				5919	5			CLAYSTONE	8 2-9 0' Top of Bedrock 8 2' Claystone gray-brown, very weathered, soft to mud hard, blocky, friable FID 8 8-9 6' 4 5 ppm No recovery (9 0-10 0')
				5918	6				
				5917	7				
				5916	8				
				5915	9				
					10				

RELATIVE GRADATIONAL SAMPLE DEPTH

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5924 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748047	AREA 001, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	11096
EAST	2084828	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/22/96	

REMARKS BACKFILL HOLE WITH 3 6 L BENTONITE NO FREE WATER

TEXTURE GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%	2 00 /2 00	5914 5913 5912 5911 5910 5909 5908 5907 5906 5905	10 11 12 13 14 15 16 17 18 19 20			CLAYSTONE	10 0-12 0' Claystone same as 8 2-9 6', good random fracture with limonite, mod hard, and blocky FID 10 0-11 0' 0 5 ppm 11 0-12 0' 0 3 ppm
										Total Depth Drilled 12 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 22 00	GROUND ELEVATION (FT) 5925 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748026	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	11196
EAST	2084769	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/25/96	

REMARKS BACKFILL HOLE WITH 6600 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 80 /2 00	5925 5924	0 1			CL	0 0-1 8' Gravelly Clay clay dark brown, moist, stiff, f g to c g gravel, angular, and some sand and silt FID 0-0 9' ND 0 9-1 8' 3 0 ppm No recovery (1 8-2 0')
			2 00 /2 00	5923 5922	2 3			CL	2 0-4 0' Clay with some brown gravel, some sand and silt roots plastic and soft FID 2 0-3 0' ND 3 0-4 0' ND
			1 80 /2 00	5921 5920	4 5			CL	4 0-5 8' Clay same as 2 0-4 0', becomes grey, trace gravel, and with trace roots FID 4 0-4 9' 0 7 ppm 4 9-5 8' 1 0 ppm No recovery (5 8-6 0')
			2 00 /2 00	5919 5918	6 7			CL	6 0-8 0' Clay same as 4 0-5 8', at 7 0' changes to red brown color FID 6 0-7 0' 3 5 ppm 7 0-8 0' 2 3 ppm
			2 00 /2 00	5917 5916	8 9 10			CL	8 0-10 0' Sandy Clay with trace gravel red brown, f g to c g sand, f g to c g gravel, moist, soft, and plastic FID 8 0- 9 0' 5 5 ppm 9 0-10 0' 4 5 ppm

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 22 00	GROUND ELEVATION (FT)	5925 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748026	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	11196
EAST	2084769	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	8 50	DATE DRILLED	01/25/96	

REMARKS BACKFILL HOLE WITH 6600 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5915	10			GC	10 0-10 8' Clayey Gravel dry - moist, very dense, f g to c g gravel, sand FID 10 0-10 8' 3 5 ppm
			0 80 /2 00	5914	11			GC	10 8-11 5' (driller notes gravel from 10 8-11 5') No recovery (10 8-11 5')
				5913	12			CL	11 5-12 0' Clay red brown, moist, soft, some sand and silt (description from trace on core barrel and driller notes soft driving) No recovery (11 5-12 0')
			1 80 /2 00	5912	13			CL	12 0-13 0' Clay same as 11 5-12 0' above FID 12 0-12 9' 3 5 ppm 12 9-13 5' 3 5 ppm
				5911	14			GC	13 0-13 8' Clayey Gravel moist, red brown, dense, f g to c g gravel, and f g to c g sand No recovery (13 8-14 0')
			1 20 /2 00	5910	15			CL	14 0-14 6' Clay red brown moist, soft, some sand and silt FID 14 0-14 6' 3 2 ppm
				5909	16			GC	14 6-15 2' Clayey Gravel same as 13 0-13 8', becomes wet FID 14 6-15 2 ppm No recovery (15 2-16 0')
			1 10 /2 00	5908	17			GC	16 0-17 1' Clayey Gravel red brown, moist-wet, dense, f g to c g gravel, f g to c g sand, and clayey matrix FID 16 0-17 1' 2 0 ppm No recovery (17 1-18 0')
				5907	18			CH	Clay gray, soft, moist, and very plastic FID 18 0-19 0' 3 0 ppm
			2 00 /2 00	5906	19			CLAYSTONE	18 2-20 0' Top of Bedrock 18 2' Claystone moist - wet, soft, slightly blocky, friable, some lignite, trace wood fragments, leaf imprints, gray-brown FID 19 0-20 0' 10 0 ppm
					20				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 22 00	GROUND ELEVATION (FT)	5925 00	PROJECT NUMBER	GEOCHAR
NORTH 748026	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD
EAST 2084769	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/25/96
REMARKS BACKFILL HOLE WITH 6600 ML BENTONITE					

LOG OF BORING NUMBER

11196

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	1 50 /2 00	5905	20			CLAYSTONE	20 0-21 5' Claystone good vertical fracture with limonite infilling at 21 7' fracture with caliche infilling FID 20 0-21 0' 3 0 ppm 21 0-22 0' 0 5 ppm
				5904	21				
				5903	22				Total Depth Drilled 22 00
				5902	23				
				5901	24				
				5900	25				
				5899	26				
				5898	27				
				5897	28				
				5896	29				
					30				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 20 00	GROUND ELEVATION (FT) 5928 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748042	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	11296
EAST	2084759	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/23/96	

REMARKS BACKFILL HOLE WITH 5400 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 60 /2 00	5927	1			CL	0 0-1 6' Sandy Clay with some gravel dark brown, f g to c g sand, moist, stiff, f g to c g gravel, roots FID 0-0 8' ND 0 8-1 6' ND No recovery (1 6-2 0')
			1 80 /2 00	5925	3			CL	2 0-3 8' Sandy Clay same as 0 0-1 6' above, some trace gravel, roots FID 2 0-2 9' 0 5 ppm 2 9-3 8' ND No recovery (3 8-4 0')
			2 00 /2 00	5923	5			CL	4 0-6 0' Sandy Clay same as 2 0-3 8' FID 4 0-5 0' 0 3 ppm 5 0-6 0' 0 4 ppm
			2 00 /2 00	5921	7			CL	6 0-8 0' Sandy Clay same as 4 0-6 0', less gravel at 6 2' FID 6 0-7 0' 0 6 ppm 7 0-8 0' 1 3 ppm
			2 00 /2 00	5919	9			CL	8 0-10 0' Sandy Clay brown, very plastic, f g to c g sand, occ black to dark brown, fracture or root stain FID 8 0-9 0' 1 3 ppm 9 0-10 0' 0 5 ppm

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 20 00	GROUND ELEVATION (FT) 5928 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748042	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	11296
EAST	2084759	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/23/96	

REMARKS BACKFILL HOLE WITH 5400 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			0 70 /2 00	5918 5917 5916	10 11 12			GC	10 0-10 7' Clayey Gravel brown, dense, moist f g to c g gravel, f g to c g sand, clay matrix, plastic (driller notes - hard - probably gravel from 10 0-12 0') FID 10 0-10 7' 1 4 ppm No recovery (10 7-12 0')
			1 80 /2 00	5915 5914	13 14			GC	12 0-12 6' Clayey Gravel same as 10 0-10 7' FID 12 0-12 8' 1 0 PPM
								CL	12 6-13 8' Sandy Clay gray with brown mottling, plastic, f g sand, moist, soft FID 12 8-13 6' ND No recovery (13 8-14 0')
			2 00 /2 00	5913 5912	15 16			CH	14 0-16 0' Clay gray with orange, moist, soft, very plastic, trace FeO2 FID 14 0-15 0' 0 2 ppm 15 0-16 0' 1 1 ppm
			2 00 /2 00	5911 5910	17 18			CH	16 0-16 5' Clay same as 14 0-16 0' FID 16 0-17 0' 1 6 ppm
								CL	16 5-17 5' Gravelly Clay brown-gray, 10% gravel, plastic, soft to stiff, moist FID 17 0-18 0' 2 6 ppm
								CLAYSTONE	17 5-18 0' Top of Bedrock 17 5' Claystone olive gray to brown, soft weathered, friable, blocky, no bedding
			2 00 /2 00	5909	19			CLAYSTONE	18 0-20 0' Claystone same as 17 5-18 0' above, soft to blocky FID 18 0-19 0' 2 5 ppm 19 0-20 0' 0 3 ppm
					20				Total Depth Drilled 20 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 10 00	GROUND ELEVATION (FT)	5930 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748062	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	11396
EAST	2084757	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/24/96	

REMARKS BACKFILL HOLE WITH 3000 ML BENTONITE NO FREE WATER

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOIL CLASSIFICATION OR ROCK TYPE	DESCRIPTION
					5930	0			CL	0 0-0 4' Sandy Clay dark brown, moist, stiff, roots FID 0-1 4' ND
				1 40 /2 00	5929	1			GC	0 4-1 0' Clayey Gravel dense moist, f g to c g gravel, f g to c g sand, slightly plastic, clay matrix No recovery (1 0-2 0')
					5928	2			CL	2 0-3 6' Clay with some sand gray brown, moist, slightly plastic, roots, caliche FID 2 0-2 8' ND 2 8-3 6' ND No recovery (3 6-4 0')
				1 60 /2 00	5927	3				
					5926	4			CL	4 0-6 0' Clay same as 2 0-3 6' above, becomes more gray with brown FeO2 mottling, plastic, caliche, no roots FID 4 0-5 0' ND 5 0-6 0' 0 3 ppm
				2 00 /2 00	5925	5				
					5924	6			CL	6 0-6 5' Clay same as 4 0-6 0' above FID 6 0-7 0' ND
				2 00 /2 00	5923	7			CLAYSTONE	6 5-8 0' Top of Bedrock 6 5' Claystone moist, gray to olive gray, blocky, soft, friable, slightly plastic to plastic FID 7 0-8 0' 0 1 ppm
					5922	8			CLAYSTONE	8 0-9 0' Claystone orange at 7 8-8 0', very weathered, cont orange to 9 0', becomes silty sandstone with trace v f g sand, trace MnO2 FID 8 0-8 6' 0 2 ppm 8 8-9 6' 0 7 ppm
				1 60 /2 00	5921	9			SILTY SANDSTONE	9 0-9 6' Silty Sandstone f g sand, trace MnO2 No recovery 9 6-10 0'
						10				Total Depth Drilled 10 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 18 00	GROUND ELEVATION (FT)	5925 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748016	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	11496
EAST	2084754	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/24/96	

REMARKS BACKFILL HOLE WITH 5100 ML BENTONITE/HYDRATE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 60 /2 00	5925 5924 5923	0 1 2			CL	0 0-1 6 Sandy Clay dark brown, moist, stiff, roots, f g to c g sand, slightly plastic FID 0-1 0' ND 1 0-1 6' ND No recovery (1 6-2 0')
			1 80 /2 00	5922 5921	3 4			CL	2 0-3 8' Clay same as 0 0-1 6', some gravel, f g to c g, trace caliche FID 2 0-2 9' 0 2 ppm 2 9-3 8' 0 6 ppm No recovery (3 8-4 0')
			2 00 /2 00	5920 5919	5 6			CL	4 0-6 0' Sandy Clay with trace to some gravel orange brown, moist, soft, plastic, f g to c g sand FID 4 0-5 0' 1 8 ppm 5 0-6 0' 2 0 ppm
			2 00 /2 00	5918 5917	7 8			CL	6 0-8 0' Sandy Clay same as 4 0-6 0', gravel zone at 6 5-7 0' FID 6 0-7 0' 3 0 ppm 7 0-8 0' 3 0 ppm
			2 00 /2 00	5916	9 10			CL	8 0-10 0' Sandy Clay same as 4 0-6 0' with trace gravel FID 8 0- 9 0' 5 0 ppm 9 0-10 0' 6 0 ppm

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 18 00	GROUND ELEVATION (FT) 5925 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH 749016	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	11496
EAST 2084754	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/24/96	

REMARKS BACKFILL HOLE WITH 5100 ML BENTONITE/HYDRATE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5915	10			CL	10 0-10 6' Sandy Clay same as 4 0-6 0' FID 10 0-10 6' 6 0 ppm
			1 90 /2 00	5914	11			GC	10 6-11 9' Clayey Gravel brown, moist, dense, f g to c g gravel, f g to c g sand, clay matrix FID 10 6-11 9' 7 0 ppm No recovery (11 9-12 0')
				5913	12			GC	12 0-13 2' Clayey Gravel same as 10 6-11 9' FID 12 0-13 2' 3 5 ppm No recovery (13 2-14 0')
			1 20 /2 00	5912	13				
				5911	14			CLAYSTONE	14 0-16 0' Top of Bedrock 14 0' Claystone moist, gray, soft, very weathered, slightly blocky, friable, 45 degree drilling fracture at 14 5', 15 0', and 15 5' with Limonite FID 14 0-15 0' 11 5 ppm 15 0-16 0' 4 0 ppm
			2 00 /2 00	5910	15				
				5909	16			CLAYSTONE	15 0-18 0' Claystone same as 14 0-16 0', color changes to olive gray, mod weathered, soft, blocky, trace wood, lignite fragment friable FID 16 0-17 0' 2 0 ppm 17 0-18 0' 0 4 ppm
			2 00 /2 00	5908	17				
				5907	18				Total Depth Drilled 18 00
				5906	19				
					20				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 18 00	GROUND ELEVATION (FT)	5925 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH 748006	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	11596
EAST 2084736	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/24/96	

REMARKS BACKFILL HOLE WITH 4800 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/ INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%						CL	0 0-1 6' Sandy Clay with gravel dark brown, moist, roots, stiff, slightly plastic FID 0-1 6' ND No recovery (1 6-2 0')
			1 60 /2 00	5924	1				
				5923	2			CL	2 0-4 0' Sandy Clay brown, moist, trace gravel, roots, plastic FID 2 0-3 0' ND 3 0-4 0' 0 6 ppm
			2 00 /2 00	5922	3				
				5921	4			CL	4 0-5 6' Sandy Clay same as 2 0-4 0' FID 4 0-4 8' 2 0 ppm 4 8-5 6' 1 7 ppm No recovery (5 6-6 0')
			1 60 /2 00	5920	5				
				5919	6			GC	6 0-7 6' Clayey Gravel brown, moist, dense, clay matrix, plastic FID 6 0-6 8' 2 0 ppm 6 8-7 6' 1 7 ppm No recovery (7 6-8 0')
			1 60 /2 00	5918	7				
				5917	8			GC	8 0-8 5' Clayey Gravel same as 6 0-7 6' above, very hard bent sampler FID 8 0-8 6' 1 5 ppm No recovery (8 5-10 0')
			0 50 /2 00	5916	9				
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 18 00	GROUND ELEVATION (FT)	5925 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748006	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	11596
EAST	2094736	LOCATOR NUMBER 18	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/24/96	

REMARKS BACKFILL HOLE WITH 4800 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE (GRAPHIC GRADATIONAL SAMPLE DEPTH)	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	1 20 /2 00	5915	10			GC	10 0-11 2' Clayey Gravel with sand same as 6 0-7 6' f g to c g sand, moist to wet, plastic clay matrix, f g to c g gravel, water @ 11 8' FID 10 0-10 6' 5 5 ppm 10 6-11 2' 9 5 ppm No recovery (11 2-12 0')
				5914	11				
				5913	12			SW	12 0-12 8' Gravelly Sand brown, saturated, f g to c g sand, f g to c g gravel, poorly mod , angular to sub-angular FID 12 0-12 8' 15 5 ppm No recovery (12 8-14 0')
			0 80 /2 00	5912	13				
				5911	14			GW	14 0-14 2' Gravelly Sand same as 12 0-12 8' above FID 14 0-15 0' 15 5 ppm
			2 00 /2 00	5910	15			CLAYSTONE	14 2-16 0' Top of Bedrock 14 2' Claystone olive gray, plastic, moist to wet, soft, friable, trace wood/carbon, becomes moist, very highly weathered FID 15 0-16 0' 17 0 ppm
				5909	16			CLAYSTONE	16 0-18 0' Claystone dark brown, moist, blocky, soft, friable, trace lignite, med wood imprints, mod to st weathered FID 16 0-17 0' 0 6 ppm 17 0-18 0' 0 5 ppm
			2 00 /2 00	5908	17				
				5907	18				Total Depth Drilled 18 00
				5906	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 20 00	GROUND ELEVATION (FT) 5927 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748036	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST M WOOD	11696
EAST	2084744	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/24/96	

REMARKS BACKFILL HOLE WITH 8 X 600 ML BENTONITE WATER @ 13 5'

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 80 /2 00	5927 5926	0 1			CL	0 0-1 8' Gravelly Clay with sand dark brown, moist, stiff to slightly plastic, f g to c g gravel, f g to c g sand, sub-angular to angular FID 0-0 9' 0 2 ppm 0 9-1 8' 0 3 ppm No recovery (1 8-2 0')
			1 80 /2 00	5925 5924	2 3			CL	2 0-3 8' Gravelly Clay same as 0 0-1 8' above but more of a sandy clay with fine gravel FID 2 0-2 9' 0 2 ppm 2 9-3 8' 0 4 ppm No recovery (3 8-4 0')
			2 00 /2 00	5923 5922	4 5			CL	4 0-6 0' Sandy Clay brown, moist, soft, plastic, trace of f g gravel, sub-angular, f g to m g sand FID 4 0-5 0' 1 1 ppm 5 0-6 0' 3 1 ppm
			2 00 /2 00	5921 5920	6 7			CL	6 0-8 0' Sandy Clay same as 4 0-6 0' FID 6 0-7 0' 5 5 ppm 7 0-8 0' 7 6 ppm
			2 00 /2 00	5919 5918	8 9 10			CL	8 0-10 0' Sandy Clay same as 4 0-6 0' FID 8 0- 9 0' 5 3 ppm 9 0-10 0' 8 6 ppm

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 20 00	GROUND ELEVATION (FT)	5927 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748036	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	M WOOD	11696
EAST	2084744	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/24/96	

REMARKS BACKFILL HOLE WITH 8 X 600 ML BENTONITE WATER @ 13 5'

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%		5917	10			CL	10 0-11 0' Sandy Clay same as 4 0-6 0' FID 10 0-11 2' 5 1 ppm
			1 20 /2 00	5916	11			GC	11 0-11 2' Clayey Gravel moist, brown, dense, f g to c g gravel, sub-angular, f g to c g sand, sub-angular No recovery (11 2-12 0')
				5915	12			GC	12 0-13 8' Clayey Gravel becomes wet @ 12 5', becomes saturated @ 13 5' FID 12 0-12 9' 2 6 ppm 12 9-13 8' 2 7 ppm No recovery (13 8-14 0')
			1 80 /2 00	5914	13				
				5913	14			GC	14 0-15 0' Clayey Gravel same as 12 0-13 8' FID 14 0-14 8' 3 0 ppm 14 8-15 6' 4 3 ppm
			1 60 /2 00	5912	15			SW	15 0-15 6' Gravelly Sand brown, wet to saturated, dense No recovery (15 6-16 0')
				5911	16			GC	16 0-16 3' Clayey Gravel saturated FID 16 0-16 6' 3 6 ppm
			0 60 /2 00	5910	17			CLAYSTONE	16 3-16 6' Top of Bedrock 16 3' Claystone light olive gray, moist to wet, very plastic, friable, very weathered, ironstone @ 16 6' No recovery (16 6-18 0')
				5909	18			CLAYSTONE	18 0-19 6' Claystone becomes less weathered, mod to strongly, olive gray, moist, blocky, soft, friable FID 18 0-18 8' 2 6 ppm 18 8-19 6' ND
			1 60 /2 00	5908	19				
					20				Total Depth Drilled 20 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5921 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748017	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	11796
EAST	2094818	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/29/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE

SAMPLE NUMBER	HERTC... PER TO... GRADATIONAL SAMPLE DEPTH	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/ INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%		5921	0			CL	0 0-0 6' Sandy Clay with gravel, dark brown, stiff, plant roots, moist FID 0-1 0' ND
				1 90 /2 00	5920	1			CL	0 6-1 9' Sandy Clay, dark brown, plant roots, moist FID 1 0-1 9' ND No recovery (1 9-2 0')
					5919	2			CL	2 0-2 8' Sandy Clay to clay with sand stiff, reddish brown to dark brown, moist FID 2 0-3 0' 0 2 ppm No recovery (2 8-4 0')
				0 80 /2 00	5918	3				
					5917	4			SM	4 0-4 2' Silty Sand with gravel reddish brown, moist FID 4 0-4 2' 0 2 ppm
				1 50 /2 00	5916	5			CL	4 2-5 5' Silty Clay stiff, moist, grayish brown FID 4 2-5 5' 0 1 ppm No recovery (5 5-6 0')
					5915	6			CLAYSTONE	6 0-7 3' Top of Bedrock 6 0' Claystone w/ silt slightly plastic, moist, some yellow/red mottling (FeO2), olive gray FID 6 0-7 0' 4 5 ppm No recovery (7 3-8 0')
				1 30 /2 00	5914	7				
					5913	8			CLAYSTONE	8 0-9 8' Claystone olive gray, yellowish/brown to yellow red mottling FID 8 0-8 9' 6 8 ppm 8 9-9 8' 14 5 ppm No recovery (9 8-10 0')
				1 80 /2 00	5912	9				
						10				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 592 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH 748017	AREA 001, THSS 119 1	CASING DIAMETER (IN)	GEOLOGIST	W BELCHER	11796
EAST 2084818	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED	01/29/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 80 /2 00	591	10			CLAYSTONE	10 0-11 8' Claystone gray with reddish brown mottling, moist, slightly plastic (10 4-10 8') mod to highly weathered reddish brown to yellow brown clay with gray mottling) FID 10 0-10 9' 20 0 ppm 10 9-11 8' 30 0 ppm No recovery (11 8-12 0')
				590	11				
				589	12				Total Depth Drilled 12 00
				588	13				
				587	14				
				586	15				
				585	16				
				584	17				
				583	18				
				582	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5922 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748002	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	11896
EAST	2084778	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/29/96	

REMARKS BACKFILL HOLE 3600 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	ELEVATION (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5922	0			CL	0 0-1 0' Silty clay with gravel dark brown, roots, moist FID 0-1 1' ND
			1 10 /2 00	5921	1			CL	1 0-1 1' Silty Clay dark brown, low plasticity, moist, roots No recovery (1 1-2 0')
				5920	2			CL	2 0-2 1' Silty Clay dark gray, wet to moist, slightly plastic FID 2 0-2 9' ND
			0 90 /2 00	5919	3			CL	2 1-2 9' Silty Clay with gravel brownish red to reddish brown, some carbon, gravel to qtzite, low plasticity, moist No recovery (2 9-4 0')
				5918	4			CL	4 0-5 0' Silty Clay with gravel moist, brownish red, qtzite and gneiss gravel FID 4 0-5 0' ND
			1 40 /2 00	5917	5			CL	5 0-5 4' Silty Clay with gravel moist, brownish red, qtzite gravel FID 5 0-5 4' ND No recovery (5 4-6 0')
				5916	6			CL	6 0-7 2' Silty Clay same as 5 0-5 4' FID 6 0-6 9' 1 5 ppm 6 9-7 8' 3 0 ppm
			1 80 /2 00	5915	7			ML	7 2-7 8' Clayey Silt with gravel moist, qtzite gravel, angular to subangular No recovery (7 8-8 0')
				5914	8			ML	8 0-9 2' Clayey Silt with gravel same as 7 2-7 8' FID 8 0-8 8' 3 5 ppm 8 8-9 5' 5 5 ppm
			1 50 /2 00	5913	9			CLAYSTONE	9 2-9 5' Top of Bedrock 9 25' Claystone gray to olive gray, reddish brown mottling, slightly plastic, weathered No recovery (9 5-10 0')
					10				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5922 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH 748002	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	11896
EAST 2084778	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/29/96	
REMARKS BACKFILL HOLE 3600 ML BENTONITE						

CAMECO SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%	1 40 /2 00	5912	10			CLAYSTONE	10 0-11 4 Claystone gray to olive gray clay, mod to highly weathered yellowish red mottling, slight to mod plasticity, moist FID 10 0-10 7' 9 0 ppm 10 7-11 4' 8 0 ppm No recovery (11 4-12 0')
					5911	11				
					5910	12				Total Depth Drilled 12 00
					5909	13				
					5908	14				
					5907	15				
					5906	16				
					5905	17				
					5904	18				
					5903	19				
						20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 18 00	GROUND ELEVATION (FT) 5922 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747997	AREA 001, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W. BELCHER	11996
EAST	2084762	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/29/96	

REMARKS BACKFILL 4800 ML BENTONITE FREE WATER @ 12 4'

SAMPLE NUMBER	SAMPLE GRAIN SIZE (GRADATIONAL)	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%		5922	0			CL	0 0-1 2' Silty Clay with gravel dark brown, moist, slightly plastic FID 0-1 2' ND No recovery (1 2-2 0')
			1 20/2 00	5921	1				
				5920	2			CL	2 0-2 9' Clay brown silty clay with gravel, moist, slightly plastic, gravel mainly qtzite FID 2 0-2 9' ND No recovery (2 9-4 0')
			0 90/2 00	5919	3				
				5918	4			CL	4 0-6 0' Silty Clay reddish brown, with gravel (qtzite & gneiss), wet at top, moist elsewhere, slight plasticity FID 4 0-5 0' 0 5 ppm 5 0-6 0' ND
			2 00/2 00	5917	5				
				5916	6			CL	6 0-7 4' Silty Clay and gravel(qtzite) reddish brown, slight plasticity, dry to moist FID 6 0-7 4' 2 5 ppm No recovery (7 4-8 0')
			1 40/2 00	5915	7				
				5914	8			CL	8 0-8 4' Silty Clay reddish brown, moist, slightly plastic FID 8 0-9 3' 11 5 ppm
			1 30/2 00	5913	9			GC	8 4-9 3' Gravel (qtzite) with silty clay reddish brown, moist, slightly plastic No recovery (9 3-10 0')
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 18 00	GROUND ELEVATION (FT)	5922 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	747997	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	11996
EAST	2084762	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/29/96	

REMARKS BACKFILL 4800 ML BENTONITE FREE WATER @ 12 4'

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				1 30 /2 00	5911	11			GC	10 0-11 3' Gravel with silty clay moist, slightly clay reddish brown, slightly plastic, gravel qtzite with some gneiss FID 10 0-11 3' 11 5 ppm No recovery (11 3-12 0')
					5910	12			GC	12 0-12 4' Gravel with silty clay same as 10 0-11 3' FID 12 0-12 4' 8 0 ppm
				0 60 /2 00	5909	13			CLAYSTONE	12 4-12 6' Top of Bedrock 12 4' Claystone brown gray w/ yellow-red mottling, wet at 12 4', plastic No recovery (12 6-14 0')
					5908	14			CLAYSTONE	14 0-15 5' Claystone gray to olive gray clay with yellowish brown to yellowish red mottling, mod plasticity, some carbon, moist to wet FID 14 0-15 0' 19 0 ppm 15 0-15 5' 8 0 ppm No recovery (15 5-16 0')
				1 50 /2 00	5907	15				
					5906	16			CLAYSTONE	16 3-18 0' Claystone gray with some yellowish brown mottling, mod plasticity, moist to wet, hard (very difficult to get sleeve out of core barrel) FID 16 0-17 0' 4 5 ppm 17 0-18 0' 1 5 ppm
				2 00 /2 00	5905	17				
					5904	18				Total Depth Drilled 18 00
					5903	19				
						20				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5922 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH 747988	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12096
EAST 2084742	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 01/29/96	

REMARKS BACKFILL HOLE WITH 3000 ML BENTONITE NO FREE WATER

HEMIC GRADATIONAL	PCE TO SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
					2 00 /2 00	5922	0			CL	0 0-2 0' Silty Clay with gravel moist, slightly plastic, plant roots FID 0-1 0' ND 1 0-2 0' ND
						5921	1				
						5920	2			ML	2 0-3 3' Clayey Silt to silty clay slight plasticity, moist, reddish brown FID 2 0-3 0' ND 3 0-3 8' 0 1 ppm
					1 80 /2 00	5919	3				
						5918	4			GC	3 3-3 8' Gravel (qtzite) with silty clay reddish brown, moist, slightly plastic No recovery (3 8-4 0')
					1 70 /2 00	5917	5			CL	4 0-5 2' Silty Clay low to mod plasticity, moist reddish brown, some gravel (qtzite) FID 4 0-5 0' 0 2 ppm 5 0-5 7' 0 5 ppm
						5916	6			ML	5 2-5 7' Clayey Silt with fine sand reddish brown some gravel (qtzite) moist, slightly plastic No recovery (5 7-6 0')
					1 70 /2 00	5915	7			ML	6 0-6 6' Clayey Silt same as 5 2-5 7' FID 6 0-6 8' 3 0 ppm
						5914	8			CLAYSTONE	6 6-7 7' Top of Bedrock 6 6' Claystone blocky, yellowish brown mottling, some carbon, mod plasticity, moist (bedrock) FID 6 8-7 8' 9 5 ppm No recovery (7 7-8 0')
					2 00 /2 00	5913	9			CLAYSTONE	8 0-10 0' Claystone yellowish brown with gray mottling to gray with yellowish brown mottling, some carbon, mod plasticity, moist FID 8 0- 9 0' 12 0 ppm 9 0-10 0' 11 0 ppm
							10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5922 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	747988	AREA OU1, THSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12096
EAST	2084742	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	01/29/96	

REMARKS BACKFILL HOLE WITH 3000 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (PLOT GRADATIONAL SAMPLE DEPTH)	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	2 00 /2 00	5912	10			CLAYSTONE	10 0-12 0' Claystone same as 8 0-10 0' FID 10 0-11 0' 11 0 ppm 11 0-12 0' 5 6 ppm
				5911	11				
				5910	12				Total Depth Drilled 12 00
				5909	13				
				5908	14				
				5907	15				
				5906	16				
				5905	17				
				5904	18				
				5903	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5921 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	798006	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12196
EAST	2084792	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/06/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE REFUSAL AT 7 0' MOVE OVER 1 0 AND CONTINUED DRILLING

SAMPLE NUMBER	SAMPLE GRADATIONAL SAMPLE DEPTH	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%	2 00 /2 00	5921	0			CL	0 0-0 6' Gravelly Clay with silt moist, loamy plants, roots with gravel, road substrate with gravel, mod (qtzite-gneiss) FID 0-1 0' ND
					5920	1			CL	0 6-2 0' Silty Clay dark brown, roots, mod plasticity, moist FID 1 0-2 0' 0 5 ppm
				1 90 /2 00	5919	2			ML	2 0-2 9' Clayey Silt low plasticity, shredded from roots, some gravel (rnded qtzite), moist, some fine sand FID 2 0-3 0' 0 8 ppm 3 0-3 9' 0 6 ppm No recovery (2 9-4 0')
					5918	3				
				2 00 /2 00	5917	4			ML	4 0-6 0' Clayey Silt reddish brown, carbon, some fine sand, low to mod plasticity, moist, some brownish red mottling FID 4 0-5 0' 0 8 ppm 5 0-6 0' 2 0 ppm
					5916	5				
					5915	6			ML	6 0-6 4' Clayey Silt same as 4 0-6 0' FID 6 0-7 0' 3 0 ppm
				1 00 /2 00	5914	7			GC	6 4-7 0' Gravel (qtzite) reddish brown clayey silt (10-15%), some carbon
					5913	8			CLAYSTONE	7 0-8 0' Top of Bedrock 7 0' Clay reddish to yellow matrix with sand, with gray mottling, silty clay with some sand f g to m g, moist, mod weathered FID 7 0-7 7' 2 7 ppm
				2 00 /2 00	5912	9			CLAYSTONE	8 0-10 0' Claystone olive gray clay with yellowish red to reddish yellow mottling, stiff, mod plasticity, some silt, moist FID 8 0- 9 0' 8 5 ppm 9 0-10 0' 17 0 ppm
						10				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5921 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH 748006	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12196
EAST 2084792	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/06/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE REFUSAL AT 7 0' MOVE OVER 1 0' AND CONTINUED DRILLING

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			2 00 /2 00	5911	10			CLAYSTONE	10 0-12 0' Claystone same as 8 0-10 0', 10 5-10 7' gray clay, 11 6-12 0' very weathered, reddish yellow, moist FID 10 0-11 0' 20 0 ppm 11 0-12 0' 21 0 ppm
				5910	11				
				5909	12				Total Depth Drilled 12 00
				5908	13				
				5907	14				
				5906	15				
				5905	16				
				5904	17				
				5903	18				
				5902	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5921 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747999	AREA OU1, IASS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12296
EAST	2084824	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/06/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER

AERIAL PID OIL
GRADATIONAL SAMPLE DEPTH
SAMPLE NUMBER

SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
0% 50% 100%	0% 100%		5921	0			ML	0 0-0 4' Clayey Silt with some gravel dry, med brown FID 0-1 3' 0 3 ppm
		1 30 /2 00	5920	1			ML	0 4-1 3' Clayey silt dark brown, loamy, roots, gravel (qtzite), roots No recovery (1 3-2 0')
			5919	2			ML	2 0-2 4' Clayey Silt same as 0 4-1 3' FID 2 0-2 4' 0 3ppm No recovery (2 4-4 0')
		0 40 /2 00	5918	3				
			5917	4			ML	4 0-4 8' Clayey Silt with qtzite gravel reddish brown, dry to moist, low plasticity 15% gravel FID 4 0-4 8' 0 2 ppm No recovery (4 8-6 0')
		0 80 /2 00	5916	5				
			5915	6			G	6 0-7 0' Gravel qtzite with reddish brown clayey silt with sand matrix (15-20%), dry to moist FID 6 0-7 0' 0 1 ppm
		1 40 /2 00	5914	7			CLAYSTONE	7 0-7 4' Top of Bedrock 7 0' Claystone stiff, gray with yellow/red mottling, carbonized wood, mod plastic, moist, trace of sand @ 7 0' FID 7 0-7 4' 0 1 ppm No recovery (7 4-8 0')
			5913	8			CLAYSTONE	8 0-9 2' Claystone olive/gray with yellow/red mottling, mod plasticity, stiff, increasing weathering with depth, very weathered 8 7-9 2' FID 8 0-9 2' 1 9 ppm No recovery (9 2-10 0')
		1 20 /2 00	5912	9				
				10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5921 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747999	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12296
EAST	2084824	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/06/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE DEPTH	GRADATIONAL SAMPLE	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			0% 50% 100%	0% 100%	2 00 /2 00	5911	10			CLAYSTONE	10 0-12 0' Claystone weathered, olive gray with yellowish red mottling, mod plasticity, weathering & iron staining along fractures, stiff, moist to dry, mod weathering FID 10 0-11 0' 10 0 ppm 11 0-12 0' 6 0 ppm
						5910	11				
						5909	12			CLAYSTONE	12 0-12 7' Claystone gray, slightly weathered FID 12 0-13 0' 4 5 ppm
					1 70 /2 00	5908	13			CLAYSTONE	12 7-13 7' Claystone dark gray, some fractures with FeO2 staining FID 13 0-13 7' 5 5 ppm No recovery (13 7-14 0')
						5907	14				Total Depth Drilled 14 00
						5906	15				
						5905	16				
						5904	17				
						5903	18				
						5902	19				
							20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12.00	GROUND ELEVATION (FT) 5921.00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748024	AREA OU1, IHSS 119.1	CASING DIAMETER (IN)	GEOLOGIST W. BELCHER	12396
EAST	2084836	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1.50	DATE DRILLED 02/06/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE. NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1.70/2.00	5920	1			ML	0.0-1.7' Clayey Silt/silty clay: dark brown clayey silt to silty clay with gravel (angular to subangular gneiss), roots, dry, loamy FID: 0.0-1.0' ND 1.0-1.7' 0.3 ppm No recovery (1.7-2.0')
			0.90/2.00	5918	3			ML	2.0-2.5' Clayey Silt/silty clay: same as 0.0-1.7' FID: 2.0-2.9' 0.3 ppm
				5917	4			ML	2.5-2.9' Clayey Silt with gravel and sand: reddish brown, qtzite gravel, slightly moist, low plasticity, f.g. sand No recovery (2.9-4.0')
			1.20/2.00	5916	5			ML	4.0-5.0' Clayey Silt with gravel: reddish brown, some fine sand, low plasticity, slightly moist FID: 4.0-5.2' 0.5 ppm
				5915	6			GW	5.0-5.2' Gravel: qtzite No recovery (5.2-6.0')
			1.80/2.00	5914	7			GC	6.0-7.1' Gravel with clayey silt: red/brown clayey silt matrix, 20% qtzite gravel, slightly moist FID: 6.0-7.1' 0.6 ppm
				5913	8			CLAYSTONE	7.1-7.8' Top of Bedrock 7.1' Claystone: grayish color, stiff, mod plasticity, moist, reddish yellow mottling FID: 7.1-7.8' 0.8 ppm No recovery (7.8-8.0')
			1.20/2.00	5912	9			CLAYSTONE	8.0-10.0' Claystone: dark olive gray to light olive gray, yellowish/red mottling, dry, stiff, low to mod plasticity, some coarse qtzite sand @8.3-8.4' FID: 8.0-9.2' 3.5 ppm
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5921 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748024	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12396
EAST	2084836	LOCATOR NUMBER 18	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/06/96	
REMARKS	BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER						

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 90 /2 00	5911	10			CLAYSTONE	10 0-11 9' Claystone olive gray to dark gray, stiff, yellowish/red mottling (10 0-10 6'), slightly weathered, dry, some fracturing, friable, stiff FID 10 0-11 0' 9 5 ppm 11 0-11 9' 8 5 ppm No recovery (11 9-12 0')
				5910	11				
				5909	12				Total Depth Drilled 12 00
				5908	13				
				5907	14				
				5906	15				
				5905	16				
				5904	17				
				5903	18				
				5902	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 10 00	GROUND ELEVATION (FT)	5923 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	747978	AREA OU1, TMSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12496
EAST	2084722	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	3 50	DATE DRILLED	02/07/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER

CHEMICAL SAMPLE / GRADATIONAL SAMPLE DEPTH | SAMPLE NUMBER | SAMPLE GRAIN SIZE (0% 50% 100%) | PERCENT RECOVERY (0% 100%) | RECOVERY / INTERVAL | DATUM (FT) | DEPTH (FT) | WELL OR PIEZOMETER CONSTRUCTION | LITHOLOGY | UNIFIED SOIL CLASSIFICATION OR ROCK TYPE | DESCRIPTION

Unified Soil Classification / Rock Type	Description
CL	0 0-1 0' Sandy Clay dark brown to dark red brown (color gradation with depth), moist, roots, low to mod plasticity, some gravel (5-10%) FID 1 0-2 0' ND No recovery (1 0-2 0')
ML	2 0-2 3' same as 0 0-1 0' FID 2 0-3 3' ND
ML	2 3-3 3' Clayey Silt with qtzite gravel and some sand reddish brown, slightly moist, low plasticity No recovery (3 3-4 0')
SM	4 0-4 3' Silty sand with qtzite gravel (15%), slightly moist, f g sand FID 4 0-5 0' 0 1 ppm
CL	4 3-5 7' Clay with silt olive gray, low to mod plasticity, slightly moist, stiff FID 5 0-5 7' 0 5 ppm No recovery (5 7-6 0')
CLAYSTONE	6 0-8 0' Top of Bedrock 6 0' Claystone olive gray, low to med plasticity, slightly moist, stiff, yellowish, slight to mod weathering FID 6 0-7 0' 0 9 ppm 7 0-8 0' 1 0 ppm
CLAYSTONE	8 0-10 0' Claystone olive gray with yellowish red mottling, stiff, mod plasticity, slightly moist, slight to mod weathering FID 8 0- 9 0' 11 0 ppm 9 0-10 0' 15 0 ppm
	Total Depth Drilled 10 00

Recovery / Interval: 1 00 /2 00; 1 30 /2 00; 1 70 /2 00; 2 00 /2 00; 2 00 /2 00

Datum (ft): 5923, 5922, 5921, 5920, 5919, 5918, 5917, 5916, 5915, 5914

Depth (ft): 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5923 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	747969	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12596
EAST	2084702	LOCATOR NUMBER 18	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/07/96	
REMARKS	BACKFILL HOLE WITH 4200 ML BENTONITE						

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 70 /2 00	5922	1			ML	0 0-1 7' Clayey Silt dark brown roots, moist, lo to mod P FID 0-1 0' ND 1 0-1 7' ND No recovery (1 7-2 0')
			1 30 /2 00	5921	2			ML	2 0-2 3' Clayey Silt same as 0 0-1 7', grades into reddish brown clayey silt @ 2 2' FID 2 0-2 3' ND No recovery (2 3-4 0')
			1 40 /2 00	5920	3			ML	4 0-4 7' Clayey Silt reddish brown gravelly (qtzite & gneiss) gravel 15%, some sand, low plasticity for silt FID 4 0-4 7' ND
			1 30 /2 00	5919	4			CLAYSTONE	4 7-5 4' Claystone gray to olive gray, yellowish red mottling, stiff, mod plasticity, slightly moist FID 4 7-5 4' ND No recovery (5 4-6 0')
			1 90 /2 00	5918	5			CLAYSTONE	6 0-6 3' Claystone same as 4 7-5 4' trace silt, slight to mod weathering FID 6 0-7 3' ND No recovery (6 3-8 0')
				5917	6			CLAYSTONE	8 0-9 9' Claystone same as 4 7-5 4', slightly weathered, some bentonite @ 9 1' FID 8 0-9 0' 6 5 ppm 9 0-9 9' 7 0 ppm No recovery (9 9-10 0')
				5916	7				
				5915	8				
				5914	9				
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5923 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747969	AREA OUL, INSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12596
EAST	2084702	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/07/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	2 00 /2 00	5913	10			CLAYSTONE	10 0-12 0' Claystone same as 8 0-9 9' FID 10 0-11 0' 7 8 ppm 11 0-12 0' 7 0 ppm
				5912	11				
				5911	12				Total Depth Drilled 12 00
				5910	13				
				5909	14				
				5908	15				
				5907	16				
				5906	17				
				5905	18				
				5904	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5924 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	747959	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12696
EAST	2084682	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/07/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/ INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%		5924	0			ML	0 0-0 3 Clayey Silt dark brown, low - mod plasticity, roots, moist stiff FID 0-1 2' 0 2 ppm
			1 20 /2 00	5923	1			GW	0 3-0 6' Gravel qtzite
				5922	2			ML	0 6-1 2' Clayey Silt same as 0 0-0 3' No recovery (1 2-2 0')
			1 70 /2 00	5921	3			ML	2 0-2 9' Clayey Silt same as 0 6-1 2' grading into next unit FID 2 0-2 9' ND
				5920	4			ML	2 9-3 7' Clayey Silt with sand reddish brown, 30% qtzite gravel, low to mod plasticity, slightly moist FID 2 9-3 7' 0 1 ppm No recovery (3 7-4 0')
			1 70 /2 00	5919	5			ML	4 0-5 7' Clayey Silt with f g sand same as 2 9-3 7' FID 4 0-5 0' 0 1 ppm 5 0-5 7' 0 2 ppm No recovery (5 7-6 0')
			1 80 /2 00	5918	6			CLAYSTONE	6 0-7 6' Top of Bedrock 6 0' Claystone olive gray, becomes silt, stiff, mod P, moist, trace reddish brown coarse sand @ 6 0', qtzite gravel @ 6 6-6 7', some lt yellowish brown mottling FID 6 0-7 0' ND 7 0-8 0' ND No recovery (7 8-8 0')
				5917	7				
				5916	8			CLAYSTONE	8 0-10 0' Claystone olive gray to gray, reddish yellow mottling, stiff, mod plasticity, mod to highly weathered, some carbon, bentonite, trace silt FID 8 0-9 0' ND 9 0-10 0' 0 2 ppm
			2 00 /2 00	5915	9				
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5924 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747959	AREA OU1, TASS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12696
EAST	2084682	LOCATOR NUMBER L9	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/07/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	TOTAL SAMPLE DEPTH	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				2 00 /2 00	5914	10			CLAYSTONE	10 0-11 0' Claystone gray, some lt yellowish red mottling, slightly weathered, moist, mos plasticity, stiff, trace gravel at 10 6-10 7', m g sand, angular to sub-angular FID 10 0-11 0' 0 4 ppm 11 0-12 0' ND No recovery (11 0-12 0')
					5913	11				
					5912	12				Total Depth Drilled 12 00
					5911	13				
					5910	14				
					5909	15				
					5908	16				
					5907	17				
					5906	18				
					5905	19				
						20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5921 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747977	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12796
EAST	2084772	LOCATOR NUMBER 18	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/07/96	

REMARKS BACKFILL HOLE WITH 4800 ML BENTONITE NO FREE WATER

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
					592 1	0			SP	0 0-0 4' Gravelly Sand reddish brown, f g to m g sand FID 0-1 0' ND
				1 80 /2 00	5920	1			ML	0 4-1 6' Clayey Silt with sand dark gray, (30-40% f g sand) FID 1 0 1 8' ND No recovery (1 8-2 0')
					5919	2			ML	2 0-3 4' Clayey Silt reddish brown, matrix 30% gravel (qtzite), low - mod plasticity, slightly moist, some sand FID 2 0-2 2' 2 4 ppm 2 0-3 4' ND No recovery (3 4-4 0')
				1 40 /2 00	5918	3				
					5917	4			CL	4 0-5 0' Clay with sand olive green, stiff, moist (30-40%) FID 4 0-5 0' ND
				1 70 /2 00	5916	5			GC	5 0-6 7' Gravel with clayey silt qtzite gravel, reddish brown, clayey silt matrix low to mod plasticity, stiff FID 5 0-6 7' ND 5 0-6 7' 0 5 ppm No recovery (5 7-6 0')
					5915	6				
				1 70 /2 00	5914	7			GC	6 0-7 7' Gravel with clayey sand same as 4 4-5 7' FID 6 0-7 0' 0 5 ppm 6 0-7 7' 0 6 ppm No recovery (6 7-8 0')
					5913	8				
				1 70 /2 00	5912	9			GC	8 0-9 7' Gravel with clayey sand same as 5 0-6 7' FID 8 0-9 0' 1 3 ppm 8 0-9 7' 2 3 ppm No recovery (9 7-10 0')
						10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5921 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747977	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12796
EAST	2084772	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/07/96	

REMARKS BACKFILL HOLE WITH 4800 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	0 90 /2 00	5911	10			CLAYSTONE	10 0-10 9 Top of Bedrock 10 0' Claystone olive gray, stiff, mod P, moist, some carbon, mottled yellow/red, mod to heavily weathered FID 10 0-10 9' 0 5 ppm No recovery (10 9-12 0')
				5910	11				
				5909	12			CLAYSTONE	12 0-14 0' Claystone olive gray, stiff, dry to moist, yellowish red mottling, some carbon, slight to mod weathering FID 12 0-13 0' ND 13 0-14 0' ND
			2 00 /2 00	5908	13				
				5907	14				Total Depth Drilled 14 00
				5906	15				
				5905	16				
				5904	17				
				5903	18				
				5902	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5925 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748801	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	12896
EAST	2084716	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/08/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOIL CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%	1 50 /2 00	5925	0			ML	0 0-1 5' Clayey Silt dark brown, moist, some gravel (gneiss), roots, stiff, plastic FID 0-1 0' ND 1 0-1 5' 0 2 ppm No recovery (1 5-2 0')
				1 50 /2 00	5924	1				
					5923	2			ML	2 0-2 7' Clayey Silt same as 0 0-1 5', increasing gravel (qtzite) content with depth (5-30%) FID 2 0-3 0' 0 2 ppm
				1 50 /2 00	5922	3			ML	2 7-3 5' Clayey Silt with gravel reddish brown, gravel qtzite (30%), low to mod plasticity, some sand f g to c g, moist FID 3 0-3 5' 0 3 ppm No recovery (3 5-4 0')
					5921	4				
				1 50 /2 00	5920	5			ML	4 0-5 5' Clayey Silt with gravel qtzite gravel (30%), reddish brown clayey silt, low to mod plasticity, moist FID 4 0-5 0' 0 7 ppm 5 0-5 5' 0 6 ppm No recovery (5 5-6 0')
					5919	6			ML	6 0-6 7' Clayey Silt with gravel same as 4 0-5 5' FID 6 0-7 0' 3 0 ppm
				1 70 /2 00	5918	7			CL	6 7-7 7' Clay olive gray with yellowish red mottling, moist, stiff, mod plasticity, some carbon with fine sand, some bentonite, mod to highly weathered FID 7 0-7 7' 6 5 ppm No recovery (7 7-8 0')
					5917	8			CL	8 0-8 8' Clay same as 6 7-7 7', 8 0-8 2' bentonite rich zone trace fine sand FID 8 0-9 0' 8 0 ppm 9 0-9 8' 3 0 ppm No recovery (8 8-10 0')
				1 80 /2 00	5916	9				
						10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5925 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748001	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12896
EAST	2084716	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/08/96	
REMARKS	BACKFILL HOLE WITH 3600 ML BENTONITE						

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%	2 00 /2 00	5915	10			CL	10 0-10 6' Clay same as 8 0-8 8' some gravel @ 10 6', moist, mod to slight mottling (decreasing with depth) Possible slide surface at 10 6' FID 10 0-11 0' 1 5 ppm
				5914	11			CLAYSTONE	10 6-12 0' Top of Bedrock 10 6' Claystone slightly weathered claystone, slight yellowish red mottling, friable, dry, low plasticity, dark olive green FID 11 0-12 0' 2 0 ppm
				5913	12				Total Depth Drilled 12 00
				5912	13				
				5911	14				
				5910	15				
				5909	16				
				5908	17				
				5907	18				
				5906	19				
					20				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 16 00	GROUND ELEVATION (FT)	5928 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH 748027	AREA 001, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12996
EAST 2084724	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/08/96	

REMARKS BACKFILL HOLE WITH 2400 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%		5928	0			ML	0 0-0 7' Clayey Silt dark brown, roots, moist, low - mod plasticity (top soil) FID 0-1 0' 0 5 ppm
			1 60 /2 00	5927	1			GP	0 7-1 2' Gravel with some silt qtzite gravel, dry FID 1 0-1 6' 0 6 ppm
				5926	2			ML	1 2-1 6' Clayey Silt with some clay, sand and gravel, moist, low - mod plasticity, dark reddish brown, qtzite gravel No recovery (1 6-2 0')
			1 70 /2 00	5925	3			ML	2 0-3 7' Clayey Silt with gravel dark brown, fine sand, stiff, low - mod plasticity, qtzite gravel FID 2 0-3 0' 1 5 ppm 3 0-3 7' 2 0 ppm No recovery (3 7-4 0')
				5924	4				
			2 00 /2 00	5923	5			ML	4 0-6 0' Clayey Silt reddish brown, low to mod plasticity, moist, trace qtzite gravel FID 4 0-5 0' 10 0 ppm 5 0-6 0' 7 0 ppm
				5922	6			ML	6 0-7 4' Clayey Silt same as 4 0-6 0' with more gravel (10-15%) FID 6 0-7 0' 13 0 ppm 7 0-7 6' 5 5 ppm
			1 60 /2 00	5921	7			GW	7 4-7 6' Gravel qtzite, angular to subangular No recovery (7 6-8 0')
				5920	8			GC	8 0-8 7' Gravel (qtzite) >80% with reddish brown clayey silt with sand matrix 20% mod plasticity, slightly moist FID 8 0-9 2' 6 5 ppm
			1 20 /2 00	5919	9			GW	8 7-9 2' Sandy Gravel (qtzite), light tan color, dry No recovery (9 2-10 0')
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 16 00	GROUND ELEVATION (FT)	5928 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748027	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	12996
EAST	2084724	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/08/96	

REMARKS BACKFILL HOLE WITH 2400 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%			10			GC	10 0-10 8' Clayey Silty Gravel with sand red/brown, 30% gravel, low - mod plasticity, moist FID 10 0-11 0' 15 0 ppm
			2 00 /2 00	5917	11			CL	10 8-12 0' Clay olive gray, yellowish red mottling, mod plasticity, moist, some silt FID 11 0-12 0' 61 0 ppm
				5916	12			GC	12 0-12 9' Clayey Gravel same as 10 0-12 0' FID 12 0-13 0' 53 0 ppm
			2 00 /2 00	5915	13			GC	12 9-13 8' Clayey Silty Gravel same as 10 0-10 8' FID 13 0-14 0' 11 0 ppm
				5914	14			CLAYSTONE	13 8-14 0' Top of Bedrock 13 8' Claystone same as 12 0-12 9', possible slide surface at 13 8'
			2 00 /2 00	5913	15			CLAYSTONE	14 0-14 8' Claystone same as 13 8-14 0' FID 14 0-15 0' 9 5 ppm
				5912	16			CLAYSTONE	14 8-16 0' Claystone dark olive gray, some red/yellow mottling, friable, dry, slightly weathered (unweathered bedrock?) FID 15 0-16 0' 5 0 ppm
				5911	17				Total Depth Drilled 16 00
				5910	18				
				5909	19				
					20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 16 00	GROUND ELEVATION (FT) 5926 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	747991	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13096
EAST	2084699	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/08/96	

REMARKS BACKFILL HOLE WITH 5400 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY / INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			1 70 /2 00	5926 5925 5924	0 1 2			ML	0 0-1 7' Clayey Silt with sand dark brown, roots, moist, mod plasticity, stiff FID 0-1 0' ND 1 0-1 7' ND No recovery (1 7-2 0')
			1 90 /2 00	5923 5922	3 4			ML	2 0-3 9' Clayey Silt with some fine sand and trace fine gravel FID 2 0-3 0' ND 3 0-3 9' 0 5 ppm No recovery (3 9-4 0')
			2 00 /2 00	5921 5920	5 6			ML	4 0-6 0' Clayey Silt with sand reddish brown, red brown, moist stiff, mod plasticity, trace gravel (qtzite) FID 4 0-5 0' 1 5 ppm 5 0-6 0' 1 0 ppm
			1 70 /2 00	5919 5918	7 8			GC	6 0-7 0' Clayey gravel with sand and silt same as 4 0-6 0' 30% gravel FID 6 0-7 0' 0 6 ppm
								SW	7 0-7 3' Gravel qtzite FID 7 0-7 7' 0 5 ppm
								GC	7 3-7 7' Clayey Gravel same as 6 0-7 0' No recovery (7 7-8 0')
			1 70 /2 00	5917	9 10			GC	8 0-10 0' Clayey Gravel same as 6 0-7 0', 30-50% qtzite gravel FID 8 0-9 0' 1 0 ppm 9 0-9 7' 0 7 ppm

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 16.00	GROUND ELEVATION (FT)	5926.00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	747991	AREA OU1, IHSS 119.1	CASING DIAMETER (IN)		GEOLOGIST	W. BELCHER	13096
EAST	2084699	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1.50	DATE DRILLED	02/08/96	

REMARKS BACKFILL HOLE WITH 5400 ML BENTONITE. NO FREE WATER

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% – 50%)	PERCENT RECOVERY (100% 0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
					5916	10			SC	10.0-10.7 same as 8.0-8.7' FID 10.0-10.9' 2.0 ppm
				0.90/2.00	5915	11			CLAYSTONE	10.7-10.9' Top of Bedrock 10.7' Clay olive gray, yellowish red mottling, stiff, mod plasticity, moist, mod weathered No recovery (10.9-12.0')
					5914	12			CLAYSTONE	12.0-14.0' Claystone same as 10.7-10.9', bentonite, moist to dry bentonite layer @ 12.2' FID 12.0-13.9' 5.0 ppm 13.0-14.0' 1.5 ppm
				2.00/2.00	5913	13				
					5912	14			CLAYSTONE	14.0-14.9' Claystone same as 12.0-14.0', moist at top to dry FID 14.0-14.9' 1.5 ppm No recovery (14.9-16.0')
				0.90/2.00	5911	15				
					5910	16				Total Depth Drilled 16.00
					5909	17				
					5908	18				
					5907	19				
						20				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5930 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH 748046	AREA 001, TMSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	13196
EAST 2084713	LOCATOR NUMBER L3	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/12/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%					ML	0 0-1 0' Clayey Silt dark brown, moist, root, stiff, gravel and sand (10%), qtzite gravel FID 0-1 0' ND No recovery (1 0-2 0')
			1 00 /2 00	1			ML	2 0-3 4' Clayey Silt with sand med yellow/red/brown, slightly moist, low plasticity, stiff, qtzite gravel @3 35-3 45' FID 2 0-3 0' ND 3 0-3 4' ND No recovery (3 4-4 0')
			1 40 /2 00	2			ML	4 0-4 2' Clayey Silt same as 2 0-3 4' FID 4 0-5 2' ND
			1 20 /2 00	3			GC	4 2-5 2' Gravel qtzite with clayey silt, reddish brown, slightly moist, low - mod plasticity, stiff No recovery (5 2-6 0')
			1 90 /2 00	4			CLAYSTONE	6 0-7 9' Top of Bedrock 6 0' Claystone with silt olive gray, moist, mod plasticity, stiff, yellowish red mottling, trace fine sand some bentonite FID 6 0-7 0' 2 5 ppm 7 0-7 9' 10 0 ppm No recovery (7 9-8 0')
			2 00 /2 00	5			CLAYSTONE	8 0-10 0' Claystone same as 6 0-7 9', some fractures FID 8 0- 9 0' 26 0 ppm 9 0-10 0' 35 0 ppm
				10				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5930 00	PROJECT NUMBER	GEOCHAR
NORTH 748046	AREA OU1, TWSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER
EAST 2084713	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/12/96

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE

LOG OF BORING NUMBER

13196

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%	1 90 /2 00	5920 5919 5918 5917 5916 5915 5914 5913 5912 5911	10 11 12 13 14 15 16 17 18 19 20			CLAYSTONE	10 0-10 6' same as 8 0-10 0' FID 10 0-11 0' 57 0 ppm
									CLAYSTONE	10 6-12 0' Claystone dark olive gray to dark gray, slightly to non-weathered, moist, stiff, friable, slightly moist FID 11 0-11 9' 54 0 ppm
										Total Depth Drilled 12 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5929 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748020	AREA OUI, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	13296
EAST	2084702	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/12/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5929	0			ML	0 0-0 6' Clayey Silt, dark brown, roots, with sand, moist FID 0-0 6' 1 0 ppm
			0 60 /2 00	5928	1				No recovery (0 6-2 0')
				5927	2			ML	2 0-2 9' Clayey Silt with fine sand some lt yellowish mottling, moist, stiff, mod plasticity, some gravel FID 2 0-3 0' ND 3 0-3 9' 1 2 ppm
			1 90 /2 00	5926	3				No recovery (2 9-4 0')
				5925	4			CL	4 0-4 8' Silty Clay with sand and gravel olive gray, moist, stiff, yellowish red mottling, mod plasticity FID 4 0-5 0' 1 5 ppm
			2 00 /2 00	5924	5			GC	4 8-5 1' Clayey Gravel silty to clayey sand with coarse sand matrix and gravel (qtzite) 50-70% FID 5 0-6 0' 2 5 ppm
				5923	6			CL	5 1-6 0' Silty Clay with sand and gravel olive gray, moist stiff, mod plasticity, yellowish red mottling
			2 00 /2 00	5922	7			CL	6 0-8 0' Clay some as 5 1-6 0', some bentonite clay, with gravel @ 4 4' FID 6 0-7 0' 4 5 ppm 7 0-8 0' 12 0 ppm
				5921	8			CLAYSTONE	8 0-9 9' Top of Bedrock 8 0' Clay dark olive gray, stiff, slightly moist, mod plasticity, friable, some yellowish red mottling FID 8 0-9 0' 24 0 ppm 9 0-9 9' 22 0 ppm
			1 90 /2 00	5920	9				No recovery (9 9-10 0')
					10				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5929 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH 748020	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST	W BELCHER	13296
EAST 2084702	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED	02/12/96	
REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER					

CHEMICAL SAMPLE DEPTH	GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			0% 50% 100%	0% 100%	1 90 /2 00	5919 5918 5917 5916 5915 5914 5913 5912 5911 5910	10 11 12 13 14 15 16 17 18 19 20			CLAYSTONE CLAYSTONE	10 0-10 2' Claystone olive gray, yellow/red mottling, mod weathered FID 10 0-11 0' 26 0 ppm 10 2-12 0' Claystone same as 8 0-9 9' FID 11 0-11 9' 13 0 ppm Total Depth Drilled 12 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5931 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748038	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13396
EAST	2084692	LOCATOR NUMBER 18	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/12/96	
REMARKS NO FREE WATER					

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
	0% 50% 100%	0% 100%						GC	0 0-1 4' Gravel with clayey silt dark brown, slightly moist, roots, stiff, qtzite gravel 0-1 4' ND No recovery (1 4-2 0')
			1 40 /2 00	5930	1				
				5929	2			GC	2 0-2 2' Gravel qtzite (60%), gravel with clayey silt matrix, olive gray to gray brown FID 2 0-3 0' ND
			1 60 /2 00	5928	3			ML	2 2-3 6 Clayey Silt with sand olive gray to gray brown, some gravel, stiff, moist, roots FID 3 0-3 6' ND No recovery (3 6-4 0')
				5927	4			CL	4 0-4 6' Silty Clay olive gray, stiff, yellowish red mottling, moist, some gravel FID 4 0-5 0' ND
			2 00 /2 00	5926	5			CLAYSTONE	4 6-6 0' Top of Bedrock 4 6' Claystone reddish yellow clay with olive gray mottling, moist, stiff, highly weathered FID 5 0-6 0' ND
				5925	6			CLAYSTONE	6 0-7 9' Claystone olive gray to gray, yellow red mottling, mod to highly weathered, stiff, moist FID 6 0-7 0' ND 7 0-7 9' ND No recovery (7 9-8 0')
			1 90 /2 00	5924	7				
				5923	8			CLAYSTONE	8 0-9 4' Claystone olive gray to gray, slightly moist, stiff, slightly weathered, some yellow red mottling along fractures FID 8 0-9 4' 3 5 ppm No recovery (9 4-10 0')
			1 40 /2 00	5922	9				
					10				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5931 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH 748038	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13396
EAST 2084692	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/12/96	
REMARKS NO FREE WATER				

VERTICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				2 00 /2 00	5920	10 11			CLAYSTONE	10 0-12 0' Claystone same as 8 0-9 4' FID 10 0-11 0' 6 5 ppm 11 0-12 0' 8 5 ppm
				2 00 /2 00	5918	12 13			CLAYSTONE	12 0-14 0' Claystone same as 10 0-12 0', very stiff, dark gray with some yellow red mottling along fractures FID 12 0-13 0' 10 0 ppm 13 0-14 0' 11 0 ppm
					5917	14				Total Depth Drilled 14 00
					5916	15				
					5915	16				
					5914	17				
					5913	18				
					5912	19				
						20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT)	5934 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748069	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	13496
EAST	2084704	LOCATOR NUMBER 18	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/12/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER

TEXTURE GRADATIONAL SAMPLE DEPTH

SAMPLE NUMBER

SAMPLE GRAIN SIZE (0% – 50% – 100%)

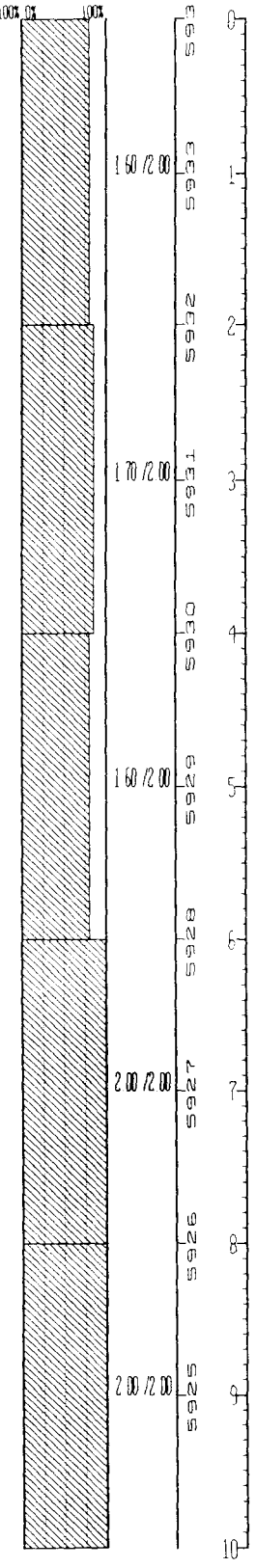
PERCENT RECOVERY (0% – 100%)

RECOVERY/INTERVAL

DATUM (FT) / DEPTH (FT)

WELL OR PIEZOMETER CONSTRUCTION

LITHOLOGY



UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
ML	0 0-0 5' Clayey Silt med brown to dark brown, slightly clayey silt, roots, stiff, slightly moist FID 0-1.5' ND 1.0
GC	0 5-1 6' Gravel 30-50% clayey silt matrix qtzite gravel (50-70%), dry FID 1 0-1 6' ND No recovery (1 6-2 0')
ML	2 0-3 7' Clayey Silt dark brown, sand and gravel (57%), moist, stiff low to mod plasticity FID 2 0-3 0' ND 3 0-3 7' ND No recovery (3 7-4 0')
GW	4 0-4 2' Gravel qtzite, dry FID 4 0-5 0' ND
CLAYSTONE	4 2-5 6' Top of Bedrock 4 2' Claystone with silt olive gray, yellow red mottling, stiff, mod plasticity, moist FID 5 0-5 6' ND No recovery (5 6-6 0')
CLAYSTONE	6 0-8 0' Claystone yellowish red with olive gray to gray mottling highly weathered, stiff, moist, mod plasticity FID 6 0-7 0' ND 7 0-8 0' ND
CLAYSTONE	8 0-10 0' Claystone olive gray with yellowish red mottling, moist, stiff, mod P, mottling decreases with depth, friable at bottom FID 8 0- 9 0' ND 9 0-10 0' ND

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5934 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748069	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13496
EAST	2084704	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/12/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER

TEXTURE GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
0%		50%	100% 0% 100%	2 00 /2 00	5924	10			CLAYSTONE	10 0-12 0' Claystone olive gray with yellowish red mottling, friable, slight to mod weathered, stiff, slightly moist to dry FID 10 0-11 0' ND 11 0-12 0' ND
					5923	11				
					5922	12			CLAYSTONE	12 0-14 0' Claystone same as 10 0-12 0', yellow red staining along fractures FID 12 0-13 0' ND 13 0-14 0' ND
				2 00 /2 00	5921	13				
					5920	14				Total Depth Drilled 14 00
					5919	15				
					5918	16				
					5917	17				
					5916	18				
					5915	19				
						20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5930 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748809	AREA OUL, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13596
EAST	2084683	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/13/96	

REMARKS BACKFILL HOLE WITH BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5930	0			GC	0 0-1 7' Gravel with clayey sandy silt dry to slightly moist, roots, stiff, med brown FID 0-1 0' ND 1 0-1 7' 0 5 ppm No recovery (1 7-2 0')
			1 70 /2 00	5929	1				
				5928	2			SW	2 0-2 2' gravel qtzite FID 2 0-3 2' 0 5 ppm
			1 20 /2 00	5927	3			ML	2 2-3 2' Clayey Silt med brown, fine clayey sand with gravel (qtzite) very stiff, moist, low to mod plasticity No recovery (3 2-4 0')
				5926	4			ML	4 0-6 0' Clayey Silt with f g sand med brown, stiff, moist, mod plasticity FID 4 0-5 0' 1 0 ppm 5 0-6 0' 2 0 ppm
			2 00 /2 00	5925	5				
				5924	6			ML	6 0-7 4' Clayey Silt with sand same as 4 0-6 0' FID 6 0-7 0' 2 0 ppm 7 0-7 8' 2 0 ppm
			1 80 /2 00	5923	7			GC	7 4-7 8' Gravel qtzite with reddish brown clayey silt-clayey sand matrix, mod plasticity, moist No recovery (7 8-8 0')
				5922	8			CLAYSTONE	8 0-9 8' top of Bedrock 8 0' Clay with silt olive gray with yellowish red mottling, moist, stiff, mod P, gravel rich (75%) at 8 0-8 2', med to low plasticity FID 8 0-9 0' 3 0 ppm 9 0-9 8' 4 0 ppm No recovery (9 8-10 0')
			1 80 /2 00	5921	9				
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT)	5930 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748009	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	13596
EAST	2084683	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/13/96	

REMARKS BACKFILL HOLE WITH BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			2 00 /2 00	5919	10–11			CLAYSTONE	10 0-12 0' Claystone same as 8 0-9 8' FID 10 0-11 0' 6 0 ppm 11 0-12 0' 9 0 ppm
			2 00 /2 00	5917	12–13			CLAYSTONE	12 0-14 0' Claystone olive gray to gray with some yellowish red mottling, moist, very stiff, mod plasticity friable at base FID 12 0-13 0' 3 0 ppm 13 0-14 0' 1 0 ppm
				5916	14				Total Depth Drilled 14 00

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5929 00	PROJECT NUMBER	GEOCHAR
NORTH 748031	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER
EAST 2084671	LOCATOR NUMBER LB	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/13/96

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE

LOG OF BORING NUMBER

13696

CHEMICAL SAMPLE DEPTH / GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% – 50% – 100%)	PERCENT RECOVERY (0% – 100%)	RECOVERY / INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
					5929	0			ML	0 0-1 9' Clayey Silt dark brown, moist, roots, some gravel, stiff FID 0 0-1 0' ND 1 0-1 9' ND No recovery (1 9-2 0')
				1 90 /2 00	5928	1				
					5927	2			CLAYSTONE	2 0-3 2' Top of Bedrock 2 0' Claystone olive gray with yellowish red mottling, stiff, moist, mod plasticity FID 2 0-3 0' ND 3 0-4 0' ND
				2 00 /2 00	5926	3				
					5925	4			CLAYSTONE	3 2-3 5' Claystone with sand slightly weathered, red/yellow to yellow red mottling
				1 90 /2 00	5924	5			CLAYSTONE	3 5-4 0' Claystone olive gray with yellowish red mottling, stiff, moist, mod plasticity
					5923	6			CLAYSTONE	4 0-4 9' Claystone same as 2 0-4 0' FID 4 0-5 0' ND 5 0-5 9' ND No recovery (4 9-6 0')
				1 80 /2 00	5922	7			CLAYSTONE	6 0-6 6' Claystone same as 4 0-4 9', highly weathered, yellow/red mottling FID 6 0-7 0' ND
					5921	8			CLAYSTONE	6 6-7 8' Claystone darker olive gray, slightly friable, some yellow/red mottling, hard, unweathered at 6 6' FID 7 0-7 8' ND No recovery (7 8-8 0')
				2 00 /2 00	5920	9			CLAYSTONE	8 0-10 0' Claystone same as 6 6-7 8', friable, dark gray, hard FID 8 0- 9 0' ND 9 0-10 0' ND
						10				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5929 00	PROJECT NUMBER	GEOCHAR
NORTH 749031	AREA 001, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER
EAST 2084671	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/13/96
REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE					

LOG OF BORING NUMBER

13696

CHEMICAL SAMPLE DEPTH	GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			0% 50% 100%	0% 100%	2 00 /2 00	5919	10			CLAYSTONE	10 0-12 0' Claystone same as 8 0-10 0' FID 10 0-11 0' 0 1 ppm 11 0-12 0' ND
						5918	11				
						5917	12				Total Depth Drilled 12 00
						5916	13				
						5915	14				
						5914	15				
						5913	16				
						5912	17				
						5911	18				
						5910	19				
							20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT)	5934 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748060	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	13796
EAST	2084677	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/13/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	GRADATIONAL SAMPLE DEPTH	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 50% 100%	0% 100%	1 60 /2 00	5933	0			ML	0 0-1 6' Clayey Silt dark brown, with sand, stiff, moist, dry, mod plasticity FID 0-1 0' ND 1 0-1 6' ND No recovery (1 6-2 0')
				1 90 /2 00	5932	1			ML	2 0-3 9' Clayey Silt with fine sand brown, moist, stiff, some gravel, roots FID 2 0-3 0' ND 3 0-3 9' ND No recovery (3 9-4 0')
				2 00 /2 00	5931	2			CL	4 0-5 6' Clay olive gray with yellowish red mottling, moist, mod plasticity, stiff, fine sand and gravel @ 5 3-5 6' FID 4 0-5 0' ND 5 0-6 0' ND
				1 70 /2 00	5930	3			CLAYSTONE	5 6-6 0' Top of Bedrock 5 6' Claystone olive gray with yellowish red mottling, moist mod plasticity
				2 00 /2 00	5929	4			CLAYSTONE	6 0-7 7' Claystone olive gray with yellowish red mottling to yellow red clay with gray mottling, mod plasticity, moist, stiff, mod - highly weathered (increasing weathering with depth) FID 6 0-7 0' ND 7 0-7 7' ND No recovery (7 7-8 0')
					5928	5			CLAYSTONE	8 0-10 0' Claystone olive gray with yellowsih red mottling, plastic, moist, stiff, fine reddish sand @ 8 9' FID 8 0- 9 0' ND 9 0-10 0' ND
					5927	6				
					5926	7				
					5925	8				
						9				
						10				

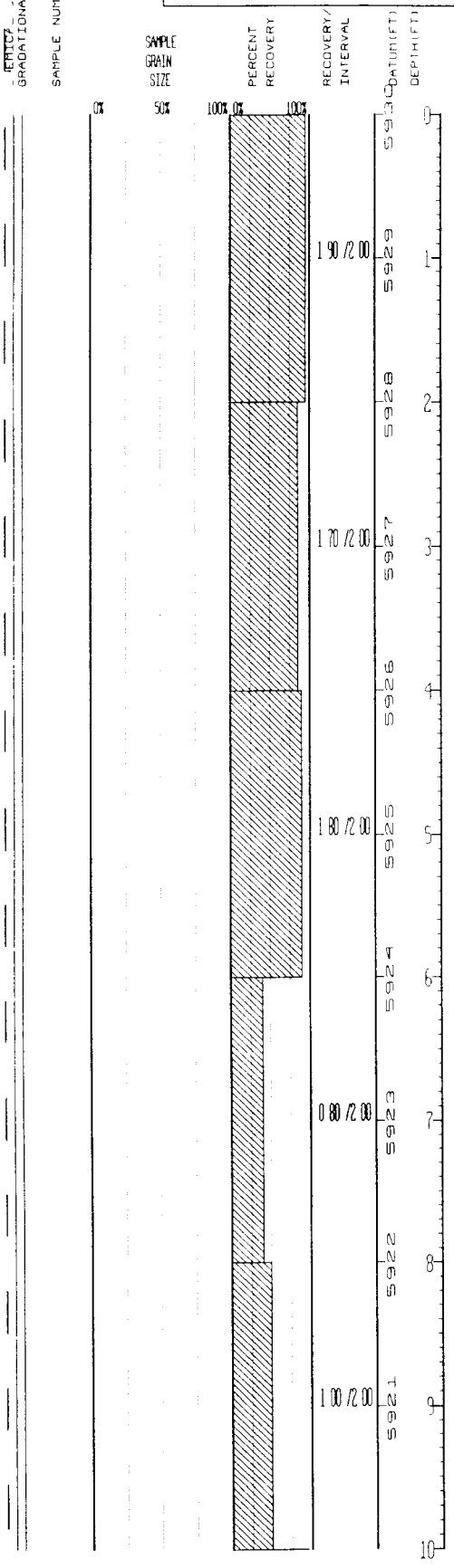
STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5934 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748060	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13796
EAST	2084677	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 2 50	DATE DRILLED 02/13/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			2 00 /2 00	5923	11			CLAYSTONE	10 0-12 0' Claystone olive grey med to dark, v stiff, friable from 10 9', some yellowish red mottling, moist FID 10 0-11 0' ND 11 0-12 0' ND
			2 00 /2 00	5921	13			CLAYSTONE	12 0-14 0' Claystone dark grey v stiff, hard, slightly moist, some yellow/red mottling FID 12 0-13 0' ND 13 0-14 0' ND
				5920	14				Total Depth Drilled 14 00

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT)	5930 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	748054	AREA 001, THSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	13896
EAST	2084735	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/14/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER



UNIFIED SOIL CLASSIFICATION OR ROCK TYPE	DESCRIPTION
CL	0 0-1 9' Gravelly Clay dark brown, qtzite gravel, some silt with sand, dry to slightly moist, roots, stiff FID 0-1 0' ND 1 0-1 9' ND No recovery (1 9-2 0')
ML	2 0-3 7' Clayey Silt with sand lt yellow to brown, stiff, moist, mod plasticity, roots, some gravel FID 2 0-3 0' ND 3 0-3 7' ND No recovery (3 7-4 0')
ML	4 0-4 3' Clayey Silt with gravel and sand dark yellowish brown stiff moist, mod plasticity, qtzite gravel, fine sand FID 4 0-5 0' 0 2 ppm
GP	4 3-4 5' Gravel qtzite (70%) with clayey silt matrix
ML	4 5-5 8' Clayey Silt with gravel and sand dark yellowish brown stiff, moist, mod plasticity, some qtzite gravel and fine sand FID 5 0-5 8' 0 4 ppm No recovery 5 8-6 0'
GC	6 0-6 8' Gravel with clayey silt qtzite and gneiss gravel, sandy silt matrix, stiff, moist, reddish brown, low - mod plasticity FID 6 0-6 8' 0 5 ppm No recovery (6 8-8 0')
GC	8 0-8 2' Gravel qtzite, olive gray clay with silt matrix, yellowish red mottling, moist, mod plasticity FID 8 0-9 0' 6 0 ppm

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5930 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748054	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13896
EAST	2084735	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/14/96	

REMARKS BACKFILL HOLE WITH 4200 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY / INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5920	10			CLAYSTONE	8 2-9 0' Top of Bedrock 8 2' Claystone olive gray with yellowish red mottling, moist, stiff, mod plasticity, bentonite No recovery (9 0-10 0')
			1 90 /2 00	5919	11				
				5918	12			CLAYSTONE	10 0-11 9' Claystone same as 8 2-9 0' FID 10 0-11 0' 7 0 ppm 11 0-11 9' 9 0 ppm No recovery (11 9-12 0')
			2 00 /2 00	5917	13				
								CLAYSTONE	12 0-12 9' Claystone same as 10 0-11 9' FID 12 0-13 0' 33 0 ppm
				5916	14			CLAYSTONE	12 9-14 0 Claystone same as 12 0-12 9' but friable olive gray FID 13 0-14 0' 166 0 ppm
									Total Depth Drilled 14 00
				5915	15				
				5914	16				
				5913	17				
				5912	18				
				5911	19				
					20				

STATE PLANE COORDINATE	TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT)	5924 00	PROJECT NUMBER	GEOCHAR
NORTH 748036	AREA QUI, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER
EAST 2084797	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/13/96

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

LOG OF BORING NUMBER **13996**

SAMPLE NUMBER	SAMPLE GRAIN SIZE	PERCENT RECOVERY	RECOVERY / INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
		0% 100% 0% 100%	2 00 /2 00	5924	0			ML	0 0-2 0' Clayey Silt with fine sand dark brown, roots, stiff some gravel, moist, mod plasticity FID 0-1 0' 6 5 ppm 1 0-2 0' 58 0 ppm
				5923	1				
			1 50 /2 00	5922	2			ML	2 0-2 3' Clayey Silt with sand brown, some gravel, stiff, moist, mod plasticity FID 2 0-3 0' 52 0 ppm
				5921	3			GP	2 3-3 1' Gravel qtzite, some clayey silt with fine sand FID 3 0-3 5' 50 0 ppm
								SC	3 1-3 5' Clayey Sand with silt yellowish brown, stiff, moist, low-mod plasticity No recovery (3 5-4 0')
				5920	4				
			1 60 /2 00	5919	5			GC	4 0-5 6' Gravel qtzite gravel (50-60%) with reddish brown clayey silt matrix, stiff, moist, low to mod plasticity FID 4 0-5 0' 25 0 ppm 5 0-5 6' 23 0 ppm No recovery (5 6-6 0')
				5918	6			ML	5 0-6 6' Clayey Silt with sand reddish brown, stiff, moist, mod plasticity
			1 60 /2 00	5917	7			GC	6 6-7 6' Silty Gravel same as 4 0-5 6' FID 6 0-7 0' 37 0 ppm 7 0-7 6' 8 5 ppm No recovery (7 6-8 0')
				5916	8			GC	8 0-8 5' Silty Gravel same as 6 6-7 6' FID 8 0-9 1' 6 0 ppm
			1 10 /2 00	5915	9			CLAYSTONE	8 5-9 1' Top of Bedrock 8 5' Claystone olive gray with yellowish mottling, stiff, moist, mod plasticity No recovery (9 1-10 0')
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 12 00	GROUND ELEVATION (FT) 5924 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748036	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	13996
EAST	2084797	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/13/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

AEMIC GRADATIONAL SAMPLE DEPTH	SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY/INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				2 00 /2 00	5914	10			CLAYSTONE	10 0-12 0' Claystone same as 8 5-9 1', some friability, slight to mod weathering, darker olive gray FID 10 0-11 0' 2 1 ppm 11 0-12 0' 3 5 ppm
					5913	11				
					5912	12				Total Depth Drilled 12 00
					5911	13				
					5910	14				
					5909	15				
					5908	16				
					5907	17				
					5906	18				
					5905	19				
						20				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT) 5934 00	PROJECT NUMBER GEOCHAR	LOG OF BORING NUMBER
NORTH	748081	AREA OUI, IHSS 119 1	CASING DIAMETER (IN)	GEOLOGIST W BELCHER	14096
EAST	2084728	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN) 1 50	DATE DRILLED 02/14/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY / INTERVAL	ELEVATION (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
				5933	0			ML	0 0-0 8' Clayey Silt dark brown, with sand, dry - slightly moist, plants and roots, mod plasticity, stiff FID 0-0 8' ND
			0 80 /2 00	5933	1				No recovery (0 8-2 0')
				5932	2			ML	2 0-3 6' Clayey Silt with fine sand brown - reddish brown, moist, stiff, roots, mod plasticity FID 2 0-3 0' 0 5 ppm 3 0-4 0' ND
			1 60 /2 00	5931	3				No recovery (3 6-4 0')
				5930	4			ML	4 0-6 0' Clayey Silt with fine sand and gravel (qtzite & gneiss) dark brown, stiff, moist, mod plasticity FID 4 0-5 0' ND 5 0-6 0' ND
			2 00 /2 00	5929	5			ML	6 0-6 4' Clayey Silt same as 4 0-6 0' FID 6 0-7 0' 0 4 ppm
				5928	6			GC	6 4-7 3' Gravel same as 4 0-6 0' with 50% qtzite gravel FID 7 0-7 8' 0 9 ppm
			1 80 /2 00	5927	7			GC	7 3-7 8' Gravel qtzite, with dark brown to reddish brown clayey silt-clayey sand matrix, low - mod plasticity, moist, stiff No recovery (7 8-8 0')
				5926	8			GC	8 0-8 6' Gravel same as 7 3-7 8' FID 8 0-9 1' ND
			1 10 /2 00	5925	9			CLAYSTONE	8 6-9 1' Top of Bedrock 8 6' Claystone olive gray, stiff, mod plasticity, moist, some yellowish red mottling No recovery (9 1-10 0')
					10				

STATE PLANE COORDINATE		TOTAL DEPTH (FT) 14 00	GROUND ELEVATION (FT)	5934 00	PROJECT NUMBER	GEOCHAR	LOG OF BORING NUMBER
NORTH	798081	AREA OU1, IHSS 119 1	CASING DIAMETER (IN)		GEOLOGIST	W BELCHER	14096
EAST	2084728	LOCATOR NUMBER L8	BOREHOLE DIAMETER (IN)	1 50	DATE DRILLED	02/14/96	

REMARKS BACKFILL HOLE WITH 3600 ML BENTONITE NO FREE WATER

SAMPLE NUMBER	SAMPLE GRAIN SIZE (0% 50% 100%)	PERCENT RECOVERY (0% 100%)	RECOVERY / INTERVAL	DATUM (FT)	DEPTH (FT)	WELL OR PIEZOMETER CONSTRUCTION	LITHOLOGY	UNIFIED SOILS CLASSIFICATION OR ROCK TYPE	DESCRIPTION
			2 00 /2 00	5923	11			CLAYSTONE	10 0-12 0 Claystone olive gray, with yellowish red mottling, moist, mod plasticity, stiff, friable @ base (11 1') FID 10 0-11 0' ND 11 0-12 0' ND
			2 00 /2 00	5921	13			CLAYSTONE	12 0-14 0' Claystone dark olive gray, friable, v stiff, slightly moist - dry, yellowish red mottling FID 12 0-13 0' 0 8 ppm 13 0-14 0' 1 1 ppm
				5920	14				Total Depth Drilled 14 00
				5919	15				
				5918	16				
				5917	17				
				5916	18				
				5915	19				
					20				